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Land for AI: Data Center Real Estate Markets

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7.1 Introduction: Data Centers in the AI Era

The rapid growth of artificial intelligence (AI) tools – such as ChatGPT, Deepseek, Claude, Grok, Ernie, Llama, and other large language models (LLMs) – has profoundly impacted the market for globalized telecommunications infrastructure, driving an unprecedented demand for massive data storage and compute resources. This surge in demand is being met by the rapid expansion and development of data centers, which serve as the backbone for storing and processing digital information at scale. Data centers refer not just to warehouse-scale computing that is used for data storage but also to data processing, or "compute," centers for use in, for example, the training or use of AI models. AI technologies rely on processing and analyzing vast amounts of data, leading to an explosion in digital data generation and computation, therefore necessitating the expansion of data centers worldwide to store and process that data. This surge amplifies the need for material, digital telecommunication infrastructure while significantly increasing regional electricity consumption, water usage for cooling systems, and land for building data centers (Sayegh, 2024).

This transformation is not merely technical but deeply financial. Data center Real Estate Investment Trusts (REITs, which we discuss later in the chapter) exemplify the financialization of digital infrastructure: rentiership is increasingly based on control over power, land, and connectivity. Their financial strategies, operational models, and forms of rent extraction differ fundamentally from traditional REITs, a difference that reflects both the materiality of digital infrastructure and the imperatives of global capital. To clarify the distinct forms of value at stake, we use the terms *data rent* and *computational rent*. Data rent refers to the value extracted from controlling the storage and transmission of digital information – often realized through fees for colocation, bandwidth, or network proximity. Computational rent, by contrast, is the value derived from providing access to compute power, such as the processing capacity required for training and deploying AI models.

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Both forms of rent are central to the business models of data center REITs and distinguish them from traditional real estate landlords.

The trajectory of AI infrastructure mirrors earlier industrial growth waves. The political scholar Herman Schwartz (2024), writing on industrial divides and new forms of production, characterizes the ICT wave of the late 20th century as a transformative era powered by general-purpose technologies such as flexible automation and cheaper computing, which reshaped production and consumption. Similarly, AI represents a rapidly diffusing general-purpose technology, spurring waves of investment and embedding digitalization into production and consumption patterns and subsequently urban and economic geographies. Yet, these industrial moments of growth are also subject to endogenous decay dynamics, limits that constrain technological and economic growth. In ICTs, for instance, the rising costs of semiconductor fabrication facilities and energy-intensive operations marked such constraints. AI infrastructure may encounter similar challenges as LLMs grow larger, requiring exponentially greater data inputs, compute power, and energy (Toczé et al., 2022). That is, innovative efficiency gains in data storage and computation are outpaced by the growth in demand and applications of LLMs.

The physical footprint of data centers is one such area where this growth and demand are outpacing efficiency gains, reshaping land and real estate markets. The footprint of facilities requires substantial space and is subsequently strategically located near urban centers to minimize latency and optimize performance (Wiessner et al., 2024). Northern Virginia's Data Center Alley exemplifies this phenomenon, leveraging proximity to Washington, D.C., alongside tax incentives and robust connectivity to become a global hub for digital infrastructure (Luitse, 2024; Rosati et al., 2023). Examining this region reveals how specific locations become pivotal for AI and how their growth impacts broader urban and economic development patterns.

This chapter explores these dynamics through analysis of white and grey literature, including financial filings and industry reports, to shed light on the interplay of AI, data centers, and land markets. Understanding these intersections is critical for navigating the future trajectories of digital urbanization. In line with infrastructural research methods (e.g., Mahmoudi et al., 2024; van Es and de Lange, 2020; Wiig, 2013), field observations via automobile and on foot in Northern Virginia were undertaken by the authors in November 2024 to photo-document and ground truth desk-based mapping research. Ultimately, we show that the AI economy's reliance on financialized land and data infrastructures transforms urban peripheries into pivotal nodes of digital capitalism, deepening logics of data colonialism and extractivism (Brodie, 2024; Thatcher et al., 2016). Following other work at the crucial intersection of technology and power (Albertus and Klaus, 2024; Graham and Marvin, 2001; Wiig et al., 2022), we argue that discussions of the inner workings of AI must also include discussions of land and the reshaping of spatial relationships that embed new forms of economic power into digitized landscapes.

7.2 The Geography of Data Centers

Understanding the current landscape of data centers requires a brief look back at the evolution of these networked computers as a key infrastructure of telecommunication and digital society. The development of these facilities can be traced to the 1990s, when early internet infrastructure and redistribution centers began to reshape the digital economy (Wiessner, 2025). These warehouse-scale facilities, precursors to today's hyperscale data centers, played a foundational role in the transformation of regional and suburban landscapes, laying the groundwork for the current wave of AI-driven expansion (Edwards et al., 2025). Warehouse-scale computing refers to the use of massive data centers that function as single, colossal computing units. These facilities consolidate thousands of servers alongside networking equipment under one roof, designed to operate at a scale where the entire data center is viewed as one large computer (Ranganathan and Hölzle, 2024). This concept grounds the discussion of data centers within the context of their spatial form as ICT warehouses due to their vast size and utilitarian design, emphasizing efficiency in space utilization, energy consumption, and cooling systems. The physical resemblance to warehouses is not merely aesthetic but integral to their operational philosophy.

7.2.1 Logics of Warehouse-Scale Computing

The historical development of warehouse-scale computing is closely tied to innovations by companies like Google in the early 2000s. Faced with the growing demands of its search engine, the growing use of cloud-based email, and development of other web services, Google pioneered custom-built data centers that could handle unprecedented levels of processing and storage. They implemented innovative cooling and energy management systems to improve efficiency, setting industry standards for large-scale data processing solutions. From a technical development perspective, warehouse-scale computing significantly impacted computing paradigms by affording a shift in industry practices toward cloud-based services and remote data processing (Ranganathan and Hölzle, 2024). It promoted the growth of software-as-a-service models and enabled economies of scale that reduced costs per unit of computing power. Third-party data center providers allowed companies to quickly scale by renting out access to server space within data centers. By consolidating resources, third-party providers can achieve reduced costs through enhanced energy efficiency and bulk management, making warehouse-scale computing both an economically and a technologically advantageous model. However, this efficiency doesn't necessarily reduce consumption (Toczé et al., 2022). Instead, it produces additional capacity – prompting new technologies that could leverage this newfound data storage capacity and computing power – contributing to the growth, demand, and proliferation of hosted and cloud-based technologies. Amazon, for example, sought to create efficiency in its distribution and geography of online shopping servers. In doing so, they were able to leverage that extra capacity for other consumer and convenience products such as streaming audio, streaming video, and personal data storage (Mahmoudi and Wiig, 2024).

Data centers are critical infrastructure that undergirds the global information and innovation economies that are concentrated in major urban areas. This infrastructure provides essential services such as cloud computing, e-commerce platforms, streaming services, and financial transactions. By facilitating real-time data processing and storage, data centers support the digital economy of cities and enable urban management systems, underscoring both the dependency of urban centers on these peripheral facilities for their daily operations and their role in driving demand in data center capacity (Toczé et al., 2022). The material and spatial dependency of the global information and innovation economies on peripheral facilities results in investment flows from urban tech companies to peripheral and peri-urban ICT infrastructure projects. This interconnectedness influences planning policies, prompting adjustments to accommodate data center needs, sometimes outside the direct urban area itself (Mahmoudi and Levenda, 2016). In peri-urban areas, development practices, energy policies, and zoning laws may be modified to allow for large-scale industrial facilities, and municipalities may provide infrastructure investments via the construction of access roads and utility hookups, and through this, the digital and physical connectivity required to network a facility into regional and global connectivity.

To appreciate the scale of these technical, economic, and material changes, it is helpful to clarify the concept of warehouse-scale computing. Warehouse-scale computing is critical for AI infrastructure because training and operating large AI models require immense, centralized processing resources. These facilities are designed not only for data storage but also for high-density compute tasks, enabling the rapid analysis and manipulation of vast datasets that underpin contemporary AI systems. The development and deployment of AI and LLMs amplify the reliance on, and scale of, warehouse-scale computing and data centers. These models require unprecedented levels of compute power and storage, necessitating hyperscale data centers capable of handling AI's massive processing demands. This dependency further entrenches the economic and spatial importance of data centers within global ICT infrastructures. As AI becomes central to global innovation economies, the proliferation of data centers sediments the flows between urban tech firms and peri-urban or rural data center hubs. The demand for reduced latency and increased processing power ensures that AI-centric workloads drive the clustering of data centers. At the same time, their form as warehouse-scale data centers contribute to the physical and economic landscapes traditionally dominated by suburban housing, retail, and warehouse distribution centers. The sheer scale and functional importance of these facilities reflect a shift in urbanization patterns, where the global innovation economy, with its urban hubs, drives the expansion of physical infrastructure in peri-urban areas (Mahmoudi and Levenda, 2016).

This shift consequently reshapes urban-peripheral relationships, as the demand for AI and its data centers reinforces the need for adaptable zoning laws, resource allocation, and infrastructure investments to sustain this computational ecosystem. Bringing these threads together, the explosive growth of AI technologies drives demand for data center capacity, which in turn accelerates the transformation of urban and peripheral landscapes. This feedback loop, where advances in AI spur data center expansion, and new infrastructure enables further AI development, then reshapes land markets, energy systems, and regional economies, reinforcing the centrality of digital infrastructure in contemporary urbanization.

7.2.2 The Financialization of Data Centers

Building on this theoretical foundation, it is important to recognize how the rise of data center infrastructure is deeply entangled with the logics of digital capitalism and the concentration of economic and social activities in cities. As digital platforms and AI applications proliferate, their infrastructural requirements are reshaping urban and peri-urban geographies, intensifying demands on land, energy, and public utilities, and generating new forms of environmental impact and spatial inequality. The financialization of data centers marks a fundamental shift in how these facilities are understood, valued, and integrated into the broader economy (Edwards et al., 2025). Once viewed as purely functional sites for data storage and processing, data centers have evolved into financialized assets capable of generating substantial long-term returns. This transformation has been driven by a growing trend of assetization (Kay and Tapp, 2022) and a growing need for capital to produce profit through the assetization of technology and data (Beauvisage and Mellet, 2020). Regarding data center economies, REITs specializing in data centers have emerged as a financialized intermediary that acquires, manages, and leases data center infrastructure to tech companies and cloud service providers (Citrome, 2014). By pooling capital from institutional and retail investors, REITs transform data centers into lucrative investment vehicles, aligning their operations with the imperatives of financialization and digital capitalism (Citrome, 2014; Greene, 2022).

Data center REITs, such as Digital Realty and Equinix, have been instrumental in embedding financial logic into the operation of data centers. These entities treat their holdings as financial assets rather than purely infrastructural nodes, decoupling the physical facilities from their operational functions and emphasizing their potential for capital appreciation and consistent revenue generation (Citrome, 2014). By leveraging both tangible elements, such as strategically located land, and intangible factors, like the demand for low-latency connectivity, these REITs amplify the economic significance of data centers. These locations are chosen not only for their affordability and proximity to major urban markets but also for their alignment with the operational needs of tech companies, ensuring seamless data transmission and service reliability (Greenstein and Fang, 2020; Sayegh, 2024). This dual value – combining real estate profitability with technological necessity – positions data center REITs as central players in the emergent, AI-centric digital economy.

REITs provide physical facilities equipped with power, cooling, and connectivity essential for data center operations. These spaces are leased not only by Amazon Web Services, Microsoft Azure, and Google Cloud but also by numerous other companies. By renting rather than owning, tech companies reduce capital expenditure and operational burdens, allowing them to focus on core business functions. This leasing model enables REITs to maintain predictable revenue streams through long-term contracts, which often include fixed monthly fees, additional charges for energy consumption, and premiums for enhanced connectivity or security. Some REITs also offer value-added services, such as interconnection, private cloud hosting, or disaster recovery solutions, further diversifying revenue sources. The exponential growth in data consumption, driven by cloud computing, and fueled by AI, has created a persistent demand-supply gap in storage and processing capabilities. REITs capitalize on this demand through continual expansion, investing in new facilities or upgrading existing ones to attract tenants. The strategic selection of locations near urban centers and critical network hubs allows REITs to command higher rents due to low latency and operational efficiencies. Major tech companies' reliance on third-party data centers for scalable solutions ensures a stable, long-term customer base, reinforcing REITs' financial viability (Citrome, 2014).

The financialization process also allows REITs to attract substantial investment by promising scalable and predictable revenue streams. Asset appreciation further enhances the value of data centers, particularly in strategic locations. As a recognized and growing segment of REITs, data center-focused investments attract significant institutional and retail capital, offering high dividends and exposure to the digital economy. The modular design of many data centers enables incremental expansion, ensuring cost-effective growth aligned with market trends. Beyond their function as revenue-generating infrastructure, data centers are fundamental to tech capital accumulation (Greene, 2022). While REITs earn income from leasing and asset appreciation, their infrastructure underpins the digital economy by enabling AI development, targeted advertising, and subscription models, without requiring tech companies to invest in real estate management. This dynamic positions REITs as both financial and infrastructural intermediaries, embedding data centers more deeply into the logic of financialized digital capitalism. By treating data centers as financial assets, REITs decouple the physical infrastructure from its operational role, instead focusing on – even isolating – potential for capital appreciation and revenue generation.

7.2.3 Space and Financialization

The financialization of data centers has significant spatial consequences, restructuring urban-peripheral dynamics and embedding financialized logics into the physical fabric of the digital economy. Though technologically advanced, data centers are immobile and capital-intensive, anchoring capital in specific locations to enable further accumulation. While data flows globally, the infrastructure supporting it is deeply rooted in specific geographies, generating distinct patterns of development and dependency tied to broader capitalist imperatives (Greenstein and Fang, 2020). The resulting clustering of data centers fosters agglomerative economies of place, where proximity among facilities creates efficiencies that drive down operational costs and enhance service reliability (Hogan, 2021). Shared infrastructure, such as cooling systems and energy grids, reduces per-unit expenses, while co-located facilities attract additional tenants and investment. These clusters amplify competitive advantages over time, creating self-reinforcing cycles of growth that integrate local economies into global digital infrastructure markets.

However, this spatial configuration also intensifies uneven development. Rural and peri-urban areas incorporated into global circuits of data center investment often experience rising land values and heightened resource pressures (Olivo and Neff, 2024). These dynamics are especially evident in the spatial and financial shifts triggered by AI. The rapid revaluation of land and real estate markets near major data center clusters illustrates how AI technologies, by demanding ever more compute power, make land with access to robust energy and connectivity infrastructure a prime asset, attracting speculative investment and driving up prices. Further, the energy and water demand of data centers can overwhelm local infrastructure, while financial capital disrupts traditional land uses and economic practices. The displacement of agricultural land and residential spaces by industrial-scale facilities further deepens peripheral regions' dependency on volatile global tech markets and financial systems, embedding vulnerabilities in local economies increasingly tied to the fortunes of data-driven capitalism (Greenstein and Fang, 2020).

The concept of "data gravity" – as defined by the data center REIT Digital Realty (Digital Realty, 2020) – further underscores the financialization of data centers, highlighting how the accumulation of data creates a gravitational pull that attracts additional infrastructure and investment by increasing the complexity and dependency of data exchange within a given region. As these facilities store and process ever-larger volumes of information, they contribute to the growth of a feedback loop that necessitates further capacity.

This loop reinforces concentrations of data centers in their central role in the global digital economy. This dynamic situates data centers at the nexus of technological ecosystems and financial markets, where they function as both operational infrastructure and speculative assets.

These transformations illustrate the broader dynamics of financialized digital capitalism, where infrastructure becomes both a productive site and a financialized asset class. The immobility of data centers locks capital into specific regions, fostering localized dependencies while sustaining global data flows, embedding financial logics into the landscapes they occupy, and perpetuating uneven development. The entanglement of geography, technology, and finance highlights the need for critical engagement with the socioeconomic and environmental implications of data center expansion. The impact of REITs extends beyond the physical construction of data centers. By channeling investment into peri-urban areas, these entities influence uneven regional development patterns, from infrastructure upgrades to policy shifts. Local governments, eager to attract data center projects, often modify and capitulate to the zoning needs and financial incentives to ensure REIT profitability (Halper and O'Donovan, 2024; Olivo and Neff, 2024). This collaboration between public and private sectors exemplifies the broader trend of neoliberal urbanism, where market-driven solutions shape the trajectory of urban development.

7.3 Northern Virginia's Data Center Alley: Convergence of Land, Data, and Capital

Northern Virginia has emerged as a key node in the global digital economy, with 453 data centers operated by 61 providers (Baxtel, 2025), the most dominant being Amazon with over 150 data centers. Yet, over 250 of these data centers are concentrated in a small area known as Data Center Alley, with its extensive network of data centers that serve to provide a competitive advantage to local firms while also serving as a global backbone for ICT and AI infrastructure. Of these data centers, 52 belong to the region's four largest REITs – Digital Realty, Equinix, NTT, and QTS – which comprise nearly 800,000 square meters of built data centers in our estimate. Figure 7.1 shows a high concentration of data centers in Ashburn, VA, nestled among residential neighborhoods. The region's transformation has been shaped by a confluence of historical infrastructure, financial incentives, and strategic location near Washington, D.C. Scholars have highlighted how Northern Virginia's rise as a data hub is rooted in its deep connectivity to global networks, facilitated by dense fiber optic corridors and a reliable energy grid (Fard, 2024; Rosati et al., 2023). The interplay of local policies and real estate investment

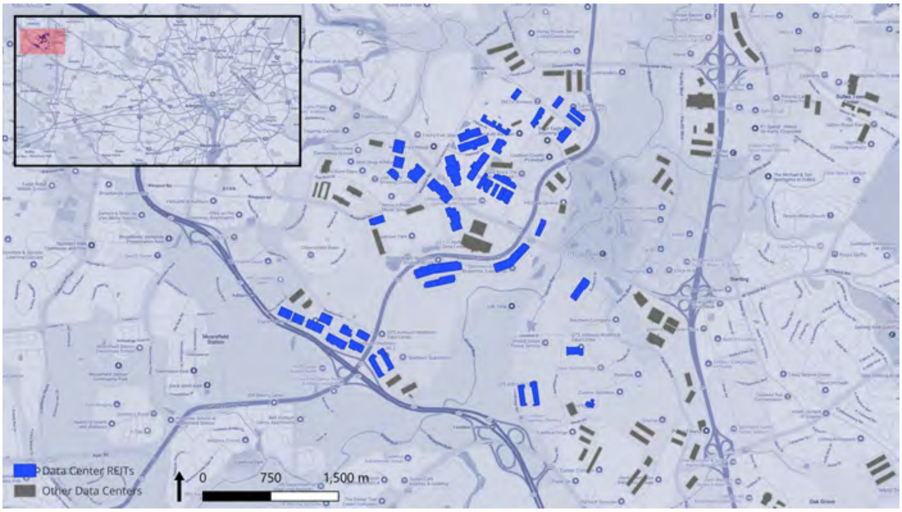

FIGURE 7.1
Data center REITs make up a significant portion of data centers in the Ashburn, Virginia area. Data compiled from Baxtel (2025), DataCenterMap.com (Data Center Map, 2025), and author fieldwork in November 2024.

has accelerated this growth, embedding data centers into the financial and spatial fabric of the region. As a result, the area has become an archetype of how financialized digital infrastructure reshapes peripheral urban geographies, creating new forms of economic dependency and spatial organization.

Fieldwork conducted over two days in November 2024 provided firsthand insights into the material presence and spatial impact of data centers in the region. The scale and security of these facilities stood in stark contrast to their surroundings. Unlike traditional suburban developments characterized by strip malls and residential communities, the region's data centers presented an aesthetic of industrial fortification: high fences, security checkpoints, and a conspicuous absence of human presence (see Figure 7.2). At one site, we were told we had to leave the premises after two security guards approached us, reinforcing the sense of restricted access and securitization that defines these infrastructures. The sheer number of ongoing construction projects indicated the rapid expansion of the industry, with cranes, excavators, and construction crews scattered across multiple locations (see Figure 7.3). Many data centers were built adjacent to new development projects by the same REITs, emphasizing the speculative nature of these investments and the expectation of continued demand.

Despite their utilitarian design, data centers are not isolated from the everyday spaces of suburban life. Observations revealed their adjacency to a variety of land uses, from apartment complexes and townhomes to entertainment districts and high-end residential developments. This juxtaposition

FIGURE 7.2
Data centers are heavily patrolled and securitized, some even with double fencing, as seen here from a data center in Northern Virginia. Picture taken by the authors.

FIGURE 7.3
Construction crews worked not just on building more data centers but also on the below surface infrastructure that they rely on. Picture taken by the authors.

FIGURE 7.4
Data and networking infrastructure are in high demand, as seen by signs posted throughout Northern Virginia stating, "We Buy Cisco, Ciena, Juniper," referring to the makers of data and networking hardware. Picture taken by the authors.

was particularly striking in the wealthier areas of Northern Virginia, where data centers coexisted with gated communities and highly manicured landscapes. Unlike lower-income urban neighborhoods in the mid-Atlantic where real estate speculation typically manifests in signs such as "We Buy Homes" or "We Pay Cash for Homes," suburban Northern Virginia featured a different kind of speculative economy – one marked by signs stating, "We Buy Cisco," referencing the secondary market for networking hardware (see Figure 7.4). This signage reflected the broader integration of data infrastructure into speculative financial circuits, where both real estate and technology assets are continually bought, sold, and repurposed.

The integration of data centers into suburban landscapes also raises questions about their environmental and infrastructural impact. The environmental and infrastructural consequences of data center growth are significant and increasingly visible. The expansion of data centers places substantial stress on public utilities and local infrastructure, often requiring major investments in energy supply, water cooling, and network connectivity. These costs are frequently socialized, with municipalities subsidizing electricity or permitting resource-intensive operations. Notable examples include the use of river water for cooling, increased CO_2 emissions, and experiments with alternative energy sources such as nuclear reactors by companies like Alphabet.

The relationship between AI computation, energy consumption, and efficiency is increasingly scrutinized, raising questions about the sustainability of current growth trajectories.

In our fieldwork, the noise from these facilities was a striking feature of the landscape; exhaust systems produced a constant hum that was especially loud near an apartment complex we visited, underscoring the ways in which these facilities alter the sensory experience of nearby residents. Roads surrounding the facilities were heavily trafficked with construction vehicles, and large swaths of land had been cleared for further expansion. These projects not only consume land at an unprecedented rate but also place significant strain on local energy and water resources. The visibility of Tesla Cybertrucks with stickers for electrical repair and networking services underscored the industry's reliance on specialized labor and technical expertise, reinforcing the entanglement between data infrastructure and broader supply chains of energy and digital services. Beyond environmental impacts, the social and economic effects on local communities also deserve attention. While data centers require relatively few on-site workers compared to other forms of real estate, their presence can reshape local labor markets and community relations. The influx of high-value infrastructure may generate limited direct employment but can have broader effects on housing, public services, and local economies, sometimes exacerbating inequalities or generating resistance from affected communities. The proliferation of data centers in the region is thus not simply an issue of land use but of resource allocation and environmental sustainability.

The presence of data centers in Northern Virginia has become a topic of public concern, as reflected in local news coverage and resident feedback (Halper and O'Donovan, 2024; Levy, 2025; Olivo and Neff, 2024). While proponents emphasize the economic benefits, including job creation in construction and maintenance, critics highlight the disruption to local communities and environmental risks. The securitization and spatial dominance of these facilities, coupled with their ever-expanding footprint, have led to increased scrutiny over zoning policies and corporate incentives, including development and revenue tax breaks (Mangum et al., 2020). Field observations confirmed the colocation (see Figure 7.5) and resulting tensions between the financial priorities driving data center expansion and the lived realities of those residing in their shadow. This ongoing transformation underscores the need for critical engagement with the socio-spatial consequences of financialized digital infrastructure, particularly as AI-driven demand accelerates the commodification of land and technological assets in peripheral regions.

While the expansion of data centers is framed as an economic win for host communities, the financial rewards flow primarily to REIT shareholders and tech companies rather than to local residents. Despite their proximity to these facilities, those living alongside data centers see little direct economic benefit, instead experiencing the downsides of industrial-scale infrastructure in their neighborhoods. The profits generated by these facilities are extracted from the land and funneled into global financial markets, reinforcing the

FIGURE 7.5
Apartment buildings near data centers with fencing and security visible. Picture taken by the authors.

disparities between capital accumulation at the corporate level and the material conditions of those who cohabitate with the data centers. This dynamic exemplifies the broader logic of financialized urbanization, where infrastructure serves as an asset for distant investors while shaping the lived experiences of those at the periphery of digital capitalism.

Although Northern Virginia serves as a leading example, it is important to recognize that similar dynamics are unfolding in global data center hubs such as Singapore (Neilson and Notley, 2019), Dublin (Brodie, 2024), and Amsterdam (Monstadt and Saltzman, 2025). Each region presents unique regulatory, infrastructural, and market conditions, but all reflect the growing centrality of digital infrastructure in urban and economic development.

7.4 Making Sense of Data Center REITs: Data Rent and Computational Rent

While data centers are not necessarily new, the scale and intensity of data and computation needs are unprecedented, fueling a data center boom that consumes vast tracts of land in peri-urban areas. As we've shown, Northern Virginia exemplifies this phenomenon, having transformed from a landscape of suburban residential neighborhoods and open farmland into a hub for hyperscale data centers. Our fieldwork revealed relentless construction activity, with cranes, bulldozers, and excavation equipment scattered across multiple sites, underscoring the urgency of expansion to accommodate AI-driven workloads. This surge in infrastructure development is not merely a technical necessity but also a reflection of broader financial dynamics.

Data center REITs have played a pivotal role in this transformation, turning data centers into financial instruments. By commodifying land and infrastructure, these financial entities fuel speculative investments, further embedding data centers into the circuits of digital capitalism. As a result, land that might once have been allocated to residential or commercial purposes is increasingly absorbed into the expansion of digital infrastructure, reinforcing the dominance of profit-driven real estate logics over long-term urban and environmental planning.

The rise of AI has dramatically reshaped the economic value of data and compute resources, introducing new forms of financialized rent generation that underpin the digital economy. The emergence of data rent – the revenue derived from storing, managing, and transmitting vast quantities of digital information – reflects the monetization of the infrastructure required to sustain AI's continuous extraction of data. Simultaneously, computational rent arises from the processing power necessary for AI platforms, such as LLMs, to function.

These forms of rent illustrate how AI has intensified the commodification of infrastructure, embedding digital activity into both the financial and physical landscape. This dynamic exemplifies how AI's infrastructural footprint is not just about technical capability but also about who captures the value produced by this expansion, deepening the inequalities embedded in digital capitalism.

TABLE 7.1

Summary of the Differences between Traditional Real Estate Rent, Data Rent, and Computational Rent

Type of Rent	Source of Value	Spatial Anchor	Key Actors	Example Mechanisms
Traditional Rent	Land/space	Urban, Residential, retail	Landlords, tenants	Lease agreements, zoning
Data Rent	Data storage/ transmission	Proximity to networks	REITs, tech firms	Colocation fees, connectivity
Computational Rent	Compute power	Near AI/cloud clusters	REITs, cloud providers	GPU leasing, power contracts

7.4.1 Data Rent, Computation Rent, and AI

Data rent capitalizes on the inherent value of storing and transmitting information, a cornerstone of AI operations. As AI platforms rely on ever-growing datasets to train and refine their models, the demand for reliable, scalable data storage has surged. Data centers have become the physical manifestation of this need, functioning as repositories for digital information that clients – from tech companies to governments – depend on. These centers charge for the space and services they provide, monetizing the act of storing and safeguarding data. This system thrives on centralization. Entities controlling data storage infrastructure wield significant power over digital capital flows, reinforcing their economic and strategic dominance. For example, data centers near major urban markets like Northern Virginia are positioned to minimize latency and enhance efficiency, making them prime sites for businesses reliant on real-time data access. These locations amplify the economic value of infrastructure, creating a concentrated geography of corporate wealth and influence.

Computational rent arises from the specialized processing power required to support AI systems. LLMs and other AI applications depend on hyperscale computing, including advanced GPUs and AI-specific hardware, to process trillions of parameters. This infrastructure incurs significant costs, from maintenance to energy consumption, which are passed on to AI companies and their clients. The scarcity of high-performance compute resources and the speculative scramble to meet demands ensure that providers can command premium prices, embedding computational rent as a core component of digital capitalism. The relationship between computational rent and data rent is spatially anchored in the clustering of data centers near AI training facilities. Proximity between massive datasets and the high-powered processors needed to train AI models reduces latency and improves overall system efficiency. As training AI models requires constant access to vast quantities of stored data, keeping storage and computation within the same physical region accelerates data retrieval, minimizes bandwidth constraints, and decreases operational lag. This is particularly critical for deep learning applications, where iterative adjustments to models depend on the rapid movement of data between storage and processing units. The closer the data is to the computation, the faster AI systems can be trained, refined, and deployed, making co-location a competitive advantage for tech firms and cloud providers.

The clustering of data centers in specific geographies is not merely a byproduct of financial speculation but a functional necessity for optimizing AI performance. As computational demand grows, so too does the need for land to house the infrastructure required to support AI training and deployment. The financialization of data centers transforms land into a strategic resource, attracting investment and reshaping peri-urban landscapes into hubs of digital production. This process drives up land values and reconfigures space, often at the expense of prior land uses, whether residential, agricultural, or commercial. AI's reliance on massive computational resources embeds digital capitalism into the physical environment, integrating financialized circuits of rent extraction directly into urban and regional development.

7.4.2 Feedback Loops between Data, Computation, Space, and Nature

The interdependence of data rent and computational rent creates reinforcing feedback loops that accelerate the expansion of digital infrastructure. As AI models grow more complex, they require increasingly large datasets for training, which in turn necessitates greater storage and processing capacity (Amvrosiadis et al., 2019). This cycle fuels exponential demand for data centers, embedding them further within global economic and technological circulations. Simultaneously, AI platforms generate new data through their operation, which not only refines existing models but also opens avenues for monetization through targeted advertising, predictive analytics, and other secondary uses (Citrome, 2014). The continuous production and consumption of data ensure that AI's infrastructure remains indispensable, further entrenching the demand for land and energy resources to sustain its expansion. Data and computational rents transform physical space into strategic assets, concentrating investment in locations where connectivity, energy availability, and urban proximity maximize efficiency (Lorenzo-Eiroa, 2023). These clusters reinforce the financialization of land, embedding data centers into the logic of real estate speculation and corporate asset management.

The financialization of data centers through REITs is not an abstract process; it materializes in specific locations, transforming landscapes and producing new spatial demands. Data and computational rent are not extracted in isolation but are embedded in physical land, where data centers require vast tracts of space for servers, cooling systems, and high-voltage connectivity. As data centers cluster in strategic locations, financial capital flows into these geographies, reshaping land markets and intensifying pressures on surrounding municipal and regional infrastructure. The financialization of digital infrastructure means that land itself becomes a speculative asset, as REITs acquire, develop, and lease properties not only for their immediate use-value but for their long-term investment potential. This process prioritizes profitability over local needs, often driving up land values, altering zoning laws, and increasing demands on energy and water resources. The clustering of data centers in regions like Northern Virginia reflects how digital capitalism does not simply operate in placeless networks but instead consolidates in specific urban-peripheral landscapes. As AI's appetite for computation grows, so too does the demand for land, embedding financial speculation directly into the built environment, where the logic of rent extraction extends beyond data and computation to the very ground on which these infrastructures stand.

The entrenchment of data and computational rent within digital capitalism reveals the material stakes of AI's expansion. The growing demand for computation is not just an abstract economic process but one that reshapes physical landscapes, restructures land markets, and prioritizes speculative investment over long-term urban and environmental planning. As AI models grow in complexity, the infrastructure supporting them becomes ever more indispensable, reinforcing the necessity of data centers while simultaneously deepening financial extraction from land, energy, and local resources. This dynamic not only accelerates the centralization of corporate wealth and influence but also underscores the uneven distribution of costs and benefits: while REITs and tech firms profit from AI's infrastructural footprint, local communities bear the burden of environmental strain, spatial disruption, and rising land values. In this way, the expansion of AI is inseparable from the financialization of the built environment, embedding digital capitalism into the urban periphery and cementing the centrality of rent extraction in the digital economy.

7.5 Conclusion: AI and the Future of Land and Urbanization

The restructuring of urban and suburban geographies to accommodate AI's infrastructure represents a profound shift in the organization of economic space. Just as postwar suburbanization was fueled by the decentralization of industrial and corporate employment away from city centers – facilitated by financial incentives, state-backed mortgages, and large-scale infrastructure projects (Ceruzzi, 2008; Garreau, 2011; Graham and Marvin, 2001; Wright, 1983) – contemporary data center expansion parallels this process in and for the digital economy. Rather than solely housing workers commuting to urban cores, today's suburban peripheries house the compute power required for the AI systems that increasingly shape urban life. The urban economy remains dependent on the infrastructure that lies beyond it, as AI-driven applications, cloud computing, and data-intensive services rely on the storage and processing capacities of these suburban digital enclaves. This division of space underscores how digital capitalism is not placeless; rather, it produces and relies on new spatial configurations that bind urban consumption to suburban and rural production (Brodie, 2024; Cugurullo et al., 2023; Fard, 2024).

Yet, unlike mid-century suburbanization, which was largely tied to homeownership and the expansion of consumerism, the financialization of AI infrastructure extracts profit through land and computation without necessarily redistributing wealth to the regions that host these developments. The economic benefits of data center expansion accrue to institutional investors and REIT shareholders rather than to the communities in which these massive facilities are built. This patchy topography of value extraction mirrors broader shifts in the contemporary economy, where infrastructure increasingly serves as an asset class rather than a public good (Furlong, 2020).

The spatial logics of AI urbanism also reinforce the broader processes of enclosure and privatization within digital capitalism (e.g., Cugurullo et al. 2023). As the AI economy continues to expand, its infrastructural footprint will further entrench existing disparities in land use, economic power, and detrimental environmental consequences. Already, this economy is remaking the suburban and exurban landscape, turning vast areas into securitized, privately controlled infrastructural spaces that primarily serve corporate clients. These dynamic raises critical questions: How will cities adapt to a model of urbanization shaped not by human labor but by the logistical needs of digital infrastructure? Unlike industrial parks or suburban office complexes, which were often integrated into municipal economies through employment or tax bases, data centers function with minimal labor and limited community interaction. Their economic significance is not measured by local productivity but by their ability to facilitate the profit-making processes of financial markets and distant corporate entities. This transformation further erodes the traditional relationship between infrastructure, place, and economic participation, embedding speculative investment into the material landscapes of AI urbanization. Through field observations and mapping from Northern Virginia's Data Center Alley, we've highlighted the tangible impacts of this transformation, from the reconfiguration of land use to the social and environmental tensions it generates. The role of REITs in driving these changes underscores the need for policymakers to reconcile the economic benefits of data center development with its broader implications. Addressing these challenges requires moving beyond a technical understanding of AI toward a deeper interrogation of how digital capitalism restructures space, governance, and economic participation. In sum, a comprehensive framework for scholars must consider the cascading effects of financialization and digital infrastructure on physical spaces. This includes prioritizing environmental resilience, ensuring community involvement in development decisions, and balancing short-term economic gains with long-term societal well-being. Only by addressing these challenges can the interplay between AI, land, and urbanization be managed to create inclusive and sustainable futures.

In sum, data center REITs stand as paradigmatic examples of the financialization of digital infrastructure. Their distinct forms of rentiership and financial strategies – shaped by the material demands of power, land, and connectivity – set them apart from traditional real estate models and underscore the profound influence of global capital on the built environment. As digital capitalism continues to evolve, the stakes of these infrastructural transformations will only intensify.

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