AGENDA

AUBURN HILLS

Planning Commission
Wednesday, August 12, 2026 ❖ 6:00 p.m.

LOCATION: Council Chamber
1827 N. Squirrel Road ❖ Auburn Hills, MI

PHONE: 248-364-6900 www.auburnhills.org
Meeting minutes are on file in the City Clerk's office.

1. **MEETING CALLED TO ORDER**

2. **ROLL CALL OF PLANNING COMMISSION**

3. **PERSONS WISHING TO BE HEARD** (regarding items not on the agenda)

4. **APPROVAL OF MINUTES** – July 8, 2026

5. **PETITIONERS**

   5a. Text Amendment to the Zoning Ordinance
   Public Hearing/Motion - Recommend to City Council the approval of the text amendment to Article XII. T&R, Technology and Research Districts; Article XIII. I-1, Light Industrial Districts; Article XIV. I-2, General Industrial Districts; and Article XVIII, General Provisions of the Zoning Ordinance, to address new provisions for clean industrial uses and establish comprehensive standards for data centers.

6. **UNFINISHED BUSINESS**

7. **NEW BUSINESS**

8. **COMMUNICATIONS**

9. **NEXT SCHEDULED MEETING** – Wednesday, September 9, 2026 at 6:00 p.m. – Council Chamber

10. **ADJOURNMENT**

➢ **NOTE:** Anyone planning to attend the meeting who needs special assistance under the Americans with Disabilities Act (ADA) is asked to contact the City Clerk's Office at 248-370-9402 or the City Manager's Office at 248-370-9440 48 hours before the meeting. Staff will be pleased to make the necessary arrangements.

IMPORTANT NOTICE TO PETITIONERS
Items will be presented to the City Council on **Monday, August 24, 2026.** It will be necessary for you to have a representative present to answer any questions from the City Council. ***CITY COUNCIL WILL NOT ACT ON YOUR ITEM IF YOU OR YOUR REPRESENTATIVE ARE NOT PRESENT.***

***** SEE REVERSE SIDE FOR PUBLIC HEARING PROCEDURE *****

AUBURN HILLS

PLANNING COMMISSION - PUBLIC HEARING PROCEDURE

Below is the public hearing procedure the Chairperson will strive to follow:

1. The Chair will declare the public hearing open and state the time at which it is opened.
2. The Chair will ask City staff if the hearing documents are in order.
3. The Chair will ask City staff if there are any written communications on the item.
4. The Chair will ask City staff to provide their presentation and recommendation.
5. The Chair will ask if the petitioner, or a representative of the petitioner, is present and for their comments.
6. After the presentations are made by City staff and the petitioner, the Chair will ask the Commission if they have any questions for the City staff and the petitioner.
7. The Chairperson asks for comments from the audience.
8. After comments from the audience are provided, the Chairperson closes the public hearing.
9. The Chair will ask the Commission for a Motion and for a Second to the Motion.
10. There may be further discussion on the motion, except if a Commission member makes a motion to table the item.
11. Lastly, the Chair will ask for a Roll Call Vote on the Motion.

Rules of conduct for public comments.

- All individual public comments shall be addressed to the Chairperson
- Each person will be given an opportunity to be heard. Persons may speak only once, unless additional input is authorized by the Chairperson.
- All comments shall be pertinent to the issue at hand and not excessively repetitive.
- For large hearings, the Chairperson may impose a time limit per person on all comments.
- The Chairperson expects courtesy from all participants during the public hearing; applause, booing, shouting, or other public outbursts will not be tolerated.

CITY OF AUBURN HILLS
PLANNING COMMISSION
MINUTES
NOT YET APPROVED

July 8, 2026

CALL TO ORDER: Chairperson Beidoun called the meeting to order at 6:00 p.m.

ROLL CALL: Present: **Carolyn Shearer, Michelle Case, Raymond Saelens, Darlene MacMillan, Jack Ferguson, Dominick Tringali, Cynthia Pavlich, Dominic Patrus, Sam Beidoun**
Absent: None.
Also Present: Director of Community Development Steve Cohen, Assistant Director of Community Development Devin Lang, Attorney Zachary Learman
Guests: None

LOCATION: Council Chambers, 1827 N. Squirrel Road, Auburn Hills, MI 48326

3. PERSONS WISHING TO BE HEARD

4. APPROVAL OF MINUTES – June 3, 2026

Moved by Ferguson to approve the minutes of June 3, 2026.
Second by Saelens.
VOTE: Yes: Saelens, Shearer, MacMillan, Case, Ferguson, Pavlich, Tringali, Patrus, Beidoun
No: None **Motion Carried (9-0)**

5. PETITIONERS

5a. Text Amendment to the Zoning Ordinance (6:02 p.m.)
Public Hearing/Motion – Recommendation to City Council for approval of a text amendment to Article VIII. B-1, Limited Business Districts, and Article IX. B-2, General Business Districts of the Zoning Ordinance.

Mr. Cohen confirmed that the hearing documents were in order and that no communications had been received regarding the petition.

Mr. Cohen explained that, on June 15, 2026, the City Council approved a license renewal and location transfer request for an adult-use marihuana establishment. The approval allows the licensed business to relocate from 1801 N. Opdyke Road to 4141 Joslyn Road. While the license transfer is governed by the City's Adult-Use Marihuana Establishments Ordinance, the proposed location must also comply with the Zoning Ordinance.

He further explained that the zoning text amendments establishing adult-use marihuana establishments as "Other Uses Permitted by the City Council on Certain Properties" in Sections 804 and 905 identify approved locations by Tax Identification Number. As a result, implementing the approved relocation requires a corresponding text amendment to update the approved location in the Zoning Ordinance.

Mr. Cohen advised that, following the Planning Commission's recommendation, the City Council will consider final action on the proposed zoning text amendment at its July 20, 2026 meeting.

Ms. Pavlich stated that there are few questions because Mr. Cohen has prepared thorough documents explaining the petition.

Mr. Saelens stated that this is a good location.

Mr. Beidoun asked if all four licenses for marihuana establishments allowed in the City have been approved. Mr. Cohen stated that all four have been approved by the City. Mr. Beidoun asked if there had been any problems at the other locations. Mr. Cohen explained that litigation has delayed the projects, but there have not been any other problems.

Ms. Shearer asked if the neighbors on Joslyn are accepting of this new location. Mr. Cohen explained that it is a shopping center area, with no impacted residential areas.

Mr. Saelens asked how large the space is. Mr. Cohen stated that it is approximately 1700 square feet.

Mr. Patrus asked if this site will have a drive-through. Mr. Cohen stated that it will not.

Mr. Patrus asked if there is a specific marihuana district. Mr. Cohen explained that there was a competitive licensing process. There is no specific district, but there are specific criteria that must be met, for example, a specific distance from schools, churches, etc. City Council chose the four best locations in the competitive process.

Mr. Beidoun asked if the owner of this property has other licenses in the City. Mr. Cohen explained that one group has three of the licenses in the City, operating under different LLCs.

Mr. Beidoun opened the public hearing at 6:10 p.m. There being no public comments, Mr. Beidoun closed the public hearing at 6:10 p.m.

Moved by Pavlich to recommend to City Council approval of the text amendment to Article VIII. B-1, Limited Business Districts, and Article IX. B-2, General Business Districts of the Zoning Ordinance.
Second by Case.
VOTE:
Yes: Pavlich, Saelens, Case, MacMillan, Shearer, Patrus, Tringali, Ferguson, Beidoun
No: None **Motion Carried (9-0)**

6. UNFINISHED BUSINESS – None.

7. NEW BUSINESS – None.

8. COMMUNICATIONS
Mr. Cohen provided an update on the progress of the Chill Box project located at the former YMCA site. He showed before-and-after photographs illustrating the significant improvements made to the property since redevelopment began.

Mr. Cohen advised that the City Council accepted the Commission's findings and recommendations regarding the editorial update to the Master Land Use Plan and authorized staff to distribute the draft amendment to the required agencies and stakeholders in accordance with State law. He noted that, following the required 42-day review period, the Commission is scheduled to hold a public hearing and consider adoption of the updated Master Land Use Plan at its September 9, 2026 meeting.

9. NEXT SCHEDULED MEETING
The next scheduled meeting is on Wednesday, August 12, 2026 at 6:00 p.m. in the Auburn Hills Council Chambers.

10. ADJOURNMENT
There being no further business, Chairperson Beidoun adjourned the meeting at 6:22 p.m.

Submitted by:
Susan McCullough, MiPMC III, CMC
Recording Secretary

CITY OF AUBURN HILLS
PLANNING COMMISSION AGENDA

MEETING DATE: AUGUST 12, 2026 **AGENDA ITEM NO 5a.**

COMMUNITY DEVELOPMENT

To: **Chairperson Sam Beidoun and the Planning Commission**
From: **Steven J. Cohen, AICP, Director of Community Development**
Submitted: **August 5, 2026**
Subject: **Public Hearing / Motion – Recommend to City Council the approval of the enclosed text amendment to Article XII. T&R, Technology and Research Districts; Article XIII. I-1, Light Industrial Districts; Article XIV. I-2, General Industrial Districts; and Article XVIII, General Provisions of the Zoning Ordinance, to address new provisions for clean industrial uses and establish comprehensive standards for data centers.**

INTRODUCTION AND HISTORY

The attached text amendment to the Zoning Ordinance updates the City's regulations governing technology-related land uses and establishes appropriate standards for data center development. The primary purpose of the proposed amendment is to ensure that data centers are located in appropriate areas and are designed and operated to minimize potential impacts on surrounding properties, while supporting the City's long-term economic development objectives.

The proposed amendment includes the following key changes:

1. Updates the intent and purpose statement for the T&R District to better reinforce the district's intended role as a location for corporate offices, research and development, and other high-quality employment uses.
2. Establishes clean industrial uses as a Special Land Use within the T&R District, permitting advanced manufacturing when the City finds such activities compatible with the district's character and surrounding development.
3. Removes data processing and computing centers and related services as a principal permitted use in the T&R and I-1 Zoning Districts.
4. Establishes data centers as a Special Land Use only within the I-1 and I-2 Districts, subject to the requirements of new Section 1837. The amendment also prohibits new data centers within the T&R District, except through approval of a Planned Unit Development (PUD) when the applicant demonstrates and the City agrees that the proposed location is appropriate, considering available infrastructure, compatibility with adjacent development, and consistency with the City's long-term planning objectives.
5. Creates a new Section 1837, Data Centers, within the General Provisions. This section establishes comprehensive standards for the location, design, and operation of data centers to help ensure compatibility with adjacent properties.

BACKGROUND

Data centers are a growing topic nationwide. They provide essential technology services, but residents often raise concerns about increased electricity use, noise, and visual impact. A recent Gallup poll found that about 71% of Americans oppose new data centers in their communities.

This staff report neither advocates for nor opposes data center development. Instead, it outlines the regulatory approach recommended by City staff, which is based on sound planning principles, technical data, and Auburn Hills' specific circumstances. The goal is to offer a fair, balanced, and fact-based framework for assessing this emerging land use.

BACKGROUND (cont.)

Under the Michigan Zoning Enabling Act, the City cannot ban a legal land use simply because it is controversial or unpopular. Zoning rules must be reasonable, fact-based, and consistent with legitimate planning goals. The City's role is to determine where a land use is suitable and to set standards that protect nearby properties, residents, businesses, and public infrastructure.

To understand the recommended approach, it helps to first understand what a data center is. In simple terms, data centers are the buildings that power the internet. They house servers that support cloud computing, artificial intelligence, online banking, healthcare records, streaming services, and many other digital services people rely on every day. Like private utilities, such as fiber-optic networks and cell towers, data centers have become an essential part of today's economy and technology infrastructure.

The recommendations in this report are based on three primary sources:

1. The City's experience with reviewing and regulating the modernization of the US Signal data center at 1035 West Entrance Drive.
2. Research into how municipalities across the country plan for and regulate data center development.
3. Coordination with DTE Energy concerning Auburn Hills' electrical infrastructure, available capacity, and the capability to support future data center development.

The City staff has prepared a pragmatic ordinance for Auburn Hills that would impose stricter regulations on data centers than those currently mandated by the City. This draft has been developed using local insights, industry research, and technical data from DTE Energy. The regulations aim to protect neighboring properties, promote responsible economic growth, and establish a transparent, predictable process for evaluating future data center projects.

UNDERSTANDING DATA CENTERS AND THEIR VARIOUS SIZES

Public concern about data centers often focuses on a specific type called "hyperscale" data centers. These are very large campuses built by major tech firms to support cloud computing, AI, and large-scale digital services. Hyperscale data centers have raised issues such as noise, increased demands on electrical and water systems, and impacts on community character. However, such large facilities are unlikely in Auburn Hills because the City lacks the land, utilities, and electrical capacity needed for them. A few locations in the northern part of the City could host medium- to large-sized data centers if electrical infrastructure is upgraded and zoning requirements are met. Smaller centers, such as the existing US Signal facility, could fit within the City's T&R and industrial zones, given the existing electrical infrastructure. Therefore, it's important for the City to set clear zoning standards now to guide where these facilities can be built, ensure they are compatible with surrounding uses, and address potential impacts before new proposals are considered.

US SIGNAL: 1035 W. ENTRANCE DR
75,400 SF
Proposed: 12 MW

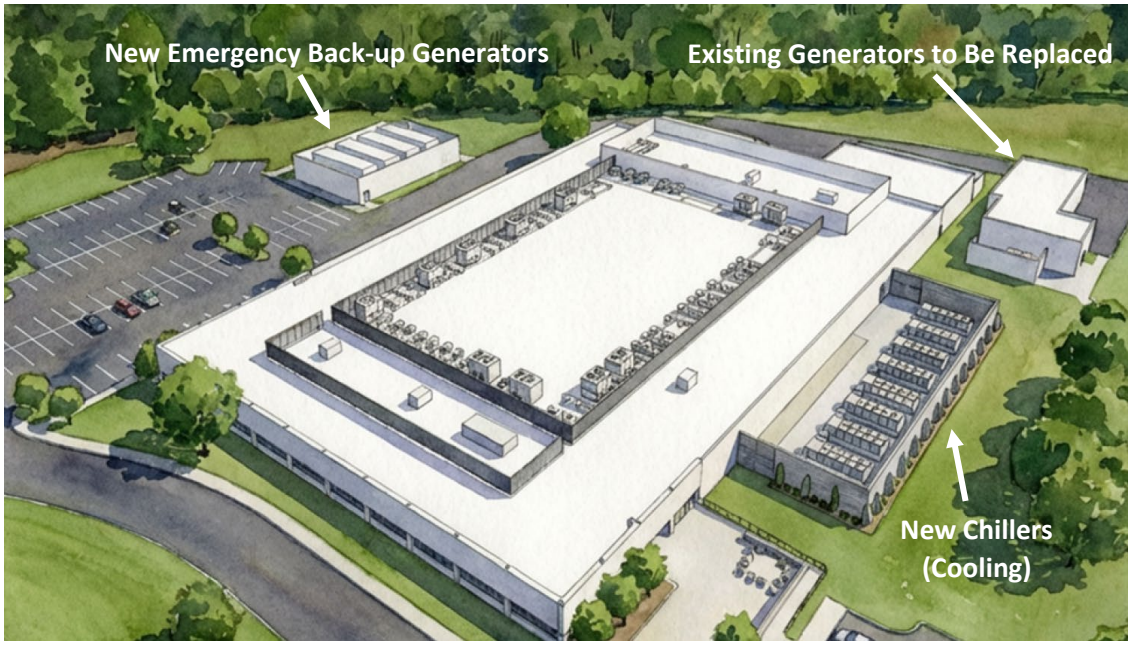
OPEN AI: SALINE DATA CENTER, PROJECT STARGATE
~1,650,000 SF (550,000 SF Each Building)
Proposed: 1.4 GW (1,400 MW)

UNDERSTANDING DATA CENTERS (cont.)

Data centers generally fall into three categories, each serving a distinct purpose:

1. Enterprise data centers, 4-10 megawatts (MW), are generally smaller facilities managed by a single company to support its own operations and, occasionally, its clients' technology requirements.
2. Colocation data centers, 10-50 MW, are managed by a third-party provider that leases secure space to various businesses. Each tenant is responsible for installing, owning, and managing its servers and equipment, while sharing infrastructure such as power, cooling, security, and electrical backup systems.
3. Hyperscale data centers, exceeding 50 MW, are extensive facilities developed and managed by leading tech firms. They support cloud computing, AI, streaming services, and other internet-based applications utilized by millions of people worldwide.

The existing US Signal facility is a colocation data center where multiple businesses lease space for their servers and technology equipment. US Signal acquired the facility in 2024 and owns and operates the building, electrical systems, cooling equipment, security systems, and other supporting infrastructure. The facility provides secure, reliable data services to a major Auburn Hills employer, regional healthcare providers, financial institutions, and other businesses throughout Metro Detroit. Originally built in 1986 as the EDS Information Processing Center, the building has operated continuously as a data center for about 40 years. To meet growing demand, US Signal is upgrading the facility's electrical capacity from approximately 6 to 12 MW, including improvements to cooling systems, standby emergency generators, and other supporting infrastructure. These $120 million upgrades are being made within the existing site, allowing the facility to expand its capacity while continuing its established operations.



Renderings of the US Signal property with all phases completed

WHY MODERN DATA CENTERS REQUIRE SPECIFIC ZONING STANDARDS

Data centers provide essential services that support today's modern economy. They enable businesses, government agencies, healthcare providers, and individuals to store, process, and access the digital information and services they rely on every day. At the same time, data centers operate differently from traditional industrial uses. They require significant electrical infrastructure, operate 24 hours a day, and rely on cooling systems and backup generators to keep services running without interruption. They also typically have fewer employees than many industrial buildings of a similar size. Because of these differences, traditional industrial zoning standards may not fully address the impacts associated with data center development.

People nationwide have raised common concerns about data centers, including noise, visual impact, utility requirements, water consumption, emergency generator testing, and compatibility with adjacent properties. Noise is often a major issue because cooling systems run continuously, producing low-frequency sounds that are especially noticeable at night. Additionally, testing backup generators can cause temporary noise disturbances if not carefully scheduled and controlled. Because of these unique characteristics, many communities have adopted zoning standards tailored to data centers. These standards address site design, noise control, equipment screening, operational requirements, and protection of surrounding properties.

Data hall inside US Signal

For these reasons, City staff recommends that Auburn Hills adopt a proactive approach by updating the Zoning Ordinance before additional data center proposals are submitted. Establishing clear standards now will provide a predictable review process, protect nearby residents and businesses, and ensure that future applications are evaluated consistently and objectively. These standards will allow the City to appropriately guide future data center development while balancing economic opportunities with the protection of surrounding properties and the City's long-term planning goals.

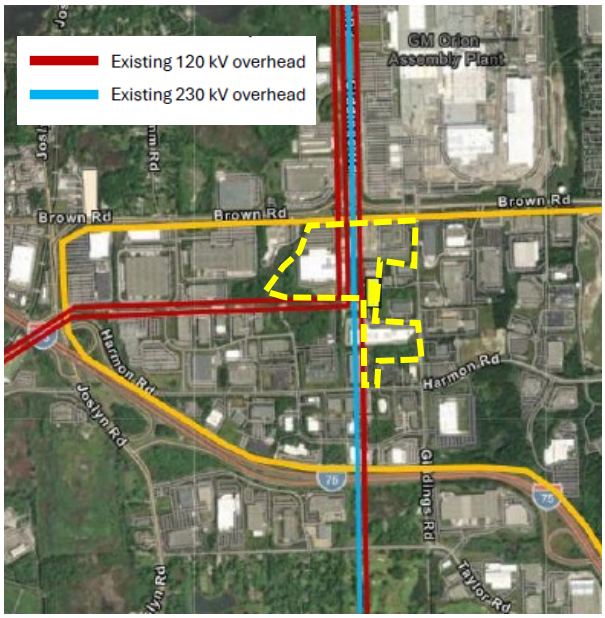
CITY STAFF CONSULTATION WITH DTE ENERGY

As part of developing regulations for future data center development, City staff evaluated the factors that influence where these facilities can be appropriately located within Auburn Hills. The review considered electrical capacity, fiber connectivity, available properties, surrounding land uses, and potential impacts on nearby properties. A key component of this evaluation was consultation with DTE Energy to better understand the City’s ability to support different types and sizes of data centers.

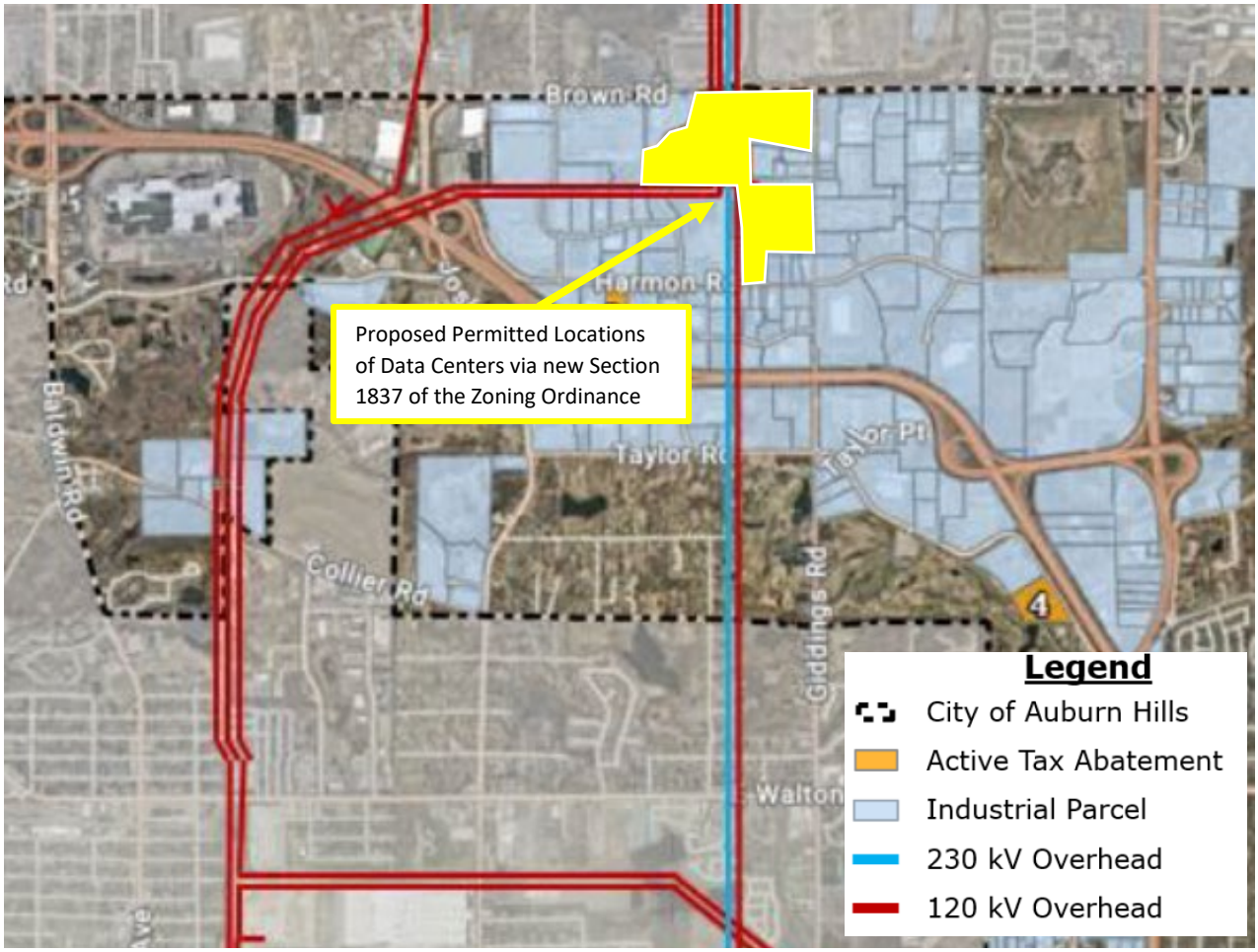
Data centers rely on two key resources: reliable electrical power and high-speed fiber connectivity. Auburn Hills has robust fiber infrastructure and an established electrical system that already serves corporate offices, research facilities, and industrial and commercial entities. Conversations with DTE Energy confirmed that Auburn Hills can host small- and mid-sized data centers in suitable locations. Facilities requiring 10 to 50 MW of power could be feasible where there is ample property, utility capacity, and appropriate site conditions. These developments would require coordination with DTE Energy to verify electrical availability and determine whether any upgrades are necessary.

CITY STAFF CONSULTATION WITH DTE ENERGY (cont.)

The evaluation also identified limitations associated with very large data center developments. Facilities requiring more than 50 MW of electrical capacity, particularly large-scale and hyperscale facilities requiring 100 MW or more, constitute a distinct category of development due to their substantial power demands. These facilities typically require major investments in electrical infrastructure, including transmission upgrades, new substations, and other utility upgrades. Such upgrades require extensive planning, engineering, permitting, and construction (at the developer's cost) before electrical service can be provided.



Based on the evaluation conducted by DTE Energy and City staff, a limited number of areas within the northern portion of Auburn Hills were identified as having the greatest potential for larger data center development due to their proximity to existing electrical transmission infrastructure. Properties near Summit Drive may be capable of supporting facilities in the 15-30 MW range. Larger properties along Brown Road have greater potential for 50-100 MW+ because they may provide sufficient space for additional electrical infrastructure, such as substations and related equipment, needed to support larger facilities.



Proposed permitted data center locations in Auburn Hills

CITY STAFF CONSULTATION WITH DTE ENERGY (cont.)

DTE Energy also stated that facilities exceeding 50 MW require detailed coordination with the utility. Depending on the project's size and location, transmission enhancements may be needed. These upgrades could take approximately 3 to 4 years to plan, design, permit, and construct, requiring considerable time and financial investment at the developer's expense before electrical service is available.

AUBURN HILLS DATA CENTER ORDINANCE – KEY ISSUES

The City's proposed regulations aim to establish a clear, predictable process for future data center projects. The goal is to protect neighboring properties, promote compatibility with surrounding land uses, and foster Auburn Hills' long-term economic growth. After evaluating infrastructure, land use, and community impacts, City staff recommends classifying data centers as a specialized industrial use requiring careful oversight. These rules do not prohibit data centers but define appropriate locations and set standards to ensure their proper design, operation, and maintenance.

1. **Site Selection Analysis**. In developing the proposed regulations, City staff conducted a citywide review to identify suitable locations for future data centers. The review assessed factors such as zoning, land availability, electrical and utility infrastructure, surrounding land uses, potential noise and visual impacts, and alignment with the City's Master Land Use Plan. It identified a small number of properties, primarily in existing industrial zones in northern Auburn Hills, that are well suited for future data center development. These sites offer better opportunities to meet infrastructure needs and minimize conflicts with nearby properties. Five of the six sites are within the I-1, Light Industrial District, and the sixth is in the I-2, General Industrial District. All are located between Brown Road and Harmon Road, west of Giddings Road. Given their size, location, and access to utilities, these industrial properties could support data centers of various scales, depending on market conditions and electrical capacity. This strategy also supports the City's focus on redevelopment and adaptive reuse. As Auburn Hills approaches full development of its remaining T&R and industrial land, the proposed regulations promote reusing existing industrial buildings and underutilized properties rather than relying solely on the limited supply of vacant land.
2. **Elimination of Data Centers as a Permitted Use in the T&R District.** The proposed ordinance would remove data centers as a permitted use in the T&R District. Instead, future data centers would be directed to the industrial properties identified in Section 1837, which are better suited for facilities with high electrical demand, specialized mechanical equipment, backup power systems, and other supporting infrastructure. To provide flexibility for future circumstances, the ordinance also includes the option to use a PUD. A data center proposed on a site not identified in Section 1837 may be considered if the applicant demonstrates that the location is appropriate, the Planning Commission recommends approval, and the City Council determines that the proposal is consistent with the City's planning objectives and ordinance standards. This approach recognizes that data centers are an important part of today's digital economy while preserving the T&R District's primary purpose of employment, technology, research, innovation, and corporate campus development. Data centers generally create fewer permanent jobs than research and development, engineering, advanced manufacturing, and corporate office uses. Given Auburn Hills' limited supply of remaining T&R-zoned land, City staff believes these properties should continue to support higher-employment uses consistent with the district's long-term vision. The existing US Signal data center is a unique case. Because it was lawfully established before the proposed ordinance, it would become a legally recognized nonconforming use and could continue operating under its approved site plan and its existing Development Agreement with the City. The Development Agreement includes enforceable requirements for noise, facility operations, monitoring, mitigation measures, and future expansion, providing protections beyond the City's zoning ordinance. Any major expansion, modification, or change beyond the facility's existing approvals would require review through the PUD process. This would allow the Planning Commission to evaluate the proposal and recommend to the City Council, which would make the final decision.

AUBURN HILLS DATA CENTER ORDINANCE – KEY ISSUES (cont.)

3. **Data Centers Classified as Industrial Land Use.** While the existing US Signal facility shows that a smaller data center can operate effectively in the T&R District with proper safeguards, City staff's assessment indicates that modern data centers have evolved substantially from the original technology types envisioned more than 40 years ago. Today's data centers function more like infrastructure-intensive industrial facilities, requiring significant electrical capacity, specialized cooling, backup power, and other support systems. These characteristics differ from those of the corporate offices, R&D centers, and engineering operations the T&R District was created to support. The City also reviewed the need to maintain appropriate distances between data centers and sensitive areas such as residential neighborhoods, parks, schools, and places of worship. Although mitigation measures can minimize impacts, the equipment and ongoing operations still require careful assessment because of potential noise, visual, and operational effects. Classifying future data centers as industrial land use helps locate them where impacts can be better evaluated, mitigated, and managed, reducing conflicts with nearby properties.

4. **Essential Provisions and Requirements of the Data Center Ordinance**
   The proposed ordinance establishes standards to ensure that data centers are appropriately located, designed, and operated in a manner compatible with surrounding properties. Key requirements include:
   A. **Purpose and Intent**. Establish standards that balance economic development opportunities with the protection of surrounding properties, infrastructure reliability, resource efficiency, and the long-term preservation of the T&R District for higher-employment technology and research uses.
   B. **Allowed Locations**. Identify specific industrial properties where data centers may be considered and direct future development to areas with appropriate infrastructure and compatible land uses. A PUD may be considered for other locations at the City Council's discretion if the applicant demonstrates the location's suitability.
   C. **Noise and Operations**. Require professional noise studies, operational monitoring, and compliance with established standards to address common concerns about noise nuisances from cooling systems, generators, and other outdoor mechanical equipment.
   D. **Emergency Backup Generators.** Limit routine generator testing, require noise controls, and allow emergency operation during power outages.
   E. **Appearance and Screening**. Require screening of mechanical equipment, compatible building design, and appropriate security fencing.
   F. **Water and Cooling Systems**. Require disclosure of cooling systems and water needs, with an emphasis on efficient, closed-loop cooling that uses little to no domestic water.
   G. **Electrical and Infrastructure**. Require demonstration of available electrical capacity and establish that applicants are responsible for required utility improvements.
   H. **Safety and Emergency Planning**. Require coordination with emergency services and compliance with applicable safety and fire codes.
   I. **Future Expansion**. Require disclosure of the ultimate build-out plans and potential increases in facility capacity.
   J. **Development Agreement**. Require a recorded agreement that runs with the land and establishes enforceable standards for noise, operations, monitoring, inspections, and corrective actions.

STAFF RECOMMENDATION

The proposed ordinance is based on the finding that data centers are infrastructure-intensive industrial uses that differ from traditional office, research, and industrial facilities because of their high electrical demand, specialized cooling systems, backup power equipment, and limited permanent staffing. These characteristics require specific standards to address potential impacts on noise, visual appearance, utility infrastructure, emergency operations, and compatibility with surrounding properties.

STAFF RECOMMENDATION (cont.)

The proposed ordinance establishes a balanced regulatory framework that recognizes the economic and technological importance of data centers while ensuring they are appropriately sited, designed, and operated. Rather than prohibiting data centers, the amendment directs future facilities to suitable locations, sets clear performance standards, and preserves areas intended for higher-employment corporate, research, and technology uses.

Based on the analysis in this report, City staff recommends approval of the proposed text amendment. The Kelly Firm has reviewed the amendment and found it legally acceptable.

MOTION

Move to recommend to City Council the approval of the enclosed text amendment to Article XII. T&R, Technology and Research Districts; Article XIII. I-1, Light Industrial Districts; Article XIV. I-2, General Industrial Districts; and Article XVIII, General Provisions of the Zoning Ordinance, to address new provisions for clean industrial uses and establish comprehensive standards for data centers.

Planning Commission
Public Notice

Meeting Date, Time, and Location:	**Wednesday, August 12, 2026 at 6:00 p.m.** City of Auburn Hills - City Council Chambers 1827 N. Squirrel Road, Auburn Hills, MI 48326
Applicant:	City of Auburn Hills
Nature of the Request:	Recommendation to City Council for approval of a text amendment to the following sections of the Zoning Ordinance: • Article XII. T&R, Technology and Research Districts • Article XIII. I-1, Light Industrial Districts • Article XIV. I-2, General Industrial Districts • Article XVIII. General Provisions
City Staff Contact:	Steven J. Cohen, AICP Director of Community Development - 248-364-6941

The proposed amendments can be inspected during regular City business hours before the meeting at the Community Development Department, located on the municipal campus at 1827 N. Squirrel Road, Auburn Hills, MI 48326.

Persons wishing to express their views may do so in person at the meeting or in writing addressed to the Planning Commission c/o Steve Cohen, Director of Community Development, at the above address.

Individuals requiring special assistance to attend or participate in the meeting in accordance with the Americans with Disabilities Act (ADA) should contact the City Clerk's Office at (248) 370-9402 or the City Manager's Office at (248) 370-9440 at least 48 hours prior to the meeting. The City will make reasonable accommodations upon request.

DRAFT
8-03-26

CITY OF AUBURN HILLS

COUNTY OF OAKLAND

STATE OF MICHIGAN

ORDINANCE NO. 26-951

TEXT AMENDMENT TO ZONING ORDINANCE

AN ORDINANCE TO AMEND ARTICLE XII. T&R, TECHNOLOGY AND RESEARCH DISTRICTS, ARTICLE XIII. I-1, LIGHT INDUSTRIAL DISTRICTS, ARTICLE XIV. I-2, GENERAL INDUSTRIAL DISTRICTS, AND ARTICLE XVIII. GENERAL PROVISIONS OF THE AUBURN HILLS ZONING ORDINANCE NO. 372

THE CITY OF AUBURN HILLS ORDAINS

Section 1.
Article XII. T&R, Technology and Research Districts of Auburn Hills Zoning Ordinance No. 372 is amended to revise the preamble to read as follows:

> The T&R, Technology and Research Districts are established to provide a high-quality environment for corporate and regional headquarters, research and development facilities, advanced technology enterprises, automation and robotics operations, aerospace, life sciences, biotechnology, information technology, engineering, and other employment-generating uses of a similar character and intensity. The Districts are intended to support Auburn Hills' role as a hub for corporate investment, innovation, and advanced technology employment opportunities by encouraging the development of businesses and facilities that contribute to the City's diversified economic base.
>
> Technology and Research Districts are intended to be located and designed to:
> 1. Support innovation, investment, and economic growth by providing a business environment that encourages the development, retention, expansion, and diversification of technology-based, research-oriented, and advanced employment uses across multiple industry sectors;
> 2. Accommodate complementary accessory and support uses that serve the operational needs of businesses and employees within the District, provided such uses remain clearly secondary and supportive of the District's primary corporate, research, technology, and employment-generating functions;
> 3. Promote high-quality development standards through coordinated site planning, building design, architecture, landscaping, and infrastructure improvements that reflect the District's importance as a location for corporate, research, and advanced technology investment; and

4. Protect the long-term function and economic vitality of the District by ensuring compatibility among permitted uses, maintaining adequate infrastructure capacity, and encouraging development patterns that are consistent with surrounding land uses and the City's long-range planning objectives.

Section 2.

Article XII. T&R, Technology and Research Districts of Auburn Hills Zoning Ordinance No. 372 is amended to revise Section 1200. Principal Uses Permitted to remove subsection 2. Data processing and computing centers, and related services, and renumber subsections 3-5 to 2-4 to read as follows:

SECTION 1200. PRINCIPAL USES PERMITTED

In the T&R Technology and Research District no building or land shall be used and no building shall be erected except for one (1) or more of the following specified uses, unless otherwise provided in this Ordinance:

1. Any use charged with the principal function of research, design, and development of pilot or experimental products and processes including research labs, training facilities, and light assembly operations as adjuncts to the principal use. Assembly operations shall be limited to those involving premanufactured finished objects and components and shall include only the incidental fabrication, machining, or forming of metal, plastic, or other materials as part of product development, experimentation, demonstration and repair, or the provision of customized components.
2. Single and multi-tenant office buildings. Sales as an adjunct to the principal use are also permitted.
3. Accessory buildings and accessory uses customarily incidental to any of the above principal uses permitted (e.g., child care, food service, and health/workout rooms, and other similar adjunct uses provided within a facility which are intended for sole use of the workers of said facility and not the general public).
4. Uses determined to be similar to the above principal permitted uses in accordance with the criteria set forth in Section 1827 and which are not listed below as Special Land Uses Permitted.

Section 3.

Article XII. T&R, Technology and Research Districts of Auburn Hills Zoning Ordinance No. 372 is amended to revise subsection 7 in Section 1201. Special Land Uses Permitted to read as follows:

7. Clean industrial uses may be permitted as Special Land Uses within the T&R District when conducted entirely within an enclosed building and when consistent with the purpose and intent of the District. Such uses shall comply with the requirements of Section 1202 and shall be subject to the following standards:
   A. Definition and Operational Characteristics. For purposes of this Section, a clean industrial use is a light industrial operation involving the assembly, incidental fabrication, processing, testing, research, development, or production of advanced technology, high-value, precision, or specialized products within an enclosed building. Clean industrial uses shall utilize processes designed to minimize external impacts, including noise, vibration, odors, dust, smoke, emissions, outdoor storage, and truck traffic. A clean industrial use may constitute the principal use of a site and need not be accessory to an office, research and development, or corporate headquarters use. A clean industrial use does not include a Data Center, as defined in Section 1837.

B. Site and Building Design Standards. Buildings and sites occupied by clean industrial uses shall maintain the high-quality character and development standards of the T&R District through superior site design, landscaping, greenspace, and architecture. Building elevations visible from public rights-of-way, private road easements, or adjacent properties shall incorporate high-quality materials, glazing, and architectural features consistent with a corporate, research, or technology-oriented appearance.

C. Transportation and Freight Limitations. Truck traffic associated with clean industrial uses shall be limited to deliveries and shipments customary and incidental to the operation of the use. Warehouses, distribution centers, fulfillment centers, freight terminals, logistics facilities, and similar uses whose primary function is the storage, distribution, or movement of goods are prohibited, regardless of whether such facilities include office, corporate, or administrative space. Uses that are dependent upon high-volume truck traffic or intensive freight movement are likewise prohibited.

Section 4.

Article XIII. I-1, Light Industrial Districts of Auburn Hills Zoning Ordinance No. 372 is amended to revise Section 1300. Principal Uses Permitted to remove subsection 4. Data processing and computing centers, and related services, and renumber subsections 5-7 to 4-6 to read as follows:

SECTION 1300. PRINCIPAL USES PERMITTED:

In the I-1 Light Industrial Districts no building or land shall be used and no building shall be erected except for one (1) or more of the following specified uses, unless otherwise provided for in this Ordinance:

1. Any of the following uses when conducted wholly within a completely enclosed building (no outside storage of permanent vehicles, material or equipment):
    - A. Warehousing and wholesale establishments, with retail sale only if accessory to the principal use.
    - B. The manufacture, compounding, processing, packaging, or treatment of such products as, but not limited to: bakery goods, candy, cosmetics, pharmaceuticals, toiletries, food products, hardware, and cutlery; tool, die, gauge and machine shops.
    - C. The manufacture, compounding, assembling or treatment of articles or merchandise from previously prepared materials such as , but not limited to: bone, canvas, cellophane, cloth, cork, feathers, felt, fiber, fur, glass, hair, horn, leather, paper, plastics, precious or semi-precious metals or stone, shell, textiles, tobacco, wax, wire, wood (excluding saw and planing mills), and yarns. Sheet metal stamping is not permitted as a principal use.
    - D. The manufacture of pottery and figurines or other similar ceramic products using only previously pulverized clay, and kilns fired only by electricity or gas.
    - E. Manufacture of musical instruments, toys, novelties, and metal or rubber stamps, or other small molded rubber products.
    - F. Manufacture or assembly of electrical appliances, electronic instruments and devices, radios and phonographs.
    - G. Manufacture and repair of electric or neon signs, light sheet metal products, including heating and ventilating equipment, cornices, eaves, and the like.

H. Automobile repair stations, automobile or other machinery assembly plants; painting and varnishing shops, and undercoating shops.
I. Experimental, film or testing laboratories.
J. Building material storage and sales in an enclosed building.

2. Private paramedical emergency facilities subject to the following conditions:
   A. Such facilities shall be located only on collector thoroughfares or major thoroughfares as indicated on the adopted Major Thoroughfare Plan of the City of Auburn Hills.
   B. All ingress and egress on the site shall be located at least fifty (50) feet from any adjacent property line or right-of-way line.
   C. If not in existence, a passing lane shall be provided opposite the ingress/egress route used for paramedical and such other emergency vehicles in addition to the required acceleration and deceleration lanes. The passing lane is required to insure that the purpose and intent of this Zoning Ordinance is met, and is deemed necessary to prevent traffic congestion in order to assure proper egress for fast moving and accelerating emergency vehicles in order to protect the health and safety of the citizens of Auburn Hills and abutting areas.
   D. All such facilities shall be developed on sites of at least one (1) acre in area.
3. Any use charged with the principal function of research, design and development of pilot or experimental products and processes including research labs, training facilities, and light assembly operations as adjuncts to the principal use. Assembly operations shall be limited to those involving premanufactured finished objects and components, and shall include only the incidental fabrication, machining or forming of metal, plastic, or other materials as part of product development, experimentation, demonstration and repair, or the provision of customized components.
4. Oil and gas wells in accordance with the criteria set forth in Section 1835.
5. Accessory buildings and accessory uses customarily incidental to any of the above principal uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area (e.g., general office, child care, food service, health/workout rooms, and other similar adjunct uses provided within a facility which are intended for sole use of the workers of said facility and not the general public).
6. Uses determined to be similar to the above principal permitted uses in accordance with the criteria set forth in Section 1827 and which are not listed below as special land uses.

Section 5.

Article XIII. I-1, Light Industrial Districts of Auburn Hills Zoning Ordinance No. 372 is amended to add new subsection 23 regulating Data Centers and renumber subsections 23-24 to 24-25 in Section 1301. Special Land Uses Permitted to read as follows:

23. Data Centers and related data processing and computing facilities, subject to the requirements of Section 1837.
24. Accessory buildings and accessory uses customarily incidental to any of the above special land uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area.
25. Special land uses determined to be similar to the above special land uses in accordance with the criteria set forth in Section 1828.

Section 6.

Article XIV. I-2, General Industrial Districts of Auburn Hills Zoning Ordinance No. 372 is amended to add new subsection 13 regulating Data Centers and renumber subsections 13-14 to 14-15 in Section 1401. Special Land Uses Permitted to read as follows:

13. Data Centers and related data processing and computing facilities, subject to the requirements of Section 1837.
14. Accessory buildings and accessory uses customarily incidental to any of the above special land uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area.
15. Special land uses determined to be similar to the above special land uses in accordance with the criteria set forth in Section 1828.

Section 7.

Article XVIII. General Provisions of Auburn Hills Zoning Ordinance No. 372, as amended, is hereby amended to add a new section 1837. Data Centers, which shall read in its entirety as follows:

SECTION 1837. DATA CENTERS

1. Purpose and Intent

   The purpose of this Section is to establish reasonable, predictable, and enforceable standards governing the siting, design, construction, operation, and expansion of Data Centers within the City of Auburn Hills in order to:

   A. Promote high-quality investment, expand the City's tax base, create employment opportunities, and support economic development by accommodating appropriately located Data Centers within designated zoning districts.
   B. Protect residents, businesses, public infrastructure, and surrounding property owners from potential adverse impacts associated with Data Center development and operation, including, but not limited to, noise, low-frequency sound, vibration, visual impacts, hazardous material storage, and demands on municipal utilities and public services.
   C. Establish measurable, objective, and enforceable operational performance standards, including post-construction verification of noise, low-frequency sound, utility usage, and other operational characteristics that may affect surrounding properties.
   D. Promote the efficient use of energy and natural resources through sustainable building design, energy-efficient equipment, stormwater best management practices, and cooling technologies that minimize potable water consumption, with a preference for closed-loop or other low-water-use cooling systems where feasible.
   E. Require coordination with electric, water, sewer, and other applicable utility providers to verify that adequate infrastructure capacity exists or will be provided by the applicant, and that facility operations will not adversely affect the reliability or availability of municipal services.
   F. Recognize that Data Centers may require substantial land area and electrical infrastructure while generating comparatively few permanent employment opportunities. Accordingly, the standards of this Section are intended to balance the City's long-term economic development objectives, preserve limited T&R, Technology and Research District land and available electrical infrastructure for employment-intensive uses, and prohibit new Data Center developments within said District except when approved by the City Council through the Planned Unit Development Option in Section 1830 and in accordance with the applicable standards of this Section.
   G. Recognize that the City is approaching build-out of its industrial land supply and encourage Data Center development through the adaptive reuse of existing industrial

buildings and underutilized industrial properties rather than on the City's limited remaining vacant industrial land.

2. Definitions
For purposes of this Section, the following definitions apply. Where a term is not defined in this Section, the definition set forth elsewhere in this Ordinance, or its plain meaning, shall control.
   A. Data Center. A building, or portion of a building, whose primary use is to house computer systems, servers, and associated components, including cooling, power distribution, backup generation, and network infrastructure, for the storage, processing, management, or distribution of data, whether operated by a single user, colocation provider, or multiple tenants. A Data Center does not include computer systems, server rooms, network equipment rooms, telecommunications closets, or similar facilities that are clearly incidental and subordinate in floor area, electrical demand, and function to another lawful principal use on the same zoning lot, primarily support the operations of that principal use, and are not operated or marketed principally as a data-processing, hosting, storage, or colocation facility.
   B. Designed Electrical Load Capacity. The maximum electrical load, expressed in Megawatts, that a Data Center is designed to accommodate at Ultimate Build-Out, including information technology equipment, cooling systems, electrical distribution equipment, backup power systems, and all supporting infrastructure, as demonstrated by electrical engineering plans, utility service agreements, manufacturer specifications, or other documentation acceptable to the City.
   C. Megawatt. A unit of electrical power equal to one thousand (1,000) kilowatts or one million (1,000,000) watts, used in this Section to express Designed Electrical Load Capacity.
   D. Ultimate Build-Out. The maximum reasonably anticipated development intensity of a Data Center site, including all existing, proposed, approved, reserved, entitled, or reasonably foreseeable future phases, buildings, additions, increases in Designed Electrical Load Capacity, mechanical systems, emergency generation, and related infrastructure, regardless of whether all phases are proposed for immediate construction.
   E. Ambient Sound Level. The A-weighted sound pressure level, expressed in dB(A), representing the existing background sound environment at the property boundary or other measurement location designated by this Ordinance.
   F. Tonal Component. A discrete, audible frequency or narrow frequency band that is readily distinguishable from the surrounding broadband sound, as determined in accordance with ANSI/ASA S12.9 or a successor standard approved by the City.
   G. Backup Generator. Any diesel, natural gas, or other fuel-fired engine-generator set installed to provide emergency or standby electrical power to a Data Center during a utility outage or other interruption of normal electrical service.

3. Existing Data Centers
Any Data Center lawfully operating on the effective date of this Section shall be considered lawful and conforming solely as to the data center use and may continue subject to its approved site plan, Development Agreement, and other applicable approvals. Nothing in this subsection shall cause a nonconforming structure or site condition to become conforming or authorize an expansion except in accordance with this Section. No increase in the maximum approved electrical capacity, measured in Megawatts, gross floor area, or Backup Generator capacity, shall be permitted unless authorized by an amendment to the recorded Development Agreement approved by the City Council. For any lawfully operating Data Center on the effective date of this Section that is not subject to a Development Agreement, any increase in designed electrical load capacity, gross floor area,

cooling system equipment, or backup generator capacity shall comply with the requirements of this Section.

4. Applicability and Permitted Locations
   A. Permitted Locations. A citywide evaluation of potential Data Center locations was conducted to identify sites capable of accommodating the use while protecting surrounding land uses and making efficient use of existing and planned infrastructure. The evaluation included consultation with the electric utility regarding available electrical service capacity and the practicality of extending service, and considered the following factors:
      1) Compatibility with surrounding land uses, including protection of residential neighborhoods and avoidance of conflicts with existing and planned development;
      2) Potential operational impacts, including continuous equipment noise from cooling systems and emergency generator testing;
      3) Availability of necessary infrastructure, including electrical service, fiber optic and telecommunications systems, and municipal utilities;
      4) Sufficiency of parcel size and configuration to accommodate the proposed use and potential future expansion;
      5) Existing development patterns and consistency with the goals and objectives of the City's Master Land Use Plan;
      6) Visual compatibility with surrounding development; and
      7) Efficient use of public infrastructure and services in a manner that promotes the public health, safety, and welfare.

      Accordingly, Data Centers, as defined in this Section, shall be permitted only on the properties identified in the following Table 1 subject to Special Land Use approval.

      Table 1

Address	Sidwell Number	Zoning District
1681 Harmon Road	14-03-100-043	I-1, Light Industrial
3985 Giddings Road	14-03-100-047	I-1, Light Industrial
1750 Summit Drive	14-03-100-052	I-1, Light Industrial
1751 Summit Drive	14-03-100-051	I-1, Light Industrial
1700 Brown Road	14-03-100-028	I-1, Light Industrial
1750 Brown Road	14-03-100-024	I-2, General Industrial

   B. Planned Unit Development Option. New Data Centers and expansions to existing Data Centers in locations other than those identified in Table 1 above may be considered only through approval of a Planned Unit Development (PUD) in accordance with Section 1830. Approval of a PUD for a new Data Center or the expansion of an existing Data Center shall be at the sole discretion of the City Council, following a recommendation from the Planning Commission. An applicant shall have no right to appeal the requirements of this section to the Zoning Board of Appeals.

5. Data Center Review Criteria
   In addition to the Special Land Use review criteria set forth in Section 1818 or PUD review criteria set forth in Section 1830, as applicable, the Planning Commission and City Council shall consider the following Data Center-specific criteria when evaluating an application:
   A. Compatibility of anticipated noise, vibration, lighting, and visual impacts with adjacent and nearby land uses.
   B. Adequacy of the proposed acoustic mitigation measures, including equipment selection, screening, building orientation, and site layout, based on the required pre-construction acoustic study.

C. Adequacy of existing and proposed emergency and utility infrastructure to serve the facility without adversely affecting service reliability for existing customers.
D. Consistency and adequacy of the proposed Backup Generator testing and operating protocols.
E. Whether the applicant has disclosed the Ultimate Build-Out of the site and demonstrated that the facility can comply with all applicable standards of this Section at Ultimate Build-Out, rather than only during the initial phase of development.

6. Application Requirements
In addition to the standard site plan submission requirements, an application for a Data Center shall include the following information to demonstrate compliance with this Section:
A. A pre-construction acoustic study prepared in accordance with subsection (7.A).
B. A written statement describing the Ultimate Build-Out of the site, including the maximum anticipated Designed Electrical Load Capacity, total floor area, and the number, size, and location of all proposed mechanical equipment, cooling systems, electrical infrastructure, and Backup Generators, regardless of whether all phases are proposed for immediate construction.
C. The utility-related information and documentation required by subsection 11(A), below.
D. A narrative describing the proposed water supply and cooling system, including anticipated water demand, water source, wastewater generation, and discharge methods, if applicable.
E. A Development Agreement, drafted by the City Attorney and signed by the applicant, together with any supporting documentation necessary to demonstrate compliance with this Section.

7. Noise and Acoustic Standards
This subsection is intended to directly address operational noise concerns typically associated with Data Centers, including mechanical equipment, cooling systems, electrical infrastructure, and Backup Generators. Because pre-construction predictive modeling cannot fully account for actual operating conditions, both pre-construction and post-construction requirements shall apply.
A. Pre-Construction Acoustic Study. Prior to Special Land Use or PUD approval and site plan approval, the applicant shall submit an acoustic study prepared by a qualified acoustical engineer that:
1) Documents existing Ambient Sound Levels at the Data Center property lines and at any Residential District boundary located within one thousand (1,000) feet of the site, based on measurements representative of both daytime and nighttime conditions.
2) Models the anticipated sound level contribution of the proposed facility at full Ultimate Build-Out, including all mechanical, cooling, electrical, and Backup Generator equipment, at the Data Center property lines and at any Residential District boundary located within one thousand (1,000) feet of the site.
3) Identifies any anticipated Tonal Component, low-frequency noise, vibration, or other sound characteristics that may increase the perceptibility or impact of facility noise and proposes specific mitigation measures, including equipment selection, enclosures, barriers, screening, and equipment orientation.
4) Demonstrates compliance with the performance standards of subsection 7.B, including any applicable adjustments for Tonal Components, low-frequency noise, or other characteristics that increase noise perception.
B. Performance Standards.
1) The facility shall comply with the noise performance standards of Section 1807.6.
2) Where residentially zoned or residentially used property is located within one thousand (1,000) feet, the City Council may impose a more restrictive numerical sound limit or additional mitigation as a condition of approval only upon a finding,

supported by the required acoustic study, that the condition is necessary to satisfy Sections 1818 and 1837.7. Any such condition shall identify the applicable numerical limit, measurement location, measurement duration, time period, and adjustment for Tonal Components or low-frequency sound.

3) Tonal Components, low-frequency noise, vibration, or other characteristics that increase the perceptibility or impact of facility noise may require additional mitigation, even where overall dB(A) limits are satisfied. Any additional mitigation required under this paragraph shall be supported by the acoustic study, stated in specific and enforceable terms, and reasonably necessary to satisfy Sections 1818 and 1837.7.
4) Compliance measurements shall be conducted in accordance with industry-recognized environmental sound measurement practices using properly calibrated equipment and under conditions reasonably calculated to produce reliable and repeatable results.

C. Post-Construction Acoustic Verification. Pre-construction modeling shall not be considered conclusive evidence of continued compliance. Accordingly:
1) Within ninety (90) days of the facility first achieving substantial operation, defined as IT load reaching fifty percent (50%) or more of the initial phase's Designed Electrical Load Capacity, the applicant shall commission and submit to the City an independent post-construction acoustic verification study performed under representative operating conditions at the highest reasonably achievable load at the time of testing, at the same measurement locations used in the pre-construction acoustic study, but in no event later than twelve (12) months after issuance of the certificate of occupancy, unless the City approves a later date for good cause.
2) If the post-construction study demonstrates non-compliance with subsection 7.B, the applicant shall submit and implement a mitigation plan subject to City approval and shall complete a follow-up verification study within one hundred eighty (180) days confirming compliance.
3) The City may require an additional verification study, at the applicant's expense, following any subsequent expansion, significant equipment replacement, change in operational characteristics, or substantiated complaint.
4) The Development Agreement for any Data Center shall include the City's right to conduct, or retain a third party to conduct, unannounced sound level monitoring at the applicant's expense not more than twice per calendar year, unless additional monitoring is warranted due to a substantiated complaint or compliance concern.

D. Complaint Response Protocol. The operator shall designate a local or readily reachable point of contact responsible for responding to noise complaints. The operator shall respond to any complaint referred by the City within one (1) business day. Three (3) or more substantiated complaints within any twelve (12) month period shall require a mandatory re-verification study under subsection 7.C at the operator's expense.

8. Backup Generators and Emergency Power

Backup Generators are necessary infrastructure but are also a principal source of potential nuisance complaints if not properly regulated. Accordingly:

A. Routine, non-emergency testing and load-bank testing of Backup Generators shall occur only Tuesday through Thursday between 11:00 a.m. and 3:00 p.m., excluding federal holidays.
B. Routine testing shall not exceed thirty (30) minutes per Backup Generator per week, except where additional operation is required due to a documented mechanical or operational necessity. Testing exceeding this limitation shall require advance written notice to the City.
C. The operator shall provide the City with written notice at least seventy-two (72) hours in advance of any scheduled testing outside routine parameters, including annual load-bank testing.

D. Backup Generators shall be equipped with exhaust silencers and, where necessary to comply with subsection 7, acoustic enclosures, barriers, or other approved mitigation measures.
E. Nothing in this subsection shall restrict Backup Generator operation during an actual utility outage or bona fide emergency.
F. Fuel storage shall comply with all applicable fire code requirements and Michigan Department of Environment, Great Lakes, and Energy (EGLE) requirements. Prior to occupancy, the applicant shall provide the Fire Department with a site-specific pre-incident plan.

9. Visual Impact, Screening, and Fencing
   A. All Backup Generators, transformers, mechanical equipment, including chillers, condensing units, and other cooling equipment, and other utility equipment located outside of a building shall be screened from view from any public or private roadway and any adjacent property through a combination of building design, opaque walls or fencing, and landscaping. Screening shall be of sufficient height and opacity to substantially conceal the equipment and achieve compliance with the noise and acoustic standards of subsection 7.
   B. Where equipment is located on the roof of a building, screening shall be accomplished through a parapet wall, screen wall, or comparable architectural enclosure of sufficient height to conceal the equipment from view at grade from adjacent public streets, private roads, and properties. Such screening shall be visually consistent with the building's architecture.
   C. Perimeter security fencing shall not exceed eight (8) feet in height, exclusive of approved anti-climb security features. Fencing shall be located behind the required landscape buffer adjacent to any public street right-of-way or private road easement. Barbed wire, razor wire, concertina wire, electrified fencing, and similar security devices are prohibited.
   D. Building facades visible from a public street, private road, or adjoining property shall incorporate architectural articulation, including variations in materials, offsets, reveals, fenestration, or comparable design elements. No building facade shall consist of an unarticulated blank wall exceeding one hundred (100) feet in length.
   E. Where a Data Center involves conversion of an existing building rather than new construction, subsection 9.D shall apply only to new construction, building additions, or facade areas materially altered as part of the conversion. For an existing facade retained without material alteration that does not meet subsection 9.D, the Planning Commission and City Council may approve alternative compliance upon finding that literal compliance is not structurally or economically feasible and that the proposed alternative, which may include landscaping, decorative screening, wall treatments, lighting, or comparable mitigation, reasonably advances the visual compatibility purposes of this Section.

10. Water Supply and Cooling Systems
    A. The applicant shall identify the proposed cooling technology, including air-cooled, evaporative, liquid, hybrid, or other systems, and provide an estimate of average and peak daily water demand at Ultimate Build-Out.
    B. Where municipal water or sanitary sewer capacity may be affected, the applicant shall coordinate with the City’s Department of Public Works and the City’s consulting engineer to demonstrate adequate capacity exists or will be provided at the applicant’s expense.
    C. Data Centers are encouraged to use closed-loop dry cooling or other water-efficient cooling technologies to minimize potable water consumption. Where potable municipal water is proposed for non-contact cooling purposes, the applicant shall demonstrate why more water-efficient alternatives are not technically or economically feasible.

D. Water efficiency and long-term water demand may be considered by the Planning Commission and City Council as part of Special Land Use or PUD review.

11. Electrical Infrastructure Impact
    A. The applicant shall request and, if provided by the serving electric utility, submit written confirmation that adequate electrical capacity exists or can be made available to serve the facility at full Ultimate Build-Out. The applicant shall also request that the utility identify any necessary infrastructure improvements, the costs assigned to the applicant under the utility's applicable tariffs, rules, and applicable law, and whether the proposed service is anticipated to adversely affect service reliability or impose additional costs on existing customers. If the utility declines or is unable to address any of these matters in writing, the applicant shall document its request and the utility's response and submit any other reasonably available utility correspondence, service-availability determination, engineering study, or service agreement addressing the requested service.
    B. Any electric substation, transmission, or distribution infrastructure required solely to serve the facility shall be constructed at the applicant's expense and shall be sited and screened consistent with subsection 9 to the extent reasonably possible when located on the same or adjacent parcel.

12. Emergency Services and Public Safety
    A. The applicant shall provide a written emergency response plan and meet with the Fire Department and Police Department to review site access, fire suppression systems, hazardous materials, including fuel storage and battery systems, and any specialized equipment or training necessary to respond safely to an incident at the facility.
    B. The applicant shall provide and periodically update as-built emergency response information, including site plans, shutoff locations, and hazardous materials inventory, to the Community Development Department and Fire Department.
    C. Any lithium-ion or other battery energy storage system shall comply with applicable fire code requirements for stationary storage battery systems and shall be reviewed by the Building Official and Fire Chief prior to installation.

13. Parking and Loading
    As part of its approval of a Special Land Use or PUD, the City Council may, following review and recommendation by the Planning Commission, approve a modification of the otherwise applicable parking or loading requirements only upon written findings that the number and design of the proposed spaces or loading areas are adequate for the facility's maximum anticipated employment, visitors, deliveries, maintenance, and emergency operations at Ultimate Build-Out; that the modification will not impair access, circulation, public safety, or neighboring property; and that all applicable accessible-parking and fire-access requirements remain satisfied.

14. Required Disclosure of Future Build-Out
    A. An applicant shall disclose all planned, approved, or reasonably foreseeable future phases, expansions, and increases in electrical capacity associated with the site. The disclosure shall provide sufficient information for the City to evaluate the facility's full potential build-out. A material misrepresentation or omission discovered before final approval may constitute grounds for denial or the imposition of appropriate conditions. A material misrepresentation or omission discovered after approval shall constitute a violation subject to the enforcement and revocation procedures in the Development Agreement.
    B. The Planning Commission and City Council shall evaluate the application based on the anticipated Ultimate Build-Out of the facility and may condition approval of an initial

phase on a demonstration that subsequent phases can comply with all applicable requirements of this Section.

15. Development Agreement

A Development Agreement is required for every Data Center facility and shall be a condition of Special Land Use or PUD approval. The Development Agreement shall establish enforceable obligations, restrictions, performance standards, and commitments applicable to the facility. The Development Agreement shall be recorded against the property, shall run with the land, and shall bind the applicant, property owner, operator, and their successors and assigns. The provisions listed below establish the minimum required contents of the Development Agreement and shall not limit the City's authority to require additional terms, conditions, restrictions, financial assurances, monitoring requirements, or obligations reasonably related to the proposed development, anticipated impacts, or Special Land Use or PUD approval. At a minimum, the Development Agreement shall address:

A. A description of the project, including the applicant, property owner, operator, site location, and general nature and scope of the proposed Data Center use.
B. The planned Designed Electrical Load Capacity, in Megawatts, for the initial phase and Ultimate Build-Out of the site.
C. A reference to the approved site plan governing the facility, including the date of approval and any subsequent amendments.
D. The specific noise performance standards, mitigation requirements, and post-construction verification requirements applicable to the site, which may be more, but not less, restrictive than subsection 7.
E. Generator testing protocols specific to the site.
F. Operational conditions applicable to the facility, including hours of routine testing, maintenance, delivery activity, and other site-specific operational restrictions.
G. The City's right of periodic inspection and monitoring, at the operator's expense, as described in subsection 7.
H. Remedies for noncompliance, including written notice of the violation, a reasonable opportunity to cure, enforcement proceedings, and, where warranted, revocation of the Special Land Use approval or enforcement of the PUD approval and Development Agreement. Except where immediate action is necessary to address an imminent threat to public health or safety, the City shall provide written notice to the operator and property owner identifying the alleged violation and allowing not less than thirty (30) days to cure. If the violation cannot reasonably be cured within thirty (30) days, the cure period may be extended if the operator commences corrective action within that period and diligently proceeds to completion. If a material violation remains uncured, the City Council may revoke the Special Land Use approval following notice and a public hearing. Any revocation shall be supported by written findings that the violation is material, remains uncured, and cannot be adequately addressed through a lesser enforcement remedy. Nothing in this subsection limits the City's authority to pursue any other remedy authorized by this Ordinance, the Development Agreement, or applicable law.
I. Any additional project-specific provisions, conditions, representations, restrictions, performance standards, or commitments that the City determines are necessary to protect the public health, safety, and welfare or implement the intent of this Section, including commitments made by the applicant during the Special Land Use or PUD review process, all of which shall be binding upon the operator and its successors and assigns.

Section 8. Repealer.

All Ordinances or parts of Ordinances in conflict herewith are hereby repealed only to the extent necessary to give this Ordinance full force and effect.

Section 9. Severability.

If any section, clause, or provision of this Ordinance shall be declared to be unconstitutional, void, illegal, or ineffective by any Court of competent jurisdiction, such section, clause, or provision declared to be unconstitutional, void, or illegal shall thereby cease to be a part of this Ordinance, but the remainder of this Ordinance shall stand and be in full force and effect.

Section 10. Savings.

Nothing in this Ordinance shall impair any final approval, permit, or vested right existing on its effective date or abate any pending violation, enforcement proceeding, liability, or remedy. Except to the extent required by a vested right established under Michigan law, an application that has not received final approval before the effective date shall be reviewed under this Ordinance.

Section 11. Effective Date.

The provisions of this Ordinance are hereby ordered to take effect upon the expiration of seven (7) days after publication in the manner prescribed by the Charter of the City of Auburn Hills and as required by law.

Section 12. Adoption.

This Ordinance is hereby declared to have been adopted by the City Council of the City of Auburn Hills at a meeting thereof duly called and held on the 24th day of August 2026 and ordered to be given publication in a manner prescribed by the Charter of the City of Auburn Hills.

AYES:
NAYES:
ABSTENTIONS:

STATE OF MICHIGAN)
) ss.
COUNTY OF OAKLAND)

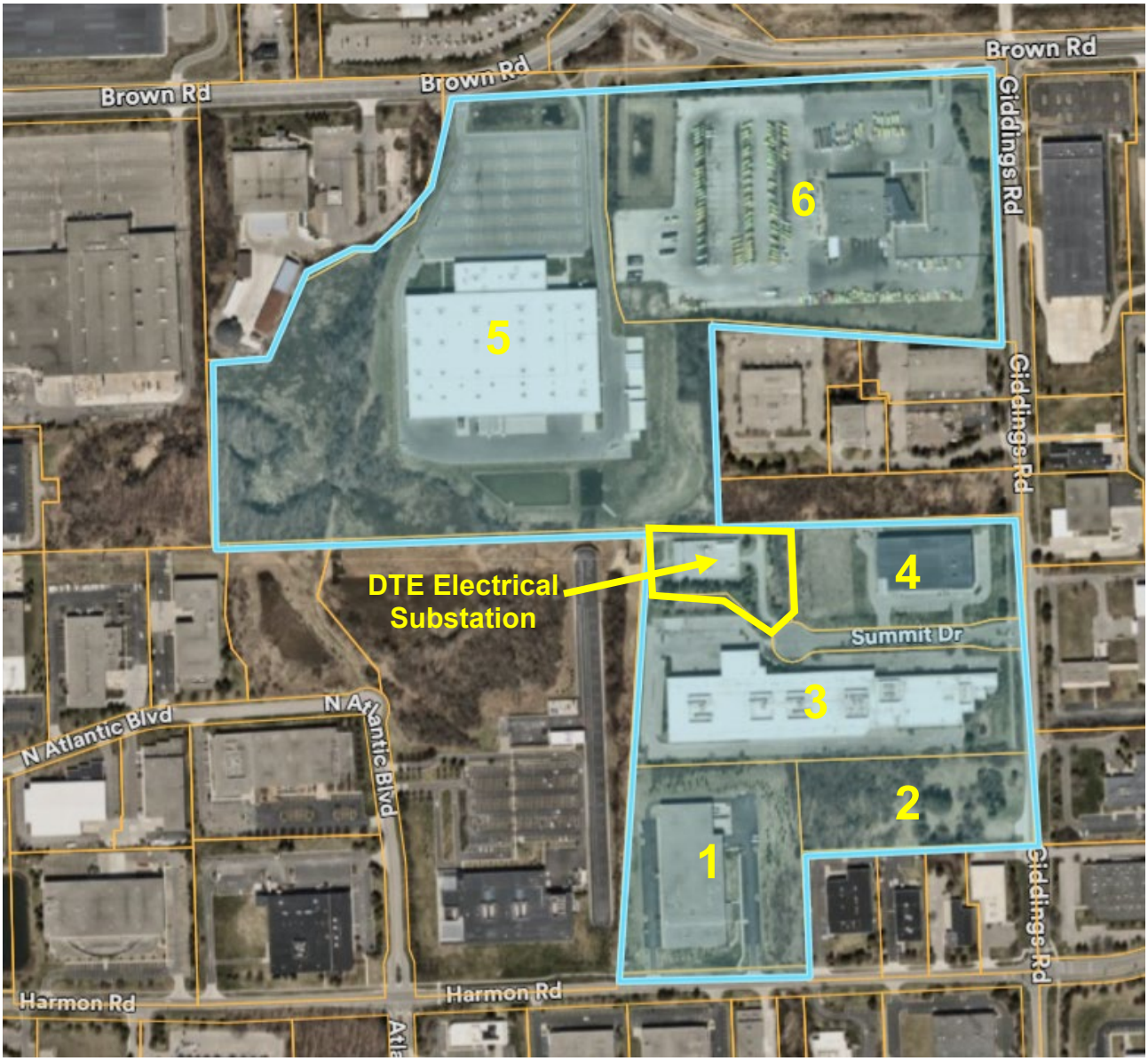
I, the undersigned, the duly qualified Clerk of the City of Auburn Hills, Oakland County, Michigan, do hereby certify that the foregoing is a true and complete copy of Ordinance No. 26-951 adopted by the Auburn Hills City Council on the 24th day of August 2026, the original of which is in my office.

_____ _____
Eugene Hawkins, III, Mayor Laura M. Pierce, City Clerk

PROPOSED DATA CENTER DEVELOPMENT LOCATIONS IN AUBURN HILLS

Data Centers, as defined in Section 1837 of the Zoning Ordinance, shall be permitted only on the properties identified in the table below subject to Special Land Use approval.

Key	Address	Sidwell Number	Zoning District
1	1681 Harmon Road	14-03-100-043	I-1, Light Industrial
2	3985 Giddings Road	14-03-100-047	I-1, Light Industrial
3	1750 Summit Drive	14-03-100-052	I-1, Light Industrial
4	1751 Summit Drive	14-03-100-051	I-1, Light Industrial
5	1700 Brown Road	14-03-100-028	I-1, Light Industrial
6	1750 Brown Road	14-03-100-024	I-2, General Industrial



AUBURN HILLS

Industrial Analysis
2026 Industrial Parcels
Map 1

City of Auburn Hills

Legend
- City of Auburn Hills
- Active Tax Abatement
- Anticipated Tax Abatement
- Existing Industrial
- Greenfield
- Unbuildable

N

0 3,500 7,000

Feet

1" = 3,500'

Source: Data provided by Oakland County and the City of Auburn Hills. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

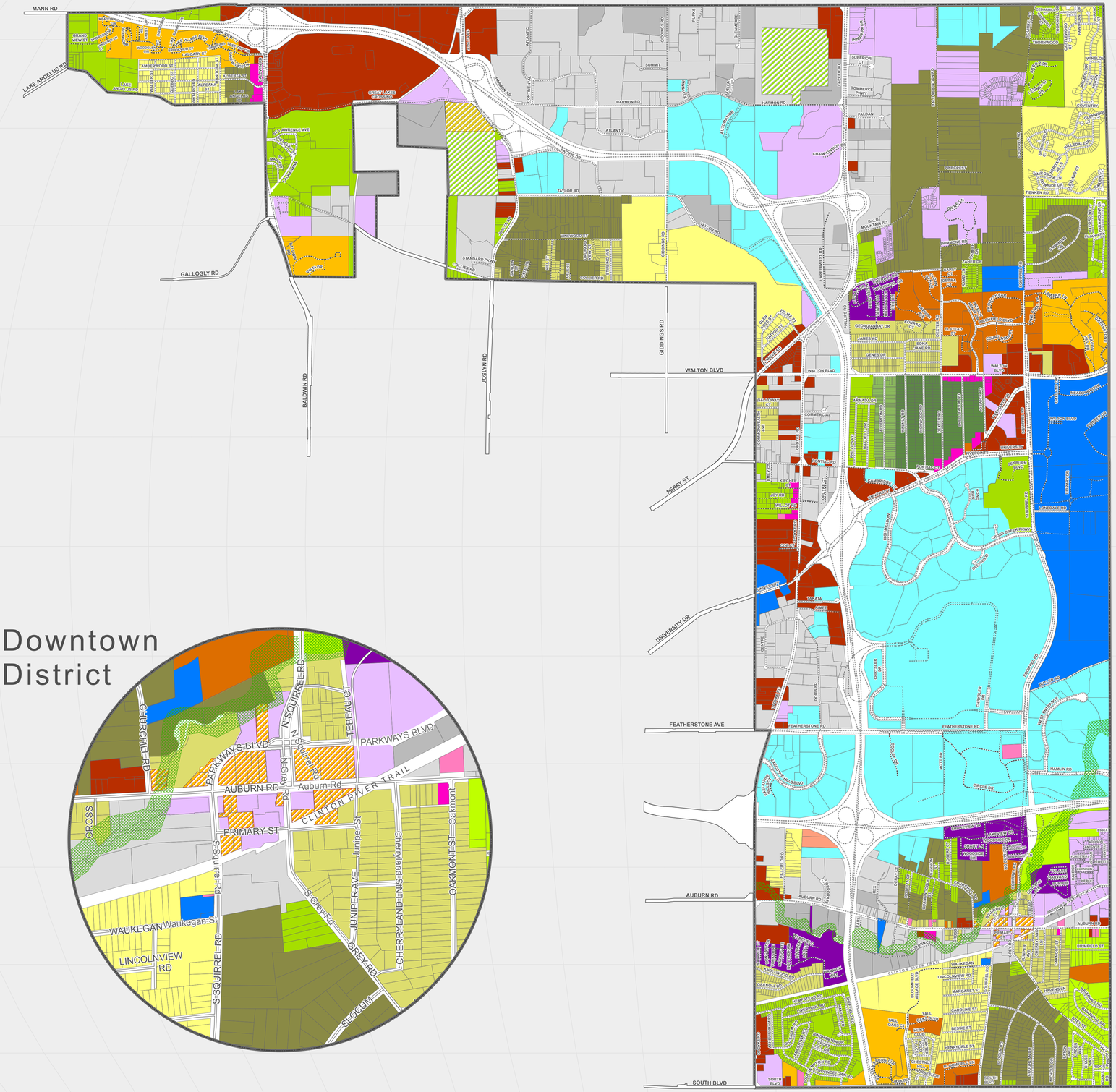
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl

Map Published: November 13, 2025

OHM

CITY OF AUBURN HILLS

OAKLAND COUNTY, MICHIGAN



OFFICIAL ZONING MAP

- R-1A - ONE FAMILY RESIDENTIAL
- R-1B - ONE FAMILY RESIDENTIAL
- R-1C - ONE FAMILY RESIDENTIAL
- R-1 - ONE FAMILY RESIDENTIAL
- R-2 - ONE FAMILY RESIDENTIAL
- R-3 - ONE FAMILY RESIDENTIAL
- R-4 - ONE FAMILY RESIDENTIAL
- RM-1 - MULTIPLE FAMILY (LOW RISE)
- RM-2 - MULTIPLE FAMILY (LOW RISE)
- RM-3 - MULTIPLE FAMILY (LOW RISE)
- MHP - MOBILE HOME PARK
- O - OFFICE
- B-1 - LIMITED BUSINESS
- B-2 - GENERAL BUSINESS
- I-1 - LIGHT INDUSTRIAL
- I-2 - GENERAL INDUSTRIAL
- I-3 - HEAVY INDUSTRIAL
- T&R - TECHNOLOGY & RESEARCH
- SP - SPECIAL PURPOSE
- P - P.U.D OVERLAY
- PL - PUBLIC LAND
- D - DOWNTOWN
- LF-5 - LANDFILL BUSINESS
- LF-11 - LANDFILL RECREATIONAL
- FLOODPLAIN

I, LAURA PIERCE, CLERK OF THE CITY OF AUBURN HILLS, DO HEREBY CERTIFY THAT THIS MAP IS A TRUE COPY OF THE ZONING MAP ADOPTED BY THE CITY COUNCIL OF THE CITY OF AUBURN HILLS ON THE 16th. DAY OF DECEMBER, 1985, A.D. AND ALL SUBSEQUENT AMENDMENTS ADOPTED AS OF MARCH 17, 2025.

Laura M Pierce

LAURA PIERCE, CLERK
CITY OF AUBURN HILLS

N
W E
S

Feet
2,000 0 2,000 4,000

Miles
0.25 0 0.25 0.5

OHM Advancing Communities℠
34000 PLYMOUTH ROAD
LIVONIA, MI 48150
734.522.6711

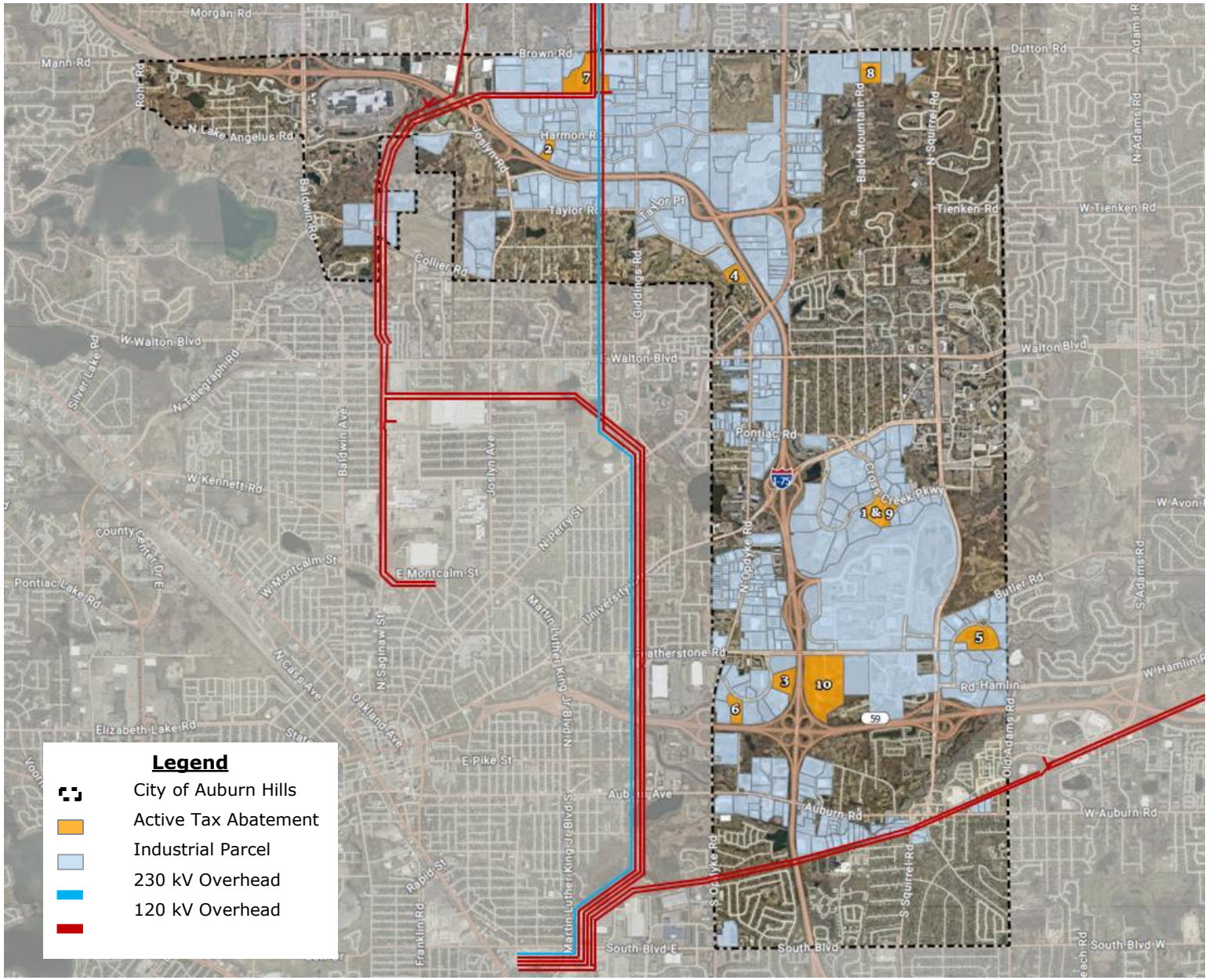
PUBLISHED 4/3/2025

Coordinate System: Michigan South NAD 83 International Feet

P:\0101_0125\0120190230_2019_Comm_Dev_Misc_Sup_GIS\ArcLayouts\c20240607 Zoning Map Update

July 23rd, 2026

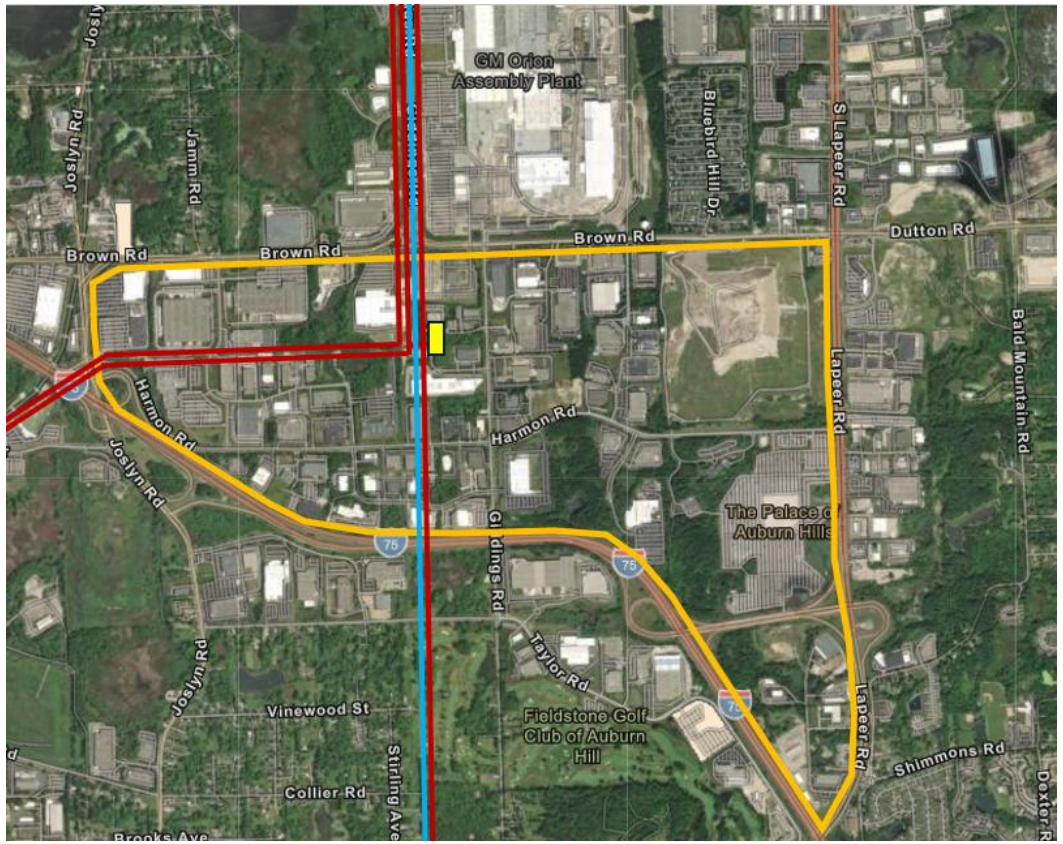
City of Auburn Hills Industrial Parcels Request



Source	Load (MVA)	Minimum Combined DTE & ITC Footprint
120kV	Up to 60	235′ x 260′ (~1.5 acres)
	60-120	460′ x 420′ (~4.5 acres)
	120-180	515′ x 500′ (~6 acres)
	180-240	Dependent on final configuration
230kV	Service requirements subject to further assessment	

***Only overhead transmission lines are depicted.**

Area 1 – Auburn Hills Industrial Parcels



"Area 1" boundary

Existing 120 kV overhead

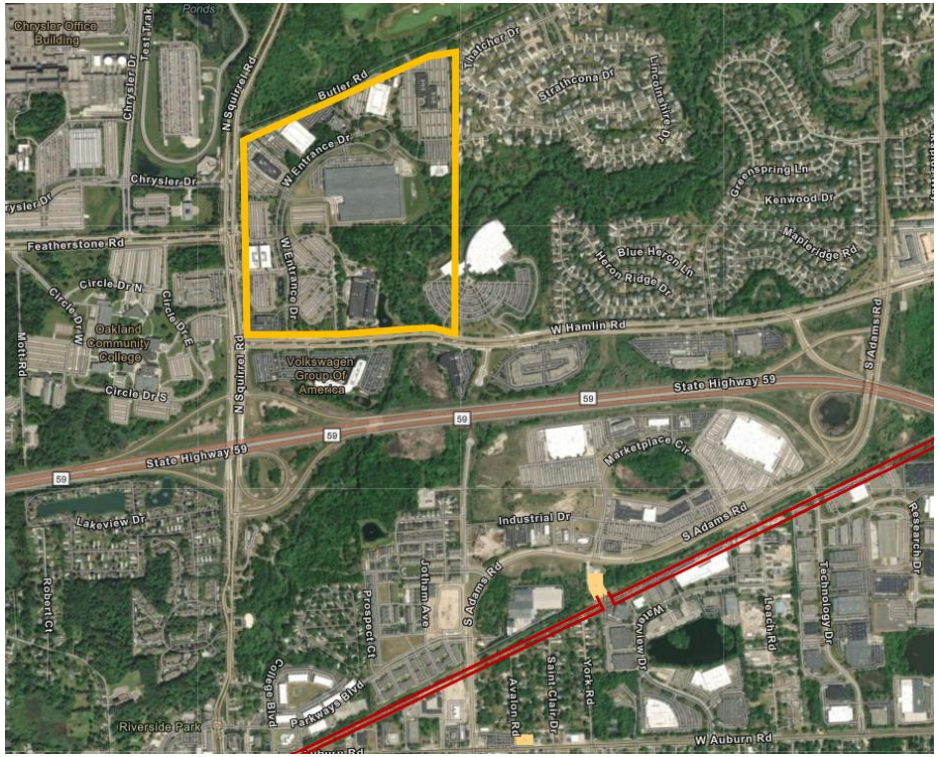
Existing 230 kV overhead

Electric Capabilities:

- Several overhead transmission circuits run through this defined area
- Plan for long-term service:
  - At a minimum, for loads greater than 10 MW ITC would need to construct a new 120kV switching station on the customer's property and loop in the 120kV circuit to the station. Additional system upgrades to support the load may be required. Additional ITC studies will be needed to confirm transmission capabilities.
  - DTE would construct a new 120kV-13.2kV industrial substation on the customer's property. Alternatively, the customer could elect to construct, own, and maintain their own substation instead of a DTE-owned substation; however, an ITC station would still be required.
- Timeline may exceed 30-36 months
  - Initial service: ≤50 MW may be available via radial taps but may exceed 24 months.

Capacity on electric circuits changes with each customer request, and no capacity is reserved at this time for this potential customer. To reserve capacity a formal Method of Service request would be required should the customer decide to move forward with a specific location. Requests for redundant feeds would also need to be evaluated in further detail by Engineering. This does not consider grid resource availability. Resource capacity timeline is reviewed by DTE's Resource Planning team during the detailed feasibility study process.

Area 2 – Auburn Hills Industrial Parcels



"Area 2" boundary

Existing 120 kV overhead

Electric Capabilities:

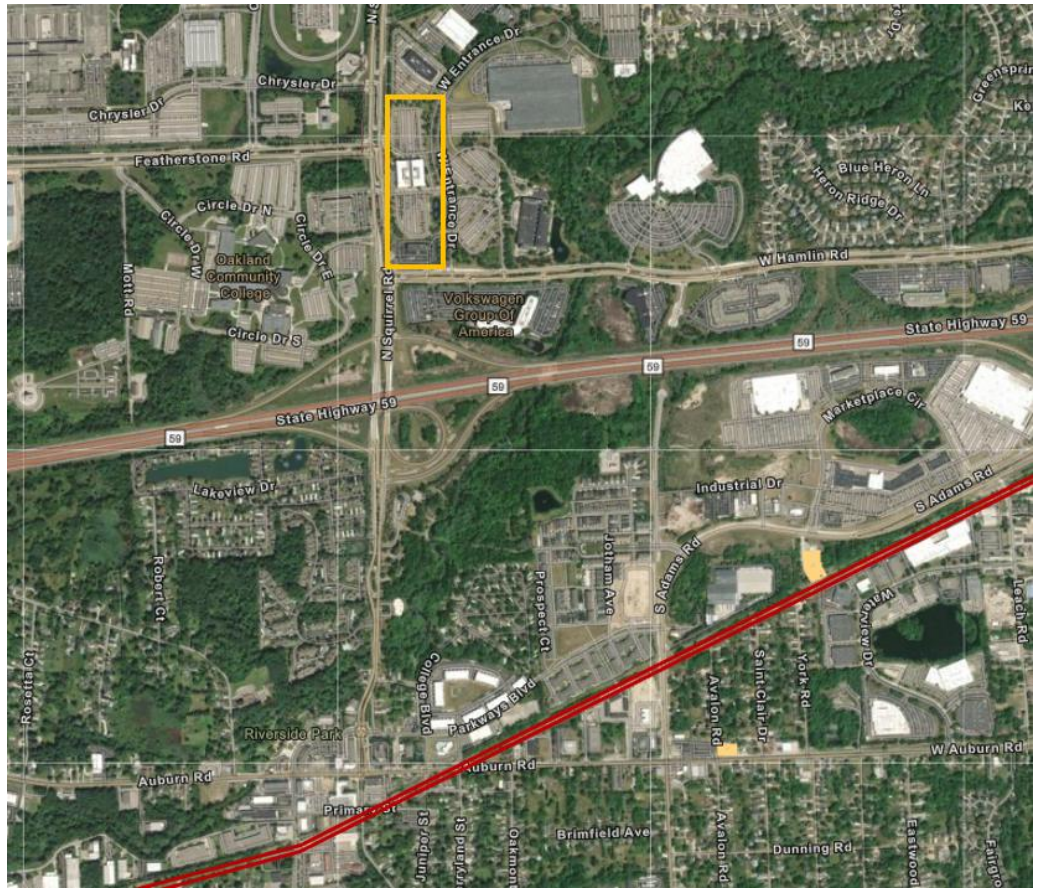
- One parallel 120kV overhead transmission circuit runs ~1.25 miles from the property.
- Due to the >1 mile line extensions required to serve the site, routing and permitting challenges are anticipated, including a freeway crossing. These factors could result in significant increases to both project costs and timelines. Customer is responsible for securing property/easements to connect their site to existing infrastructure.

- Plan for long-term service:
  - At a minimum, for loads greater than 10 MW ITC would need to construct a new 120kV switching station on the customer's property and loop in the 120kV circuit to the station. Additional system upgrades to support the load may be required. Additional ITC studies will be needed to confirm transmission capabilities.
  - DTE would construct a new 120kV-13.2kV industrial substation on the customer's property. Alternatively, the customer could elect to construct, own, and maintain their own substation instead of a DTE-owned substation; however, an ITC station would still be required.

- Timeline may exceed 36-42 months
  - Initial service: ≤50 MW may be available via radial taps but may exceed 24 months.

Capacity on electric circuits changes with each customer request, and no capacity is reserved at this time for this potential customer. To reserve capacity a formal Method of Service request would be required should the customer decide to move forward with a specific location. Requests for redundant feeds would also need to be evaluated in further detail by Engineering. This does not consider grid resource availability. Resource capacity timeline is reviewed by DTE's Resource Planning team during the detailed feasibility study process.

3501-3551 Hamlin Road, Auburn Hills, MI 48326



Approximate site boundary

Existing 120 kV overhead

Electric Capabilities:

- One parallel 120kV overhead transmission circuit runs ~1.1 miles from the property.
- Due to the >1 mile line extensions required to serve the site, routing and permitting challenges are anticipated, including a freeway crossing. These factors could result in significant increases to both project costs and timelines. Customer is responsible for securing property/easements to connect their site to existing infrastructure.

- Plan for long-term service:
  - At a minimum, for loads greater than 10 MW ITC would need to construct a new 120kV switching station on the customer's property and loop in the 120kV circuit to the station. Additional system upgrades to support the load may be required. Additional ITC studies will be needed to confirm transmission capabilities.
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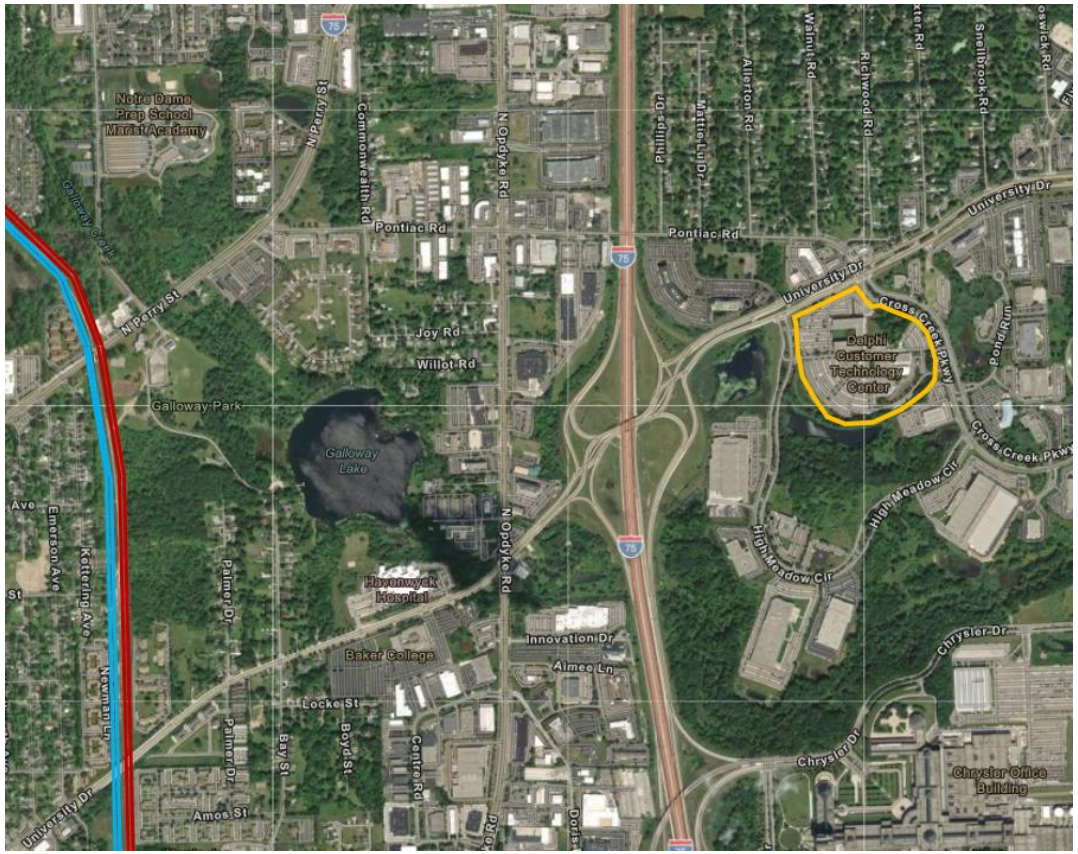
  - Initial service: ≤50 MW may be available via radial taps but may exceed 24 months.

Capacity on electric circuits changes with each customer request, and no capacity is reserved at this time for this potential customer. To reserve capacity a formal Method of Service request would be required should the customer decide to move forward with a specific location. Requests for redundant feeds would also need to be evaluated in further detail by Engineering. This does not consider grid resource availability. Resource capacity timeline is reviewed by DTE's Resource Planning team during the detailed feasibility study process.

July 23rd, 2026

3000 University Dr, Auburn Hills, MI 48326



Approximate site boundary

Existing 120 kV overhead

Existing 230 kV overhead

Electric Capabilities:

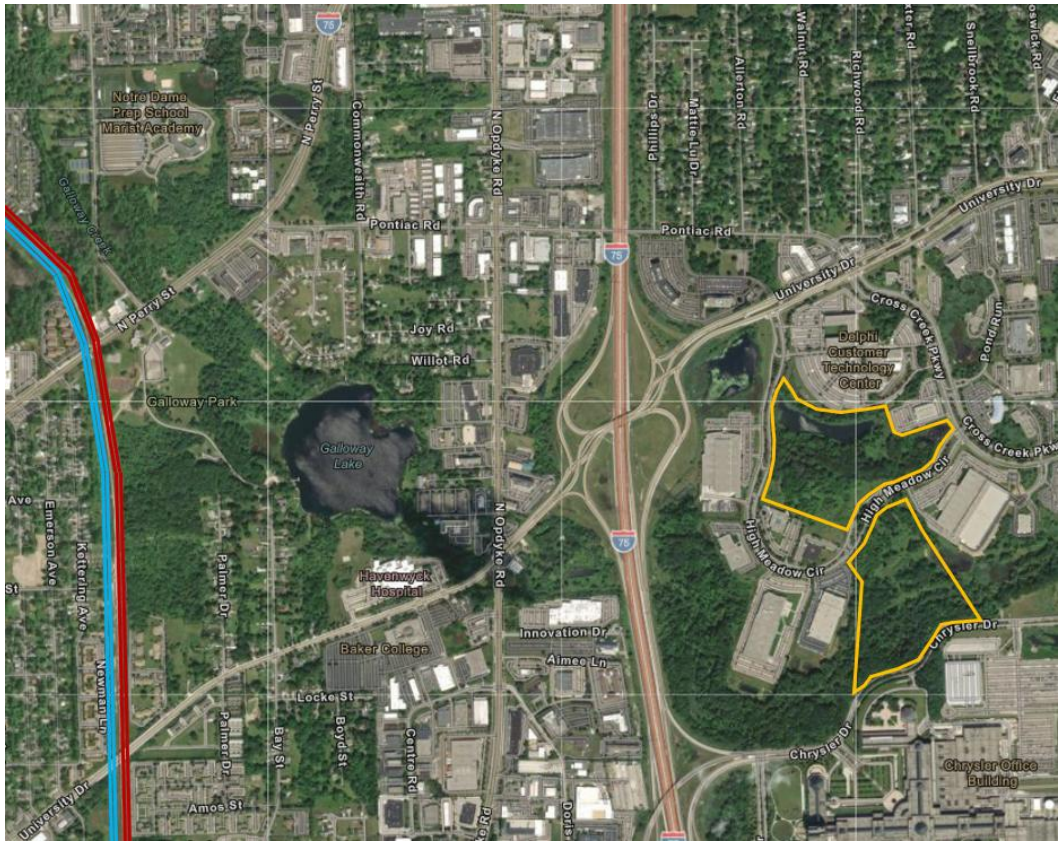
- One parallel 120kV overhead transmission circuit runs ~1.5 miles from the property.
- Due to the >1 mile line extensions required to serve the site, routing and permitting challenges are anticipated, including a freeway crossing. These factors could result in significant increases to both project costs and timelines. Customer is responsible for securing property/easements to connect their site to existing infrastructure.

- Plan for long-term service:
  - At a minimum, for loads greater than 10 MW ITC would need to construct a new 120kV switching station on the customer's property and loop in the 120kV circuit to the station. Additional system upgrades to support the load may be required. Additional ITC studies will be needed to confirm transmission capabilities.
  - DTE would construct a new 120kV-13.2kV industrial substation on the customer's property. Alternatively, the customer could elect to construct, own, and maintain their own substation instead of a DTE-owned substation; however, an ITC station would still be required.

- Timeline may exceed 36-42 months
  - Initial service: ≤50 MW may be available via radial taps but may exceed 24 months.

Capacity on electric circuits changes with each customer request, and no capacity is reserved at this time for this potential customer. To reserve capacity a formal Method of Service request would be required should the customer decide to move forward with a specific location. Requests for redundant feeds would also need to be evaluated in further detail by Engineering. This does not consider grid resource availability. Resource capacity timeline is reviewed by DTE's Resource Planning team during the detailed feasibility study process.

Oakland Technology Park Industrial Parcels



Approximate site boundaries

Existing 120 kV overhead

Existing 230 kV overhead

Electric Capabilities:

- One parallel 120kV overhead transmission circuit runs ~1.5 miles from the property.
- Due to the >1 mile line extensions required to serve the site, routing and permitting challenges are anticipated, including a freeway crossing. These factors could result in significant increases to both project costs and timelines. Customer is responsible for securing property/easements to connect their site to existing infrastructure.

- Plan for long-term service:
  - At a minimum, for loads greater than 10 MW ITC would need to construct a new 120kV switching station on the customer's property and loop in the 120kV circuit to the station. Additional system upgrades to support the load may be required. Additional ITC studies will be needed to confirm transmission capabilities.
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- Timeline may exceed 36-42 months
  - Initial service: ≤50 MW may be available via radial taps but may exceed 24 months.

Capacity on electric circuits changes with each customer request, and no capacity is reserved at this time for this potential customer. To reserve capacity a formal Method of Service request would be required should the customer decide to move forward with a specific location. Requests for redundant feeds would also need to be evaluated in further detail by Engineering. This does not consider grid resource availability. Resource capacity timeline is reviewed by DTE's Resource Planning team during the detailed feasibility study process.

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ARTICLE XII
T&R, TECHNOLOGY AND RESEARCH DISTRICTS

PREAMBLE

~~The T&R Technology and Research Districts are designed to provide for the coordinated development and complementary research, office, applied technology, and light industrial uses in a planned complex which offers a full range of support facilities and services including hotels, recreation, and multiple family housing.~~

~~1. Technology and Research Districts are to be located and designed to:~~
~~2. Create employment and activity focal points which benefit the surrounding community.~~
~~3. Provide opportunities for establishing mutually supportive relationships with institutions for higher learning.~~
~~4. Afford safe and efficient access to and from nearby highway interchanges.~~
~~5. Ensure a high standard of visual and environmental quality by preserving significant open spaces, protecting natural site amenities, and strictly limiting the nuisance impacts sometimes associated with light industrial operations.~~
~~6. Create a unified District image through coordinated infrastructure development, site planning, and architectural design.~~

The T&R, Technology and Research Districts are established to provide a high-quality environment for corporate and regional headquarters, research and development facilities, advanced technology enterprises, automation and robotics operations, aerospace, life sciences, biotechnology, information technology, engineering, and other employment-generating uses of a similar character and intensity. The Districts are intended to support Auburn Hills' role as a hub for corporate investment, innovation, and advanced technology employment opportunities by encouraging the development of businesses and facilities that contribute to the City's diversified economic base.

Technology and Research Districts are intended to be located and designed to:
1. Support innovation, investment, and economic growth by providing a business environment that encourages the development, retention, expansion, and diversification of technology-based, research-oriented, and advanced employment uses across multiple industry sectors;
2. Accommodate complementary accessory and support uses that serve the operational needs of businesses and employees within the District, provided such uses remain clearly secondary and supportive of the District's primary corporate, research, technology, and employment-generating functions;
3. Promote high-quality development standards through coordinated site planning, building design, architecture, landscaping, and infrastructure improvements that reflect the District's importance as a location for corporate, research, and advanced technology investment; and
4. Protect the long-term function and economic vitality of the District by ensuring compatibility among permitted uses, maintaining adequate infrastructure capacity, and encouraging development patterns that are consistent with surrounding land uses and the City's long-range planning objectives.

SECTION 1200. PRINCIPAL USES PERMITTED

In the T&R Technology and Research District no building or land shall be used and no building shall be erected except for one (1) or more of the following specified uses, unless otherwise provided in this Ordinance:

1. Any use charged with the principal function of research, design, and development of pilot or experimental products and processes including research labs, training facilities, and light assembly operations as adjuncts to the principal use. Assembly operations shall be limited to those involving premanufactured finished objects and components and shall include only the incidental fabrication, machining, or forming of metal, plastic, or other materials as part of product development, experimentation, demonstration and repair, or the provision of customized components.
2. ~~Data processing and computing centers, and related services~~,
3. ~~3.~~ *2* Single and multi-tenant office buildings. Sales as an adjunct to the principal use are also permitted.
4. ~~4.~~ *3* Accessory buildings and accessory uses customarily incidental to any of the above principal uses permitted (e.g., child care, food service, and health/workout rooms, and other similar adjunct uses provided within a facility which are intended for sole use of the workers of said facility and not the general public.
5. ~~5.~~ *4* Uses determined to be similar to the above principal permitted uses in accordance with the criteria set forth in Section 1827 and which are not listed below as Special Land Uses Permitted.

SECTION 1201. SPECIAL LAND USES PERMITTED:

The following uses may be permitted under the purview of Section 1818 by the City Council, after site plan review and Public Hearing by the Planning Commission, and subject further to such other reasonable conditions which, in the opinion of the City Council, are necessary to provide adequate protection to the health, safety, general welfare, morals and comfort of the abutting property, neighborhood and the City of Auburn Hills:

1. Retail business conducted wholly within an enclosed building. Such uses shall be accessory to the principal use of the premises. Freestanding retail shopping centers and freestanding restaurants, including drive-through and drive-in restaurants, shall not be permitted in the district.
2. Banks and credit unions with drive-in facilities may be permitted when said drive-in facilities are incidental to the principal function, and subject to the following conditions:
   A. Drive-up stations shall provide at least five (5) queuing spaces eighteen (18) feet long by ten (10) feet wide from each order/transaction station. The lane containing the queuing spaces shall be separate and distinct from other access drives and maneuvering lanes for parking spaces. The queuing space lane shall have a clear width of ten (10) feet and be physically separated from access drives, maneuvering lanes and parking spaces with a landscaped area eight (8) feet wide with raised curbs on all sides.
   B. Drive-up windows shall provide at least ten (10) queuing spaces eighteen (18) feet long by ten (10) feet wide from the window. The lane containing the queuing spaces shall be separate and distinct from other access drives and maneuvering lanes for parking spaces. The queuing space lane shall have a clear width of ten (10) feet and be physically separated from access drives, maneuvering lanes and parking spaces with a landscaped area eight (8) feet wide with raised curbs on all sides.
3. New motels, hotels, and conference centers, or the expansion of existing motels, hotels, and conference centers, shall only be permitted in the T&R Technology and Research Districts via Section 1830. Planned Unit Development Option. The decision to approve a Planned Unit Development allowing a motel, hotel, and/or conference center, or the expansion of an existing motel, hotel, and/or conference center, in the T&R Technology and Research Districts shall be at the sole discretion of the City Council, after recommendation from the Planning Commission. An applicant shall not have the right to seek relief from this section to the Zoning Board of Appeals. Motels, hotels, and conference centers approved by the City Council in the T&R Technology and Research Districts before February 17, 2020 shall be considered legally conforming and subject to the Zoning Ordinance standards and conditions in effect at the time of the City approval.
4. Nursery schools, day nurseries and child care centers provided the following conditions are met:
   A. Such facilities shall be located on major thoroughfares with an existing or proposed right-of-way of one hundred and twenty (120) feet.

B. Any area not used for parking in the front yard shall be kept in lawn and landscaped in accordance with Section 1808.
C. Outdoor play areas shall be in the side or rear yard in the amount of one hundred (100) square feet for each child cared for, but at least a minimum of one thousand two hundred (1,200) square feet.
D. Whenever the school or center abuts a residential district, parking, drop off, and play areas shall be screened with an obscuring six (6) foot fence or wall, four foot six inch (4'6") high berm with landscaping or a twenty (20') foot wide greenbelt landscaped in accordance with Section 1808, or a combination of the above, whichever in the opinion of the Planning Commission and City Council achieves the objective of screening and controlling noise levels.
E. Any other conditions which the Planning Commission and City Council deem necessary to assure that the technology and research character of the district shall be maintained.

5. Multiple family residential dwellings shall not be permitted as a Special Land Use, but shall only be permitted via Section 1830. Planned Unit Development Option in the T&R Technology and Research Districts. The decision to approve a Planned Unit Development allowing multiple family residential dwellings in the T&R Technology and Research Districts shall be at the sole discretion of the City Council, after recommendation from the Planning Commission. An applicant shall not have the right to seek relief from this section to the Zoning Board of Appeals.
6. Public, quasi-public, and commercial recreation facilities including parks, golf courses, health and athletic clubs.
7. ~~Light industrial uses listed as Principal Uses Permitted in Section 1300 when conducted wholly within an enclosed building and subject to the Required Conditions specified below in Section 1202.~~ ***Clean industrial uses may be permitted as Special Land Uses within the T&R District when conducted entirely within an enclosed building and when consistent with the purpose and intent of the District. Such uses shall comply with the requirements of Section 1202 and shall be subject to the following standards:***
   A. Definition and Operational Characteristics. For purposes of this Section, a clean industrial use is a light industrial operation involving the assembly, incidental fabrication, processing, testing, research, development, or production of advanced technology, high-value, precision, or specialized products within an enclosed building. Clean industrial uses shall utilize processes designed to minimize external impacts, including noise, vibration, odors, dust, smoke, emissions, outdoor storage, and truck traffic. A clean industrial use may constitute the principal use of a site and need not be accessory to an office, research and development, or corporate headquarters use. A clean industrial use does not include a Data Center, as defined in Section 1837.
   B. Site and Building Design Standards. Buildings and sites occupied by clean industrial uses shall maintain the high-quality character and development standards of the T&R District through superior site design, landscaping, greenspace, and architecture. Building elevations visible from public rights-of-way, private road easements, or adjacent properties shall incorporate high-quality materials, glazing, and architectural features consistent with a corporate, research, or technology-oriented appearance.
   C. Transportation and Freight Limitations. Truck traffic associated with clean industrial uses shall be limited to deliveries and shipments customary and incidental to the operation of the use. Warehouses, distribution centers, fulfillment centers, freight terminals, logistics facilities, and similar uses whose primary function is the storage, distribution, or movement of goods are prohibited, regardless of whether such facilities include office, corporate, or administrative space. Uses that are dependent upon high-volume truck traffic or intensive freight movement are likewise prohibited
8. Vertical Take-Off and Landing fields (VTOL), and Heliports shall be permitted subject to the following conditions:
   A. The minimum site size for heliports shall be one (1) acre, unless the location or other circumstances would dictate a smaller site, and shall conform in dimension to the requirements of the FAA.
   B. Any petitioner for a heliport shall prepare a written statement to City Council addressing at least the following factors:

1. Minimum obstructions in the approach and departure area.
2. Minimum disturbance from noise and desirable location with regard to adjacent land use.
3. Access to surface transportation.
4. Safety precautions for the control of pedestrian and vehicular circulation in relation to the heliport.

9. Wireless communication facilities in accordance with the standards and requirements listed in Section 1832, except for co-location applications which are subject to the administrative review provisions listed in Section 1832, Item K.
10. Vehicular evaluating tracks, provided the following conditions are met:
    A. The track shall be screened from public view in accordance with Section 1808.
    B. Any outdoor lighting shall be shielded in compliance with Section 1810.
    C. The noise limitations and other requirements of Section 1807, shall be adhered to.
    D. Adequate safeguards shall be provided to prevent the trespass of animals onto the track.
11. Outside storage of vehicles only when the vehicles are accessory to the principal use of the premises. The vehicle storage shall relate to the retrofit, manufacture, or testing of said vehicles. Space for said outside storage of vehicles shall be provided in addition to required parking. Such areas shall be screened from adjacent public right-of-ways and properties with a minimum twenty-five (25) foot landscaped greenbelt with staggered eight (8) foot evergreen trees. Alternative screening techniques within the minimum twenty-five (25) foot landscaped greenbelt shall be at the discretion of the City Council, after recommendation from the Planning Commission. *Exception: The Director of Community Development may approve the outside storage of vehicles only when the vehicles are accessory to the principal use of the premises and provided the total site area is no less than four-hundred (400) contiguous acres.*
12. Colleges, universities, and other such institutions of higher learning, both public and private, provided the property is located on the land bounded by M-59 and Featherstone Road, between I-75 and Squirrel Road. In addition to requirements for signs permitted within Section 1811. Signs, the following additional sign standards shall apply:
    A. Two (2) automatic changeable copy signs may be permitted and shall be considered as a separate special land use under the purview of Section 1818, provided the following conditions are met:
        1. The sign shall meet the standards of Section 1811.3(C)1 for automatic changeable copy signs, with the following exceptions:
            a. The sign may be increased in height from ten (10) feet to twelve (12) feet and in width from twelve (12) feet to twenty (20) feet.
            b. The LED copy area of the sign may be increased from sixty (60) to eighty (80) square feet in size.
            c. The signs shall be setback a minimum of one (1) foot from the road right-of-way and adjacent property lines.
            d. The total sign area on each face of the sign shall not exceed two hundred (200) square feet.
    B. Two (2) signs incorporated in decorative landscape walls may be permitted and shall be considered as a separate special land use under the purview of Section 1818, provided the following conditions are met:
        1. The signs may only be permitted along Squirrel Road and Featherstone Road.
        2. The height of the sign shall not exceed eight (8) feet.
        3. The signs shall be setback a minimum of one (1) foot from the road right-of-way and adjacent property lines.
        4. The total sign area of each sign may not exceed two hundred (200) square feet.
    C. One (1) accessory identification pylon sign may be permitted on the property adjacent to an interstate highway and shall be considered as a separate special land use under the purview of Section 1818, provided the following conditions are met:
        1. The height of the sign shall not exceed sixty-five (65) feet.
        2. The sign shall be setback a minimum of thirty (30) feet from the road right-of-way and adjacent property lines.

3. The total sign area permitted on each face of the sign shall not exceed two hundred (200) square feet.

D. The signs described in this subsection A-C may be submitted in a single special land use permit application package or in parts.

14. ***Data centers and related data processing and computing facilities, subject to the requirements of Section 1837.***

~~13.~~***14*** Accessory buildings and accessory uses customarily incidental to any of the above special land uses permitted.

~~14.~~***15*** Special land uses determined to be similar to the above special land uses in accordance with the criteria set forth in Section 1828. The application for Special Land Use Approval will be evaluated on the basis of the following criteria in addition to the requirements of Section 1818. Will the proposed development:

1. Have an adverse effect on the ambient noise level for a significant number of people?
2. Have an adverse visual or aesthetic effect?
3. Adversely divide or disrupt an established community, or divide existing uses?
4. Have an adverse effect on areas of unique interest or scenic beauty?
5. Destroy or detract from important recreational areas?
6. Interfere with important wildlife breeding, nesting, or feeding grounds?
7. Significantly increase air or water pollution?
8. Adversely affect the water table of the area?
9. Cause excessive congestion on existing ground transportation facilities?
10. Adversely affect the Master Land Use Plan for the area and the City?

SECTION 1202. REQUIRED CONDITIONS:

Principal and Special Land Uses Permitted shall be subject to the following conditions, as applicable:

1. Building Height:

   Any building over four (4) stories shall require the approval of the City Council in accordance with Section 1818. Any mechanical equipment on the roof of the building, and penthouses on the building, may not be more than twenty (20) feet in height. Mechanical equipment and penthouses are not counted as a story for purposes of this Section.

2. Setbacks:

   A. Buildings containing office uses, light industrial uses or research-related lab and/or assembly operations, or any mixture of said uses, shall be setback a minimum of fifty (50) feet from any public right-of-way. Minimum side and rear yard setbacks specified in Section 1701 for I-1, Light Industrial uses shall be observed.

   B. Buildings four (4) stories or taller shall provide a minimum front, side, and rear setback equal to the height of the building.

   C. Nursery schools, day nurseries, and child care centers shall observe the minimum setback requirements specified in Section 1701 for the B-2, General Business district.

   D. Hotels, motels, and conference centers shall be set back a minimum of fifty (50) feet from any public right-of-way. Minimum side and rear yard setbacks shall be equal to the height of the building.

   E. Public, quasi-public, and commercial recreation buildings shall be setback a minimum of fifty (50) feet from any public right-of-way. Minimum side and rear yard setbacks specified in Section 1701 for B-2, General Business uses shall be observed.

   F. All buildings shall be located at least one hundred (100) feet from any residential development.

   G. All residential uses shall observe the applicable minimum setback requirements specified in Section 1700.

3. Landscaping and Buffers:

   A. Landscaping shall be provided in accordance with the requirements of Section 1808.

   B. A minimum twenty-five (25) foot landscaped greenbelt shall be provided abutting public right-of-ways and private road easements in accordance with Section 1808 and kept free of parking.

C. A minimum twenty-five (25) foot landscaped greenbelt with staggered eight (8) foot evergreen trees shall be provided between residential and non-residential uses. Alternative screening techniques within the minimum twenty-five (25) foot landscaped greenbelt shall be at the discretion of the City Council, after recommendation from the Planning Commission.

D. For each one (1) story increase over four (4) stories, an additional three (3) feet of greenbelt shall be added to the greenbelt required by Section 1805 and Section 1808. This provision shall not apply to the twenty-five (25) foot required greenbelt.

4. Outside Storage:
No outside storage shall be permitted, with the exception of outside storage of vehicles as provided in Section 1201, Item 11.

5. Off-Street Parking:
Off-street parking shall be provided in accordance with Sections 1804 and 1805.

6. Cross-Access Interior Drives:
Cross-access interior drives, or drives that will allow vehicles to move from one site to another without entering the frontage street, may be required.

7. Off-Street Loading:
Off-street loading space shall be provided in accordance with Section 1701, Item p and Section 1806, with the exception that office uses shall provide paved loading space at a ratio of ten (10) square feet per front foot of building.

8. Performance Standards:
All development shall adhere to the Performance Standards specified in Section 1807.

9. Protection of Natural Amenities:
Natural terrain and amenities shall be protected and preserved to the greatest extent possible.

10. Site Plan Review:
Site plan review and approval is required for all development within the District in conformance with Section 1815.

11. Freestanding Lighting:
Freestanding light poles shall not exceed forty (40) feet in height and lighting shall be shielded onto the site so as to not become a nuisance to adjacent areas. For purposes of clarification, the height of light poles illuminating outdoor recreation facilities permitted via Section 1201, Item 6 may exceed forty (40) feet in height at the discretion of the City Council upon Special Land Use review and approval of said use.

SECTION 1203. AREA AND BULK REQUIREMENTS

See Article XVII, Schedule of Regulations, for additional requirements limiting the height and bulk of buildings and not in conflict with this Article XII.

(Amended: 3-06-00 per Ordinance No. 658)
(Amended: 11-11-02 per Ordinance No. 712)
(Amended: 10-06-03 per Ordinance No. 726)
(Amended: 6-26-17 per Ordinance No. 894)
(Amended: 2-17-20 per Ordinance No. 913)
(Amended: 3-18-24 per Ordinance No. 938)
(Amended: 3-17-25 per Ordinance No. 946)

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ARTICLE XIII
I-1, LIGHT INDUSTRIAL DISTRICTS

PREAMBLE

The I-1 Light Industrial Districts are designed so as to primarily accommodate wholesale activities, warehouses, and industrial operations whose external physical effects are restricted to the area of the District, and in no manner affect in a detrimental way any of the surrounding districts. The I-1 District is so structured as to permit, along with any specified uses, the manufacturing, compounding, processing, packaging, assembly, and/or treatment of finished or semi-finished products, from previously prepared material, it being the intent that the processing of raw material for shipment in bulk form, to be used at an industrial operation at another location, not be permitted.

The general goals of this use district include, among others, the following specific purposes:

1. To provide sufficient space, in appropriate locations, to meet the needs of the City's expected future economy for selected types of manufacturing.
2. To promote manufacturing development which is free from danger of fire, explosions, toxic and noxious matter, radiation, and other hazards, and from offensive noise, vibration, smoke, odor, and other objectionable influences.
3. To promote the most desirable use of land in accordance with a well considered plan. To protect the character and established pattern of adjacent development, to conserve the value of land and buildings, and other structures, and to protect the City's tax revenues.

SECTION 1300. PRINCIPAL USES PERMITTED:

In the I-1 Light Industrial Districts no building or land shall be used and no building shall be erected except for one (1) or more of the following specified uses, unless otherwise provided for in this Ordinance:

1. Any of the following uses when conducted wholly within a completely enclosed building (no outside storage of permanent vehicles, material or equipment):
   - A. Warehousing and wholesale establishments, with retail sale only if accessory to the principal use.
   - B. The manufacture, compounding, processing, packaging, or treatment of such products as, but not limited to: bakery goods, candy, cosmetics, pharmaceuticals, toiletries, food products, hardware, and cutlery; tool, die, gauge and machine shops.
   - C. The manufacture, compounding, assembling or treatment of articles or merchandise from previously prepared materials such as , but not limited to: bone, canvas, cellophane, cloth, cork, feathers, felt, fiber, fur, glass, hair, horn, leather, paper, plastics, precious or semi-precious metals or stone, shell, textiles, tobacco, wax, wire, wood (excluding saw and planing mills), and yarns. Sheet metal stamping is not permitted as a principal use.
   - D. The manufacture of pottery and figurines or other similar ceramic products using only previously pulverized clay, and kilns fired only by electricity or gas.
   - E. Manufacture of musical instruments, toys, novelties, and metal or rubber stamps, or other small molded rubber products.
   - F. Manufacture or assembly of electrical appliances, electronic instruments and devices, radios and phonographs.
   - G. Manufacture and repair of electric or neon signs, light sheet metal products, including heating and ventilating equipment, cornices, eaves, and the like.

H. Automobile repair stations, automobile or other machinery assembly plants; painting and varnishing shops, and undercoating shops.
I. Experimental, film or testing laboratories.
J. Building material storage and sales in an enclosed building.

2. Private paramedical emergency facilities subject to the following conditions:
   A. Such facilities shall be located only on collector thoroughfares or major thoroughfares as indicated on the adopted Major Thoroughfare Plan of the City of Auburn Hills.
   B. All ingress and egress on the site shall be located at least fifty (50) feet from any adjacent property line or right-of-way line.
   C. If not in existence, a passing lane shall be provided opposite the ingress/egress route used for paramedical and such other emergency vehicles in addition to the required acceleration and deceleration lanes. The passing lane is required to insure that the purpose and intent of this Zoning Ordinance is met, and is deemed necessary to prevent traffic congestion in order to assure proper egress for fast moving and accelerating emergency vehicles in order to protect the health and safety of the citizens of Auburn Hills and abutting areas.
   D. All such facilities shall be developed on sites of at least one (1) acre in area.
3. Any use charged with the principal function of research, design and development of pilot or experimental products and processes including research labs, training facilities, and light assembly operations as adjuncts to the principal use. Assembly operations shall be limited to those involving premanufactured finished objects and components, and shall include only the incidental fabrication, machining or forming of metal, plastic, or other materials as part of product development, experimentation, demonstration and repair, or the provision of customized components.
~~4. Data processing and computing centers and related services.~~
~~5.~~ ***4.*** Oil and gas wells in accordance with the criteria set forth in Section 1835.
~~6.~~ ***5.*** Accessory buildings and accessory uses customarily incidental to any of the above principal uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area (e.g., general office, child care, food service, health/workout rooms, and other similar adjunct uses provided within a facility which are intended for sole use of the workers of said facility and not the general public).
~~7.~~ ***6.*** Uses determined to be similar to the above principal permitted uses in accordance with the criteria set forth in Section 1827 and which are not listed below as special land uses.

(Amended: 11-11-02 per Ordinance No. 712)
(Amended: 4-21-14 per Ordinance No. 859)

SECTION 1301. SPECIAL LAND USES PERMITTED:

The following uses may be permitted under the purview of Section 1818 by the City Council, after site plan review and Public Hearing by the Planning Commission, and subject further to such other reasonable conditions which, in the opinion of the City Council, are necessary to provide adequate protection to the health, safety, general welfare, morals and comfort of the abutting property, neighborhood and City of Auburn Hills:

1. Lumber and planing mills when completely enclosed and when located in the interior of the District so that no property line shall form the exterior boundary of the I-1 District.
2. Metal plating, buffing and polishing, subject to appropriate measures to control the type of process to prevent noxious results and/or nuisances.
3. Sheet metal stamping operations limited to die tryout and prototype parts (vs. regular production parts) provided that blank sizes shall be limited to 54 inches by 36 inches by 0.035 inches, and further provided that Performance Standards of Section 1807, Item 10 shall be adhered to. In addition to the information required for Site Plan Review by Section 1815, Items 3 and 5, the petitioner shall provide data on soil conditions and assurances, through press foundation design or other, that potential changing ground conditions will not cause increases to noise levels and vibration standards exceeding maximum allowable limitations.
4. Storage of vehicles such as trucks, farm implement tractors, off-road self-propelled vehicles, and trailers when accessory to the main use of the building subject to controls to eliminate unsightly appearance.

5. The temporary storage of vehicles overnight or through weekend days only when the vehicles are accessory to the main use of the premises. Space for such parking shall be provided in addition to required employee parking.
6. Check cashing facilities other than banks, savings and loans, and credit unions only when located on an individual parcel not accessible to any other use, and only when not adjacent to a parcel which contains a retail or restaurant use.
7. Self-storage facilities used to provide temporary storage needs for businesses, apartment dwellers, and other individuals on a self-service basis subject to the following:
   A. The minimum site size devoted to traditional facilities with rows of multiple single-story storage buildings with self-service primarily accessible from an exterior driveway shall not be less than ten (10) acres. Vertical, multiple-story climate controlled facilities, dedicated for the exclusive use of storage, with self-service access primarily from common interior spaces shall have no minimum site size.
   B Ingress and egress from the site shall be provided from a major thoroughfare of one hundred and twenty (120) feet in existing or proposed right-of-way.

   (Amended: 1-22-07 per Ordinance No. 795)
8. Warehouse, storage and transfer, electric and gas service buildings and yards, water supply plants, water and gas tank holders, railroad transfer and storage tracks, heating and electric power generating plants, and railroad right-of-way.
9. Building material storage and sales, including landscaping materials and pallets.
10. Sales space for new cars, motor homes, travel trailers, and mobile homes, with used cars, used motor homes, used travel trailers, and used mobile homes as an accessory facility only to the new sales, subject to the following:
    A. All lighting shall be shielded from adjacent residential districts in accordance with Section 1810.
    B. Ingress and egress to the outdoor sales area shall be at least sixty (60) feet from the intersection of the right-of-way of any two (2) streets.
    C. Screening and landscaping shall be provided in accordance with Section 1808 where the I-1 District abuts R, RM, MHP or residential uses in the SP Special Purpose District.
11. Sales space for used cars provided the following conditions are met:
    A. Such uses shall only be allowed on major thoroughfares of one hundred and twenty (120) feet in right-of-way.
    B. Ingress and egress to the site shall be at least sixty (60) feet from the intersection of the right-of-way of any two (2) streets.
    C. In addition to loading and unloading area, parking spaces, and maneuvering lanes, display areas shall be provided with asphaltic or concrete surfacing.
12. Indoor recreational uses involving large uses of a nature which could be easily converted to industrial usage.
13. Wireless communication facilities in accordance with the standards and requirements listed in Section 1832. Wireless Communication Facilities, except for co-location applications which are subject to the administrative review provisions listed in Section 1832, Item K.
14. Vertical Take-Off and Landing fields (VTOL), and Heliports shall be permitted subject to the following conditions:
    A. The minimum site size for heliports shall be one (1) acre, unless the location or other circumstances would dictate a smaller site, and shall conform in dimension to the requirements of the FAA.
    B. Any petitioner for a heliport shall prepare a written statement to City Council addressing at least the following factors:
       1. Minimum obstructions in the approach and departure area.
       2. Minimum disturbance from noise and desirable location with regard to adjacent land use.
       3. Access to surface transportation.
       4. Safety precautions for the control of pedestrian and vehicular circulation in relation to the heliport.
15. Commercial Kennel and Animal Husbandry. The raising for profit of any fur bearing animals or commercial kennel shall be permitted on parcels of five (5) acres or more in size and the pens or

cages shall be located not less than one hundred (100) feet from any front, side or rear property line, and further provided that such use shall not be injurious to the surrounding neighborhoods. The property shall not be located within 1,000 ft. of a residential district. In the instance of the raising for profit of horses, cows, or other large animals that weigh two hundred (200) pounds or over at maturity, the minimum site size shall be five (5) acres plus one (1) acre for each additional animal. Further, all requirements of the Performance Standards in Section 1807 shall be adhered to.

A. Doggy Day Care Facility - Exception
   1. Site size, building size, setbacks, and location.
      a. The minimum parcel size shall be three-quarters (3/4) of an acre.
      b. The maximum number of kennels and dogs housed in the kennel / indoor play area (e.g., excluding office, lobby, breakrooms) shall be determined by the following ratios:
         i. 1 kennel per 125 sq. ft. of kennel / indoor play area
         ii. 1 dog per 75 sq. ft. of kennel / indoor play area
      c. The building and outdoor play area together shall meet setback requirements for the I-1, Light Industrial district.
      d. Property shall not be located within 1,000 ft. of a residential district.
      e. Said use shall not be permitted in multi-tenant buildings.
   2. Permitted Use.
      a. Animals shall be limited to dogs.
      b. Dogs may be groomed, trained, exercised, socialized, and boarded overnight; but not bred, sold, or let for hire.
      c. Accessory uses may include the retail sale of products related to the operation.
   3. Outdoor Play Area. All animal boarding and training shall be located inside the building, with the exception that on-site outdoor play areas may be permitted for limited use.
      a. The location and size of the outdoor play area shall be at the full discretion of the City Council, after recommendation from the Planning Commission. The size of the outdoor play area shall be a minimum of 10% of the enclosed structure and a maximum 20% of the enclosed structure.
      b. A sight-obscuring fence shall provide full containment for the animals. The fence structure shall be deep enough and secured to the ground to prevent escape and high enough to prevent the animals from jumping or climbing over.
      c. The outdoor play area shall be cleaned at least daily. Liquid animal waste shall be disposed of in accordance with best management practices.
   4. Interior Requirements. In addition to requirements of the Building Code as determined by the Building Official, the facility shall:
      a. Utilize impervious, washable materials for all wall finish materials a minimum of 48 inches from the floor (e.g., sealed masonry, ceramic title, glassboard, or marlite). Floor finish shall be sealed concrete or other approved impervious surface. Liquid-tight curbing, at least six inches high, shall be installed along all walls for sanitary confinement and wash-down cleaning.
      b. Connect the floor drain system to the sanitary sewer system.
   5. Waste Disposal. Refuse pick-up shall be a minimum of two (2) times a week, unless the Building Official determines additional disposal is required. Animal wastes shall be enclosed in a container of sufficient construction to eliminate odors.

(Amended: 8-01-05 per Ordinance No. 756)

16. Restaurants, including those defined as drive-through, provided the following requirements are met:
   A. There shall be a minimum distance of at least two thousand (2,000) lineal feet between restaurants with indoor seating only, regardless of zoning district, on the same side of any right-of-way.
   B. There shall be a minimum distance of at least two thousand (2,000) lineal feet between drive-through and/or drive-in restaurants, regardless of zoning district, on the same side of any right-of-way.
   C. The minimum yard requirements of the B-2 General Business District shall be adhered to.

D. Such uses shall only be allowed on major thoroughfares existing or proposed to be at least one hundred and twenty (120) feet in right-of-way.
E. Ingress and egress to the site shall be at least sixty (60) feet from the intersection of the rights-of-way of any two (2) streets.
F. Ingress and egress shall be limited to one (1) boulevard entrance, unless circumstances exist where individual drives can be placed at least five hundred (500) feet apart.
G. Restaurants with drive-through facilities shall only be permitted on sites containing one and one-half (1½) net acres, and having one hundred and fifty (150) feet of road frontage width. The Site Plan shall clearly reflect that the queuing lane and parking maneuvering lane are not in conflict, and will not inhibit safe ingress and egress from/to the main access thoroughfare.
H. Restaurants with drive-through facilities shall provide at least ten (10) vehicle queuing spaces eighteen (18) feet long by ten (10) feet wide from the order station. The lane containing the queuing spaces shall be separate and distinct from other access drives and maneuvering lanes for parking spaces. The queuing space lane shall have a clear width of ten (10) feet and be physically separated from access drives, maneuvering lanes and parking spaces with a landscaped area five (5) feet wide with raised curbs on all sides.

17. Outdoor seating or outdoor facilities for the serving and/or consumption of food or beverages for restaurants and other similar uses, where food and/or beverages are served and/or consumed, subject to all provisions of Article IX, Section 902, Special Land Uses Permitted.
18. Offices, provided the following requirements are met:
    A. The Building in which the office use is to be located does not exceed fifteen thousand (15,000) square feet in total area.
    B. The minimum yard requirements of the I-1 Light Industrial District shall be adhered to.
    C. Loading space shall be provided in the rear or side yard in the ratio of at least ten (10) square feet per front foot of building and shall be computed separately from the off-street parking requirements.
    D. Except as otherwise provided herein, all other requirements of the O Office District as contained in Article VII of this Ordinance shall be complied with.
19. Private clubs, fraternal organizations and lodge halls.
20. Churches and places of worship.
21. Colleges, universities and other such institutions of higher learning, both public and private, provided the property is located on the land bounded by M-59 and Featherstone Road, between I-75 and Squirrel Road.
22. Training facilities, located on parcels that are twenty-five (25) acres or greater in size, that provide a scenario-based learning environment for career preparation and continuing education in law enforcement, firefighting, and emergency medical services as well as civilian emergency preparedness.
23. ***Data centers and related data processing and computing facilities, subject to the requirements of Section 1837.***
~~23.~~***24*** Accessory buildings and accessory uses customarily incidental to any of the above special land uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area.
~~24.~~***25*** Special land uses determined to be similar to the above special land uses in accordance with the criteria set forth in Section 1828.

(Amended: 11-11-02 per Ordinance No. 712)
(Amended: 5-15-06 per Ordinance No. 779)
(Amended: 6-25-18 per Ordinance No. 903)

SECTION 1302. AREA AND BULK REQUIREMENTS:
See Article XVII, Schedule of Regulations, limiting the height and bulk of buildings.

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ARTICLE XIV
I-2, GENERAL INDUSTRIAL DISTRICTS

PREAMBLE

The I-2 General Industrial Districts are designed primarily for manufacturing, assembling, and fabrication activities including large scale or specialized industrial operations whose external physical effects will be felt to some degree by surrounding districts. The I-2 District is so structured as to permit the manufacturing, processing and compounding of semi-finished or finished products from raw materials. All uses in the I-2 General Industrial District shall be so regulated as to not become a nuisance to any adjacent residential district or use.

SECTION 1400. PRINCIPAL USES PERMITTED:

In the I-2 General Industrial Districts no building or land shall be used and no building shall be erected except for one (1) or more of the following specified uses, unless otherwise provided for in this Ordinance:

1. Any principal uses first permitted in an I-1 District, provided the standards of this I-2 District are met.
2. Lumber and planing mills when completely enclosed and when located in the interior of the District so that no property line shall form the exterior boundary of the District.
3. Metal plating, buffing and polishing, subject to appropriate measures to control the type of process to prevent noxious results and/or nuisances.
4. Sheet metal stamping operations provided that blank sizes shall be limited to 54 inches by 36 inches by 0.035 inches and further provided that the Performance Standards of Section 1807, Item 10 shall be adhered to. In addition to the information required for Site Plan Review by Section 1815, Items 3 and 5, the petitioner shall provide data on soil conditions and assurances, through press foundation design or other, that potential changing ground conditions will not cause increases to noise levels and vibration standards exceeding allowable limitations.
5. Experimental, film, or testing laboratories.
6. Manufacture and repair of electric or neon signs, light sheet metal products, including heating and ventilating equipment, cornices, eaves, and the like.
7. Warehouse storage and transfer, and electric and gas service buildings and yards, water supply and sewage disposal plants, water and gas tank holders, railroad transfer and storage tracks, heating and electric power generating plants, and railroad right-of-way.
8. Building material storage and sales.
9. Oil and gas wells in accordance with the criteria set forth in Section 1835.
10. Accessory buildings and accessory uses customarily incidental to any of the above principal uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area.
11. Uses determined to be similar to the above principal permitted uses in accordance with the criteria set forth in Section 1827 and which are not listed below as special land uses.

(Amended: 11-11-02 per Ordinance No. 712)
(Amended: 4-21-14 per Ordinance No. 859)

SECTION 1401. SPECIAL LAND USES PERMITTED:

The following uses may be permitted under the purview of Section 1818 by the City Council, after site plan review and Public Hearing by the Planning Commission, and subject further to such other reasonable conditions which, in the opinion of the City Council, are necessary to provide adequate

protection to the health, safety, general welfare, morals and comfort of the abutting property, neighborhood and City of Auburn Hills:

1. Any Special Land Uses Permitted in the I-1 District, provided the standards of this I-2 District are met.
2. Sheet metal stamping operations subject to appropriate measures to control the process to eliminate unsatisfactory effects on adjacent property from vibration and noise.
3. Indoor recreational uses involving large uses of a nature which could be easily converted to industrial usage.
4. Heating and electric power generating plants, and all necessary accessory uses.
5. Any production, processing, cleaning, servicing, repair, or storage of materials, goods, or products which shall conform with the Performance Standards set forth in Section 1807.
6. The raising of animals or commercial kennels subject to the Special Land Use requirements of Section 1301, Item 15 of the I-1 District.
7. Truck tractor and trucking facilities, including storage and repair.
8. Freight yards and truck terminals.
9. Fleet fueling facilities other than gasoline service stations, provided the following requirements are met:
   A. Such uses shall not provide any service or retail facilities.
   B. Such uses shall not provide any temporary or permanent parking facilities, other than for the employees of the fleet fueling facility.
   C. Queuing spaces shall be provided for vehicles waiting to be fueled and such spaces shall be separated from any other maneuvering lanes.
   D. Direct access shall be provided for ingress and egress to the facility from a collector or major thoroughfare as indicated on the adopted City of Auburn Hills Major Thoroughfare Plan.
   E. Any overhead canopies shall meet all setback requirements.
   F. Toilet facilities shall be provided.
10. Wireless communication facilities in accordance with the standards and requirements listed in Section 1832. Wireless Communication Facilities, except for co-location applications which are subject to the administrative review provisions listed in Section 1832, Item K.
11. Outdoor theaters subject to the following conditions:
   A. The proposed internal design shall receive approval from the City Engineer as to adequacy of drainage, and other technical aspects.
   B. Points of ingress and egress shall be available to the outdoor theater from abutting major thoroughfares of at least one hundred and twenty (120) feet in existing or proposed right-of-way, or greater, and shall not be available from any residential street.
   C. All vehicles waiting or standing to enter the facility shall be provided off-street waiting space in the ratio of one (1) space for every ten (10) viewing spaces within the drive-in theater. No vehicle shall be permitted to wait or stand within a dedicated road right-of-way.
12. Sales and rental of construction equipment and other types of large machinery in which outside storage of same is the primary use.
13. ***Data centers and related data processing and computing facilities, subject to the requirements of Section 1837.***

~~13.~~***14*** Accessory buildings and accessory uses customarily incidental to any of the above special land uses permitted; however, accessory uses shall not exceed fifty (50) percent of the gross building area.

~~14.~~***15*** Special land uses determined to be similar to the above special land uses in accordance with the criteria set forth in Section 1828.

(Amended: 11-11-02 per Ordinance No. 712)

SECTION 1402. AREA AND BULK REQUIREMENTS:

See Article XVII, Schedule of Regulations, limiting the height and bulk of buildings.

Video Reference

A 27-minute video produced by PBS that outlines the main concerns and issues related to data centers.

Click on either link below:
https://www.pbs.org/newshour/video/horizons/2026/06/why-communities-are-revolting-against-data-centers

https://www.youtube.com/watch?v=fkB8mt1DEVw

Why communities are revolting against data centers

Fundraiser

PBS NewsHour

STATE OF MICHIGAN
OFFICE OF THE GOVERNOR
LANSING

Michigan Affordability and Responsible Growth Pledge

A Commitment to Michigan Families and Communities

Michigan welcomes companies that want to invest, create jobs, and strengthen our economy. With that opportunity comes a responsibility to be a good neighbor.

When it comes to data center development, Michigan has the strongest regulations and safeguards in the nation. The State of Michigan believes economic growth and consumer protection go hand in hand. Michigan laws and orders from the Michigan Public Service Commission ensure that companies pay the full cost of development, strengthen our electric grid, safeguard our natural resources, and ensure that the costs of private investment are not shifted onto residents or small businesses.

A Commitment from Data Center Companies

By signing this pledge, we agree to invest responsibly, operate openly, and work in partnership with Michigan communities to ensure our projects deliver lasting benefits while putting working families first.

1. Michiganders Will Never Pay for Data Center Energy Demands

Michigan households and small businesses will not see higher costs because of our operations. We pledge to bear the electric system costs directly attributable to serving our data centers, including generation capacity and grid upgrades. This includes paying for new generation capacity, all associated grid upgrades or expansions necessary to serve our data centers, and all energy costs incurred to serve our facilities.

2. Build, Bring, or Buy New, Additive Power Resources

We commit to securing new and additional energy, generation, capacity, or flexibility where needed to keep our operations from straining the existing grid. Further, we agree to pursue feasible opportunities to build or secure additional clean and renewable energy capacity in Michigan by investing in a diverse mix of technologies, such as solar, wind, battery, and other low-emission technologies, while prioritizing affordability for all ratepayers.

3. Long-Term Contracts That Protect Households and Small Businesses

We will sign long-term energy service agreements with utilities, pay for a minimum amount of generation capacity regardless of whether used or not under those agreements, and prevent stranded costs from falling on working families. This is in alignment with Michigan law preventing cost-shifting across all other customer classes.

4. Growth Should Help Lower Costs for Everyone

We affirm and support Michigan regulators' finding that adding large customers can lower costs for other ratepayers by helping defray the fixed costs of the electric grid.

5. Strengthening Grid Reliability for Families and Communities

We will make sure data centers help maintain electric grid reliability for Michigan families and small

businesses. We will coordinate with grid operators to support flexible load solutions and demand management programs.

6. Compliance with Michigan's Environmental Protections
We commit to complying with all applicable environmental permitting and public engagement requirements, including those protecting air quality, water use and water quality, wetlands, and natural resources. We also agree to oversight and routine inspections from regulators and government entities.

7. Protecting Michigan's Freshwater
We commit to protecting local water resources by building and utilizing next-generation technologies that minimize water use, like closed-loop systems, purchasing water only from municipal systems with adequate capacity, or pursuing new and more efficient solutions for sustainable water use that come to market. We will pay our fair share for the water supply and infrastructure needed to serve the data center, which will help lower costs for Michigan households.

8. Supporting Jobs and Local Community Benefits
We will prioritize hiring Michigan workers and support local workforce training where available and feasible. We commit to investing in Michigan through tax contributions that expand the tax base. With this new funding, local and state lawmakers can support schools, bolster resources for emergency services, and fix infrastructure without raising taxes on working families. We further commit to funding the infrastructure required for our projects, so those infrastructure costs will never raise taxes on working families.

9. Transparency and Accountability to the Public
We will report our operations, environmental compliance status, and community investments, as may be required under Michigan's regulatory and permitting processes, and we will participate as required in public notice and comment processes.

10. The Bottom Line: Michigan Working Families Come First
We affirm that the cost of our operations will not be shifted onto Michigan families or small businesses. We will work to contribute to lower costs, stronger infrastructure, and greater economic stability for the communities we join.

Agreed by:

ANTHROP\C
ANTHROPIC, PBC
July 15, 2026

Google
Google LLC
July 15, 2026

Microsoft
Microsoft Corporation
July 15, 2026

OpenAI
OpenAI OpCo, LLC
July 15, 2026

ORACLE
Oracle Corporation
July 15, 2026

verrus
Verrus, LLC
July 15, 2026

WHAT MICHIGAN LOCAL GOVERNMENTS SHOULD KNOW ABOUT DATA CENTERS

February 2026

GRAHAM SUSTAINABILITY INSTITUTE
CENTER FOR EMPOWERING COMMUNITIES
UNIVERSITY OF MICHIGAN

Table of Contents

Background & Purpose

While data centers have operated in Michigan for some time,[1] they have largely existed without debate or public scrutiny. With the growth of AI and cloud computing, however, demand for larger, more resource-intensive data center facilities has surged. Following the recent expansion of state-level tax incentives for data centers, developers have begun looking to Michigan to identify new siting opportunities for significantly larger facilities.

Much has been written about the opportunities and risks that AI and data centers pose to society at large.[2] **This guide is not intended to resolve or mediate this society-wide debate; instead, it focuses on local-level considerations.** Like all land uses, data centers bring both positive and negative local impacts to the communities that host them. These impacts can vary depending on the specific technology used within a data center, the state regulations that shape its development, and its location within the host community. For example, there is a trade-off between the amount of water and energy a data center consumes, which depends heavily on the cooling technology used. State and local policy can also shape data center impacts on water and energy, as well as the direct economic impacts on the host community, including property taxes and job creation.

This guide is intended to provide Michigan local government officials and planners, particularly those with zoning authority, with the information they need to effectively participate in data center siting conversations. The first section of this guide provides a basic introduction to the environmental and economic impacts of data centers and links them to the current Michigan policy context. In the second section, we offer planning and zoning recommendations applicable not just to data centers but to a range of industrial land uses. Wherever possible, we draw on lessons from data center development in other states and from other industrial development, including our own expertise with large-scale renewable energy projects. **Since policies, technologies, and best practices for data center siting are rapidly evolving, readers should treat this guide as a working document. We plan to revise it or add supplementary guides as we learn more.**

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[1] Estimates range on the number of data centers currently in Michigan, likely due to the broad definition of what constitutes a data center. The U.S. Department of Energy's Office of Scientific and Technical Information's Data Center Atlas lists nine data centers in Michigan. Recent local reporting has noted approximately 44 data centers in the state. Mongird, K., Thurber, T., Vernon, C., Burleyson, C., Akdemir, K. Z., & Rice, J. (2025). *Im3 open source data center atlas*. Pacific Northwest National Lab (United States). https://doi.org/10.57931/2550666; *Your guide to Michigan's data center boom—And the growing backlash*. (2025, November 18). WKAR Public Media. https://www.wkar.org/wkar-news/2025-11-17/your-guide-to-michigans-data-center-boom-and-the-growing-backlash

[2] *Data centers are amazing. Everyone hates them.* (n.d.). MIT Technology Review. Retrieved February 5, 2026, from https://www.technologyreview.com/2026/01/14/1131253/data-centers-are-amazing-everyone-hates-them/; Copley, M. (2025, October 14). Data centers are booming. But there are big energy and environmental risks. *NPR*. https://www.npr.org/2025/10/14/nx-s1-5565147/google-ai-data-centers-growth-environment-electricity

Data Center Basics

A data center is any physical room or facility that houses information technology infrastructure. Many data centers provide computing services that keep websites running, enable video streaming, and support the software used by banks, hospitals, and human resources departments. With the rise of technologies such as cloud-based services and the Internet of Things (e.g., “smart” appliances, building systems, and other equipment that send data and can be controlled via the internet), we have seen the construction of newer, larger data centers to accommodate these increasingly popular technologies.[3] In particular, the advent of generative artificial intelligence (genAI) and large language models (LLMs) has driven the development of very large data centers.

A data center’s infrastructure includes not just the servers (i.e., computers) that store and process information, but also networking equipment to get information to and from the internet, power supply equipment to protect the computers against fluctuations in electricity, and environmental control equipment to cool and maintain humidity.[4] The graphic on the next page includes a useful depiction of the components of a data center.

While a data center supporting a small business’s operations, for example, may be as small as a closet, most of the current attention – and the rest of this guide – focuses on large, “hyperscale” data centers. Hyperscale data centers house over 5,000 servers, and have a footprint ranging in size from 10,000 to millions of square feet.[5] Generally, the digital services enabled by hyperscale data centers benefit a national or multi-region customer base rather than just the community or business property where the facility is located.

Data center companies choose sites for new development based on a variety of factors. In addition to needing to find a site with enough land to house the data center, they also require sites near an electric transmission line with sufficient capacity to provide power to the facility and high-capacity, low-latency fiber-optic cable to connect to the internet.[6] [7] If the data center plans to use water for cooling, it must also be sited near an adequate water source. From a financial perspective, developers are also more likely to build new facilities in localities that offer tax exemptions or other financial incentives.

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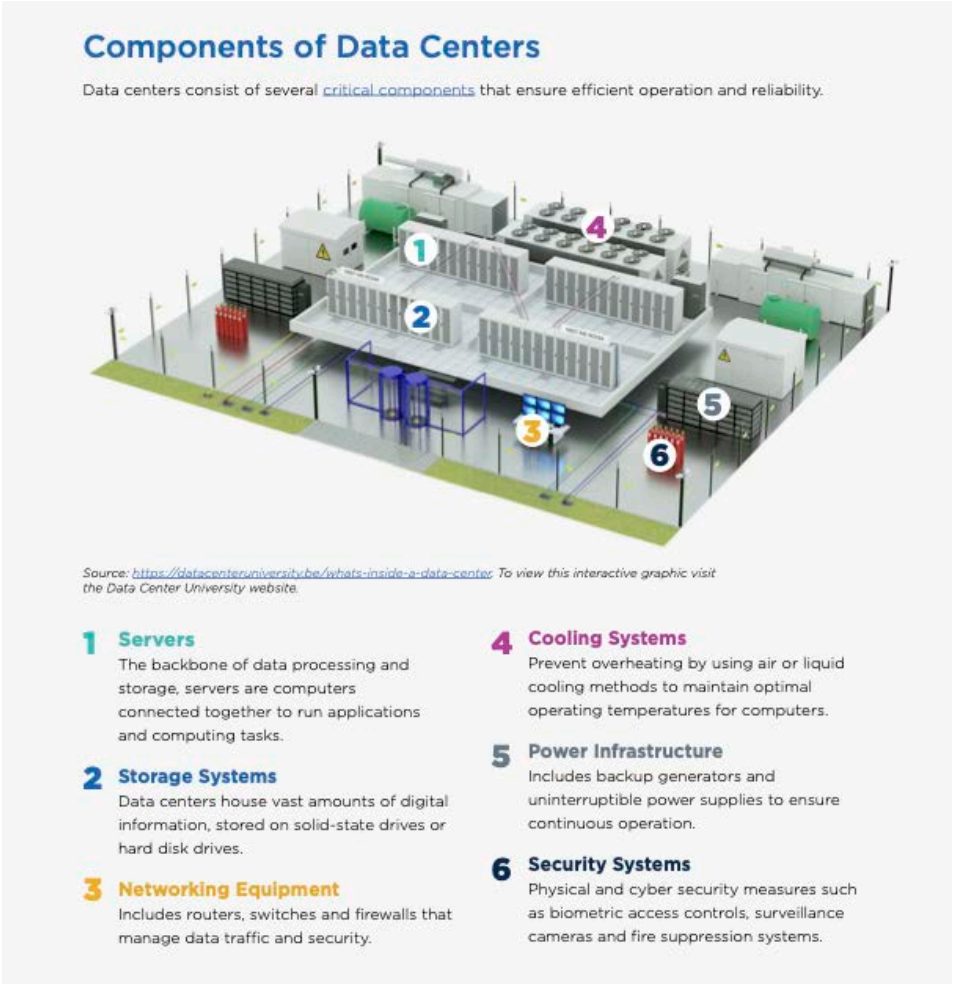
[3] Center for Sustainable Systems, University of Michigan. 2025. "Artificial Intelligence Factsheet." Pub No. CSS25-22. https://css.umich.edu/publications/factsheets/built-environment/artificial-intelligence-factsheet

[4] *What is a data center?* | *ibm*.

[5] *What is a hyperscale data center?* | *IBM*. (2024, March 21). https://www.ibm.com/think/topics/hyperscale-data-center

[6] CallisonRTKL, R. B., Vice President and Director, Mission Critical Group. (2015, January 19). *Parameters to consider in the data center location decision*. Area Development. https://www.areadevelopment.com/data-centers/data-centers-q1-2015/data-center-location-decision-parameters-46734866.shtml

[7] A recent trend in hyperscale data center development is for hyperscalers to build their own privately-owned, low-latency fiber networks if their preferred site lacks reasonable access to backbone fiber. Datacenters.com. (2025, September 3). *Who’s Building the Next 200MW Colocation Campuses—And Why?* . https://www.datacenters.com/news/who-s-building-the-next-200mw-colocation-campuses-and-why



Source: National League of Cities

Environmental Impacts and Michigan Policies

This section details a summary of key environmental impacts; generally, the most environmentally-friendly data centers are those that:

- Use water- and energy-efficient equipment and practices within the data center
- Are powered by electricity sources that have low water use and reduced emissions[8]
- Have thoughtful site selection that avoids important habitats and sensitive lands
- Commit to decommissioning - removing infrastructure at the end of the facility's useful life

Energy and Water Consumption

Questions about water and energy consumption frequently arise in data center discussions. Because the numbers associated with data center resource consumption are so large, it may be helpful to put them in context. Some of the most water-intensive hyperscale data centers, for example, can require up to five million gallons of water per day.[9] Putting this into perspective within Michigan's context, the Great Lakes Water Authority's five freshwater treatment plants have maximum rated capacities between 240 and 540 million gallons per day, and currently have an estimated combined maximum demand of 1 billion gallons per day.[10] Using an example within the context of Michigan's energy consumption, the proposed data center in Saline Township would require 1,400 megawatts of power capacity. By comparison, the state's total generation capacity in 2024 was just over 32,000 megawatts.[11]

Energy and water consumption are presented here together because they are linked. While there is currently a gap in publicly available data on energy and water use by specific computing and cooling technologies,[12] we do know that there is typically a trade-off between energy and water use. Technologies like evaporative cooling are more energy-efficient but more water-intensive. Meanwhile, air-cooled or closed-loop chillers use minimal to no water, but are energy-intensive.[13] Both types of cooling systems are common, and often the developer may choose between them based on availability of water and cost; the water-efficient closed-loop systems are currently more costly than open-loop evaporative cooling.[14] As noted in this document's state-level tax abatement section, the sales and use tax exemptions for "enterprise" data centers, which were

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[8] Xiao, T., Nerini, F.F., Matthews, H.D. *et al.* Environmental impact and net-zero pathways for sustainable artificial intelligence servers in the USA. *Nat Sustain* 8, 1541–1553 (2025). https://doi.org/10.1038/s41893-025-01681-y

[9] Wroth, K. (2025, October 17). *Data drain: The land and water impacts of the ai boom*. Lincoln Institute of Land Policy. https://www.lincolninst.edu/publications/land-lines-magazine/articles/land-water-impacts-data-centers/

[10] GLWA 2022—2026 CIP Appendix D: System Background Information. (n.d.). Great Lakes Water Authority. https://www.glwater.org/wp-content/uploads/2020/12/GLWA-2022-2026-CIP_AppendixD.pdf

[11] https://www.eia.gov/electricity/state/michigan/

[12] Shehabi, A., Smith, S.J., Hubbard, A., Newkirk, A., Lei, N., Siddik, M.A.B., Holecek, B., Koomey, J., Masanet, E., Sartor, D. 2024. 2024 United States Data Center Energy Usage Report. Lawrence Berkeley National Laboratory, Berkeley, California. LBNL-2001637. https://escholarship.org/content/qt32d6m0d1/qt32d6m0d1.pdf

[13] *Google's Water Risk Framework Assessing watershed health in data center communities*. (2023, December).

[14] *Chilling out: Data centers find new ways to reduce cooling costs | news & insights*. (n.d.). Gray. Retrieved February 4, 2026, from https://www.gray.com/insights/chilling-out-data-centers-find-new-ways-to-reduce-cooling-costs/

signed last year, include requirements related to water and energy. However, these same provisions are not required for the “qualified” data center exemption category, which has been available since 2015.

When thinking about a data center’s sustainability, something to note is that even in data centers that have minimal *direct* use of water for cooling, there may still be *indirect* use of water. That is because most U.S. power plants are thermoelectric[15] and require significant amounts of water to operate.[16] This indirect water impact is no different from that of other high-demand electricity users, and can be minimized when data centers are located in electricity grids that have less reliance on thermoelectric power plants or when the data centers themselves are powered by electricity sources that do not require water for operations (e.g., wind and solar power). Consequently, this water use is rarely in the community hosting the data center, but rather in communities that host power plants that supply electricity to the grid. While Michigan’s electricity fleet has been reducing its reliance on thermoelectric power plants as it adds renewables to the grid, in 2024, Michigan’s electric power plants withdrew roughly 5.4 billion gallons of water per day for power plant cooling.[17]

Like the federal government, Michigan does not have policies specifically governing data center energy use.[18] However, the Michigan Public Service Commission (MPSC, also known as the Commission) regulates several policies relevant to data centers. Primarily, the MPSC regulates both the investor-owned utilities that charge data centers for electricity and natural gas and the terms of service under which those utilities operate. The Commission also requires all entities that provide electricity to customers in Michigan, including investor-owned utilities, cooperatives, municipal utilities, and alternative electric suppliers, to prove each year that they have adequate resources planned four years ahead to meet their customers' electricity needs.[19] Furthermore, the Commission has the power to require additional customer protections in special contract requests submitted by investor-owned utilities seeking to work with data centers, and to attach conditions to any approval it grants. However, the Commission cannot control where data centers are built, approve their construction, or issue permits related to their water consumption.[20]

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[15] A thermoelectric power plant uses an energy source (e.g., coal, natural gas, or nuclear) to heat water to create high-power steam which is then used to spin a turbine to generate electricity.

[16] In 2023, data centers directly consumed approximately 17 billion gallons of water in their operations and indirectly consumed 211 billion gallons through their energy use. Sadasivam, N. (2025, November 24). *How to make data centers less thirsty*. Grist. https://grist.org/energy/how-to-make-data-centers-less-thirsty/

[17] Annual Report of the Great Lakes Regional Water Use Database. (2024). Great Lakes Commission. https://cms.waterusedata.glc.org/media/2024-Water-Use-Report-FINAL.pdf

[18] There is currently federal guidance (not requirements) on data centers used by the federal government. Offutt, M., & Zhu, L. (2025). *Data Centers and Their Energy Consumption: Frequently Asked Questions*. Library of Congress. https://www.congress.gov/crs-product/R48646#fn59

[19] *Resource planning*. (n.d.). Retrieved January 4, 2026, from https://www.michigan.gov/mpsc/regulatory/electricity/resource-planning

[20] *Issue Brief:Case No. U-21990, DTE Electric’s Application for Approval of Special Contracts*. (2025, December 18). Michigan Public Service Commission. https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/info/briefs/Issue_Brief_U_21990_DTE_12_18_25-(002).pdf

The MPSC also manages the implementation of Michigan's clean energy standard, legislation that shapes the types of power plants that provide electricity to Michigan utilities.[21] This law requires utilities to obtain 15% of their power from renewable energy resources each year through 2029, and then 50% in 2030. In 2035, an 80% clean energy standard will take effect, with a target of 100% in 2040. During this transitional period, the MPSC is responsible for reviewing each utility's renewable energy plan to ensure compliance with the standard and for approving cost-recovery mechanisms for regulated utilities. The Commission also has the ability to grant a utility an extension for compliance under certain circumstances.[22]

While the MPSC has jurisdiction over the state's utility rates and customer protections, the Department of Environment, Great Lakes, and Energy (EGLE) regulates water withdrawals. Within EGLE, the Geologic Resources Management Division (GRMD) oversees Michigan's regulation of large quantity water withdrawals, with the goal of protecting the state's environment from significant impacts caused by large-volume water consumers. Specifically, Michigan landowners, such as a data center using traditional evaporative cooling, must obtain prior approval before operating pumps capable of withdrawing at least 70 gallons per minute.[23] The permitting process relies on GRMD's Water Withdrawal Assessment Tool (WWAT) for wells or surface water intakes from streams, rivers, or ponds with less than five acres of surface area. GRMD grants approval when no Adverse Resource Impact (ARI) on nearby streams and rivers is determined, resulting in a Water Withdrawal Registration that becomes void if the withdrawal isn't operational within 18 months.[24] Further permitting is required in sensitive areas or when large-quantity withdrawal owners seek new or increased withdrawals exceeding 2,000,000 gallons per day (pumps with flow rates of 1,389 gallons per minute or more).[25] These regulations apply to any on-site water producers in the state, from agriculture to public water supplies, and would apply whether a data center seeks to withdraw water via a well or if its increased demand would prompt a public water supply to increase its water withdrawals.

In the case of a data center seeking supply through a public water utility, Michigan's Safe Drinking Water Act requires these facilities maintain adequate capacity and reliability for existing customers.[26] Further, EGLE will reject water treatment plant construction permits if capacity assessments reveal a proposed expansion or alteration will leave a system with inadequate technical, financial, or managerial capacity to meet requirements.[27]

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[21] *Clean energy standard*. (n.d.). Retrieved January 4, 2026, from https://www.michigan.gov/mpsc/commission/workgroups/2023-energy-legislation/clean-energy-standard
[22] MCL 460.1032 (2). https://legislature.mi.gov/documents/mcl/pdf/MCL-ACT-295-OF-2008.pdf
[23] *Wwat*. (n.d.). Retrieved October 7, 2025, from https://www.egle.state.mi.us/wwat/home
[24] *Wwat*. (n.d.). Retrieved October 7, 2025, from https://www.egle.state.mi.us/wwat/home
[25] *Wwat*. (n.d.). Retrieved October 7, 2025, from https://www.egle.state.mi.us/wwat/home
[26] Safe Drinking Water Act, Mich. Comp. Laws § 325.1005(1)(e) (1976).
[27] Safe Drinking Water Act § 325.1004(2), (7).

Wastewater

Data center cooling systems influence not only water consumption but also the overall quality and volume of wastewater produced. Some cooling systems, like evaporative cooling, can generate wastewater with altered pH, and high concentrations of conditioning chemicals and biocides that are used to reduce the growth of bacteria such as *legionella*.[28] While these chemicals are important for minimizing
public health risks, they could strain local treatment plants that are not equipped to handle them. Other next-generation data center designs, such as closed-loop and dry cooling, are moving toward minimal or near-zero wastewater discharge.

EGLE's Water Resources Division (WRD) regulates waste or wastewater discharging into the waters of the state. Waters of the state are defined in law as groundwaters, lakes, rivers, and streams, along with all other watercourses and waters, including the Great Lakes. The regulations applicable to wastewater discharges can be divided into three permitting categories: discharges directly into surface water, discharges directly onto the ground or subsurface into the groundwater, and indirect discharges into nearby municipal wastewater treatment systems.

The first category applies to anyone discharging, or proposing to discharge, waste or wastewater into the state's surface waters. This type of permit is required by law under the National Pollution Discharge Elimination System (NPDES) program. This applies to any type of wastewater, including commercial, industrial, and sanitary sewage. The NPDES program is intended to control direct discharge into the surface waters of the state by imposing effluent limitations and other conditions to meet state and federal requirements.

The second category applies to anyone discharging, or proposing to discharge, waste or wastewater directly onto the ground or into groundwater. This type of discharge would require a Groundwater Discharge Permit or an exemption. A groundwater discharge permit imposes effluent limitations and/or groundwater limits set to protect the groundwater for the intended purposes. The intended purposes include protecting nearby drinking water wells, along with groundwater seeping into nearby surface water, to ensure the groundwater is safe for all who use it. This permit type applies to any wastewater, including commercial, industrial, and sanitary sewage. There are other regulating authorities, such as the Local Health Departments, that may become involved through the issuance of construction permits for discharges containing only sanitary sewage generating less than 10,000 gallons per day.

The third category applies to any indirect discharges (those who discharge to a municipal wastewater treatment facility via a sanitary sewer) and does not require an NPDES or groundwater discharge permit. Discharge to a separate storm sewer (i.e., does not go to a municipal wastewater treatment facility) is considered a direct discharge and may require either

[28] CDC. (2024, May 8). *Strategies for identifying cooling towers*. Investigating Legionnaires' Disease. https://www.cdc.gov/investigate-legionella/php/public-heaMichiganlth-strategy/identifying-cooling-towers.html

an NPDES or a groundwater discharge permit. Discharge to a municipal wastewater treatment facility may require a permit from the municipality under the Industrial Pretreatment Program.

Air Quality

The main air quality impact of data centers stems from emissions associated with electricity production, specifically nitrogen oxides and fine particulate matter (PM2.5).[29] Data centers typically draw most of their power from the grid, so the majority of these emissions are generated off-site in the communities hosting the power plants serving the power grid at large. Thus, when data centers are built in regions with cleaner power plants, these air emissions are lower. This impact can be furthered through the adoption of flexible operational strategies, such as load shifting, dynamic scheduling, and participation in virtual power plant (VPP) programs, which can help reduce emissions during peak demand periods. While these strategies are not yet widespread, research indicates that they most effectively reduce emissions when utilized in regions where renewables are already abundant and cost-competitive.[30]

Even when connected to the grid, data centers have on-site back-up generators, typically fueled by natural gas or diesel, to maintain operations during outages.[31] Actual emissions at the data center will depend on the number of generators, their size, and permitted runtime hours, and will vary based on individual data center operational standards. In Michigan, EGLE's Air Quality Division (AQD) requires air use and installation permits for equipment emitting air contaminants unless exempted explicitly under Part 2 of the air quality rules (Rules 277-291). While Rule 285(g) exempts the sort of small internal combustion engines that might be used in emergency back-up generators, data centers must also comply with Rule 278, which prohibits using exemptions when total project emissions exceed significance thresholds (e.g., 40 tons/year of nitrogen oxides, 100 tons/year of carbon monoxide, or 10 tons/year of particulate matter 2.5 micrometers or smaller). If aggregate emissions from all back-up generators exceed these thresholds, individual engine exemptions become invalid, and the site must obtain a permit for the entire fleet of generators on-site and any other air-emitting equipment.[32]

Land

As with other land uses, the environmental impact of a data center on its site largely depends on site characteristics, the land management practices used during construction, and what happens to the site at the end of the facility's lifespan.

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[29] Mitigating the public health impacts of ai data centers. (2025, November 5). *Harvard Business Review*. https://hbr.org/2025/11/mitigating-the-public-health-impacts-of-ai-data-centers

[30] Tran, T. (2025, October 29). Flexible data centers and the grid: Lower costs, higher emissions? -. *CEEPR*. https://ceepr.mit.edu/flexible-data-centers-and-the-grid-lower-costs-higher-emissions/

[31] *A primer for local governments: Understanding data centers*. (2025, April). National League of Cities. https://www.nlc.org/wp-content/uploads/2025/04/Data-Centers-Fact-Sheet.pdf

[32] Insights from Liesl Clark, Director of Climate Action Engagement at the University of Michigan

Data centers may cause environmental harm if sited in areas with sensitive natural features, such as steep slopes, wetlands, floodplains, and unique habitats. Construction activities, such as grading or heavy equipment use, can lead to soil compaction, topsoil removal, and changes in natural water flow, which can hinder the site's future plant growth and water-holding capacity.[33] Furthermore, if infrastructure is abandoned at the end of the project's life, it may result in the creation of a brownfield or make future redevelopment challenging. Such impacts, however, are not unique to data center development, and there are already state and local policies in place to address these common concerns with other industrial developments.

Sometimes there is a concern about whether data centers will impact other land uses, for example, by converting agricultural land. Even if many data centers are constructed, at the national- or state-level, they are only expected to be a minuscule fraction of total land area.[34] At the local level, however, there could be noticeable impacts if multiple large data centers are built in close proximity, or if data center development is combined with land-use changes from other sectors (e.g., housing development, energy infrastructure).

Quality of Life

In addition to direct impacts on land, data centers can raise several quality-of-life concerns for neighboring properties. Drawing on lessons from data centers in both Loudoun County, Virginia's "Data Center Alley," and Linn County, Iowa, we have learned that many of these issues can be mitigated through attentive siting.

Many quality-of-life concerns arise from other similar types of industrial development. Construction activities, for example, often have exceptionally high levels of disruption for neighbors, with heavy truck traffic, construction-related noise, and dust.[35] When foundations are being constructed, the developers may need to dewater, raising concerns of temporary impacts on local water tables or soil erosion.[36] As with other construction activities, soil erosion permits issued by the county or municipality would be required for "any earth change activity that disturbs one or more acres of land or which is within 500 feet of a lake or stream."[37] Similarly, when data centers or other industrial activities are developed on previously undeveloped sites,

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[33] Augst, T., Fierke-Gmazel, H., Gould, M. C., Krol, M., Mills, S., Neumann, B., Reilly, M., & Stoetzer, O. (2025). Planning and Zoning for Solar Energy Systems: A Guide for Michigan Local Governments (Updated ed.). Michigan State University Extension, Michigan State University School of Planning, Design and Construction, and University of Michigan Center for EmPowering Communities.

[34] Power Play: The Emerging Powered Land Opportunity (n.d.) Hines. Retrieved January 5, 2026,https://www.hines.com/powered-land/power-play-full-report

[35] *Data Centers in Virginia*. (2024). [Report to the Governor and the General Assembly of Virginia]. Joint Legislative Audit and Review Commission. https://jlarc.virginia.gov/pdfs/reports/Rpt598.pdf

[36] *$750m iowa data center's unpermitted wells draw $20k fine against dewatering contractor | engineering news-record*. (n.d.). Retrieved February 4, 2026, from https://www.enr.com/articles/61162-750m-iowa-data-centers-unpermitted-wells-draw-20k-fine-against-dewatering-contractor

[37] Soil Erosion and Sedimentation Control Program (SESC). (n.d.). Retrieved February 6, 2026 from https://www.michigan.gov/egle/about/organization/water-resources/soil-erosion/sesc-overview

there is a visual change to the landscape. This is apparent not just during the day, but also at night when parking lot and security lighting may create a notable change to the nighttime character of the property.

Other impacts, though, are more unique to data centers. One of the primary complaints of existing data centers in Loudoun County, for example, is the associated noise.[38] Unlike many industrial facilities with variable operational patterns, data centers operate continuously, producing consistent noise that can be problematically disruptive for neighboring residents. In particular, Loudon County found that inaudible low-frequency sounds were a nuisance to some data center neighbors.[39]

[38] *Data Centers in Virginia*. (2024)
[39] *Data Centers in Virginia*. (2024).

Economic Impacts and Michigan Policies

The primary draw of data centers as a land use, at both the state and local levels, is the economic activity they generate. There are, however, concerns about whether data centers will increase electricity costs for consumers. Here, we outline the potential economic impacts of data centers and the policies in Michigan that shape them.

State-level Tax Abatements to Attract Industry

Data centers, like other industries, drive economic activity in the states and communities where they are located. This includes, notably, the direct economic impacts of the surge in construction activity and the initial investment in data center equipment. But it also includes indirect economic benefits to the suppliers of the equipment and other materials that go into data centers, as well as induced effects when data center workers spend their wages on goods and services.[40] While new economic activity in a state expands the tax base and can fund state and local government services, states often reduce certain taxes to attract industry. Today, 36 states have laws approving state tax incentives for new data center development.[41]

For the past decade, the state of Michigan has offered a state-level sales and use tax exemption for "qualified" data centers, with new legislation adopted in 2024 aimed primarily at attracting hyperscale or "enterprise" data centers. The policies governing the sales and use tax exemption are from three key pairs of laws:

- Effective December 23, 2015, **PA 251 and 252 of 2015** added Michigan Compiled Law (MCL) 205.54ee and MCL 205.94cc to Michigan's General Sales Tax Act and Use Tax Act to create sales and use tax exemptions through December 31, 2035, for the sale, use, or consumption of data center equipment for qualified data centers. Under these Acts, a "qualified data center" is "facilities of one or more buildings located in Michigan that are owned or operated by an entity whose primary business is operating a data center for itself and colocated businesses; the entity must also receive 75% or more of its revenue from unaffiliated colocated businesses." The Acts required the creation of 400 new data center-related jobs by January 1, 2022, and 1,000 by January 1, 2026. Data center-related jobs include "jobs created at qualified data centers, by colocated businesses, and by contractors making improvements to realty that constitute a qualified data center."[42]

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[40] *DataCenters-JoyceFoundation_2026-01-13_Final.pdf | Powered by Box*. (n.d.). Retrieved February 4, 2026, from https://virginia.app.box.com/s/8qq2ggbdgwhf4atrorghtrcqsq64wd74

[41] *An overview of state data center-related tax incentives | naiop | commercial real estate development association*. (n.d.). Retrieved January 12, 2026, from https://www.naiop.org/research-and-publications/magazine/2024/Winter-2024-2025/development-ownership/an-overview-of-state-data-center-related-tax-incentives/

[42] *Notice Regarding Data Center Exemption*. (2016, March 14). State of Michigan Department of Treasury. https://www.michigan.gov/treasury/-/media/Project/Websites/taxes/Notices/Data_center_exemption_notice.pdf?rev=e6f7d971f9bd4eccba3f208b3fe9d862&hash=DF4CBADC90F299058E7F2F3358A823A2

- Effective February 13, 2020, **PA 29 and 30 of 2020** amended MCL 205.54ee and MCL 205.94cc to establish reporting obligations for sales and use tax exemption claims regarding the sale or purchase of data center equipment.[43] Under these Acts, persons seeking exemptions in a particular calendar year must file Form 5726 by January 31 of the following year. Form 5726 requires information on the sales or purchase price of all exempt equipment, and any information needed by the Department of Treasury to calculate School Aid Fund revenue loss as a result of tax exemption claims.
- Effective April 2025, **PA 181 and 207 of 2024** amended MCL 205.54ee and MCL 205.94cc to extend the original tax exemption period from 2035 to 2050 (and to 2065 for data centers built on brownfields), and to establish a new "enterprise data center" facility type that must meet more stringent requirements compared to "qualified data centers" to receive tax exemptions.[44] In August 2025, the Michigan Strategic Fund (MSF) published formal implementation guidelines for the new amendments, including related to clean energy, water, and green building standards.[45] Since then, several organizations have submitted comments to the MSF Board requesting changes, particularly related to the interpretation of the clean energy requirements, asking for that standard to be applied from the outset of the data center's operations rather than a future date.[46, 47]

Table 1 summarizes key features of these incentives. While both incentive categories have job-creation requirements, their other requirements vary considerably. While smaller, non-hyperscale data centers may only meet the definition of a "qualified" data center, many of the current larger data center development proposals may meet both definitions. Notably, while "enterprise" data centers have many more requirements than "qualified" data centers, the certification process provides greater certainty for developers because the certificate is granted by MSF before they purchase the equipment. By contrast, the "qualified" data center incentive is provided by the retailer at the point of sale, but subject to a Treasury audit which introduces some risk that the exemptions may have been invalid. It is difficult to determine which of the two exemptions data center developers will seek.

[43] *Notice: Report for qualified data center exemptions - form 5726*. (n.d.). Retrieved from https://www.michigan.gov/treasury/reference/taxpayer-notices/notice-report-for-qualified-data-center-exemptions-form-5726

[44] *Enterprise Data Center Sales & Use Tax Exemption*. (2025, August 26). Michigan Economic Development Corporation. https://www.michiganbusiness.org/globalassets/documents/data-center/enterprise_data_center_information.pdf

[45] *Enterprise Data Center Sales & Use Tax Exemption*. (n.d.). Michigan Economic Development Corporation. https://www.michiganbusiness.org/services/data-centerreitissuegulate/

[46] *2025-11-13 letter to msf re data center tax exemption guidelines*. (n.d.). Retrieved from https://www.documentcloud.org/documents/26285411-20.25-11-13-letter-to-msf-re-data-center-tax-exemption-guidelines/

[47] Lyijynen, N. (2025, December 11). *Comments on data center generation » mieibc*. MIEIBC. https://www.mieibc.org/comments-on-data-center-generation/

Table 1. Summary of Sales and Use Tax Exemptions for Qualified and Enterprise Data Centers

	Qualified Data Center	**Enterprise Data Center**
Key definitional feature	Must receive 75% or more of revenue from colocated businesses that are not affiliates of the owner/operator	Must have a minimum of $250M equipment investment
Job Requirements	400-1,000 aggregate statewide	30 per facility at 150% median prosperity wage
Clean Energy	No requirements	90% of usage (interpretation unclear, see below)
Green Building Standards	No requirements	One or more certified standards within 3 years
Water Source	No requirements	Municipal
Property Tax	No requirements	Cannot receive sunset, state, or local property tax benefits without local approval
Certification Requirements/Details	To claim the exemption when purchasing eligible data center equipment, the purchaser must provide a completed Michigan Sales and Use Tax Certificate of Exemption (Form 3372) to its seller. Must also file Form 5726	Must receive Michigan Strategic Fund certification before making purchases that are qualified for the exemption. No new certifications after December 31, 2029.
Revocation	No requirements	If certification is revoked, repayment of all related tax exemptions is required (if the revocation occurs 10 years after certification, 50% of the tax exemptions must be repaid).

Local Taxes and Employment

Job creation is a primary focus of state-level tax incentives. While state-level estimates of Michigan-specific job creation suggest there will be significant employment opportunities,[48] it is unclear how many direct or indirect data center jobs could be filled by residents of the host community. The vast majority of direct data center jobs are temporary construction positions. Once completed, there would be on-site operational and security positions, but estimates of how many range from dozens[49] to hundreds.

The more significant economic incentive for the host community would likely be the property taxes paid by the data center developer and operator. Because data center equipment is costly, data centers can significantly increase the property tax base. However, these increases may shift year-to-year.

The State Tax Commission lists data centers as a commercial use,[50] and the equipment within the data center would be taxed as commercial personal property. Most of the equipment, including servers and networking equipment, would likely be reported in Section F of the Personal Property Statement, which has a relatively fast depreciation.[51] The 2026 multipliers for Section F assess true cash value at 60% of the installed cost of that equipment in year 1, but just 8% of the true cash value when that equipment is 7 years old. As older equipment in the data center is replaced with newer equipment, that new equipment would again start out at a 60% multiplier, but–as is the case with many classes of personal property–there may be years when the taxable value of the personal property is less than the previous year. If there is a large increase in the real property on the site (for example, from new buildings or significant site improvements), these swings in tax revenue may be more muted. Regardless, local governments may need to think strategically about how to utilize these new personal property tax revenues. Lessons might be gleaned from our recent guide on renewable energy revenue streams.[52]

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[48] Group, T. B. (n.d.). *Michigan data center jobs 2026: Openai stargate hiring update*. Retrieved February 4, 2026, from https://thebirmgroup.com/michigan-data-center-jobs-2026-stargate-project-brings-thousands-of-opportunities-to-washtenaw-county/; *Gov. Whitmer submits public comment in support of stargate project, creating thousands of jobs, meeting strong environmental standards*. (n.d.). Retrieved February 4, 2026, from https://www.michigan.gov/whitmer/news/press-releases/2025/12/03/whitmer-submits-public-comment-in-support-of-stargate-project-creating-thousands-of-jobs

[49] Chung, W. (2025, October 6). *Data center staffing levels: How many people does a facility need?* Broadstaff. https://broadstaffglobal.com/data-center-staffing-levels-how-many-people-does-a-facility-need

[50] Michigan State Tax Commission Property Classification MCL 211.34c. (2018) https://www.michigan.gov/treasury/-/media/Project/Websites/treasury/MISC_4/ClassificationRealProperty.pdf?rev=efb8cc4963494e1393d2675b4fab9092&hash=B7240AE93E5ABE808D0CDC7FD8AB38BE

[51] 2026 Personal Property Statement (Form L-4175), https://www.michigan.gov/taxes/-/media/Project/Websites/taxes/Forms/Property-Tax/632/632_ty2026.pdf?rev=9bd5f68f4fda4d828cc4306ea6ba749b&hash=F72987A0B2EC0E2795E0C065E33E265D

[52] Stoetzer, O., Krol, M., & Mills, S. (2025). Strategies for Renewable Energy Revenue: A Guide for Michigan Local Governments. University of Michigan Center for EmPowering Communities. https://graham.umich.edu/project/renewable-energy-revenue

Local governments do have discretion to offer data center property tax incentives, including via PA 198 agreements.[53] In certain situations, data centers may also be eligible for property tax exemptions via the Michigan Renaissance Zone Act, which are not approved at the local level but instead approved by the Michigan Strategic Fund.[54] In order to qualify for the "enterprise" data center sales and use tax exemption, however, any local property tax incentive must be approved by each local unit of government affected by the incentive. This is not a provision to qualify for the "qualified" data center sales and use tax exemption.

Impacts on Electricity Rates

Another common data center question is whether they will increase electricity costs, given the reports on electricity rate increases in some states like Virginia and Ohio that have undergone significant data center development.[55, 56] There is also, however, nationwide data finding the opposite impact: that looking across all states, those that had increased electricity load typically saw decreases in electricity rates compared to the others.[57]

There are multiple reasons that conflicting observations can be true at the same time. One key point is that it is challenging to assess what would have happened to electricity rates in the absence of data center load growth. Across the country, U.S. average retail electricity prices have been rising faster than inflation for residential consumers due to costs associated with grid maintenance and capacity expansion.[58] On the one hand, the load growth that data centers bring can help spread these fixed grid-related costs over more kilowatt-hours of electricity consumed, thereby reducing increases or the rates themselves for residential customers. On the other hand, if grid expansion is only needed to bring data center load online, data centers may be contributing to cost increases.

In Michigan, customer utility rates and ratemaking policy are set by the MPSC. By statute, Michigan abides by cost-of-service ratemaking, which means that utility rates assign "costs to customer classes based on usage patterns."[59] Additionally, Michigan's recent legislation on enterprise data center use and sales tax exemptions dictates that these data centers can only qualify if they use an electric service rate that prevents residential customers from subsidizing

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[53] 1974 PA 198, MCL 207.551 to 207.572
[54] 1996 PA 376, MCL 125.2681 to 125.2696
[55]As data centers for AI strain the power grid, bills rise for everyday customers. (n.d.). Washington Post. https://www.washingtonpost.com/business/2024/11/01/ai-data-centers-electricity-bills-google-amazon/
[56] Saul, J. Nicoletti, L. Pogkas, D. Bass, D. and Malik, N. (2025, September 29) AI data centers are sending power bills soaring. Bloomberg Technology. https://www.bloomberg.com/graphics/2025-ai-data-centers-electricity-prices/
[57] Wiser, R., O'Shaughnessy, E, Barbose, G., Cappers, P., & Gorman, W. (2025) Factors influencing recent trends in retail electricity prices in the United States. The Electricity Journal. https://www.sciencedirect.com/science/article/pii/S1040619025000612#sec0020
[58]New Berkeley Lab report summarizes trends in retail electricity prices and price drivers. (2025, January 6). Energy Markets & Planning Berkeley Lab; Lawrence Berkeley National Laboratory. https://emp.lbl.gov/news/new-berkeley-lab-report-summarizes-trends-retail-electricity-prices-and-price-drivers
[59]Putnam, C. (n.d.). Cost of Service Ratemaking. Michigan Public Service Commission Department of Licensing and Regulatory Affairs. https://pubs.naruc.org/pub.cfm?id=53889A44-2354-D714-5158-979D43EA47CF

their facilities' electric costs.[60] Some of the Commission's recent decisions were designed to ensure that large-load customers, such as data centers, contribute significantly to the new and embedded costs associated with expanding Michigan's electric grid.

[60]Enterprise Data Center Sales and Use Tax Exemption Guidelines. (2025).

Considerations for Local Government Policy-Making

The primary tool that local governments have to shape data center development is zoning. The Michigan Zoning Enabling Act (MZEA) sets out the minimum procedures that local governments must follow when making amendments.[61] It, along with past state and federal court cases, also sets parameters for zoning authority. For example, the MZEA states that local zoning ordinances "shall not have the effect of totally prohibiting the establishment of a land use," with only a few rare exceptions.[62] While local governments have broad latitude to direct land uses to particular districts and set development standards or conditions on land uses, those standards and conditions must be reasonable and should be based on facts.[63]

Furthermore, while there is much attention to the significant community benefits that a data center may be able to bring (e.g., financial contributions to park or open-space funds, fire departments, or other community priorities), there are limitations to making these agreements required as part of zoning approval, or enforcing them if the developer decides not to make-good on the agreement.[64] Agreements with developers for community benefits are more solidly enforceable if entered into in exchange for a public subsidy of the project, such as a local property tax abatement or some other publicly-funded improvement that will benefit the project.[65] As a result, we also briefly discuss property tax abatements below. Enforceable community benefits may also result from settling a lawsuit with the data center developer, but that path comes along with additional legal fees for the local government.[66]

We offer the following considerations for local governments, but advise municipal officials to consult their local planner and municipal attorney before making any changes to their plans or zoning ordinances.

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[61] Michigan Zoning Enabling Act, MCL 125.3101 to 125.3702 (2006). https://www.legislature.mi.gov/documents/mcl/pdf/mcl-Act-110-of-2006.pdf

[62] MCL § 125.3207

[63] MCL § 125.3504

[64] Review, T. R., & Elia, E. (2024, July 18). *Legislative exactions | the regulatory review*. https://www.theregreview.org/2024/07/18/elia-legislative-exactions/

[65]Community Benefit Planning and Agreements: A Summary Overview. (2024). Michigan State University Center for Community and Economic Development. https://ced.msu.edu/upload/community%20benefits/Community%20Benefits%20Brief_FinalVersion.pdf

[66] Consent Judgment, RD Michigan Property Owner I LLC v. Saline Township, No. 2025-001577-CZ (Washtenaw County Circuit Court Oct. 15, 2025). https://salinetownship.org/uploads/notices/SalineDataCenterConsentJudgmentFinalExecutionCopy492124804975v1.pdf

#1: Consider whether your industrial zone is appropriate for data centers

The footprint of a data center and the state regulations that apply to this land use are not significantly different from those of other large industrial activities, so it may be logical for local governments to use their approach to industrial development as a starting point for data center policymaking. However, given limited greenfield industrial development in Michigan over the last three decades and the comparatively large footprint of data centers relative to other light industrial uses, we recognize that few Michigan communities have had robust conversations about their industrial zones. Now is the time for such a conversation.

The first step should be to review the spatial footprint of your industrial district(s) and the infrastructure capacity to serve them. Many industrial uses–not just data centers–require electricity infrastructure and access to water (even if only a well). Your community's master plan (sometimes called a comprehensive plan) may have already considered where infrastructure is most suitable for industrial development, and so you should compare the spatial extent of your current industrial zoning with what is suggested in the Master Plan. This will help you determine whether it is appropriate to expand your industrial district.

In addition to dictating where industrial uses may be permitted in your community, zoning also lays out which processes developers must follow if they wish to develop their properties. It is very common to allow industrial development "by-right" in industrial zones - that is, with limited discretion by the planning commission or Township board / City Council, so long as the developer meets all of the standards in the zoning ordinance (see Consideration #2). Given the increased scale of industrial developments, it may be appropriate to treat larger industrial uses (e.g., those greater than 15,000 square feet, or whatever has been typical in your community) as special land uses, which affords the Planning Commission and board the opportunity to give proposals additional review and apply conditions to their approval.

#2: Include quality-of-life impacts in industrial zoning regulation

Historically, industrial uses have been concentrated near other industrial uses to minimize impacts on surrounding land uses from emissions, noise, and light pollution. Industrial districts were commonly buffered from residential districts either through public infrastructure, such as roads or waterways, or through less sensitive uses, such as office or commercial zones. But in communities that have seen limited industrial activity, or in those where existing industrial zones are not large enough to accommodate new industrial activity like data centers, there may not be ample space to buffer from other land uses. As a result, a community might consider updating the standards in industrial zones to ensure that any new industrial activity–data centers included–is protecting quality-of-life in neighboring districts. Your community's most important quality-of-life

impacts to regulate may be informed by your comprehensive plan. Common considerations might include:

- Visual screening: While it is common to require vegetative screening in some districts, this requirement may not apply in industrial districts, particularly if your zoning ordinance did not anticipate that an industrial district would expand to abut residential areas.
- Sound: Some communities have community-wide sound standards that exist outside of zoning codes. These often apply to all noise emitters and may differentiate sound levels by time of day or day of the week (with a higher expectation of quiet on weekends). This approach sets a constant expectation for all land uses, not just industrial uses. If this is not practical, it is also possible to include sound standards for specific land uses or land-use classes. Standards that apply to large-scale renewable energy projects may be a useful starting point, as sound standards are common in the regulation of these facilities.[67]
- Light: Another common concern about industrial activities, particularly in rural areas, is the light pollution they may cause, especially when they are developed in areas without streetlights. Some communities, including Emmet County,[68] have dark-sky ordinances that limit light pollution from all land uses. These same concepts can be applied specifically to industrial uses if that is the concern. Another option is to require dark-sky-compliant light fixtures for all proposed site plans.
- Decommissioning: Many industrial facilities have specialized designs with limited opportunities for reuse at the end of their life. From our brownfield experience, when a company is no longer in business or decommissioning the facility is too costly, these facilities are sometimes abandoned, creating an eyesore and public health hazard in the community and increasing redevelopment costs. As a result, it is increasingly common that industrial facilities enter into a decommissioning agreement that includes a financial guarantee that the facility, and any infrastructure that no longer has a useful purpose, will be removed at the end of its life. Again, it may be instructive to look to large-scale renewable energy projects for sample language.

These regulations would be in addition to the setbacks, height, lot-area coverage, and parking standards that are common in most zoning ordinances. While it is possible to use these more customary regulations to help buffer or minimize the impacts of industrial uses, there may be unintended consequences (e.g., industrial uses actually requiring more land to comply with large setback requirements) and so you may wish consider directly addressing the quality-of-life concern (e.g., sound, visual impact, light), rather than using setbacks as a proxy for those concerns.

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[67] Krol, M., and Mills, S. (2024). Planning & Zoning for Battery Energy Storage Systems: A Guide for Michigan Local Governments. University of Michigan Center for EmPowering Communities. https://graham.umich.edu/project/bess-guide; Augst, T., Fierke-Gmazel, H., Gould, M. C., Krol, M., Mills, S., Neumann, B., Reilly, M., & Stoetzer, O. (2025). Planning and Zoning for Solar Energy Systems: A Guide for Michigan Local Governments (Updated ed.).

[68] Emmet County. (2023). *Emmet County zoning ordinance* (Ordinance No. 15-1, updated through April 28, 2023). https://www.emmetcounty.org/UserFiles/Servers/Server_3942756/File/Ordinances,%20Bylaws%20&%20Rules/Zoning%20Ordinance/Emmet-County-Zoning-Ordinance-4_28_2023.pdf

#3: Get commitments in writing

While it is ideal to use your zoning ordinance to set clear standards and thresholds that apply to data centers or industrial districts, you may be able to get some commitments or added specificity on particular impacts in writing. For example, if your community wants on-site generators to only run during power outages or for weekly testing, it may be beneficial to obtain that commitment in writing and specify permitted operating hours to minimize noise impacts on residents. If there are other commitments that matter to your community, such as delivery truck routes or transparency on water or energy usage, etc., consider getting them in writing as well.

The appropriate mechanism to secure written commitments for your community will depend on the specific agreement at hand and whether it is tied to zoning (for example, special land-use conditions or willingly offered terms by the developer as part of a conditional rezoning), a development agreement, or a discretionary property tax incentive. A municipal attorney can help identify the most appropriate mechanism, though guidance from the Michigan Municipal League is instructive for municipalities seeking community benefits commitments.[69]

#4: Request a Property Tax Guarantee

A primary community-wide benefit of hosting a data center is the increase in the property tax base that accompanies the project. It is not uncommon, however, for the personal property tax tables to change over the life of an industrial project such as a data center, which can prompt disputes between the local government and the taxpayer over the property tax valuation. Having a written commitment that the developer will pay the property tax revenues they discuss during the permitting process may help reassure the community that these benefits will materialize.

This approach has proven successful in Dickinson County, which accepted a Property Tax Guarantee from the developers of the Groveland Mine Solar project.[70] In the guarantee, the developer committed to a floor for property tax payments to the local governments. If the tax tables change in a way that reduces their required payments, they will still pay the committed amount. If, however, the tax tables change in favor of the local government, the developer is still responsible for paying the higher taxes.

#5: Explore data center integration with other industrial infrastructure

While a data center developer likely views the heat generated by their facility as a waste stream, other industries see it as an input and invest in generating it. Thus, there may be local

[69] *Handbook for General Law Village Officials* (p. 71). (2024). Michigan Municipal League . https://mml.org/wp-content/uploads/2024/07/CH-14-Planning-and-Zoning.pdf
[70] Stoetzer, O., Krol, M., & Mills, S. (2025). Strategies for Renewable Energy Revenue: A Guide for Michigan Local Governments.

opportunities for the data center to create a circular economy and put at least some of that heat to beneficial use. Opportunities include greenhouses, other industrial processes, and district heating systems, as is being proposed in Lansing.[71] Your local government can encourage the use of this waste stream by proactively identifying existing land uses in your community that require heat and sharing those with potential data center developers.

Similarly, local governments can explore with the data center developer the possibility of co-locating data centers with electricity infrastructure, like solar or battery energy storage. While a data center is unlikely to be able to fully power itself with on-site energy generation due to a mismatch between the footprints of large-scale renewables and data center technologies, siting some infrastructure on-site at the data center can reduce the need to build power plants elsewhere. Furthermore, this electricity infrastructure might boost the local property tax base.

[71]Kaplan, L. V. (2025, November 5). *Proposed downtown data center focused on sustainability*. City Pulse. https://www.lansingcitypulse.com/stories/proposed-downtown-data-center-focused-on-sustainability,164052

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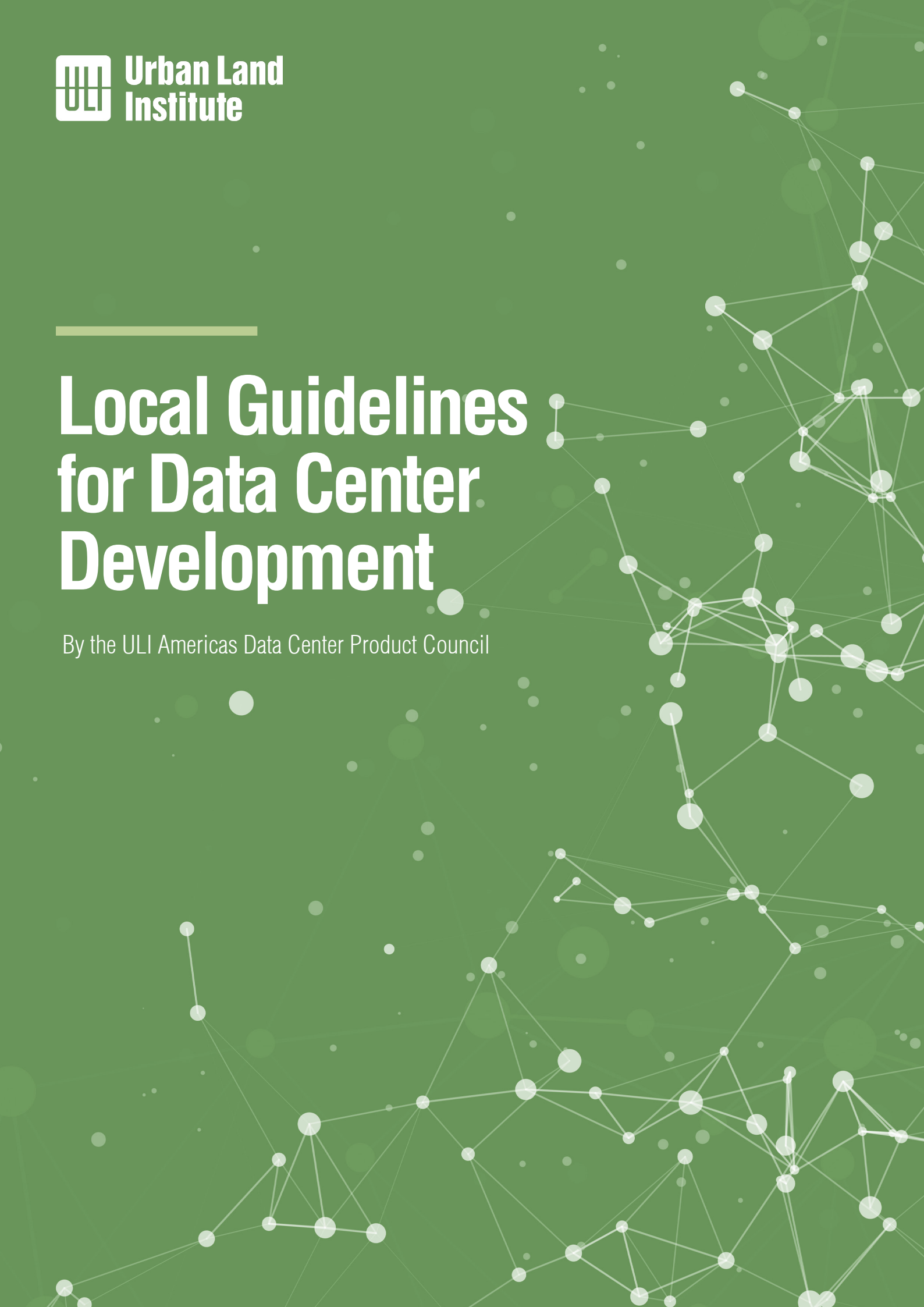
MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Urban Land Institute

Local Guidelines for Data Center Development

By the ULI Americas Data Center Product Council



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About the Urban Land Institute

The Urban Land Institute is a global, member-driven organization comprising more than 48,000 real estate and urban development professionals dedicated to advancing the Institute's mission of shaping the future of the built environment for transformative impact in communities worldwide. ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 84 countries.

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Urban Land Institute

ULI Americas Data Center Product Council

Contents

1 Introduction: data centers 101

This paper seeks to demystify data centers and their purpose while offering a balanced model zoning ordinance for data center development that authorities having jurisdiction (AHJs) can adapt straight from the page. It also aims to provide a roadmap to data center development for local officials, planners, and other municipal decision-makers.

Data centers are still a relatively new land use, and they are often misunderstood or miscategorized. To be ready when data centers are proposed in your jurisdiction or to attract them, first it is important to understand their purpose in our society and how they function, as well as to have strategies to mitigate common challenges.

Essential infrastructure

In the morning, most of us brush our teeth or take a shower. We may not know where the water comes from or where it goes. We may not know that it is treated at a plant and arrives at our homes, where wastewater departs, is received in a facility, and is released into surface water systems.

These days, we often check our email or social media first thing in the morning, even before we shower or brush our teeth. The internet—like water, sewer, and power systems—has become part of our essential everyday infrastructure.

Water and sewage systems are typically financed and delivered by local cities or counties. Power is funded and delivered by a mix of public and private entities. Data centers, however, which form the backbone of the internet, are financed, developed, and operated primarily by privately held businesses. Unlike what occurs with other critical infrastructure systems, the development of data centers requires navigating a complex landscape of private property laws, environmental impact assessments, and local zoning regulations. Local officials, in other words, play a key role in ensuring access to the internet economy.

Purpose and function

A **data center** is a building that houses the infrastructure that supports the world's computing functions. This building is filled with servers that process and store the data commonly referred to as "the cloud."

Processing and storage

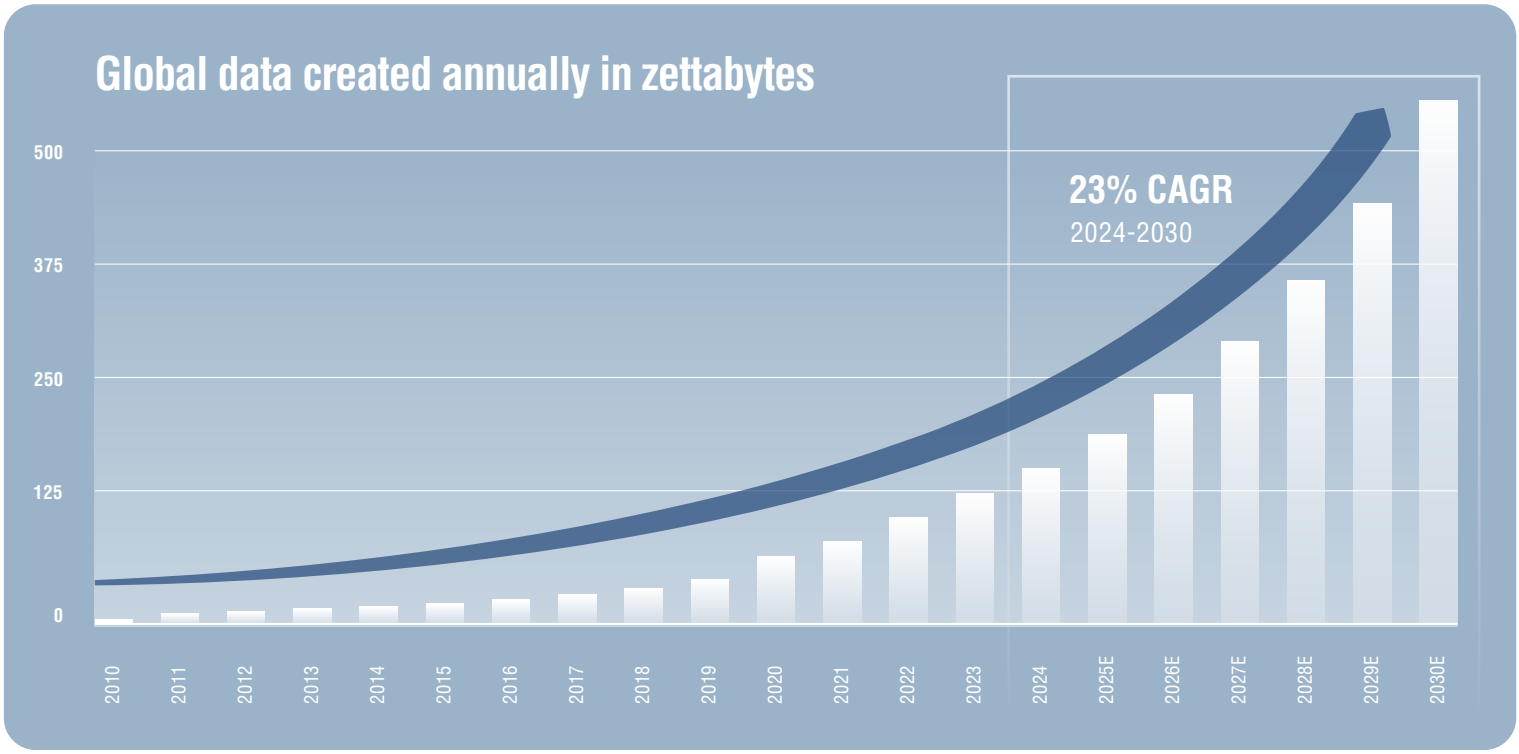
Whenever you swipe your credit card, join a Zoom meeting, or send an email, your virtual activity connects to a real place in the physical world: a data center.

What gets processed in a data center? A better question: what does not? Data centers house our national security systems, including military communications. They enable online commerce, financial services, health care, and other essential services. Each app on your phone—even offline apps that

sync—and every activity on the internet requires a data center.

When you use your smartphone, that tiny device does not process your requests. Instead, your phone asks questions that get answered in data centers—usually in a fraction of a second.[1]

Data centers' primary function is processing and accessing data, but they also store data, safeguarding sensitive information so it's inaccessible to hackers. When you save a file to the cloud, you are not storing it in the sky. A data center stores it, more efficiently and securely than a filing cabinet ever could.



Source: JLL Research, IDC

The demand for more data center capacity

Our economy and communities were able to continue functioning during the Covid-19 pandemic—when schools, workplaces, and social gatherings shifted to the internet—thanks in large part to the support provided by data centers. This change also moved us further into an economy that exists, largely, online.

The rise of remote work and advancements in artificial intelligence (AI) that require high-density computing increased the demand for processing and data storage, thus requiring more data center capacity. As a result, this property category has grown significantly.

If society and the economy continue the shift to the internet, we would seem to face a need for more data centers. Where these new data centers will be developed is a matter of great importance that requires several variables to come together. To discuss these variables, we first must discuss what a data center is.

Types of data centers

Corporate or **enterprise data centers**, which store and process a single organization's data, rose in prominence in the mid-1990s as the dot-com boom drove demand for fast internet connectivity and 24/7 operations. These data centers often store the data of financial institutions—think American Express or Wells Fargo—that typically own and operate such facilities themselves, rather than leasing them from a provider.

1 "One: You Use Data Centers," Where the Internet Lives, Google, podcast audio, https://podcasts.apple.com/us/podcast/one-you-use-data centers/id1541394865?i=1000501909698.

At **colocation data centers**, which include **retail data centers**, third-party operators lease data center space—a certain number of server cabinets, for example, or kilowatts (kW) to multiple companies.

Wholesale data centers are a type of colocation data center where a third-party developer rents large portions of the space and energy capacity to one company–often, all of it.

Telecom data centers, owned by telecommunications companies such as Verizon, are where traffic from cell towers "switches" to the internet. These facilities tend to be smaller than the other data center types and require less energy.

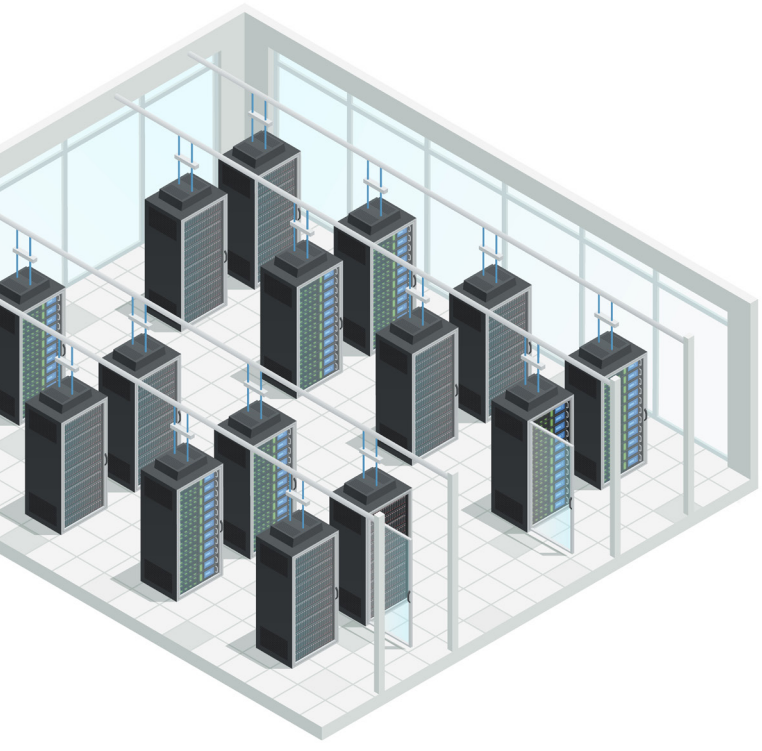
Hyperscale data centers are built for a single customer: one of the large tech companies that provide many of the services we use every day—Google (Google Cloud), Amazon (AWS), Microsoft, and Meta. These companies sometimes own their own centers, and sometimes they lease them from a third-party developer. These centers are built based on the data demands of the hyperscaler.

The name *hyperscaler* emphasizes the ability to scale resources up or down quickly and efficiently to meet demand. These companies have a massive number of users and generate vast amounts of data, which together demand substantial processing power and storage capacity, especially as user bases grow unpredictably.

Differences from industrial warehouses

Data centers differ from other forms of commercial real estate. They constitute a relatively new category and, until recently, they were concentrated in select geographic areas. As a result, the buildings housing our essential internet infrastructure are widely misunderstood.

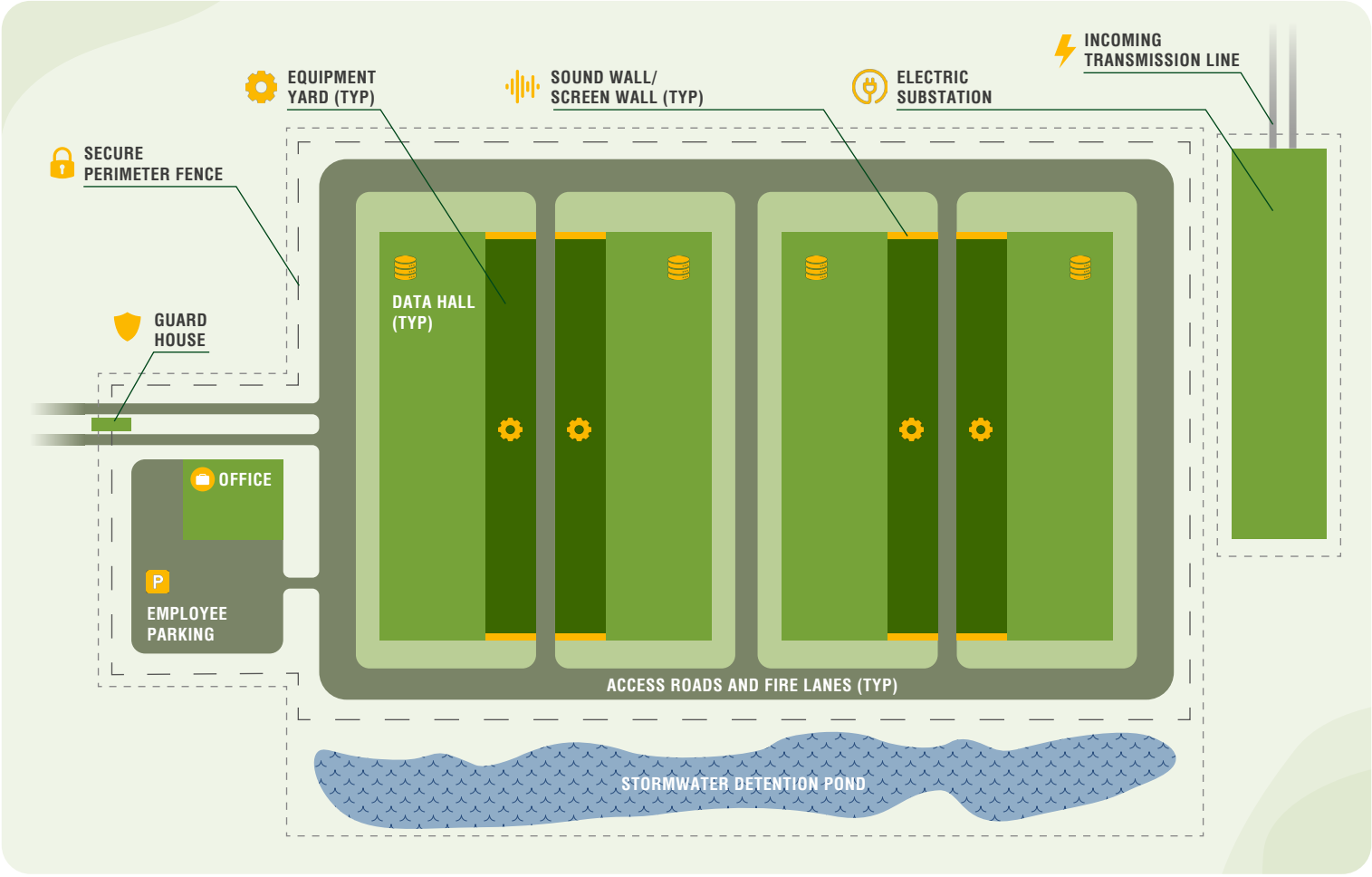
Typically, data centers are not explicitly mentioned in zoning codes. Instead, they fall under the umbrella of general industrial zoning uses. But because they store data, they are not typical warehouses. Their classification, as such, causes planning challenges, which we will detail further in a later section.



Here's how data centers differ from industrial warehouses or factories:

- Data centers are more compatible with other uses nearby because, unlike factories or warehouses, they are odorless and lack truck traffic.
- They are often taller than traditional single-story warehouses. Data centers can be single-story or multistory. Single-story data centers start at around 30 feet (9.1 meters) and multi-story data centers go up from there.
- They require fewer employees once construction is complete, so long-term impacts on traffic, schools, and public services are minimal.
- They need fewer parking spaces and plumbing fixture counts than are typically mandated by industrial codes.
- Data centers require more robust underground and above-ground infrastructure.
- Unlike warehouses and factories, data centers have external electrical and mechanical equipment.
- Some data centers need multiple layers of redundancy, which we'll discuss in a moment.
- Data centers require more security measures than industrial buildings, including 24/7/365 surveillance and controlled-access points.

Let's tour a hyperscale data center campus



Most of the data centers developed today are hyperscale data centers—typically within campuses. We tour one below.

Approaching the campus

As you approach a hyperscale data center campus, you are likely to encounter a fence or gate—often with a gatehouse—beyond which you may be able to see equipment yards and cooling equipment in the distance.

Security

Data center campuses have extensive security measures and strict protocols for employees and visitors. Infrared surveillance cameras and tall, anti-climb security fences that detect movement surround the property. A guard at the gatehouse checks guests' credentials outside. If you make it past this point—few people do—you will find another security checkpoint at the entrance to the data center building itself, where additional security personnel check badges.

Equipment yards

Before heading inside, let's first follow the winding campus driveway and stop at the mechanical and electrical equipment yards.

Electrical yards

In the electrical yards, you'll hear the low hum of static if you stand directly under the transmission lines. A nearby **utility substation transformer** receives this power and converts it down to the lower voltage needed for use inside. The medium-voltage power feeds into **switchgear** in the electrical yard—or another type of power distribution equipment that similarly dispenses electrical power throughout the data center.

Alongside the switchgear, you will see multiple generators that provide emergency power in case of an electrical utility outage. If they look like they aren't running, it's because they are usually turned off. Except during emergency outages, they are turned on only for monthly maintenance tests for a mere 30 minutes[2] and are quiet while running due to sound-attenuated enclosures.

2 GeneratorSource, "Data Center Generator Maintenance," GeneratorSource, January 2024, https://www.generatorsource.com/blog/January-2024/Data-Center-Generator-Maintenance.aspx.

Redundancy

Like hospitals, data centers require a high level of redundancy to ensure they never go down, and the generators are part of this preparedness. Redundancy is often also created through multiple power feeds. The servers have backup capacity, too. For instance, your inbox is stored on several servers so that if one fails, your emails remain accessible.

Mechanical yards

The mechanical yards operate similarly but typically focus on cooling rather than on power redundancy. On the ground, you'll find chillers that cool the data center. At some data centers, they are on the roof.

Heat is a byproduct of computer processing. The servers within data centers must remain cool to function correctly. There are multiple ways of to achieve this cooling, but for the purposes of this paper, we focus on three main categories: air-cooled chillers, water-cooled chillers, and evaporative cooling.

A highly efficient **air-cooled chiller system** is sealed in a closed loop and uses little to no water—less than the amount used in three single-family homes.

Both water-cooled and evaporative systems use more water and consume less electricity than air-cooled chiller systems. In an open-loop **water-cooled chiller system**, cooling towers evaporate water for cooling purposes. **Evaporative cooling** is primarily achieved by large air-handling units that move air across a wet medium to evaporate water, which removes heat and cools the air in the data hall.

Data center structure

Let's now make our way through the security checkpoint and into the data center building itself. Inside, we find the **data hall**, where the servers sit in rows of tall racks along a series of aisles fed by **electrical distribution equipment**. Data halls are the *pièce de résistance* of any data center. Such a structure is typically designed from the data hall outward, with all supporting infrastructure responding directly to its needs.

If you examine the racks from the floor upward, you see bundles of colorful fiber optic cables (inside of which are thin strands of glass) connecting servers to switches and routers. These cables enable high-speed data transfer. Without them, we would be unable to access the web or many of the apps we use daily. The cables are organized in lanes that converge at massive **switches**.

Inside the data center building, you also find electrical rooms that house other critical power supply infrastructure. Battery-powered **uninterruptible power supply (UPS) systems** sit in large cabinets against the wall. In the event of a utility outage, these systems feed power to **power distribution units (PDUs)** inside the data hall. UPS systems are the first-used backup power source and often prevent use of the generators outside.

The importance of clustering

The internet is a network of interconnected networks, and so are data centers. **Clustering** refers to the practice of linking the servers at multiple data centers with high-speed, low-latency connections so they work together as a unified system. This interconnected group is called a cluster, and each server in the cluster is called a **node**.

Importantly, clustering requires physical proximity: locating multiple data centers close to one another geographically so that optical signals in fiber cables don't lose strength. That's why a huge portion of global internet traffic passes through major hubs such as northern Virginia's "Data Center Alley."

Clustering also requires interconnection—linking these data centers through high-speed, low-latency connections.

Reduced latency

One primary reason for data center clustering is to reduce **latency**, the time it takes for information to travel from its source to its destination. When data centers are geographically distant from each other, latency increases, which leads to slower application performance for end users, including the dreaded "spinning wheel of death." When data centers are located near each other, data can travel shorter distances, and this information exchange runs faster. Due to quicker response times, the user experience improves.

Improved reliability

Clustering enhances redundancy. If one data center server goes offline, others in the cluster can take over, ensuring continuous service availability. Without clusters, one server failure could cause an outage with international implications. In the appendix, we explore this concept further through a case study.

Load balancing

Clustered data centers allow for more efficient **load balancing**, the process of distributing network traffic across multiple servers at interconnected data centers. This practice prevents any single server or center from becoming overwhelmed.

Shared infrastructure

Data centers require conduits for power and, in some cases, water. When data centers cluster, they benefit from shared power and cooling infrastructure while also reducing the need for long-distance fiber optic connections.

2 What happens when data centers come to your region: opportunities, challenges, and mitigations

Data centers can provide significant economic benefits and other opportunities. Data center projects also introduce unique planning challenges, however. To be prepared, and to seize opportunities when appropriate, AHJs must understand these challenges and how to mitigate them.

Opportunities

Support essential national infrastructure

Data centers contribute to national infrastructure and economic growth. Also, they enable the digital economy by underpinning businesses of all sizes in virtually every industry.

According to the United States Department of Energy[3], "At a national level, data centers are critical to supporting America's economic growth by powering businesses and enabling continued leadership in innovation, including for AI applications."

HERE'S HOW DATA CENTERS SUPPORT NATIONAL SECURITY AND ECONOMIC GROWTH:

They protect the privacy of all of the data within U.S. borders against cyber threats by powering security measures such as encryption, firewalls, and access controls.

They host critical infrastructure for our emergency services, providing the necessary computing power and data storage to support communication networks, emergency response coordination, and real-time data analysis during crises.

Our health care system depends on data centers. They enable a range of services, from telehealth visits to managing digital health records, and they even assist in providing data-analysis-informed diagnoses for patients.

Banks and the rest of our financial ecosystem rely on data centers for their daily operations.

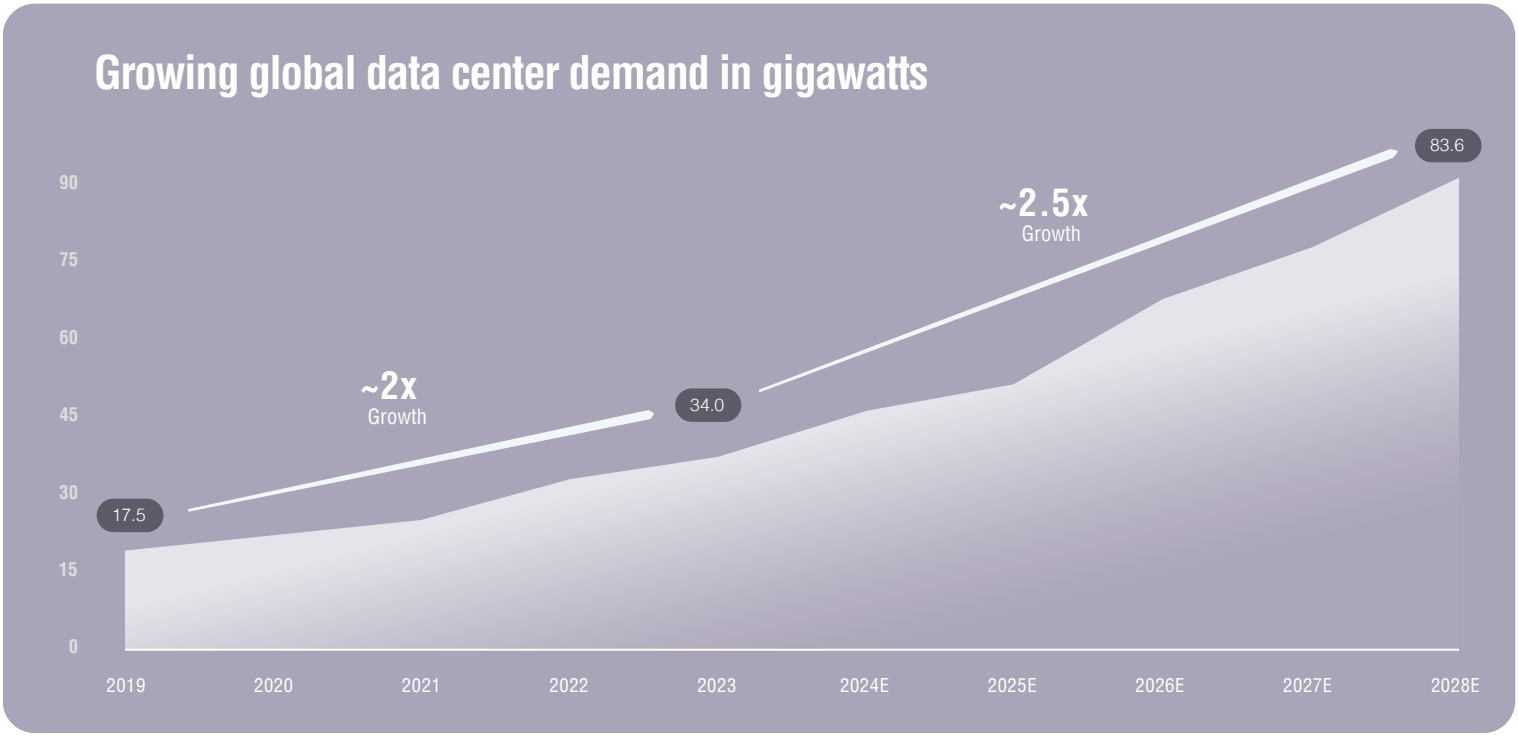
Data centers also support the development and deployment of emerging tech. Data centers are the backbone of AI infrastructure, which requires rapid data processing, storage, and analysis at scale.

On a macroscale, maintaining advanced data center infrastructure allows the U.S. to compete with such countries as China in the race for AI dominance, thus fostering economic growth and strengthening national security through technological leadership.

On a microscale, data centers also improve businesses' operational efficiency by democratizing access to supercomputer processing and secure cloud storage so that small businesses can compete more easily with larger corporations.

3 U.S. Department of Energy, "Clean Energy Resources to Meet Data Center Electricity Demand," https://www.energy.gov/policy/articles/clean-energy-resources-meet-data center-electricity-demand.

Increase much-needed processing and storage capacity



Source: CBRE, DC Bytes

Our needs for data center capacity have grown—and continue to grow at a fast clip as we create more data.

If we don't build data centers that support this increasing data density, it could hamper the economy, business operations, and our daily lives.

On a microlevel, a lack of data center capacity or redundancy makes files and apps load slowly. On a macrolevel, if we don't build enough data centers to meet our growing storage and processing needs, there will be outages with international consequences, like the October 2021 Meta outage. We include a case study on this incident and its profound impacts in the appendix.

Jobs

When data centers are in operation, they require fewer employees to operate than most other commercial properties, leaving minimal impacts on traffic in surrounding areas. A typical data center operates with fewer employees than other commercial or industrial facilities. Unlike industrial facilities, there is no fleet of trucks going in and out, which further minimizes traffic congestion.

More workers are present while the data center campus is under construction, though. Data center construction projects happen in phases, especially on larger campus developments, and these phases can extend over several years. This phased approach often leads to misunderstandings regarding the permanency of the increased traffic. Clear communication about the nature and duration of construction phases can help manage expectations and reduce misunderstandings.

This phasing approach has a plus side, however. Data centers create local construction jobs for tradespeople who otherwise travel from job to job—with less fossil fuel consumption thanks to reduced commuting. Jobs related to data center construction typically provide these workers, sometimes called journey-people, with more stability and longer timelines, offering a higher quality of life. This outcome, in turn, can prevent or alleviate labor shortages and reduce renovation and building expenses in the area, benefiting homeowners and businesses.

Although the operational workforce of data centers is relatively small, people employed in these roles are well-compensated, often earning six-figure salaries without the need for significant training or a college degree. During both the construction and operational phases, data center jobs boost to the local economy because workers spend at retail stores, nearby restaurants, hotels, and suppliers.

Data centers also indirectly create many jobs across the broader economy. According to PricewaterhouseCoopers International Limited[4] (PwC), each direct job in the U.S. data center industry

4 PwC, "Economic Impact Study of the US Data Center Industry," January 2021; "Data Centers and Ancillary Job Creation," TechIndustryReview, March 2022.

generates, on average, six ancillary jobs throughout the national economy. As a result, the total annual impact of the data center industry on national employment—combining direct, indirect, and induced effects from both construction and operations—grew from 2.9 million jobs in 2017 to 3.5 million jobs in 2021, representing a 20 percent increase.

Furthermore, the PwC study does not include jobs created by the cloud access and processing power that data centers enable. Data centers also facilitate zero-commute remote work across the country, further reducing fossil fuel consumption and contributing to a more sustainable economic model.

Tax revenue

Data centers provide municipalities with substantial economic and fiscal benefits through various forms of tax revenue (if unabated) that far exceed ones associated with other property types.

Hyperscale data centers are capital-intensive developments that can cost billions to construct—and are filled with high-value equipment and infrastructure. Taxes levied against them can be a windfall for AHJs.

A case in point: the data center tax base in Loudoun County, the central hub of North Virginia's Data Center Alley, increased from $15.996 billion in 2023 to $25.627 billion in 2024, constituting 58.5 percent of the municipality's total tax revenue.[5]

Data center owners pay two primary forms of property taxes. The first is real property tax, which applies to the land campuses are built on and the permanent structures that sit upon it, such as buildings. The second is personal property tax, which is levied on movable assets such as the servers and equipment inside data centers.

These revenues become significant boons to surrounding municipalities. In Loudoun, personal property tax revenue from computer equipment purchases for data centers surged by 170 percent in 2023, accounting for two and a half times the tax revenue.

The presence of data centers can also lower the overall tax burden for residents. In Loudoun, the general property tax rate is set at $0.87 per $100 of assessed value; it would be $1.33 (an additional 52 percent) but for the influx of data center developments, according to the county's executive director of economic development.[6] Revenue from data centers accounts for $0.47 of the tax rate, thereby alleviating the burden on other taxpayers.

Data center revenue can be channeled into net-zero programs and those related to health care, education, and other critical public services.

Data center revenue can be channeled into net zero programs and ones related to health care, education, and other critical public services. Revenue from data centers in Quincy, Washington, for example, has been used to fund local schools, public safety, and infrastructure improvements.[7]

By 2026, Loudoun County projects it will receive roughly $1.4 billion in tax revenue from the personal property tax it levies on computer equipment alone.[8] This amount constitutes nearly half of Loudoun County's entire fiscal 2021 budget of $3 billion.

Community incentive packages

Data center operators also provide significant benefits through incentive packages negotiated with municipalities that can include funding for schools or public infrastructure projects. In multiple cases, hyperscalers have funded renewable energy plants and created workforce development programs in areas where they operate.

As part of AWS' $10 billion data center campus investment in Mississippi, the company developed STEM-focused workforce training and career awareness programs for K-12 school systems and funded the state's first utility-scale wind farm.[9] You can learn more about the community benefits the hyperscaler provided in the appendix.

5 Emily Leayman, "Loudoun's Data Center Tax Base Jumps, Residential Increases Continue," Patch, February 8, 2024, https://patch.com/virginia/ashburn/loudouns-data-center-tax-base-jumps-residential-increases-continue.

6 Hanna Pampaloni, "Rizer: Land Value Increases Bring Benefits and Challenges," Loudoun Now, June 28, 2024, https://www.loudounnow.com/business/rizer-land-value-increases-bring-benefits-and-challenges/article_5b417aa8-3592-11ef-b587-f7ca7fd349c0.html.

7 Nick Parker, "Quincy Data Centers: The Data Center Conversation" (Presentation, Port of Quincy), https://wedaonline.org/wp-content/uploads/2020/10/Port-of-Quincy-Presentation.pdf.

8 "Loudoun Data Center Revenue Growth," Washington Business Journal, October 19, 2020, https://www.bizjournals.com/washington/news/2020/10/19/loudoun-data-center-revenue-growth.html.

9 Amazon Staff, "AWS plans to invest $10 billion in Mississippi, the largest capital investment in the state's history," About Amazon, January 25, 2024, https://www.aboutamazon.com/news/aws/aws-10-billion-investment-mississippi.

The region that includes Fredericksburg, Virginia—an emerging exurban hyperscale campus market located southeast of Loudoun County—is a case study in how AHJs can attract landslide economic and fiscal benefits while mitigating potential concerns well in advance.

In March 2024 Virginia's governor, Glenn Youngkin, alongside other state and local elected officials, announced that AWS was making a $35 billion dollar investment in data centers in Spotsylvania, Caroline, Stafford, and Louisa counties, creating approximately 2,000 new jobs. Also announced was AWS' contribution of $400,000 in community funds to those localities.

We explore how AHJs in the region did the work to prepare for and attract that investment in the appendix, which also covers similar measures in Elk Grove Village, Illinois, a unique suburban community northwest of downtown Chicago that modified its zoning code to attract data center development.

Challenges and mitigations

Sustainability

The sustainability of data centers is a significant concern for both AHJs, as well as for data center operators and developers, who ensure that their centers are designed and engineered to minimize emissions and other community impacts.

Grid impact

Let's address the misconception that data centers draw from the grid power that other customers, such as residential consumers and retail operators, could use. This concern is common among constituents when a data center is proposed in a municipality.

The grid is heavily regulated. Under existing federal regulations (and in Texas, the only state that regulates its own power grid), demand from a new customer cannot affect the reliability or availability of an existing customer.

Rather than taking power from the grid, new large-load customers such as data center operators face the challenge of finding readily available power that the utility can deliver—especially because many seek clean power sources.

According to the U.S. Department of Energy (DOE), as quoted in a recent article,[10] data centers can actually catalyze the grid's clean energy transition: "Near-term data center driven electricity demand growth is an opportunity to accelerate the build-out of clean energy solutions, improve demand flexibility, and modernize the grid while maintaining affordability."

Here's why: in many municipalities, energy providers are obligated to meet the power demands of various users. When a significant portion of demand comes from data center operators, many of which have strong commitments to using renewable energy, that activity accelerates the greening of the grid. These companies, driven by their climate goals, place considerable pressure on utility providers to adopt cleaner energy solutions.

> "Near-term data center driven electricity demand growth is an opportunity to accelerate the build-out of clean energy solutions, improve demand flexibility, and modernize the grid while maintaining affordability."
>
> *U.S. Department of Energy*

Unlike AHJs, which cannot create the demand to push forward such changes themselves, data center operators wield considerable influence by creating substantial demand for renewable energy.

This dynamic forces utilities to accelerate and help finance their transition to greener energy sources, thereby modernizing the grid to meet contemporary environmental standards. Public officials have a critical role to play in this scenario. By ensuring the existence of clear and easy-to-follow guidelines for data center development within their jurisdictions, AHJs can become integral to the solution, thus fostering a cleaner energy infrastructure.

Conversely, discouraging data center development could inadvertently push these operations into regions with less stringent grid standards and undermine broader sustainability efforts. Thus, the collaboration between data center operators and local governments is pivotal in driving the clean energy transition and ensuring grid modernization.

10 U.S. Department of Energy, "Clean Energy Resources."

Grid sustainability

Data center companies—third-party developers, operators, and hyperscalers among them—typically have far stricter carbon reduction commitments than do municipalities themselves.

- The top five hyperscalers have a combined renewable energy portfolio totaling more than 45 gigawatts (GW) worldwide, the equivalent of roughly 118,215 Tesla Model 3 motors[11] running on full power—and that figure doesn't include on-site generation.[12] Roughly 57 percent of global corporate wind and solar capacity tracked by S&P Global Commodity Insights is tied to these five companies alone.
- Amazon first committed to powering all of its operations, including AWS data centers, with 100 percent renewable energy by 2025. As of 2023, Amazon reported achieving this goal early, with 100 percent of its electricity consumption matched with renewable energy sources. The company also set a goal to reach net-zero emissions by 2040.[13]
- Microsoft committed to designing and operating data centers that are carbon negative, water positive, and zero waste before 2030, procuring 100 percent renewable energy on a global scale by 2025, and significantly expanding and decarbonizing local electricity grids.[14]
- Apple has committed to becoming carbon-neutral across its entire supply chain and product life cycle by 2030. This effort includes using nearly 10 GW of existing renewable energy and investing in new renewable generation.[15]
- Google, meanwhile, announced its goal in September 2020 to operate carbon-free, on clean local electricity, 24 hours a day, 7 days a week, 365 days a year by 2030. From 2010 to 2023, the company signed more than 115 agreements totaling in excess of 14 GW of clean energy generation capacity.[16]
- Meta committed to net zero emissions for its supply chain and to becoming water positive by 2030. The company plans to power all of its data centers with renewable energy by 2025.[17]

The methods through which hyperscalers and data center developers are working toward these goals include:

On-site generation: Some data centers have solar panels or other renewable energy sources installed directly on their premises. Wind and solar require a lot of land, however, and on-site land is usually scarce. As such, these projects typically provide only a small portion of data centers' total energy needs.

Power purchase agreements (PPAs): In a PPA, data center companies (the buyers) sign long-term contracts with renewable energy providers (the sellers) to purchase electricity from specific wind or solar farms. PPAs often support the development of new renewable energy, thus contributing to overall grid decarbonization and improving the grid mix for local residents and businesses.

Renewable energy certificates (RECs): Companies purchase RECs to offset their energy consumption, which supports the economics of clean energy development. RECs are not necessarily tied to the specific municipalities where data centers are located, though.

Investment in renewable projects: Hyperscalers often invest directly in the development of new renewable energy projects.

Diesel generators

The role of diesel generators at data centers is often misunderstood. As we discussed elsewhere, these generators are present only as a backup power source.

Also worth noting is that diesel generators are subject to a comprehensive regulatory framework. The Environmental Protection Agency (EPA) sets federal standards implemented and enforced at the state level for generators, and states may

11 U.S. Department of Energy, "How Much Power is 1 Gigawatt?" Office of Energy Efficiency & Renewable Energy, https://www.energy.gov/eere/articles/how-much-power-1-gigawatt.

12 S&P Global Market Intelligence, "Datacenter Companies Continue Renewable Buying Spree, Surpassing 40 GW in US," S&P Global, https://www.spglobal.com/market-intelligence/en/news-insights/research/datacenter-companies-continue-renewable-buying-spree-surpassing-40-gw-in-us.

13 Amazon, "Climate Solutions," Amazon Sustainability, https://sustainability.aboutamazon.com/climate-solutions.

14 Microsoft, "Microsoft's Datacenter Community Pledge: To Build and Operate Digital Infrastructure That Addresses Societal Challenges and Creates Benefits for Communities," Microsoft Blog, accessed September 15, 2024, https://blogs.microsoft.com/blog/2024/06/02/microsofts-datacenter-community-pledge-to-build-and-operate-digital-infrastructure-that-addresses-societal-challenges-and-creates-benefits-for-communities/.

15 Apple Inc., "Apple's Climate Roadmap," Apple Newsroom, https://www.apple.com/newsroom/2021/07/apples-climate-roadmap/.

16 Google, "Build a Carbon-Free Future for Everyone," Google Sustainability, accessed September 15, 2024, https://sustainability.google/projects/carbon-free-24x7/.

17 Meta, "The Next Stage of our Climate Commitment: Net-Zero Supply Chain Emissions by 2030," Facebook Newsroom, https://about.fb.com/news/2021/10/the-next-stage-of-our-climate-commitment-net-zero-supply-chain-emissions-by-2030/.

have additional requirements.[18] Once permitted, each diesel generator's operation is bound by strict regulations. Operators typically may run generators for only a limited number of hours per year for routine maintenance and inspection purposes.

Although it varies by facility, generators at data centers are typically used far less than these rules dictate. Generators' brief monthly operation to ensure proper functioning is comparable to running a pump system that's been inactive for an extended period—regular checks prevent potential issues that accompany prolonged inactivity, such as seized components or degraded lubricants.

Greener alternatives to diesel are in various stages of development, but none has been proved at scale yet.

Water sustainability

Cooling accounts for almost 40 percent of the total energy consumed by data centers, McKinsey and Company estimates.[19] Several factors determine the type of cooling that is most sustainable yet still suitable for the job.

Air cooling can be more efficient at lower load percentages and smaller equipment capacities. It can also be sustainable at any scale when the data center is located in an area with a high percentage of renewable sources in the energy grid, including ones generated on site.

When cooling processes require water, nonpotable water sources can be used so as not to reduce the local drinking water supply. Nonpotable water is treated—either at a local plant or, in some cases, on site–to remove contaminants, solids, and impurities. Then recycled water is then distributed in plum-colored pipes, which accounts for the nickname the **purple pipe system**. To pursue it, companies often consider access to recycled wastewater an important factor in the early stages of site selection.

Hyperscalers have even helped AHJs finance such projects, though that's not always viable, which makes proximity to existing treatment facilities a key consideration. In 2012, Google funded the construction of the Sweetwater Creek Sidestream Plant in Douglas County, Georgia, which we explore further in the appendix.

Electrical utility transmission and distribution

When developers vet a site for a data center, they consider whether there are adequate transmission lines. At the local level, there can be pushback against the building of new transmission lines, inside and outside a data center context. Local pushback against transmission lines increased by 57 percent from 2022 to 2023, according to Columbia Law School research.[20]

This challenge exists not just for data centers but also for the clean energy transition. One truism says that the transition can't happen without transmission. Here's why: as more sectors such as transportation go electric, overall power demand is likely to increase, requiring greater transmission capacity. Grids in the U.S. are not connected, which is a problem because such clean energy sources as solar and wind are often located far from urban centers, where electricity is most needed. Connecting grids across the country requires a plethora of new transmission lines.

"By the 2030s, we need to build so many new lines that they would reach to the moon if they were strung together," says Bill Gates, cofounder of Microsoft, in a video on his YouTube channel. "And by 2050, we'll need to more than double the size of the grid, while replacing most of the existing wires."

Most transmission lines, built between the 1950s and the 1970s, are now outdated.[21]

How did we get here? For a long time, electricity generation was centralized, and there was no need for a connected grid. Large coal-powered plants and nuclear power plants produced massive amounts of electricity in specific locations. This electricity was then distributed widely to homes, businesses, and industries throughout a large area. Power flowed primarily in one direction: from centralized plants to distributed end users.

As we transition to clean grid sources, however, we need a less centralized, more distributed system. Unlike fossil fuel plants, renewable energy sources are often geographically dispersed, variable in output, and located far from major consumption centers. They require a shift to an interconnected grid with diverse, distributed sources, one that's more resilient to outages and increasingly frequent extreme weather events caused by climate change. This shift requires more cross-regional transmission or inter-regional transmission. It requires . . . transmission lines.

18 U.S. Environmental Protection Agency, "Regulations for Emissions from Heavy Equipment with Compression-Ignition Engines," https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-emissions-heavy-equipment-compression.

19 Srini Bangalore et al., "Investing in the Rising Data Center Economy," McKinsey & Company, January 17, 2023, https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/investing-in-the-rising-data center-economy.

20 "Opposition to Renewable Energy Facilities in the United States," Sabin Center for Climate Change Law, Columbia Law School, May 2023, https://scholarship.law.columbia.edu/sabin_climate_change/200/.

21 Bill Gates, "The Surprising Key to a Clean Energy Future," Gates Notes, January 24, 2023, https://www.gatesnotes.com/Transmission.

Often, constituents don't understand that transmission lines are an essential part of our sustainable future, even without data center demand. Properly communicating this message to a community isn't easy, but it's essential. Siting data centers near transmission infrastructure is most efficient, as doing so allows for use of the existing infrastructure and the associated rights of way for new infrastructure, if needed.

Sound

Another common community concern is sound. Most mitigations related to it are already baked into the development process. Data center designers, architects, and engineers tend to design data center campuses to mitigate impacts from sound upon nearby neighbors, including strategic placement of generators away from other uses. Developers typically employ on-site acoustic monitors as part of regulatory entitlements to ensure sound levels remain within acceptable limits.

Let's discuss where sounds occur at data center campuses. Remember the low hum in the equipment yards? It comes from cooling equipment. Screens and sound attenuators make it barely audible.

Generators make mechanical sounds, albeit only when they are turned on for testing or emergencies. Sound impacts can also be easily mitigated by housing generators in sound-attenuated enclosures with proper exhaust systems.

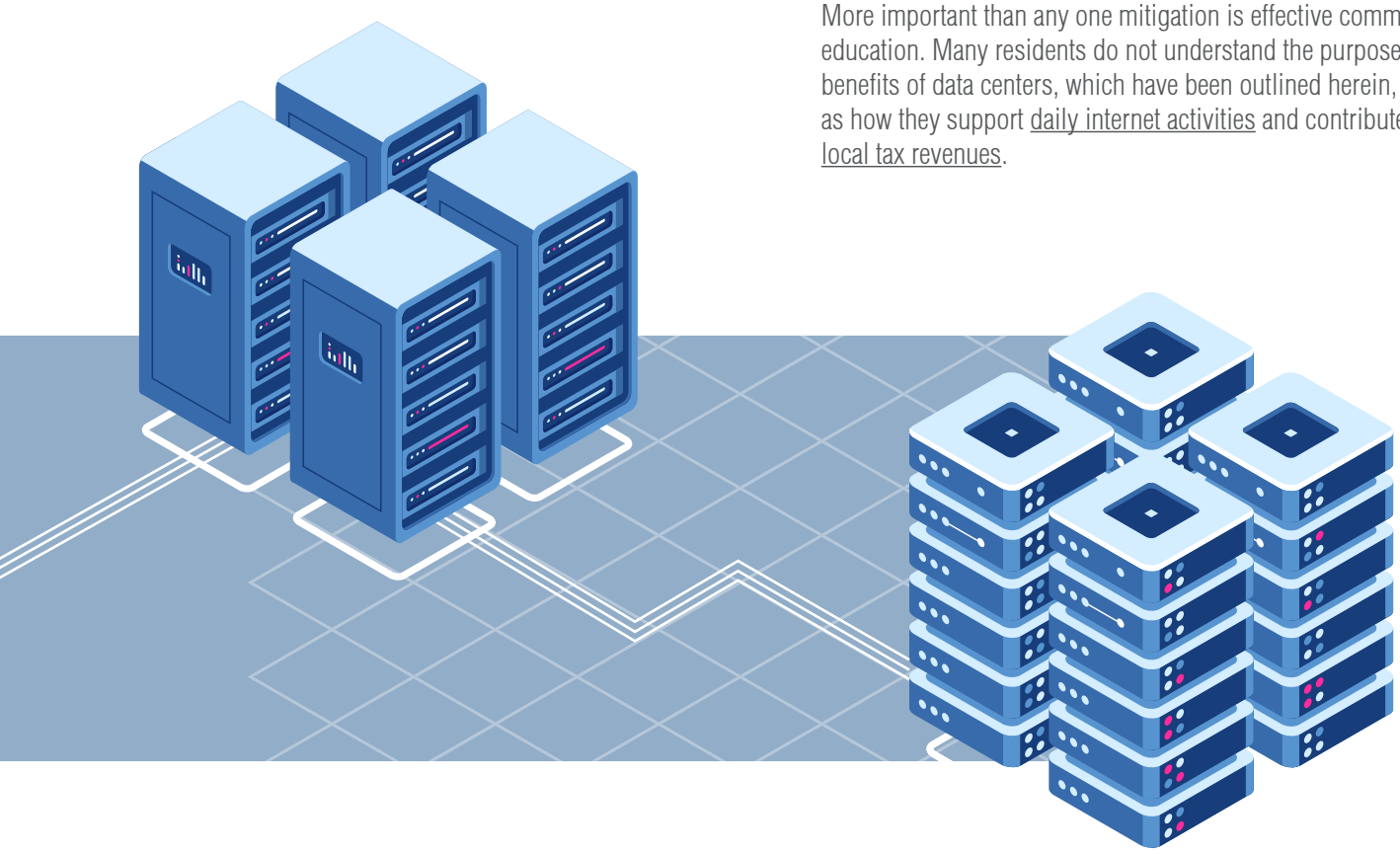
Aesthetics

Community members often raise concerns about whether data center campuses will look as if they fit into the community. This issue can be mitigated by:

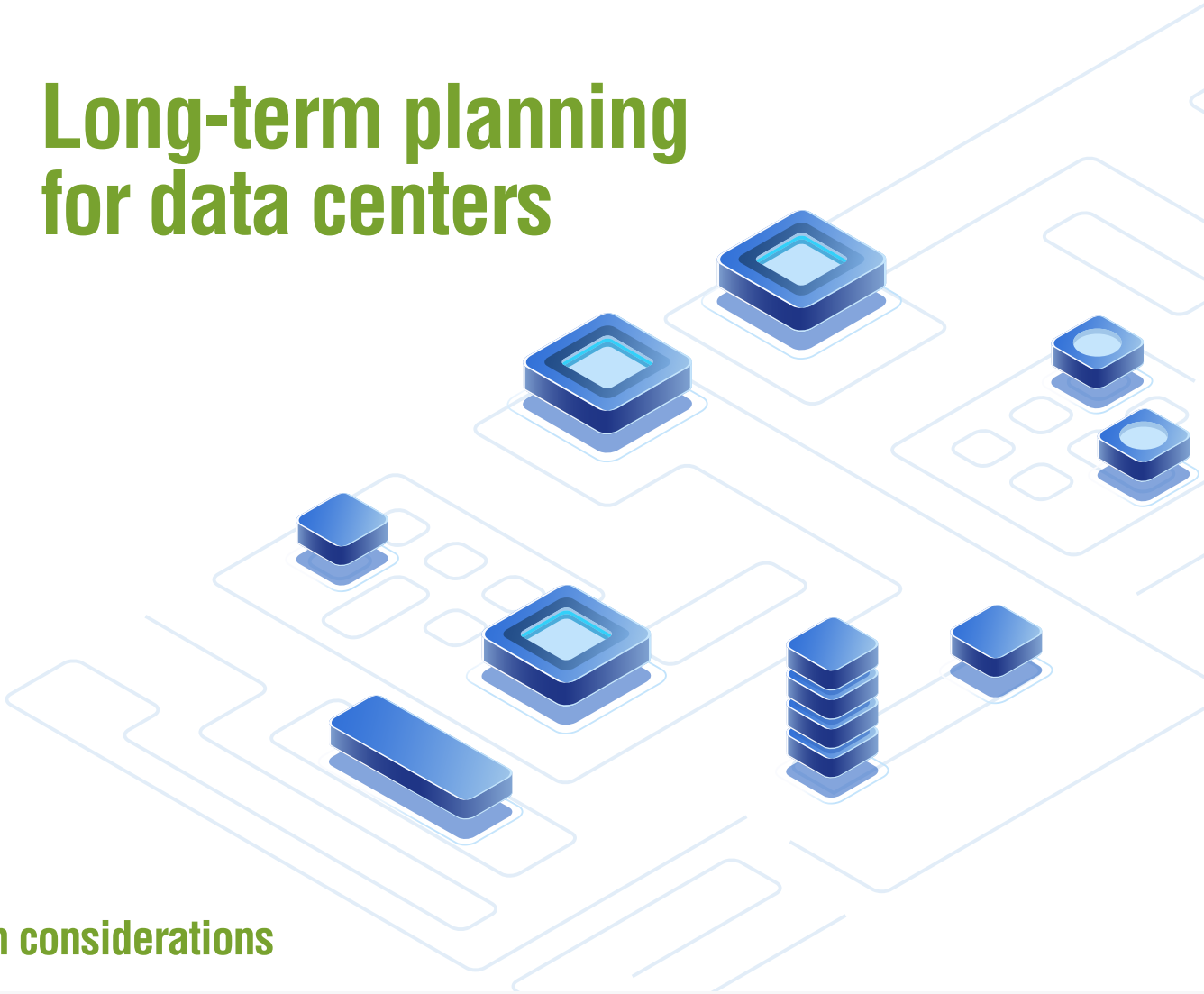
- Creating buffer zones near residential and retail areas
- Employing glass façades in key areas to make data centers more closely resemble office buildings than industrial complexes
- Applying other exterior design techniques that use materials and colors to blend buildings into their surroundings, if required and appropriate to the context

Although these mitigations are effective, it's important not to codify excessively specific or restrictive design standards into zoning codes, as doing so can discourage data center development. Exceedingly stringent height restrictions, for example, could hinder the functional design of these facilities. Balancing aesthetic considerations with operational needs of data centers is key.

More important than any one mitigation is effective community education. Many residents do not understand the purpose and benefits of data centers, which have been outlined herein, such as how they support daily internet activities and contribute to local tax revenues.



3 Long-term planning for data centers



Location considerations

Because of their unique operational and physical requirements, several crucial factors must be considered when deciding what sites suit data centers:

Power

Data centers are power-intensive. Reliable and robust access to power is non-negotiable, making proximity to high-capacity substations essential.

Roads

Whereas operational traffic is minimal, the initial construction phase generates more traffic. Thus, easy access to highways and major roads is vital for logistics and transportation.

Land

Hyperscale campuses require ample land area to accommodate both the facility and its accompanying infrastructure.

Discharge infrastructure

If there is runoff from water-based cooling, a site will need adequate infrastructure for wastewater discharge, such as a connection to a municipal sewer system, an on-site water treatment facility, or proper drainage.

Wet utilities

Some data centers require access to municipal water supply greater than what typical industrial developments need. The climate goals of most hyperscalers and developers are driving demand for recycled, rather than potable, water.

Frequent missteps

Common pitfalls in planning for data centers include:

Height restrictions:

Failing to allow sufficient building height can impede the efficient design of cooling systems, which rely heavily on vertical space for optimal airflow. The minimum height for a single-story data center could be as much as 30 feet (9.1 m). In denser jurisdictions with higher land basis, multistory data centers are common and typically require at least 66 feet (20.1 m) of height, in addition to considerations for rooftop equipment. Minimum heights are generally measured ground level to the roof line. Ancillary height structures, such as parapets, equipment platforms, screens, and stairwells can add another 15–20 feet (4.6–6.1 m) of height in some cases.

Zoning challenges:

The lack of a uniform land-use category for data centers presents challenges for localities in siting these facilities appropriately. Data centers typically fall between office and industrial/warehouse uses, which often makes the applicant request variances that appear to be special considerations rather than basic requirements. This outset can lead to high-stakes decision-making by exception that undermines the existing zoning codes.

Building code challenges:

Typical building code requirements around occupancy and plumbing fixtures may need to be modified for data center uses.

Parking and plumbing standards:

Regulations developed for office or warehouse uses often impose excessive parking and plumbing fixture counts on data centers, which necessitate variances and complicate the planning process.

Substation zoning:

Substations often fall under different categories than does the data center itself, creating further zoning inconsistencies and the need for additional, sometimes separate, approvals for one campus.

Construction confusion:

Data center campuses are often built over time, as we discussed above, which can cause planning confusion. The sightlines of a campus may change over time, so it's important to consider both the full campus and each individual building in the planning process.

Fire Department considerations:

Fire departments that are not yet experienced with data centers might not know that the on-site batteries and generators are for backup purposes only, so education is essential. Yet even though those backups aren't frequently used, data centers are built with robust fire detection and suppression systems. Modern batteries for UPS applications include multiple safety features, including battery management systems that monitor voltage, temperature, and current. Fuel tanks for backup generators are typically stored in separate, fire-rated enclosures, and secondary containment systems are used to prevent fuel spills and leaks.

Clear rules benefit all parties

Clear rules in zoning codes and land use plans, as well as in the entitlement and permitting processes, benefit all stakeholders involved in data center development, including the surrounding community.

Clarity simplifies the planning process, reduces the amount of planning that is done by exception, and lets communities gain maximum financial benefits from data center developments.

In the next few sections, we discuss planning options for AHJs seeking to be prepared to regulate thoughtful data center development, to attract it, or both. We also provide a model zoning ordinance that municipalities can adopt, designed to address common concerns while avoiding excessively restrictive measures that could hinder data center development.

4 Regulating data centers

Planning-related options

AHJs that want to bring data centers to their region can start by identifying strategic locations. Municipalities should perform comprehensive analyses to determine suitable areas, based on power availability, infrastructure, and environmental impact.

Ideally, more than one area should be designated for potential development—as with the process for industrial parks—to provide flexibility and attract varied investments.

Option 1: Create an overlay district

One option for guiding the development of data centers is to incorporate an overlay district. An overlay district is mapped to certain areas of the jurisdiction's zoning map without necessarily changing the underlying zoning district and what is allowed therein.

A historic overlay district is a common application of this tool. It typically provides for certain additional standards—an expansion of the uses that might be permitted in that district, a limitation of them, or some mix of the two.

A data center overlay district can allow for the development of data centers and prescribe that such development meet certain standards or requirements. An overlay district clearly indicates where and under what circumstances data centers are permitted and provides additional direction to any data center developer seeking to develop in that jurisdiction.

Option 2: Create a planned innovation, research, and technology (PIRT) district

PIRTs—and their regional equivalents, which include innovation zones, technology corridors, and research and technology parks—offer municipalities a flexible approach to land use that goes beyond traditional industrial or commercial zoning.

This designation allows for a mix of uses and can adapt to the specific requirements of data centers without necessitating a rezoning. Data centers in a PIRT district can integrate seamlessly with adjacent research facilities or tech hubs, fostering synergistic growth and innovation. Examples of successful PIRT districts include Palo Alto's Stanford Research Park.[22]

When data centers are sited clearly as being a by-right use, data center developers are more likely to consider the location for investment because they have the required certainty that the land they acquire won't struggle or be delayed in the approvals process. In the appendix, we explore how Elk Grove Village did so successfully.

Option 3: Note preferred data center locations in the comprehensive plan and invite owner- or hyperscaler-initiated rezoning applications

AHJs can identify preferred locations for data center development in their comprehensive plans and invite rezoning applications in those areas.

Municipalities and data center companies can agree on development conditions—sometimes called proffers, development agreements, or conditional zoning—which are voluntary commitments made by developers in return for allowed zoning. They outline specific conditions or promises agreed upon to mitigate the impact of proposed developments or to otherwise benefit the municipality's residents.

Development conditions may include infrastructure improvements, restrictions on use, environmental protections, community benefits, and other strictures. They are flexible enough to apply to various zoning categories, including PIRTs.

Option 4: Implement a specific data center zoning district defined by ordinance

Creating a data center-specific zoning district is a solution that's more detailed and restrictive than the previous three. We recommend it as a best practice in many jurisdictions because it establishes clear guidance on where data centers are permitted by right and eliminates the possibility that high-stakes decisions are made by exception. The ordinance should define data centers and outline general standards for building them, such as building size thresholds, height limits, and floor area ratio (FAR) requirements.

The zoning ordinance should include specific use standards for data centers, such as parking, setbacks, buffering, plumbing fixture counts, equipment screening requirements, and operational sound limits. The next chapter consists of a model ordinance that AHJs can adopt.

22 "About Stanford Research Park," Stanford Research Park, https://stanfordresearchpark.com/about/.

5 Model zoning ordinance guidelines

AHJs that want balanced and transparent zoning standards that mitigate unwanted impacts while encouraging the many potential benefits of data center development can take this zoning ordinance off the page and adapt it.

No two jurisdictions are the same. Each needs to layer in its own considerations.

Our intention, however, is to offer a strong foundation upon which AHJs can build zoning districts for data centers defined by ordinance. Note that the language provided below is to be included in the zoning ordinance and there may be other provisions that govern development, such as in the building code as it pertains to plumbing fixtures, that may need to be adjusted.

For example:

- Rural counties can consider additional guidelines and requirements when a data center is adjacent to certain agricultural uses or other sensitive uses.
- Urban municipalities can consider additional guidelines and requirements when a data center is adjacent to transit hubs or to prioritize pedestrian activity.

Zoning categories

Broadly, zoning districts in which data centers have specific considerations fall into four categories:

Residential: Because data centers are ultimately an industrial use, we believe that data centers are not appropriate in residential districts.

Industrial: Given the nature of data centers, they should be permitted in all industrial categories, from light industrial to heavier industrial. In such areas, data centers should be permitted as any other industrial use would be allowed, including following the same height, setback and landscaping requirements.

Rural/agricultural: In rural areas, data centers should be permitted to the extent that industrial uses would be permitted in such areas, provided that the same conditions are applied that would be applied to permissible industrial uses on such land. If another industrial use would require a certain setback, landscaping treatment or other mitigation on rural or agricultural land, our recommendation is that the same conditions be applied for a data center on such land.

Commercial: Data centers in commercial areas can be appropriate, provided they comply with certain use standards as set forth below. For the purpose of this section, commercial districts are defined as ones that permit a diversity of nonresidential uses, such as office and retail.

Use standards for commercial areas

Data centers shall be permitted by right in commercial districts if the following criteria are met:

1. To provide screening and reduce noise levels, all equipment for cooling, ventilation, or otherwise operating the facility—including generators or other power supply equipment—must be fully enclosed, except when determined by the [zoning administrator] not to be mechanically feasible. If the zoning administrator determines that full enclosure is not mechanically feasible, all equipment for cooling, ventilation, or power generation must be screened by a wall or similar barrier. In addition, any accessory electrical substation must be screened from adjacent nonindustrial properties or public streets by a wall or similar barrier. This standard does not apply to solar panels.
2. 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.
3. The primary façades of data centers must include either:
    a. A change in the primary facade surface for every approximately 150 horizontal feet of at least one of the following: building material, pattern, texture, color, or accent material; or

b. A minimum of thirty percent (30%) of the primary facade shall be comprised of windows, doors, or similar fenestration design features such as faux windows that are generally distributed horizontally and vertically across the façade.

c. These standards do not apply to accessory uses.

d. For the purposes of this requirement, a primary facade shall be deemed to be a facade that fronts on a public street.

4. Buildings may be constructed up to one hundred (100) feet (30.5 meters) in height or taller with special exception approval and subject to FAA limitations.

5. FAR shall not exceed [1.5 times the maximum FAR of the commercial district] without approval of a special exception. With approval of a special exception, the FAR may be increased to [2.5 times the maximum FAR of the commercial district].

Use standards for industrial areas adjacent to residential

Although data centers are appropriate in all industrial zoning categories, special attention may be afforded when industrial land is adjacent to residential. In such cases, the following language could be included in the locality's zoning ordinance:

1. Where industrial is adjacent to residential or any other sound-sensitive use, any data center building or ancillary equipment should (1) be located at least 200 feet (61 m) from the residential or noise-sensitive use or (2) meet the other standards set out for data centers in the commercial districts set out in section 1.

   a. A lesser distance that does not conform to the standards in paragraph 1, above, may be allowed with special exception approval.

Parking requirements for all data centers

As referenced elsewhere in this document, the parking requirements for data centers are far less than would be required for another industrial or commercial use of a similar size. Overbuilding parking for a given data center site or campus can be unnecessarily costly but more importantly creates excess impervious surface and avoidable environmental consequences. Accordingly, we recommend that the parking requirements for data centers be established either by:

1. Applying the parking requirements for office that exist in the ordinance, but only to the portion of the data center building that is actually utilized for office space; or

2. Requesting a staffing plan from the data center developer and allowing such data to inform the minimum number of needed parking spaces.

6 Appendix, contacts, and additional resources

Appendix: case studies

Google's Gmail and the need for redundancy

According to Google's podcast *Where the Internet Lives*,[23] Gmail launched in 2004 while offering a staggering 1 gigabyte of storage—more than 250 times the capacity of other email services at the time.

Gmail revolutionized user expectations and increased the need for data center capacity. It made every individual's account data exist on multiple interconnected servers at Google's hyperscale data centers, ensuring that users always have access to their personal information, even in the event of individual server failures, and allowing users to search and organize emails in a new way.

The Meta outage and the quest for data center capacity

The October 2021 Meta outage affected Facebook, Instagram, WhatsApp, Messenger, Oculus, and other services, making them inaccessible to billions of users for six to seven hours. This disruption, caused by an ill-timed and erroneous maintenance command, led to a cascade of failures that severed Meta's data centers from the internet. The primary cause was a lack of redundancy in the backbone network, which left no failover capacity for critical services.[24]

The economic impact was significant, with individuals and businesses that relied on these services facing major interruptions—amplified by the fact that many users sign in to other apps and services through their Facebook logins. As Mike Isaac and Sheera Frenkel wrote, in the New York Times, this mix of factors led "to unexpected domino effects such as people not being able to log into shopping websites or sign into their smart TVs, thermostats, and other Internet-connected devices."[25] Meta's stock value dropped by billions of dollars during and after the outage.[26]

Google's financing of a water treatment plant

In 2012, Google funded the Sweetwater Creek Sidestream Plant in Douglas County, Georgia. This move made its nearby data center the first in the state to use recycled water for cooling. Google partnered with the Douglasville-Douglas County Water and Sewer Authority on an initiative to conserve the Chattahoochee River's potable water supply, especially during droughts and summertime.

AWS' community incentives package in Mississippi

As part of AWS' $10 billion data center campus investment in Mississippi—the single largest capital investment in that state's history—the company funded Mississippi's first utility-scale wind farm, located in Tunica County, and developed STEM-focused workforce training and career awareness programs for K-12 school systems.

The hyperscaler committed to supporting local educational institutions—community colleges, technical schools, universities, and workforce development organizations—by developing training programs for high-demand career pathways in data center construction and operations, as well as the broadband expansion sector. AWS also provided a free cloud computing curriculum to local institutions and learners.

Fredericksburg, VA's windfall

Located southeast of Loudoun County, Fredericksburg, Virginia, is an emerging exurban hyperscale campus market. Alongside its regional partners, it represents a case study in attracting data center development—and landmark economic and fiscal benefits–while also mitigating potential concerns well in advance.

In March 2024, Virginia's governor, Glenn Youngkin, alongside other state and local elected officials, announced that AWS was making a $35 billion investment in data centers in Spotsylvania, Caroline, Stafford, and Louisa counties, thereby creating approximately 2,000 new jobs. It was also announced

23 Fischer Barry, "Two: Inside the Walls," Where the Internet Lives, December 9, 2020, podcast, 40:54, https://www.google.com/about/datacenters/podcast/.

24 Kerry Sheridan, "Facebook Outage: Social Media Giant Blames Network Problem for Global Disruption," BBC News, October 4, 2021, https://www.bbc.com/news/technology-58793174.

25 Mike Isaac and Sheera Frenkel, "Gone in Minutes, Out for Hours: Outage Shakes Facebook," New York Times, October 4, 2021, https://www.nytimes.com/2021/10/04/technology/facebook-down.html.

26 Greg Roumeliotis, "Facebook Services, Including Instagram and WhatsApp, Suffer Worldwide Outage," Reuters, October 5, 2021, https://www.reuters.com/technology/facebook-instagram-whatsapp-suffer-outage-2021-10-04/.

that AWS would be contributing $400,000 in community funds within those four localities, which, together with bordering Fredericksburg, constitute an economic region: the Fredericksburg Area Association of Realtors service area.

What Youngkin called the largest single economic development investment in the history of the state didn't happen by accident. The Fredericksburg Regional Alliance (FRA) at the University of Mary Washington and other regional groups had together been paving the way for data center development since 2016, when they also focused on ensuring the facilities would be built away from residential areas or well-buffered if close to them.

"The reality is [that] this region is one of the [fastest-growing] areas in the Commonwealth. With growth comes the need for infrastructure and services that the area can [afford only] by attracting new revenue sources or raising taxes on local businesses and residents," stated Curry Roberts, president of the FRA, in a local op-ed. "To get ahead of this [need], leaders in our region have worked for over a decade to attract data centers and the tremendous local tax revenue they bring."

According to Roberts, the regional coalition began its quest by evaluating 50 sites to determine whether—based on zoning, transmission lines, and water access—they were compatible with data center use. The coalition eventually narrowed it list down to 15 locations across five localities, with each site exceeding 100 acres. This groundwork set the stage for an ambitious economic development plan aimed at attracting major industry players such as AWS.

Roberts emphasized the importance of getting information in front of the public proactively, rather than waiting for opposition to arise. Stafford County, for example, held several community meetings to educate people about data centers before any specific projects were proposed.

Stafford and Spotsylvania counties set the stage for evaporative cooling by engineering recycled wastewater systems for that purpose in data centers. These systems are now used by data centers, which pay for the service, thus creating additional revenue for the localities.

When AWS approached regional leaders in 2018 about a data center project, the FRA was able to act quickly. It coordinated with localities to harmonize tax rates and depreciation schedules on a parcel that straddled several jurisdictions, ensuring a straightforward fiscal environment for AWS.

Although the project stalled during the pandemic, by 2023 AWS had acquired and entitled approximately 2,500 acres (1,012 ha), paving the way for the development of 18 million to 19 million square feet (1.7 million–1.8 million sq m) of data center space.

Tax benefits from the investment are immense. According to Roberts, for every dollar of service demanded by a data center, the operator is paying $13 in taxes.

Elk Grove Village's innovation district

Elk Grove Village, Illinois, a suburban community northwest of downtown Chicago, is located at a major fiber intersection. It intentionally attracted data center development through a combination of zoning code modifications, the promotion of strategic location advantages, and proactive communication with the development community.

Since its formation, the village has had unique zoning. The eastern half of the community, adjacent to O'Hare International Airport, is home to the largest contiguous industrial park in the United States and is zoned as such. The western half of the village is primarily residential and zoned to protect housing.

Matthew Roan, the village manager of Elk Grove Village, said the municipality updated its zoning code to spur redevelopment within its office park by creating a new "innovation and technology" zoning district that specifically permitted data centers as an approved use, thus inviting data center operators to fill unused space.

Additional modifications to the zoning code allow data centers to have greater building heights and front-yard fencing or screening that wouldn't normally be permitted for industrial uses. Other changes reduce parking requirements. All of these changes allow data center builders to get their projects off the ground more quickly, amid the certainty that the structures can be built and won't struggle in the approvals process—an uncertain phase that makes land acquisition too risky for some parties.

This proactive approach has attracted data center developers and hyperscalers, including Meta and Microsoft. Roan, who has served in various roles in village government since 2000, said it brought significant economic benefits to the region, including long-term development and permit fee revenues, financial assistance for local school districts and other taxing bodies, high-quality site aesthetics, and temporary construction jobs. The increased tax and fee revenue from data centers allowed the village to reinvest in infrastructure improvements and redevelopment projects, he said.

This strategic positioning of Elk Grove Village as a data center hub exemplifies how proactive municipal policies can drive growth and innovation—as well as stable economic returns. Once data centers make their large capital investments, Roan said, they tend to stay in the community long term, unlike more transient industrial users.

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7 Glossary

air-cooled chiller system: A cooling system sealed in a closed loop that typically consumes very little water—less than the amount used in three single-family homes.

clustering: The practice of data centers locating near one another, connecting their servers to work as a unified system, or both.

colocation data centers: Multi-tenant data centers where third-party operators (developers) lease data center space—a certain number of server cabinets, for example, or kilowatts (kW) to a host of other companies.

corporate data centers: Also called enterprise data centers, these facilities store and process a single organization's data. These data centers often store the data of financial institutions—think American Express or Wells Fargo—that typically own and operate such facilities themselves, rather than leasing them from a provider.

data center: A building or campus that houses the infrastructure that supports the world's computing functions.

data hall: The rooms in data centers where data is processed and stored.

evaporative cooling: A cooling system that uses large fans to move air across a wet medium to evaporate water, which removes the heat from the data center and cools the air.

hyperscale data centers: Large data center buildings or campuses that process and store the data of companies that often need to scale up or scale down their infrastructure quickly.

hyperscaler: A company that occupies and operates a large data center building or campus. These companies—which include AWS, Microsoft, Google and Meta, often need to "scale up" their infrastructure quickly.

latency: The time it takes for information to travel from its source to its destination.

load balancing: The process of distributing network traffic across multiple servers at interconnected data centers.

node: An individual server in a cluster of servers.

phasing: A process for data center campus construction that occurs in stages.

power distribution units (PDUs): Devices that distribute energy to servers, network devices, and other equipment within a rack.

power purchase agreements (PPAs): An agreement between a data center company (the buyer) and a renewable energy provider (the seller) to purchase electricity from specific wind or solar farms.

purple pipe system: A recycled water setup whereby water is treated to remove contaminants, solids, and impurities and then distributed via plum-colored pipes.

renewable energy certificate (REC): A tradable commodity wherein each REC equates to the generation of 1 MWh of power from a qualified renewable resource, usually wind or solar power generation facilities.

switch: A device used to connect network devices and route data through interconnected networks.

switchgear: Power distribution equipment that controls, protects, and distributes electrical power throughout the data center.

telecom data centers: Where traffic from cell towers "switches" to go out to the internet. Typically owned by such telecommunications companies as Verizon, these centers tend to be smaller facilities than the other data center types and require less than 10 kWs.

uninterruptible power supply (UPS) systems: Electrical equipment used in data centers to provide battery backup power in the event of a power outage.

utility substation transformer: A large electrical device in the electrical yards of a data center campus that steps down high-transmission voltages from the utility grid to lower, more manageable medium-voltage levels suitable for distribution throughout the data center.

water-cooled chiller system: An open-loop pipe system in which water removes heat from the refrigerant.

wholesale data center: A type of data center where a third-party developer rents a large portion of the space, the energy capacity, or both to one company–often, all of it.