CITY OF CHARLOTTE

RESPONSIBLE DATA CENTER SITING, ENERGY, WATER, COMMUNITY PROTECTION, AND STATE-LAW COMPLIANCE ORDINANCE

(Full Updated Version - August 15, 2026)

SECTION 1. PURPOSE AND FINDINGS

The Charlotte City Council finds that:

Large-scale data centers impose extraordinary demands on the electric grid, water systems, and surrounding neighborhoods.

These facilities can increase electricity rates, strain water supplies, elevate noise pollution, and accelerate diesel emissions from backup generators.

Communities closest to industrial development — disproportionately Black, Brown, working-class, and historically under-resourced neighborhoods — bear the greatest burden when regulations are weak.

Cities across the United States have adopted stronger protections than temporary moratoriums, including mandatory renewable energy requirements, water use permitting, zoning buffers, and public approval for incentives.

Charlotte has a responsibility to ensure that any data center development aligns with public health, environmental justice, climate goals, and community well-being.

Charlotte intends to exercise its zoning authority responsibly, transparently, and in full compliance with state law.

Therefore, the City of Charlotte enacts the following ordinance to establish the strongest local protections in North Carolina.

AND FURTHER FINDS THAT data centers present unique impacts — including continuous low-frequency noise, large-scale water withdrawal, diesel emissions, substation and transmission expansion, heavy-haul transportation requirements, extensive land conversion, stormwater and impervious surface impacts, waste heat, and cumulative infrastructure burden — that require specialized, enforceable development standards rather than reliance on general industrial regulations.

THE CITY ALSO FINDS THAT best practices from more experienced jurisdictions (including Loudoun County, Virginia) support strong setbacks, buffering, ambient noise studies, disclosure of full campus buildout, and cumulative-impact review prior to approval.

SECTION 2. DEFINITIONS

“Data Center” means any building, structure, or portion of a building or structure exceeding 10,000 square feet of gross floor area that is designed, constructed, or operated primarily to house, operate, or maintain computer servers, networking equipment, data storage systems, or related electronic infrastructure, and that has, or is designed to have, a continuous electrical power demand of one megawatt (1 MW) or more.

"**Edge Data Center**" or "**Modular Data Center**" means a data center that is designed and deployed at or near the point of data consumption to support low-latency applications, typically with a total power capacity of less than ten megawatts (10 MW) at full buildout. These facilities may consist of prefabricated, modular, containerized, or skid-mounted units and are commonly used for 5G networks, content delivery networks, Internet of Things (IoT), artificial intelligence inference, or telecommunications infrastructure.

"**Enterprise Data Center**" means a data center that is owned and operated by a single organization primarily to support its own internal computing, data storage, networking, and business operations, rather than to provide services to third-party customers.

"**Colocation Data Center**" means a data center in which floor space, power, cooling, and connectivity infrastructure are leased or licensed to multiple unrelated customers, each of whom installs, owns, and manages their own servers and information technology equipment within the facility.

"**Hyperscale Data Center**" means a data center designed and operated at massive scale, typically with a power capacity of fifty megawatts (50 MW) or greater at full buildout, characterized by highly standardized building designs, large contiguous floor plates, extensive redundancy, and primary use by a single hyperscale cloud provider, technology company, or artificial intelligence operator to deliver cloud computing, large-scale data processing, or global digital services.

"Onsite Renewable Energy" means solar, geothermal, battery storage, or other non-fossil energy systems located on the parcel.

"Water Intensive Cooling System" means any cooling method requiring more than 1 million gallons per month.

"Environmental Justice Community" means any census tract identified by the City as historically overburdened by pollution or underinvestment.

"Downzoning" means a zoning map or text amendment that reduces allowable land use intensity, density, or development rights, conducted in accordance with Chapter 160D.

"High Impact Data Center" means any data center with a peak monthly electricity demand of 50 MW or more, or any facility meeting the definition under G.S. 160D-974 (≥100 MW).

"Sensitive Receptor" means any existing dwelling, school, church, cemetery or burial ground, historic resource, public park, or community facility.

"Low-Frequency Noise" means noise below 250 Hz, including tonal, pure-tone, or narrow-band noise associated with cooling equipment, HVAC systems, transformers, and generators.

SECTION 3. CREATION OF DATA CENTER ZONING DISTRICTS

3.1 Establishment of "Data Center Districts"

No data center may be constructed or expanded except within the newly created Data Center zoning districts.

3.2 Minimum Standards

All data centers shall meet the following minimum standards:

- Minimum parcel size: 20 acres.
- 1,000-foot setback from residential, parks, and school property lines.
- Maximum noise level: 65 dB at property line, measured continuously.
- Backup generator testing limited to 9:00 AM–5:00 PM weekdays only.
- Diesel generators should not be used for grid support.
- Diesel generators and diesel equipment used for grading and construction purposes must meet or exceed EPA Tier 4 cleaner-emission standards and/or renewable diesel alternatives.
- Generators required to be located within sound-limiting enclosures.

All data centers must comply with the specialized noise, setback, buffering, and generator standards in Section 3.3 and Section 8, which supersede any general industrial noise standard.

3.3 Specialized Noise, Setback, and Buffering Requirements

A. Ambient Noise Studies Required

- Pre-construction ambient noise study measuring A-weighted and C-weighted levels at all property lines adjoining residentially used property and sensitive receptors.
- Post-construction compliance study required before issuance of a Certificate of Occupancy.

B. Nighttime and Daytime Noise Limits

- **Daytime limit:** 50 dBA (8:00 AM–8:00 PM).
- **Nighttime limit:** 40 dBA (8:00 PM–8:00 AM).
- No audible pure-tone, tonal, narrow-band, or low-frequency noise above ambient levels at any sensitive receptor.

C. Setbacks

- Minimum 1,000-foot setback between any principal data center structure, cooling facility, generator facility, battery storage facility, substation, or fuel storage facility and any sensitive receptor.
- Setbacks apply to all future phases of campus buildout.

D. Buffers and Tree Canopy

- 100-foot vegetative buffer around the entire site perimeter.
- Evergreen screening required where visibility or noise exposure remains.
- Existing tree canopy must be preserved to the maximum extent practicable.

E. Generator Restrictions

- Routine testing limited to weekday daytime hours only.
- Emergency generators may not be used for economic dispatch or grid-support purposes.
- All generator facilities must include acoustic treatment and comply with state air quality standards.

F. Lighting

- Requirement of exterior lighting to use full cutoff fixtures, minimize skyglow, prevent light trespass, and be shielded from adjoining properties.

SECTION 4. ENERGY REQUIREMENTS

4.1 Energy Efficiency

Applicants shall demonstrate that the proposed facility incorporates commercially available energy-efficient design features and operational practices to minimize peak electrical demand, improve energy efficiency, and reduce impacts on the regional electric grid.

4.2 Onsite Renewable Energy Mandate

We encourage data centers to power their operations using 100% onsite renewable energy, but at a minimum, 20% of a data center's power demand must be powered by onsite renewable energy sources.

4.3 Carbon and Grid Impact Certification

Prior to approval, the applicant must obtain from Duke Energy:

- A Grid Impact Statement certifying that the project will not increase residential electricity rates.
- A Carbon Impact Assessment demonstrating alignment with Charlotte's Strategic Energy Action Plan+.

4.4 Prohibition on Fossil-Fuel-Only Designs

No data center may rely solely on diesel or natural gas for backup power.

4.5 State Law Aligned Energy Review

Charlotte will not impose energy policy requirements that conflict with state authority or utility regulation. Energy-related conditions will be tied directly to the state-required site assessment under G.S. 160D-974 and the City's adopted plans.

Applicants must disclose maximum electrical demand over the full life of the project, including all future phases, and identify required substation and transmission upgrades.

SECTION 5. WATER USE AND COOLING REGULATION

5.1 Water Use Permit Required

Any data center using more than 1 million gallons per month must obtain a City Water Use Permit, renewed annually.

5.2 Water Caps and Reporting

- Annual water use cap established by Charlotte Water.
- Monthly public reporting of water consumption.
- Mandatory disclosure of cooling technology and discharge impacts.

5.3 Prohibition on Water-Intensive Cooling in Drought Conditions

During Stage 1 drought or higher, water-intensive cooling systems must cease operations or switch to air-based cooling.

5.4 Alignment with G.S. 160D-974 Cooling Requirements

High Impact Data Centers must employ closed-loop cooling systems to minimize water consumption. Cooling system impacts will be evaluated through the state-required site assessment.

5.5 Cooling Technology Evaluation

Applicants shall evaluate the energy and water implications of proposed cooling technologies and demonstrate that the selected design minimizes combined energy consumption, water use, and environmental impacts to the maximum extent practicable.

Applicants must provide a Hydrologic Impact Analysis including withdrawal, discharge, wastewater capacity, and cumulative watershed effects. Cumulative watershed effects shall be determined using the latest model developed by the Catawba-Wateree Water Management Group and include secondary water use from energy production.

SECTION 6. ENVIRONMENTAL AND COMMUNITY IMPACT REVIEW

6.1 Full Environmental Impact Statement (EIS)

All proposed data centers must complete an Environmental Assessment (EA), or, where required based on project scale, potential impacts, or applicable federal, state, or local requirements, an Environmental Impact Statement (EIS) covering:

1. Air quality and diesel emissions
2. Operational heat impact and localized microclimate effects assessment
3. Noise impacts
4. Water consumption and wastewater discharge plan
5. Grid reliability and infrastructure demand
6. Climate impacts, resilience, and GHG emissions evaluation
7. Natural resources and habitat assessment;
8. Cumulative impacts on environmental justice communities.

The EIS must also address low-frequency noise, vibration, stormwater runoff, traffic impacts, decommissioning, e-waste, and full campus buildout.

1. Pre-Construction Air Quality Baseline Requirement

No data center permit shall be approved without first establishing a rigorous, hyper-local air quality baseline. Developers must fund and deploy a fence-line and neighborhood air-monitoring network for at least twelve (12) consecutive months prior to commencement of any site disturbance or construction activity. This baseline shall be used to measure, attribute, and mitigate any future increases in pollution.

2. Construction-Phase Air Quality Monitoring and Mitigation

During all construction activities — including excavation and site grading, all diesel equipment must meet EPA Tier 4 standards. Furthermore, during operation of diesel-powered equipment — real-time, continuous monitoring for PM2.5 and PM10 shall be maintained at the property boundary. If particulate matter exceeds health-protective thresholds, construction operations must pause immediately and implement dust-suppression and emission-mitigation protocols until levels return to safe limits.

3. Operational-Phase Air Quality Accountability and Generator Emissions Monitoring

During operation, permanent, community-accessible PM2.5 monitors shall be maintained around the facility and within neighboring residential areas. All emissions data — including during generator testing, maintenance, and emergency operation — must be streamed to a public-facing dashboard in real time to ensure full transparency and protection against cumulative long-term exposure.

4. Operational Phase Non-Emergency Use of Generators

During operation, generators are operated only for true, unforeseen emergencies or required maintenance/testing, not for momentary grid disturbances, bridging power, demand response, planned outages, or primary power.

6.2 Public Comment Requirement

A minimum 60-day public comment period and at least two community meetings must be held before approval.

6.3 State-Law-Consistent Environmental Review

Charlotte will use the G.S. 160D-974 site assessment as the foundation for environmental review.

6.4 Prohibition on Fossil-Fuel-Fired Generation

Data centers shall not rely on fossil-fuel-fired generation as a primary or routine source of electrical power. Permanent on-site combustion facilities intended for continuous, scheduled, or peak-shaving electrical generation shall be prohibited unless specifically authorized through a public hearing and a finding by City Council that no feasible alternative exists and that the proposed facility will not adversely affect public health, air quality, or adopted climate goals.

6.5 Natural Resources and Habitat Assessment

Building upon the site assessment required by G.S. 160D-974, applicants shall prepare a Natural Resources and Habitat Assessment to demonstrate how site design preserves mature tree canopy, minimizes habitat fragmentation, and protects environmentally sensitive areas to the maximum extent practicable.

6.6 Health Impact Assessment

For High Impact Data Centers, applicants shall prepare a Health Impact Assessment evaluating potential public health effects associated with the associated environmental exposures.

6.7 Transportation and Equipment Routing Plan

Applicants shall prepare a Transportation and Equipment Routing Plan identifying proposed routes for oversized construction materials and equipment, including transformers, generators, cooling equipment, and other large components.

6.8 Alternatives Analysis and Cumulative Impacts

Applicants shall perform an Alternatives Analysis to demonstrate that reasonable alternatives to the proposed site layout were considered to minimize impacts to nearby neighborhoods, environmentally sensitive resources, and public infrastructure. Applicants shall also evaluate the cumulative impacts of

existing and planned data centers on electrical infrastructure, water resources, transportation systems, and surrounding communities, including reasonably foreseeable future phases of development.

6.9 Electronic Waste Management Plan

Applicants shall submit an Electronic Waste Management Plan describing procedures for the replacement, recycling, reuse, and disposal of electronic components in accordance with applicable federal and state requirements.

6.10 Decommissioning and Site Restoration Plan

Prior to approval, applicants shall submit a Decommissioning and Site Restoration Plan describing the removal of equipment, generators, batteries, substations, cooling systems, hazardous materials, and electronic waste, together with procedures for site restoration and reuse following the cessation of operations.

Because the potential environmental, infrastructure, and community impacts of data centers increase substantially with facility size and electrical demand, the City establishes a tiered review process that applies increasingly rigorous evaluation requirements to larger developments. A graduated framework allows regulatory oversight to remain proportional to project impacts while avoiding unnecessary requirements for smaller facilities.

Table 1. Proposed Tiered Review Framework for Data Centers

Tier	Threshold	Required Review
Tier 1: Standard Data Center	<20 MW peak demand or <100,000 sq. ft.	Standard City permitting and development review; compliance with applicable zoning, stormwater, landscaping, tree preservation, and building code requirements; e-waste management plan.
Tier 2: Large Data Center	20–50 MW or 100,000–500,000 sq. ft.	Enhanced Environmental Review; Transportation and Oversized Equipment Routing Plan; Noise Study; Water Use Assessment; Utility Infrastructure Assessment; Electronic Waste Management Plan; Community Engagement Meetings.
Tier 3: High Impact Data Center	50–100 MW or 500,000–1,000,000 sq. ft.	All Tier 2 requirements plus Health Impact Assessment; Natural Resources and Habitat Assessment; Cumulative Infrastructure Assessment; Climate Resilience Assessment; Construction Management Plan; Expanded Public Engagement (minimum two public meetings).
Tier 4: Regional Hyperscale Campus	>100 MW or >1,000,000 sq. ft. (or phased campus exceeding 100 MW at full buildout)	All Tier 3 requirements plus comprehensive Environmental Impact Statement (EIS); Independent Third-Party Technical Peer Review funded by the applicant; Fiscal Impact Analysis; Alternatives Analysis; City Council approval following a public hearing; Community Benefits Agreement; Annual post-construction monitoring and reporting.

Environmental findings may inform zoning decisions, including downzoning, but only when consistent with Chapter 160D and the Comprehensive Plan.

SECTION 7. COMMUNITY BENEFITS AND ACCOUNTABILITY

7.1 Community Benefits Agreement (CBA)

Developers must negotiate a binding Community Benefits Agreement with affected neighborhoods, including:

1. Local hiring commitments
2. Community investment funds
3. Air and noise monitoring
4. Emergency response plans

CBAs must include funding for independent noise and air monitoring, including low-frequency noise, and must provide annual public reporting.

7.2 Incentive Transparency and Public Approval

No tax incentive, land subsidy, or infrastructure support may be granted unless:

1. The full incentive package is published publicly for 30 days, and
2. Approved by a two-thirds vote of the City Council.

7.3 State Law Respectful Community Protections

CBAs will not be used as a substitute for zoning authority or as a mechanism to indirectly downzone property. All community benefit requirements will be tied to the state-required site assessment and the City's adopted plans.

SECTION 8. ENFORCEMENT AND PENALTIES

Violations of this ordinance may result in:

1. Suspension of operations
2. Revocation of permits
3. Fines up to $10,000 per day
4. Required corrective action plans

Charlotte may consider zoning amendments, including downzoning, only when consistent with Chapter 160D, the Comprehensive Plan, and the state-required site assessment.

Failure to meet noise, setback, buffering, generator, or air quality monitoring standards shall constitute a major violation subject to immediate enforcement, including work stoppages, fines, and suspension of operations.

All air quality monitoring data required under this ordinance shall be maintained, audited, and made publicly available for the life of the facility.

Data centers must submit annual reports detailing air quality performance, particulate levels, generator testing emissions, and any mitigation actions taken.

SECTION 9. RELATIONSHIP TO STATE LAW AND DOWNZONING

This ordinance is intended to complement and implement G.S. 160D-974 and shall be construed to preserve Charlotte's zoning authority while avoiding conflict with the NC General Assembly.

Charlotte will not adopt any blanket ban on data centers or any automatic downzoning triggers.

All zoning decisions will be made case-by-case, based on the Comprehensive Plan and the state-required site assessment.

Charlotte will coordinate with the NC Utilities Commission, DEQ, and the UNC Collaboratory to ensure alignment with statewide policy direction.

Nothing in this ordinance shall be construed to limit the City's authority to adopt stronger development standards for data centers when necessary to protect public health, safety, and welfare.

SECTION 10. EFFECTIVE DATE

This ordinance shall take effect immediately upon adoption.