RESEARCH ARTICLE

Proximity and Policy: The Spatial Attractiveness of Data Centers Across Five U.S. Markets

Gionni Carr, Tennessee State University, Nashville, Tennessee, United States, https://orcid.org/0009-0001-2150-5775.

ABSTRACT: The rapid expansion of data centers across the United States has intensified concerns about where these facilities are built, their environmental impacts, and who bears the resulting costs. This study examines what spatial characteristics make a host site attractive for development, using a two-dimensional framework of proximity and policy. The analysis draws on a purposive sample of five markets: California, Arizona, Texas, Tennessee, and Virginia. Each was selected for hosting large numbers of data centers or for rapid growth in the data center market. The study employs a document-based comparative design, treating a characteristic as common when documented in at least three of the five markets. Findings indicate that proximity determinants are decisive preconditions for development: reliable, inexpensive power, transmission-ready land, and network connectivity, reinforced by agglomeration. Water operates as a conditional factor, binding only in arid markets. Policy determinants such as tax incentives and utility ratemaking are common but non-essential, as evidenced by California's prominence without a dedicated incentive. Interpreted through the spatial echo, the analysis posits that the characteristics that attract data centers become the channels through which costs reach the host community: rising utility rates attributed in the literature to rate design, water strain in arid regions, and incentives that erode the tax base. Synthesizing a fragmented and fast-moving evidence base, the study lays the groundwork for future research on the environmental and human impacts of data centers. Proximity determines where the burden is created, and policy determines who is left to carry it.

KEYWORDS: critical geography, data centers, spatial echo, proximity, policy

Proximity and Policy: The Spatial Attractiveness of Data Centers Across Five U.S. Markets

The siting of a data center is rarely accidental. A site's appeal to developers results from a deliberate alignment of spatial factors rather than chance. Physical proximity to critical resources is the first spatial attractiveness feature for data centers. For a data center, proximity involves closeness to critical resources for effective operation, including (a) reliable and inexpensive power; (b) large parcels of transmission-ready land; (c) pre-existing network infrastructure; and (d) adequate water for cooling (Daim et al., 2013; Siddik et al., 2021; Joint Legislative Audit and Review Commission [JLARC], 2024; Nain, 2024; Cushman & Wakefield, 2025; Vabson et al., 2026). Site location attractiveness also depends on proximity to the population

served, as shorter distances to end users reduce latency and improve reliability (Nain, 2024; Vabson et al., 2026). While proximity is a primary driver of data center attractiveness, policy is a secondary factor that can further increase that attractiveness. In site selection, policy factors into this evaluation, as data center companies consider tax incentives, energy rate structures, and water governance to determine the long-term value of a location.

Together, proximity and policy frame the study's central question. Proximity governs the initial attraction between a data center and a site, while policy shapes whether that attractiveness endures. Data centers are critical to the seamless functioning of daily digital activities, from social media engagement and streaming services to e-commerce and cloud computing (Guidi et al., 2024). As digital technology consumption rises, data centers have become essential infrastructure for numerous industries—including healthcare, banking, government, and education—which increasingly rely on data transmissions, cloud servers, and digital storage capacity (Siddik et al., 2021; JLARC, 2024; Cushman & Wakefield, 2025). According to JLARC (2024), data centers are specialized facilities that manage, process, and share large amounts of data. They enable the digital services people rely on daily, including websites, mobile applications, and cloud-based platforms such as email and media streaming (JLARC, 2024).

Data centers function to store, process, and transmit massive amounts of data, housing anywhere from thousands to millions of computing cores (Guidi et al., 2024). Siddik et al. (2021) describe data centers as specialized industrial facilities mediating the flow of almost all modern-day digital activities, including data processing, storage, and distribution. The demand for data center expansion has prompted many U.S. states to offer economic incentives to attract data center companies to their jurisdictions (JLARC, 2024; Cushman & Wakefield, 2025; MultiState, 2025). While data centers serve as the throughline for many digital interactions that the average person engages with daily, their residence doesn't come without economic and environmental costs. As noted by Guidi et al., (2024), "the exponential rise of artificial intelligence (AI) and the widespread adoption of generative AI models have profoundly impacted the need for data centers, significantly increasing demand in terms of number and size (p. 1)." According to the Datacenter map (https://www.datacentermap.com/usa/), the U.S. has 4,319 data centers, with the top five states having the highest numbers of data centers: Virginia (609), Texas (464), California (287), Illinois (228), and Georgia (219). Data centers in Virginia facilitate approximately 70% of global internet traffic and serve as the global leader in data center hosting (MultiState, 2025).

Data Center Classification

The complex nature of data centers prevents them from being classified by size alone. Additional variables describe data centers, such as power draw, facility business model, and server and CPU counts. For this initial research, we will draw on the size and facility business model to categorize data centers. Enterprise data centers are usually located on- site at the company they serve, owned, operated, and designed by a single company to meet its technology needs (JLARC, 2024). Colocation data centers are spaces leased to multiple tenants who are responsible for maintaining their own computer equipment, while the owner of the entire facility is responsible for providing cooling technologies, power, and security for all tenants (JLARC, 2024). Hyperscale data centers are built for large technology companies, housed in massive warehouse facilities, and require significant power and operational capacity to run (Guidi et al., 2024; JLARC, 2024; Shehabi et al., 2024).

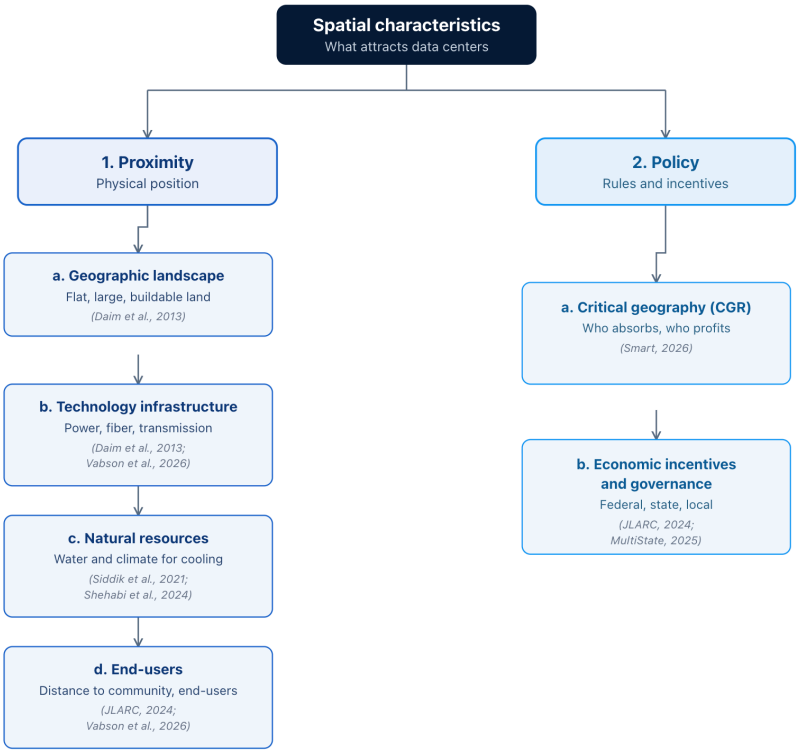
Defining the Term Spatial

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

Spatial features play a major role in determining data center construction. However, for the purposes of this study, the term “spatial” extends beyond a strictly geographical interpretation to encompass a multidimensional framework. For the purposes of this research, the term “spatial” includes not only the physical location of a site but also factors such as (a) technology infrastructure; (b) community infrastructure; (c) political infrastructure; and (d) proximity to natural resources, electrical resources, and consumers. This broader definition aligns with relevant theoretical frameworks that treat spatial characteristics as a composite of interconnected physical, social, and political variables, thereby framing the evaluation of site attractiveness in the context of data center development. Data center companies and tenants require specific accommodations for their spaces. As noted by GBC Engineering (2025), selecting optimal data center locations should include (a) Power Availability and Cost; (b) Network Connectivity; (c) Environmental and Regulatory Considerations (https://gbc-engineers.com/news/data-center-design-criteria). These accommodations include large, affordable parcels of land, access to an electrical grid, access to water-rich resources, and favorable state/local economic incentives.

Cushman and Wakefield (2025) also note the strain data centers bring to the host location, stating that “Power constraints remain a critical challenge, with utility availability playing a key role in site selection for hyperscalers and large colocation projects (p. 2). Several markets have begun adjusting their economic development strategies to specifically offer the spatial characteristics needed to entice large-scale data center projects. These elements include economic incentives, streamlined approval processes, and industry-friendly regulations to encourage data center companies to build within their ecosystems (Cushman & Wakefield, 2025). Spatial characteristics describe the varying features of a specific location that make it attractive to data center companies, and this study organizes them into two dimensions: proximity and policy. Each dimension is further divided into subcategories that structure the analysis that follows. See Figure 1 below for a visual representation of how the researcher initially categorized these two dimensions and their subcomponents.

Figure 1: *Spatial Characteristics Model: Factors Influencing Data Center Site Attractiveness*



Note. This figure reflects the researcher's initial visualization of the spatial characteristics that shape data center site attractiveness. Drawing from multiple researchers, the model groups these characteristics into two broad categories—proximity and policy. The figure is intended as a conceptual synthesis of the literature rather than as a direct reproduction of any single source.

Spatial Characteristics Model: Factors Influencing Data Center Site Attractiveness.

Proximity

For the purposes of this research, proximity is defined as the physical distance between a data center and the critical resources that directly affect its operational effectiveness and the quality of service delivered to end users. These essential resources include network infrastructure, water for cooling, and a reliable power supply (Nain, 2024; Vabson et al., 2026). A central focus is also placed on the spatial relationship between data centers and the population they serve, since physical distance from end-users is a primary determinant of connection latency—the time required for data to travel between the facility and users (JLARC, 2024, p. 4; Nain, 2024; Vabson et al., 2026). Elevated latency can degrade performance, making low latency critical for functions such as financial transactions and high-quality media streaming (JLARC, 2024, p. 4). For this reason, data centers often cluster near population, business, and government hubs, optimizing their location to maintain low latency for customers (JLARC, 2024, p. 4; Shehabi et al., 2024, p. 36). Additionally, as Nain (2024) emphasizes, proximity to Internet Exchange Points further enhances data centers' performance by enabling low-latency connections and multiply redundant

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

bandwidth: “When data centers are in close geographic proximity to these Internet Exchanges, organizations utilizing their services benefit from low- latency connections and multiply redundant bandwidth” (p. 7). By refining the focus to these concrete spatial relationships, this study underscores proximity as a decisive factor in both data center siting decisions and user experience.

Geographic Landscape

Data centers can, in some instances, deliver meaningful economic benefits to distressed communities, but attracting them is not simple (JLARC, 2024). Most modern data center campuses require 230kV transmission lines, large flat parcels of land in close proximity to those transmission lines, and ready access to roads, water, and sewer infrastructure (JLARC, 2024). The site selection process moves quickly once a data center company has identified a viable location; they’re expecting the land and surrounding infrastructure to be move-in ready when the company arrives to begin construction (JLARC, 2024).

Technology Infrastructure

When considering locations for data center expansion, Xiao et al. (2025) used a cluster of Midwestern states (Texas, Montana, Nebraska, and South Dakota) to juxtapose geographical differences for data center attractiveness. Texas was described as having abundant renewable energy resources and a low-stress water resource zone, which lowers water-saving costs while reducing public concern. In contrast, Montana, Nebraska, and South Dakota were described as “currently host minimal data-center capacity, indicating that most of their existing internet infrastructure may support only residential or standard industrial applications. This raises potential connectivity and security concerns for high-performance AI services (Xiao et al., 2025, p. 1548).” Equipping these Midwestern states with the infrastructure standards required for AI data center development will require significant upgrades to broadband and security infrastructure. Those upgrades entail real financial and environmental costs and complicate the process of attracting data centers (Xiao et al., 2025). Making host sites attractive requires deliberate planning, cross-sector coordination, and a clear commitment to aligning technological growth with long-term environmental responsibility. Expanding AI data centers within this Midwestern cluster of states requires responsible consideration of public health concerns of the host community and an intentional emphasis on environmental responsibility, requiring additional considerations by data center companies (Xiao et al., 2025). Natural Resources: The interconnectedness of data centers, natural resources consumption, and the energy resources needed for data centers to operate is both layered and cyclical.

As noted by Siddik et al. (2021), data centers rely on the electricity grid to power their operations; the electricity grid relies on local power plants to distribute electricity; and U.S. electricity generation is the 2nd-largest consumer of water and the 3rd-largest cause of Greenhouse Gas Emissions. In that same study, it was estimated that data centers in the US emitted 31.5 million tons of greenhouse gases in 2018 (Siddik et al., 2021). Water sources are critical to data center operations. As servers, computers, chips, and other data center equipment emit massive amounts of heat, cooling data center equipment is essential to its continued functionality. According to MultiState (2025), liquid cooling technologies consume less water than other cooling technologies, such as evaporative cooling, making them more appealing to lawmakers and regulators (MultiState.us/insider/2025).

Federal/State/Local Economic Incentives and Governance. Currently, there are no uniform policies at the federal, state, or local levels governing data centers. Data center governance varies from state to state, wherein the data center

companies seek the most favorable economic and resource-rich environments to expand operations. As data centers consume massive amounts of electricity, a mounting concern for community members is rising utility bills when data centers are built near community areas. What occurs far too often is that data centers consume large amounts of electricity and then pass the bill on to local community members. For example, in May of 2026, the state of Tennessee passed House Bill 1847/Senate Bill 2128, holding data centers accountable for the cost of electricity infrastructure they exclusively use. This means the cost of their electricity use cannot be passed along to any other constituency, providing a form of protection for community members. Tennessee General Assembly passed House Bill 1847/Senate Bill 2128, which prohibits county or metropolitan governments, as well as incorporated cities, towns, or electrical utility providers, from paying for or absorbing the cost of electrical infrastructure that solely serves a data center. The new law took effect on May 7 after it was signed by Governor Bill Lee (https://www.wate.com/news/top-stories/tennessee-data-center-infrastructure-costs-law/).

In 2025, lawmakers in more than 40 states introduced a combined 267 data center bills across a range of policy areas (MultiState, 2025). Energy was the dominant concern. Of those 267 bills, 126 focused on energy-related issues, including special rate negotiations with large customers, nuclear energy, and studies to better understand how data centers affect the broader energy system (MultiState, 2025). South Carolina enacted legislation allowing electric utilities to negotiate special rates for large customers, and Maryland passed a law aimed at preventing data center energy costs from being passed on to other ratepayers (MultiState, 2025). Water and tax policy drew significant attention as well. Sixteen states considered 39 bills that could affect water use in data centers, including a Minnesota law requiring a separate water-use permit process for data centers specifically (MultiState, 2025). On the tax side, lawmakers in 32 states introduced 75 bills addressing data center tax incentives. Some states created new tax exemptions, while others modified the incentive structures already on the books (MultiState, 2025).

Purpose of the Study. The current study is significant in that it investigates not only the association between how states and localities position themselves as attractive sites for data center operations, but also critically examines which spatial characteristics render host sites appealing to data centers. By identifying these factors, the research synthesizes a fragmented, fast-moving evidence base into a single comparative account of data center siting decisions.

This investigation lays the essential groundwork for future scholarship on the environmental and community impacts of data centers, offering a framework for assessing both immediate and long-term consequences. Furthermore, by incorporating spatial echo (Smart, 2026), this study offers a new lens for evaluating how data center siting affects surrounding communities, highlighting the broader implications of these choices. The states examined in this research were selected through purposive sampling based on their common descriptors, either being "leading" among top US states with data centers or situated within "fastest-growing markets" for data centers. Additionally, the (5) states selected were based on their geographic differences, with each situated across different regions of the United States. Each state also has a high volume of data centers and an active state legislature on data center policy. By examining the spatial characteristics these locations share through the lenses of proximity and policy, the researcher aims to provide a clearer picture of what data center companies look for when making expansion decisions.

Conceptual Framework: The Spatial Echo

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

The significance of this research is grounded in the spatial echo concept. The spatial echo and its sender-receiver model originate with Smart (2026) and the Tennessee Educational Funding and Policy (TNEFP) research program. This study applies the framework to data center siting rather than originating it. Smart (2026) defines the spatial echo as the reproduction of historically assigned advantage and disadvantage across municipal boundaries, carried forward by the ordinary, race-neutral machinery of institutions such as school finance (p. 4). That work traces the mechanism from the 1930s Home Owners' Loan Corporation (HOLC) redlining maps to the fiscal capacity and distress of present-day Michigan school districts. Although contextually, Smart (2026) initially operationalized the spatial echo through Michigan school financing research, the overall theory expanded to illustrate how the effects of data center expansion reverberate outward to the host community. The spatial echo provides a measurable way to analyze how an intervention (i.e., a decision, policy, structure, or law) created in one space can reverberate (echo) into other spaces, shaping who benefits from or who pays for the original intervention (Smart, 2026). The research found that measured redlining exposure predicts lower tax base wealth per pupil and strongly predicts which districts required state fiscal rescue between 2014 and 2024. Smart (2026) concludes that the 1930s grading remains legible in school finance today, "not as fading residue but as an executed design (p. 17).

Within this research, the original intervention was the 1930s HOLC redlining maps. The "echo" was how that intervention led to contemporary fiscal issues within Michigan school districts, which include (a) weaker contemporary tax base growth; (b) lower taxable value per pupil; (c) accelerated enrollment loss; (d) persistent fiscal distress (Smart, 2026). In the context of this current research, the original intervention within the spatial echo is the decision to locate a data center at a specific site, and the "echo" is everything that reverberates outward from that decision into the surrounding community over time. What gives the echo its spatial force is that the very characteristics that make a site attractive to data center companies—abundant and inexpensive electricity, access to water, large parcels of land, and favorable tax incentives—are the same channels through which the echo travels back out: cheap power becomes the basis for rising utility costs, available water becomes watershed and aquifer strain, and tax incentives erode the local revenue base. Each effect, moreover, reverberates through a distinct geographic boundary. Higher electricity costs are spread across the data center's utility service territory; water withdrawals are absorbed within the local watershed; emissions and noise concentrate in the immediate host community; and forgone tax revenue is felt within the taxing jurisdiction, including the local school district that depends on that base to fund its schools.

The echo is also durable. A hyperscale campus, its dedicated transmission lines and substations, and the twenty- to thirty- year tax-abatement agreements that accompany it impose a fixed spatial footprint that continues to shape the host community long after the siting decision is made. Within the data center context, then, the echo includes, but is not limited to (a) job creation; (b) local tax incentives or tax breaks and their downstream effect on the school district revenue base; (c) environmental impacts of data centers; (d) community health concerns caused by data center CO2 emissions; (e) natural resource strain from cooling the data center; and (f) the long-term economic viability of the surrounding area. Sender-Receiver Model: Additionally, Smart (2026) introduced a conceptual anchor for the spatial echo, called the sender-receiver model. In that analysis, districts rooted in redlined urban cores act as senders: they lose mobile state aid as students leave, while remaining responsible for fixed costs that cannot follow them. Historically insulated suburbs act as receivers, importing that aid without absorbing the region's legacy liabilities. Smart (2026) measured this transfer directly and found that the most redlined cores, including Detroit, Flint, Pontiac, and Lansing, are the largest net losers of student aid each year,

while affluent suburbs are net gainers. Within the data center context, this study situates the sender-receiver concept introduced by Smart (2026) and applies it directly.

Once a data center is sited, the surrounding community functions as the sender, "sending" out mobile capital in two forms: economic capital, in the form of tax dollars and public incentives, and environmental capital, in the form of the water, land, and grid capacity the facility consumes. What distinguishes the spatial echo is that this value does not stay in place. The mobile capital is exported across community boundaries to recipients elsewhere, while the costs it generates—higher electricity bills, noise pollution, watershed strain, and CO2 emissions—are fixed in the host geography and cannot accompany the value that leaves. The receivers in this model occupy two different spatial positions. Proximate co-receivers are the state and local governance structures that capture tax revenue and political capital within the data center's boundary and, in turn, provide the tax breaks and incentives that attract the facility.

Distant receivers are the data center operator and its shareholders—typically headquartered far from the host site—together with the regional, national, and global users who consume the cloud services the facility produces. The data center is therefore both a receiver of local benefits and a "sender" of echoes—strained natural resources, rising electricity costs, and environmental impacts—back into the surrounding community. The underlying premise introduced by Smart (2026) remains consistent, and its spatial logic becomes clearer in this extension: mobile value is extracted from the community and carried beyond its boundaries, while fixed costs and liabilities are trapped within it. In short, the benefits leave; the burdens stay.

Research Focus. This study seeks to examine the following question: Across five leading and fast-growing data center markets — California, Arizona, Texas, Tennessee, and Virginia — what common spatial characteristics, spanning both proximity and policy, make host sites attractive to data center companies? Supporting sub-questions include:

- *Policy*: What state and local policy conditions, tax incentives, regulatory treatment, governance, and approval processes recur across these sites?
- *Proximity*: What physical and infrastructural conditions, available land, power capacity, water access, network connectivity, and proximity to consumers recur across the sites these companies select?

Literature Review

The siting of data centers sits at the intersection of infrastructure studies, economic geography, energy and water policy, and the study of spatial equity. This review synthesizes that literature to establish what is currently understood about why data centers are located where they are, and then applies that synthesis comparatively to answer the study's research question. It is organized around the two dimensions that structure the study—proximity and policy—and situates both within the spatial theory that informs the conceptual framework. The review first characterizes data centers as a class of critical infrastructure and the forces driving their growth, then situates them within critical geography and the emerging field of critical data center studies, before examining, in turn, the proximity and policy determinants of siting. It then introduces the five focal markets, presents a comparative analysis identifying the common spatial characteristics that make host sites attractive, and closes by discussing the implications of those shared characteristics for the communities that host them. The review makes three contributions: it consolidates a determinants literature that has developed along separate disciplinary tracks; it compares the five markets systematically to distinguish necessary conditions from merely common ones; and it reframes those determinants,

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

through the spatial echo, as the conditions under which a facility's costs later reverberate into the communities that host it.

Research Approach and Scope

This review adopts a structured, integrative approach rather than a systematic protocol: it organizes a heterogeneous and fast-moving evidence base around an a priori analytic framework rather than around an exhaustive search of a fixed database. Its scope is the determinants of data center siting in the United States from approximately 2015 to 2026, with particular attention to five focal markets—California, Arizona, Texas, Tennessee, and Virginia. Patton (2015, Module 30) describes such purposive selection as sampling for information-rich cases, and the five markets meet that standard, each hosting either the largest concentration of United States data centers or one of its fastest-growing markets. Sources were drawn from four tiers, in descending order of evidentiary weight: peer-reviewed journal articles; government, legislative, and national-laboratory documents (e.g., Lawrence Berkeley National Laboratory, the U.S. Department of Energy, the International Energy Agency, and state legislative analyses); authoritative industry market analyses, principally CBRE's data center market reports; and reputable journalism, used where it provides the most current documentation of state-level developments not yet treated in the scholarly literature.

Sources were selected for direct relevance to siting determinants or to one of the five focal markets, with preference given to primary and peer-reviewed material and recency prioritized given the speed of change in the sector. The inclusionary metrics for source selection were determined by the following: (a) the source addresses one or more siting determinants or documents conditions in at least one focal market; (b) falls within one of the four source tiers; (c) originates within the 2015 to 2026 review window, giving preference to newer sources when multiple sources cover the same development; (d) is accessible and retrievable by other researchers, whether freely or through registration. Sources that included promotional vendor materials and opinion-based commentary, without a documentary basis, were excluded. Source identification followed a three-stage workflow that enables traceability and replication.

First, the researcher established a two-dimensional model of proximity and policy and drafted initial categories based on preliminary research (see Figure 1). As the subject area has evolved faster than the peer-review cycle, the source hierarchy admits government documents, market analyses, and current journalism beneath peer-reviewed scholarship. Second, research assistants applied the researcher's criteria, retrieved additional resources, and returned their provisional groupings in table form. Third, the researcher independently verified each source and grouping and made all final categorical determinations. As noted by Bowen (2009), document analysis proceeds through an iterative process of skimming, reading, and interpretation (p. 32). Additionally, Bowen (2009) cautions that documents are not inherently precise, accurate, or complete records, and directs the researcher to determine the "authenticity, credibility, accuracy, and representativeness" of each selected document, including the purpose for which it was produced (p. 33). The inclusionary criteria and tier structure above directly align with Bowen's evaluation, as criterion (a) aligns source relevance with the study's two-dimensional framework (see Figure 1); criterion (b) applies the descending tier structure and weights credibility; and the exclusion of promotional and opinion- based material screens each document against the purpose for which it was produced.

Bowen (2009) further recommends seeking convergence and corroboration across different sources of evidence to reduce the bias a single source can carry (p. 28). The majority threshold described below serves that corroborative

function. For the comparative analysis, the literature was coded against the study's framework of spatial characteristics, and a characteristic was treated as common when it was documented in a majority—at least three—of the five focal markets and across multiple source tiers, with limitations noted where the public record is uneven. Data Centers as Critical Infrastructure: Data centers are specialized facilities that store, process, and transmit large volumes of data, enabling the websites, applications, and cloud-based services—including email and media streaming—that define contemporary digital life (JLARC, 2024). Industry and policy analysts typically distinguish three facility types. Enterprise data centers are owned and operated by a single organization for its own computing needs; colocation facilities lease space and shared cooling, power, and security to multiple tenants who maintain their own equipment; and hyperscale facilities are very large campuses built for major technology firms and characterized by enormous power and operational demands (JLARC, 2024). The composition of the sector has shifted decisively toward the latter two forms: by 2023, hyperscale and colocation facilities accounted for nearly 80% of server energy use in the United States, up from a minority share a decade earlier (Shehabi et al., 2024).

The scale of the sector's growth is the central fact shaping its geography. Drawing on a congressionally mandated analysis, Shehabi et al. (2024) estimate that U.S. data center electricity use rose from 58 terawatt-hours (TWh) in 2014 to 176 TWh in 2023—roughly 4.4% of national consumption—and project a range of 325 to 580 TWh, or 6.7% to 12% of national electricity, by 2028 (U.S. Department of Energy, 2025). Globally, the International Energy Agency (2025) estimates that data centers consumed about 415 TWh in 2024 and projects that figure will more than double to roughly 945 TWh by 2030. The proximate driver of this acceleration is artificial intelligence, which industry and research analyses identify as the primary source of projected load growth (Electric Power Research Institute, 2024; Pew Research Center, 2025). Deloitte (2025), for example, estimated that U.S. AI data center power demand could rise from roughly 4 gigawatts (GW) in 2024 to 123 GW by 2035. This growth carries resource demands that are spatially concentrated rather than diffuse. A single hyperscale facility can draw on the order of 100 megawatts of power—comparable to the electricity use of roughly 100,000 households—and can consume up to two million liters of water per day for cooling (International Energy Agency, 2025). Siddik et al. (2021) estimated that in 2018, U.S. data centers consumed about 72 TWh of electricity, were associated with approximately 31.5 million tons of carbon dioxide emissions, and accounted for some 383 billion liters of indirect water consumption through electricity generation.

Mytton (2021) found that U.S. data centers consume on the order of 1.7 billion liters of water per day, while documenting that fewer than one-third of operators measure their water use at all—a transparency gap that recurs throughout the siting literature. Because these footprints fall in particular places, the question of where data centers are built is inseparable from who bears their costs. Critical Geography: The lens of this study is situated in critical geography (CG), which offers a framework for better understanding where data centers are located and why that placement matters. Critical geographers ground the "critical" in questions of social justice and inequality (Soja, 2010) and treat geography as the study of how space, land, and resources are organized to produce unequal outcomes. Smart (2026) extends CG by applying spatial theory, namely the spatial echo, which illustrates how a decision made in one place and time continues to reverberate outwardly, over time, to communities and their inhabitants. Taken together, the research situates these two concepts as complementary. Whereas Soja (2010) explains why location is never neutral, Smart (2026) extends the non-neutrality of specific location decisions and explains how the idea of non-neutral placements can travel across space and time (through the sender-receiver model) to determine who pays and who benefits from

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

specific decisions. Education research applies this same lens. Tate (2008) mapped the "geography of opportunity" to show how poverty and place jointly structure educational outcomes, and Liu et al. (2020) demonstrate that a critical geography framework makes structural inequality visible by examining how space is produced, valued, and allocated. The spatial processes that determine where educational opportunity concentrates also determine where facilities like data centers are located and which communities bear their costs. A data center does not simply appear on an empty parcel of land. Rather, it is placed in a community with an existing tax base, a water supply, and its own land-use patterns (JLARC, 2024). The proximity determinants that attract data center operators to specific locations include pre-existing network infrastructure, reliable, inexpensive power, and large parcels of transmission-ready land (JLARC, 2024; Nain, 2024; Cushman & Wakefield, 2025; Vabson, 2026).

The same physical traits that make a site attractive are the traits a host community must absorb; thus, the situation of the Smart (2026) sender-receiver model as a data center draws its power from the local grid and its cooling water from local, often strained, water supplies (Siddik et al., 2021; JLARC, 2024). Policy, as a secondary determinant, then elucidates how those costs and benefits are distributed across state and local populations, as states use tax incentives and related tools to attract the industry to their jurisdictions (JLARC, 2024; MultiState, 2025). While tax incentives and operation costs savings are an attractive feature of the data center industry, the resource strain, rising electrical costs, and lost tax revenue are often passed along to community residents - thus, CG operates in concert with the spatial theory to help articulate the layered and non-linear decision-making matrix of site attractiveness for data centers and how the cost-benefit analysis of proximity and policy decisions reverberate outwardly to surrounding communities.

Situating Data Centers Within Spatial Theory. The premise that the location of infrastructure is a matter of equity rather than mere engineering has deep roots in critical geography. Harvey (1973) argued that urban space is simultaneously shaped by and productive of social relations, such that processes of uneven development concentrate advantage and disadvantage across space under capitalism. Building on Henri Lefebvre's notion of the right to the city, Soja (2010) advanced the concept of spatial justice, contending that justice itself has a geography and that the distribution of resources, services, and access across space can either reproduce or challenge structural inequality. These traditions establish the analytic move on which the present study depends: treating the placement of a facility as a distributive decision with consequences that radiate across space.

A growing body of work applies this lens directly to data centers, often under the banner of critical data center studies. Holt and Vonderau (2015) challenged the popular imaginary of an immaterial "cloud," insisting that data centers are physical, sited, and embedded in particular landscapes. Hogan (2015) traced how the National Security Agency's Utah Data Center became a flashpoint over water use in an arid region, illustrating how the resource demands of computing infrastructure are absorbed locally. Vonderau (2019) showed how peripheral regions court data centers as engines of economic rejuvenation, reframing remote and demographically weak areas as hubs of digital capitalism while assuming the associated environmental and infrastructural burdens. Similar dynamics appear in the United States, where Levenda and Mahmoudi (2019) documented the "silicon forest and server farms" of the Pacific Northwest as expressions of digital capitalism's uneven geography. Edwards et al. (2025) synthesize this field, arguing that data center infrastructure is neither inherently beneficial nor harmful but carries different consequences depending on one's location relative to it—an explicitly relational framing.

European scholarship extends this account beyond the United States. Velkova (2016) documents how operators in Stockholm and Paris capture server waste

heat and sell it to city heating systems, converting a disposal cost into revenue and benefiting the host city. Monstadt and Saltzman (2025) show how deeply such facilities entangle with urban governance in Amsterdam, the self-proclaimed "digital gateway to Europe." These cases show that policy, not geography alone, plays a key role in whether a host community bears the costs of a data center or shares in its benefits. This literature consistently finds that the benefits of data centers tend to accrue beyond the host community, accruing to distant firms, shareholders, and cloud service users, while the material costs of power, water, land, and emissions are borne locally. That asymmetry is precisely what the spatial echo framework was developed to make measurable. Originally formulated to show how a spatial intervention reverberates through fiscal and community outcomes across space and time (Smart, 2026), the framework provides the conceptual architecture for treating a data center siting decision as an intervention whose effects echo outward into the surrounding community. The determinants reviewed below constitute the conditions under which that echo is set in motion.

Proximity Determinants of Data Center Siting

The most consistent finding in the siting literature is the primacy of electricity. Reliable, abundant, and inexpensive power is repeatedly identified as the single most important locational factor, in part because hyperscale and AI facilities require firm, continuous power at a scale that few sites can accommodate (Shehabi et al., 2024; JLARC, 2024). A peer-reviewed multi-criteria suitability analysis of Texas reinforces this hierarchy, finding energy access and infrastructure to be among the most influential determinants of where data centers can locate (Arzumanyan et al., 2025). The character of demand also varies by facility type. Research summarized by Rice University (2026), analyzing pre-pandemic location data, found a bifurcated geography: third- party colocation facilities cluster in dense urban markets to remain close to the customers and latency-sensitive applications they serve, whereas cloud and hyperscale providers, whose services can be delivered from a distance, concentrate enormous facilities in lower-density regions where power, land, and construction are cheaper and economies of scale are easier to achieve. Land and transmission infrastructure form a second cluster of proximity factors. Modern campuses require large, flat parcels situated near high-capacity transmission lines—on the order of 230 kilovolts—with ready access to roads, water, and sewer service, and developers generally expect sites to be move-in ready when construction begins (JLARC, 2024; Arzumanyan et al., 2025).

Water availability constitutes a third factor whose salience depends heavily on local conditions. Because servers generate substantial heat, cooling can require large volumes of water, and the resulting demands are felt acutely in water-stressed regions even when they are modest as a share of statewide use (Mytton, 2021; Siddik et al., 2021; Walton, 2025). A fourth factor is network connectivity and the agglomeration dynamics it produces. Once a region attracts an initial concentration of facilities, the fiber networks, substations, workforce, and permitting precedents that accompany them lower the cost of subsequent development, generating a path-dependent clustering that helps explain why a small number of regions host disproportionate shares of capacity (CBRE, 2025; JLARC, 2024; Vonderau, 2019). Notably, the empirical literature suggests that financial incentives are not the principal driver of these decisions. Tarczynska (2016) reported that, in a survey of data center owners, only a small fraction described tax credits and local incentives as the most important site- selection factor, with access to inexpensive and reliable power and to locations free from natural and man-made hazards emerging as the dominant considerations. This finding—that proximity to physical resources outweighs policy inducements—frames the policy determinants reviewed next not as the cause of siting

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

but as a layer of public costs and governance superimposed on decisions largely driven by geography.

Policy Determinants of Data Center Siting

Despite their secondary role in location decisions, public policies—particularly tax incentives and utility ratemaking—shape both where data centers locate at the margin and who bears their costs. Dedicated tax incentives for data centers are now widespread: by the National Conference of State Legislatures' count, 38 states offer them, most commonly in the form of sales, use, and property tax exemptions (Stateline, 2026). Atkinson (2020) identifies competition for technology investment, conducted largely through state tax structures, as a standing feature of the American innovation system. Data center incentive packages are the newest round of that competition. These exemptions are among the costliest subsidies states provide. Good Jobs First (2025) found that, of the 32 states offering data center incentives, 12 do not disclose even aggregate revenue losses, and that several states that have calculated their returns lose between 52 and 70 cents for every dollar spent on data center sales tax exemptions. Earlier work by Tarczynska (2016) estimated that subsidized data center deals had cost state and local governments an average of roughly $1.95 million per job, a figure driven by the sector's capital intensity and minimal permanent employment.

Bahar and Wright (2026) reinforce this point. The researchers compared built facilities with sites where announced facilities were never built, and found that substantial local investment fades within 5 kilometers of the facility, with no measurable gains in salaries, new businesses, or employment once facilities open. Utility ratemaking has emerged as a second, increasingly contested policy arena. As data centers strain regional grids, a central question is whether the cost of new generation and transmission is borne by the facilities themselves or shifted onto other ratepayers. The evidence is mixed and actively debated. Several analyses link data center growth to rising household costs: residential electricity prices in the United States rose roughly 25% between 2020 and 2024 even as large commercial and industrial users saw little increase (Kirk, 2026); outstanding household utility debt and disconnections have climbed sharply (Environmental and Energy Study Institute, 2026); and wholesale prices near concentrations of data centers have risen substantially (World Resources Institute, 2025). The burdens of these increases fall disproportionately on low-income and minority households (Kirk, 2026). A competing body of analysis argues that, where large-load tariffs are well designed, data centers can cover their own service costs and may even relieve upward pressure on residential rates by spreading fixed costs across more consumption (Energy + Environmental Economics, 2024).

The economic logic holds under the right conditions. Revesz and Unel (2020) demonstrate that whether a large load lowers or raises costs for other customers turns on rate design rather than on the load itself. Martin and Peskoe (2025), reviewing nearly 50 regulatory proceedings, document how utilities offer data centers discounted contracts while folding the infrastructure costs of serving them into the general rates that all customers pay. The association between data center concentration and rising residential costs is attributed in this literature to rate designs and governance rather than to the facilities alone. In response, a number of states and utilities have begun creating separate rate classes and tariffs for large loads (Environmental and Energy Study Institute, 2026). A wave of recent state legislation reflects these concerns. Texas's Senate Bill 6 (2025) established a regulatory framework for large electrical loads of 75 megawatts or more in the ERCOT region, imposing interconnection cost contributions and emergency curtailment requirements intended to protect grid reliability and prevent shifting infrastructure costs onto other

customers. Tennessee's House Bill 1847 and Senate Bill 2128 similarly prohibit local governments and utilities from absorbing the costs of electrical infrastructure serving a data center, requiring operators to bear those costs themselves (Tennessee Lookout, 2025; Eggers, 2026a). Alongside fiscal and energy measures, governance and transparency have drawn scrutiny: analysts have criticized the opacity of incentive agreements and the speed and limited public input characterizing some local approvals (Good Jobs First, 2025; JLARC, 2024). Where approval processes outpace public input, community response has followed. Devine-Wright (2009) reframes local opposition as place-protective action, arising when a proposed facility threatens the attachments and identities residents hold in a place. Tennessee, one of this study's focal markets, illustrates the pattern. Since fall 2025, nine cities and counties have adopted data center construction moratoriums.

Additionally, a petition opposing a facility adjacent to the Nashville Zoo drew roughly 380,000 signatures, and moratorium proposals are advancing in Nashville and Knoxville (Eggers, 2026b). Monstadt and Saltzman (2025) trace the same trajectory internationally, as Amsterdam moved from recruiting data centers to a construction moratorium once their footprint became visible. Opposition, on this evidence, is a recurring feature of the siting process rather than noise around it. Taken together, this literature documents the determinants of siting individually—power, water, land, connectivity, and incentives—but rarely compares markets to identify what they share, and it seldom connects those determinants to the spatial-equity outcomes documented in critical data center scholarship. The comparative analysis that follows addresses the first of these gaps directly by examining five focal markets using the same proximity and policy framework.

The Five Focal Markets. The five markets examined here—California, Arizona, Texas, Tennessee, and Virginia—were selected as a purposive sample spanning the nation's established high-volume and fast-growing, policy-active data center geographies, and each represents a distinct market archetype. Virginia is the mature global hub, home to the world's largest concentration of capacity and the most developed body of public analysis. Texas is the resource-abundant, high-incentive market, pairing cheap land and an independent grid with some of the largest subsidies in the country. Arizona is the resource-constrained case, where rapid growth collides with acute water scarcity. Tennessee is the rapid, AI-driven entrant, where the arrival of large facilities has made environmental-justice concerns especially salient. California is the high-cost market that competes on connectivity and municipal power rather than on incentives. These archetypes are not merely descriptive; they structure the comparison by ensuring that the search for common characteristics spans markets with materially different resource endowments, policy regimes, and stages of development.

A characteristic that recurs across cases as varied as land-rich Texas and land-constrained California is more credibly a general determinant of attractiveness than one observed in a single market. The following analysis arrays each market against the proximity and policy factors developed above. Comparative Analysis Across Five Markets Analytic Approach As outlined in the Research Approach, each market is treated as a case, and the reviewed literature is arrayed against the framework's proximity factors (power, land and transmission, water, and connectivity and agglomeration) and policy factors (tax incentives, energy and rate policy, and water and governance), shown in Tables 1 and 2. A characteristic is treated as common when it is documented in at least three of the five markets, and the analysis notes where the public record is sparse rather than inferring beyond the evidence. Yin (2003) notes that multiple-case designs build their findings through repetition. When a result appears across several cases, confidence in that result grows (pp. 46–47). The three-of-five threshold applies this logic. Additionally, Yin (2003) notes that no formula sets how many cases must agree. The number is "a matter of discretionary,

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

judgmental choice" based on how much certainty the study requires (p. 51). When a market does not follow the shared pattern, it is not a weakness of the design. Rather, that difference itself becomes part of the analysis. In this research, Yin's (2003) case-design logic is applied across the proximity and policy domains to identify the characteristics of data center attractiveness common to the five focal markets.

Common Proximity Characteristics

Table 1: *Proximity Determinants of Data Center Attractiveness Across Five Markets*

State	Power	Land & transmission	Water	Connectivity & agglomeration
Virginia	World's largest U.S. market (~5 GW; ~340 facilities), lowest vacancy nationally, though the grid is increasingly strained (JLARC, 2024; CBRE, 2025)	Large parcels near 230 kV lines; sites expected move-in ready (JLARC, 2024)	Substantial use assessed; less binding than in arid states (JLARC, 2024)	"Data Center Alley"; ~13% of global capacity; densest fiber and strongest clustering (JLARC, 2024; CBRE, 2025)
Texas	Inexpensive, reliable power and a competitive ERCOT market; energy access among the most influential siting factors (Arzumanyan et al., 2025)	Abundant land; availability a key suitability criterion (Arzumanyan et al., 2025)	Less binding; not among the most influential statewide siting factors (Arzumanyan et al., 2025)	Dallas–Fort Worth surpassed 1 GW (3rd-largest NA market); metros lead on infrastructure (CBRE, 2025; Arzumanyan et al., 2025)
Arizona	Competitive operating costs; favorable climate and low disaster risk (Arizona Commerce Authority, 2025)	Abundant desert parcels (Walton, 2025)	Binding constraint; municipal caps and supplemental-supply rules (Walton, 2025; Grist, 2026)	Phoenix among the largest, fastest-growing NA markets; strong fiber (CBRE, 2025)

Tennessee	Low-cost TVA power plus a reduced state tax rate on electricity; TVA approved up to 300 MW for xAI (Eggers, 2026a; Stream Data Centers, 2026)	Lower-cost land than primary markets; rapid uptake in Memphis and Nashville (Tennessee Lookout, 2025)	Aquifer reliance; cooling-water scrutiny (Tennessee Lookout, 2025)	~60 facilities; Nashville an "emerging" market (Tennessee Lookout, 2025)
California	Among the highest statewide rates, yet Santa Clara's municipal utility (~25% below the incumbent IOU) anchors the market (San José Spotlight, 2025)	Scarce, very high cost (~$6–7M/acre) (dgtl Infra, 2024)	Drought-exposed; new data-center water-tracking law (James, 2024)	Silicon Valley demand, dense fiber, legacy semiconductor sites; strong clustering (San José Spotlight, 2025; CBRE, 2025)

Note. GW = gigawatts; NA = North American; ERCOT = Electric Reliability Council of Texas; TVA = Tennessee Valley Authority; IOU = investor-owned utility; kV = kilovolts.

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

Common Policy Characteristics

Table 2: *Policy Determinants of Data Center Attractiveness Across Five Markets*

State	Tax incentives	Energy & rate policy	Water & governance
Virginia	Sales/use tax exemption; ~$1B abated annually (JLARC, 2024; Good Jobs First, 2025)	Active cost-of-service and rate-allocation debate; reform recommendations (JLARC, 2024)	Local siting approvals; transparency concerns (JLARC, 2024)
Texas	Sales tax exemption (≥100,000 sq ft; ≥$200M); ~$1B in FY 2025 (Good Jobs First, 2025; Stream Data Centers, 2026)	Senate Bill 6 (2025) imposes interconnection-cost and curtailment rules on large loads (≥75 MW) in ERCOT to protect ratepayers (Senate Bill 6, 2025)	Limited subsidy disclosure (Good Jobs First, 2025)
Arizona	Computer Data Center Program: TPT and use tax exemption, 10–20 years (Arizona Commerce Authority, 2025)	Competitive operating costs; water, not rate policy, is the binding constraint (Arizona Commerce Authority, 2025)	Municipal water caps and supplemental-supply requirements (Grist, 2026)
Tennessee	Sales/use tax exemption plus a reduced electricity tax rate (Stream Data Centers, 2026)	HB 1847/SB 2128 bars shifting data-center infrastructure costs to other ratepayers (Eggers, 2026a)	Emerging registration and reporting proposals (Tennessee Lookout, 2025)
California	No dedicated state data-center tax incentive (Stream Data Centers, 2026)	Strict cost-of-service rules; data-center water-tracking law (James, 2024)	Municipal and environmental review, e.g., Santa Clara (San José Spotlight, 2025)

Note. TPT = Transaction Privilege Tax; FY = fiscal year; MW = megawatts.

Answering the Research Question

Synthesizing both dimensions, the literature indicates that an attractive host site, across these five markets, shares a recurring profile: reliable and comparatively inexpensive power delivered through high-capacity transmission; sufficient, transmission-adjacent land; adequate but increasingly contested water; dense connectivity amplified by agglomeration; and, in most cases, a tax-incentive regime.

Within that profile, the proximity factors, above all power and connectivity, emerge as the binding determinants, while policy incentives appear as a common but non-essential accompaniment, a reading reinforced by California's position as a major market that competes without a dedicated incentive. The subquestions resolve as follows: the common proximity characteristics are cheap, reliable power, transmission-ready land, sufficient water, and clustered connectivity; the common policy characteristics are widespread equipment and electricity tax exemptions, paired with an emerging body of cost-shifting and water-use regulation. This convergence answers the study's question and, at the same time, frames its significance, because the very characteristics that attract a facility are the channels through which its costs subsequently echo into the host community.

Implications Through the Spatial Echo

Read through the spatial echo (Smart, 2026), these shared determinants are not neutral site attributes but the leading edge of a longer chain of consequence. The inexpensive power that draws a facility becomes the grid and transmission investment whose allocation states now legislate to keep off residential bills; the water that cools it becomes the resource that arid communities begin to ration; and the tax exemptions that recruit it become the abated revenue base on which local services, including school districts, depend. The convergence identified here therefore provides the empirical groundwork for the study's next phase, which will trace how these determinants reverberate financially, environmentally, and educationally across the boundaries of the communities that host them. Establishing what these markets share is the necessary first step: only once the common profile of an attractive site is specified can its downstream echoes be measured.

Results

This study sought to explore the association between how a purposive sample of five markets positioned themselves as attractive sites for data center operations and the spatial characteristics that, if any, make host sites attractive for data centers. Examining these five markets (California, Arizona, Texas, Tennessee, and Virginia) as a comparative sample, this section reports findings on the spatial characteristics that make them attractive across the dimensions of proximity and policy. Consistent with the study's document-based design, a characteristic is treated as a common finding when it was documented in at least three of the five markets (see Tables 1 and 2). Within the proximity dimension, four characteristics emerged as recurring themes across the markets, with access to power emerging as the decisive one. Firstly, the results indicate that every attractive market shared access to reliable, comparatively inexpensive electric power delivered through high-capacity transmission. This pattern held even in markets where statewide power was expensive.

California, for example, was the costliest market in the sample, and the data indicated that data center development clustered around Santa Clara (Silicon Valley) because its municipal utility priced electricity roughly 25% below the dominant investor-owned provider (San José Spotlight, 2025). This same driver, which surfaced in both low-cost and high-cost markets, indicates that data centers having access to reliable power supplies is not merely a common feature but a binding and decisive spatial characteristic. The second finding indicated that data centers across all five markets favored large, inexpensive parcels of land near transmission lines. However, that need was met depending on how scarce land was locally. Where land was cheap and plentiful (e.g., Texas and Arizona), development spread across the landscape, creating more favorable conditions for hyperscale data center locations. Where land

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

availability for move-in-ready parcels is scarce (e.g., California and Virginia), data center site developments are clustered within a dense core. The third finding required a more precise classification. Water did not meet the majority threshold as a binding constraint.

Access to cooling water reached a genuine limit only in Arizona and drought-exposed portions of California, while Texas, Tennessee, and Virginia documented substantial use without binding scarcity (Grist, 2026; JLARC, 2024). The analysis therefore classifies water as a conditional factor rather than a common one. Water shapes siting decisions in arid markets and carries less weight elsewhere. Its importance depends on regional conditions rather than holding across all markets. Lastly, dense connectivity and agglomeration recurred in every case, as prior investment in fiber, substations, and permitting precedent lowered the cost of each additional data center facility (CBRE, 2025; JLARC, 2024). Across all five markets, the proximity profile of spatial characteristics that make host sites attractive converged on inexpensive and reliable power, transmission-ready land, and dense connectivity reinforced by clustering, with water operating as a conditional factor that binds only in arid markets. The policy dimension revealed two recurring characteristics and one notable exception.

The most prevalent feature was the dedicated tax incentive, typically realized as a sales-and-use tax exemption on equipment and, in several states, on electricity. This incentive was present in four of the five markets and absent only in California. That exception constitutes the study's most significant policy finding, since California ranks among the leading markets despite offering no dedicated incentive (MultiState, 2025). This indicates that while tax incentives contribute to market attractiveness, they are not essential for establishing an attractive market, a conclusion supported by survey evidence suggesting that operators value reliable power and suitable land over subsidies (Tarczynska, 2016). The second policy finding, which has gained prominence recently, is a regulatory shift toward conditioning data center growth, especially through measures designed to prevent energy infrastructure costs from being passed on to other ratepayers. Texas's Senate Bill 6 (2025) and Tennessee's House Bill 1847 exemplify this turn (JLARC, 2024; MultiState, 2025). However, it is important to acknowledge that the available evidence varies in depth and transparency across these markets, particularly regarding the disclosure of incentive agreements and regulatory practices. These evidence gaps limit the ability to make fully comprehensive comparisons, underscoring the need for further research and more consistent documentation across jurisdictions. In summation, these findings provide a detailed answer to the research question. Spatial attractiveness for host sites shares a recurring profile of cheap and reliable power, transmission-ready land, and clustered connectivity, conditioned by water, where aridity makes it binding, paired in most cases with some iteration of tax incentives. Within that profile, the proximity factors, most notably power and connectivity, are the decisive determinants, while policy incentives serve as a common but non-essential accompaniment. California's spatial attractiveness for data centers without a single dedicated incentive makes the point clear: proximity draws data centers to a site, while policy strengthens the case for staying.

Discussion

This research demonstrates that spatial attractiveness is structured fundamentally by two dimensions—proximity and policy—with proximity exerting a more decisive influence. Access to reliable, inexpensive power, transmission-ready land, and clustered connectivity consistently emerges as the set of non-negotiable physical criteria for a viable site, with water joining that set conditionally in arid markets. In contrast, policy considerations such as tax incentives and initiatives to

control cost-shifting play a supporting role, influencing site selection only after the essential proximity factors have been satisfied. California's data center prominence, without a dedicated incentive package, is the clearest evidence of this sequence: a market can attract data centers on physical attractiveness alone, but no incentive can substitute for the power, land, and connectivity needed to make a host site operational. The broader significance of these findings lies in the spatial echo at the moment data centers begin construction and throughout their life cycle, juxtaposing the cost-benefit analysis for data centers with that of their surrounding communities.

The same characteristics that draw a data center to a site are the channels through which its costs return to the surrounding community. This is the spatial echo described by Smart (2026), in which a siting decision reverberates outward long after it is made. Cheap power becomes the basis for rising utility costs for surrounding community members, available water strains watersheds and aquifers, and tax incentives erode the local revenue base. The sender-receiver model (Smart, 2026) frames this directly: the benefits leave the community; the burdens stay. What makes a location attractive to a distant company is therefore inseparable from what makes it costly for the residents who host the facility. That reverberation is not evenly distributed, and the two heaviest burdens travel differently. Electricity strain is a matter of cost rather than depletion. It appears when demand outpaces the grid's ability to expand affordably, and when the resulting costs fall on households rather than the data centers driving them (Revesz & Unel, 2020; JLARC, 2024). Water strain is a matter of finite local stock, concentrated in the arid markets least able to absorb it (Siddik et al., 2021).

Rising electricity costs, water resource strain, and lost tax revenue hit hardest the communities and residents with the least capacity to withstand them, which positions future research to assess more fully the impacts data centers have on their surrounding environments and communities. This study is limited in scope to identifying which spatial characteristics make a host site attractive, positioning proximity and policy as unequally weighted yet complementary determinants. While offering valuable insight into how these dimensions function as the initial terms by which benefits and burdens are distributed, the analysis does not extend to measuring the actual outcomes or broader repercussions for host communities. Consequently, these findings cannot fully capture the range or magnitude of social, economic, and environmental impacts that may emerge over time. Through the lens of the spatial echo, this examination of host-site attractiveness across proximity and policy provides only a starting point for more comprehensive assessments of data centers' short- and long-term effects. To address these gaps, future research should empirically investigate how specific siting decisions shape environmental pressures, community well-being, and local economies. Using the spatial echo and the sender-receiver model (Smart, 2026), such work can illuminate how proximity and policy distribute both benefits and burdens across particular populations.

Limitations

This study analyzes existing public documents rather than collecting firsthand data through interviews, surveys, or measurement. That record is uneven across the five markets, as some states have studied their data center industries in depth while others have not. As such, the evidence supporting each market varies in volume and detail. Industry market analyses are produced by firms with a stake in the market they describe, and several require registration to access. The tier structure accounts for this by weighting them below peer-reviewed and government sources. One technical source, Vabson et al. (2026), is a preprint that has not completed peer review, and its claims are weighted accordingly. The data center sector also changes quickly. Findings reflect the record available within the review window and may not

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

capture developments after it. Finally, the five-market design supports what Yin (2003) calls analytic generalization: findings extend the framework rather than describe all markets (p. 10). The patterns identified here warrant testing in additional markets.

References

Arizona Commerce Authority. (2025). Computer data center program. https://www.azcommerce.com/incentives/computer-data-center-program/

Arzumanyan, M., Rodriguez Calzado, E., Lin, N., Bahadur, V., Das, J., Ko, T. L., & Koesterke, L. (2025). Geospatial suitability analysis for data center placement: A case study in Texas, USA. Sustainable Cities and Society. Advance online publication. https://www.sciencedirect.com/science/article/abs/pii/S221067072500561X

Atkinson, R. D. (2020, November). Understanding the U.S. national innovation system, 2020. Information Technology and Innovation Foundation.

Bahar, D., & Wright, G. C. (2026). The local economic impact of data centers [Working paper].

Bowen, G. A. (2009). Document analysis as a qualitative research method. Qualitative Research Journal, 9(2), 27–40. https://doi.org/10.3316/QRJ0902027

CBRE. (2025). North America data center trends H2 2025. CBRE Research. https://www.cbre.com/insights/books/north-america-data-center-trends-h2-2025

Cushman & Wakefield. (2025). Americas data center update H1 2025. Cushman & Wakefield Research.

Daim, T. U., Bhatla, A., & Mansour, M. (2013). Site selection for a data centre—a multi-criteria decision-making model. International Journal of Sustainable Engineering, 6(1), 10–22. https://doi.org/10.1080/19397038.2012.719554

Deloitte. (2025). AI data centers jolt power demand: Insights from Deloitte's 2025 AI Infrastructure Survey. Deloitte Insights. https://action.deloitte.com/insight/4718/ai-data-centers-jolt-power-demand Devine-Wright, P. (2009). Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action. Journal of Community & Applied Social Psychology, 19(6), 426–441. https://doi.org/10.1002/casp.1004 dgtl Infra. (2024). Northern California data centers: Silicon Valley. https://dgtlinfra.com/northern-california-data-centers-silicon-valley/

Edwards, D., Cooper, Z. G. T., & Hogan, M. (2025). The making of critical data center studies. Convergence, 31(2), 429–446. https://doi.org/10.1177/13548565231224157

Eggers, C. (2026a, April 5). Elon Musk's xAI, pollution and data centers — what you need to know about a Tennessee bill. WPLN News. https://wpln.org/post/elon-musks-xai-pollution-and-data-centers-what-you-need-to-know-about-a-tennessee-bill/

Eggers, C. (2026b, June 11). Tennessee communities are blocking data centers. Nashville could be next. WPLN News. https://wpln.org/post/tennessee-communities-are-blocking-data-centers-nashville-could-be-next/

Electric Power Research Institute. (2024). Powering intelligence: Analyzing artificial intelligence and data center energy consumption.

Energy + Environmental Economics. (2024). Virginia data center study: Grid and customer cost impacts. Prepared for the Virginia Joint Legislative Audit and Review Commission. https://www.ethree.com/jlarc-load-growth/

Environmental and Energy Study Institute. (2026). Data center power demands are contributing to higher energy bills. https://www.eesi.org/articles/view/data-center-power-demands-are-contributing-to-higher-energy-bills

Good Jobs First. (2025). Cloudy with a loss of spending control: How data centers are endangering state budgets. https://goodjobsfirst.org/cloudy-with-a-loss-of-spending-control-how-data-centers-are-endangering-state-budgets/

Grist. (2026). Arizona's water is drying up. That won't stop its data center rush. https://grist.org/technology/arizona-water-data-centers-semiconducters/

Guidi, G., Dominici, F., Gilmour, J., Butler, K., Bell, E., Delaney, S., & Bargagli-Stoffi, F. J. (2024). Environmental burden of United States data centers in the artificial intelligence era. arXiv. https://doi.org/10.48550/arXiv.2411.09786

Harvey, D. (1973). Social justice and the city. Johns Hopkins University Press.

Hogan, M. (2015). Data flows and water woes: The Utah Data Center. Big Data & Society, 2(2), 1–12. https://doi.org/10.1177/2053951715592429

Holt, J., & Vonderau, P. (2015). "Where the Internet lives": Data centers as cloud infrastructure. In L. Parks & N. Starosielski (Eds.), Signal traffic: Critical studies of media infrastructures (pp. 71–93). University of Illinois Press.

International Energy Agency. (2025). Energy and AI. https://www.iea.org/reports/energy-and-ai

James, I. (2024, August 31). Amid a data center boom, California lawmakers pass a bill to track water use. Los Angeles Times.

Joint Legislative Audit and Review Commission. (2024). Data centers in Virginia (Report No. 598). Commonwealth of Virginia. https://jlarc.virginia.gov/landing-2024-data-centers-in-virginia.asp

Kirk, K. (2026, January 6). Home electricity bills are skyrocketing. For data centers, not so much. Yale Climate Connections. https://yaleclimateconnections.org/2026/01/home-electricity-bills-are-skyrocketing-for-data-centers-not-so-much/

Levenda, A. M., & Mahmoudi, D. (2019). Silicon forest and server farms: The (urban) nature of digital capitalism in the Pacific Northwest. Culture Machine, 18, 1–14.

Liu, R., Fischmann, S., Hong, A., & Melville, K. (2020). Spatializing community-based learning: How a critical geography framework can foster understandings of structural inequality and egalitarian relationships. *Journal of Community Engagement and Higher Education, 12*(1), 16–28. https://scholars.indianastate.edu/jcehe/vol12/iss1/2.

Martin, E., & Peskoe, A. (2025, March). Extracting profits from the public: How utility ratepayers are paying for Big Tech's power. Harvard Law School Electricity Law Initiative.

Monstadt, J., & Saltzman, K. (2025). How data centers have come to matter: Governing the spatial and environmental footprint of the 'digital gateway to Europe.'

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0

International Journal of Urban and Regional Research, 49, 757–778. https://doi.org/10.1111/1468- 2427.13316

MultiState. (2025). State data center policy 101: Legislative trends, key terms, and what to expect in 2026.

Mytton, D. (2021). Data centre water consumption. npj Clean Water, 4(1), 11. https://doi.org/10.1038/s41545-021-00101-w

Nain, V. (2024). A review of the factors impacting the optimal placement of data centers. TechRxiv. https://doi.org/10.36227/techrxiv.170775575.59564473/v1

Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice (4th ed.). Sage Publications.

Pew Research Center. (2025). What we know about energy use at U.S. data centers amid the AI boom. https://www.pewresearch.org/short-reads/2025/10/24/what-we-know-about-energy-use-at-us-data-centers-amid-the-ai-boom/

Revesz, R. L., & Unel, B. (2020). Managing the future of the electricity grid: Modernizing rate design. Harvard Environmental Law Review, 44(1), 43–115. https://ssrn.com/abstract=3373163

Rice University. (2026). Data center location decisions focus on cost and proximity, not job centers, study shows. Rice Business. https://business.rice.edu/news/data-center-location-decisions-focus-cost-and-proximity-not-job-centers-study-shows

San José Spotlight. (2025). Santa Clara data centers hit max energy capacity. https://sanjosespotlight.com/santa-clara-data-centers-hit-max-energy-capacity/

Senate Bill 6, 89th Leg., Reg. Sess. (Tex. 2025).

Shehabi, A., Smith, S. J., Hubbard, A., Newkirk, A., Lei, N., Siddik, M. A. B., Holecek, B., Koomey, J., Masanet, E., & Sartor, D. (2024). 2024 United States data center energy usage report (LBNL-2001637). Lawrence Berkeley National Laboratory. https://doi.org/10.71468/P1WC7Q

Siddik, M. A. B., Shehabi, A., & Marston, L. (2021). The environmental footprint of data centers in the United States. Environmental Research Letters, 16(6), 064017. https://doi.org/10.1088/1748-9326/abfba1

Smart, R. E. (2026). The spatial echo of inequity: How 1930s HOLC grading designed contemporary school-district fiscal outcomes across Michigan metropolitan areas [Research brief]. Tennessee Educational Funding and Policy. https://doi.org/10.66981/tnefp.spatial-echo-michigan.2026

Soja, E. W. (2010). Seeking spatial justice. University of Minnesota Press.

Stateline. (2026). Many states don't report losses from data center tax breaks, study says. https://stateline.org/2026/04/15/many-states-dont-report-losses-from-data-center-tax-breaks-study-says/

Stream Data Centers. (2026). Tax incentives for data centers. https://www.streamdatacenters.com/resource-library/glossary/tax-incentives-for-data-centers/

Tarczynska, K. (2016). Money lost to the cloud: How data centers benefit from state and local government subsidies. Good Jobs First.

Tate, W. F., IV. (2008). “Geography of opportunity”: Poverty, place, and educational outcomes. Educational Researcher, 37(7), 397–411. https://doi.org/10.3102/0013189X08326409

Tennessee Lookout. (2025). Artificial intelligence is the economic revolution no one asked for. https://tennesseelookout.com/2025/12/23/artificial-intelligence-is-the-economic-revolution-no-one-asked-for/

U.S. Department of Energy. (2025). DOE releases new report evaluating increase in electricity demand from data centers. https://www.energy.gov/articles/doe-releases-new-report-evaluating-increase-electricity-demand-data-centers

Vabson, M., Za'ter, M. E., Sajadi, A., Baker, K., & Hodge, B.-M. (2026). Optimal county-level siting of data centers in the United States. arXiv. https://doi.org/10.48550/arXiv.2601.16315

Velkova, J. (2016). Data that warms: Waste heat, infrastructural convergence and the computation traffic commodity. Big Data & Society, 3(2), 1–10. https://doi.org/10.1177/2053951716684144

Vonderau, A. (2019). Scaling the cloud: Making state and infrastructure in Sweden. Ethnos, 84(4), 698–718. https://doi.org/10.1080/00141844.2018.1471513

Walton, B. (2025, June 13). Data centers a small, but growing factor in Arizona's water budget. Circle of Blue. https://www.circleofblue.org/2025/supply/data-centers-a-small-but-growing-factor-in-arizonas-water-budget/

World Resources Institute. (2025). From energy use to air quality, the many ways data centers affect US communities. https://www.wri.org/insights/us-data-center-growth-impacts

Xiao, T., Fuso Nerini, F., Matthews, H. D., Tavoni, M., & You, F. (2025). Environmental impact and net-zero pathways for sustainable artificial intelligence servers in the USA. Nature Sustainability, 8, 1541–1553. https://doi.org/10.1038/s41893-025-01681-y

Yin, R. K. (2003). Case study research: Design and methods (3rd ed.). Sage Publications.

© Tennessee Educational Funding and Policy, 2026
ISSN 3071-4982 (print) · 3071-4990 (online) | CC BY 4.0