

Northern Va. is the heart of the internet. Not everyone is happy about that.



By [Antonio Oliva](#)

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A drone soared over a cluster of data center buildings in Northern Virginia, recording video of rooftop exhaust fans whose constant whir, nearby residents say, has tormented them since last spring.

“We’re getting pummeled,” Dale Browne, head of the Great Oak Homeowners Association, said about the footage, which showed his Prince William County neighborhood surrounded by data centers that make internet cloud technology possible. “Absolutely pummeled.”

Northern Virginia is home to about 275 data centers, handling at least a third of the world’s online use, with dozens more of the massive structures either under construction or planned as local officials seek to tap into the hundreds of millions of dollars in tax revenue generated by an industry that requires few government services in return.

And as more people use cloud computing devices in their daily lives — streaming video, storing files, Zooming to work — their actions fuel a demand for even more data centers to store, process and disseminate that digital information.

The growth in the industry, underscored by Virginia Gov. Glenn Youngkin’s (R) [announcement](#) last month that Amazon plans to invest \$35 billion by 2040 to build multiple data centers across the state, has sparked debates about local land use policies in neighborhoods where data center buildings — some the size of several football fields — sit less than 100 feet from the nearest home.

Residents and some local legislators argue that the industry’s footprint in the region is expanding too much, too fast and in the wrong places, posing [potential risks](#) to the surrounding environment — and, in some cases, creating noise from cooling fans that disrupt neighborhoods such as Browne’s.

“A lot of local governments in Northern Virginia, they look at data centers as local governments downstate look at casinos,” said state Sen. Chap Petersen (D-Fairfax City) during a news conference held in Richmond last month with Del. Danica A. Roem (D-Prince William) to announce a trio of bills aimed at curbing the industry’s presence near battlefield sites and federal or state parks.

“They’re like, ‘Oh, it’s free money.’ It’s not free,” Petersen said. “[If] you’re going to get paid a lot of revenue, millions of dollars, believe me, there’s going to be an impact on your community.”

The heart of the internet

The concrete and glass buildings just off Loudoun County Parkway in Ashburn look like an ordinary collection of offices, save for the spiked metal fences and a security guard posted at the parking lot entrance.

Inside is the beating heart of the internet in the eastern United States. Informally known as the MAE-East network access point, the Ashburn site owned and operated by the Equinix digital infrastructure [company](#) is one of several “primary nodes” for the internet in the world. From it springs a web of underground fiber-optic cables linking to the region’s growing number of data centers and to trans-Atlantic cables that connect Northern Virginia to other parts of the world.

Ashburn became the center of the internet on the East Coast in the 1990s, after AOL and WorldCom Inc. [moved their operations there](#), said Josh Levi, president of the Data Center Coalition trade group. Because the success of online computing is measured by the least amount of delay — or latency — in the movement of data, physical proximity to the MAE-East primary node is key, leading many of the earliest data centers to also set up their operations in Loudoun, Levi said.

Each new data center built has meant more fiber-optic cable laid, increasing the network’s density while broadening it outward — “and it becomes this kind of snowballing of connectivity,” he said.

Data centers in Northern Virginia

Data center activity in the region measured by megawatts consumed

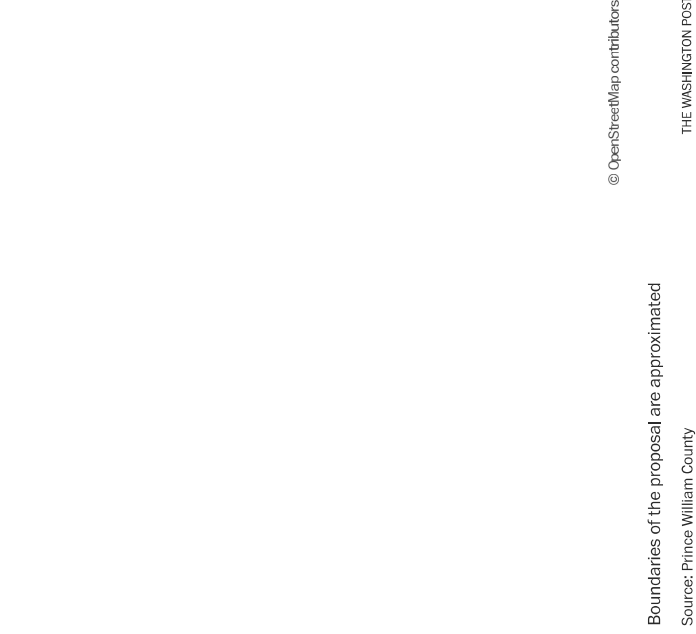
The spreading infrastructure — including electric transmission lines servicing the industry — has allowed surrounding jurisdictions to market their available land as data center sites.

Today, nearly 13,500 people in the data center industry, which supports 45,000 total jobs, with the state offering tens of millions of dollars in tax exemptions to attract more data centers, according to state economic development officials.

Local jurisdictions can tax the value of the computer equipment inside the buildings without having to provide many government services — giving Northern Virginia a steady stream of funds that, officials say, can go toward schools or affordable housing.

Loudoun collects about \$576 million in annual local tax revenue from its 115 data centers, a third of its property value stream. Prince William, the second-largest market in the state, receives about \$79 million every year from the 35 functioning data centers there, with another 5.4 million square feet of data centers under development, according to the county economic development department. A proposed 2,100-acre "Digital Gateway" project in Gainesville that hasn't reached development stages would generate another \$400 million, county officials say.

Proposed Digital Gateway location



And the industry is expanding across the Potomac River into Maryland, where Frederick County officials are preparing for a 2,100-acre data center campus planned for a long-dormant aluminum factory site.

Levi said the demand for more large data centers will only increase as the world turns to self-driving vehicles, smart refrigerators, virtual-reality software and other forms of cloud-based technology. In the future, smaller “edge data centers” serving self-driving vehicles from one location to the next and connected via fiber-optic cables to larger data centers will also become part of the local landscape, he said.

“You are going to see a lot of those smaller data centers moving forward, closer to people to help provide that more immediate compute power,” he said.

Noisy exhaust fans

Carlos Yanes believes he can tell when the world's internet activity spikes most nights. It's when he hears the sounds of revving machinery, followed by a whirring peal of exhaust fans that are part of the computer equipment cooling system inside an Amazon Web Services data center about 600 feet from his house.

The sound keeps him awake, usually while nursing a headache brought on by the noise, and has largely driven his family out of the upstairs portion of their Great Oaks home, where the sound is loudest.

Before his 1-year-old son, Derek, was born, he and his wife, Stephany, converted a bedroom near their own into a nursery decorated with cartoons of baby safari animals.

The child hasn't spent much time there, though, sleeping instead near a pile of suitcases and old toys in a basement storage area, with white-noise machines placed all over the house in hopes of drowning out the sound of the data center fans. Last year, in hopes of fixing the problem, the couple spent about \$17,000 on soundproof windows. But that made it worse, Yanes said, creating a vibrating droning noise inside the house.

"It's affected me financially, emotionally and in every other way I can think of," he said, confessing to waiting for mortgage interest rates to drop so the family can sell the house they bought in 2019 and move. "If I would have known what I was walking into a few years back, I would not have chosen this place."

Browne, the HOA president, has repeatedly pushed Amazon to fix the problem. Amazon, whose founder Jeff Bezos owns The Washington Post, has placed shrouds around the exhaust fans atop all three of its functioning data centers at the site. But those haven't done much to muffle the sound, neighborhood residents say. The company also plans to install wind bands on the fans and replace the blades with quieter ones, a process that is likely to take several months.

Amazon spokesman Duncan Neasham said the company is committed to being a good member of the community.

"In the very small number of isolated instances where we have received feedback on sound levels from our neighbors, we have taken immediate steps to lower sound levels and engineer solutions to further reduce sound," Neasham said in a statement.

Gloria Biess, who lives with her husband, John, across the street from Yanes, said the sound has kept her from spending time in her backyard serenity garden, which features gurgling koi fish ponds. Instead, Biess, 74, raises the volume of her smart TV while reading the Google News site on her laptop, aware that her way of drowning out the sound relies on data centers like the ones that upset her.

"I think about it all the time: All the technology we enjoy," she said. "We're addicted to it, aren't we?"

Outdated land use policies

Part of the issue is related to Prince William's 33-year-old noise ordinance, which in residential areas like Great Oak limits daytime noise to 60 decibels, or what a normal conversation sounds like from about three feet away, and 55 decibels at night. But the ordinance exempts air conditioners, which are what the data center cooling systems and exhaust fans technically are.

Ann B. Wheeler (D-At Large), chairwoman of the Prince William Board of County Supervisors, said the county is in preliminary discussions about updating the noise ordinance to regulate large commercial air conditioners. But, she said, that conversation is complicated because it could also affect other businesses, such as grocery stores.

"Can we even only have it just for the data center industry?" Wheeler said. "I think they would actually be okay with that because they want to fix this. But I don't think that would be legal."

Also, noise-related problems are not widespread in the industry, which has been migrating to more efficient and quieter cooling systems as part of an overall push to be eco-friendly. The industry has also started to rely more on clean energy, with data centers using about 36 percent of the Dominion Energy utility's solar capacity in Virginia, according to the Data Center Coalition.

Even so, the industry's expansion has fueled broader discussions over land use policies.

Prince William, hoping to surpass Loudoun as the industry's largest hub, is trying to expand its specially designated "overlay district" for data centers into some rural areas while adding design standards, such as noise buffers, tree planting and building colors that blend in with the surrounding environment.

Loudoun officials are preparing similar "performance standards" for noise and environmental impact, said Supervisor Michael R. Turner (D-Ashburn), who chairs a county land use and transportation committee.

The county is also considering keeping data centers from being built in some areas — particularly along the Route 7 corridor and near homes — a conversation initiated after Dominion warned last summer that it did not have enough transmission lines and substations to serve newly built data centers in the county. The utility company said it has since accelerated its development plans to meet the demand for power.

With available land running out in Loudoun and proximity to the MAE-East site still preferred, the newest industry trend in the county is to ask for more density, or floor-area ratio, which indicates a desire to build vertically at existing sites instead of out to other areas, Turner said.

"There are a lot of data centers in Europe that are 10-story buildings," Turner said.

'Like a gold rush'

The quiet Amberleigh Station neighborhood in the Bristow area of Prince William initially had no problems with the data centers planned for 196 acres of tree-filled land near homes and an elementary school.

The proposal to rezone that area from agricultural to light industrial, approved by the county board in the fall of 2021, offered no details on where the buildings would go or which data center company would operate the site. But local residents seemed satisfied that the land acquisition company behind the proposal — JK Land Holdings — would not be bringing in a junkyard, landfill or anything else causing more traffic or industrial pollution.

Then, some of the towering pine trees lining a neighborhood walking trail were cleared in preparation for the development earlier this year, and several homeowners — moved by the controversy over the Digital Gateway — were incensed.

“The construction noise and, after they go online, the noise from that will destroy us,” said Steve Pleickhardt, president of the local homeowners association, noting plans under county review for another 270-acre data center complex about a quarter-mile away. “It will absolutely destroy us.”

Mike Mitchell, whose backyard deck and hot tub face the forested area targeted for development, said he and his neighbors didn’t realize the extent of the plan in his neighborhood, which calls for several data center buildings. The county held community meetings about the proposal during the height of the pandemic, when there was a concern about large gatherings, and many residents skipped them, Mitchell said.

Now, he’s worried about the value of his home and the potential impacts on his three children — ages 7, 4 and 2 — whose bedrooms face the site.

“We were planning on staying here until my kids graduated high school, then move to the beach,” Mitchell said. “It messes up our whole financial plan.”

Chuck Kuhn, owner of JK Land Holdings, said the public’s perception of data centers has dramatically changed since the project was introduced. He blamed that shift on the few data centers in the region that have not used “best-in-class cooling systems,” which Kuhn said “is reflecting poorly on the overall data center community.”

But the industry has also begun pushing harder for more space, said Supervisor Jeanine Lawson (R-Brentsville), who represents the area. Some applications submitted for some data centers in her district include building heights of 100 feet, she said.

“They’ve become very aggressive, egregious, in their applications,” Lawson said, calling the fervor over the industry’s large amounts of money “like a gold rush.”

For example, the three parcels slated for development outside Amberleigh Station were assessed at a total of \$8.1 million before they were rezoned, according to county records. JK Landholdings paid \$48.5 million a few weeks after the rezoning was approved.

“We feel very comfortable that over time we’ll get a reasonable return on our investment there,” said Kuhn, whose company, which owns several data center sites in the region, plans to enter into a joint venture with a yet-to-be-determined company at the Bristow site.

Ringed by development

The two data center buildings just outside the Loudoun Meadows neighborhood in Aldie are included in a 2020 lawsuit brought by Amazon, alleging that former employees and business partners ran a multimillion-dollar real estate fraud scheme that has triggered a federal investigation.

Homeowners see what appears to be a lack of activity at the unfinished site as a reprieve from a dark new reality — one where the shadows of the buildings fall over some houses in the mornings.

During the past three years, their neighborhood has become ringed by data center buildings, with Microsoft developing another hub of data centers on a 66-acre site that sits across a man-made lake from Loudoun Meadows.

When houses in the residential development began selling in the early 2010s, prospective buyers didn’t realize that what looked like farmland abutting the property was actually zoned for light-industrial use, allowing a data center to be built “by right,” without needing a vote from the county board, residents said.

Instead, the Loudoun Meadows website featured pastoral photos of the lake, with a fisherman gliding past a red barn in one photo. “That was one of the selling points; it was the lake and the farm,” said Krista Geller, whose house, which she and her husband bought in 2013, now sits about 70 feet from one of the Amazon buildings.

That was the scene until the data center construction began in 2019, a few months before many residents hunkered down during the pandemic and worked from home, said Ben Keethler, a member of the homeowners association board.

Now, a pair of empty beachfront chairs at the lake look out toward a horizon of nearly finished buildings at the Microsoft site, a scene punctuated by the beeps of construction cranes.

This story was updated to correct the amount paid by JK Land Holdings for three parcels of land in Prince William County.