bae urban economics

Memorandum

To: Jess Alexander, Principal, Stantec

From: Mary Burkholder, Associate Principal

Date: August 23, 2021

Re: Prince William County Data Center Study – Market Demand Analysis

Background

BAE Urban Economics is providing a market study of the data center industry as part of a study being led by Stantec on a proposal to expand Prince William County's data center overlay zone. Included below is the last component of BAE's work, a draft market demand analysis. Drafts of the remaining three components of BAE's work--an emerging trends review, a best practice in economic development review and an economic impact analysis--were submitted earlier this month. Once the drafts of the four pieces have been reviewed and approved by the client, they will be compiled into one report and submitted to Stantec and Prince William County.

Introduction/Methodology

A typical market study would review supply of what is being analyzed, in this case data centers in Prince William County, the potential market for those data centers, and with that information, provide an estimate of future demand for data centers. At the request of Prince William County, BAE provides most of the information about existing data centers in the County at the aggregate level, to show a general picture of the current supply. In certain cases, where public information is available about the data centers, BAE provides some more specific information about existing centers if it is critical to include in the overall analysis.

Information about existing data centers in Northern Virginia, which includes Prince William County, was obtained by reviewing industry reports, data center real estate reports, and interviews with state and local economic development representatives. Information about proposed data centers and land transactions was collected from articles in the local press or industry reports. Because of the limitations of providing specifics about the existing data centers in Prince William County, including the location of the centers, BAE market demand analysis is less specific and detailed in terms of identifying the range of demand and the geographic location of that demand than what would be typical for a market study. Nonetheless, the conclusions of the study should provide guidance on the demand for data

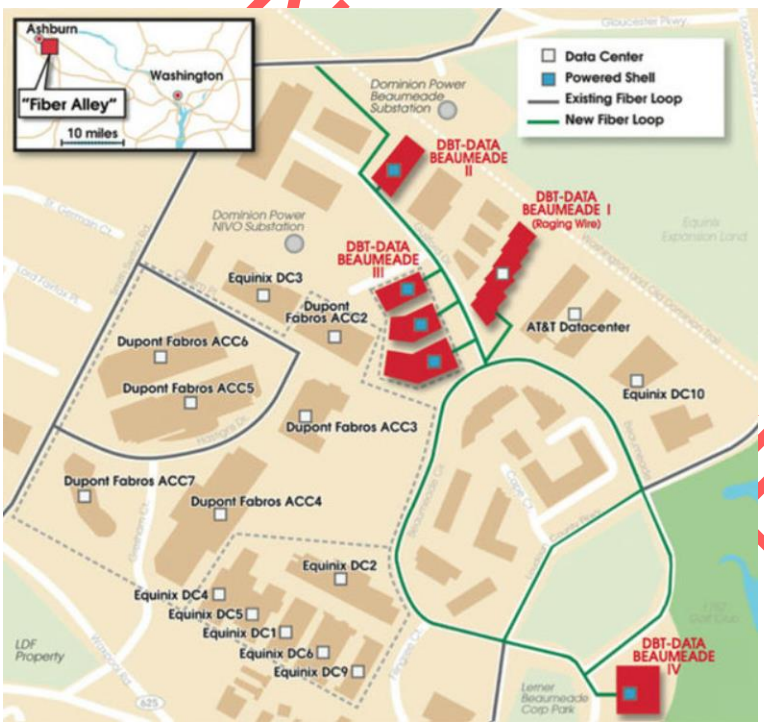
centers in the County as a part of what is considered when deciding whether the data center overlay zone should be expanded.

Data Centers in Northern Virginia

According to data center information clearinghouse Baxtel, there are currently 180 data center sites in Northern Virginia primarily in three counties: Fairfax, Loudoun, and Prince William.[1] Northern Virginia is the largest data center market in the world. The area makes up 48 percent of the primary market inventory of data centers in the United States.[2]

Most of the data centers in Northern Virginia are located in Loudoun County. Specifically, the largest concentration of data centers is in an area known as "Data Center Alley" along the Dulles Greenway (VA 267) which includes Ashburn, Sterling, and Leesburg. By far the largest concentration of data centers in Data Center Alley is in Ashburn, in the area surrounding the Equinix campus and Beaumeade Circle, as shown in Figure 1.

Figure 1: Ashburn Data Center



[1] Baxtel, "Northern Virginia Data Center Market." Retrieved from https://baxtel.com/data-center/northern-virginia.

[2] CBRE Research, "A Source of Stability: Digital Infrastructure in 2020, North American Data Center Report H2 2020." Retrieved from https://www.cbre.us/research-and-reports/North-American-Data-Center-Report-H2-2020

All of the major players in the industry have data centers in Loudoun County including Amazon Web Services, Google, Microsoft Corp., CyrusOne, Digital Realty Trust, and Equinix. As shown in Table 1, four of the five largest data centers in Northern Virginia are located in Loudoun County. Each of these four is located in Ashburn, the largest of which is QTS Ashburn Lockridge with 105 MW of power.

Table 1: Largest Data Centers in Northern Virginia

Company	County	Site Name	Total Building SqFt	Gross SqFt.	Power (MWs)
QTS Data Centers	Loudon	QTS Ashburn Lockridge			105.0
Digital Realty Trust	Loudon	Digital Realty Loudoun Ashburn Campus	1,700,000		80.0
Equinix	Culpepper	Equinix Culpeper Campus	850,000	172,534	62.5
Digital Realty Trust	Loudon	44372 Round Table: Digital Realty	223,200		60.0
Aligned Energy	Loudon	Aligned Ashburn	881,755 (est. at full buildout 12/31/2020)	200,000 (est. at full buildout 12/31/2020)	100.0 (at full buildout 12/31/2020)

Source: Baxtel, BAE, 2021

While land options are becoming more limited, there are still several data centers in Loudoun County currently under construction or in the planning stage. According to the Loudoun County Economic Development, the County has 25 million square feet of data centers currently operational, with another four million square feet in development. The County attributes much of the continued growth in the data center market to comparatively inexpensive power available from Dominion Energy and to the County's Fast Track Program which provides priority reviews for economic development projects that provide significant impact on the tax base. Data centers are part of the fast track group—19 projects sought fast track approval between July 2020 and December 2020 alone.[3]

Prince William County also has a growing data center market. According to Prince William County economic development officials there are currently 26 data centers in the County, with two additional centers under construction and one planned. The two under construction are small QTS facilities on their campus, with one and three MG of power, respectively. The

[3] Miller, Rich. "Data Center Construction Surging Amid Supply Constraints in Top Markets." Retrieved from https://datacenterfrontier.com/data-center-construction-surging-amid-supply-constraints-in-top-markets/.

planned center is a 1,100,000 square feet Amazon Web Services data center with 150 MW of power.[4]

Companies with data centers in Prince William County presently include Iron Mountain, Amazon Web Services (multiple facilities), CloudHQ, COPT, Equinix, Evoswitch, Opus Interactive, QTS, and VAZATA. The largest of these is Iron Mountain which has two data centers on its 83-acre campus. The first Iron Mountain building (VA-1) is 168,000 square feet and has 14 MW of power. The second building (VA-2) has 221,500 square feet of space and 24 MW of renewable power. The master plan for Iron Mountain includes two additional buildings totaling approximately 600,000 square feet of space.

Overall, in 2020 in the Northern Virginia market, 380 MW of single-tenant (e.g., Amazon Web Services, Microsoft, etc.) data center inventory was added, while 230 MW of multitenant inventory was added.[5] As of Summer 2021, there is an estimated 3 percent vacancy rate for data centers in the Northern Virginia market.[6]

Current Market Demand for Data Centers

From interviews with data center real estate specialists, interviews with state and local economic development officials in Virginia and Maryland, and industry reports, strong demand for data centers persists in Northern Virginia. It is widely agreed that Loudoun County continues to enjoy most of that demand, but Prince William County is poised to the recipient of more demand for data centers going forward if Loudoun County runs out of space. Everyone contacted for this study indicated the growth potential for data centers in Prince William County was great. Current growth in the market overall in Northern Viriginia is "explosive" as one data center real estate specialist indicated. As Prince William County leaders review a proposal to expand the data overlay zone, which would allow data centers by right, the following observations should be kept in mind:

1) Land prices for proposed data centers are rising to unprecedented heights – Land sales for data center sites in Loudoun and Prince William Counties between March and August 2021 have ranged from $425,000 - $3.02 million per acre. In July 2021, Microsoft purchased two parcels in Prince William County for a combined $95.1 million

[4] Cushman & Wakefield, "Data Center Update Americas: United States and Canada." (2021). Retrieved from https://www.cushmanwakefield.com/en/insights/americas-data-center-update.

[5] JLL, "2020 Year-End Data Center Outlook: A Review of the Industry's latest trends and what to expect in 2021." Retrieved from https://www.us.jll.com/en/trends-and-insights/research/data-center-outlook.

[6] Cushman & Wakefield, "Data Center Update Americas: United States and Canada." (2021). Retrieved from https://www.cushmanwakefield.com/en/insights/americas-data-center-update.

or just over $1 million per acre. In August 2021, Amazon Web Services purchased 17.15 acres for $32.5 million or over $1.85 million per acre.[7]

2) The primary drivers for data center real estate site selection are availability of power and access to fiber – Data center real estate specialists indicate access to reliable power and access to fiber, particularly dark fiber, are the most important factors in data center site selection. Dominion Energy, which is the primary power source for Loudoun County, is the preferred power provider for data centers. Though most of Prince William County gets its power from Northern Virginia Elective Cooperative (NOVEC), Dominion provides power in certain parts Prince William County.

3) State economic incentives are important for attracting data centers, but not as important as availability of power and access to fiber – The Commonwealth of Virginia offers an exemption for retail sales and use tax for qualifying computer equipment purchased by data centers that meet statutory investment and employment requirements. General eligibility is $150 million of new capital investment, 50 new located at the data center in applicable locality (this job threshold is frequently met by having multiple data centers owned by a company on a campus in a Virginia county), and each new job at the data center must be paid at least 150 percent of prevailing wage in the locality where the data center is located.[8] These incentives are helpful, but do not drive decisions according to data center real estate specialists.

4) Local personal property tax rates are a factor, but are not likely to be a primary consideration for data center site selection – Different localities in Virginia charge different personal property tax rates for data center personal property. In the more populated parts of the state, these range from $0.40 per $100 of assessed value in Henrico County to $4.57 per $100 of assessed value in Fairfax County. Prince William County recently elected to raise the property tax on IT equipment, with a phased increase through 2024 that shifts the rate from $1.35 per $100 to $2.00 per $100. It is not yet known if this would affect demand in Prince William County.

5) Other serious competitors to Northern Virginia for data center investments are emerging – Though demand for data centers in Northern Virginia remains quite strong, a few other areas in the broader region are offering both sites and improved incentives that may sway some data center interests in the longer-term including Henrico County

[7] Cordell, Carten. "Amazon Web Services Pays $32.5 million for Yet Another Data Center Parcel in Loudoun." Washington Business Journal. (August 13, 2021). Retrieved from https://www.bizjournals.com/washington/news/2021/08/13/amazon-picks-up-land-parcel-in-loudoun-for325m.html#:~:text=Amazon%20Web%20Services%20pays%20%2432.5,data%20center%20parcel%20in%20Loudoun&text=Amazon%20Web%20Services%20scored%20another,from%20the%20Amazon.com%20Inc.

[8] There are lower thresholds for capital investment and jobs in "distressed localities," but this would not apply to Prince William County.

and Frederick County, Maryland. Of particular note is a June purchase of 2,100 acres in Frederick County, Maryland by a joint venture of Quantum Loophole and TPG Real Estate Partners for $100 million in cash ($47,619 per acre). The CEO of Quantum Loophole indicates the site has "the entitlement, power, water and proximity to Northern Virginia that the internet industry needs for success."[9] Additionally, as of 2020, Maryland now exempts sales and use tax of qualified personal property for data centers. Data centers in Maryland must create at lease five positions at the data center and make a minimum investment of $5 million in qualified data center personal property in most parts of the state, and $2 million in distressed areas or federal Opportunity Zones.

[9] Massive Maryland property sells for $100M. bizjournals.com. (2021, June 28). https://www.bizjournals.com/baltimore/news/2021/06/28/alcoa-sells-maryland-property.html.