ECONOMIC IMPACT ANALYSIS OF PROSPECTIVE EXASCALE DATA CENTER DEVELOPMENT IN MORROW COUNTY, OREGON

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JOHNSON ECONOMICS

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I. INTRODUCTION

JOHNSON ECONOMICS was hired to prepare a third-party analysis of the economic impacts of a potential exascale data center campus in Morrow County, Oregon. The assumptions used in this analysis were built through research of third-party sources on data center development costs, employment, and direct and indirect impacts.

The impacts discussed here are for a hypothetical data center campus development of 1,264 acres, based upon a known study site in the County. The exact details of any prospective data center development at the site are unknown, so this analysis relies on industry standards, third-party information, and consultant experience.

The analysis is intended to provide rough-order-of-magnitude estimates of the likely economic impacts of a data center in this location, based on the best and most reasonable assumptions available at the time this analysis was completed.

This analysis discusses data center industry trends nationally and regionally, and considers the following categories of economic impact from the proposed development:

A. **Economic Need:** Trends in the data center industry nationally and regionally, that indicate the ongoing and growing need for additional data center development, and aggregation of data centers into increasingly larger campuses.

B. **Economic Impacts:** Impacts on employment, payroll, and capital investment from the construction of the facility, and on-going operations. Direct, indirect, and induced impacts are considered.

C. **Fiscal Impacts:** Projected impacts to local, state, and federal revenues from property and income taxes, fees, and system development charges.

This report focuses on the expected economic benefits of a hypothetical large data center campus for Morrow County.

II. EXECUTIVE SUMMARY

This report presents analysis of a hypothetical 1,264-acre, 1-gigawatt "exascale" data center campus located in Morrow County. Data center industry trends and projected impacts are summarized below:

- Independent estimates of the coming growth in demand and development of data center capacity agree that growth will be very rapid and likely to accelerate year-to-year for the foreseeable future. The United States remains the leading market in the world for data center development, capacity, and usage.
- The trend toward aggregation of data center facilities into larger and larger campuses is the underlying impetus and support for the expected development of one or more very large (exascale) data center campus developments in the Columbia Basin in the foreseeable future.

- Continuous growth over the last five years in the Columbia Basin indicates that large technology companies have the will and resources to develop large data center campuses at a rate of one to two per year, consuming somewhere between 200 to 300 acres per year, for the foreseeable future.
- This historical pace of growth projected forward indicates a demand for at least 3,000 acres of appropriate industrial land to site large-format data center campuses over 10 years. Given the acceleration of data center demand, development and capacity nationwide, there is likely to be demand even in excess of 3,000 acres if appropriate sites are available.
- Given these growth trends, the trend towards building ever larger data center campuses has become more prevalent across the United States. Operating companies and investors are looking to lock in the efficiencies of scale from constructing and operating very large facilities in a single location and are confident that there will be ample demand for a huge amount of new capacity in coming decades.
- The rapidly emerging next step is to scale up data center campuses from one- to two-hundred-acre facilities (hyperscale facilities), to much larger campuses of 800, 1,000, or 1,500 acres. These very large campuses are coming to be called "exascale" or "gigawatt" data centers.
- The build-out of a 1,264-acre exascale data center campus as modeled in this analysis would entail a high level of investment in real property and equipment over the coming years. Data centers are a very high-investment category of development due to the amount of infrastructure and equipment needed to run these specialized facilities, in addition to the high density of information technology that users install within them. On average, the investment in development and equipment for data centers exceeds the cost for traditional industrial uses and even most high-tech manufacturing uses.
- As outlined in this report, the hypothetical development is projected to bring a range of economic and fiscal benefits to the state, Morrow County, and the community. The positive impacts include new employment, payroll, spending with vendors on construction and operations, new tax revenue, and indirect and induced economic activity from suppliers, vendors, and households.
- The project is not anticipated to have any net *negative* economic impacts on the County as the development would pay for its own development and infrastructure. State and local revenues are not reduced because of the data center economic development programs, because absent these programs the region may not attract investments of this scale at all. Instead, the County and region would derive many benefits from this investment and ongoing economic activity long after incentives expire.
- For this analysis, we have modeled a hypothetical exascale data center campus of 16 buildings of 250k square feet each, or 4M total square feet of space for main data center operations. The modeled exascale campus would have a total power capacity of up to 1GW.
- **Total Capital Investments:** The modeled exascale data center campus is assumed to support a load of 1,000 total utility megawatts (MW). The **total estimated investment in this facility would be roughly $8 billion**, including land, infrastructure and facilities improvements.
    - Due to the variation in costs for data centers, and unforeseen market factors over coming years, we estimate a potential range of $7B to $12B in total investment at this location. An assumption on the more conservative end of this range was selected for this analysis.
- **Construction Phase:** The high level of capital investment in the facility would translate into an estimated 6,400 direct full-time equivalent (FTE) jobs over the construction period, assumed to be eight years. Because the development period is estimated to extend over many years, the total estimated construction jobs likely

represent many of the same employees, employed over the project lifecycle.

- Direct jobs during this phase would pay an estimated average annual wage of over $78,000 per full time employee (FTE). Benefits average 30% in the construction industry (via BLS), indicating average total wages and benefits of over $100,000 per FTE annually.
- The direct economic impact ($8 billion development cost) is joined by nearly $1.5 billion in indirect and induced impact, for an estimated total impact of nearly $9.5 billion in total economic impacts over the eight-year construction phase.

- **Operations Phase:** Upon completion, the facility is projected to support approximately 560 FTE employees. Employment at the site would include employees of the data center's operations, maintenance, security, and other property management functions. Indirect and induced employment supported by ongoing operations would support an additional 490 employees in Morrow County, including vendors, commercial services, and beneficiaries of spending in the community from operations and employees at the site.
  - Direct employment at the data center is expected to pay high employee compensation of approximately $110,000 per FTE, well above the median annual earnings of Morrow County residents with full employment.
  - Annual economic output from operations is projected to be $430 million, with a large share being the cost of power, maintenance, and staffing. Total economic impact in the County, including indirect and induced impacts, is projected to be $490 million annually.
- For this analysis, tax projections were generated assuming a 15-year tax exemption on improvements via the Oregon Strategic Investment Program (SIP), with a return of the remaining value (after depreciation) beginning in the 16th year. Even given this assumption, the long-term tax generation potential from these large projects is high.
  - By the 20th year, total cumulative tax revenue to local jurisdictions is projected to total over $300 million dollars, including 32% to Morrow County, and 32% to the school district.
  - Given the high projected level of investment, a rural location like Morrow County is allowed to tax the first $150M of investment under the state SIP rules, and also to collect an annual community service fee of $3M, even while the tax exemption is in effect.
  - When the 15-year SIP tax abatement expires, annual taxes to the jurisdictions could approach $70 million annually. Even allowing for annual depreciation, this high tax level would significantly boost the tax base for decades beyond.

III. Data Center Industry Trends

Data center development has been booming worldwide over the past decade, with the U.S. leading the way and a prominent submarket established in Oregon, including the Columbia Basin (Morrow County and adjacent Umatilla County). These facilities have been attracted to the area, as well as Central Oregon, due to the availability of ample affordable power and water resources that meet the criteria for data center campuses, as well as large, flat development sites to house these substantial facilities. Local and state financial incentives have also helped attract this development.

Data centers accommodate the physical equipment necessary to store, manage, process, and transmit digital information over the internet. Demand for data centers has increased rapidly and continues to do so, especially as cloud computing, cell phone and streaming services, remote meetings and events, e-commerce, and artificial intelligence (AI) become more prevalent. Data centers are the physical manifestation of the constantly accelerating growth of online activity of the past and future decades.

> "The importance of data centers in today's digital economy cannot be overstated—they are the lifeblood of everything from:
>
> - Hosting private cloud applications for businesses (e.g., CRM, ERP systems[1])
> - Processing big data and powering machine learning and AI
> - Supporting high-volume eCommerce platforms
> - Powering online gaming communities
> - Managing data storage, backups, and recovery
> - Powering stock trading systems
> - Real time medical imaging, diagnosis, and research
> - Enabling autonomous vehicles and real-time maps
>
> These are just a few examples of how data centers are integrated into every corner of modern life. As digital needs continue to grow, the complexities of building and managing these facilities also expand."[2]

While data centers come in a wide variety of sizes and capacities, development in the Columbia Basin has consisted almost exclusively of large data center campuses, which serve the needs of the largest internet and cloud computing companies including Amazon, Google, Meta (Facebook), Apple, and Microsoft. These companies are among the largest and best capitalized in the world with the resources to make these massive investments.

National Growth

Estimates of the coming growth in demand and development of data center capacity differ in this quickly evolving sector, but all market analysts seem to agree that growth will be very rapid and likely to accelerate year-to-year for the foreseeable future. The United States has pioneered this industry and remains the number one global market for data center development and operations.

[1] CRP = Customer Relationship Management; ERP = Enterprise Resource Management (i.e. business administration software)
[2] "The Billion-Dollar AI Gamble: Data Centers As The New High-Stakes Game." Forbes, 2024

A 2024 report[3] by Cushman and Wakefield on the data center (DC) market finds that new development of these facilities is still accelerating globally, with the amount of new development known to be in the current pipeline (excluding those in land planning stage) expected to increase DC capacity by 2.5 times in the Americas market alone. (The data center industry measures capacity in megawatts of power to run equipment.) The report forecasts that DC revenues from cloud storage and AI customers is expected to grow by nearly 900% within the next 5 years.

A market report by Infrastructure Masons projects that computing capacity in the data center industry will double between 2021 and 2026, while the industry will grow by three times over the next 10 years.[4]

Meanwhile, a recent analysis by McKinsey & Company projects that global demand for data center capacity might grow by 3.5 times over current levels by 2030, just six years from now. The analysis estimates that global demand for data center capacity could rise at an annual rate of between 19% and 22% per year, or as much as 27% per year at the upper end of the possible range.[5] (The forecasted growth of 3.5 times by 2030 was already revised upwards from McKinsey's 2023 estimate of 2.5 times growth.)

The large "hyperscale" DC category has been the fastest growing type in terms of capacity. As of 2010, hyperscale campuses represented an estimated 13% of total capacity among data centers. As of 2022, they represented an estimated 77% of total capacity.[6] With the largest technology companies needing their own dedicated data centers to accommodate their own storage and AI needs or run cloud operations, the growth of very large data center campuses (hyperscale and exascale) is expected to continue to outpace other categories. Recent years have seen the introduction of exascale data centers, which are discussed more below.

Meanwhile, smaller categories of data centers are expected to diminish as a share of total capacity. Co-location centers, owned by third-party operators with capacity that is leased to multiple other businesses, are expected to continue to grow, but less quickly than large centers. Growth in small "enterprise centers", run by smaller individual businesses for their own needs, has stagnated as they increasingly rely on outsourcing to the other two categories for their data storage and processing needs. Enterprise centers now make up 10% of data center capacity and this share is falling year by year.

Physical capacity in land, facilities, power and water will be needed globally, nationally, and regionally to meet this accelerating strong demand. The United States remains the leading market in the world for DC development, capacity, and usage. The trend toward aggregation of data center facilities into larger and larger campuses is the underlying impetus and support for the expected development of one or more very large (exascale) data center campuses in the Columbia Basin in the foreseeable future.

Regional Growth (Oregon)

Oregon is now an established major market for data center development with the largest data center clusters focused on the eastern Columbia Basin (Morrow and Umatilla), Portland metro area, and Prineville. Currently, the Portland metro area has the greatest number of data centers, with most in the Hillsboro area. However, these tend to be smaller data centers in the co-location category. Land constraints and shortage of available industrial sites in the Metro area restrict the size and expansion of DC campuses. The Prineville area is home to a small number of large campuses, specifically Apple and Meta (Facebook) campuses of roughly 150 and 360 acres, respectively.

[3] "Global Data Center Market Comparison." Cushman and Wakefield, 2024.
[4] "State of the Digital Infrastructure Industry." Infrastructure Masons, Annual Report 2024.
[5] "AI power: Expanding data center capacity to meet growing demand." McKinsey & Company, 2024.
[6] "*What do you Need to Know About Designing Data Centers?",* Consulting Specifying Engineer, May/June 2023

The Columbia Basin is home to the greatest concentration of hyperscale data centers in the state, with a much larger number of large campuses averaging over 100 acres (see more below). Development activity has also been the most robust in the Columbia Basin as the need for large sites, land prices, water, and power resources make it a very competitive candidate for location.

Oregon is a globally significant data center market. The Cushman and Wakefield report assesses Oregon to be the #8 DC market in the world, and #4 in the United States. Oregon is now home to very large data center campuses and clusters for many of the largest tech companies in the world. Established markets have advantages for DC operators including vendors, construction expertise, and state and local governments and utilities that are familiar with the industry and its needs. Oregon ranks even better in some categories, including being:

- #3 globally in IT load (computation capacity), #2 nationally
- #6 globally in presence of cloud operators, #4 nationally
- #5 globally in renewable power options, #1 nationally
- #1 in tax structure nationally

Regional Growth (Umatilla and Morrow Counties)

Over the prior decade, investment and jobs growth in this sector has been extremely robust and outstripped growth in any other sector in the region. Prior to 2024, nine large data center campuses had been developed in Morrow and Umatilla Counties with multiple additional facilities now approaching completion. The nine completed campuses are spread in dispersed locations across the two counties and include 34 total individual data center buildings of roughly 200k-225k square feet each and accompanying substations for each campus.

There are currently eight additional campuses planned or under development, for a total of 17 hyperscale data center campuses expected to be completed over a period of roughly 12 years.

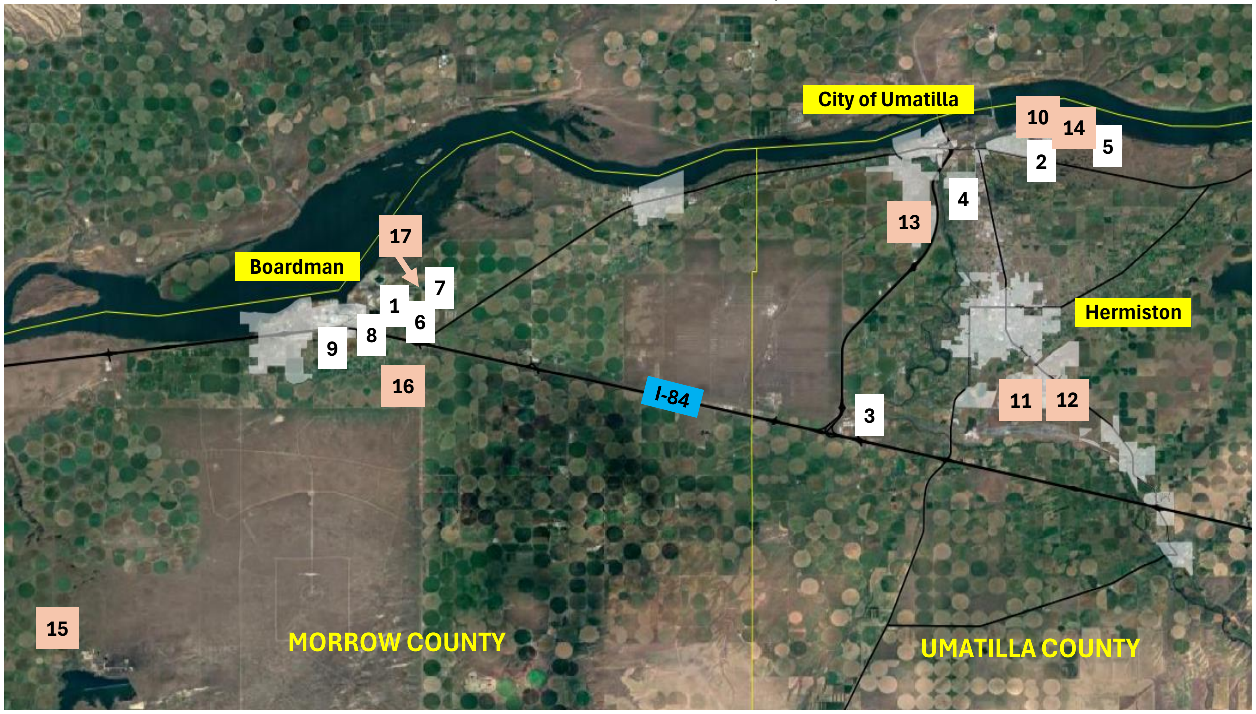
Only two of the completed developments began operation prior to 2021. The remainder (15 of 17 campuses, with 60 buildings) were either completed in the last five years or will be delivered in the next two years. Between 2021 and roughly 2026, an average of 2.5 data center campuses will be completed each year across the two counties. At an average of 120 acres per campus, this is average land development of roughly 300 acres per year for large data centers.

The following map and table (Figure 3.1) summarize the existing and planned data center developments in the region. Of the 17 total data center projects identified, eight are in Morrow County and nine are in Umatilla County.

Continuous growth over the last five years indicates that large technology companies have the will and resources to develop hyperscale data center campuses at a rate of one to two per year, consuming somewhere between 200 to 300 acres per year, for the foreseeable future.

This historical pace of growth projected forward indicates a demand for at least 3,000 acres of appropriate industrial land to site large-format data center campuses over 10 years. Given the acceleration of data center demand, development and capacity nationwide, there is likely to be demand even in excess of 3,000 acres if appropriate sites are available.

FIGURE 3.1: EXISTING AND UNDER DEVELOPMENT DATA CENTERS, MORROW AND UMATILLA COUNTIES



Site #	Years Built (Est.)	Total Acres	DC Buildings
Completed			
1	2014-2017	60	3
2	2014-2022	35	3
3	2022-2023	126	4
4	2023	187	4
5	2023-2024	83	4
6	2021-2022	108	4
7	2023	100	4
8	2019-2023	68	4
9	2021-2023	82	4
Under Development/Planned			
10	2024	131	4
11	2024-2025	100	4
12	2024-2025	114	4
13	2024-2025	194	4
14	2025-2026	133	4
15	2024-2025	100	4
16	2024-2025	125	4
17	2024-2025	130	4
TOTALS:	17	1,876	66
Since 2019:	15	1,781	60
Avg. Annual (Since 2019):	2.5	297	10

SOURCE: Baxtel, Data Centers.com, Umatilla and Morrow County assessors and GIS, Google Earth, Johnson Economics

Growth in AI

One of, if not the primary, driving factors of recent and future growth in data center development is the growth in artificial intelligence (AI), and especially generative AI, which require a vast amount of processing and storage capacity. AI demands DC capacity in two primary ways: one for training AI models such as large language models (LLMs) on the enormous reams of data required, and then for operating the AI models for the end users.

The use of artificial intelligence, especially generative AI, has accelerated greatly over just the last few years, and demand for AI is only forecasted to increase. Generative AI refers to a subset of artificial intelligence that learns the underlying patterns in training data to produce new content or data based on the prompts of users. Examples include chatbots that provide textual responses to prompts, as well as image and video programs which produce novel visual results from descriptive text prompts. McKinsey & Company estimates that by 2030, 70% of global demand for data center capacity will be for or related to advanced AI workloads, and that generative AI will account for about 40% of this demand.[7] This AI-related demand is growing from very low levels as recently as 2022, as Bloomberg reports:

> "With the influx of consumer generative AI programs like Google's Bard and OpenAI's ChatGPT, the generative AI market is poised to explode, growing to $1.3 trillion over the next 10 years from a market size of just $40 billion in 2022, according to a new report by Bloomberg Intelligence (BI). Growth could expand at a [compound annual growth rate] of 42% [per year] …."[8]

With this rise in demand for AI use comes a rise in demand for processing power capacity, especially given that AI models are continuing to evolve and become more complex. Goldman Sachs Research forecasts growth of 160% in AI-driven data center power demand by 2030.[9] This is despite recent improvements in efficiency; for example, from 2015 to 2018, data center workloads almost tripled, but power demand remained mostly constant. These efficiency gains have been outpaced over the last few years by the magnitude of power needed for AI workloads.

The world's largest technology companies and governments are investing heavily in AI infrastructure as the size and implications of this wave have become apparent. Data center development will necessarily have to continue to accelerate to keep pace with this explosive growth and will benefit those regions ready to capitalize with available land, power, and water resources.

Exascale Data Centers

Given the trends discussed above, it is not surprising that over the past few years, the trend towards building ever larger data center campuses has become more prevalent across the United States. Companies and investors are looking to lock in the efficiencies of scale from constructing and operating very large facilities in a single location, while anticipating that there will be ample demand for a huge amount of new capacity in coming decades.

The rapidly emerging next step is to scale up data center campuses from one- to two-hundred-acre facilities (hyperscale facilities), to much larger campuses of 800, 1,000, or 1,500 acres. These very large campuses are coming to be called "exascale" or "gigawatt" data centers. Exascale data centers can have power capacities of one to two gigawatts; in comparison, hyperscale DCs typically range from 20-50 megawatts.

Nationally, several examples of this type of exascale data center are being planned or built out now, including:

[7] "AI power: Expanding data center capacity to meet growing demand." McKinsey & Company, 2024.
[8] "Generative AI to become $1.3 trillion market by 2032, research finds." Bloomberg, 2023.
[9] "AI is poised to drive 160% increase in data center power demand." Goldman Sachs Research, 2024.

- The Cumulus Data Center in Berwick, Pennsylvania, was sold to Amazon Web Services in 2023.[10] The campus is 1,200 acres, co-located with an existing nuclear power plant that will power the data center directly. Over several years, the data center capacity is expected to reach 960 megawatts, with one 300,000 square foot building completed so far.
- Crusoe Energy Systems recently announced the first phase of a large AI data center at the 1,000+ acre Lancium Clean Campus in Abilene, Texas.[11] The data center portion will begin with a 200-megawatt data center, and once fully completed, will offer 1.2 gigawatts of power capacity, drawn primarily from local renewable energy.
- In Virginia, the Surry Green Energy Center has 30 data center buildings planned on 641 acres.[12] This project is also collocated with an existing nuclear power plant and plans to add additional small modular reactors to the site in the future. While the power capacity has not yet been specified, this project will have a similar scale to the Cumulus Data Center and the Lancium Clean Campus data center.
- Project Range located in metro Phoenix consists of a proposed 1,000 total acres across two DC campuses, 30 buildings and over 5 million square feet. The master-planned project is expected to entail an estimated $14 billion investment.[13]
- The Quantum Loophole project in Maryland is a 2,100-acre campus that claims it will be the largest data center campus in the world upon completion. The campus will include an estimated investment of up to $30 billion and utilize almost two gigawatts of power. The campus will be built in phased development with environmental mitigation and hundreds of acres of greenspace included.[14]
- The Google Council Bluffs data center campus in Iowa contains roughly 1,000 acres and has seen an estimated $5.5 billion in investment so far, with another potential $1 billion investment announced.[15]

Locating these large facilities depends on several factors, including availability of large tracts of suitable land, proximity to a dependable high-capacity power source, and often availability of water capacity for cooling. Many of these exascale facilities will be located in more remote locations to meet these requirements.

Exascale data centers are unlikely to locate in urban areas due to many considerations, including the significant acreage requirement, potential construction and operational incompatibilities with other urban uses, and extensive infrastructure requirements. As with other specialized uses such as solar farms, wind farms, or marine terminals, the need for exascale data center campuses of the future may be thought of as comparable in importance to essential utility or public-service uses, providing the data backbone on which the entire internet, cell and streaming services rely.

Economies of Scale

There are major perceived benefits to development at this scale, over accommodating the same DC capacity over some number of smaller sites. These include:

[10] " The Growth of Gigawatt-Scale Data Centers for Powering AI and Renewable Energy Innovation." Vertical Data, 2024.
[11] "Crusoe to Build Initial 200MW AI Data Center With Plans to Expand at 1.2 GW Lancium Clean Campus." Lancium, LLC, 2024.
[12] "Surry planners endorse data center that projects up to 3,000 jobs." Faleski, 2024.
[13] "Mega $14 billion data center project proposed in metro Phoenix", Phoenix Business Journal, March 2024.
[14] Quantumloophole.com
[15] "Google Continues to Invest in Iowa Data Centers." Data Center Frontier, July 2024.

- **Process, planning, and time costs:** The process of finding and securing sites from multiple owners, obtaining entitlements and permits, and planning the site and facilities is costly and time-consuming. Securing a single large site consolidates this process and reduces costs to the developer. The savings in time from reducing multiple transactions to one development process is particularly important in the current data center development environment when competing companies and regions are racing to meet exploding demand.

- **Economies of scale in construction:** Co-locating a large number of data center buildings at one location rather than across two or more smaller locations creates efficiencies in all phases. During construction, a single large site will allow for the substantial construction infrastructure required to be staged on one site while all phases of the campus are built out. Building materials, equipment, and labor can be staged and utilized at one consolidated location. Off-site improvements such as roads and utilities serving the site must be constructed for one site rather than multiple locations, and transportation congestion impacts associated with intensive construction activity will be focused on the immediate vicinity of a single site rather than across multiple locations.

- **Economies of scale in operations:** Centralized facilities will create similar efficiencies in operations by allowing staff to work more efficiently across multiple data center buildings, allowing centralization of other operations such as security, grounds, janitorial, administration, etc. at one location rather than managing and funding redundant systems at multiple sites. More buildings will be able to share mechanical, electrical, water and other systems at the site, and the impacts and cost of constructing and maintaining key off-site electrical, water, and other required services will be reduced to a single location. In the case of data centers, co-location of more facilities on one campus also reduces the data latency, or time to send and process data, by reducing distance of communication. All such efficiencies reduce the cost-per-unit of the data center services being produced, with benefits that accrue in favor of larger campuses.

- **Limited externalities:** A single location, particularly in a more remote location, reduces the potential for external impacts of a facility on other surrounding land uses and the community at large, particularly residential uses. For example, the power requirements of hyperscale and larger facilities require direct service by high-capacity electric power *transmission* lines, which generally involve much larger and taller towers and require wider corridors than typical local *distribution* lines, which can be extended on typical power poles and/or underground. Compared to a single exascale facility, meeting the need for hyperscale data centers on distributed sites could necessitate extending new overhead electric transmission lines in multiple corridors to reach them all.

  Similarly, a single large exascale campus can be served by consolidated water, sewer, telecom and other utilities that would otherwise require disruptive construction in multiple locations. The traffic generated by these large operations will also be focused on one location served by adequate roadways rather than dispersed locations.

IV. PROJECT DESCRIPTION

This analysis evaluates the fiscal and economic impact profile of a prospective exascale data center located in Morrow County on a site of roughly 1,264 acres. The specifications of any eventual data center campus built at the site are unknown, so this analysis relies on assumptions drawn from industry standards, third-party information, and consultant experience.

The analysis is intended to provide rough-order-of-magnitude estimates of the likely economic impacts of a data center in this location, based on the best and most reasonable assumptions available at the time this analysis was completed.

Note: *the scale of development and estimated investment in a campus of this size are extremely large, putting them among the very largest projects by property value in the state of Oregon. As explained below, the level of investment in the type of exascale data center modeled here runs to the many billions of dollars, with commensurate economic and fiscal impacts.*

Hypothetical Site Plan: An exascale data center campus of 1,264 acres could be expected to accommodate an estimated 16 to 20 individual data center buildings of an average of 250,000 square feet (sqft). Data center developments typically include space for electrical substations, parking/circulation, mechanical, HVAC, water treatment, landscaping and stormwater management, and back-up power generation. Some buffer space may be required between collections of data center buildings, and between buildings and off-campus land uses.

For this analysis, we have modeled a hypothetical exascale data center campus of 16 buildings of 250k sqft each, or 4M total sqft of space for main data center operations. The modeled exascale campus would have a total power capacity of up to 1GW.

Development Timeline: This analysis assumes that the hypothetical exascale campus would be built out continuously at a pace of four buildings every two years. The first four buildings are assumed to be completed in 2027, with four more every two years, until completion of the campus in 2033. This would be roughly eight years from the time of this report.

ANTICIPATED CAPITAL INVESTMENT

Data centers are a very high-investment category of development due to the amount of infrastructure and equipment needed to run these specialized facilities, in addition to the high density of information technology that users install within them. On average, the cost of development and equipment for data centers exceeds the cost for traditional industrial uses and even most high-tech manufacturing uses.

Investment per MW: This analysis applied a cost-per-cMW (Critical MW) approach to estimate capital investments in the property for this data center development.[16] The cost-per-cMW approach is favored by the industry. The cost of building a data center development can vary widely depending on size, location, and specifications of the facility.

[16] The power capacity of a data center is discussed in terms of total "utility MW" or the total available power to run all aspects of the property (1GW in this case), and the "critical MW" (cMW) which is the power load required to maintain the critical IT functions of the data center business (828 cMW in this case.)

Industry sources have cited costs of anywhere from $7M to $12M per cMW. However, in recent years, development costs have escalated due to inflation in the costs of energy, materials and labor, supply chain disruptions, and other factors.

This analysis finds a conservative cost estimate of $10M per cMW. For comparison, the most recent global survey of data center cost trends by Turner and Townsend[17] estimated an average cost in the Portland market of $10.5M per MW as of 2024. Data centers in the Morrow County area were not included in this survey but are likely to face comparable costs, balancing cheaper land with greater labor and material constraints.

Total Capital Investments: The modeled exascale data center campus is assumed to support a load of 1,000 total utility MW, or 828 critical MW (see footnote).

- At a cost of $10M per cMW, the **total estimated investment in this facility would be roughly $8 billion**, including land, infrastructure and facilities improvements.
- Due to the variation in costs for data centers, and unforeseen market factors over coming years, we estimate a potential range of $7B to $12B in total investment. An assumption on the more conservative end of this range was selected for this analysis.

V. ECONOMIC IMPACTS – MORROW COUNTY

The construction and ongoing business operations of the data center will have significant economic benefits to the local and regional economy. To model the economic impacts of various activities, Johnson Economics utilized the IMPLAN (IMPact for PLANning)[18] economic multiplier model. IMPLAN is an economic impact model designed for analyzing the effects of industry activity (employment, income, or business revenues) upon all other industries in an economic area.

A. IMPLAN MODELING METHODOLOGY

IMPLAN models the magnitude and distribution of economic impacts, and measures three types of effects. These are the direct, indirect, and induced changes within the economy. The following is a brief definition of the three impact types:

Direct Impacts: The actual change in activity affecting a local economy. For example, if a new industrial building is constructed, direct economic impacts represent the value-added output for that firm/user, as well as the jobs required for development and the labor income paid.

Indirect Impacts: Indirect impacts reflect the response of all other local businesses within the geographic area to the direct impact. Continuing the previous example, indirect impacts of a new institutional user would comprise revenues for related venders (e.g., real estate services, suppliers, etc.), and the jobs and labor income thereby generated.

Induced Impacts: These reflect the response of households within the geographic area affected by direct and indirect impacts. In the given example, induced impacts would be the increase in all categories of spending by

[17] Data Center Cost Index 2024, www.turnerandtownsend.com/insights/data-centre-cost-index-2024/

[18] Minnesota IMPLAN Group (MIG), Stillwater, Minnesota

households in the geography directly or indirectly employed by the businesses' activities.

Our analysis evaluated the Jobs, Labor Income, and Value-Added Output of our estimated direct industry change and commodity change activities. (Value Added Output is the difference between an industry's or an establishment's total economic output and the cost of its intermediate inputs.)

Geographic Level

Impact analysis has varying degrees of geographic coverage. Specifically, vendors who provide goods and services in response to modeled impacts are in a range of locales. For this analysis, we focused on impacts retained in Morrow County. That is, indirect and induced impacts which leak outside of the county are not included. The degree to which indirect and induced impacts are captured within Morrow County and the surrounding region will be a function of how well local businesses capitalize on the opportunities associated with the facilities.

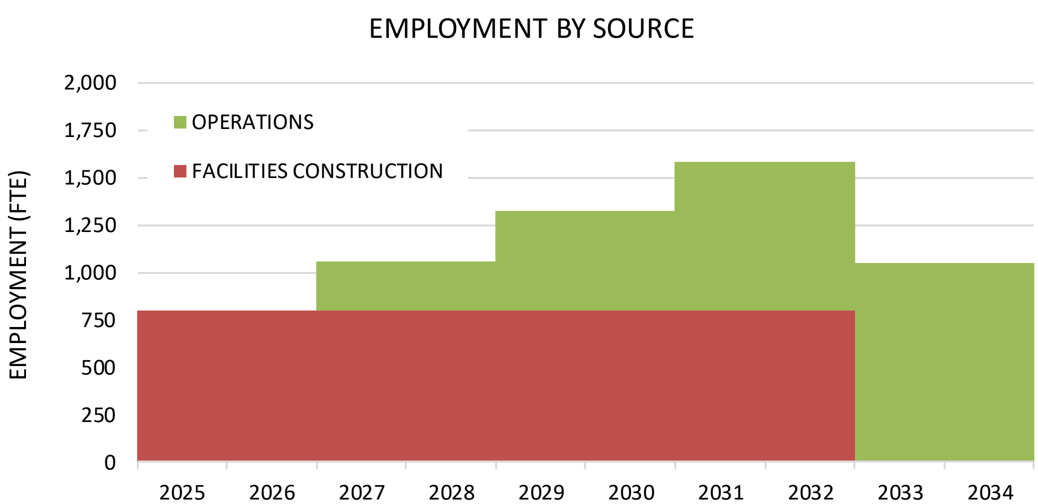
B. Economic Impacts of Construction Activity & Operations

Figure 5.1 presents an estimate of the economic impacts from the eight-year construction period of the proposed development, as well as on-going operations of the facility. Given the size of the project, the total number of jobs is expected to be higher during the construction period; however, the project's operations phase will provide roughly 560 on-going high-wage jobs upon completion.

- **Construction Phase:** The high capital investment in the facility would translate into an estimated 6,400 direct full-time equivalent (FTE) jobs over the entire construction period, or 800 FTE per year over eight years. Because the development period is estimated to extend over many years, the total estimated construction jobs likely represent many of the same employees, employed over the project lifecycle.
- Direct jobs during this phase would pay an estimated average annual wage of over $78,000 per FTE. Benefits average 30% in the construction industry (via BLS), indicating average total wages and benefits of over $100,000 per FTE annually. The average wage of $78,000 would be 60% higher than the median earnings of a Morrow County resident who is employed year-round and full-time: $47,500 (Census).
- The direct economic impact ($8 billion development cost) is joined by nearly $1.5 billion in indirect and induced impact, for an estimated total impact of nearly $9.5 billion in total economic impacts over the eight year construction phase.
- **Operations Phase:** Upon completion, the facility is projected to support approximately 560 FTE employees. Employment at the site would include employees of the data center's operations, maintenance, security, and other property management functions. Indirect and induced employment supported by ongoing operations would support an additional 490 employees in Morrow County, including vendors, commercial services, and beneficiaries of spending in the community from operations and employees at the site.
- Direct employment at the data center is expected to pay high employee compensation of approximately $110,000 per FTE, well above the median annual earnings of Morrow County residents with full employment.
- Annual economic output from operations is projected to be $430 million, with a large share being the cost of power, maintenance, and staffing. Total economic impact in the County, including indirect and induced impacts is projected to be $490 million annually.

FIGURE 5.1: SUMMARY OF TOTAL ECONOMIC IMPACTS (CONSTRUCTION AND OPERATIONS)

	PROJECTED IMPACTS, MORROW COUNTY (2024 $s)			
	Employment	Labor Income	Value Added	Output
FACILITIES CONSTRUCTION				
Direct Effect	6,370	$502,100,000	$4,120,400,000	$8,000,000,000
Indirect Effect	370	$28,100,000	$389,300,000	$750,100,000
Induced Effect	480	$21,300,000	$439,600,000	$737,000,000
Total Effect	7,220	$551,500,000	$4,949,300,000	$9,487,100,000
OPERATIONS				
Direct Effect	560	$82,300,000	$194,800,000	$429,700,000
Indirect Effect	420	$27,870,000	$18,600,000	$55,300,000
Induced Effect	70	$2,920,000	$1,100,000	$4,900,000
Total Effect	1,050	$113,090,000	$214,500,000	$489,900,000



SOURCE: Johnson Economics and Minnesota IMPLAN Group, Inc.

After completion of the development and one year of operations, the total impact of the development (direct, indirect, and induced) is estimated to be nearly $10 billion to the local and regional economy. After ten years of operation, it is estimated to be over $14 billion to the local and regional economy.

VI. FISCAL IMPACT

In addition to economic impacts, the data center development will have potential fiscal implications for the County, Port of Morrow, other local service providers and the State of Oregon. These impacts include property taxes, income and business taxes, and development charges and fees.

Given the very high level of anticipated investment, the likely Real Market Value (RMV) of the property after completion will be commensurately high ($8 billion in investment over eight years, depreciated over 31 years).

A. Impact Before Tax Incentives

Data center developments in Morrow County and nearby counties typically apply for a package of tax incentives that may defer taxes of the property for five to as many as fifteen years. Given this likelihood, a firm estimate of Taxable Assessed Value (TAV) from the property, and the resulting tax revenue, is difficult to generate.

The figures presented in Figure 6.1 projected tax revenues without tax incentives applied, reflecting the full value of the data center campus investments modeled.

- Based on these assumptions, the taxable value of the facility is expected to remain very high despite some depreciation of the real property. At its peak, the annual property tax revenue (to all taxing jurisdictions) could exceed $93 million annually.
- By the 20th year, total cumulative tax revenue is projected to total over $1.2 billion dollars.
- Figure 6.1 shows this projected revenue by local taxing jurisdiction over ten and 20-year periods. Benefits to the County, school district, and other districts are projected to be in the tens of millions of dollars over these periods.

Figure 6.1: Projected Tax Revenue by District (2024/25 Rates)

Tax Code 2511	Tax Rate (per $1,000 of TAV)				10-Year	20-Year
Taxing District	**Education**	**Government**	**Bond**	**Total**	**(2025 - 2034)**	**(2025 - 2044)**
Morrow County		4.1347		4.1347	$155,660,000	$400,870,000
UMA-Morrow Radio District		0.1700		0.1700	$6,400,000	$16,480,000
Health District		0.6050	0.3900	0.9950	$37,460,000	$96,470,000
Port of Morrow		0.0841		0.0841	$3,170,000	$8,150,000
Boardman RFD		0.7464	0.2325	0.9789	$36,850,000	$94,910,000
Unified Recreation District		0.4560		0.4560	$17,170,000	$44,210,000
Morrow School District	4.0342			4.0342	$151,880,000	$391,130,000
Intermountain ESD	0.6156			0.6156	$23,180,000	$59,680,000
BMCC	0.6611		0.1797	0.8408	$31,650,000	$81,520,000
Vector Control		0.2899		0.2899	$10,910,000	$28,110,000
Oregon Trail Library		0.2536		0.2536	$9,550,000	$24,590,000
Total Tax Rate	**5.3109**	**6.7397**	**0.8022**	**12.8528**	**$483,880,000**	**$1,246,120,000**

Source: Morrow County, Johnson Economics

- Of the total millage rate, Morrow County receives over 32% of revenue, and the Morrow School District receives just under 32%. The health district and the fire district each receive nearly 8% of revenue.
- Total projected tax revenue to the County could be over $150 million over 10 years, and over $400 million over 20 years. Total projected tax revenue to the school district would be similar (Figure 6.1).

B. Impact with Tax Incentives

As noted, the ultimate tax benefits to local jurisdictions will be highly dependent on any tax incentives applied to this project. The most commonly used tax incentives for large industrial projects are Enterprise Zone incentives and the Oregon Strategic Investment Program (SIP). In this case, the modeled data center project is not anticipated to take place within a designated Enterprise Zone.

The more likely program to be used by a data center campus developer in the county would be the SIP program, which offers a 15-year tax abatement incentive to large developments that meet requirements for high level of investment and high-paying employment.

For this analysis, tax projections were generated assuming a 15-year tax exemption on improvements, with a return of the remaining value (after depreciation) beginning in the 16th year. Even given this assumption, the long-term tax generation potential from these large projects is high.

- By the 20th year, total cumulative tax revenue is projected to total over $300 million dollars.
- Figure 6.2 shows this projected revenue by local taxing jurisdiction over ten and 20-year periods. Benefits to the County, school district, and some other districts are projected to be in the tens of millions of dollars over these periods.
- When the SIP tax abatement expires, annual taxes to the jurisdictions could approach $70 million annually. Even allowing for annual depreciation, this high tax level would then continue beyond the 20-year horizon presented in Figure 6.2, significantly boosting the tax base for decades beyond.

FIGURE 6.2: PROJECTED TAX REVENUE BY DISTRICT (2024/25 RATES)
ASSUMING STRATEGIC INVESTMENT PROGRAM INCENTIVE

Tax Code 2511	Tax Rate (per $1,000 of TAV)				10-Year	20-Year
Taxing District	**Education**	**Government**	**Bond**	**Total**	**(2025 - 2034)**	**(2025 - 2044)**
Morrow County		4.1347		4.1347	$17,834,184	$97,962,291
UMA-Morrow Radio District		0.1700		0.1700	$733,260	$4,027,762
Health District		0.6050	0.3900	0.9950	$4,291,729	$23,574,257
Port of Morrow		0.0841		0.0841	$362,748	$1,992,558
Boardman RFD		0.7464	0.2325	0.9789	$4,222,285	$23,192,804
Unified Recreation District		0.4560		0.4560	$1,966,863	$10,803,880
Morrow School District	4.0342			4.0342	$17,400,698	$95,581,172
Intermountain ESD	0.6156			0.6156	$2,655,265	$14,585,239
BMCC	0.6611		0.1797	0.8408	$3,626,619	$19,920,839
Vector Control		0.2899		0.2899	$1,250,424	$6,868,520
Oregon Trail Library		0.2536		0.2536	$1,093,852	$6,008,474
Total Tax Rate	**5.3109**	**6.7397**	**0.8022**	**12.8528**	**$55,437,927**	**$304,517,796**

- Total projected tax revenue to the County could approach nearly $18 million over 10 years, and nearly $100 million over 20 years. Total projected tax revenue to the school district would be similar (Figure 6.2).