A Bureau of Business Research Report
From the University of Nebraska—Lincoln

# Final Report

## Economic and Fiscal Impacts of Sarpy County Data Centers

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## Executive Summary

Large data centers have been locating in Sarpy County, Nebraska over the last decade, especially in the Highway 50 region. The pace of center locations has accelerated in recent year given the ongoing construction of a large Facebook data center in the county. The number and pace of projects represents the formation of an industry cluster in Sarpy County, where data centers continue to be drawn by the competitive advantages of the Highway 50 corridor, including competitive electricity rates, a high-quality workforce, the presence of developable land in a growing urban environment, and incentive packages. The significant developments which have already occurred, and the potential for additional data center projects, suggest a need for an analysis of the economic and fiscal impact of Sarpy County data center projects.

This study examines the economic and fiscal impacts of Sarpy County data center projects during both the construction phase and during annual operations. The study considers the local impact on Sarpy County, the impact on the Omaha Metropolitan Area (Nebraska portion), and the impact on the State of Nebraska. The study also examines the net fiscal impact of data centers and compares those net impacts to an alternative economic development project for Sarpy County, using the example of a manufacturing plant.

Data on construction period impacts are presented below in Table ES.1. Impacts are presented per 10,000 square feet of data center building construction. This is done because construction activities and impacts depend on the size of the project. As seen in Table ES.1, the statewide economic impact from construction is $10.6 million and 53 job-years for each 10,000 square feet of construction. Most of this impact occurs in Sarpy County. The Sarpy County economic impact during the construction period is $9.2 million and 46 jobs for each 10,000 square feet of construction.

**Table ES.1**
**Sarpy County Data Centers**
**Construction Period Economic Impact per 10,000 Square Feet**

| | Construction Period Impact Per 10,000 Sq. Ft. | | |
|---|---|---|---|
| | Sarpy County | Omaha MSA | Statewide |
| Output (Millions $) | $9.2 | $10.3 | $10.6 |
| Value-Added (Millions $) | $3.1 | $3.7 | $3.8 |
| Labor Income (Millions $) | $2.3 | $2.7 | $2.7 |
| Job-Years | 46 | 52 | 53 |

Source: BBR calculations

Table ES.2 shows the expected annual economic impact on Nebraska from the operation of the four largest Sarpy County data centers which are currently in operation or under construction. These are the Facebook, Fidelity, Travelers and Yahoo data centers. The annual economic impact on Nebraska is $522.05 million in output (business sales). Just under half of this amount, $238.16 million, is value-added, including $115.72 million in labor income each year. The employment impact is 1,899 jobs.

**Table ES.2**
**Sarpy County Data Centers Annual Economic Impact Nebraska**

| | Statewide Impact Annual Operations | | |
|---|---|---|---|
| | Direct | Multiplier | Total |
| Output (Millions $) | $303.74 | $218.31 | $522.05 |
| Value-Added (Millions $) | $36.36 | $201.79 | $238.16 |
| Labor Income (Millions $) | $25.57 | $90.15 | $115.72 |
| Employment | 430 | 1,469 | 1,899 |

Source: BBR calculations

Table ES.3 again displays the statewide economic impact during the operations period but also displays the impact on Sarpy County and the Omaha Metropolitan Area (Nebraska portion). Most of the economic impact occurs within Sarpy County. The annual economic impact in Sarpy County is $332.10 million in output, including $66.96 million in labor income earned in 1,203 jobs. There are 526 jobs in other parts of the Omaha Metropolitan Area (Nebraska portion) in addition to the jobs in Sarpy County.

**Table ES.3**
**Sarpy County Data Centers Annual Economic Impact by Region of the State**

| | Annual Operations Impact | | |
|---|---|---|---|
| | Sarpy County | Omaha MSA | Statewide |
| Output (Millions $) | $332.10 | $424.91 | $522.05 |
| Value-Added (Millions $) | $103.92 | $162.30 | $238.16 |
| Labor Income (Millions $) | $66.96 | $96.39 | $115.72 |
| Employment | 1,203 | 1,729 | 1,899 |

Source: BBR calculations

Table ES.4 shows the net fiscal impact of Sarpy County data centers on Nebraska state government each year. The net fiscal impact reflects both new tax revenue due to new business activity and households in Nebraska and new expenditures for providing state public services to these business and households. New tax revenue is negative for state government during the incentive period, that is, the period when data centers receive incentives under the Nebraska Advantage program. This is because data centers can receive a tax credit for real property tax payments to local governments. There is a net fiscal loss of $10.02 million per year during the incentive period but a net fiscal gain of $3.59 per year after incentives have ended.

**Table ES.4**
**Annual Net Fiscal Impact for State Government**

| State Government | Revenue (Millions $) | Expenditure (Millions $) | Net Fiscal Impact (Millions $) |
|---|---|---|---|
| During Incentive period | -$2.77 | $7.25 | -$10.02 |
| After Incentive Period | $10.83 | $7.25 | $3.59 |

Source: BBR calculations

The fiscal impact for local government is positive both during and after the incentive period, in part because data centers require a significant investment in real property (buildings) but have not pursued tax increment financing, and in part because most incentives in the Nebraska Advantage program are offered by state government. During the incentive period, there is a net fiscal gain of $3.79 million each year for local governments. After the incentive period, there is a net fiscal gain of $6.26 million each year.

**Table ES.5**
**Annual Net Fiscal Impact for Local Governments**

| Local Governments | Revenue (Millions $) | Expenditure (Millions $) | Net Fiscal Impact (Millions $) |
|---|---|---|---|
| During Incentive period | $11.08 | $7.29 | $3.79 |
| After Incentive Period | $13.55 | $7.29 | $6.26 |

Source: BBR calculations

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# 1. Introduction

Over the last decade, four large data center have chosen to locate in Sarpy County, Nebraska. The pace of placement, in fact, is accelerating, as is evident from the ongoing construction of the large Facebook data center along Highway 50. The number and pace of projects represents the formation of an industry cluster in the county. Data centers may continue to be drawn by the competitive advantages of the Highway 50 corridor, including competitive electricity rates, a high-quality workforce, the presence of developable land in a growing urban environment, and incentive packages. The significant developments which have already occurred, and the potential for additional data center projects, suggest the need for an economic and fiscal impact analysis.

This study examines the economic and fiscal impacts of Sarpy County data centers, including he the local impact on Sarpy County, the impact on the Omaha Metropolitan Area (Nebraska portion), and the impact on the State of Nebraska. The study also considers the significant economic impact on the electric utility industry, given that the capital-intensive data center industry has substantial energy needs. The project also examines the net fiscal impact of data centers with the net fiscal impact of economic development project in less capital-intensive industries.

The project methodology is presented in Section 2. The methodology discusses the approach to calculating the economic impact in both the construction phase and the annual operations phase. Section 3 provides the economic impact on Sarpy County, the Omaha Metropolitan Area, and the State of Nebraska during both the construction and operations phases, as well as the economic impact of Dixon County, Nebraska, given that a windfarm in that county will support the Facebook data center. Fiscal impacts are presented in Section 4.

# 2. Methodology

The ongoing development of the Facebook data center along Highway 50 in Sarpy County, Nebraska is a major investment in a capital and energy-intensive industry. Capital intensive projects often generate a unique economic development pattern, including significant upfront construction activity, high wage employment and large labor market multiplier impacts. That economic development pattern suggests a need to assess the economic impact of data center investments, locally for Sarpy County as well as for the broader Omaha region and the State of Nebraska.

A. Economic Impact

The potential economic impact is substantial. The Facebook data center which is under construction will be a 2,600,000 square foot facility. Three other data center facilities which have been located in Sarpy County have been between 100,000 and 200,000 square feet in size. All of these investments require infrastructure, a large building and a significant power plant. There is also a need to install the servers and other data storage equipment which will operate at the facility. All of this construction activity generates a large direct economic impact on the Sarpy County. For example, one recent report from the United States Chamber of Commerce indicated

that data center construction costs averaged $1,305 per square foot.[1] A large data center project can create hundreds or perhaps a few thousand construction jobs over a multi-year construction period.

In addition to the direct economic impact, there is also a multiplier impact on the economy. The multiplier impact occurs for two reasons. First, construction activity creates a demand for other local businesses, such as building supply wholesalers, fuel and energy providers. Second, construction workers, especially those hired locally, spend their paychecks at businesses throughout the Omaha economy such as retail stores, entertainment venues, housing, insurance, health care and other types of household spending. Even out-of-state construction workers will spend a portion of their paychecks locally on lodging and dining. The Bureau of Business Research will estimate both parts of the multiplier impact, utilizing the IMPLAN model. Specifically, for each dollar of construction spending the IMPLAN model can estimate additional spending at area business. Similarly, for each direct construction job or dollar of labor income, the IMPLAN model can estimate the number of multiplier jobs and the dollars of multiplier income at other businesses. For the current project, the IMPLAN model would utilize data on the unique business structure of the Sarpy County (and state and Omaha region) economy to accurately reflect the degree to which additional business activity is captured within the region.

The sum of the direct economic impact and the multiplier impact is the total economic impact. The total economic impact during the construction period will be estimated for Sarpy County, the Omaha region and the State of Nebraska. The construction period impact also will be summarized on a per 10,000 square foot basis. This information can be used to project the likely impact of any new data center facilities located in Sarpy County.

The centers are also very capital intensive, implying that labor income (wages, salaries and benefits) is a smaller share of total output than for some other types of businesses. At the same time, capital intensive businesses such as data centers utilize a significant amount of energy and pay higher wages to a skilled labor force. Some data centers require development of renewable energy sources to offset their energy needs, creating additional opportunities in local markets.

Utilizing the research of the U.S. Chamber of Commerce, the Bureau of Business Research will obtain estimates for employment, typical wages, and approximate energy needs for data centers. That research found that data centers on average have annual operations costs which are 8.6% of project capital expenditure, with 40% of annual expenditures for electricity, 15% for staffing, 5.5% for real estate and insurance and the remaining 30.5% for maintenance, administration costs, and other costs. This information will be utilized to estimate the direct annual economic impact of Sarpy County data centers (including the existing centers and the Facebook facility which is under construction) in terms of output, employment, and labor income (wages, salaries and benefits).

[1] Technology Engagement Center, 2017. Data Centers: *Job Opportunities in Communities Nationwide*. United States Department of Commerce.

The IMPLAN model will be used to estimate the multiplier impact, in this case the multiplier impact from annual operations. The IMPLAN model will be modified to reflect the preference among many data centers for the use of renewable electric power. In particular, the resulting multiplier impact reflects the employment and cost structure of wind power providers rather than the average Nebraska power producer. Annual multiplier impacts will be estimated in terms of output, value-added, employment, and labor income (wages, salaries and benefits). Annual multiplier impacts will be added to annual direct impacts to yield the total annual economic impact.

The Bureau also will include a section where findings are summarized on a per worker basis for a data center facility. This information then can be used to project the likely impact of any new data center facilities which may located in Sarpy County in the future. For the case of the Facebook data center, the study also breaks out the share of the statewide economic impact which would occur in Dixon County, Nebraska. Dixon County is the site of the Rattlesnake Wind Company windfarm expected to support electricity for the Facebook project.

B. Fiscal Impact

Data centers reflect a unique mix of taxable property and labor income. Data center are subject to business taxes but also personal taxes paid by workers on their income and spending. State and local income, sales, and property tax impacts also are generated due to the economic multiplier impact. These additional income, sales and property tax impacts will be estimated using average statewide ratios between new economic activity and each type of tax revenue. An assessment of direct business taxes also reflect the incentive packages which are provided to data centers by state government. Annual fiscal impacts will be estimated once the data centers are in operation.

Data center projects, like any business, also generate public costs as well as new tax revenue. Public services are provided to the data center and to businesses which are part of the multiplier impact. Public services also are provided to employee households. Households utilize public services, including education services for the children of employees. These fiscal service costs will be captured, using average state and local government spending patterns.

Fiscal cost impacts are subtracted from tax revenue impacts to estimate the net fiscal impact of data centers. Net fiscal impacts also are compared to another hypothetical economic development project, a manufacturing facility which is less capital-intensive. A less capital-intensive project would require less taxable property per workers, and might pay lower wages, implying less income and sales tax per worker.

## 3. Economic Impact

This section presents estimates for the construction period impact and annual operations impact of Sarpy County data centers. Analysis includes both existing data centers and data centers under construction. Economic impacts are developed for Sarpy County, the Omaha Metropolitan Area (Nebraska portion) and the State of Nebraska. In the case of the Facebook data center, a portion of the statewide impact occurs in Dixon County, Nebraska due to windfarms which will support the data center. The Dixon County impact also will be estimated.

Table 3.1 below shows existing Sarpy County data centers as well as the Facebook data center which is currently under construction in Sarpy County. There are currently seven data centers. The largest of the data centers is the planned 2.6 million square foot Facebook center but the Fidelity, Travelers and Yahoo data centers are 100,000 to 200,000 square foot facilities. These large data centers are an in-house operation for an international company, and therefore, serve national or international markets. The economic activity of these data centers is supported by customers around the nation and world. The Lightedge data center and the two Tierpoint data centers, however, serve more of a local market. Economic impact analysis focuses on local economic activity which is supported by external customers. As a result, this study will estimate the economic impact of the Facebook, Fidelity, Travelers and Yahoo data centers.

**Table 3.1**
**Sarpy County Data Centers**

| Data Centers |
|---|
| Facebook (under construction) |
| Fidelity |
| Lightedge (formerly Cabela's) |
| Tierpoint (2) (formerly Cosentry) |
| Travelers Data |
| Yahoo |

A. Construction Period Impact

The construction period impact results from the investment in buildings and related equipment at each data center site. In addition to a shell building, all data centers require a significant and redundant power plant, and heating and cooling equipment to control the environment within each center. While such equipment is often purchased from a national vender, there are significant costs for installing this equipment. Such installation costs also contribute to the local economic impact along with the construction of the shell building and work on surrounding grounds. Data storage equipment is also purchased from a national vendor and is typically not included in the local economic impact.

The size of the construction period impact is a function of the size of each data center investment. The research team gathered information from median reports about the amount of each data center investment. In cases where information was only available on the square feet of the facility, from media reports or the Sarpy County Assessor, the research team utilized an industry average of $1,305 per square foot developed in the United States Chamber of Commerce report (see footnote 1). The Sarpy County Assessor also provide information on the value of real taxable property, a proxy for the value of the land and building investment. The total construction cost of the Facebook, Fidelity, Travelers and Yahoo facilities, including purchased and installed servers, is approximately $4.05 billion.

According to the U.S. Chamber of Commerce report, its survey of data centers determined that 57% of construction costs were for the building and installation of electrical and mechanical equipment. The remaining 43% of costs were for land and for purchasing electrical and mechanical equipment. Those costs were adjusted for the actual value of the buildings and land

at Sarpy County data centers which were gathered from the Sarpy County Assessor's Office.[2] The economic activity associated with land purchases (i.e, realtors, legal) are a small share of land costs. Further, specialized electrical and mechanical equipment is typically purchased from out of state suppliers and manufactured in another state. As a result, the direct impact on the local economy is a portion of the total construction cost. The direct economic impact is $2.1 billion of the total $4.1 billion construction cost.

Table 3.2 shows the economic impact during the construction period in Sarpy County. The data shows a direct construction period business spending (output) of $2.14 billion (U.S. Chamber of Commerce Report; see footnote 1). There is a $0.72 billion multiplier impact on output during the construction period. Recall that the multiplier impact occurs as construction firms purchase inputs and services and as employees of construction firms spend their paychecks. The multiplier impact is approximately 0.34, indicating $0.34 in additional economic activity in Sarpy County for each $1 spent building construction or mechanical and electrical equipment installation during the construction period. The total construction period economic impact is $2.85 billion.

Table 3.2 also shows a direct impact in terms of value added of $0.57 billion. Value-added includes labor income (wages, salary, benefits and proprietor income), capital consumption, returns to land and business tax payments. The direct impact estimate for value-added was based in part on direct output, and typical ratios of value-added to business sales in the construction industry, as well as data on the actual employment at the Facebook data center construction site. Results suggest approximately one-quarter of construction activity is due to labor and other factors or production and half is due to the purchase of intermediate products, such as building materials. The multiplier impact for value-added is $0.38 billion and the total construction period impact is $0.95 billion in value-added. As seen in Table 3.2, most of the value-added impact during construction is due to payments to labor, whether wages, salaries, benefits or proprietor's income for contracts. The direct construction period impact in terms of labor income is $0.49 billion. The multiplier impacts is $0.22 billion and the total construction period labor income impact is $0.71 billion. This labor income impacts is spread out over an estimated 14,219 job-years. These jobs years occurred during the construction of existing data centers and have been and will be occurring during the construction of the Facebook data center. About two-thirds of those job years are direct employment at construction projects with the remaining one-third occurring at other businesses due to the multiplier impact.

**Table 3.2**
**Construction Period Economic Impact for Sarpy County Data Centers**
**Sarpy County**

| | Sarpy County Impact Construction Period | | |
|---|---|---|---|
| | Direct | Multiplier | Total |
| Output (Millions $) | $2,135.55 | $715.75 | $2,851.30 |
| Value-Added (Millions $) | $567.00 | $383.88 | $950.87 |
| Labor Income (Millions $) | $485.29 | $223.41 | $708.70 |
| Job-Years | 9,583 | 4,636 | 14,219 |

Source: BBR calculations

[2] Data accessed at http://apps.sarpy.com/sarpyproperty/ during May 2018

Table 3.3 shows the economic impact in the Omaha Metropolitan Area (Nebraska portion) during the construction period. Economic impacts for the Omaha Metropolitan Area are larger given that some of the multiplier impact occurs in nearby counties, such as Douglas County. Note that the direct economic impacts are the same, since the construction activity all occurs in Sarpy County. The multiplier impact is larger as some suppliers to the construction businesses are located in Douglas or other metropolitan area counties and construction workers also spend some of their paycheck in these counties. The metro area multiplier impact for output is 0.49, implying $0.49 in multiplier impact for each $1 of construction spending. The total economic impact during the construction period is $3.19 billion in output. The total value-added impact during the construction period was $1.15 billion in the Omaha Metropolitan Area and the total labor income impact was $0.83 billion. This labor income impact was spread over an estimated 16,057 job-years. When compared to results for Sarpy County in Table 3.2, these results indicate that approximately 1,850 job-years of multiplier employment occurred in neighboring counties.

**Table 3.3**
**Construction Period Economic Impact for Sarpy County Data Centers**
**Omaha Metropolitan Area (Nebraska Portion)**

| | MSA Impact Construction Period | | |
|---|---|---|---|
| | Direct | Multiplier | Total |
| Output (Millions $) | $2,135.55 | $1,054.83 | $3,190.38 |
| Value-Added (Millions $) | $567.00 | $580.40 | $1,147.40 |
| Labor Income (Millions $) | $485.29 | $340.24 | $825.54 |
| Job-Years | 9,583 | 6,474 | 16,057 |

Source: BBR calculations

Table 3.4 shows the economic impact during the construction period in the State of Nebraska. Results indicate that most of the construction period impact is concentrated within the Omaha Metropolitan Area. In addition to the direct economic impact of $2.14 billion there is a multiplier impact of $1.15 billion and a total construction period economic impact of $3.29 billion. There was a value-added impact of $1.19 billion in Nebraska during the construction period and a labor income impact of $0.85 billion. The labor income impact was spread over an estimated 16,551 job-years.

**Table 3.4**
**Construction Period Economic Impact for Sarpy County Data Centers**
**Nebraska**

| | Statewide Impact Construction Period | | |
|---|---|---|---|
| | Direct | Multiplier | Total |
| Output (Millions $) | $2,145.37 | $1,147.24 | $3,292.61 |
| Value-Added (Millions $) | $569.60 | $618.92 | $1,188.53 |
| Labor Income (Millions $) | $487.53 | $365.63 | $853.16 |
| Job-Years | 9,627 | 6,924 | 16,551 |

Source: BBR calculations

B. Annual Operations Impact

The 4 Sarpy County data centers will have annual operations spending of $303.74 million once all centers are finished and in operation. An estimated $94.88 million (31%) of this annual spending will be for electricity purchases,[3] with the remaining amount spent on operations. Electricity purchases are divided evenly between generation and transmission and distribution. The direct annual economic impact is $303.74 million in output, $36.36 million in value-added, $25.57 million in labor income and 430 jobs. Direct employment is based on current employment at existing data centers and planned employment at the Facebook data center. Industry averages are utilized to estimate direct wages and benefits per jobs and value-added. If industry averages generate an estimate of fewer than 30 permanent employees at a particular data center, an estimate of 30 job is utilized, since employment of 30 or above is required in state incentive packages.[4] The majority of the 430 data center jobs are expected to be located at the Facebook data center.

Table 3.5 shows the annual operations economic impact on Sarpy County. The direct annual impact is $228.29 million, which is less than the annual operations spending of $303.74 million across the 4 data centers. The direct annual impact is less since baseload electricity generation occurs outside of Sarpy County. There is an annual multiplier impact of $103.81 million. The multiplier impact is approximately 0.45, implying $0.45 in business sales due to the multiplier impact for each $1 in annual operations spending. Recall that the multiplier impact occurs as data centers purchases inputs and services and as employees of data centers spend their paychecks. The output multiplier for operations is higher than the output multiplier for construction (0.34) discussed in Table 3.2. Table 3.5 also reports the annual operations impact in term of value-added. The annual value-added impact is $103.92 million in Sarpy County, including $66.96 million in labor income.

**Table 3.5**
**Operations Economic Impact for Sarpy County Data Centers**
**Sarpy County**

| | Sarpy County Impact Annual Operations | | |
|---|---|---|---|
| | Direct | Multiplier | Total |
| Output (Millions $) | $228.29 | $103.81 | $332.10 |
| Value-Added (Millions $) | $36.36 | $67.56 | $103.92 |
| Labor Income (Millions $) | $25.57 | $41.39 | $66.96 |
| Employment | 430 | 773 | 1,203 |

Source: BBR calculations

The labor income impact is spread over an estimated 1,203 jobs. This implies an annual labor income of $55,700. This is a high average wage (and benefit) level given that more than half of

[3] The United States Chamber of Commerce report (see footnote 1) finds that nationwide electricity costs account for 40 percent of data center operating costs. However, a report from RTI International (Z Oliver, K. Clark-Sutton, S. VanLear, L. Aramayo, B. Lim, C. Moss, S. Zayed, and J. Petrusa, *The Impact of Facebook's Data Center Fleet*, RTI International, March 2018) finds that Facebook data centers use 38 percent less electricity than the average data center.

[4] A minimum of 35 would apply to the Travelers data center as some additional company employees have been co-located at that data center, according to discussions with the Sarpy County Economic Development Authority.

the employment impact is outside of data centers, including in industries such as retail, services and hospitality.

Table 3.6 shows the annual operations economic impact in the Omaha Metropolitan Area (Nebraska portion). The direct impact is somewhat larger as a portion of the baseload electricity generation for OPPD occurs in the Omaha Metropolitan Area. Economic multipliers also are larger for the Omaha Metropolitan Area given that some of the multiplier impact occurs in Douglas County and other nearby localities within the metropolitan area. The output multiplier is 0.83, implying $0.83 in multiplier impact for each $1 in direct business spending. The total annual economic impact is $424.91 million in output within the metropolitan area. The total annual value added impact is $162.30 million, with an annual labor income impact of $96.39 million. That labor income impact is spread over an estimated 1,729 jobs. That employment figure indicates that approximately 525 of the permanent jobs due to data center operations are located in Douglas or other metro counties.

**Table 3.6**
**Annual Operations Economic Impact for Sarpy County Data Centers**
**Omaha Metropolitan Area (Nebraska Portion)**

| | MSA Impact Annual Operations | | |
|---|---|---|---|
| | Direct | Multiplier | Total |
| Output (Millions $) | $232.08 | $192.82 | $424.91 |
| Value-Added (Millions $) | $36.36 | $125.93 | $162.30 |
| Labor Income (Millions $) | $25.57 | $70.83 | $96.39 |
| Employment | 430 | 1,299 | 1,729 |

Source: BBR calculations

Table 3.7 shows the annual operations economic impact in the State of Nebraska. The direct economic impact rises to $303.74 million given the generation of electricity at wind power and fossil fuel baseload plants located outside of the Omaha Metropolitan Area. In addition to the direct annual economic impact of $303.74 million there is a multiplier impact of $218.31 million and a total annual economic impact of $522.05 million. The annual value-added impact on the state of Nebraska from data center operations is $238.16 million. This value-added impact includes a $115.72 million labor income impact spread over an estimated 1,899 jobs.

**Table 3.7**
**Annual Operations Economic Impact for Sarpy County Data Centers**
**Nebraska**

| | Statewide Impact Annual Operations | | |
|---|---|---|---|
| | Direct | Multiplier | Total |
| Output (Millions $) | $303.74 | $218.31 | $522.05 |
| Value-Added (Millions $) | $36.36 | $201.79 | $238.16 |
| Labor Income (Millions $) | $25.57 | $90.15 | $115.72 |
| Employment | 430 | 1,469 | 1,899 |

Source: BBR calculations

**C. Standardized Impact of Sarpy County Data Centers**

Economic impact estimates for the 4 large data centers in Tables 3.1 through 3.7 provide insights about the potential economic of future projects. In particular, impacts can be summarized on a per-worker and per-square foot basis, and used to project the potential economic impact of proposed data centers. In the following tables, the average construction period impact from Tables 3.1 through 3.4 is presented per 10,000 square feet of data center space, and the average annual operations impact from Table 3.5 through 3.7 is presented per worker.

Table 3.8 shows the average construction period economic impact per 10,000 square feet of data center space. This information can be used to gauge how much the economy in Sarpy County, the Omaha Metropolitan Area and the State of Nebraska would be impacted by the construction or expansion of a data center in Sarpy County, depending on the size (in square feet) of the facility. The construction period economic impact is presented for output (business sales), value-added component, labor income and employment. The construction period impact would be $9.2 million in output in Sarpy County for each 10,000 square feet of additional data center capacity and $10.6 million statewide. The employment impact is 46 job-years in Sarpy County for each 10,000 square feet of space and 53 job-years statewide.

**Table 3.8**
**Sarpy County Data Centers**
**Construction Period Economic Impact per 10,000 Square Feet**

| | Construction Period Impact Per 10,000 Sq. Ft. | | |
|---|---|---|---|
| | Sarpy County | Omaha MSA | Statewide |
| Output (Millions $) | $9.2 | $10.3 | $10.6 |
| Value-Added (Millions $) | $3.1 | $3.7 | $3.8 |
| Labor Income (Millions $) | $2.3 | $2.7 | $2.7 |
| Job-Years | 46 | 52 | 53 |

Source: BBR calculations

Table 3.9 shows the average annual operations impact per job at a Sarpy County data center. The average annual operations impact in Sarpy County would be $772,000 per worker. That value of business sales per worker reflects the capital intensive nature of data centers. The average annual operations impact rises to $1,214,000 per worker statewide, given that the base load electric power used in the plants is generated outside of the county. Electric power generation is also a capital intensive activity. The statewide value-added impact from operations is $554,000 per worker each year, including $269,000 in labor income. The annual income reflects the wages, salary and benefits of both data center workers and additional persons employed due to the multiplier impact. Statewide, there are 4.4 total jobs for each job at a Sarpy County data center, that is, 1 job at the data center, and 3.4 additional jobs.

**Table 3.9**
**Sarpy County Data Centers**
**Annual Operations Economic Impact per Worker**

| | Annual Operations Impact Per Worker | | |
|---|---|---|---|
| | Sarpy County | Omaha MSA | Statewide |
| Output ($1000s) | $772 | $988 | $1,214 |
| Value-Added ($1000s) | $242 | $377 | $554 |
| Labor Income ($1000s) | $156 | $224 | $269 |
| Employment | 2.8 | 4.0 | 4.4 |

Source: BBR calculations

D. Dixon County Impact

The statewide economic impact presented in the previous sections reflects base load electricity generation at facilities located throughout Nebraska. This section examines the local economic impact of a wind power facility in Dixon County, Nebraska. Specifically, the Facebook data center will utilize wind power from the Rattlesnake Wind Company, located in Dixon County. The Rattlesnake project totals 320 MW utilizing 125 (3.15 MW) wind turbines with a 45 percent yield. Facebook has the vast majority (310 of 320 MW) of the Rattlesnake project. Such use of wind power will generate additional economic development in rural Nebraska.

This section considers the construction period and annual operating impact from developing and utilizing wind power in Dixon County, Nebraska. Economic impact estimates will rely on analysis conducted for Nebraska windfarms in a 2014 UNL Bureau of Business Research report *The Economic and Tax Revenue Impact of the Nebraska Wind Power Industry.* This report was developed with the support of the Nebraska Power Association. The report provided estimates of the amount of local (own county) employment, labor income and output impacts per megawatt of wind tower capacity in Nebraska. Estimates were provided for the construction period and for annual operations. For example, the report found an $11,000 local county operations impact per megawatt of capacity and a local job impact of 1 job per 9 MW of capacity. These estimates are applied to the capacity of the Rattlesnake project to estimate the local economic impact during both the construction period and during annual operations. These local economic impacts are presented in Table 3.10 and are projected for Dixon County, Nebraska.

**Table 3.10**
**Potential Local Economic Impact for Sarpy County Data Center Utilizing Wind**
**Construction Period and Annual Operations Impact**

| | Local Impact | | |
|---|---|---|---|
| | Output (Millions $) | Labor Income (Millions $) | Employment |
| Construction Period | $17.2 | $7.5 | 154 |
| Annual Operations | $3.5 | $1.9 | 37 |

Source: BBR calculations

Wind farm construction would have a local economic impact of $17.2 million, including $7.5 million in labor income and 154 job-years. Local construction jobs would include building roads and cement for placing the wind turbines, which is inherently local and regional employment. The estimated construction impact is limited since wind turbine components are not generally manufactured in Nebraska and workers specializing in erecting wind turbines often come from out of state. Construction period impacts would occur during the period when wind turbines are added to the site, typically several years. The 154 job-years also would be spread out over multiple years. For example, if wind turbines are assembled at the site over a 5-year period, there would be an impact of 31 jobs over 5 years.

By contrast, operating impacts are permanent, occurring year after year for the decades during which the wind turbines are in operation. Impacts during operation years reflect employment and labor income for technicians to monitor and maintain wind turbines as well as office workers such as managers, bookkeepers and administrative assistants. There are also operating impacts from purchasing local services and supplies such as utilities, insurance, fuel, vehicles and replacement parts. Annual payments to landowners are another component of the annual operating impact. The annual operations impact for the county economy would be $3.5 million in output, including $1.9 million in labor income spread over 37 jobs. This impact would include direct jobs at the windfarm as well as the multiplier impact as the windfarm purchases supplies and services and as windfarm workers spend their paychecks.

## 4. Fiscal Impact

There is a fiscal impact associated with the economic impacts described above. The additional economic activity leads to new tax revenue and new expenses on public services. In the case of new revenue, the data center facilities generate local property tax revenue and the wages of data center employees generate state income tax revenue and state and local sales tax revenue. This section of the report examines the income, sales, and property tax impacts of Sarpy County data centers during the operations period. These are the recurring tax impacts which would occur every year. Fiscal impacts are not estimated for the construction period. Table 4.1 shows estimates of the total state and local tax impact that would occur each year throughout Nebraska.

The tax revenue impact comes from seven sources. The first source is the direct property tax impact. The $6.33 million tax revenue impact is based on the real property tax liability of each data center as reported by the Sarpy County Assessor.

The second source relates to the property taxes paid by the estimated 430 data center employees on their homes, given that the median sale price of $190 thousand per single-family homes in Sarpy County. Bartik (1991)[5] finds that approximately 80 percent of new jobs due to economic development projects are filled by additional residents in a local economy (new migrants to a county or a reduction in outmigration among existing residents), while the remaining 20 percent are due to increased labor force participation, or filled by previously unemployed workers. This implies that 80% of the 430 data center jobs will lead to a new housing unit. Table 4.1 shows the calculated increase in property value and annual property tax of $1.54 million.

[5] Bartik, Tim, 1991. *Who Benefits from State and Local Economic Development Policies?* W.E. Upjohn Institute for Employment Research

The third source is the annual property tax revenue due to the multiplier impact; that is, the property taxes paid by the workers and businesses which receive income due to the multiplier impact. There is an annual multiplier income of $90.15 million for workers and proprietors throughout Nebraska. This income is primarily devoted to household spending, including spending on taxable property. Statewide, there is a ratio of $1.47 dollars in taxable property for each $1 of annual income. In Table 4.1, the ratio of 1.47 is applied to the $90.15 million to estimate an impact on property tax base of $132.52 million. As much of this multiplier impact will occur in Sarpy County, a local tax rate of 0.023 is applied to yield an estimate of $3.05 million in property tax.

The fourth source is the state income tax paid by data center employees. State income tax revenue is estimated based on the effective income tax rate, or average share of personal income (which includes wages, salaries and benefits) which is paid to state income tax. This effective rate is the ratio of state personal income tax to (non-transfer) personal income. This ratio was 0.027 in Nebraska for the 2016-17 tax year, implying a 2.7% average rate. In Table 4.1, this rate is applied to the direct labor income impact from the 4 data centers, yielding a $0.68 million in annual revenue. Note that the ratio of 0.027 reflects only personal income tax, and assumes that no corporate income taxes are paid.

The firth source is the state income tax paid due to labor income from the multiplier impact. Both personal and corporate income tax will be generated due to the multiplier impact (businesses benefiting from the multiplier impact would not necessarily receive incentives). The statewide ratio of personal and corporate income taxes to non-transfer income is 0.030, or a 3.0% average tax rate. Applying this effective tax rate to the $90.15 million income impact yields an estimated income tax impact of $2.70 million each year.

**Table 4.1**
**Total State and Local Government Tax Revenue Impacts**

| | Income Impact | Ratio | Tax Base | Rate | Tax Revenue |
|---|---|---|---|---|---|
| Center Direct Property Tax (Millions $) | | | $289.91 | 0.022 | $6.33 |
| Workforce Property Tax (Millions $) | $81.69 | 0.80 | $65.35 | 0.024 | $1.54 |
| Multiplier Property Tax (Millions $) | $90.15 | 1.47 | $132.52 | 0.023 | $3.05 |
| Center Direct Income Tax (Millions $) | $25.57 | 1.00 | $25.57 | 0.027 | $0.68 |
| Multiplier Income Tax (Millions $) | $90.15 | 1.00 | $90.15 | 0.030 | $2.70 |
| Sales Tax Electricity (Millions $) | $94.88 | 1.00 | $94.88 | 0.075 | $7.12 |
| Other Sales Tax (Millions $) | $115.72 | 0.35 | $40.50 | 0.073 | $2.95 |
| Tax Credit Property Tax (Millions $) | | | | | -$6.33 |
| Tax Credit Sales Tax (Millions $) | | | | | -$9.25 |
| Total | | | | | $8.79 |

Source: BBR calculations

The sixth source is sales tax paid on electricity usage, given that a significant share of data center operating costs are devoted to purchasing electricity. Based on the U.S. Chamber of Commerce and RTI International studies (see footnote 3), this report has assumed that electricity purchases

are 40% data center operating costs except at the Facebook center where electricity use is expected to be less. This amounts to $94.88 million in electricity purchases per year in the four data centers. Applying the 7.5% state and local sales tax to this amount (based on 2% local sales tax rates in Papillion and La Vista) yields a sales tax impact of $7.12 million.

The seventh source is other state and local sales tax payments. Statewide, there is $0.35 in taxable sales for each $1 of income. Applying this ratio to the $115.72 million income impact yields $40.50 million in sales tax base. Applying the state and local sales tax rate yields $2.95 in state and local sales tax revenue each year.[6]

As seen in Table 4.1, there is also a reduction in revenue due to incentives received by data centers. The Fidelity, Facebook and Travelers data centers are assumed to be in the Tier 2 incentive program under Nebraska Advantage while the Yahoo data center is in Tier 4. The data centers therefore are eligible for an exemption from taxes on personal property and sales tax on capital purchases. For that reason, the analysis in Table 4.1 has assumed no tax revenue from personal property or sales tax from capital expenditures. The data centers also are eligible for a 6% wage credit and a 10% investment credit which can be applied to sales tax, income tax, and site specific real property taxes. This is the reason why a lower rate, excluding corporate income tax revenue, is applied to the income of data center employees. In other words, the model assumes that the data centers pay no corporate income tax.

The incentive package is also the reason why Table 4.1 includes a state tax credit equal to the estimated direct (real) property tax payments of the data centers. Table 4.1 also includes a state and local sales tax credit. That state and local sales tax credit is equal to the sales tax revenue on electricity plus an estimate of the sales tax paid by data centers for other items during annual operations, including retail purchases such as office supplies, parts used during repair services, and any office related spending such as restaurants or recreation. An estimated 13.6% of annual operations costs were modeled to be spent on such items subject to sales tax. This percentage was estimated based on the detailed industry spending patterns which are reported in the IMPLAN Model.[7]

Note that there is no property tax impact from incentive programs as the data centers did not seek tax increment financing. After adjusting for these tax credits, the total state and local tax revenue impact is $8.79 million each year.

While the state and local totals in Table 4.1 are the broadest measure of the tax revenue impact, fiscal analysis occurs separately at the state and local level, implying a need to provide separate information about state tax revenue and local tax revenue. Table 4.2 shows the estimated state tax revenue impact, using the same methodology applied in Table 4.1, but including only state income tax and the state portion of sales tax impact (0.055 rate). State incentive payment also are included in Table 4.2. The statewide sales and income tax impact including incentives is a net loss of $2.77 million per year.

[6] A 2% local sales tax rate is utilized for taxable sales expected to occur within Sarpy County and a 1.5% rate is utilized for taxable sales expected to occur elsewhere in Nebraska.

[7] This information is maintained in the industry production function feature.

**Table 4.2**
**Total State Government Tax Revenue Impacts**

| | Statewide Impact |
|---|---|
| Direct Income Tax (Millions $) | $0.68 |
| Multiplier Income Tax (Millions $) | $2.70 |
| Sales Tax Electricity (Millions $) | $5.22 |
| Other Sales Tax (Millions $) | $2.23 |
| Tax Credit Property Tax (Millions $) | -$6.33 |
| Tax Credit Sales Tax (Millions $) | -$7.27 |
| Total | -$2.77 |

Source: BBR calculations

The local tax revenue impact is shown in Table 4.3 for all three scenarios, statewide, Omaha MSA (Nebraska portion) and Sarpy County. The tax revenue impact includes exempted local sales tax due to state incentive programs. The tax revenue impact on local governments throughout the state is $11.08 million per year. The annual tax revenue impact for local governments in the Omaha Metropolitan Area (Nebraska portion) is $10.32 million while it is $9.17 million in Sarpy County.

**Table 4.3**
**Total Local Government Tax Revenue Impacts**

| | Statewide Impact | Omaha Metro Area Impact | Sarpy County Impact |
|---|---|---|---|
| Property Tax (Millions $) | $10.92 | $10.27 | $9.27 |
| Sales Tax Electricity (Millions $) | $1.90 | $1.90 | $1.90 |
| Other Sales Tax (Millions $) | $0.72 | $0.62 | $0.47 |
| Tax Credit Sales Tax (Millions $) | -$2.47 | -$2.47 | -$2.47 |
| Total | $11.08 | $10.32 | $9.17 |

Source: BBR calculations

The tax revenue impacts are half of the fiscal impact story. The full fiscal impact also requires examining the cost of providing services to the businesses and workers associated with the economic impact. Table 4.4 show the cost for state programs. The table shows how the state 2017 general fund expenditure of $4.33 billion is allocated to businesses and households, based on assigning education expenditures to households and splitting other state expenditures evenly between business and households. The table then utilizes value-added and population in the state to calculate the ratio of business expenditures per dollar of state value-added and the household expenditures per capita. The ratio for business is then applied to the annual impact of Sarpy County data centers in Nebraska in terms of value-added. The ratio for people is then multiplied by the population impact. The population impact is the employment impact multiplied by 1.98 and then multiplier by 0.8. Employment is multiplied by 1.98 since there are 1.98 total residents of Sarpy County per employed residents. Population is multiplied by 0.8 since 80% of positions would be expected to be filled by new residents to Nebraska (new in-migrants or a reduction in outmigrants). The total state government expenditure impact is $7.25 million per year.

**Table 4.4**
**Total State Government Expenditure Impacts**

| Group | 2017 General Fund Expenditure (Millions $) | Value-Added (Millions $) or Population | Ratio | Impact (Millions $) or Population | Tax Revenue (Millions $) |
|---|---|---|---|---|---|
| Business | $1,221 | $121,774 | 0.010 | $238 | $2.39 |
| People | $3,108 | 1,920,076 | $1,619 | 3,003 | $4.86 |
| Total | $4,329 | | | | $7.25 |

Source: BBR calculations

Table 4.5 shows a similar calculations for local government expenditure. The total local government expenditure supported by sales and property tax revenue was calculated based on revenue from both sources in 2017, which is tracked by the Nebraska Department of Revenue. The figures reflect expenditures on county government, municipal governments, school districts and special districts (i.e., fire districts). Expenditures on school districts and community colleges are allocated to households and other expenditures are split between business and households, as before. The total local government expenditure impact for local governments statewide is $7.29 million per year.

**Table 4.5**
**Total Local Government Expenditure Impacts**

| Group | 2017 Estimated Expenditure (Millions $) | Value-Added (Millions $) or Population | Ratio | Impact (Millions $) or Population | Tax Revenue (Millions $) |
|---|---|---|---|---|---|
| Business | $87 | $7,936 | 0.011 | $238 | $2.60 |
| People | $283 | 181,439 | $1,560 | 3,003 | $4.69 |
| Total | $370 | | | | $7.29 |

Source: BBR calculations

Table 4.6 shows the net fiscal impact for state government in Nebraska during and after the incentive period. During the incentive period, there is annual fiscal loss of $10.02 million for state government. After the incentive period ends, there is an annual fiscal gain of $3.59 million.

**Table 4.6**
**Annual Net Fiscal Impact for State Government**

| State Government | Revenue (Millions $) | Expenditure (Millions $) | Net Fiscal Impact (Millions $) |
|---|---|---|---|
| During Incentive period | -$2.77 | $7.25 | -$10.02 |
| After Incentive Period | $10.83 | $7.25 | $3.59 |

Source: BBR calculations

Table 4.7 shows the net fiscal impact for local governments in Nebraska. During the incentive period, there is a net fiscal gain of $3.79 million each year for local governments statewide. After the incentive period, there is a net fiscal gain of $6.26 million each year.

**Table 4.7**
**Annual Net Fiscal Impact for Local Governments**

| Local Governments | Revenue (Millions $) | Expenditure (Millions $) | Net Fiscal Impact (Millions $) |
|---|---|---|---|
| During Incentive period | $11.08 | $7.29 | $3.79 |
| After Incentive Period | $13.55 | $7.29 | $6.26 |

Source: BBR calculations

Table 4.8 shows the net fiscal impact for local governments in Sarpy County and the Omaha Metropolitan Area (Nebraska portion) as a whole during the incentive period. There is a net fiscal gain of $6.21 million per year for local governments in Sarpy County. The net fiscal gain falls to $6.06 million for the Omaha MSA as a whole. The fiscal gain is largest in Sarpy County since other counties have new population and business activity but do not have the large property tax impact from data centers.

**Table 4.8**
**Annual Net Fiscal Impact for Local Governments in Sarpy County and Omaha MSA**

| Local Governments | Revenue (Millions $) | Expenditure (Millions $) | Net Fiscal Impact (Millions $) |
|---|---|---|---|
| Sarpy | $9.17 | $2.97 | $6.21 |
| Omaha MSA | $10.32 | $4.26 | $6.06 |

Source: BBR calculations

Tables 4.9 and 4.10 show the estimated economic and fiscal impact for an alternative economic development project based in Sarpy County. We utilize the hypothetical example of a manufacturing plant with 430 workers. The manufacturing plant is in the fabricated structural products industry, which is a common manufacturing industry with a presence in Sarpy County. Most manufacturing plants are less capital-intense and utilize less electricity per worker than a large data center. Therefore, manufacturing plants tends to have lower employment and labor income multiplier impacts, and therefore, generates both less tax revenue and fewer state and local public expenditures. We assume that manufacturing plant would have half as much real property (i.e., buildings) per worker than a data center. Like data centers, the manufacturing plant also is expected to have received state tax incentives but not local tax increment financing.

Table 4.9 shows the state fiscal impact of the alternative economic development project. Both revenue and expenditure impacts are lower than for the data center industry. There is a net fiscal loss of -$5.38 million per year for state government during the incentive period. After the

incentive period, there is a smaller net fiscal loss of $0.73 million. The difference is that the manufacturing plant would not generate as much sales tax on electricity as a data center.

**Table 4.9**
**Annual Net Fiscal Impact for State Government**
**Alternative Economic Development Project**

| State Government | Revenue (Millions $) | Expenditure (Millions $) | Net Fiscal Impact (Millions $) |
|---|---|---|---|
| During Incentive Period | -$2.15 | $3.23 | -$5.38 |
| After Incentive Period | $2.50 | $3.23 | -$0.73 |

Source: BBR calculations

Table 4.10 shows the local fiscal impact of the alternative economic development project. Again, both revenue and expenditure impacts are lower for the manufacturing plant than for the data center industry. There is a net fiscal gain of $2.37 million during the incentive period which rises to $2.66 million after the incentive period.

**Table 4.10**
**Annual Net Fiscal Impact for Local Governments**
**Alternative Economic Development Project**

| Local Government | Revenue (Millions $) | Expenditure (Millions $) | Net Fiscal Impact (Millions $) |
|---|---|---|---|
| During Incentive Period | $5.59 | $3.22 | $2.37 |
| After Incentive Period | $5.88 | $3.22 | $2.66 |

Source: BBR calculations

## Appendix 1. About the UNL Bureau of Business Research and Key Personnel

### *A. The Bureau of Business Research*

The Bureau of Business Research is a leading source for analysis and information on the Nebraska economy. The Bureau conducts both contract and sponsored research on the economy of the United States as well as Nebraska and its communities including: 1) economic and fiscal impact analysis; 2) models of the structure and comparative advantage of the current economy; 3) economic, fiscal, and demographic outlooks, and 4) assessments of how economic policy affects industry, labor markets, infrastructure, and the standard of living. The Bureau also competes for research funding from federal government agencies and private foundations from around the nation and contributes to the academic mission of the University of Nebraska-Lincoln through scholarly publication and the education of students.

### *B. Key Personnel*

#### Dr. Eric Thompson – Principal Investigator

Dr. Eric Thompson will be the principal investigator on this project. Dr. Thompson is the Director of the Bureau of Business Research and an Associate Professor of Economics at the University of Nebraska-Lincoln. Dr. Thompson has conducted a broad group of economic impact studies including impact studies of Nebraska agriculture, irrigation and regulation of irrigation, Sandhill Cranes migration, the Nebraska child care industry, the Omaha Zoo, the Nebraska horseracing industry, Husker Harvest Days, and the UNL Athletic Department. Dr. Thompson also works on demographic projections, and analyses of economic development programs for Nebraska and cities in Nebraska. He also has conducted numerous economic impact studies for the Lincoln Department of Economic Development, the Omaha Chamber of Commerce, the Nebraska Department of Economic Development, various Nebraska industries and Nebraska tourism attractions. Dr. Thompson's research has received support from the United States Department of Labor, the United States Department of Agriculture, the Robert Wood Johnson Foundation, the Nebraska Health and Human Services System, as well as Lincoln, Omaha, and Nebraska organizations and agencies. In his previous employment, Dr. Thompson served as the Director of the Center for Business and Economic Research and a Research Associate Professor of Economics at the University of Kentucky. Dr. Thompson received his Ph.D. in agricultural economics from the University of Wisconsin-Madison in 1992. His research fields include regional economics, economic forecasting, and state and local economic development. His research has been published in Regional Science and Urban Economics, the Journal of Regional Science, the American Journal of Agricultural Economics, the Journal of Cultural Economics, and the Economic Review of the Federal Reserve Bank of Cleveland.