Case 1:

Executive Summary

Data centers are integral to the functioning of the digital economy, serving as the backbone for digital applications and services, data storage, and user connectivity. With the rapid development of artificial intelligence (AI), there is a growing demand for specialized data centers capable of meeting the computational needs of AI models. O'Leary Ventures proposes the construction of a 100MW AI data center to address this demand.

Selecting the right site for a data center involves considering various factors, including land availability, power infrastructure, water access, fiber connectivity, regulatory environment, and workforce availability. Additionally, understanding market trends is crucial, with the US data center market categorized into primary, secondary, and tertiary markets.

Current market conditions indicate record-high demand and low vacancy rates, driven by increased AI development and cloud computing needs. Primary markets such as Northern Virginia and Silicon Valley face challenges such as power supply constraints and expensive real estate, driving the search for alternative locations.

Three recommended site locations are outlined in this report:

1. South Dallas: Offering a favorable business environment, skilled workforce, and lower land and power costs compared to other primary markets, South Dallas is positioned as an opportune location for data center development.
2. Northern Nevada: With proximity to Silicon Valley, favorable energy costs, access to fiber connectivity, and a less prohibitive regulatory environment compared to California, Northern Nevada presents an attractive option for serving the Silicon Valley market.
3. North Dakota: Despite being in its infancy as a data center market, North Dakota offers advantages such as cheap real estate, energy costs, and favorable tax incentives. Its well-developed power grid enables quicker deployment, making it a viable option for investment.

In conclusion, selecting the right location for a data center is crucial for O'Leary Ventures, considering the significant investment and long-term implications involved. Each area presents its own set of advantages and trade-offs, and careful consideration must be given to factors such as market conditions, infrastructure, and regulatory environment. The report highlights South Dallas, Northern Nevada, and North Dakota as potential investment opportunities for O'Leary Ventures, each offering unique benefits suited to different conditions and requirements.

Data centers are like the beating heart of the digital economy. They supply the raw computational power that runs the world's digital applications and services, store the trillions of gigabytes of data, and connect all this to end users. The aggressive development of artificial intelligence is creating a veracious appetite for computational power to develop and train these

models. Thus, the demand for specialized data centers such as the 100MW AI Data center proposed by O'Leary Ventures is increasing.

Many factors come into play when it comes to selecting a site for a center. First and foremost is the land on which it will be built. Historically, the cost of land wasn't an essential factor, but post-Covid land prices have gone up considerably due to increased competition among data center developers and other commercial real estate projects. Secondly, power is going to be the most significant expense during operations. Not only does the region need to be able to support the 100MW capacity, but it must also be capable of quickly constructing the appropriate infrastructure, such as substations and transmission lines. Access to water is essential because of the high-density racks that will be required of an AI data center; air-cooling won't be sufficient, and water-cooling will take place. Proximity to fiber cables is another crucial factor, helping reduce the costs of constructing new underground fiber cables. The regulatory and tax environment of the state in which the site is located can offer numerous advantages, such as sales tax exemptions on equipment, state or corporate taxes, and overall business conditions. The remaining factors include proximity to customers, natural disaster zones, accessibility to green energy, and a skilled workforce.

Current market and trends overview: Overall, the data center markets in the US are categorized into primary, secondary, and tertiary markets. The primary markets have evolved from the telecom industry carrier hotels, and thus, many data centers are clustered in these regions. Primary markets include Northern Virginia, Silicon Valley, Dallas, Atlanta, Phoenix, Hillsboro, and Chicago. Secondary markets are central Washington, Austin, Southern California, Seattle, Houston, Denver, Minneapolis, and North Carolina. Tertiary markets include everywhere else or subregions of primary or secondary markets.

Present market conditions consist of record high demand and decade-low vacancy rates driven primarily by the increasing computing needs of AI development and cloud computing. The industry as a whole is being driven by businesses outsourcing their IT needs to data centers. This demand has caused a rise in the development of 50MW+ data centers that were once uncommon 5-7 years ago. As such, real estate in primary markets is becoming harder and harder to come by. Markets such as Northern Virginia are suffering from power and transmission supply issues, which will delay the construction of new data centers for several years. Markets such as Silicon Valley and Southern California suffer from expensive real estate, expensive power, unfavorable business conditions, and taxes despite being a hub for AI intelligence and data center demand.

Overall, each location will have its own problems, and the decision of where to invest should be made with O'Leary Ventures' expertise in mind and which problems it would rather face as there is no perfect location. Below are three recommended site locations based on three different scenarios. Each has its trade-offs.

1. South Dallas

Dallas remains one of the hottest markets for data centers, and for good reason. The data center industry in Dallas originated from the telecommunication infrastructure and has grown into the data center titan it is today with a favorable business environment, skilled workforce, low cost to

power, and relatively cheaper land to other primary markets. This has caused a hub of activity in northern Dallas for data center development. Due to the continued growth north of Dallas, the possible data center sites are being bought up, pushing companies to develop in the south. Southern Dallas has more available land at a cheaper cost than Northern Dallas, but it comes with the trade-offs of a little bit more fiber and cable infrastructure needing to be built. Nevertheless, this is an opportune location due to the experienced and skilled workforce from the Dallas – Fort Worth metro. This would help significantly during the construction and operations of the facility. The state of Texas has an independent power grid, meaning that they are free from the Federal Power Act, bringing cheaper electricity rates to the state. However, this does come with some risks, as seen with recent blizzards. Texas also offers state tax exemptions for data center owners/operators. Some special considerations must be made out due to tornado and earthquake considerations. This will drive up the cost of construction to make sure the facility is secure. Overall, South Dallas is a good location for a data center due to the business environment, land and power costs, and skilled workforce.

2. Northern Nevada

Northern Nevada represents a unique opportunity to be in the vicinity of Silicon Valley without the downsides of California's location. Silicon Valley has been the global center of technological innovation since the 1980s and will further solidify that position with each advancement of AI. Due to this geographical region being the center for innovation and being in the greater state of California, the price of real estate, power, and taxes place a heavy constraint on building a data center. The area is very developed, and thus, commercial real estate has a hefty price tag. California's electricity rates are well above the national average and among the most expensive states for electricity. Combining this with unfavorable tax laws for both individuals and corporations, as well as a highly regulated business environment, shows the downsides of this location quite well. This is why Northern Nevada is an excellent location for servicing the Silicon Valley market at much lower costs. Northern Nevada is located in proximity to Silicon Valley(3 milliseconds away), has more favorable energy costs, has access to long-haul fiber, and has a great workforce. Geographically, it is much further from fault lines than California. This means lower costs to construct a seismic-resistant facility. Northern Nevada should be considered for serving Silicon Valley customers at the core of the AI revolution.

3. North Dakota

North Dakota's data center operations are just in its infancy, with several large 100MW data centers popping up in Ellendale and near Williston within the past two years. Although not seen as a market for data centers, companies are just starting to recognize the value play that can be made in this state. Cheap real estate, energy costs, and favorable tax incentives are positioning North Dakota to become a viable tertiary market. A primary driver of this is the well-developed power grid, which enables the data center to go online much quicker than other primary markets with power supply issues. This moves timelines up years and this speed-to-market advantage should be noticed. In addition, the state exports over 50% of the electricity it generates, which means plenty of power availability and cheap energy prices. In fact, in January 2024, ND had the second lowest electricity rates in the country. ND also has surprisingly good fiber connectivity for being such a rural and sparsely populated state. ND is far from fault lines, hurricanes,

tornados, forest fires, or tsunamis. ND also has a sales tax exemption for IT and Networking equipment under certain conditions. Some downsides are the potential for blizzards, flooding, or freeze events. ND is also far from customers, and its tech labor force is less developed than a big city. Lastly, O'Leary Ventures' current presence in ND makes it much more attractive than similar states such as Wyoming, South Dakota, or Nebraska. Further investment into ND would help strengthen O'Leary Ventures' relationship with the state and its people.

In summary, as demand for computational power continues to grow, so does the demand for data centers. Selecting a location for a data center is exceptionally critical because, unlike other forms of real estate, data centers are up to 10 times more expensive and are often years-long undertakings. Selecting the wrong site could bring unrecoverable financial losses and a tremendous waste of resources to the company. This report highlights three locations that would be suitable for O'Leary Ventures to invest in for various reasons under various conditions: Dallas for being in a thriving, growing data center hub, Nevada for its proximity to Silicon Valley, and North Dakota for its cheap cost of resources.

References

2024 Global Data Center Market Comparison. (n.d.). Page 3. https://cushwake.cld.bz/2024-Global-Data-Center-Market-Comparison/3/

Angara, J. (2022, June 30). *The key to reducing data center construction costs*. AKCP Remote Sensor Monitoring | Data Center Monitoring. https://www.akcp.com/blog/the-key-to-reducing-data-center-construction-costs/#:~:text=The%20main%20cost%20hog%2C%20though,power%2C%20redundancy%2C%20and%20availability.

Applied Digital announces energizing of facility in Ellendale, North Dakota. (n.d.). Applied Digital Corporation. https://ir.applieddigital.com/news-events/press-releases/detail/50/applied-digital-announces-energizing-of-facility-in

Average electricity retail prices. (n.d.). Global Energy Institute. https://www.globalenergyinstitute.org/average-electricity-retail-prices-map

Conte, N. (2023, December 26). *Mapping the biggest tech talent hubs in the U.S. and Canada*. Visual Capitalist. https://www.visualcapitalist.com/biggest-tech-talent-hubs-in-us-canada/

datacenterHawk. (n.d.). *One platform. Trusted by industry leaders. Backed by expert analysts*. datacenterHawk. https://datacenterhawk.com/platform

datacenterHawk. (2021, February 2). *Why is Data Center Location Important? – Data Center Fundamentals* [Video]. YouTube. https://www.youtube.com/watch?v=Y90Y5HZdeIE

datacenterHawk. (2022a, April 7). *Big Topics: Data Center Site Selection with CBRE* [Video]. YouTube. https://www.youtube.com/watch?v=9IIIRj5ao20

datacenterHawk. (2022b, May 4). *Big Topics: Data Center Investing with Carlyle* [Video]. YouTube. https://www.youtube.com/watch?v=yJsNETMiQ6M

Hasler, C., & Hasler, C. (2024, February 14). *The United States has an updated map of earthquake hazards*. Eos. https://eos.org/articles/the-united-states-has-an-updated-map-of-earthquake-hazards#:~:text=High%20Hazard%20in%20California%2C%20Alaska,damaging%20earthquake%20within%20a%20century.

Krazit, T. (2024, February 15). *How AI is changing the modern data center*. Runtime. https://www.runtime.news/how-ai-is-changing-the-modern-data-center/

The Impact of Artificial intelligence on data centers: A Comprehensive analysis. (n.d.). https://www.digitalrealty.com/resources/articles/data-center-ai

Zhang, M. (2024a, March 29). *How Much Does it Cost to Build a Data Center?* Dgtl Infra. https://dgtlinfra.com/how-much-does-it-cost-to-build-a-data-center/

Zhang, M. (2024b, March 29). *How Much Does it Cost to Build a Data Center?* Dgtl Infra. https://dgtlinfra.com/how-much-does-it-cost-to-build-a-data-center/

Zhang, M. (2024c, April 11). *United States data centers: Top 10 locations in the USA*. Dgtl Infra. https://dgtlinfra.com/united-states-data-centers/#:~:text=The%20top%2010%20data%20center%20locations%20in%20the%20United%20States,Washington)%2C%20and%20Los%20Angeles.