National Laboratory of the Rockies

Unlocking Synergistic Benefits of Colocation of Data Centers at Airports

Otto VanGeet, Sonja Berdahl, Scott Cary, Brett Oakleaf

Introduction

While national attention has focused on the requirements of energy-intensive new data centers, airports are facing a similar, though largely unnoticed, surge in electricity demand. Across the United States, airports are rapidly adding load from several sources: new gates and terminals, expanding tenant needs such as electrified rental cars and commercial kitchens, growing reliability requirements, and a shift to electric ground support equipment, buses, trucks, and potentially electric aircraft. Demand is rising just as commercial air travel is projected to grow more than 60% between 2019 and 2050—intensifying the pressure on airport energy systems.[1]

This white paper evaluates the potential of a new energy system configuration: Strategic colocation of data centers—on airport property or adjacent to airports—in order to realize significant operational, economic, and environmental benefits to airports, data centers, and the communities they serve. While increasing demand from both airports and data centers requires both parties to make significant infrastructure investments, colocation can mitigate some of the energy, land use, water and waste heat, permitting, and connectivity challenges of siting and powering these industries.

Key Term: Airport Colocation

Airport data center colocation means placing a data center on or adjacent to airport owned land, typically within the airport's industrial or aerotropolis zone. While the airport provides land, power access, and connectivity, the data center operator builds and runs the facility. It is **not** the same as *IT colocation* (defined as renting racks in a third party data center). Instead, it is a **land-use and infrastructure** partnership between an airport authority and a data center developer.

Unprecedented Demand Growth

Data Centers

Data center growth is largely driven by rising use of artificial intelligence (AI), which reached 53% population adoption in three years, faster than the personal computer or the Internet.[2]

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[1] Amy Schwab, Anna Thomas, Jesse Bennett, Emma Robertson, and Scott Cary. 2021. *Electrification of Aircraft: Challenges, Barriers, and Potential Impacts*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-80220. www.nrel.gov/docs/fy22osti/80220.pdf.

[2] Sha Sajadieh et al. Chapter 4: Economy. *The AI Index 2026 Annual Report*. AI Index Steering Committee, Institute for Human-Centered AI, Stanford University, Stanford, CA, April 2026. https://hai.stanford.edu/assets/files/ai_index_report_2026.pdf.

This rapid adoption creates much uncertainty around the estimates for growth in data center development and energy usage. Goldman Sachs projects a 160% increase in power demand from data centers by 2030, and McKinsey projects U.S. data center electricity demand will triple by 2030.[3,4] Wood Mackenzie notes that the number of data center requests for interconnection is growing faster than projected, and the size of the data centers is increasing in tandem.[5] At the start of 2023, the average proposed data center was estimated to have approximately 150 MW of demand, which has since doubled to 300 MW for a single data center—roughly equivalent to the capacity of a small city. Gigawatt campuses are now emerging as a new benchmark for hyperscale operators.[6]

Wood Mackenzie analysts tracking the technology sector have forecast demand growth of 10%–20% per year through 2030, which would require 13–35 GW of new capacity in the next 5 years.[7] In comparison, the average nuclear reactor in the United States has a capacity of just over 1 GW, which means that the equivalent of 13–35 new U.S. nuclear plants are needed to meet immediate data center demand growth.[8]

Importantly, this estimate for new capacity is only for data center loads and does not include growth in other energy-intensive industries like critical minerals mining, manufacturing, transportation, and buildings. Further complicating planning for future power needs is a lack of transparency—or awareness—in the data center industry around actual power usage (i.e., operating capacity) and the flexibility of those loads, which vary by the size of the data center, its ownership model, and its workload—e.g., AI training workloads require a one-time burst of extreme energy use and compute (GWh per run) while Inference is a continuous stream of smaller energy uses that, over time, exceed training in total energy footprint due to high frequency.[9]

Airport Electrification

While data center demands are creating a surge in requests for grid interconnection, airport electrification is still somewhat on the horizon. BETA Technologies demonstrated the first passenger-carrying, fully electric aircraft flight on June 3, 2025, flying from East Hampton Airport to John F. Kennedy International Airport in New York. When electrified aviation demand hits the grid in greater numbers, it will be significant—especially for charging advanced air mobility aircraft. A 2021 report from the National Laboratory of the Rockies (NLR) stated that battery capabilities needed for advanced air mobility aircraft will likely require megawatt-level charging to support the required rapid recharging (i.e., a full recharge in less than 30 minutes) for a single aircraft.[10]

In addition to advanced air mobility charging, airports are increasingly seeking to electrify passenger buses, trucks, and other fleet vehicles associated with airport operations. The number of electric vehicles added to rental car fleets is also growing and requires charging at or near the airport. More passengers flying on more aircraft will require more energy to heat and cool concourses, move baggage, and power airplanes as they idle at the gates. Greater loads are also expected as airports increasingly rely on AI to support airport operations—especially those with low latency or real-time processing requirements, such as facial recognition for rapid check-in or micro-weather forecasting that may require on-premises compute.[11]

While the projections for new capacity needed for aviation and transportation are sounding fewer alarms than those for data centers, they are not insignificant. Insight is needed into the amount of power airports will need in the short- and medium-term. Perhaps an even more important task is to determine their load shapes: how much power they will consume, and when. The challenge is to apply managed charging technology and time-of-use rate concepts to predict and manage when vehicles—rental cars, buses, equipment, and aircraft—will need to charge, and how much power their charging will require.

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[3] Goldman Sachs. 2024. "AI is poised to drive 160% increase in data center power demand." Goldman Sachs, May 14, 2024. https://www.goldmansachs.com/insights/articles/AI-poised-to-drive-160-increase-in-power-demand.

[4] A. Green, H. Tai, J. Noffsinger, P. Sachdeva, A. Bhan, and R. Sharma. 2024. "How data centers and the energy sector can sate AI's hunger for power." McKinsey & Company, Sept. 17, 2024. www.mckinsey.com/industries/private-capital/our-insights/how-data-centers-and-the-energy-sector-can-sate-ais-hunger-for-power.

[5] Chris Seiple. 2024. "Gridlock: the demand dilemma facing the US power industry." Wood Mackenzie, October 2024. www.woodmac.com/horizons/gridlock-demand-dilemma-facing-us-power-industry/.

[6] Craske, Ben. 2026 "Meta Breaks Ground on 1 GW Indiana Campus with US$10bn Boost." Data Center Magazine February 12, 2026. https://datacentremagazine.com/news/meta-breaks-ground-on-1gw-indiana-campus-with-us-10bn-boost?utm_source=copilot.com

[7] Green et al. 2024. *How data centers and the energy sector can sate AI's hunger for power*.

[8] U.S. Department of Energy, Office of Nuclear Energy. (2021, March 31). INFOGRAPHIC: *How much power does a nuclear reactor produce?* https://www.energy.gov/ne/articles/infographic-how-much-power-does-nuclear-reactor-produce

[9] DigitalOcean. (2026, February 27). *AI inference vs training: Key differences explained.* https://www.digitalocean.com/resources/articles/ai-inference-vs-training

[10] Schwab et al. 2021. *Electrification of Aircraft.*

[11] Kyle Barnes. 2026. "Soaring to New Heights: How AI is Redefining the Airport Customer Experience." *Cisco Customer Experience*, February 6, 2026. https://blogs.cisco.com/customerexperience/soaring-to-new-heights-how-ai-is-redefining-the-airport-customer-experience

Opportunities From Flexibility

The key to efficiently powering data centers and airports is to leverage the variability and flexibility of their loads to balance power needs between the two operations.

Airports and data centers both require 24/7 reliable power 365 days per year. While airports experience variable electricity demand depending on the weather, flight schedules, and operations tempo (e.g., the number of people moving through the airport at different times of the day and days of the week), demand is predictable. Airport peak loads typically occur on hot days in summer from air conditioning and busy travel periods. Conversely, airport loads drop during off-peak times or cooler times of the year.

The critical question is whether data centers have enough flexibility to offset peak load times at airports—not to shut down, but to "slow down" computing on demand. In other words: Do data centers have enough flexibility to handle load variability to complement airport operations?

A 2025 study by the Nicholas Institute for Energy, Environment & Sustainability at Duke University concluded that the U.S. grid can handle significant new loads such as data centers as long as they are flexible: "Flexible load strategies can help tap existing headroom to more quickly integrate new loads, reduce the cost of capacity expansion, and enable greater focus on the highest-value investments in the electric power system."[12] The study focused on balancing authorities and introduced the term "curtailment-enabled headroom" to describe how much additional load the U.S. grid can serve.

Similarly, a 2025 NLR white paper explored the concept of using latent flexibility that exists within nearby residential, commercial, and industrial buildings to help alleviate the costs and pressures of siting and powering distributed-edge data centers (<20 MW). The premise is that a grid-integrated approach that couples energy efficiency, demand-responsive building loads, and waste heat reuse networks from nearby buildings represents untapped flexibility solutions to reduce peak demand and expand effective feeder capacity to unlock additional capacity headroom, reduce interconnection delays, and limit cost impacts to customers. The question then becomes: Could airports provide some of the capacity needed for rapid deployment of new data centers?

The intermittent nature of airport loads means that there is nearly always "headroom" to accommodate at least a portion of the demand from a data center, as long as the data center can lower their net load during peak airport demand times. In general, non-time-sensitive AI training workloads could be curtailed or shifted, though AI inference (i.e., providing answers in real time) workloads would be harder to shift or curtail. Even if a data center is unable to shift its load, battery energy storage and other distributed energy resources provided by the data center could be used to help provide power during peak times and support grid stability by absorbing predictable—and sometimes unpredictable—airport peaks. The benefits of this premise could include lower energy costs for both the airport and data center, a flat energy profile that is preferable to the grid/energy supplier, faster interconnection times for data centers, and a possibility of allowing the utility to defer some grid investments, thus insulating local communities from rising electricity costs.

The Importance of Flexible Loads

The concept of "flexibility" in the bulk power system represents a system's ability to adapt to changing conditions. Flexibility is crucial for maintaining a reliable electric grid by improving the ability to balance electricity supply and demand second by second while adapting to societal needs for energy over time. Traditionally, power plants provided this flexibility by adjusting their output to follow demand, and new infrastructure was built to enable both load and supply to grow. As load growth returns, electrification increases, and variable energy resources are added to the grid, ensuring that the system has the flexibility it needs has become crucial.

Electric Power Research Institute. 2025. "Grid Flexibility Needs and Data Center Characteristics." White paper. www.epri.com/research/programs/063638/results/3002031504.

[12] Tyler H. Norris, Tim Profeta, Dalia Patino-Echeverri, and Adam Cowie-Haskell. 2025. *Rethinking Load Growth: Assessing the Potential for Integration of Large Flexible Loads in US Power Systems*. Durham, NC: Nicholas Institute for Energy, Environment & Sustainability, Duke University. hdl.handle.net/10161/32077.

Colocation Siting Benefits

The global race to AI has been called by an April 2025 article in Forbes "a geopolitical chess match with trillion-dollar stakes." To participate in the race, data center developers need available power and capacity; favorable electric tariffs and interconnection processes; affordable land, a robust fiberoptics network, and a technical workforce. Other challenges include the availability of water for cooling; local zoning ordinances around land use, state and local taxes, air quality, and noise; and supply chain issues for raw materials and technology components like chips and transformers. The Forbes article concluded that the AI contest "isn't about who crosses a finish line first—it's about who navigates an endless obstacle course with the fewest stumbles."

Airports that consider data center colocation opportunities may be able to remove several of these obstacles.

Land Use and Zoning

Land use and local zoning laws are becoming increasingly contentious for communities considering data center development. The tax revenue that data centers bring to communities seeking economic development can support local schools and other public services, which could make them very attractive to communities with dwindling tax bases or those looking to redefine themselves as a center for high-tech industries. But the investment does not come without a cost to communities.

Some communities are starting to push back on what they believe is an overdevelopment of data centers. In Loudoun County, Virginia—the county with the highest concentration of data centers in the world—a group of citizens have begun raising concerns about power and land use, as well as noise and other environmental impacts.[13] Loudan County is not alone; a wave of data center moratoria— a formal pause on new data center projects—is spreading across the county while states sort out the industry's impact on electric grids, water supplies, land use, and public budgets.[14] Moratoria and delays in permitting proposed data center projects are costly to developers: One developer estimates costs of $10,000 per day in lost revenue per megawatt. A 100MW data center stuck in permitting could cost the developer $1,000,000 a day.[15]

While local governments pause to better understand how best to permit and zone data centers, most major airports have industrial or logistics districts on their perimeters. These areas could be attractive to data center developers because they already support high-capacity electrical infrastructure, fiber backbones, 24/7 operations and transportation access. Plus, these zones are already incompatible with housing, which typically represents a major conflict for data center developers.

Derisking Infrastructure Investments

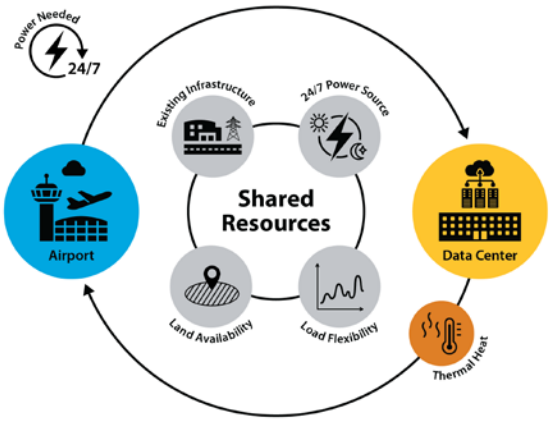

Figure 1. Airports and data centers have multiple power demand and land use compatibilities. *Image by National Labratory of the Rockies (NLR).*

In early 2025, regulators in the state of Indiana approved new "large load" interconnection rules that protect existing consumers from paying for the grid upgrades needed to support new data centers.[16] The idea is to shift the cost of new infrastructure to the end user that will receive the benefits rather than the traditional rate-based approach that spreads the costs across all ratepayers. Twenty-nine other states have large load tariffs in place for specific utilities, and ten more are pursuing similar tariff structures (three new states) to ease the rate impacts for consumers.[17] In October 2025, the U.S. Department of Energy directed FERC to establish rules for enabling data center interconnection to the transmission system.

When developers are required to bear more of the cost for energy infrastructure, they look for solutions to lower their costs. Like data centers, airports require

[13] Ryan Murphy and Emily Feng. 2025. "Why more residents are saying 'No' to AI data centers in their backyard." NPR, July 17, 2025. www.npr.org/2025/07/17/nx-s1-5469933/virginia-data-centers-residents-saying-no.

[14] Anthony Elmo, 2026. "Data Center Moratorium Bills are Spreading in 2026." Good Jobs First, February 19, 2026. https://goodjobsfirst.org/data-center-moratorium-bills-are-spreading-in-2026/.

[15] Stephen Lacey. 2026. "Can Data Centers Regain Their Social License?" Open Circuit, May 15, 2026. https://www.latitudemedia.com/news/open-circuit-can-data-centers-regain-their-social-license/.

[16] Ethan Howland. 2025. "Indiana regulators approve 'large load' interconnection rules." *Utility Dive*, Feb. 20, 2025. www.utilitydive.com/news/indiana-iurc-large-load-interconnection-data-center-aep-amazon-google/740452.

[17] Large-load tariffs are approved for specific utilities in AL, AR, AZ, IA, ID, IN, MN, MO, MS, MT, NC, ND, NE, NV, NY, OH, OR, SD, TX, UT, VA, WA, WV, and WY and are pending for specific utilities in AR, AZ, CA, IL, FL, KS, MO, MI, SD, VA, and WI according to the Smart Energy Power Alliance's "Database of Large-Load Tariffs." sepapower.org/large-load-tariffs-database/.

massive electrical capacity, so utilities often build large substations, redundant feeders, and high-voltage transmission lines near airports. Siting data centers near airport infrastructure can reduce interconnection times and substation upgrade costs and may delay the need to upgrade local distribution grids.

Where available capacity is scarce, data centers developers typically look to alternative power supplies. This can include investing in next-generation technologies that can be built on-site, such as fuel cells, hydrogen, batteries, small modular nuclear reactors, geothermal energy systems, and natural gas generation, or nearby existing assets such as underutilized nuclear resources. One example is the partnership between Microsoft and Constellation Energy to restart the Three Mile Island nuclear plant.[18]

Many of these technologies can be used to support peak loads, reliability, and resilience as a backup power source, while others augment baseload capacity. These technologies lend themselves to potential partnerships with airports that have similar energy needs and goals for affordability, reliability, resilience and security. In addition to optimizing infrastructure investments, colocating data centers with airports could result in more efficient permitting and siting of needed transmission and distribution assets.

Connectivity Infrastructure

Data centers are facilities that house computing infrastructure—servers, storage systems, networking gear, cooling, power, and security—and require robust connectivity infrastructure to enable the exchange of data between people, devices, and organizations. Connectivity infrastructure includes wired networks such as fiber-optic cables, wireless networks like Wi-Fi, and satellite systems. Data center developers generally look for areas that already have robust fiber-optic systems but will enter partnerships to build their own if needed.

As airport operations become more automated and connected to the grid, airports will also require robust connectivity infrastructure to operate in the digital age. Some of the processes that rely on real-time data include airport security, work requirements and staffing based on changing flight schedules, reoptimizing gate utilization, dynamic operational changes, weather forecasting to optimize takeoffs and landings, energy resilience forecasting, and eventually autonomous flight. As airports increasingly rely on AI for operational functions that require real-time processing, proximity to data centers will become increasingly necessary.

Energy Security and Resilience

U.S. data centers and airports are defined by the United States Department of Transportation as critical infrastructure and will become even more critical as industries become dependent on AI's capabilities, including transportation, financial institutions, healthcare, emergency services, national security, and more. As such, reliable and continuous function is a matter of both national security and global competitiveness. Data centers require a continuous supply of electricity because their data and computation needs are often tied to critical mission systems. Even short disruptions can lead to data loss, service disruptions, and financial damages. Similarly, power disruption at airports can put lives at risk and disrupt commerce on a nationwide basis as a single closure cascades across the system.

Because of the critical importance of U.S. energy security, both data centers and airports are exploring on-site generation options—including both traditional and advanced energy systems. These include natural gas generation, fuel cells, energy storage, small modular reactors (SMRs), solar, and geothermal power. These technologies can be integrated and combined to improve resilience and reduce reliance on standard grid connections, which can be variable during storms and other unintended outages.

Thermal Energy and Heat Reuse

Most large airports have central plants that distribute heating and cooling water to their buildings year-round. Most of the hot water is used to heat the buildings in the winter months, but some heat is needed year-round for domestic hot water; food service; HVAC reheat; and other end uses. Northern airports also make significant investments into chemical and mechanical removal of snow and ice across hundreds of miles of lane pavement, which could be partially reduced through pavement heating while reducing the potential for ground vehicle and aircraft accidents.

Data centers generate a significant amount of heat as a byproduct of running and cooling their servers. Excess heat needs to be removed from the data center or cooled through some type of thermal management system such as chillers, which use additional energy and often require water. Instead of being cooled, data center waste heat could be captured using heat exchangers or other heat recovery systems. Reusing heat represents significant potential to save the data center both energy and water. Moreover, the site that reuses the heat saves heating energy that would otherwise need to be provided from other sources.

[18] Laila Kearney. 2025. "Three Mile Island nuclear plant reboot fast-tracked to 2027." Reuters, June 26, 2025. www.reuters.com/sustainability/climate-energy/shut-three-mile-island-nuclear-plant-may-restart-2027-owner-says-2025-06-25.

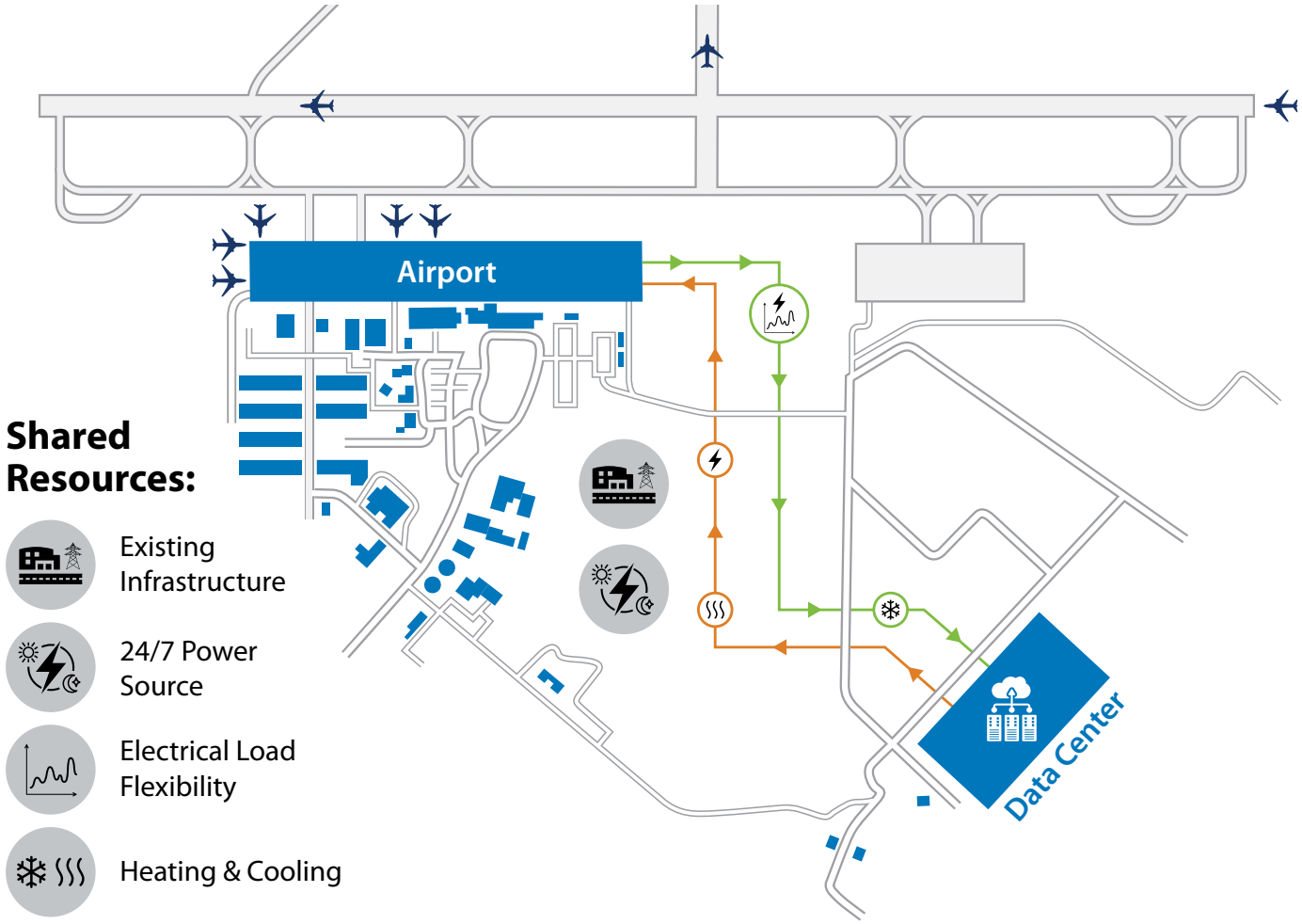

Figure 2: Airports have the potential to provide co-location benefits to airports. *Image by NLR.*

Since airports often have heating water distribution networks, there is a potential benefit of locating data centers near airports to allow waste heat to be reused. (An existing water distribution system often can be repurposed for reusing the heat from data centers thus lower the cost to develop the system.) The closer the data center can be located to the heat distribution network at the airport, the lower the infrastructure cost and the better the economics of heat reuse. If the heat from the data center is too low a temperature for direct heat reuse, a heat pump can be installed to boost the heating water temperature as needed. While the heat is primarily used to heat buildings and supply hot water for restrooms and food services, it can also be used to preheat de-icing products for aircraft, and further, melt snow on pavements in areas subject to icing or heaving (not shown in Figure 2).

See the appendix of this report for a theoretical case study of heat reuse at an airport.

Where are the Opportunities for Colocation?

The map in Figure 3 highlights where fiberoptic networks and transmission infrastructure already exist to support data center development—and where airports may offer available land and favorable zoning.

The pattern is clear: data centers cluster in major population centers, yet many smaller cities have an underrecognized advantage. Airports with open land, established fiber connections, and adequate transmission capacity could be strong contenders for future data center growth. Proximity to airports also benefits data center customers, many of whom make frequent onsite visits to manage equipment or oversee critical operations.

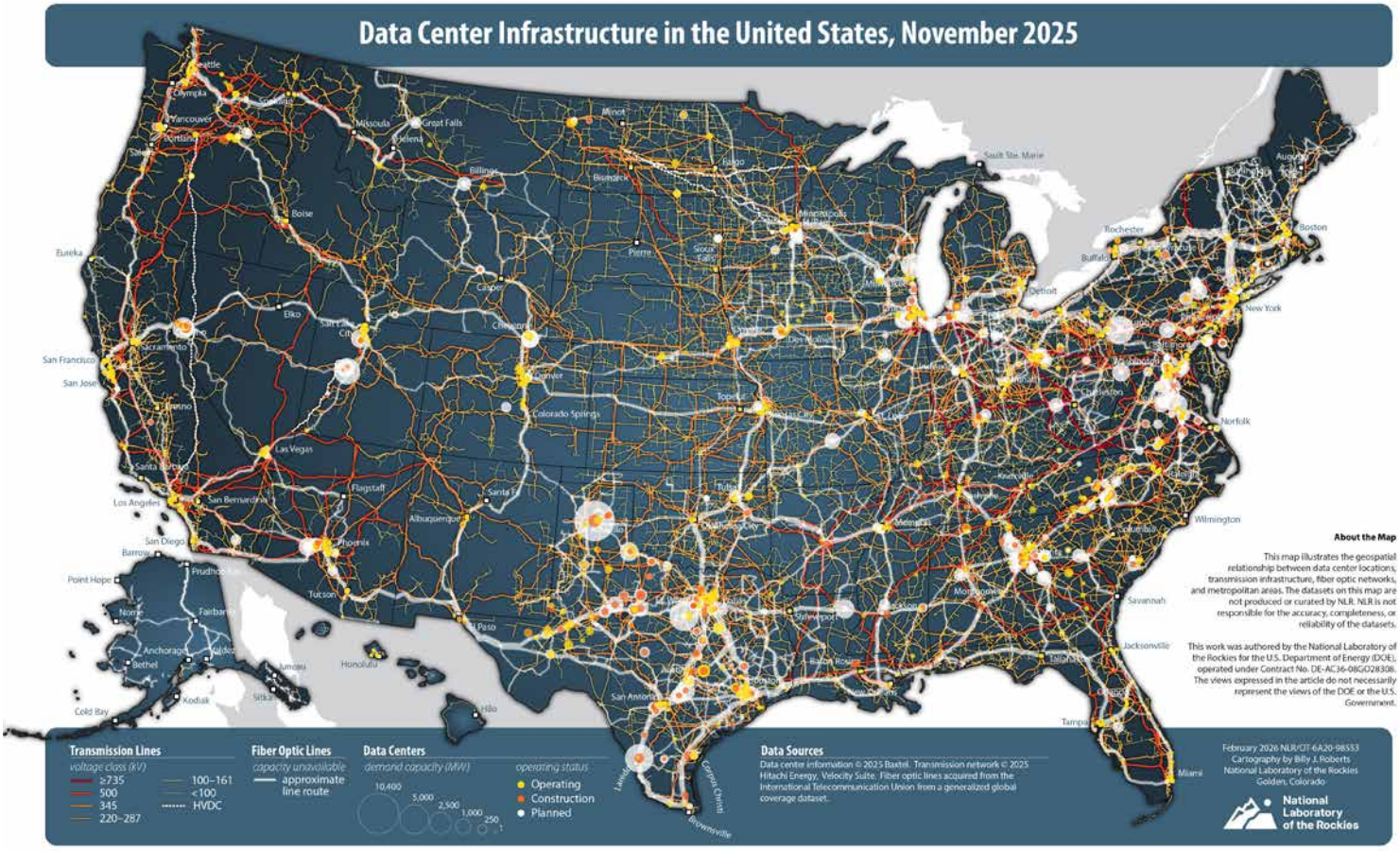

Figure 3. Data center infrastructure and airports in the United States *Image by NLR.*

Conclusion

Some projections suggest that U.S. electricity demand could triple by 2030. If that proves true, it will significantly expand opportunities for data centers, airports, utilities, and other power providers to form new strategic partnerships. These collaborations can enhance energy security and resilience across critical infrastructure while also enabling smarter land use, reducing distribution and transmission spending, lowering development and operating costs, and even making productive use of waste heat.

Exploring the potential benefits of colocating data centers with airports is one piece of a much broader effort to prepare for an economy-wide expansion of electricity infrastructure. Meeting the needs of rapidly growing sectors—critical minerals mining, data centers, manufacturing, electric vehicles, and the building and industrial sectors—will require strategies that integrate land use, environmental impacts, community benefits, and the shared use of energy, water, and infrastructure. Colocation offers an additional advantage: the substantial waste heat produced by data centers could be reused to help heat airport facilities.

The path forward begins with collaboration—developing the data, conducting analyses, and quantifying the full range of benefits that colocated data centers and airports could provide. NLR is uniquely equipped to support this effort with tools and expertise that enable network-level analysis and help optimize the ground energy infrastructure needed to address some of the most pressing challenges of our time.

For more information on NLR's capabilities and tools, contact:

Brett Oakleaf

Strategic Partnership Manager
Innovation, Partnering, and Outreach (IPO) Group

National Laboratory of the Rockies
15013 Denver West Parkway
Golden, CO 80401

Work: (303) 275-3771
Cell: (303) 888-3605
Brett.Oakleaf@nlr.gov

APPENDIX

Case Study: Data Center Alley and Dulles International Airport

Loudoun County Virginia is known as "Data Center Alley" because it has the highest concentration of data centers in the world, with more planned. In March 2026, the Virginia Assembly passed the first U.S. law focused on data center heat reuse. That law requires Virginia's energy department to identify heat reuse opportunities, facilitate communication between data centers and heat users, evaluate best practices and policies, and make recommendations for local and state policies.

The Northern Virginia Regional Commission provides an interactive map on their website showing that many of the existing and planned data centers are located adjacent to Dulles International Airport (IAD), primarily on the northeast edge of the airport property.[19] Most of IAD's buildings are also located along the northeast edge of the airport property. The snapshot from the map in Figure 4 shows that data centers along the northeast corner are located closest to airport property and airport facilities that may be candidates to reuse data center waste heat.

Figure 5 details each current or proposed data center, including parcel number, size, and boundaries.

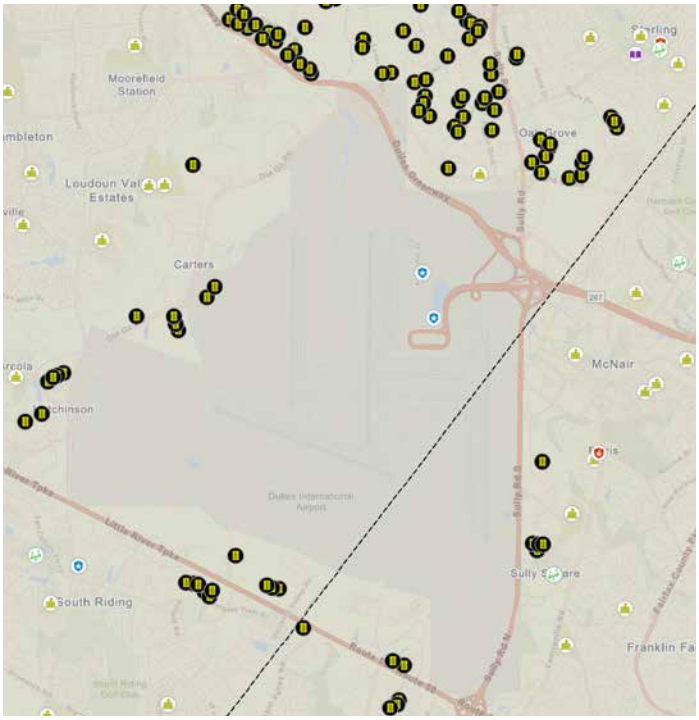

Figure 4. Data center proximity to public facilities. *Source: Northern Virginia Regional Commission*

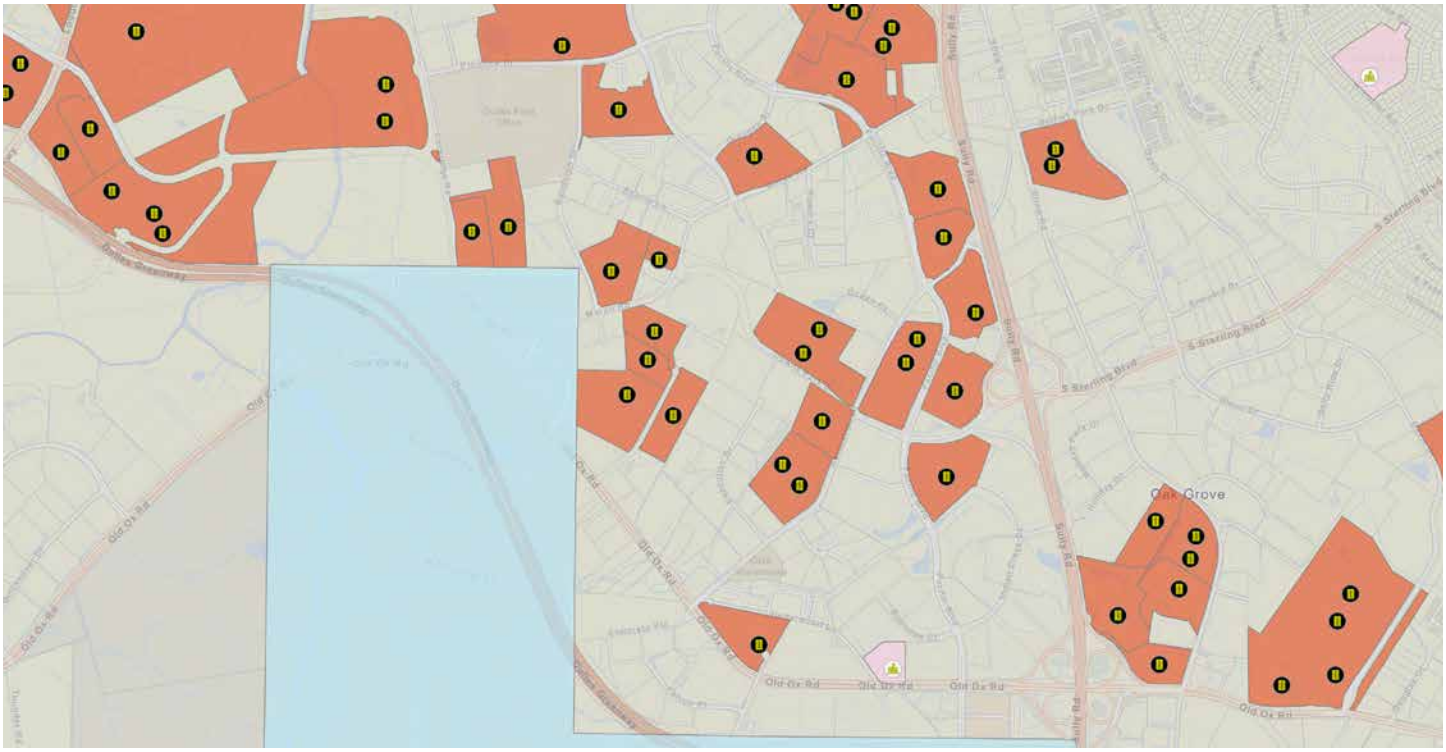

Figure 5. Data center siting map. *Source: Northern Virginia Regional Commission*

[19] Northern Virginia Regional Commission. n.d. "Data Centers." Accessed Sept. 19, 2025. www.novaregion.org/1598/Data-Centers.

Dulles Electrical Capacity and Use

According to IAD energy managers, the airport consumed about 214.6 GWh of electricity in 2024. The primary electrical utility distribution to IAD terminates at a pair of 33.6 MVA, 230 kV/13.2 kV utility transformers. The transformers are equipped with two-stage fans, which further increase the service capacity to 44.8 MVA and 56.0 MVA, respectively, when engaged. Note that the pair of transformers provide 100% backup in case a transformer fails. With significant planned electrification of planes, ground transportation, and buildings, little peak load electricity is available; however, significant off-peak electricity should be available.

The highest electrical energy use months are June, July, and August, when outdoor temperatures and the number of people traveling are both at their highest points of the year, causing high air-cooling loads. The difference between the current average load of 24.5 MW and peak load of 37 MW is about 12.5 MW, meaning the average load is about 66% of the peak load. However, utilities do not like to routinely run transformers above the nominal rating, 33.6 MVA (about 33.6 MW), when fans are required. To be conservative, the difference between the current average load of 24.5 MW and the transformer rating of about 33.6 MW is about 9.1 MW, meaning the average load is about 73% of the transformer rating without using transformer cooling fans.

The 73% ratio of average to peak load means that excess electrical capacity of about 9 MW is available most of the time. If a data center can be built that allows load flexibility (reducing load at times and/or using on-site generation or energy storage for power), then about 9 MW of electricity capacity should be available most of the time from the existing utility transformer with 100% backup without having to run cooling fans. A significant amount of engineering analysis would be required to verify these high-level observations and to determine the actual amount of power that could be available, when it could be available, where interconnections with the electrical system could be made, the associated costs for the electrical system, and how the data center would use load or generation flexibility to complement airport operations.

Data Center Heat Reuse

IAD utilizes a central high-temperature hot water system for its primary heating needs. It is assumed for this analysis that the goal is to meet all the heating needs in February 2018, 384 MWh(th)/day of thermal energy, which is an average load of 16 MW(th) of thermal energy. The optimum reuse of data center heat would be based on the lowest life cycle energy cost, which would require hourly heating load data (not available for this analysis) and the capital and operating expenses of a heat reuse system, including heat exchangers, piping, and heat pump(s) to boost water temperature to meet the needs of IAD buildings and other uses. The optimal amount of heat reuse based on the lowest life cycle cost usually “right sizes” infrastructure systems’ size and cost and is seldom sized to meet peak load. Some institutions have carbon reduction goals or requirements that may lead to larger heat reuse systems.

It is assumed for this analysis that the conceptual data center has an average load of 20 MW, 16 MW(th) of thermal energy is always available for export, and thermal energy storage is installed as needed to allow the 16 MW(th) of thermal energy to meet the total energy needs of airport heating for February 2018 (16-MW(th) average). Note that geothermal borehole thermal energy storage could be used for “seasonal” storage of excess heating in the summer for use in the winter. The 16-MWh(th) average would meet all IAD heating needs except in January (52.4%), December (73.1%), March (77.4%), and November (94.7%). The remaining heat required would be provided by existing natural gas boilers, which are typically specified to remain for energy resilience. The economics of heat recovery could be calculated based on installed cost of the heat reuse system, electrical energy use (heat pump), electrical energy cost, operations and maintenance costs, and the cost of natural gas system operations and maintenance, as appropriate.

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National Laboratory of the Rockies

15013 Denver West Parkway
Golden, CO 80401
303-275-3000 • nlr.gov

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