DATA CENTERS & MUNICIPAL CONTROLS

Considerations and Recommendations

Tredyffrin Township - 2026

Tredyffrin Township
Chester County, Pennsylvania
Department of Planning and Zoning

BACKGROUND

What Is A Data Center?

- **Large buildings, similar in scale to warehouses, that house servers, storage systems, and networking hardware for cloud computing**
- Utilitarian architecture, typically windowless, ranging from 30 to 150 feet in height
- **Can consist of a single building or a "campus" of multiple buildings**
- Single buildings on smaller lots may need to be two or more stories tall
- **Can range in size from 100,000 to several million square feet**
  - Typically require lots of at least 5 acres
- **Can demand large amounts of power and water**
  - Large data centers can demand tens to hundreds of megawatts, an amount comparable to the demand of a small city



Types Of Data Centers

- **Retail**
  - Leases both space and equipment to one or multiple companies. The Center itself provides day-to-day services
- **Wholesale**
  - Leases only the space and a power connection. Day to day operation is done by the lessee
- **Hyperscale**
  - Large facilities owned and operated by a single-company and tailored to their specific computing needs.






025 Google


NO TURNS

Why Data Centers Matter Now

- **Rapid expansion driven by AI and cloud computing**
- **Interest in southeastern Pennsylvania due to existing infrastructure and state incentives**
- **Local governments are experiencing impacts from large proposals**
  - 1.6 million-square-foot data center in East Whiteland
  - Residents calling for a data center moratorium in Plymouth Township
- **Important to act proactively**
  - Our code does not currently permit data centers. Because this use is not expressly allowed, the Township could face liability and potentially be required to permit the use in an otherwise unsuitable location.

Why We Need Regulations

- Our code provides a schedule of uses for its industrial districts; **data centers are not listed**.
  - Regarding the schedule of uses, Section 208-40 goes on to state, “The absence of the use from the table indicates that use is not allowed within that zoning district.”
- The Pennsylvania MPC requires municipalities to “provide for the use of land within the municipality for…**a reasonable range of nonresidential uses**.”
- Relevant court cases have upheld this statute and have granted developers site-specific relief where a municipality failed to provide for a legitimate use.
  - *National Land & Investment Co. v. Easttown Township Board of Adjustment* (1965)
  - *Casey v. ZHB of Warwick Township* (1974)
  - *Fernley v. Board of Supervisors of Schuylkill Township* (1985)
- **By not acting, we forfeit our leverage to decide where data centers go, how they are regulated, and the performance standards they’re held to.**
  - The Township needs to decide how data centers fit within its planning toolkit.

Potential Concerns

- **Noise**
  - While the operations of the building generate noise, many of the worst examples come from diesel generators or onsite natural gas power plants.
- **Water usage**
- **Energy grid strain**
  - Although it is an important aspect, this is difficult for municipalities to regulate. Typically, it is an agreement between the utility and the developer.
- **Air quality (if power is generated onsite)**
  - Can be eliminated if on-site power generation is prohibited.
- **Monopolizing land use**
  - A consideration for large greenfield developments, but less so in built-out municipalities such as Tredyffrin.
- **Scale and massing**
  - Data centers are large buildings, and have the potential to be monolithic and out of character in a suburban context.

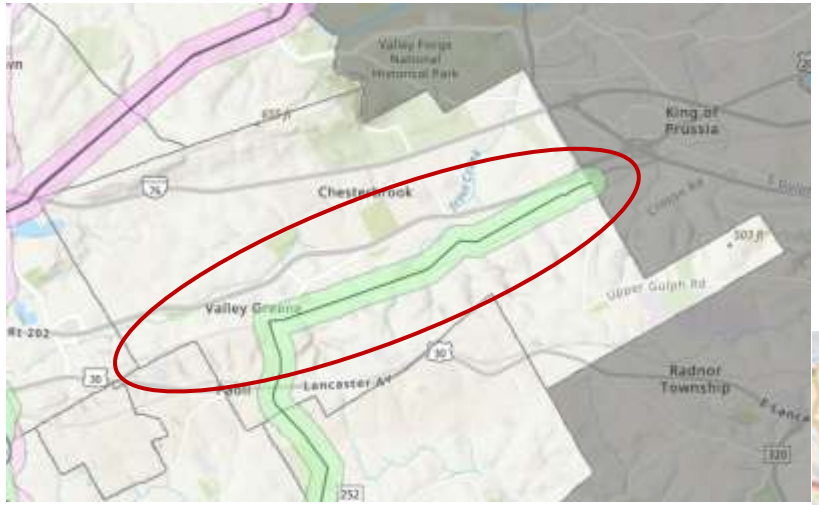
Potential Benefits

- **Increase in real estate tax revenue**
  - Aging office buildings and older manufacturing centers could be converted, increasing tax assessments
- **Transfer tax revenue**
  - Initial hit of cash from the sale of land
- **Permit and review fees**
- **Substantial increase in EDUs (a standardized measure representing wastewater flow) and associated Township fees**
- **Possible community benefits agreements (CBA)**
  - An agreement to help mitigate negative externalities caused by the development. There must be a clear nexus and proportionality; otherwise, it could be viewed as an exaction.
- **Limited, but high-paying job opportunities**
  - Most jobs generated by data centers are temporary and occur during construction. However, a limited number of high-paying jobs are created during operations.
- **Site improvements such as sidewalks, tree plantings, road upgrades paid for by the developer.**

What attracts Data Centers?

- Proximity to high-voltage transmission lines
- Access to natural gas pipelines
- Access to long-haul fiber optic trunks
- Access to public water
- Existing road infrastructure
- Large parcels of land

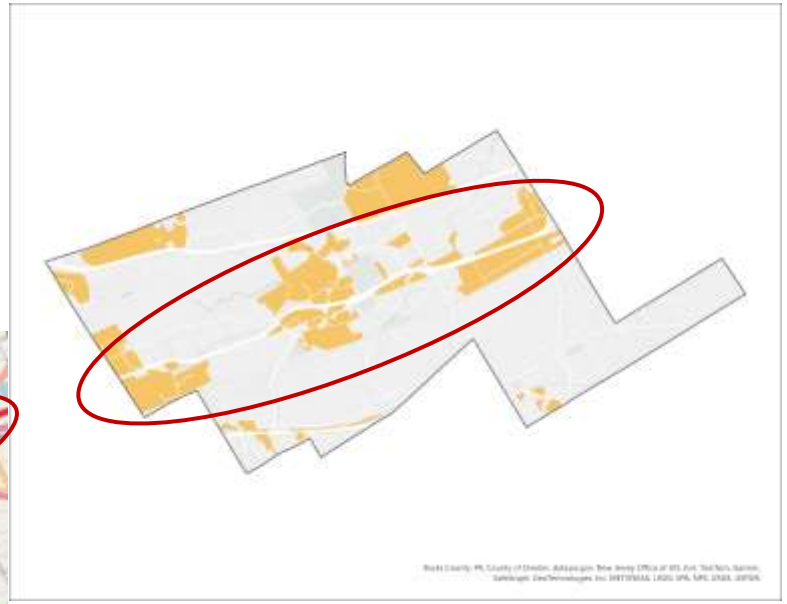
Where in the Township Does This Description Fit?



Sunoco Natural Gas Pipeline



PECO High Voltage Transmission Lines



Parcels over 5 acres

CONSIDERATIONS

Minimizing Negative Impacts

- **Require state-of-the-art water systems**
  - Example: Closed-loop, geothermal system
- **Limit proximity to "sensitive receptors"**
  - Homes and apartments
  - Assisted living or other residential institutional uses
  - Hospitals/medical facilities
  - Schools
  - Daycare centers
  - Parks (public recreational areas)
- **Reexamine noise pollution standards**
  - Current standards limit noise to 55 dBA during the day and 50 dBA at night. Ensure these align with best practices
- **Limit size through bulk and area requirements**
  - Increase required setbacks relative to the zoning district
- **Examine design standards**
  - Current design standards are strict in the LI, PIP, and O Districts. They should be reviewed to ensure that they are sufficient.
- **Examine tree plantings and screening standards**

RECOMMENDATIONS

Zoning District Recommendations

- **Best suited to the LI: Light Industrial and PIP Planned Industrial District**
  - While heavy industrial would be preferred; it is not a district found in Tredyffrin Township. These two zoning districts would be the closest alternative.
- **Proximity to "sensitive receptors" should be considered**
  - A sensitive receptor is a use that is vulnerable to the noise caused by a data center. Schools, medical facilities, residential areas, and Township Parks.
  - Precautions should be implemented that limit the uses proximity to residential districts (Cannot be placed within X distance of a "sensitive receptor")
- **Data Centers should be a permitted by conditional use**
  - Provides a check on expansion, gives the Board oversight of data center development, and creates an opportunity for public participation

Bulk and Area Considerations

- **Minimum lot size tied to the size of the data center**
  - For example, 5 acres per 100,000 sq ft of data center space
- **Increase setback from property lines relative to what is permitted in the base zoning district**
- **Examine current height and impervious standards in LI to ensure they meet best practices**

Regulations	LI
Minimum area	10 acre lot
Minimum lot width	200 feet
Minimum street yard	65 feet
Minimum yard abutting residential	50 feet
Minimum yard abutting nonresidential or rail-road right-of-way	30 feet
Minimum separation be-tween structures	60 feet
Maximum building coverage	40%
Maximum impervious coverage	50%
Maximum building height	60 feet, unless within 200 feet of a residential district, then 42 feet

Landscape Buffers and Screening

- SALDO requirements should be reviewed to ensure proper screening requirements
- The current woodland ordinance requires tree plantings to include a mix of native species
- Parapets should be required to cover rooftop equipment

Appearance and Architectural Standards

- **Examine SALDO to ensure attractive façade design when facing a public street**
  - Data centers should be subject to the design standards found in our office districts: § 181-50C(1)(b) “When visible from the public right-of-way… or for any facade abutting a residential district, facades must include architectural features to avoid the appearance of blank walls…”
- **Limit the use of single materials and monochromatic colors**
  - Break up the monolithic design that the form of a data center can often produce
    - § 181-50C(1)(d) “Building facades in excess of 80 feet must include a repeating pattern with no less than two of the following elements: color change, texture change, material change, or a wall articulation…”
- **Examine fencing regulations to prevent the use of chain link, barbed wire, or other “hostile” fence types.**



Data Center without architectural variation



Data Center with variation and an articulated main entrance

Noise and Vibration Standards

- **Data centers operate 24 hours a day, potentially generating constant noise**
  - Although much of the sound is considered “white noise,” some components generate low-frequency noise that travels farther and penetrates structures more deeply.
- **Require pre-construction and post-construction noise studies**
  - Example: “The applicant shall submit a pre-construction noise study prepared by an acoustical engineer establishing baseline ambient noise and vibration levels and shall include different times of day.”
  - Example: “The applicant shall submit a noise study of existing operations no sooner than one month, but no more than 12 months, after the issuance of the first Certificate of Occupancy.”
- **Noise measurements should be taken at the property line**
  - Example: “Sound levels at the property line shall not exceed 40 dB(A) and 50 dB(C) from 7:00 p.m. to 7:00 a.m., nor shall they exceed 45 dB(A) and 60 dB(C) from 7:00 a.m. to 7:00 p.m.”
- **Current ordinance requires that A-weighted sound levels shall not exceed 55 dBA during daytime hours and 50 dBA during nighttime hours.**

Energy Use

- **Data centers can require as much power as a small city**
  - Large facilities require 50 to 100 megawatts of power
  - Balance strain on the grid with local pollution concerns
  - “Bringing their own power” can reduce strain on the electrical grid, but it typically requires co-locating a power plant with the data center
  - Strike a balance between allowing on-site energy generation and storage while keeping noise and air pollution to a minimum.
- **Require LEED data center standards**
  - Can be required outright, or as a density bonus granted by conditional use
  - Example: “Projects shall be designed and constructed to meet the current USGBC LEED BD+C: Data Centers rating system, or equivalent design standard, as approved by the municipal engineer.”
- **Require an Energy Usage Plan**
  - A plan outlining annual energy demand, energy storage solutions, proposed backup power, and documented efforts to use green energy
  - Example: “The applicant for a data center shall provide an Energy Usage Plan with the Conditional Use application”
- **Limit or ban the use of fossil fuel power generation**
  - This could reduce one of the largest generators of noise and pollution associated with data centers.
  - Encourage the use of emerging technologies, such as fuel cells, for quiet, pollution-free energy generation.

Backup Power Regulation

- **Ban fossil fuel generators and promote battery use for backup power**
  - Relying on battery backup reduces noise and air pollution caused by diesel generators
- **Restrict onsite power generation for day-to-day operations**
- **Require fuel cells and solar power to be used in tandem with batteries for backup power generation**
- **Greatly reduces concerns surrounding noise and air pollution**

Water Usage & Cooling Impacts

- **Many data centers require millions of gallons per day of water for cooling**
  - Public water utilities need approval from the Delaware or Susquehanna River Basin Commission for new water withdrawals exceeding 100,000 gallons per day
- **Restrict the use of private groundwater for any primary use**
  - Example: “No principal use on a data center site shall use private groundwater wells or direct withdrawals from surface watercourses as its primary source of water for cooling purposes”
- **Require a letter from the public water utility confirming sufficient capacity**
- **Require closed-loop geothermal cooling systems as a baseline and encourage more efficient systems as they are developed**
  - Examples include Immersion cooling and evaporative cooling are emerging technologies. They should be permitted upon approval by the Township Engineer.
- **Require a drought response plan**
- **Require a wastewater disposal analysis plan**
  - Example: “The applicant shall submit documentation certified by the public authority that the public authority can support the conveyance and treatment needed.”

Decommissioning Requirements

- **With the rapid advancement in technology, it is reasonable to assume many data centers will become obsolete**
- **Require a decommissioning plan**
  - Removal of all structures
  - Plan for the disposal of hazardous materials
  - Plan for site restoration
  - Require financial security agreements to ensure that decommissioning occurs

CONCLUSIONS

Key Takeaways

- **Municipalities cannot prohibit data centers outright, but they can regulate them.**
- **While data centers present broader policy concerns, municipal authority is largely limited to location, design, and performance standards.**
- **Without appropriate regulations, data centers can negatively affect community planning objectives and quality of life.**
- **Tredyffrin Township is unlikely to attract large-scale data center campuses, but it may be susceptible to data center conversions within existing office or industrial buildings.**
- **Well-crafted regulations can reduce pollution, improve aesthetics, and promote more efficient operations, making data centers better neighbors.**
- **Our responsibility is to ensure that any proposed development is planned and designed in a manner that best serves the residents of our community.**