



Data Centers

*Land Use Code Considerations
for Impacts and Public Safety*

May 2026



**Delaware County
Planning Department**

The Delaware County Planning Department has compiled the following considerations regarding land use code approaches and factors for addressing data centers and their related impacts. We acknowledge that this land use is still evolving, and we expect that over time regulations will properly mitigate their effects. It is also our understanding that the Commonwealth of Pennsylvania may be considering state level data center guidance and/or regulations, and if that happens, we will aid in disseminating said information. In the meantime, we offer the following information for your consideration. At the end of this memo are additional resources that may also be helpful.

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USE CATEGORIZATION AND TYPES

It is recommended that data centers be classified as a **conditional use**. This classification provides municipal officials with additional oversight regarding the data center’s design and potential impacts. It allows the municipality to set forth compliance criteria that are specific to data centers to ensure that the applicant includes proper siting and mitigation measures. When crafting conditions, consideration should be given to the factors within the sections below. From a scaling, impact, and impervious coverage standpoint, industrial zones are the best fit for data centers.

DEFINITIONS

While large scale buildings have emerged as the typecast for data centers, there are various data center types and intensities that should be addressed by the code. It is recommended that data center codes define different scales which constitute a data center. In smaller instances, location of data equipment within a portion of a building could still constitute a data center. Other scenarios should also be defined such as edge data centers (with a smaller building footprint and a closer proximity to end users), colocation facilities (where multiple entities operate separate hardware systems within a shared space), and hyperscale and other high-intensity data centers. For smaller instances, consideration should be given to a definition that classifies a development as a data center when the percentage square footage of said building exceeds a threshold limit for data processing equipment.

Sensitive Receptors (those uses that may be impacted by a data center) should also be defined and should include residential uses, hospitals, daycares, schools, parks, and community centers.

*The smallest **Edge Data Centers** can be the size of a shipping container.*



Leading Edge Data Centre on the old CSU South Campus.jpg from Wikimedia Commons by Robert Myers, CC-BY-SA 3.0/au

*The largest **Hyperscale Data Centers** can be over 1 million square feet.*



Google Data Center, Council Bluffs Iowa (49062863796).jpg from Wikimedia Commons by Chad Davis, CC-BY 2.0

PUBLIC HEALTH PROTECTIONS

It is highly recommended that data center ordinances **address public health factors** such as noise, heat, and light pollution. It's been generally observed that a 500' minimum separation distance of a data center from Sensitive Receptors has been used in model ordinances. However, it should be noted that there is no case law upholding this requirement. A different approach is to stipulate performance standards for the above noted factors and require the data center applicant to furnish equipment specifications/proof upfront within the application that devices utilized will not be impactful offsite (example: server hum or vibration, chiller heat impacts, and light pollution).

FIRE SAFETY PLAN & GRID IMPACTS

There are emergency services and community facilities that will likely be impacted by a new data center including, but not limited to, local volunteer fire companies and the energy grid. Many data centers are very large and filled with highly electrified equipment comprised of various heavy metals. The large building scale presents challenges for finding and addressing a fire within such a cavernous space. The applicant should be required to provide a [Fire Safety Plan](#) to ensure procedures are in place for reporting a fire and assisting in response. Additionally, it is highly recommended that large scale buildings contain isolation zones to prevent fire spread. If batteries are to be utilized, dedicated fire suppression systems should be utilized designed specifically for chemical fires and consideration should be given to isolating battery storage from the rest of the facility. Finally, the data center operator must maintain regular outreach and engagement between itself and local fire companies to ensure that first responders are aware and prepared for data center emergency calls.

Proactive communication should be had with the power utility company, specifically examining proposed data center usage and current grid capacity. Special focus should be given to peak use during summer months when grids are challenged and data center electricity usage is at the highest. The utility should provide feedback regarding how electricity capacity will be routed in the event brownouts are necessary **with written confirmation that residential portions of the grid and critical medical and infrastructural uses are given priority over other uses, ensuring public safety.**

Consideration should be given to including a required Developer Agreement for the above related community impacts that result from data centers. The agreement should provide support for volunteer fire companies who likely will require specialized equipment, regular equipment upgrades, and ongoing specialized training to ensure they are prepared to safely respond to a fire call at a data center. Additionally, power grids that are aged, near capacity, or may be stressed during peak months may require upgrades. **A developer agreement will serve to document necessary preemptive public improvement upgrades provided by the data center operator that will offset the impacts of the data center.**

DESIGN STANDARDS & BACK-UP GENERATORS

Similar to other large scale and visually impactful developments, design standards should be applied to data centers. Consideration should be given to requiring architectural articulations within spans over 100' per side, and screening for mechanical equipment, incorporation of faux windows, and color palette consideration as well as corner abutment requirements for building spans over 300'. Additionally, it is recommended that earthen/landscaped berms be incorporated within separation distances abutting Sensitive Receptors to further mitigate against data center sounds and visual impacts. When abutting commercial and industrial uses, landscaped buffers utilizing staggered coniferous trees augmented with lower-level shrubbery and plantings can be used. All chillers, pump stations, electrical substations/boxes, and other necessary ground and roof based mechanical equipment should be screened (including fencing and landscaping when on the ground).

Lighting design standards can be provided to ensure that site lighting does not contribute to light pollution. Similarly, requirements for back-up energy generators can be provided to ensure that noise pollution and exhaust fumes do not become an issue (EPA Tier 4 generators with Level 3 sound-attenuated enclosures are highly recommended). Both lighting and generator use can also be stipulated within code as being on an as-needed-basis. Base lighting can be incorporated within the design with additional lighting activated as needed by motion sensors. **Generators should only be utilized when the utility provider indicates grid vulnerability (regular unnecessary use should be prohibited).**

Separation Distance	Performance Standards
Requires a flat distance between proposed facilities and existing Sensitive Receptors	Requires equipment specifications or other proof of minimizing/ eliminating offsite impacts
Can be more or less stringent depending on surrounding uses	Independent of surrounding uses

Earthen Berms can reduce light and noise impacts offsite with a vegetated barrier.



Noise protection hill, Prague Chodov.jpg from Wikimedia Commons by Packa, CC-BY-SA 3.0

Light Pollution	<p>An increased amount of light at night lowers melatonin production, which results in sleep deprivation, fatigue, headaches, stress, anxiety, and other health problems.</p> <p style="text-align: center;">-National Geographic</p>
Noise Pollution	<p>Studies have shown that there are direct links between noise and health. Problems related to noise include stress related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity.</p> <p style="text-align: center;">-US Environmental Protection Agency</p>
Air Pollution	<p>Public health concerns related to high air pollution exposures include cancer, cardiovascular disease, respiratory diseases, diabetes mellitus, obesity, and reproductive, neurological, and immune system disorders.</p> <p style="text-align: center;">-National Institute of Environmental Health Sciences</p>
Heat Island Effect	<p>Heat islands are urbanized areas that experience higher temperatures than outlying areas. Structures such as buildings, roads, and other infrastructure absorb and re-emit the sun’s heat more than natural landscapes such as forests and water bodies.</p> <p style="text-align: center;">-US Environmental Protection Agency</p>

UTILITIES

Data centers have significant needs from various utilities including water, electricity, gas, and sewer. It is recommended that a data center applicant provide confirmation letters of ‘No-Impact/Will-Serve’ from utility providers within their final land development application. Additionally, consideration should be given to requiring on-site water recycling to reduce consumption and to pre-treatment of wastewater before its release for sewer treatment (specifically pre-treatment for PFAS).

The applicant should be required to provide the host Municipality with an executed Curtailment Agreement which stipulates that when under a “Grid Emergency,” “Peak Demand Event,” or “Voltage Reductions,” the data center will reduce its electrical draw to “Maintenance Only” level (not to exceed 10% of normal operational capacity). Events such as those previously mentioned and related details/actions/usage statistics must be documented within the Annual Compliance Report (see Annual Compliance Report comment).

It is recommended that a cooling system stipulation be added such that said system(s) be closed-loop and air cooled-chiller technology. Open-loop or “once-through” evaporative chilling should be prohibited as it is intensive from a water consumption standpoint and the resulting steam contributes to the heat island effect.

In the event the data center is drawing water from a natural source, a water conservation/hydrologic study must be performed to ensure that the amount proposed to be drawn does not impact other uses. Additionally, any required state or local permits for natural sources should be obtained prior to final land development application/approval. Finally, **consideration should be given for requiring Public Utility Commission (PUC) approval prior to final land development application.**

SITE DECOMMISSIONING OR UPGRADES

The data center applicant should provide guidelines in the event that the data center needs to be decommissioned or upgraded. Specific details should be given pertaining to removal and disposal of unneeded or obsolete electronic materials. Consideration should be given to requiring upfront bonding to the host municipality to cover the potential burden of site abandonment or decommissioning.

ACCESSORY USES

Data centers have need for accessory uses such as power generators, water towers, water pumps, electric substations, fuel storage tanks, and wastewater treatment plants. These factors can be identified and addressed separately with stipulations pertaining to their own unique characteristics. It should be noted that ‘power plant’ was not included in the beforementioned list because staff consider this a primary use which should be regulated accordingly.

ANNUAL COMPLIANCE REPORTING

The data center operator should be required to provide an annual report detailing the usage of the various utilities on a monthly basis including analysis of efficiency. Explanation should be given generator usage, drops in efficiency, and spikes in energy and/or water usage. Report documentation should include how the data center operator engaged with and supported local fire departments.

ADDITIONAL DATA CENTER RESOURCES

Delaware County Planning Department: The Department is organized into three functional planning areas: Environmental, Infrastructure, and Planning Services, assisted and supported by a professional Administration staff. Located at 2 West Baltimore Avenue, Media, Pennsylvania, also available at 610-891-5200 or at Planning_Department@co.delaware.pa.us

Data Center Power Demand: MIT Energy Initiative – a clearinghouse for research and publications <https://energy.mit.edu/strategic-priorities/data-center-power-demand/>

Diesel Generators Report: Better Data Center Project – provides insight on diesel generator usage and best practices betterdatacenterproject.com

Fire Safety Information: International Association of Fire Fighters (IAFF) – educational article from the perspective of fire safety professionals <https://www.iaff.org/news/data-centers-are-booming-and-fire-fighters-must-adapt-to-new-challenges/>

Model Ordinances: Lancaster and York Counties – developed helpful model ordinances that address data centers which are available on their websites.

Ordinance Guide: Chester and Montgomery Counties – developed a general data center guidance document that can be found at <https://www.chescoplanning.org/UandI/DataCenters/>