

Data Center Trends in Georgia and Considerations for Local Communities

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Data Centers: Global, National, and Local Topic

Rapid Increase in Development Sites

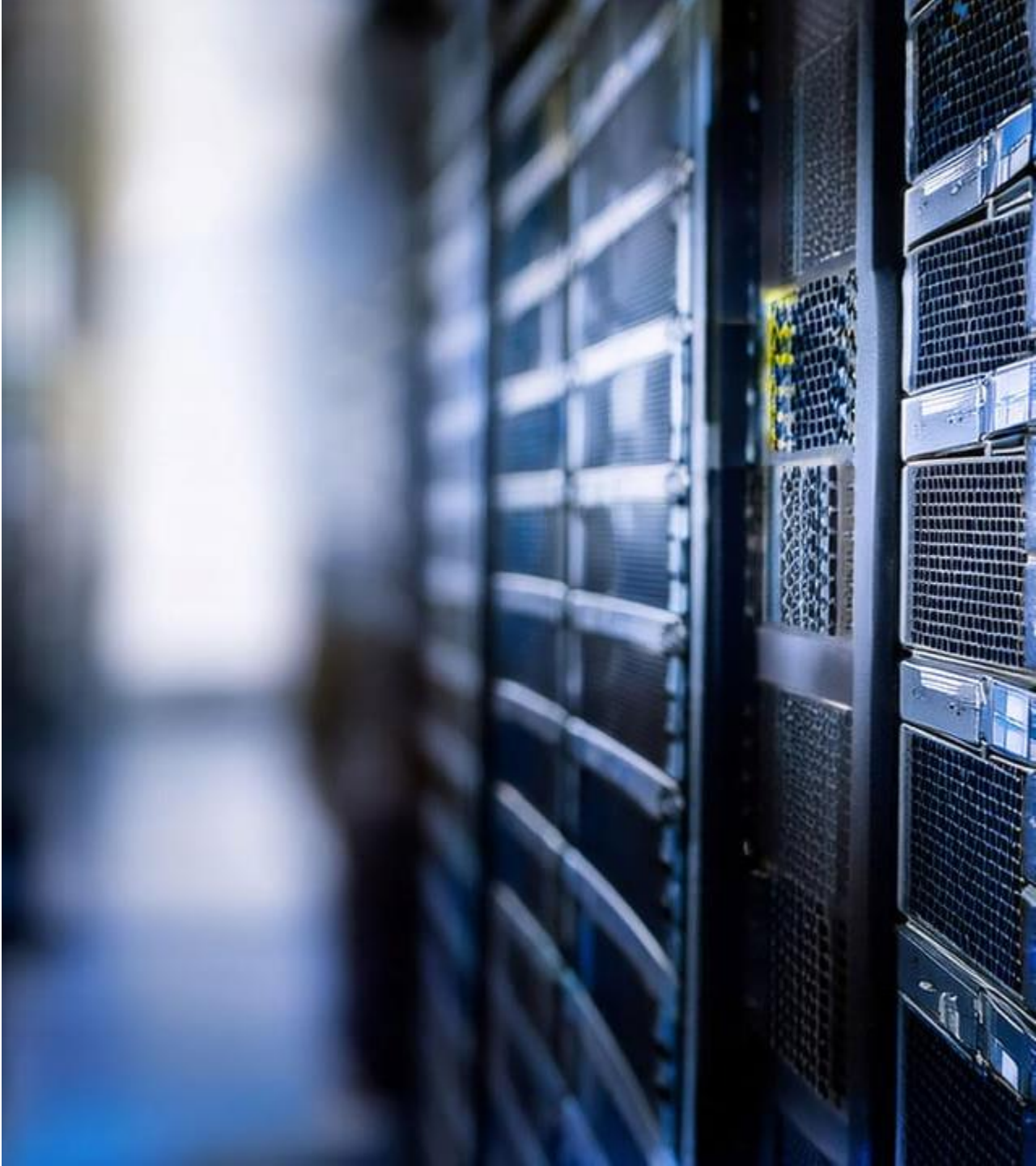
- Impacts on energy and water demands
- Additional pressure on existing infrastructure

Major Concerns about Resource Use

- Possible land, water, & air impacts
- Secondary concerns
 - Noise, appearance, & opportunity cost

New Development Type

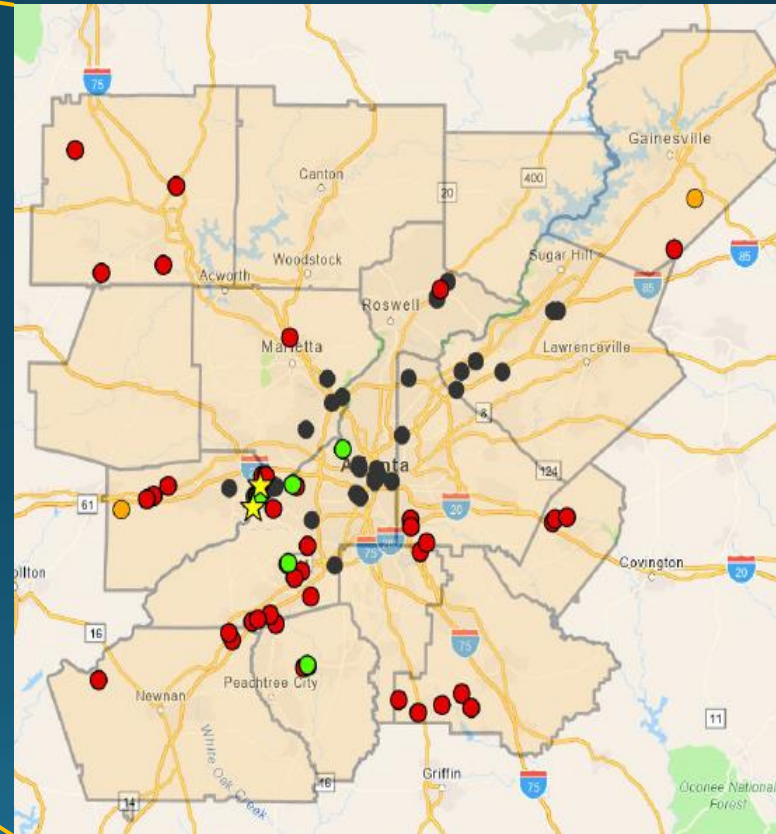
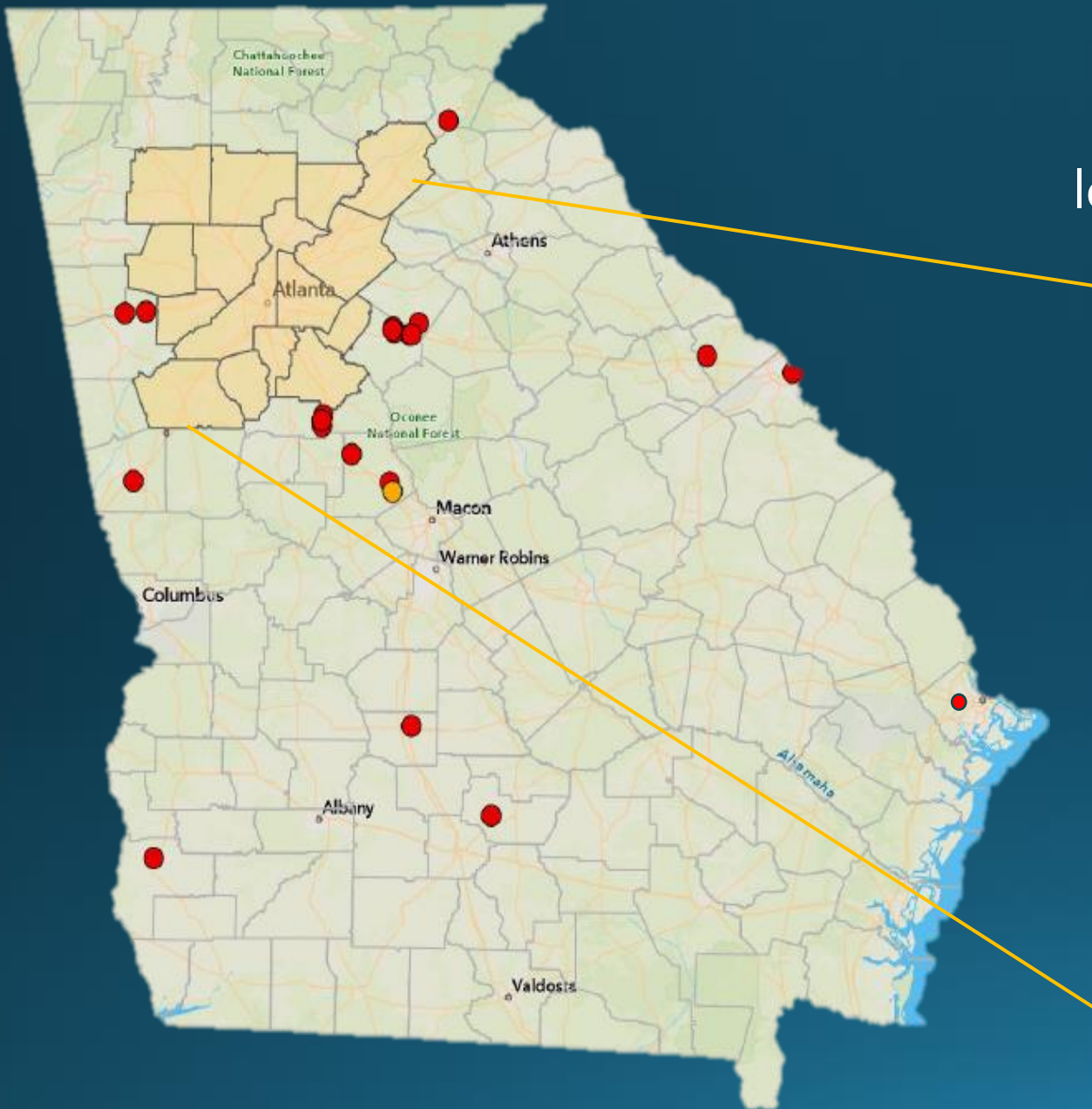
- Often not covered by existing local jurisdiction development recommendations & zoning practices



Data Center Growth in the Region

Location Trends:

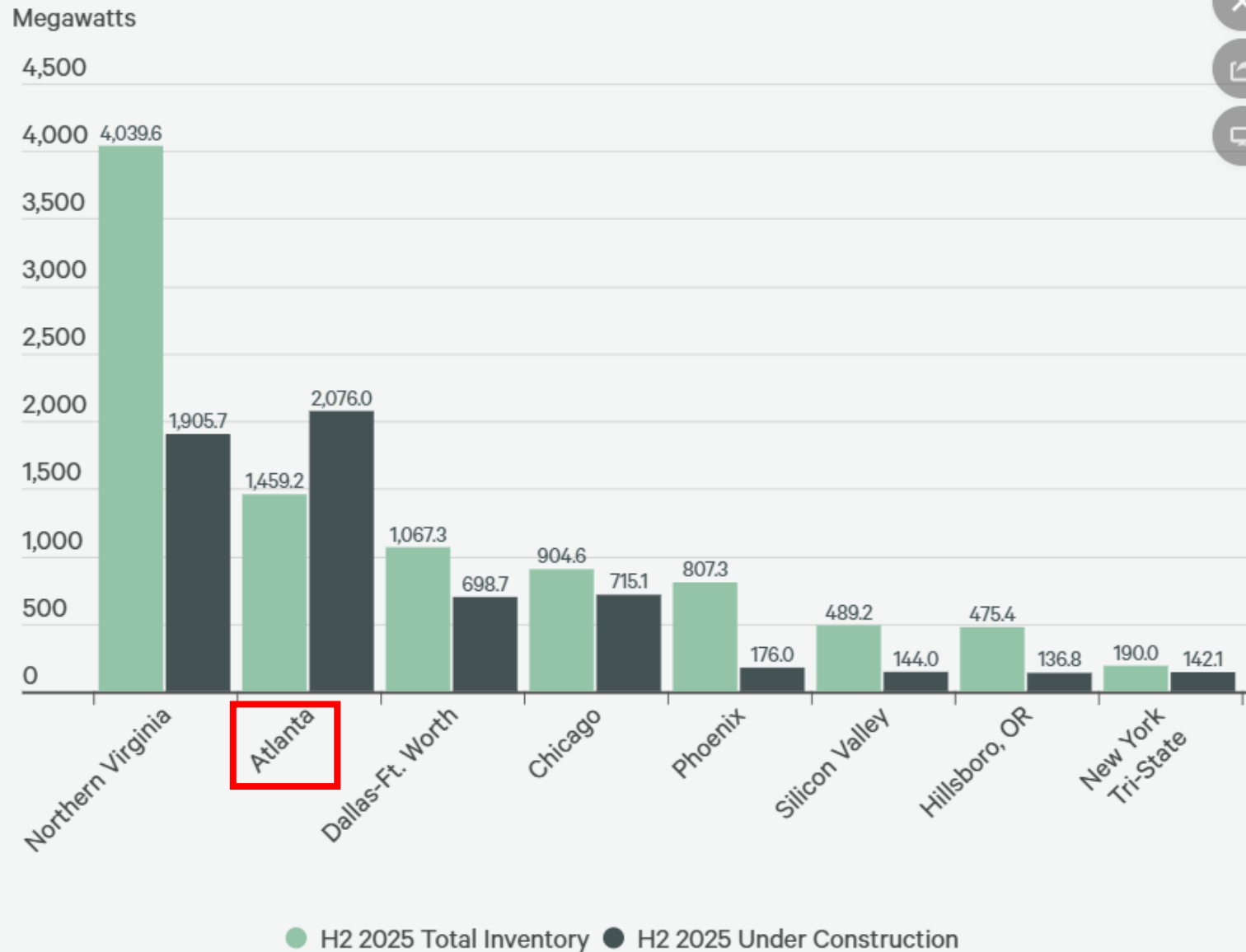
Majority of proposed locations are looking for larger available tracts of land



- Completed
- Proposed
- Existing
- Withdrawn
- ★ Denied

2076 MW

**Metro Atlanta continues
to have the 2nd most
data center
construction capacity in
North America**



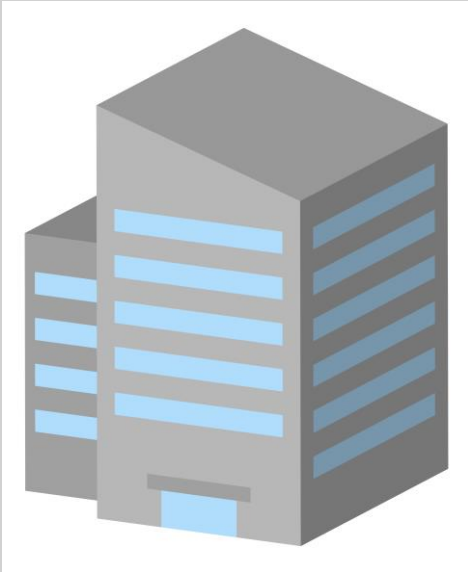
Energy and Data Centers

1 Megawatt (MW) = one million watts of power, and is enough to supply 650 homes

Small data centers today are ~50MW

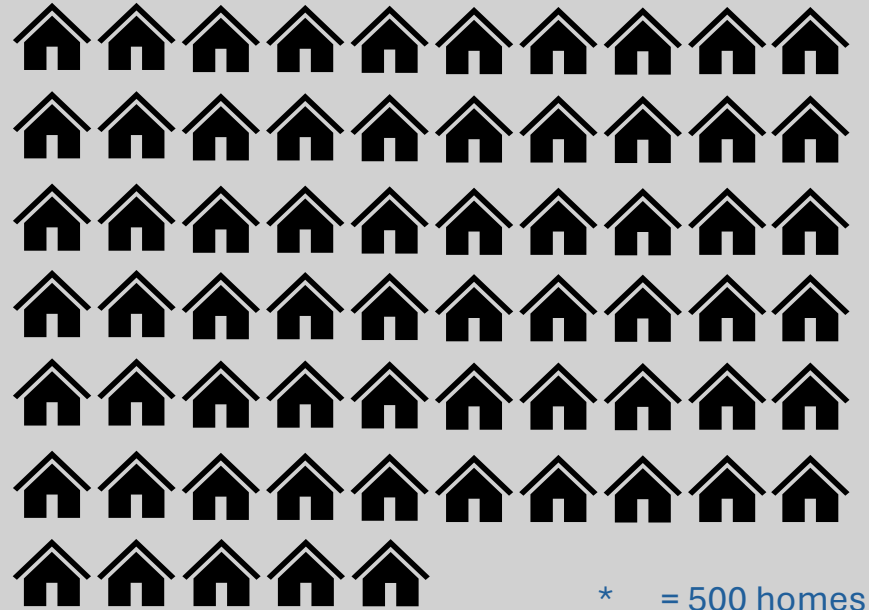
Today data center proposals can be upwards of 1 GW

50 MEGAWATTS CAN POWER EITHER



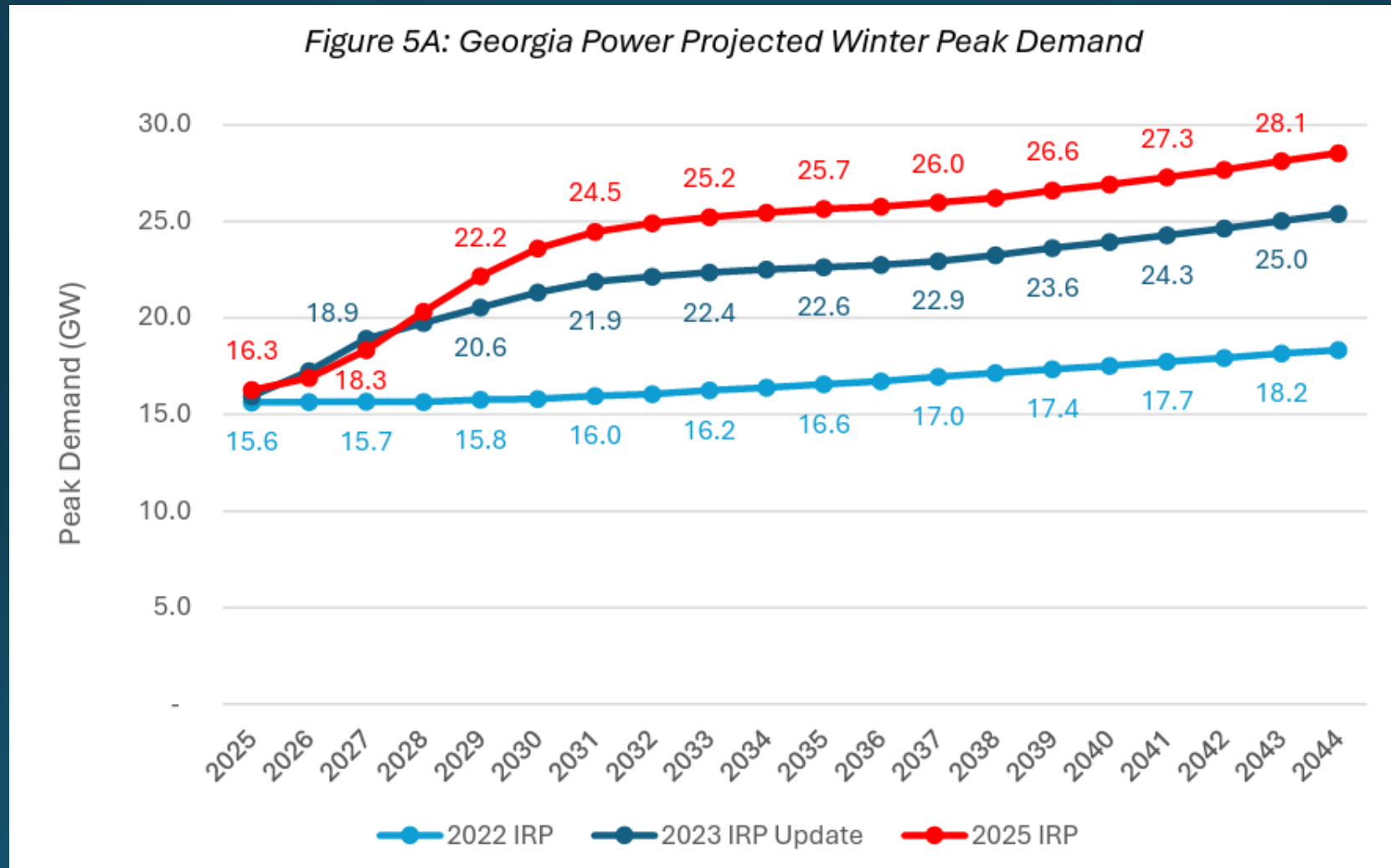
1 Small Data Center

OR



32,500 Homes

Increased forecasted energy demands mostly associated with data centers

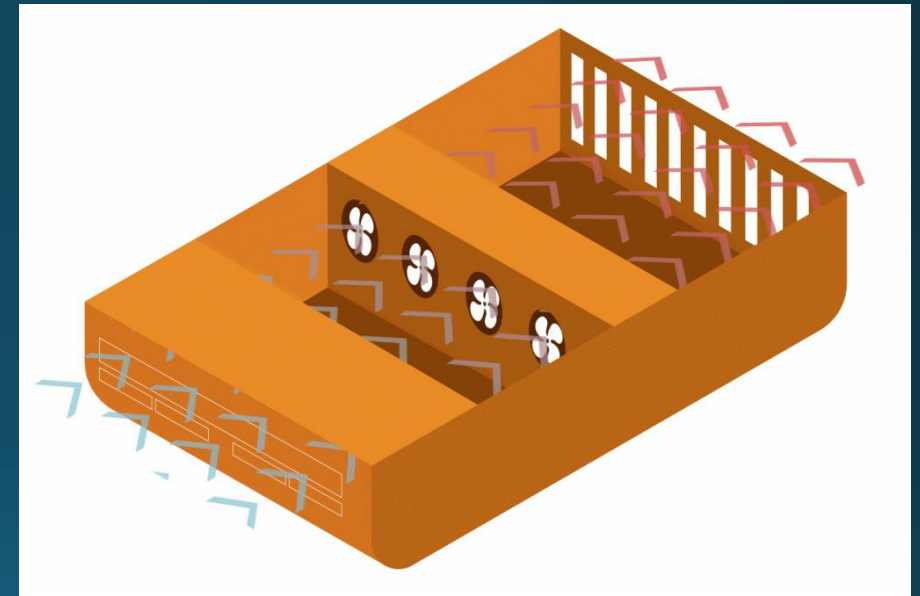


Source: Georgia Power, 2025 IRP

Cooling and Water Use in Data Centers

Cooling Technologies

- **Operational temperature** is imperative to the stability of system performance
- **Heat removal** by the cooling system is one of the most prominent challenges in the maintenance of data centers
- **“Fatal heat”**- damages the performance of components of the data center
- **~30% of the power consumption** goes towards cooling



Types of Data Center Cooling

- Air Cooling
- Liquid Cooling
- Immersion Cooling
- Evaporative Cooling
- Closed-loop Cooling
- Hybrid Cooling
- Free Cooling



Relevant Cooling Methods to Georgia

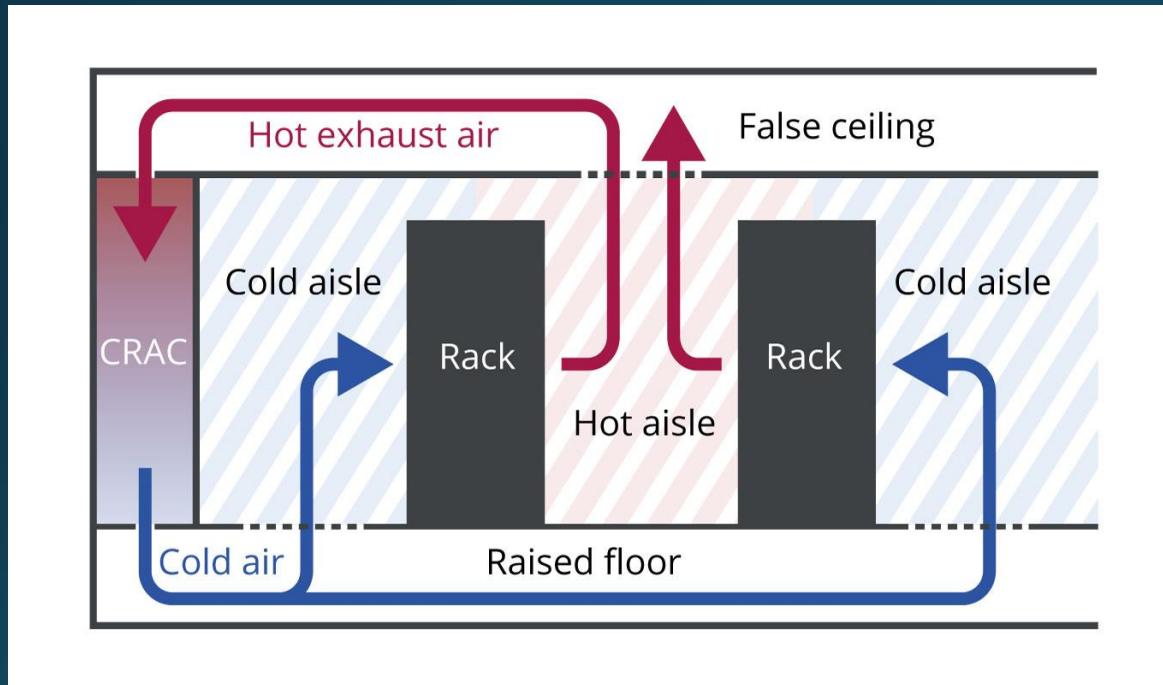
Evaporative water cooling:

Uses natural water evaporation process to remove heat from the air
Water intensive
Can lose up to 80% of water to the atmosphere
Reduces return water flow to rivers and reservoirs

‘Closed-loop’ cooling:

A water-glycol mix continuously circulates in a sealed circuit to absorb heat
Uses significantly less water, but requires more energy
More expensive to install and operate

Air-Cooling System



Air-cooling was once the most widely used; suitable for lower-density computing

In-efficient in larger centers due to low density and heat dissipation capacity in the air

Traditional Evaporative Cooling

Liquid Cooling - Ideal for high-density and high-performance computing

- More efficient heat transfer through cool plates

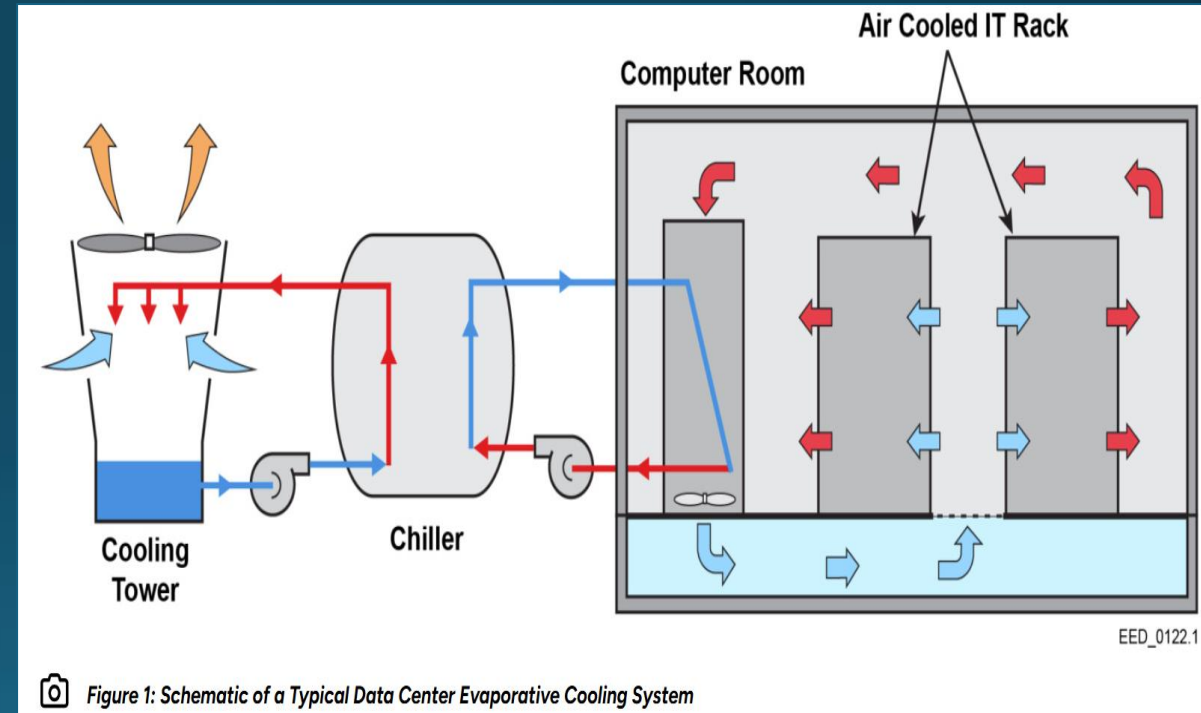
More efficient heat removal

- Allows for closer component packing
- Greater computing capacity within the same footprint

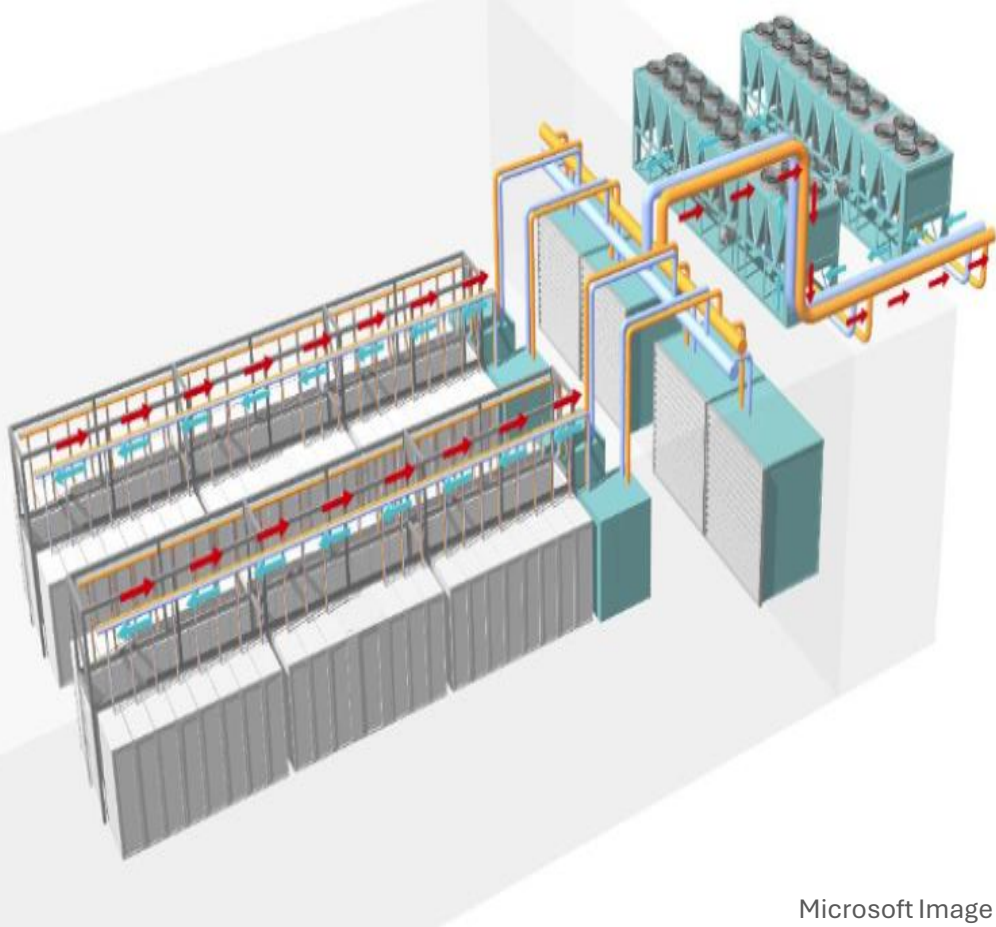
Communities should anticipate evaporative cooling methods in the initial site plan proposal

~80% water is lost due to evaporation

(Google 2024 Environmental Report)



Stewarding our limited resources with Non-Evaporative Cooling technologies



Microsoft Image

Closed-loop cooling recommended over Evaporative
Stewarding our limited resources

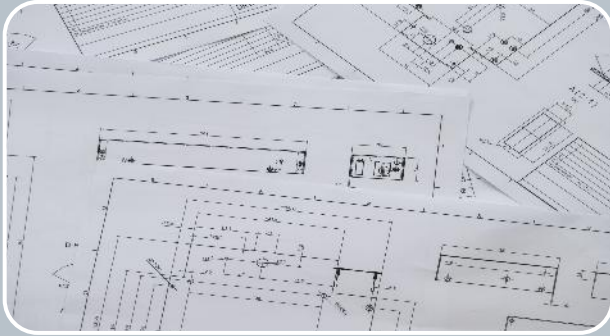
- A water-glycol mix or other refrigerant mixture circulated in a closed loop system
- Minimum amount of water needed to flush/refill system as needed periodically
- Provides resilience to facility during moments of drought and emergency outages
- Reduced impact to regional water supplies

Though it uses less water, the capacity required may still be similar to other commercial/industrial water users in a community.

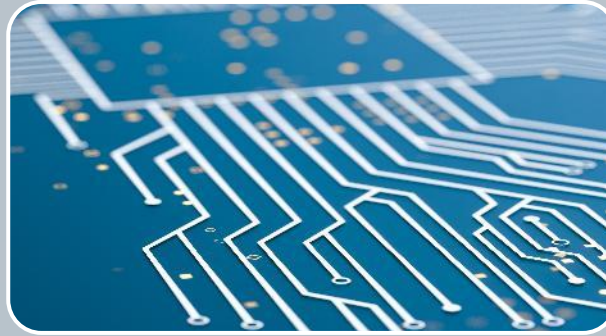
Tradeoffs

- *Larger capital investment*
- *Physical footprint*
- *Higher energy demands*

Cooling Trends in Georgia



Water Demands:
Most development proposals are not asking for millions of MGD, as once initially feared



Non-evaporative cooling:
Developments are shifting to installing Closed-Loop Cooling or similar technologies



Still Possible:
Sites still have the option of full evaporative cooling with a higher water demand

However, trends do not directly indicate this

How much water are data centers requesting?



Depends on

Size	Scale Building or campus?	Type of Facility Data storage vs AI/Processing	Energy Demands	Type of Cooling Air vs Liquid Evaporative vs Closed-Loop
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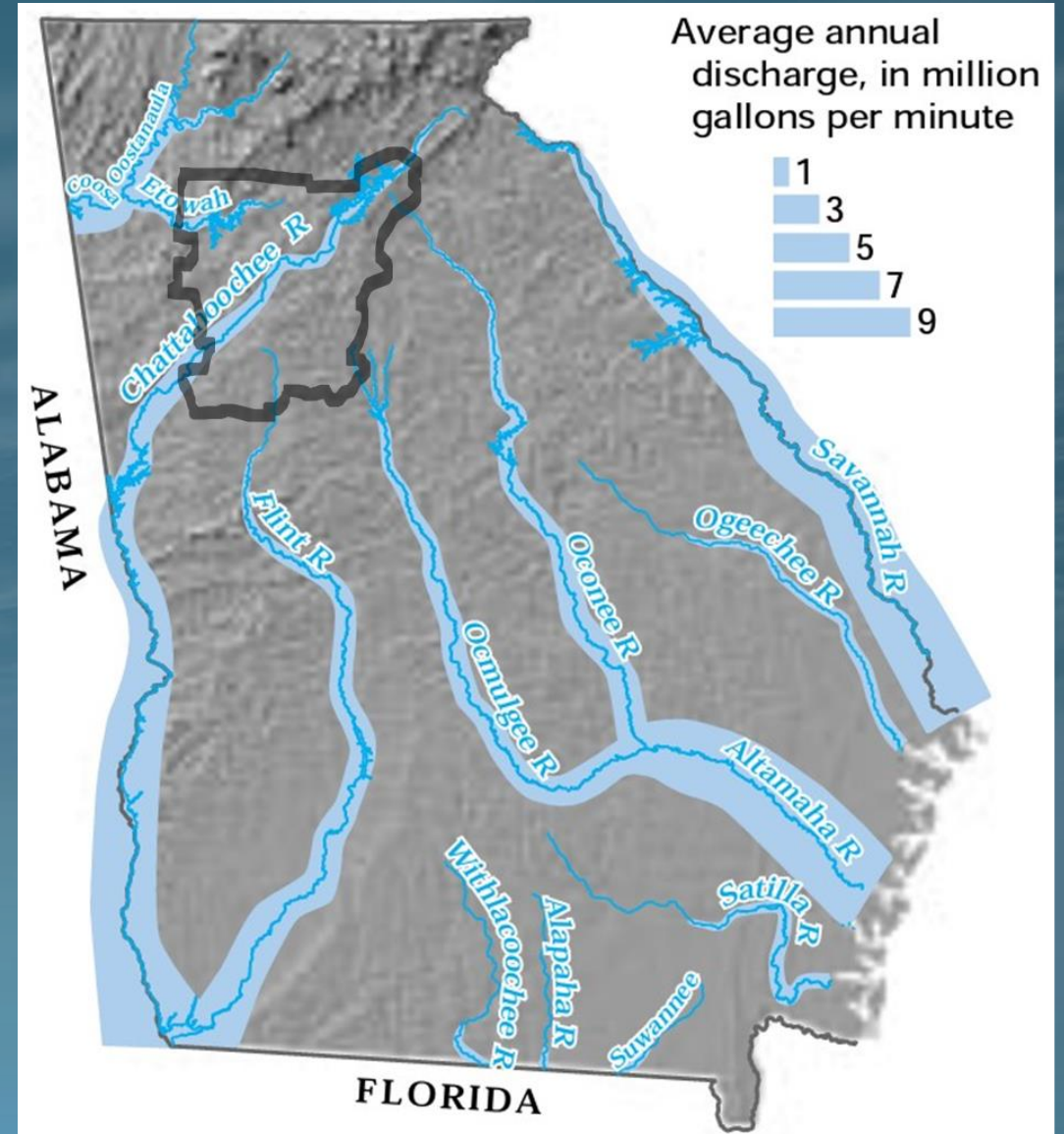
Water demand requests in Metro Atlanta

Evaporative As much as 9 million gallons per day*	Closed-Loop Typical range 5,000 to 50,000 gallons per day
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*Update on site
originally proposing
evaporative cooling

Why Cooling Methods Matter in Metro Atlanta?

- One of the smallest available surface water supplies of any major metro area
- Drought-prone
- Stewarding water resources for metro and downstream users
- Leaders in water conservation – by necessity



Considerations for Local Communities



**Local Economic
Impacts**



Job Creation



**Land Use Present
and Future**



**Additional
Infrastructure
Needs**



**Environmental
Health Impacts**



**Drought
Management**



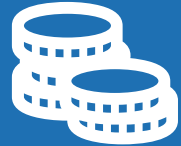
**Emergency
Outages**



Critical Issues

How could a data center benefit your community?

Significant tax revenue growth



- Property taxes
- Business taxes
- Sales taxes

Epicenter for further commercial and economic growth



- Indirect economic boost via income tax revenue and consumer spending
- Fund public services
 - Infrastructure projects and community development

Financial Planning



Direct revenues toward community priorities, such as:

- Education
- Housing funds
- Fire and safety investments
- Community development
- Infrastructure upgrades

Workforce Development



- Data center could provide or support work force training programs for the community
- Create high-paying construction jobs
- Skilled technical roles

Site Readiness



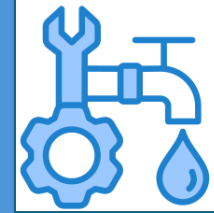
Physical Infrastructure

- What does it look like?
- Does construction/operations of project shift other development plans?
- Re-evaluate Comprehensive Plan
- Setting precedent for future proposals
- Adaptive Infrastructure or “Stranded Asset”?



Environmental & Public Health Impacts

- Stormwater runoff and water quality
- Community awareness, consideration and communication
- Coordination with fire/emergency services



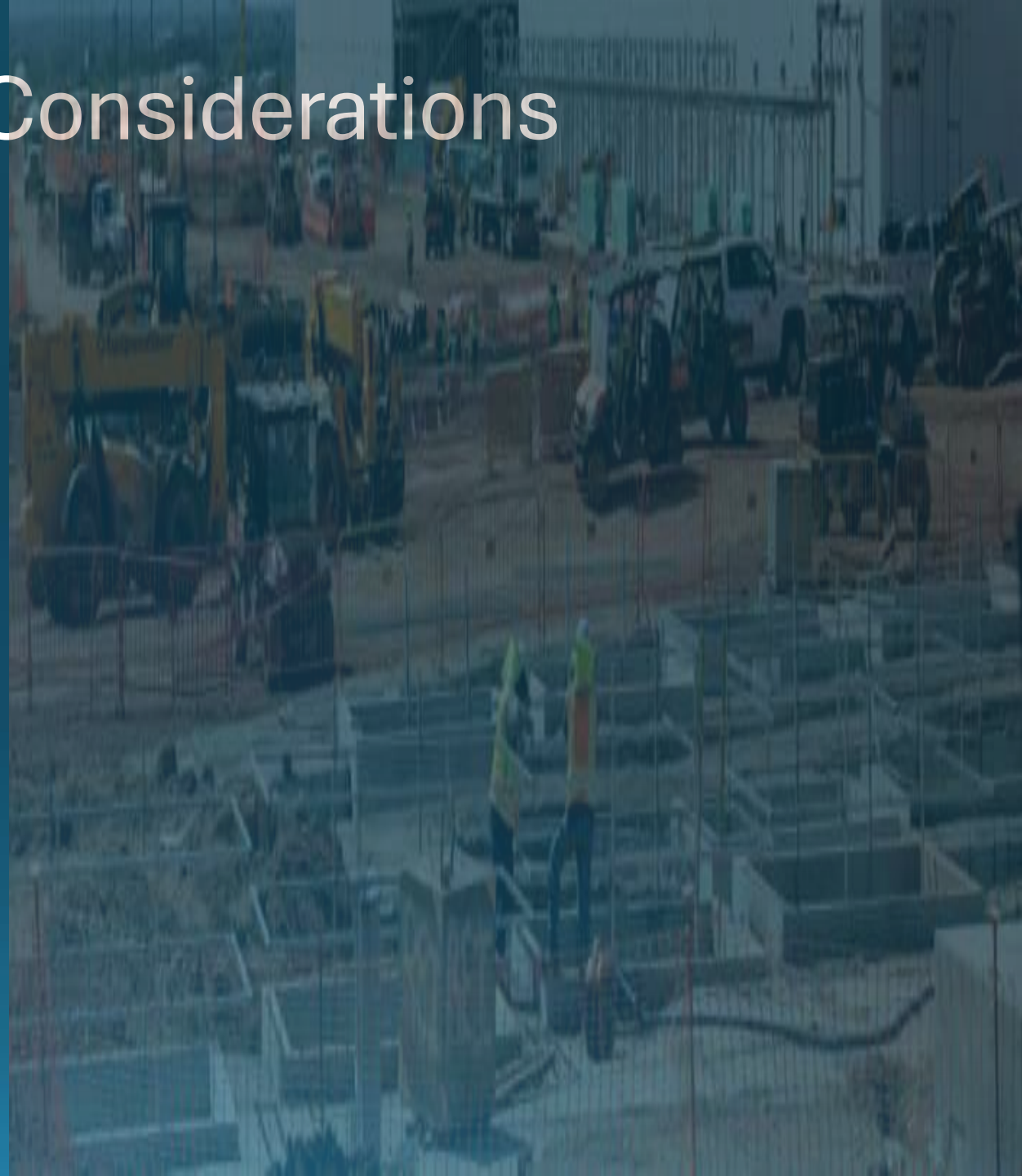
Water Service Considerations

- Immediate demand and future capacity needs
- Additional infrastructure needs
- Coordinate and understand wastewater requirements from developers
- Know developer’s system reliability and expectations early in discussions
- Critical infrastructure

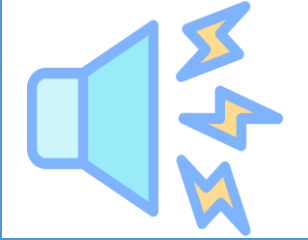
Development Ordinance Considerations

Variables to consider when the site is actively being constructed:

- Building set-backs
- Lighting directed away from adjoining property
- Landscaping - mature versus young planting requirements for buffers
- Noise thresholds and generator testing frequencies
 - Instances of developments moving forward without for noise and air quality impacts
- Specialized fire fighting training/cooperation needs



Addressing Community Concerns



Noise Impacts

Possible sources of concern:

- Generators
 - Testing and running
- Cooling systems
- Site construction
- Energy “hum”
- Sub-level decibels impacting wildlife and communities



Land Development

Possible sources of concern:

- Tree removal
- Stormwater runoff
- Traffic
- Property values



Community Awareness & Communication

Important to engage with community:

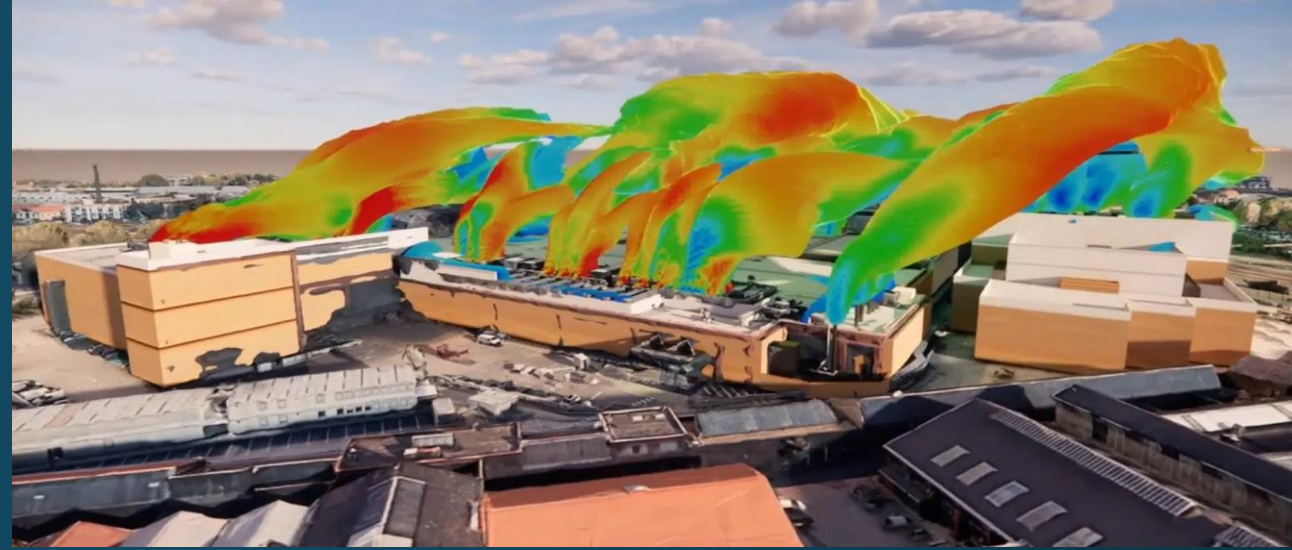
- Daily-life impacts
- Public outreach sessions
- Study/Mitigation efforts
- Zoning code amendments

Air Quality

- Possible degradation during construction and in operations
 - Construction dust
 - Diesel generators (back up energy supply)
- Exposure to fine particulate matter, even at a low level, can pose substantial health risks and threaten local wildlife and minimize plant growth and yield – F. Dominici, professor of biostatistics. Harvard's School of Public health

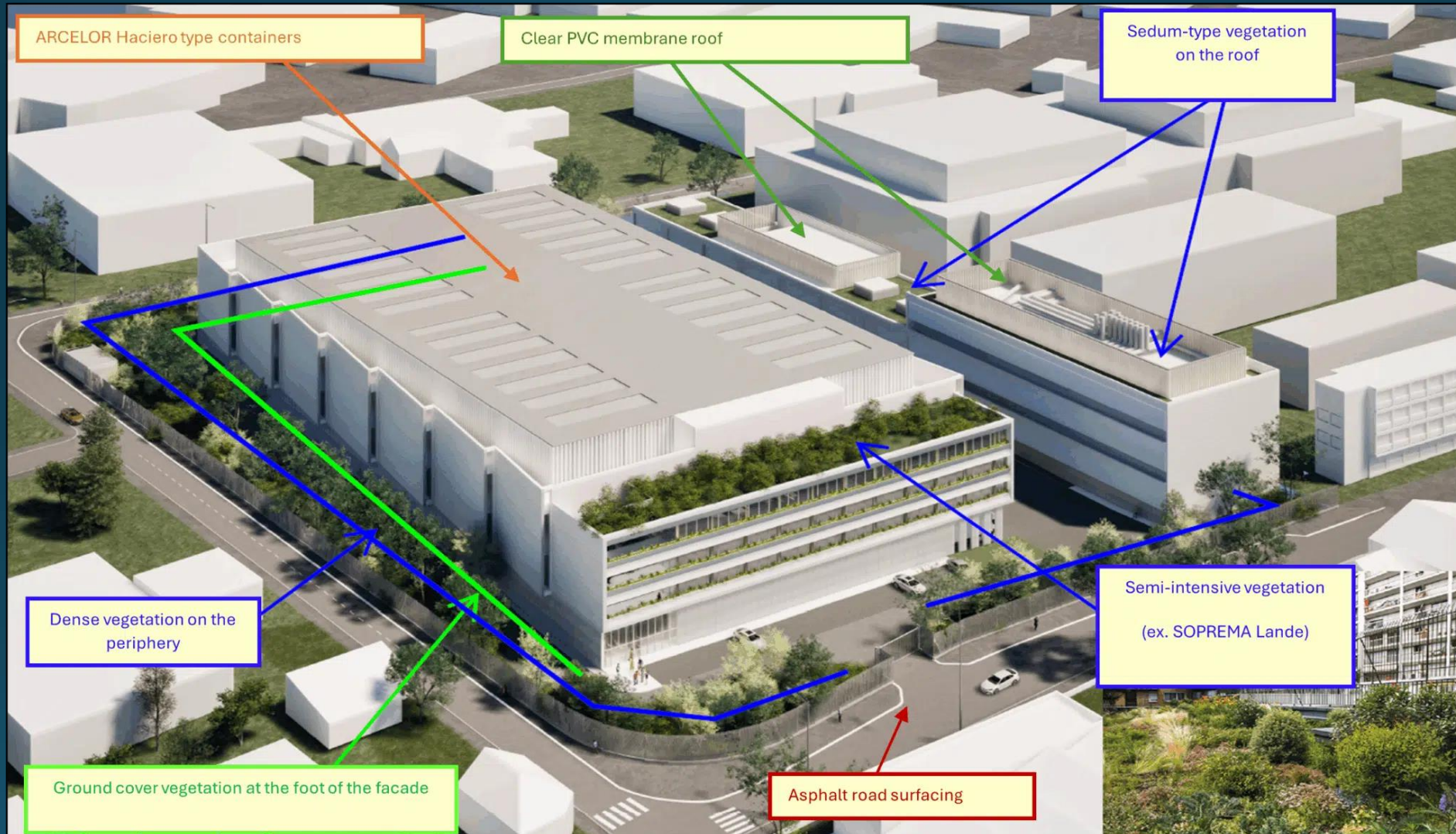


Heat Island Effect



- Emerging international research comparing AI Hyperscalers to older data centers
- On-site heat release via energy-intensive processes
 - Increasing computation demands
 - Powering cooling systems
- Increase of 3.6 F
 - Extreme cases up to 16.4 F
- Heat impacts being felt upwards of 6 miles from site
- Dense urban environment acts as a **heat trap**, limiting dispersion and favoring recirculation on neighboring facades and air intakes

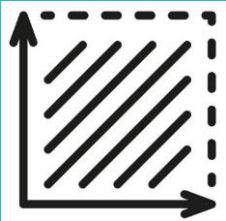
Site Design can reduce Effects



Solar and Green Roof Installation?

On-site solar unlikely to meet full power demands but can provide benefits

1 MW of power = 5 acres of solar panels



100 MW of power = 540 acres of solar panels

Roof designs with solar or green roofs not preferable for most sites

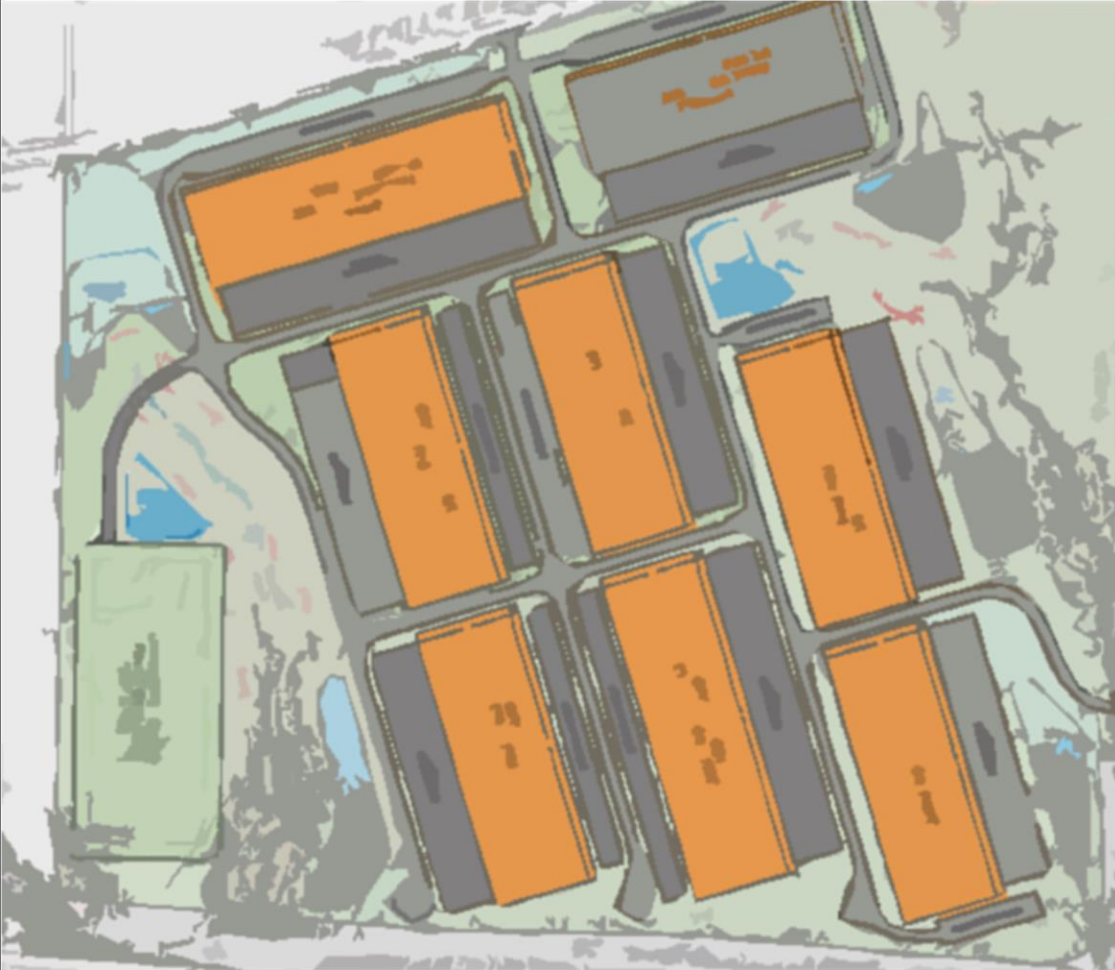
Associated risk concerns:

Could cause damage to expensive technology investment at the facility

Potential to disrupt operations

Green roofs require additional water during dry periods

Zoning



Re-zoning

- Many development proposals are requesting re-zoning of proposed site
- Agriculture or Light-industrial

Considerations

- Need to be prepared for refining land use
- Protecting your communities down the road

Typical Infrastructure Layout

On-site
Water
Storage

Backup
Generators

Electrical
Substation

Cooling
System

Douglas County
Google Data Center



An aerial photograph of a suburban neighborhood. On the left, there are several houses with dark roofs and some trees. A road curves through the middle of the image. To the right of the road, there is a large, open, grassy field. Further to the right, there are more houses and a parking lot with several cars. The overall scene is a typical suburban development.

Community Benefit Agreements

Helps to address public concerns

- Identifies key community concerns
- Provide greater benefits to communities impacted by data center construction and operations

Several key features

- Transparency
- Community investments
- Sustainability for communities

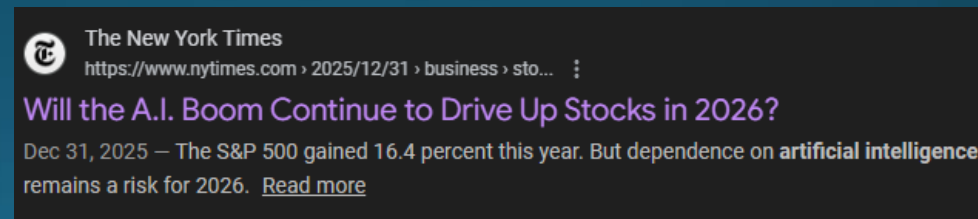
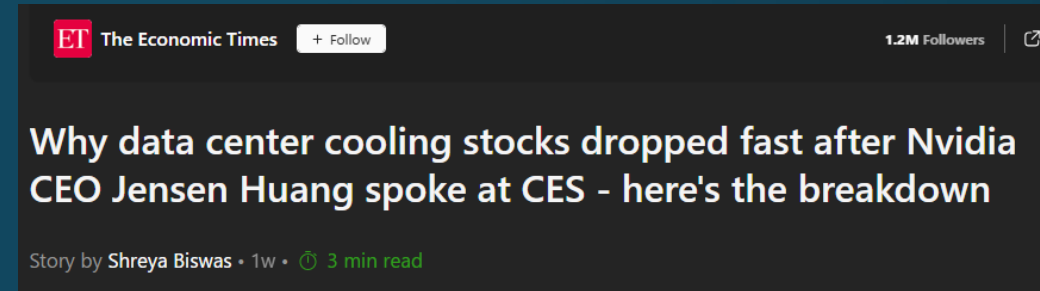
Industry Trends

Uncertainty of industry trends

- Chip development
- Increase/decrease of stocks

Rapid technology advancements

- Likely increases in efficiency and technological capabilities



Typical Comment Provided by ARC during DRI Process

The water resources of the metro Atlanta region are critically important to the region's economic vitality and quality of life.

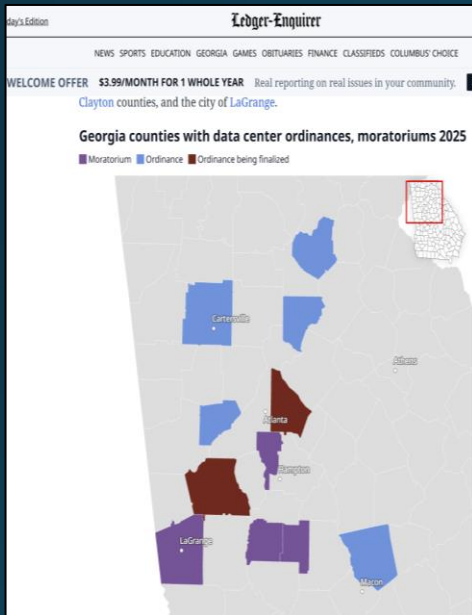
The region lies in the headwaters of six major river basins, where natural surface water sources are small relative to other major metropolitan areas and in need of a high level of protection.

The firm yield of water supply sources available to individual jurisdictions also varies, and some jurisdictions have larger available supplies than others.

ARC recommends a careful examination by the *Water Provider* of its capacity to meet peak-day demands for this project, in addition to other current and projected future peak-day demands.

ARC also recommends that the *Water Provider* require the installation of advanced “waterless” cooling technologies or “near waterless” technology to reduce the burden on the drinking water supplies and increase the resiliency for both the project and the potable water system.

Known Current Local Government Efforts Across Georgia



Findings of the 90-day moratorium

- Data Center Moratorium adopted on March 18, 2025
 - Includes new applications for zoning action for Data Centers and Accessory Uses, including those that were under review but had not been advertised
- Moratorium will expire on June 18, 2025
- Staff is to return a report on its Findings during this time period
- A variety of sources were consulted in compiling this research, including the Atlanta Regional Commission, GA DCA online DRI Submissions, and numerous articles in the Atlanta Journal-Constitution. All original source material is preserved and available for review.

Current Moratoriums

- City of Roswell
- DeKalb County
- Pike County
- Lamar County
- Troup County
- LaGrange
- Crawford County
- Monroe County
- Rockdale County
- Paulding County

Ordinances Under Development

- DeKalb County
- Henry County

Ordinances Passed

- Coweta County
- Lumpkin County
- Bartow County
- Forsyth County
- Douglas County
- Jones County

Zoning Rules Adopted

- City of Atlanta
- Forsyth County
- City of South Fulton

The background is a dark blue gradient with various white and yellow line-art icons. These include a sun, clouds, a hand holding a pencil, a calculator, a pen, a tree, a gear, a line graph, a bar chart, a pie chart, and a pencil. The text is centered and reads:

“The promise of revenue expansion and diversification will require **strategic planning** to **ensure community needs are addressed** in concert with achieving **long-term economic prosperity** for the County.”

-Prince William County 2023 Data Center Industry Tax Revenue Report

The Big Picture



Developers

Engage with water providers early in project planning discussions.



Water Providers

Consider impacts and establish parameters for water use



Local Leaders

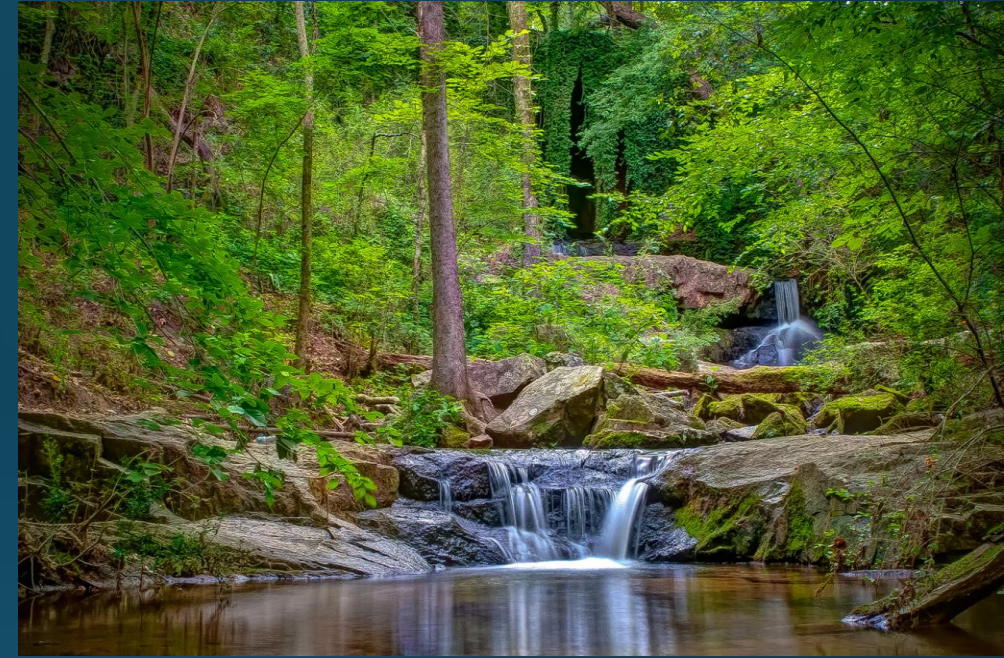
Support policies for balanced, resilient growth.



**Trade-offs and Informed
Decision Making Discussion
for balanced and resilient growth**

The resilience of our region—both today and tomorrow—**depends on all of us.**

Scan the QR Code
to visit the MNGWPD website
for additional resources



For Technical Assistance & additional information contact

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Metropolitan North Georgia Water Planning District