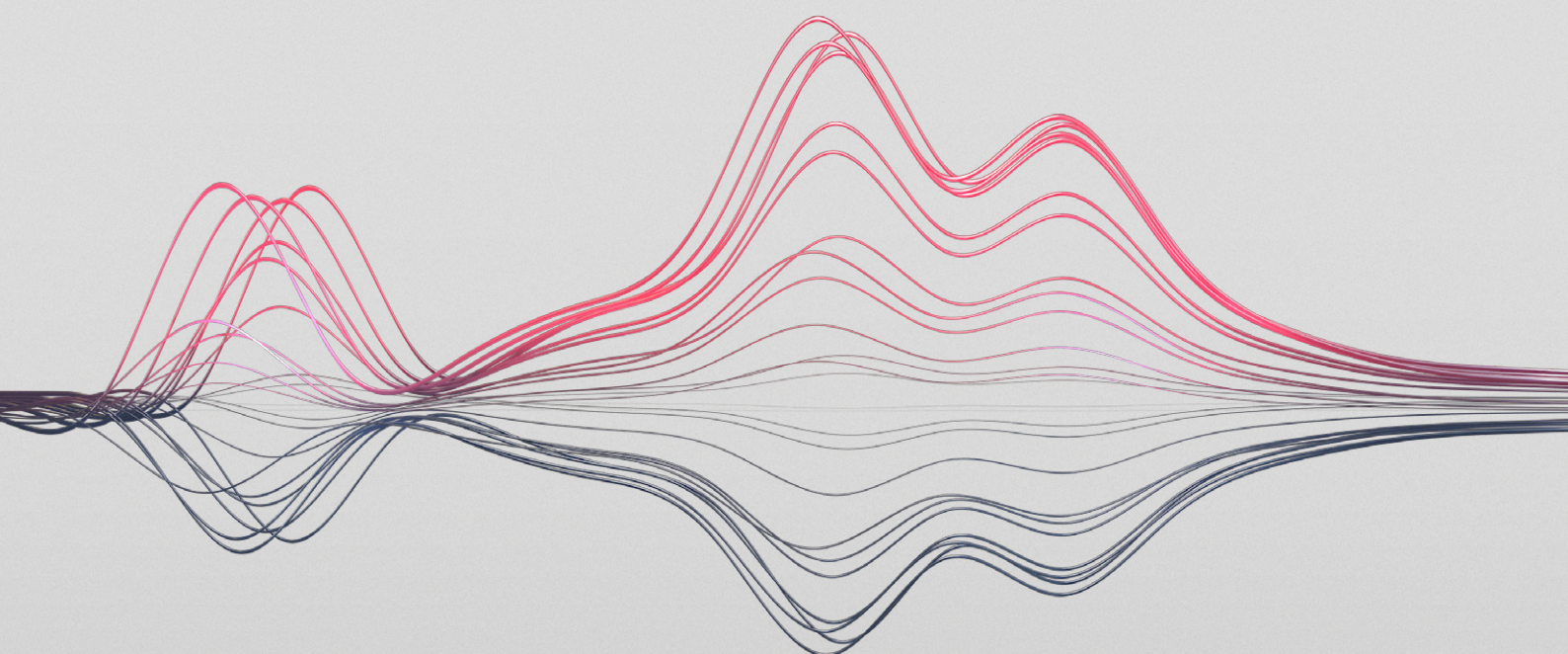


The rise of data centers

IN NORTHERN VIRGINIA



The rise of data centers in Northern Virginia

What are data centers?

Data centers are physical structures that house computing equipment for the purpose of storing and permitting access to massive amounts of data that is used to power the innumerable information services that we depend on every day, such as streaming movies, sending emails and browsing social media. Demand for data center services has increased in line with the growth in worldwide internet use. Rapidly emerging information services, such as

artificial intelligence (AI) and wired devices for the home (security systems, smart TVs, thermostats, dishwashers and ovens), as well as B2B applications and the expansion of 5G, will continue to fuel rapid demand and growth. See [Exhibit 1](#) for illustrations of data centers.

Why are so many data centers located in Northern Virginia?

[Northern Virginia boasts the largest data center market in the world](#) (See Figure 1). At present, there are

over 150 data centers in the region. Virginia is a popular location for data centers because of its favorable tax incentives, proximity to low-cost energy, extensive fiber network, skilled workforce, and affordable land. Moreover, Northern Virginia has long benefited from its proximity to Washington, DC, as has the data center sector.

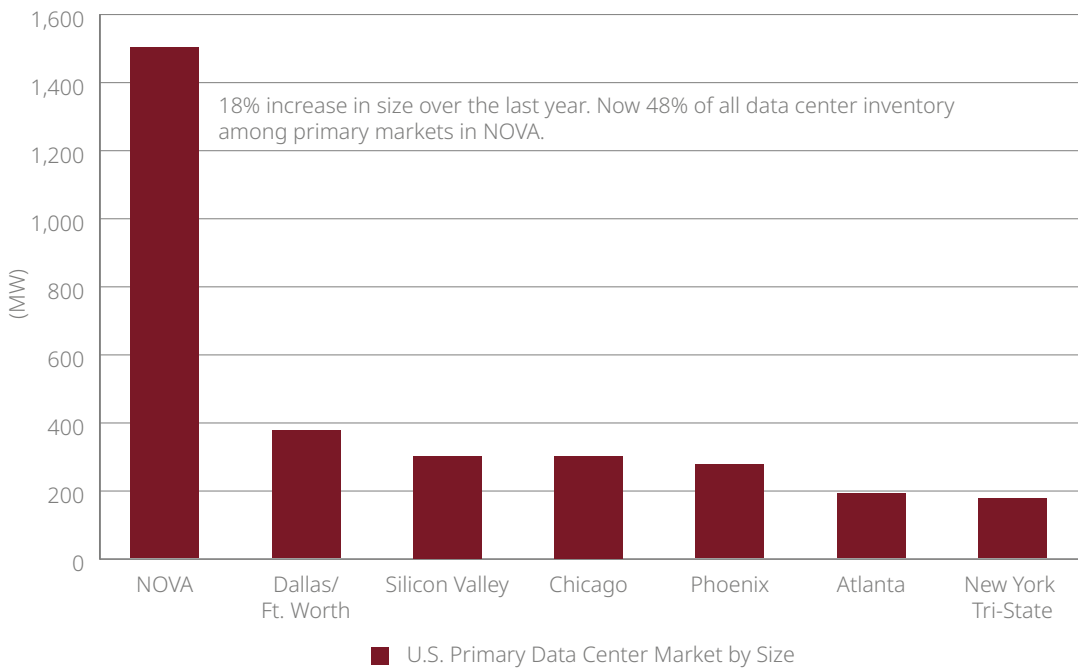


Figure 1: Source: CBRE Data Center Solutions, H1 2021

FINANCIAL INCENTIVES FOR DATA CENTER DEVELOPERS AND OPERATORS

Virginia is a business-friendly state and one of 31 states that openly promote incentives for data center expansion. These financial incentives have had a far-reaching impact on the region's data center growth. In 2021, Virginia granted data centers USD124.5 million in tax breaks. According to a cost analysis conducted by the Virginia's Joint Legislative Audit and Review Commission, a whopping 90% of data center investments undertaken by firms that received sales and use tax exemptions would not have occurred in the state if the incentive had not been offered. According to the Commission's findings, data center employment and investment surged in Virginia as data center incentives were expanded.

LOCAL GOVERNMENT AND PUBLIC PARTNERSHIP

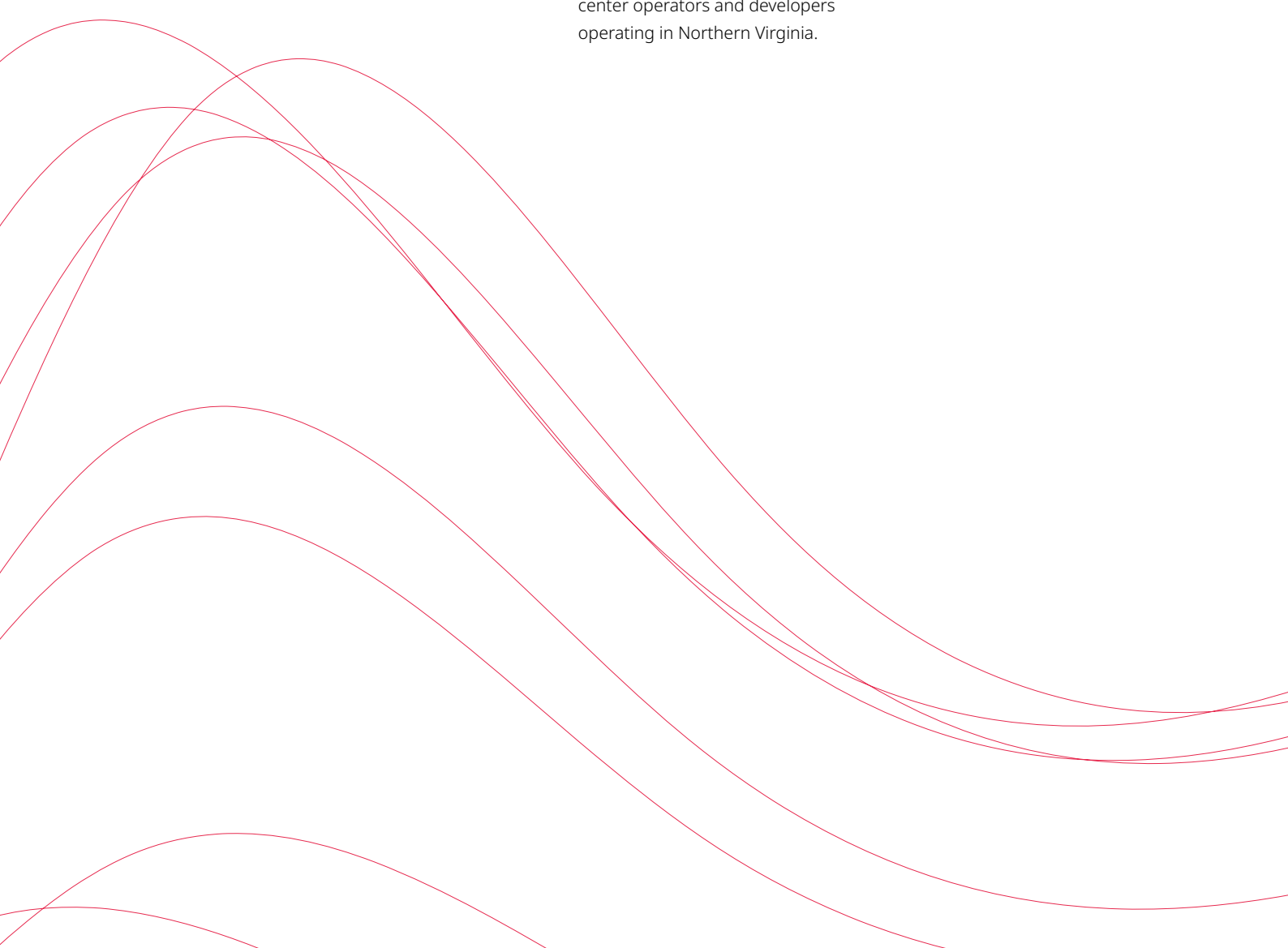
The careful cooperation between power utilities, local governments, and state agencies to attract new business and sustain existing data center expansion is a crucial component in Northern Virginia's industrial growth. For example, Loudoun County offers a streamlined site plan approval process for data centers through its Fast-Track Commercial Incentive Program. Dominion Energy, Virginia's largest energy supplier, offers low-cost power that is among the most affordable in the nation – with electric rates 30% below the US average.

Such reliable power at a low cost, combined with world-class fiber networks and cost-effective renewable energy alternatives, provides immediate value to data center operators and developers operating in Northern Virginia.

WELL-TRAINED WORKFORCE

Virginia has one of the largest data center workforces in the nation. In Loudoun County alone, data centers provide more than 12,000 jobs to a wide variety of skillsets. To address the labor challenges confronting Northern Virginia's data centers, a heavy emphasis is placed on community partnerships to provide data center training programs and certificates aimed at developing skilled workers.

Notably, Northern Virginia has a well-developed pipeline of competent data center workers, owing to the existence of data center-specific degree programs at institutions such as Northern Virginia Community College (NOVA) and George Washington University.



Economic impact on Northern Virginia

The development and continuous operation of data centers in Northern Virginia has far-reaching implications for the state's economy. Companies spend billions of dollars constructing and equipping data centers with computer servers and electricity. These expenditures have a positive economic ripple effect that benefits contractors and subcontractors, vendors, retail businesses, restaurants, hotels, and local governments.

Job creation by data centers is among the most commonly cited factors driving tax revenue growth. As a result, the majority of elected officials and taxpayers frequently ask why companies establishing data centers receive such favorable tax incentives. In 2020, Virginia's data center industry directly provided approximately USD4.5 billion in economic output and employed more than 14,000 people.

Further, data centers pay millions of dollars in state and local taxes. Locally, data centers are taxed on real estate, construction materials, equipment purchases, tangible personal property such as computer servers, business licenses, and industrial utilities. Moreover, many data centers are still obligated to pay state sales and use taxes on data center equipment purchases since they do not meet the Virginia data center incentive standards.

Environmental impact and improvements

The most widely recognized challenge facing data centers is their massive cumulative energy consumption. The global electricity demand of data centers was 205 TWh in 2018, which represents about 1% of total global electricity demand.

Shifting to renewable energy has substantial environmental benefits beyond lowering carbon emissions. In Northern Virginia,

Dominion Energy has announced intentions to expand its use of renewable energy sources in response to new environmental legislation and pressure from technology businesses trying to lessen their reliance on fossil fuels. As of November 2019, 51% of all renewable energy produced by Dominion Energy was directly attributed to data centers. Private technology companies,

like Google and Meta, have all committed to using renewable energy to power their entire operations. Moreover, water cooling technology advancements have enabled the creation of a closed water system that recycles water and uses only enough water to restore the water lost to evaporation.

Data centers in the age of COVID-19

The COVID-19 pandemic has affected every part of society, and demand for more internet access is a significant part of this. The Northern Virginia suburbs are experiencing the ripple effects of the world's demand for internet access. With more individuals working from home, attending virtual classes, shopping online, and bingeing shows on streaming networks, there is a bigger demand than ever for instantaneous, virtual connectivity.

According to [OpenVault's Broadband Insights Report](#), broadband traffic increased by 51% as a result of lockdowns and remote learning. Data centers were able to improve their interior servers and capacity in response to the increased load on their networks. See [Exhibit 2](#) for illustrations of servers.

The pandemic caused internet traffic to increase while prompting the exponential growth of cloud

technology and virtual collaboration for businesses. Cloud services are certainly becoming increasingly popular as more organizations adjust to working remotely. As companies evolve, data centers will continue to expand and adapt to meet the increased need for connectivity. Emerging trends point to a greater dependence on cloud capabilities as organizations adjust their business models to include more flexible remote working options.

An essential consideration: Land use and zoning

One of the major issues with securing site approval is the underlying zoning of the property.

Zoning was established in the US to protect the health, safety, and welfare of the community. Since zoning laws were established, states have typically delegated and assigned zoning authority to local governments. In Virginia, it is the responsibility of the county

or municipality to control the jurisdiction's zoning. Each locality has its own complex ordinances and nuances regarding the way land is to be used (different elected officials for each jurisdiction, unique regulations and processes). Addressing the necessary legal processes means that, on average, a zoning case may take 9 to 18 months to resolve, depending on the complexity of the case.

More specifically, for the Northern Virginia region, the data center industry is finding that available land with conforming zoning has dwindled markedly, prompting companies to expand into new jurisdictions throughout Northern Virginia – and to encounter fresh challenges with unique land use challenges in each locality. To address these issues, experienced counsel is vital.

Simply put...

Northern Virginia, with its rich history, prime location, dependable energy supply, impressive connectivity, and advantageous tax incentives, is a natural fit for the data center sector. With these factors, combined with a business-friendly environment and a skilled workforce, Northern Virginia has quickly become the data center capital of the world.

DLA Piper has been involved in and with the data center industry for over 25 years and has secured some of the largest, most complicated and, at times, controversial, zoning and entitlement approvals in the thriving Northern Virginia market.

Learn more about our work in Northern Virginia by contacting the author.



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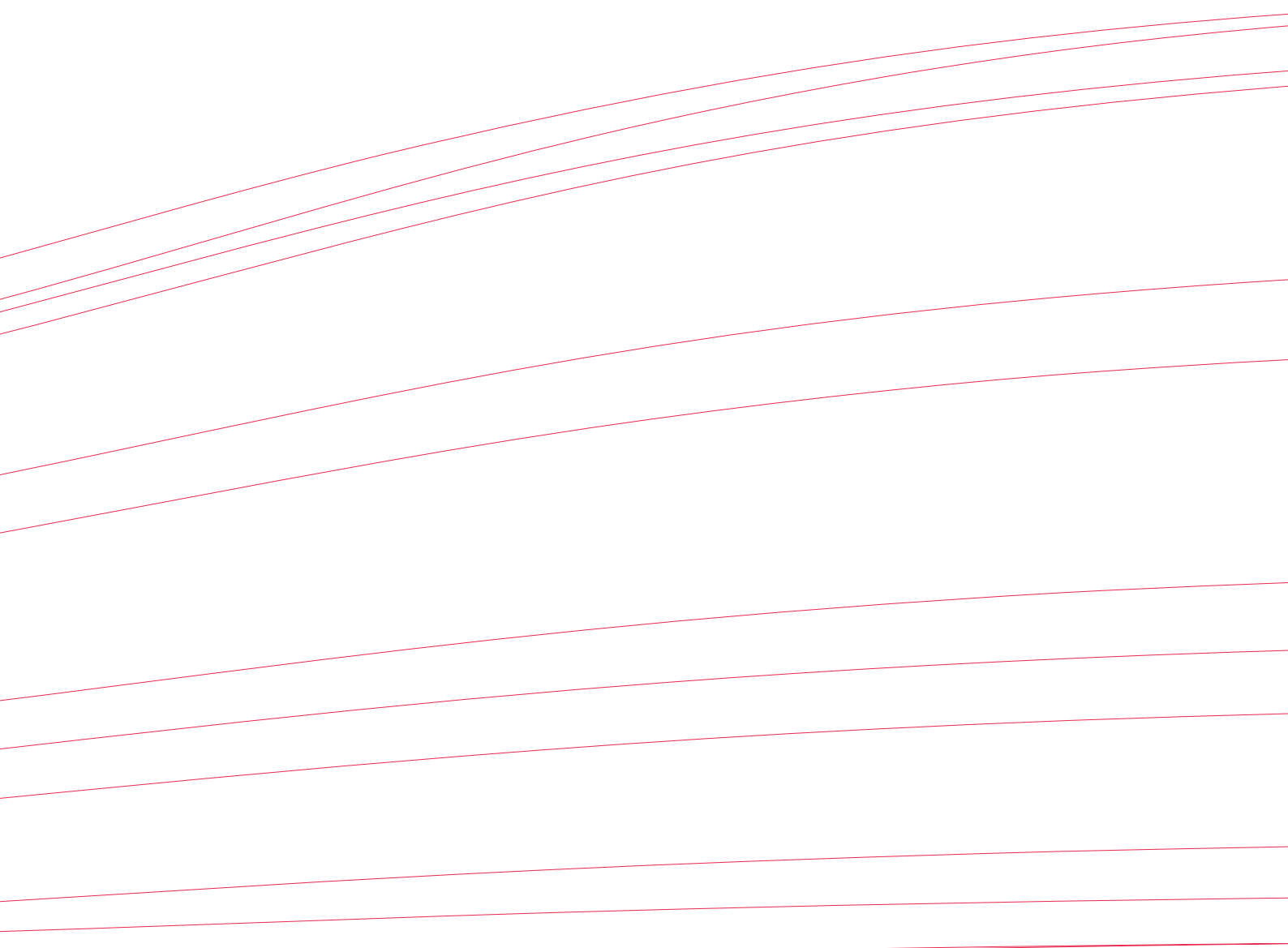


Exhibit 1 – Representative data center exteriors



Exhibit 2 – Representative data center interiors/servers



