

The Economic Impacts of Data Centers in Rural Communities: A Narrative Review

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Introduction

Data centers have become a focal point of economic development strategy in rural communities across the United States, with local and state governments offering substantial tax incentives and other inducements to attract this rapidly expanding industry. Recent research from the Pew Research Center found that while only 13% of existing data centers are located in rural places, 67% of proposed data centers are planned for rural areas (Seets and Radde, 2026). Proponents argue that data centers generate significant employment and community benefits, making them attractive anchors for rural economic revitalization (CBRE, 2024). These benefits are routinely echoed in the campaigns by data center developers and economic development organizations as they try to convince communities of the types of economic prosperity that could emerge due to this development. Take for example a hyperscale data center being developed for OpenAI and Oracle on hundreds of acres of land in rural Michigan, not far from the city of Ann Arbor, home to the University of Michigan. The proponents of this data center say it will create over 2,500 union construction jobs, 450 permanent jobs, and 1,500 jobs in the surrounding communities to support the project (Oracle, 2026).

However, as data centers emerge as essential infrastructure for artificial intelligence and cloud computing, a critical question arises: does this form of information infrastructure investment actually produce meaningful public benefits, particularly in the rural communities that host it? The majority of the economic benefits being advertised by developers are projections rather than known realities. Recent research has found positive employment effects, but several studies call into question the size and efficacy of the economic impact claims being made by modern data center developers, particularly for rural locations (Alvarez et al., 2026; Bahar & Wright, 2026; Yue & Zeng, 2026). Moreover, data centers raise environmental concerns and potentially have

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negative economic impacts on the local economy that require assessing trade-offs between positive and negative impacts (Alvarez et al., 2026). While the stated economic and community impacts and benefits could be substantial for rural communities where data centers are sited, it's important for us to understand whether these stated economic impacts are as impactful as we are led to believe. This is a particularly important point to interrogate as we see nationwide citizen backlash against data centers and their environmental and land-based impacts. If economic and community impacts are what communities are set to receive in a tradeoff for land and environmental impacts, communities need to reliably and factually understand what they are receiving in the form of economic benefits.

Economic and community impacts are just a few of the issues facing wide scale data center development today. Other externalities, including those mentioned above, such as environmental impacts, impacts on electrical grid and water infrastructure, and the role of noise pollution, are also key to a holistic understanding of the relationship between data centers and the communities that host them. For the purposes of this paper, we specifically focus on economic effects and the community impacts that can help bolster economic impacts. We would point readers to other sources that discuss things like environmental impacts (Lifset et al., 2025) and infrastructure impacts (Shehabi et al., 2024).

To achieve our ends, this paper presents findings from a narrative review (Sukhera, 2022) of 206 documents, including academic articles, white papers, industry reports, grey literature, and industry publications, of which 51 addressed economic impacts and informed our analysis. Drawing on infrastructure studies and community and economic development frameworks, we ask: what are the economic impacts of data centers in rural U.S. communities? We examine two sub-questions: (1) what are the real and perceived impacts on job creation, and (2) what types of community benefits do data center developments actually produce?

The paper continues as follows: first, we describe our method, including the development of our corpus and our selection process for inclusion and exclusion. Second, we present our findings which focus on two areas: 1) employment, particularly job growth and economic multipliers, and 2) community benefits, particularly local tax impact and the role of Community Benefits Agreements in capturing economic benefits. Third and finally, our discussion section situated our findings within broader conversations about unequal digital development and the role that rural communities play in hosting infrastructure they may not benefit from. We conclude with a call for stronger evidence and policy frameworks that account for the uneven capture of benefits and the uneven incidence of costs of digital infrastructure projects.

Method

This study uses a narrative review to examine how existing literature characterizes the economic and community impacts of data center development in rural U.S. communities (Sukhera, 2022). A narrative review is appropriate because research in this area is limited and draws on a wide range of sources. In addition to peer-reviewed scholarship, much of the discussion surrounding data center development appears in gray literature, including policy reports, industry white papers, consulting reports, economic development briefs, and journalistic analyses. These sources play an important role in shaping how data centers are understood as economic development strategies and therefore are included in the analysis.

Unlike a systematic review, a narrative review is not intended to identify every publication meeting a fixed set of inclusion criteria. Instead, it seeks to synthesize a diverse body of literature, identify recurring themes, and clarify areas of agreement, disagreement, and uncertainty (Sukhera, 2022). This approach is well suited to the present study because the available evidence is methodologically diverse, including economic impact assessments, case studies, policy analyses, and a small but growing body of causal empirical research. A narrative review also allows industry and policy documents to be examined alongside academic research while recognizing that these sources differ in their purpose and evidentiary strength.

Search Process and Corpus

Literature searches were conducted iteratively using Google Scholar, through targeted web searches, and selectively on academic databases using EBSCO. Because large-scale cloud computing and hyperscale data center development emerged primarily after 2000, searches were limited to publications released from 2000 onward. Search terms included combinations of *data centers*, *rural economic development*, *economic impact*, *job creation*, *community development*, and *tax incentives*. Additional documents were identified through backward citation searching.

Documents were included if they substantially examined data centers as mechanisms for economic development, local investment, employment, fiscal impacts, or community growth in rural or non-metropolitan communities. Documents focused primarily on environmental sustainability, electricity demand, water consumption, cooling technologies, carbon emissions, or electronic waste were excluded. This decision reflects the analytical focus of the study on the economic narratives and evidence surrounding rural development rather than the environmental consequences of data center expansion. We recognize that these repercussions also have economic effects, especially when considering development tradeoffs, but do not explore them in this paper in detail.

The initial search identified 206 documents. Following title, abstract, and full-text screening, 51 documents met the inclusion criteria for the final review. Most excluded documents focused primarily on technical engineering questions or environmental impacts rather than community-level economic outcomes. The final corpus includes peer-reviewed scholarship as well as gray literature from industry, government agencies, consulting firms, economic development organizations, think tanks, and trade publications. This diversity reflects the current state of knowledge in which many of the claims shaping public debate originate outside the academic literature.

Analysis

Analysis followed an interpretive qualitative approach. Each document was read in its entirety to identify its central claims, assumptions, and framing of rural economic development. Particular attention was given to how documents characterized anticipated economic benefits, employment effects, fiscal impacts, infrastructure investments, workforce development, community trade-offs, and the broader narratives used to justify data center development.

These initial readings informed the development of a structured codebook that guided qualitative coding in ATLAS.ti. Coding focused on identifying recurring claims and patterns of interpretation rather than measuring the frequency of specific terms or arguments.

Coding was conducted by the first author. To strengthen interpretive rigor, approximately 40% of the coded excerpts were independently reviewed by the last author. Differences in interpretation were discussed and resolved through iterative refinement of the coding framework. Table 1 summarizes the final review corpus by source type.

Table 1. Final review corpus by publication type

Source Type	n	Representative Sources
Peer-reviewed journal articles & conference proceedings	8	Mayer (2023); Mayer & Velkova (2023); Hogan (2015); Greenstein & Fang (2025); Ngata et al. (2025); Ashmead & Kelly (2023); Miller et al. (2025); Yue & Zeng (2026)
Scholarly book chapters	2	Bueno Sousa (2012); Inshakova & Kachalov (2022)
Working papers and preprints	1	Alvarez et al. (2026)
Industry and consultancy reports	16	Mangum Economics (NE, AZ, GA, IL); PwC (2025, two reports); SRC EvalMetrics/Ohio Chamber Foundation (2025); Johnson Economics; Krebs & Tivnon/ECONorthwest; Sage Policy Group; U.S. Chamber of Commerce Technology Engagement Center (2020); AWS; BCG; Golden Shovel; CBRE

Trade press and industry media	6	Manufacturing Dive; IEEE Spectrum; DataCenterKnowledge; Technical.ly; IMPLAN Support
Policy reports, think tanks, and advocacy organizations	9	Bahar & Wright (2026); Turner Lee & West (2025); Goetzel, Muro, & Methkupally (2026); Pipa & Aley (2026); Hicks (2025); Center for Public Enterprise; Ohio River Valley Institute; James Madison Institute; Tech Policy Press
Trade and economic development organizations	4	Northern Virginia Technology Council; International Economic Development Council; U.S. Chamber of Commerce C_TEC; The Right Place
Government and independent research organizations	5	Federal Reserve Bank of Richmond; Pew Research Center; University of Nebraska (Thompson, 2019); Weldon Cooper Center (UVA); Gerald R. Ford School of Public Policy (Michigan)
TOTAL	51	

Results

Employment

Employment is the primary economic benefit emphasized in proposals for new data center developments. Public announcements and economic development materials routinely foreground projected job creation as evidence that a facility will generate lasting local prosperity (Day, 2017; Mahan, 2025). The prominence of these employment claims raises a straightforward question: what does the broader empirical literature suggest about the employment impacts of data centers, and to what extent do widely cited projections align with observed outcomes? To answer this question, we distinguish among four forms of employment evidence examined in the literature: construction employment, operational employment, multiplier-based estimates of indirect and induced jobs, and causal evaluations of realized employment effects.

Construction Employment

Construction employment is typically the largest and most visible employment benefit associated with new data center developments. Data centers come in a range of sizes, from microdatacenters to midsize and hyperscale data centers, and operational characteristics, such as reliability and sustainability, that impact their construction time and related employment effects. Public projections for a single facility commonly fall in the 1,500–1,700 range (Johnson Economics, 2025; Day, 2017), well below the 2,500 construction jobs claimed for the Oracle/OpenAI Michigan facility discussed above. These figures are also rarely differentiated by facility size, and it is often unclear whether they refer to job-years, peak construction employment, or the total number of individuals employed over the course of a project. Industry reports rarely make these distinctions explicit, making it difficult to compare estimates across sources. Considerably larger

figures are sometimes reported when employment is aggregated across multiple projects or an entire regional industry (Northern Virginia Technology Council, 2024; see Table 2 for industry-reported estimates and Table 3 for independent and government analyses). These estimates are not directly comparable, however, as they differ in both the unit of analysis and the methods used to generate them. More importantly, most represent prospective economic projections rather than realized employment outcomes.

Independent analyses of individual projects present a more complicated picture than either industry projections or a simple characterization of construction employment as "modest" would suggest. Thompson's (2019) IMPLAN analysis of four completed hyperscale-era data centers in Sarpy County, Nebraska—including a 2.6-million-square-foot Facebook facility developed over several years alongside three smaller data centers—estimated approximately 9,627 direct construction job-years across the four facilities, or about 2,400 job-years per facility on average. This estimate exceeds the industry-reported figures discussed above. By contrast, Hicks's (2025) difference-in-differences analysis of Texas counties from 2001 to 2024 found a statistically significant increase of approximately 195 non-residential construction jobs for each data center developed. Although these studies use different methods and measure construction employment in different ways, both suggest that construction impacts are more nuanced than the headline projections commonly cited in economic development materials. Two additional causal studies reinforce this temporal pattern, though using a different metric. Alvarez et al. (2026) find a construction employment effect that shrinks from 60.0% in 2005 to 7.1% by 2020 relative to a modeled county baseline, and Bahar and Wright (2026) find an 11% increase in the six years following a county's first large facility. Neither reports a raw job count comparable to Thompson's or Hicks's figures, but both independently confirm that construction employment effects are front-loaded and diminish once the build-out phase ends.

The contrast between these findings is informative, but it also reflects differences in what each study is actually measuring. Hicks's Texas sample spans facilities built during a period when the industry was shifting from smaller enterprise and colocation facilities toward the hyperscale campuses that now dominate new construction (Greenstein & Fang, 2025). Because his estimates are not broken down by facility type, they likely average across projects with substantially different construction needs. Thompson, in contrast, examines a single, large hyperscale cluster at one point in time. Neither study, therefore, offers a "typical" estimate of construction employment that can be generalized across the diverse projects now being developed in rural communities. This limitation applies not only to these empirical studies but also to the industry projections they are compared against.

Even where construction employment is substantial, two characteristics limit its long-term contribution to rural labor markets. First, construction employment is inherently temporary, typically lasting only during the 18- to 24-month construction period before declining sharply once facilities become operational (Mayer, 2023). Some larger scale data centers may have

staggered construction phases so construction employment may be spread over a longer period, without necessarily increasing its total local benefit. Second, a considerable share of construction-related spending does not translate into employment for workers in the host community. It is important to understand how much of the effect will remain local or regional, which depends heavily on the presence of complementary business activities. IMPLAN guidance suggests that only a small proportion of total capital expenditures uses local construction labor, while much of the investment is directed toward specialized equipment, servers, electrical infrastructure, and contractors located outside the region (O'Leary, 2025). Mayer's (2023) analysis of Google's Groningen, Netherlands, data center illustrates this dynamic, documenting extensive reliance on temporary workers recruited from outside the local labor market.

Overall, the available evidence suggests that construction employment is a meaningful but highly variable economic benefit. Its magnitude might depend on factors such as facility scale, the period in which the project was built, and the capacity of the host region's labor market. Yet these differences are rarely reflected in public job projections. The proposed Oracle/OpenAI facility in Michigan, for instance, is expected to generate 2,500 construction jobs—well above Thompson's estimate for a large hyperscale cluster and substantially higher than Hicks's causal estimate of approximately 195 jobs per facility. The comparison highlights the gap between headline projections and what independent empirical research has found for similar developments.

Employment during Operation

Ongoing employment is the category for which the empirical evidence is most consistent. Across independent studies, operational data centers employ relatively few workers once construction is complete. Early evidence from Google-hosting communities found that facilities typically employed approximately 45 permanent workers (Bueno Sousa, 2012). More recent studies reach similar conclusions at larger geographic scales. In Northern Virginia, home to the world's largest concentration of data centers, direct data center employment accounted for less than 0.5% of the regional workforce (Ngata et al., 2025). Statewide estimates are similarly modest: Virginia's data center industry directly employed approximately 5,500 workers in 2021, representing only about 0.1% of the state's total workforce (Mullin, 2023).

Although the number of permanent positions is relatively small, these jobs are generally well compensated. Mullin (2023) reports that average wages in Virginia's data center industry were more than twice the statewide private-sector average. However, these positions also tend to require specialized technical skills and experience, raising questions about the extent to which they are filled by workers already residing in rural host communities rather than by employees recruited from elsewhere.

Evidence from individual communities further illustrates the uncertainty surrounding projected employment figures. Bueno Sousa's (2012) case study of three early Google data center locations found that, in two communities, Google ultimately chose not to claim state tax incentives rather

than meet employment thresholds tied to job creation. In another case, local officials reported that they were unable to independently verify the number of people employed at the facility. As one official explained, "there were job numbers thrown out there... but how many people they have working there? We don't know." Rather than suggesting that employment projections are necessarily inaccurate, these cases highlight the limited transparency surrounding realized employment outcomes once facilities become operational.

More contemporary measurements of permanent employment, such as that performed by Hicks (2025), find jobs in NAICS codes related to areas such as information services or data processing to have no statistical significant impact. Though the literature shared here should be taken cautiously in its conclusion. It suggests that permanent employment should not be understood as the primary mechanism through which data centers contribute to rural economic development. While the jobs that are created are often high paying, the total number of positions is consistently small relative to local labor markets, and there is limited independent evidence demonstrating that projected employment levels are routinely achieved or verified after facilities begin operation. While this may change in the future as the infrastructure evolves, current evidence suggests low to no permanent employment impacts.

Table 2. Industry / Consultant Projections

Source	Location/Scope	Project Size	Construction Jobs	Operational Jobs	Total Impact (Multiplier)
Data Center Coalition & PwC (2023)	USA, national	Mixed/composite — a national average spanning small to large facilities, not one real project	1,000–10,000 per campus	50–300 per campus	6× direct jobs
Day (2017), U.S. Chamber of Commerce	USA, "typical" facility	Medium-to-large "typical" facility (industry-standard composite for its era)	1,688	157/yr	N/A
Northern Virginia Technology Council / Mangum Economics (2024)	Virginia, statewide 2023	Not applicable	14,240	12,140	78,140 (3.5×)
SRC EvalMetrics (2025), Ohio Chamber of Commerce Research Foundation	Ohio, statewide 2024	Not applicable	—	—	95,217 total

Johnson Economics (2025)	Morrow County, (proposed exascale campus)	Exascale	1,500	560 direct	1,050 (560 + 490 indirect/induced; ~1.9×)
Krebs & Tivnon (2014), ECONorthwest	Prineville, OR (Facebook)	Large/hyperscale-era facility — one of Facebook's first purpose-built data centers, though modest by today's hyperscale standards (the campus later grew far larger; this study only covers its early phase)	—	—	3,592 OR workers total (2.4× jobs, 1.5× income)

Table 3. Independent / Government / Academic Descriptive Studies

Source	Location/Scope	Project Size	Construction Jobs	Operational Jobs	Total Impact (Multiplier)
JLARC (2024)	Virginia, statewide	Not applicable, statewide industry total, not a single project	3,000–5,000	100–400	6,000–8,000 (~1.3–2×)
Thompson (2019)	Sarpy County, NE (4 facilities)	one 2,600,000 sq ft Facebook facility, plus three smaller facilities (Fidelity, Travelers, Yahoo) each 100,000–200,000 sq ft	9,627 direct	430 direct	Construction: 16,551 (~1.7×); Operations: 1,899/yr (4.4×)
Mullin (2023), Richmond Fed	Virginia, statewide 2021	Not applicable, statewide industry total, not a single project	—	5,500 (0.1% of state workforce)	—
O'Leary (2025), Ohio River Valley Institute	Pennsylvania, statewide	Not applicable, statewide industry total, not a single project	—	15,525–18,270 (~27–111 per facility)	—

Ngata et al. (2025)	Northern Virginia	Not a single project; "Data Center Alley" is a dense, multi-facility regional cluster	—	<0.5% of local workforce	—
Bueno Sousa (2012)	3 early Google host communities (Goose Creek SC, Council Bluffs IA, Pryor OK)	—	—	~45/facility	—

Note: reported job figures in this table are drawn from source materials that rarely specify whether counts represent job-years, peak concurrent employment during construction, or total distinct individuals employed at any point in a project. This ambiguity is itself a limitation of the underlying literature; the absence of standardized units complicates any direct comparison across studies, including the comparisons in this table.

Relationship to Rural Labor Environments

The ability to capture the employment impacts in a rural labor environment are further complicated. Construction jobs are notoriously mobile, especially with respect to large infrastructure projects that require a variety of specialized trades. While not as severe as the phenomenon of “fly-in, fly-out” employment we see in areas like oil and gas in which employees fly into work sites from far away (Storey, 2010), data center construction jobs largely do not go to local laborers. Reporting from the New York Times in 2024 on data center boom towns in Washington found that electricians helping build the data centers were largely from outside the region (Weise, 2024). An economic development organization in rural New York estimated that 60% of jobs for their data center project were going to come from outside their 14 county region (Tarczynska, 2026). Even organizations who specialize in connecting skilled trades people to projects are sounding the alarm that local labor markets don’t fulfill the needs of data center projects. (FlexTrades, 2026). We would expect similar results in long-term, operational jobs of data centers, which are highly specialized and technical - an attribute typically underrepresented in the rural workforce. This is confirmed by the work of Yue and Zeng (2026), who find local job impacts of data centers to be negligible in rural counties, while simultaneously finding significant increases in employment and other economic indicators in metropolitan areas.

This should not be a surprise, as there is plenty of historical evidence for this exact same phenomenon in other types of booms. For example, wind and solar development of the past decade has had similar problems. Researchers at the Midwest Energy Policy Institute found that 86% of labor on North Dakota’s wind projects at the time of writing in 2020 came from non-local sources and other wind projects in Minnesota had similar employment disparities (Gigstad and Manzo, 2020). Further evidence from large scale, rural construction projects in the

1970s also shows similar deployment of non-local labor (Chalmers, 1977). Taken together, we can see that the promises of jobs for rural communities as part of the economic impact of data centers is largely erroneous. While there are some employment benefits, those employment benefits largely accrue to non-local labor.

A broader ecosystem strategy focused on training local residents for data center jobs, potentially through a community benefits agreement, faces a fundamental constraint. The available evidence suggests that there are relatively few enduring jobs to train workers for (Bueno Sousa, 2012; Thompson, 2019; Hicks, 2025), and those positions are concentrated in a limited number of technical specialties, such as network operations and electrical systems maintenance. Moreover, Bahar and Wright (2026) find that meaningful information-sector employment gains emerge only when four or more data centers cluster within the same local economy, rather than from a single facility. Most rural communities considering a proposed data center are unlikely to experience development at that scale. As a result, workforce training may still be a worthwhile component of a community benefits agreement, but the current evidence does not support it as a solution to the limited long-term employment opportunities associated with a single data center.

Indirect and Induced Employment

Given that the number of enduring jobs created by data centers is relatively small, many assessments emphasize indirect and induced employment as evidence of broader regional economic benefits. These multiplier analyses are derived from input-output models of the economy that capture the ripple effects of data center construction and ongoing expenses (operation, maintenance, refurbishing) on suppliers and household consumption along the value chain.

Direct effects measure the effects of data center investment on revenue, employment, and taxes of their suppliers. Indirect effects estimate the additional economic impulses (revenues, employment, taxes) created by the spending of these firms to their own upstream suppliers. Some studies go further and examine induced effects, generated by the increased income of workers in these directly and indirectly implicated industries. Rather than measuring realized employment and other outcomes, multiplier analyses estimate the potential economic activity generated under a specified set of assumptions.

Knowledge of these effects contributes to understanding the economic impacts of a project, but multiplier studies have important limitations and drawbacks that often remain hidden. First, these effects are distributed spatially but multiplier analyses typically only report total effects. Only a share of these total will materialize locally while most will benefit suppliers at various distances across the country (leakage). All other things being equal, smaller and more remote areas will experience lower local/regional benefits and much higher leakage. Second, multiplier analyses

usually assume tacitly that suppliers and labor markets are not capacity constrained so that the additional spending will translate into economic activity without upward pressure on prices and wages. Third, modelers must make assumptions that are often based on judgment rather than solid evidence. For example, to assess induced effects, assumptions about the share of additional income that will be spent locally must be made. Finally, models generally do not consider the timeline over which direct, indirect, and induced effects materialize, and they do not systematically assess risks, such as the “crowding out” of other economic activities as a result of increasing prices, interest rates, or labor shortages.

As a consequence, reported employment multipliers vary substantially across studies. Industry-sponsored analyses commonly estimate between 2.4 and 7.4 additional jobs for every direct data center position (Krebs & Tivnon, 2014). Even among industry-commissioned studies, facility-specific multiplier estimates vary considerably: Johnson Economics' (2025) assessment of a proposed data center campus in Morrow County, Oregon estimated an employment multiplier of less than 1.9, near the lower end of the range reported anywhere in this literature. Independently modeled estimates land in a similar range. Thompson's (2019) retrospective analysis of Sarpy County, Nebraska found an operational multiplier of 4.4. Taken together, both industry-commissioned and independently modeled facility-specific multipliers in this review generally fall between 1.9 and 4.4, considerably below the industry-association range of up to 7.4 and further still below the largest figures circulating in public advocacy around proposed developments (critiqued in O'Leary, 2025).

The wide variation in reported multipliers thus reflects more than differences among projects. It also reflects differences in modeling assumptions, geographic scale, and the boundaries over which economic effects are calculated. Consequently, multiplier estimates should not be interpreted as directly comparable measures of economic impact. Instead, they provide projections of potential economic activity under particular economic conditions and assumptions.

Viewed collectively, multiplier studies suggest that data centers may generate economic activity extending beyond their direct workforce. At the same time, the substantial variation across reported estimates highlights the uncertainty surrounding the magnitude of these broader employment effects and underscores the importance of interpreting projected multiplier effects separately from realized employment outcomes.

Empirical and Statistical Evaluation of Economic Impacts

The strongest available evidence on data center employment comes from a small but growing body of causal studies (summarized in Table 4) that estimate realized labor market outcomes rather than projected economic impacts. Although these studies employ different research designs and reach somewhat different conclusions, they point toward a common pattern: data

centers can generate positive employment effects, but those effects are generally more modest and more context dependent than the totals suggested by prospective economic impact projections, which are designed to capture broader regional spillover that these causally-identified, county-level studies do not test for.

The available studies differ primarily in the contexts they examine and the methods they use to estimate employment effects. Bahar and Wright's (2026) synthetic control analysis argues that counties receiving data centers were already experiencing faster employment growth prior to facility construction. Consequently, simple comparisons between counties with and without data centers can overstate employment effects. Using synthetic controls to construct more appropriate comparison groups, they estimate that naïve comparisons overstate employment impacts by approximately a factor of three. Their analysis also demonstrates substantial variation by facility type, with hyperscale facilities generating measurable gains in information-sector employment, whereas colocation facilities produce construction activity with little evidence of longer-term information technology employment. They further find that counties hosting multiple facilities experience substantially larger information-sector gains than counties hosting only a single data center, suggesting that agglomeration effects emerge only after a regional technology ecosystem develops.

Hicks's (2025) difference-in-differences analysis of Texas counties identifies a statistically significant increase only in non-residential construction employment, finding no measurable long-term effect on overall county employment. Alvarez et al. (2026), using a national shift-share design, estimate a modest increase in total employment that becomes statistically insignificant after accounting for state-level policy differences. Yue and Zeng's (2026) facility-level difference-in-differences analysis similarly identifies positive employment and wage effects but finds that these benefits are concentrated almost entirely in metropolitan counties with established supplier networks and skilled labor pools. Employment spillovers in non-metropolitan counties were statistically indistinguishable from zero.

Two independent causal studies, using different data sources and methods, both find that facility type — hyperscale/Big Tech versus colocation/third-party — is a stronger predictor of local economic benefit than the presence of a data center alone (Bahar & Wright, 2026; Yue & Zeng, 2026)

Taken together, these studies suggest that the question is not whether data centers generate employment benefits, but under what conditions those benefits emerge. Across the causal literature, employment effects appear to depend on characteristics of both the facility and the host region, including the presence of specialized labor, supplier networks, and complementary economic activity. These conditions are more commonly found in metropolitan regions than in the rural communities that have become the primary locations for new data center development

(see Seets & Radde, 2026 who report that 67% of planned data centers are in rural areas and that 39% are planned in counties that currently do not have any).

The contrast between this body of evidence and commonly cited employment projections is instructive. Developers and industry associations routinely cite figures at both the facility and state level — the Oracle/OpenAI Michigan facility's claimed 2,500 construction jobs and 450 permanent jobs (Oracle, 2026), the Northern Virginia Technology Council's (2024) statewide total of 78,140 jobs supported by Virginia's data center industry, or the Ohio Chamber Foundation's (SRC EvalMetrics, 2025) claim of 95,217 jobs statewide — as evidence of the scale of local economic benefit host communities can expect. The causal literature does not suggest that employment claims made during siting processes are impossible. Rather, it indicates that the magnitude and distribution of realized employment effects are substantially more uncertain than prospective projections often imply. For rural communities evaluating proposed developments, this distinction underscores the importance of viewing projected employment estimates as hypotheses to be tested against subsequent evidence rather than as established economic outcomes.

Table 4. Empirical Studies

Source	Location/Scope	Project Size	Construction Effect	Total Employment Effect
Hicks (2025)	Texas counties	Not disaggregated by facility size	+195 jobs (non-residential building construction only; statistically significant)	~No net effect (Information sector)
Alvarez et al. (2026)	National county panel, 1995–2020	Not disaggregated by facility size	+60.0% (2005), fading to +7.1% (2020)	+3.9% by 2020 (loses significance with state FE)
Bahar & Wright (2026)	National, 770 facilities	Facility type (hyperscale vs. colocation) reported; and clustering (single vs. 4+ facilities per county) are reported and are the paper's central scale-related findings	+11%	+4–5% total; hyperscale only for information-sector gains; 4+ facility counties see +23% info-sector growth, single-facility counties see none
Yue & Zeng (2026)	National, metro vs. non-metro counties	Facility type reported (Big Tech vs. third-party colocation)	—	+3.5% (metro counties only); "negligible" in non-metro counties

Community benefits

Tax Revenue

Tax revenue is the community benefit with the strongest evidentiary footing in this literature — real money does flow to host governments, and unlike employment claims, this is one area where independent studies and industry sources broadly agree on direction, if not magnitude. Ohio's data center industry generated \$2.6 billion in state and local tax revenue between 2017 and 2021 (Technology Council of West Michigan), and Virginia's, despite its tax incentives, contributed roughly \$600 million annually, with Loudoun County reporting \$8.60 in local tax revenue for every dollar of county spending tied to data centers (Technology Council of West Michigan, n.d.). Thompson's (2019) independent, retrospective analysis of Sarpy County, Nebraska corroborates this at the local level with unusual precision: after incentives ended, the county's four data centers produced a net fiscal *gain* of \$6.26 million annually for local government — though during the incentive period itself, that gain shrank to \$3.79 million, and the state government's own books ran a net fiscal *loss* of \$10.02 million per year during the same window, turning positive only after incentives expired.

That Sarpy County finding is the clearest evidence in our corpus that tax revenue benefits are real but timing-dependent, and it previews the tension this subsection returns to below: the same incentive structures that attract facilities also delay, and in some cases erase, the fiscal benefit they're meant to justify.

Indirect Spending Effects

Beyond direct tax capture, sources in this literature point to secondary spending, construction-period income tax, sales tax on equipment purchases, and induced household spending, as a further community benefit. Facebook's Prineville, Oregon operations generated close to \$500,000 in property taxes and over \$750,000 in personal state income taxes in 2013 alone, with more than \$6.5 million in state income taxes collected during the 2009–2013 construction period specifically (Krebs & Tivnon, 2014). Nebraska's statewide data center buildout produced a combined \$1.3 billion in tax revenue from roughly 490 permanent workers and 1,500 construction workers. These figures are consistent with the Employment section's finding that indirect spending tracks construction activity closely and operational activity more modestly — which means, structurally, that a large share of a facility's indirect fiscal benefit to a community front-loads into the same 18–24 month window as its temporary construction jobs, rather than recurring steadily over the facility's operating life.

Problematic Tax Abatement Limiting Impact

The deployment of property tax abatements as a development incentive could limit the positive impact of data center development for rural communities. Property tax abatements are typically given to industrial and other large scale development projects due to the impact of those developments on local labor environments. For example, in the State of Michigan, there is an

Industrial Facilities Exemption established in 1974 that provides manufacturers and those typically zoned as industrial use the ability to request a property tax abatement. These abatements were usually created because manufacturing facilities employed large numbers of people, so the tradeoffs still benefited the local community through local wages and the resulting spending from those employees. We are now seeing data center companies seek out those same types of property tax abatements. For example, in the development of a data center in a rural township in Michigan at the time of writing, an Oracle/OpenAI data center developer recently requested a 50% property tax abatement. Given that data centers support lower long-term local jobs, tax abatement could greatly limit the positive monetary impacts that data center development has on the local communities that host them. In doing so, communities would be giving up financial security, leaving primarily negative impact.

Community Benefits Agreements

Community Benefits Agreements (CBAs) — legally binding contracts negotiated directly between developers and host communities, distinct from and often layered on top of standard tax incentive packages — are increasingly discussed as a tool for capturing benefit more directly and durably than tax revenue alone can guarantee (Paudel, 2026). Where they exist, they can be specific: a Lancaster County, Pennsylvania, CBA required its data center developer to contribute \$10 million plus \$250,000 to a county community foundation, in installments before construction and after operations began, alongside a detailed e-waste management plan (Nolette, 2026). But the same analysis of that agreement found significant enforceability gaps: language requiring the developer to "reasonably maximize" rainwater capture or design for climate resiliency "where feasible" is difficult to hold anyone to, and the committee empowered to direct the community foundation's use of funds does not include a direct community representative.

Limited Evidence of CBAs

Community benefits agreements are a relatively new phenomenon in the world of planning and development, so there is no evidence of impact of CBAs in data center development. Though, we have some preliminary and limited evidence of their effectiveness in other development domains. For example, research on CBAs in Los Angeles found that there was technical compliance with CBAs by developers, though it's difficult to ascertain whether some of the positive impacts (e.g., increase in living wage jobs) can be attributed to the CBAs or broader shifts in local employment (Marantz, 2015). Researchers from McMaster University similarly find successful compliance with CBAs across multiple countries (Olatoye et al., 2019). Though, as Marantz (2015) argues, technical compliance does not always lead to evidence of real impact given the difficulty of identifying causal pathways for development. Further, the evidence of CBA effectiveness is entirely out of urban projects. To our knowledge, there are no studies available that have evaluated the effectiveness or technical compliance of CBAs in rural contexts. This is largely an artifact of the CBA landscape, which largely resides in the urban planning realm. We would hope

to see more work on CBA effectiveness for data centers, as well as wind and solar development, that would help us better understand these tactics for rural communities.

Open questions

Spillover effects

Two kinds of spillover recur across the causal literature without being fully resolved, and both bear directly on how confidently this paper's findings can be applied to a specific rural site.

The first is geographic spillover to neighboring, non-host counties, largely untested in data center research specifically. Alvarez et al. (2026) find statistically significant effects on house prices (+17.7% by 2020) in host counties, but their design does not test whether his or other pressures extend into adjacent counties that share a labor market or a power grid without hosting a facility themselves. This matters most in rural contexts, where a single facility may draw workers, water, or electricity from a wider surrounding region than the county line implies, potentially spreading costs beyond the jurisdiction receiving the tax revenue.

The second concerns economic spillovers within the local economy. Existing evidence suggests that employment gains depend not only on the presence of a data center but also on broader regional conditions. For example, Bahar and Wright (2026) find substantially larger information-sector employment gains in counties hosting multiple facilities than in counties with only a single data center, while Yue and Zeng (2026) report that employment benefits are concentrated primarily in metropolitan areas with established supplier networks and skilled labor pools. Together, these findings raise important questions about whether similar spillover effects can be expected in rural communities that typically host only a single facility. Future research should examine the conditions under which data centers stimulate broader regional economic activity beyond their direct employment effects.

Discussion

Weak empirical evidence of economic impact

The existing literature provides evidence that data center development can generate local economic benefits. Construction activity creates temporary employment, operating facilities contribute to local tax bases, and expenditures associated with construction and operation stimulate additional economic activity through local supply chains. However, the available evidence provides considerably less agreement regarding the magnitude and distribution of these benefits than is often reflected in public discussions surrounding proposed developments.

Part of this uncertainty reflects differences in the methods used to estimate economic impacts. Much of the existing literature relies on input-output and multiplier models, which estimate the potential economic activity generated by construction and operation under a set of assumptions regarding supplier relationships, household spending, and regional economic structure. As discussed in the previous section, these models provide useful estimates of potential economic effects but do not measure realized outcomes. Their results are particularly sensitive to assumptions regarding local supply chains and economic leakage—factors that are likely to differ substantially across rural communities. Consistent with these limitations, the multiplier estimates reviewed in this paper vary considerably.

The smaller body of retrospective and causal research presents a more mixed picture. Hicks (2025) finds no statistically discernible net employment effects associated with data center development in Texas once gross job gains are evaluated alongside losses in other sectors. Alvarez et al. (2026) identify modest positive employment effects that disappear once state policy differences are taken into account. Bahar and Wright (2026) report stronger gains for hyperscale facilities than for colocation facilities, while Yue and Zeng (2026) find that measurable employment and wage effects are concentrated primarily in metropolitan counties with established supplier networks and specialized labor markets. The disagreement across these studies is itself informative. Rather than converging on a single estimate of economic impact, the available evidence suggests that realized benefits depend on regional economic conditions, facility characteristics, and institutional context. Read together, these studies converge less on a common estimate of impact than on a common condition for impact: the presence of pre-existing economic infrastructure that many rural host communities do not possess.

This does not imply that data centers fail to contribute to local economies. Rather, it suggests that current evidence is insufficient to support the broad, undifferentiated claims regarding economic benefits that frequently accompany siting decisions. The empirical literature remains relatively small, relies on a limited number of retrospective evaluations, and examines projects across diverse regional and institutional settings. Consequently, many of the economic claims made during siting processes continue to rely primarily on projected rather than observed outcomes. The Oracle and OpenAI facility proposed for rural Michigan, for example, advertises 2,500 construction jobs, 450 permanent jobs, and 1,500 supporting jobs. Nothing in the existing literature suggests that outcomes of this magnitude are impossible. At the same time, the current empirical evidence provides little basis for expecting benefits of this scale in a typical rural setting, particularly in the absence of the metropolitan labor markets and supplier networks associated with the strongest observed outcomes.

From a policy perspective, this distinction is important. Economic impact projections and empirical evaluations answer different questions. Projection models estimate what might occur under a specified set of assumptions, whereas retrospective and causal studies evaluate what actually occurred following investment. Conflating these two forms of evidence risks presenting

modeled scenarios as established outcomes. As data center development continues to expand into rural communities, a stronger body of empirical evidence will be needed to identify when projected benefits are realized, the conditions under which they occur, and how they vary across different local contexts.

Rural Communities as Critical Hosts of Digital Infrastructure

We are seeing rural communities increasingly becoming critical hosts of the most important infrastructure, digital or otherwise, to power our modern society. Wind and solar development is largely concentrated in rural communities; oil and gas exploration is largely developed in rural communities; the electrical grid and Interstate system are largely located in rural places; the list goes on. Now we are seeing data centers shift their geographic dominance from the industrial and business parks of urban and suburban areas to the rural peripheries across the United States. As reported by Pew (Seets & Radde, 2026), 67% of proposed data centers in 2026 were in rural communities.

We have seen major backlash from rural communities for all types of infrastructure projects, most recently in the data center domain. Part of this is likely explained because of the lack of perceived direct benefits for rural communities coming out of these infrastructure projects. Contemporary infrastructure projects such as data centers and wind and solar development, as we argue above, have limited economic impacts for their host communities. Yet these same infrastructural developments have broader benefits that are diffused across society. In other words, much of the burden of hosting our most important infrastructure is placed on rural communities, where the vast majority of the benefits of that infrastructure accrue elsewhere. This is especially prevalent in hyperscale data centers drawing the most attention today given lower rates of technological adoption and technological literacy in rural communities, meaning lower benefits from the technology that require data centers to run and scale effectively. This is why it is so important that there are other policy mechanisms that generate additional economic returns for rural hosts of infrastructure (e.g., restrictions on property tax abatements).

A preliminary policy framework for addressing uneven capture of benefits

This section proposes a preliminary set of five policy proposals, each aimed at correcting a specific gap between the economic benefits data centers are projected to deliver and the benefits our review finds they reliably produce for rural host communities.

Job training & feasibility for rural communities

Workforce training programs are frequently proposed as a way for residents of a region where a development is sited to capture some of the employment benefits of that nearby facility. Our review suggests a proposal such as this warrants caution rather than default inclusion. Operational employment is small in absolute terms, concentrated in specialized technical roles. Meaningful information-sector job growth appears to happen around clusters of facilities, a scale

most rural places are unlikely to reach. Under these conditions, a training program built around a single proposed facility risks preparing workers for positions that may not materialize at greater employment levels locally. A policy framework should therefore treat workforce training as conditional rather than default: appropriate where cluster-level deployment is underway or projected, tied to specific documented positions rather than aspirational employment, and subjected to a feasibility assessment before it's incorporated into something like a community benefits agreement.

Employment transparency

Even where employment or investment thresholds prove to be reliable and substantial for communities, there is a long history of questions as to whether employment guarantees given by developers are actually being met. As one local official stated in prior work, "there were job numbers thrown out there... but how many people they have working there? We don't know" (Bueno Sousa, 2012). The broader absence of standardized, independently audited reporting across the cases in our corpus is in part why causal employment research in this area remains so limited, and also why we see so much distrust in the employment claims of data centers. A policy framework should require standardized annual reporting filed with a state agency rather than left to voluntary developer/company disclosure that includes things like employment by residency, tax payments, and negotiated benefits. Beyond enforcement, such a requirement would potentially generate more systematic, verifiable data that could support stronger empirical evidence lacking.

Independent, third-party economic impact assessments

In addition to employment, broader economic impact assessments are needed. Our review documents wide variation in economic multiplier estimates used to justify proposed developments: independently estimated, facility-specific multipliers generally fall between 1.9 and 4.4, while industry-sponsored analyses report values as high as 7.4, with still larger figures circulating in public advocacy around specific projects. Because these estimates directly shape public and official perception of a proposed project's value before it is built, and because the studies producing them are often commissioned by the developers whose siting applications they support, a policy framework should require that the economic impact assessments used in siting decisions be independently commissioned. These should be funded through a developer fee but conducted by an entity without a financial stake in the outcome. Their underlying assumptions about local supply chains and economic leakage should be disclosed publicly. Moreover, they should specify, as far as possible, the spatial and temporal pattern of effects. This would not eliminate the uncertainty inherent to projection modeling, but it would reduce the risk that self-interested multiplier assumptions substitute for independent evidence in local decision-making.

Restrictions on property tax abatements

Property tax abatements represent one of the more direct threats to the fiscal benefits identified elsewhere in this review. States such as Michigan permit abatements through regulations such as the 1974 Industrial Facilities exemption that were designed for manufacturing on the assumption that large scale local employment would offset the lost revenue. This assumption likely does not hold for employment in data centers. Given data centers across the country are already seeking property tax abatements, a policy framework should include enforceable limits, including abatement rates tiered to demonstrated local employment, or outright restrictions on abatements given the sector's comparatively low employment levels relative to other forms of industrial land use that typically receive these incentives.

Compensation payments for communities

As noted above, data centers are increasingly sited to serve national-scale digital infrastructure and AI compute demand, yet the fiscal, environmental, and land-use costs of that demand are highly concentrated in the communities that host the infrastructure. This asymmetry echoes the logic that originally justified federal-to-state compensation formulas in other infrastructure projects, such as the interstate highway program, in which localities bearing the burden of a national system received funding from the federal government for hosting said infrastructure. An analogous mechanism could establish a more consistent floor of compensation than that which currently exists (i.e., piecemeal benefits negotiated at time of contractual agreement with developers). Although, a mechanism such as this raises a complication the highway model did not face: data center development is driven by private, often opaque corporate ownership rather than direct public investment, so any compensation formula would need a defensible basis for routing public transfer payments through what is fundamentally privately owned infrastructure. Existing Community Benefit Agreements, such as the Lancaster County, Pennsylvania agreement's \$10 million plus \$250,000 community foundation contribution, offer a partial precedent for quantifying developer obligation, but their ad hoc, site-by-site negotiation is precisely what a standardized federal or state compensation formula would aim to replace.

Conclusion

Our discussion in this paper focused on a critical assessment of the economic impacts of data centers, especially in asserted employment benefits for rural communities. But this is not the only tradeoff that needs to be considered. Several of the issues addressed point to a need for analyzing community impacts in a broader context that includes a broader set of costs and benefits. For example, concerns about the effects of data centers on local energy prices, water, and environmental conditions will likely depend on non-local factors. For example, electricity price effects will be contingent on the capacity, fuel mix, and operational characteristics of the regional electricity system (Shehabi et al., 2024). They will also depend on complementary policies, such as approaches to renewable energy. Effects on water supply will be contingent on approaches to water pricing that may be influenced by factors beyond the control of a community. This suggests the need for broader impact assessments that properly account for

potentially negative effects (which would exert “negative multiplier effects”). It also suggests that effective data center policy will require coordination between communities and between different layers of government. Future work in this area should bring together these converging policy landscapes to ensure a more holistic understanding of the costs and benefits of data center development.

AI Disclosure

During the preparation of this manuscript, the authors used Claude (Anthropic) to assist with drafting of narrative text for portions of the Results sections based on author-provided coded quotations, and source documents. All AI-assisted output was reviewed, fact-checked against original sources, and substantively revised by the authors prior to submission. The AI tool did not independently contribute original analysis beyond organizing and improving the language of the material the authors directed it to.

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