Guidelines for Data Centers

Land Use Policy Committee
October 17, 2023

Carmen Bishop, Zoning Administration Division
Katherine Hermann, Planning Division

Board Matter – May 9, 2023

Directed staff to:

- Research environmental issues and mitigations
- Develop locational guidelines
- Review how data centers should be approved
- Consider if guidelines should be in the Comprehensive Plan and/or Zoning Ordinance

CoreSite, 12098 Sunrise Valley Dr.

Project phases

AWS, 4101 Westfax Dr.

Summer 2023 – Initial research
- Assemble staff team and consultant services
- Background research
- Information gathering meetings (industry and environmental stakeholders)

Fall 2023 – Continue research and outreach
- Continue meeting with stakeholders
- Community input session October 5
- Board Land Use Policy Committee October 17
- PC Land Use Process Review Committee October 19

Late fall/early winter - Deliverables
- Prepare and transmit report to Board before end of year

2024 – Next steps
- Potential presentations on recommendations
- Comprehensive Plan and/or Zoning Ordinance amendments TBD

What is a data center?

Where is "the cloud"??

A data center is purpose-built to house computer servers and network connections

- Optimal cooling and other systems to support servers

- Secure environment

- Built for 99.999% reliability

- Growth spurred by:
  - More people online
  - Business, finance, entertainment, healthcare, education
  - AI, autonomous vehicles, and more!

Stack Infrastructure, Manassas
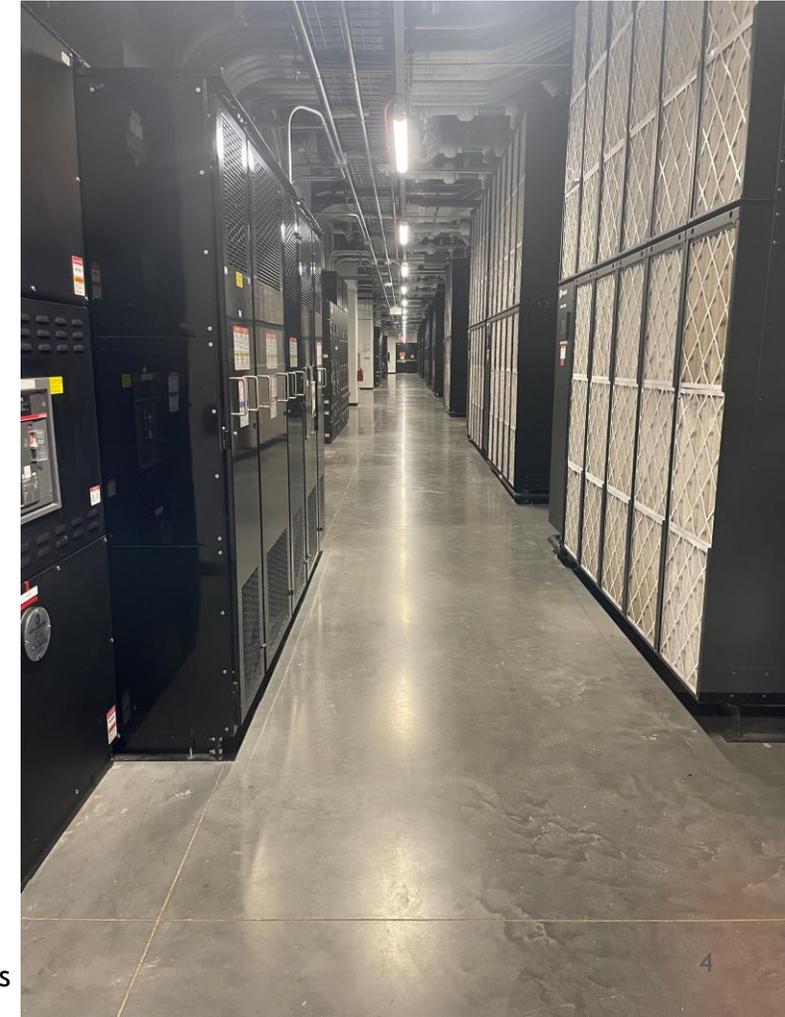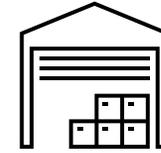
Data centers in Fairfax
Existing, in progress, and proposed

- 12+ existing
- Range in size from about 30,000 sf to 500,000 sf

- 5 in progress (site plan approval)
- Range in size from about 240,000 sf to 2+ million sf

- 1 proposed
- About 400,000 sf

Trends in data center development

- Demand: Projected to double from 2022 to 2030

- Various business models: cloud, co-location, enterprise, edge

- Cloud providers will remain in the lead

- Focus on sustainability

Digital Realty, Ashburn

Existing guidelines – Comprehensive Plan

Land Use Element of the Policy Plan, Appendix 12:
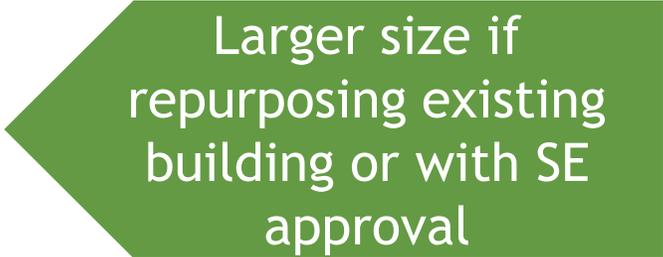
- Performance criteria related to:
    1. Transportation
    2. Noise, light, environment
    3. Building design
    4. Parcel consolidation
    5. Site design

Rendering, SE Plat, CoreSite,
12379A Sunrise Valley Dr.

Existing regulations – Zoning Ordinance

- Defined as an industrial use

- Allowed in industrial, medium and high intensity office districts, and certain planned districts
  - C-3 and C-4 (office) by right up to 40,000 GFA
  - I-2 and I-3 by right up to 80,000 GFA

    Larger size if repurposing existing building or with SE approval

  - I-4, I-5, I-6 allowed by right
  - PRC, PDC, PTC allowed where shown on approved development plan

- Must enclose HVAC and generators (except in I-4, I-5, I-6)

Research topics

- Energy demand

- Water demand

- Water quality

- Air quality

- Noise

- Aesthetics

AWS, 3980 Virginia Mallory Dr.

Energy demand
Energy use depends on type of cooling & IT equipment

- Air-cooled systems use more energy and less water vs. evaporative cooling systems use more water and less energy

- Need access to transmission lines and substations
  - SCC process for review and approval of transmission lines
  - SE (except I-3 – I-6) and 2232 for substations


Air-cooled system, Stack Infrastructure, Manassas 10

Water demand 💧

Water use depends on type of cooling

- Data centers – significant, but not the largest water users in Fairfax
  - Per square foot, data centers use more water than office, but less than retail or hotel

- Fairfax Water projects demands based on growth projections and has indicated they are well-prepared to address water needs

Water quality

- Evaporative cooling discharges to wastewater systems
  - research and monitoring recommended

- Diesel tank storage and handling – mitigate potential spills through design
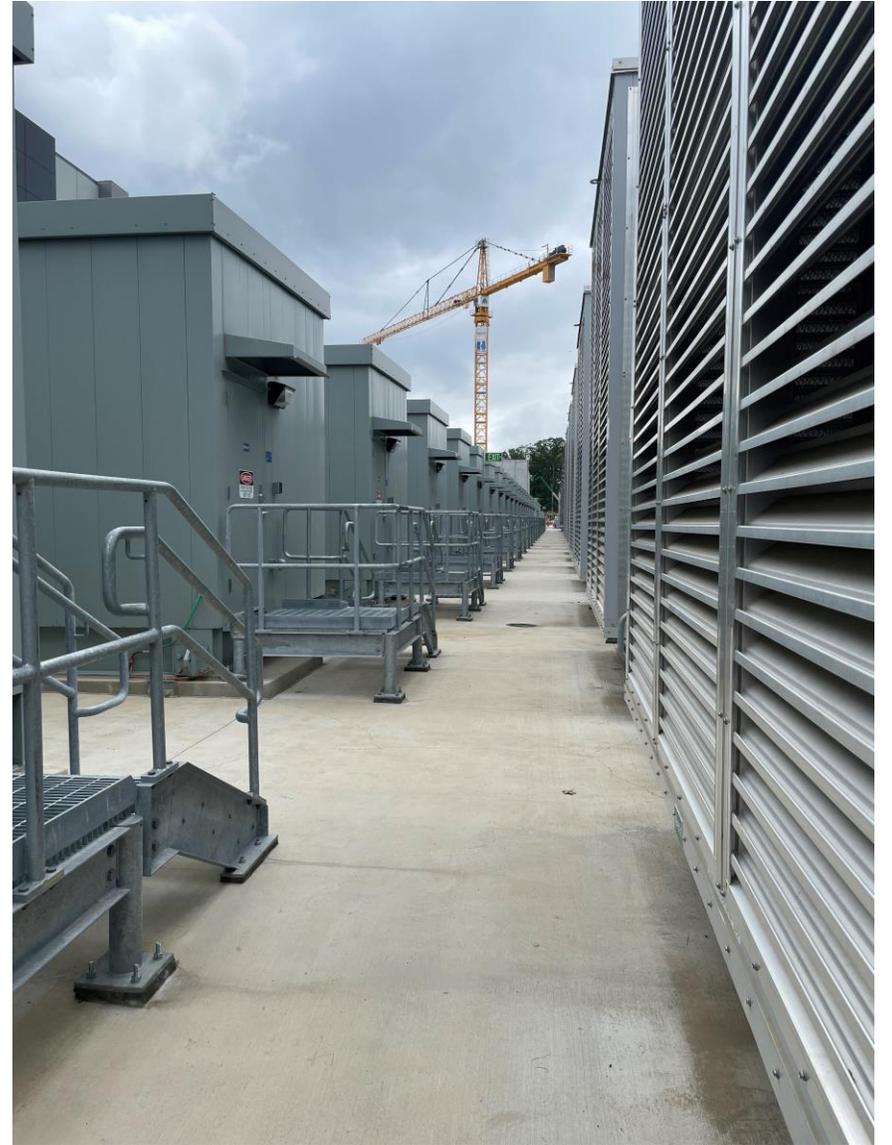
Generators (outside enclosure), Stack Infrastructure, Manassas

Air quality

- Air quality impacts from emergency generators
  - Regulated by DEQ
  - Emission limits and controls
  - Monitoring devices
  - Hours limited during ozone season
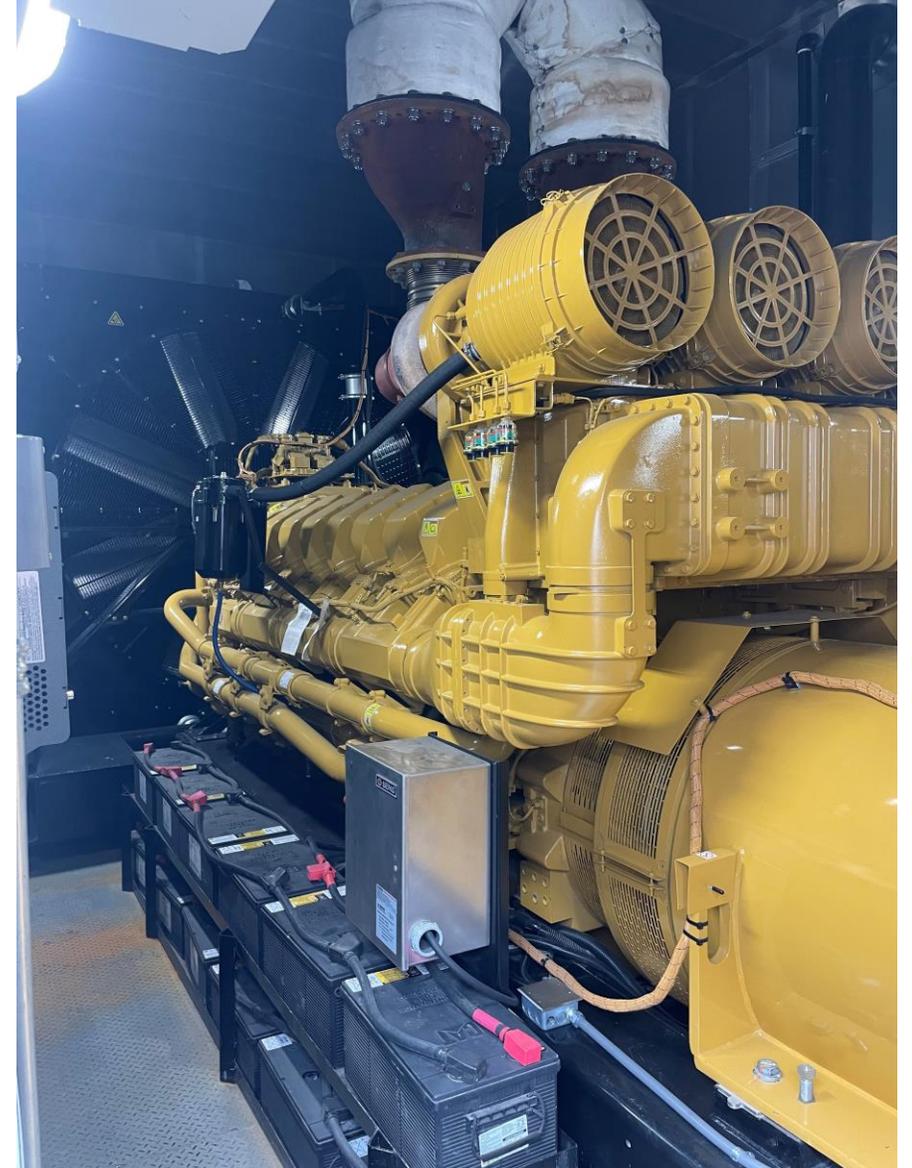
Generators (inside enclosure),
Stack Infrastructure, Manassas

Noise

- Extensive cooling systems and large numbers of backup generators: need for noise mitigation

- Various options: type of equipment, baffling, enclosures, site design, etc.

Aesthetics

Rendering, RZ/FDP Parkstone Tech

3980 Virginia Mallory, by right

Rendering, RZ/SE Loisdale Station

QTS, Ashburn

15

Considerations for guidelines and standards

Zoning Ordinance – Permissions and Use Standards

Permissions/Location

- Consider a maximum size for by right in I-4 – I-6 with SE for larger size **OR** SE for all districts regardless of size

- Consider setbacks, screening, and performance criteria when near residential

Noise

- Expand equipment enclosure requirement to the I-4 – I-6

- Require noise modeling for all data centers by right and RZ/SE and consider lower dBA

- Consider standards for emergency generator usage and testing

Zoning Ordinance – Use Standards, cont'd

Water Quality

- Monitoring and pre-treatment of wastewater discharge in all watersheds

- In UOSA service area: use non-chemical/non-water-based cooling or provide pre-treatment

- Added safety features for diesel handling and spill containment

Aesthetics

- Add standards for façade differentiation, entrance features, etc.

- Require viewshed analyses from nearby residential for RZ/SE

Comprehensive Plan

- Create a new Appendix to the Land Use Element of the Policy Plan for Data Centers

  → Then update the performance criteria from the current Appendix 12

- Consider options to address divergences between current zoning district designations and Plan options for residential and/or mixed use

Questions?

Webpage: https://www.fairfaxcounty.gov/planning-development/data-centers

Email: ffx-data-centers@PublicInput.com