The Montrose Group, LLC

TRANSFORMING YOUR WORLD

# MONTROSE GROUP 2024 TOP 10 CORPORATE SITE LOCATION TRENDS WHITE PAPER

**JANUARY, 2024**

100 East Broad Street, Suite 2320, Columbus, Ohio 43215

January 2024

Dear Friend:

Based upon the negotiation of over 300 corporate site location projects across the United States for companies big and small in a wide range of industries, the Montrose Group annually creates a Top 10 list for corporate site location trends. The Montrose Group 2024 Top 10 Corporate Site Location Trend List and White Paper illustrates the impact of a slowing economy plus a transformational Presidential Election both of which will likely slow the economy and corporate site location projects this year. Not all the news for 2024 will be bad as continued opportunities exist to redevelop struggling office space, retain and attract growing industries such as semiconductor and EV facility supply chains, food and beverage and global Foreign Direct Investment projects. We hope you enjoy the Montrose Group 2024 Top 10 Corporate Site Location Trend List and White Paper and are always glad to answer any questions or discuss your corporate site location project or how your region or community should be coordinating business retention and attraction campaigns to capture high-wage job growth and capital investment.

Sincerely,

David J. Robinson
Principal
Montrose Group, LLC

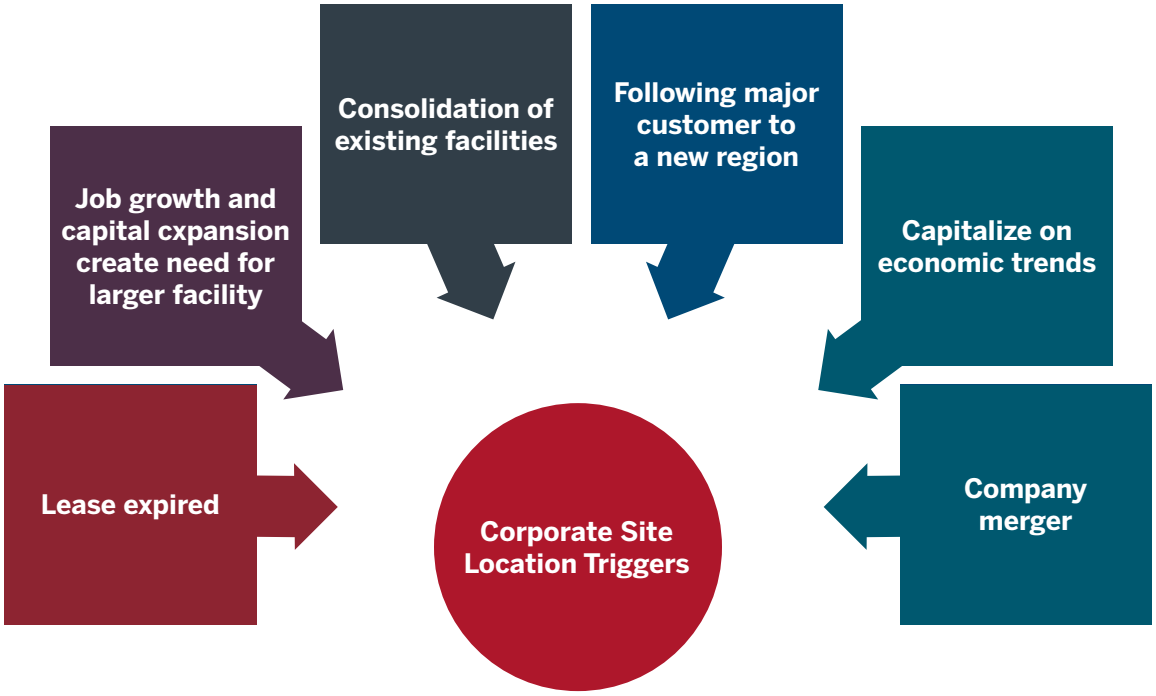
## About the Montrose Group, LLC

The Montrose Group, LLC provides corporate site location, economic development advising and planning, and lobbying consulting services. The firm brings together some of the leading practitioners in economic development planning and strategy engaged in economic development planning at the state, local, and regional levels, and corporate site location consulting.

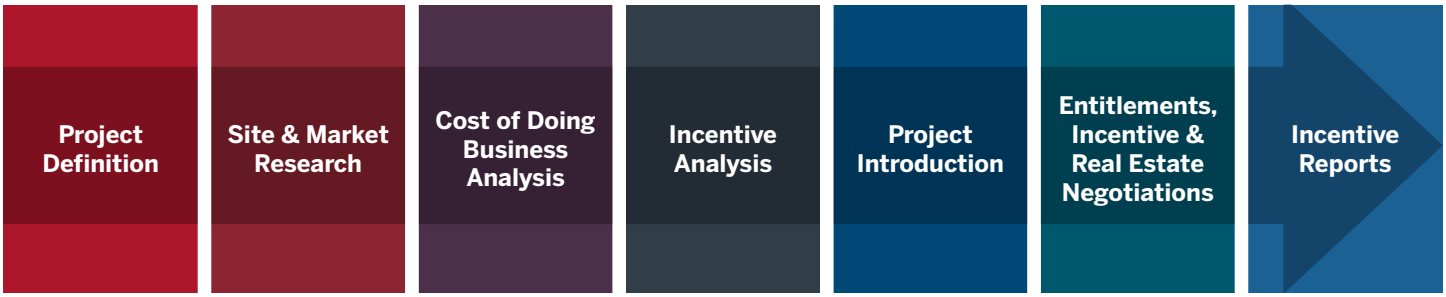
- Montrose Group leadership has negotiated over 300 corporate site location projects across the United States with companies large and small in a wide range of industries involving over $3 B in economic development incentives and including the location of global firms to the United States utilizing a multi-step process that begins with defining potential markets that a company can grow through economic, demographic, workforce, housing, quality of life, cost of doing business and economic development incentive analysis, launching of confidential corporate site location projects with targeted communities, and negotiating of site entitlements, compensation packages, real estate and economic development incentive packages.
- Montrose Group has researched and drafted over 50 regional and community economic development plans utilizing a Learn, Listen, and Do approach to economic development planning that starts with fundamental economic development research to understand who a community or site is and then listens to what the community wants the region, company or site to be and then develops a detailed action plan tied to local and outside funding sources centered on the business retention and attraction of high wage jobs and capital investment for Business Incubator Studies, Comprehensive Economic Development Plans, Downtown Redevelopment District Plans, Diversity, Equity and Inclusion Economic Development Plans, Distressed Structure Feasibility Plans, Economic Development Incentive Studies, Economic Impact Studies, EDO Structure Studies, Housing Studies, Industry Cluster Analysis', Placemaking Studies, Site Development Studies, Utility Economic Development Strategies, and Workforce Studies.
- Montrose Group acts as an economic development advisor to communities to support the development and operation of business retention and expansion programs, economic development incentive programs, business attraction programs, Community Development Block Grant programs, project financing for major civic projects that include Grayfield Mall redevelopment, housing development, industrial park development, Downtown redevelopment, tax abatement programs, school compensation agreements, utility serve agreements, Minority Business Enterprise and small business development support, economic development public meeting support and participation, economic development executive search and other day to day issues a local economic development department faces.
- Montrose Group acts as a lobbyist in Ohio for clients with the local, state, and federal government on a wide range of matters for arts and culture, K-12 education, health care, computer software consulting, higher education, global business consulting, engineering consulting, local governments, real estate developers and other organizations.

Nothing in this report should be considered legal advice as the Montrose Group, LLC is not a law firm and does not provide legal advice. Competent legal counsel should be sought before relying on any strategy outlined in this report.

**Corporate Site Location 101.** The corporate site location process decides where a company is located, and this process is about a lot more than tax incentives. Triggers such as the end of a real estate lease, growth needs beyond their current facility, decay of their existing facility, consolidation of existing facilities, a growth opportunity tied to a customer, a merger of companies, or a company seeking to capitalize on an economic trend tell a company they should undertake a corporate site location project.




The corporate site location process begins with defining the project to learn about the industry, the number of jobs, payroll, and capital investment planned by a company, needs for the project site, and geographic markets that fit the company's business plan leading to the creation of potential state and regional target list for the company's location. Next, market research begins to understand the economic analysis of growth, industry cluster, labor shed, transportation, infrastructure, and supply chain of an industry, company, and region and potential real state options for each of these markets. Sites in these states and regions are reviewed as well as the real estate, labor, and tax policy all impacting the cost of doing business in a region followed by an analysis to review relevant infrastructure finance programs and economic development incentives. Upon completion of this research, the company will then narrow its search to a handful of sites in multiple states and cities that all would fit the company's business purpose. A confidential Request for Proposal or project letter is then sent from a corporate site location consultant or legal counsel that outlines the nature of the corporate site location project and the specific needs of the company related to the site in question with specific infrastructure, workforce, incentive, and site needs. Site acquisition, land use entitlements, economic development incentives, and government compensation agreements are then negotiated. Defining the economic prospects, workforce capabilities and cost of doing business in multiple regions is the first step for companies considering an economic expansion.



# MONTROSE GROUP 2024 TOP 10 CORPORATE SITE LOCATION TRENDS ILLUSTRATE CHALLENGES AND OPPORTUNITIES OF A SLOWING ECONOMY

Based upon the negotiation of over 300 corporate site location projects across the United States for companies big and small in a wide range of industries, the Montrose Group annually creates a Top 10 list for corporate site location trends. The Montrose Group 2024 Top 10 Corporate Site Location Trend List illustrates the impact of a slowing economy plus a transformational Presidential Election both of which will likely slow the economy and corporate site location projects this year. Not all the news for 2024 will be bad as continued opportunities exist to redevelop struggling office space and retain and attract growing industries such as semiconductor and EV facility supply chains, food and beverage, and global Foreign Direct Investment projects.

This discussion focuses on longer-term trends and not just short-term blips in economic, demographic, or popular culture impacting corporate site location projects. What is a trend? A trend is not a bad mullet haircut popular in the 1990s. A trend applies to the general direction maintained by a winding or irregular course--think the globalization of the U.S. economy. The Montrose Group's top 10 2024 corporate site location trends are impacted by a slowing economy plus the 2024 economy.

| Montrose Group Top 10 2024 Corporate Site Location Trends |
|---|
| 1. Cooling, Stagnating Economy |
| 2. Urban, Suburban and Rural Doom Loop |
| 3. Budding Energy Crisis |
| 4. 2024 Elections |
| 5. The Reemergence of Public Industrial Parks |
| 6. Rise of the Great Lakes |
| 7. Food and Beverage Industry Growth |
| 8. Foreign Reinvestment in the US |
| 9. Giga factories supply chain issues |
| 10. AI Shock to impact skilled occupations and advanced services and tech regions |

2024 will see a cooling, stagnant economy across the United States as rising interest rates slows down development and economic investment. The evacuation of U.S. offices as a lingering impact of COVID-19 continues the trend of Work from Home that is driving up office occupancy rates and creating a Doom Loop effect that is driving down office rents, building values, future tax gains, and ultimately the loss of public services that will future impact the success of the neighborhood surrounding the vacant office. Challenges with the delivery of energy to economic development projects will also harm the U.S. economy as energy demand grows with energy-intensive data centers and other projects and the supply of energy drops as politicians kill energy-rich coal plants and fight over the location of renewable energy projects. The Presidential election, which may be a rematch of octogenarians illustrates very different views of the national economy and puts at risk everything from chip microprocessors to EV projects in the corporate site location pipeline. The rising interest rates have stopped speculative private industrial park development but the demand for industrial products remains creating an opportunity for the development of the public sector industrial park. The Great Lakes states will remain strong competitors with the South and Southwest as these regions compete for billions of corporate site location projects driven by manufacturing projects. Major corporate site location projects in 2024 will continue for food and beverage processing, Foreign Direct Investments, and the giga factories for chip microprocessors and EV supply chain all continue to move back to the U.S. for production following the disruption caused by COVID-19, rising European energy costs and an Anywhere But China political perspective impacts economic and trade policy. Finally, the early rise of Artificial Intelligence (AI) will impact job growth in banking, insurance and financial services, computer software, and professional service firms as technology replaces college-educated workers.

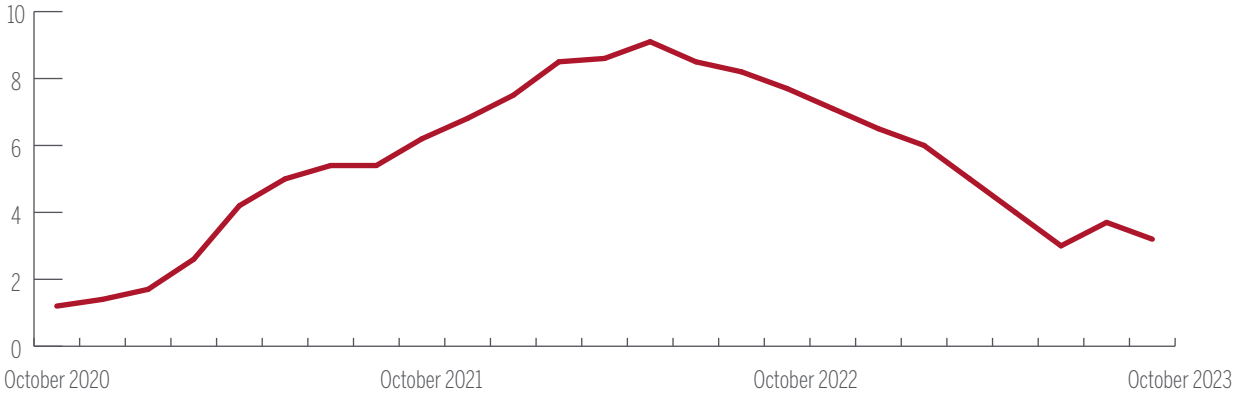
2024 won't be the best of years for corporate site location and may well prove a time for companies and communities to prepare for growth in 2025.

# A COOLING, STAGNANT U.S. ECONOMY TO SLOW 2024 CORPORATE SITE LOCATION PROJECTS

Most really good parties result in an equally strong hangover. 2024 will likely be a hangover and not a party year. The federal government, in response first to COVID-19 and then based upon a political turnover to the Democrats in Washington, ran the money printing press 24 hours a day. The Congress with the support of President Joe Biden primed the economic pump to an unprecedented level putting government money into the national economy. Much of that government funding and policy was geared toward address major economic policy goals of bringing back microprocessor chip production back to the United States and transitioning the global auto industry to Electric Vehicles. Also, the Biden Administration supported worker wage increases through unionization more than any administration in recent times.

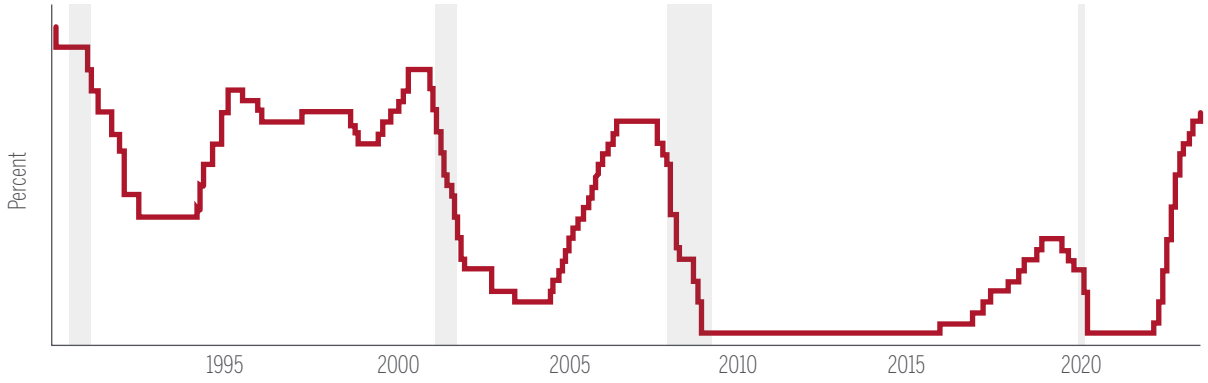
The result of Washington's spending and wage policy was inflation. Inflation was at a post-pandemic high of 9.1, and inflation remains a concern at 3.2%.

**Monthly 12-month inflcation rate in the United States from October 2020 to October 2023**




Driven by concerns over the U.S. inflation rate, the Federal Reserve did the right thing and increased interest rates to slow the economy down. Inflation is now showing signs of continuing to go down, and the Federal Reserve has indicated it may not raise rates again in 2024 due to the inflation rate.

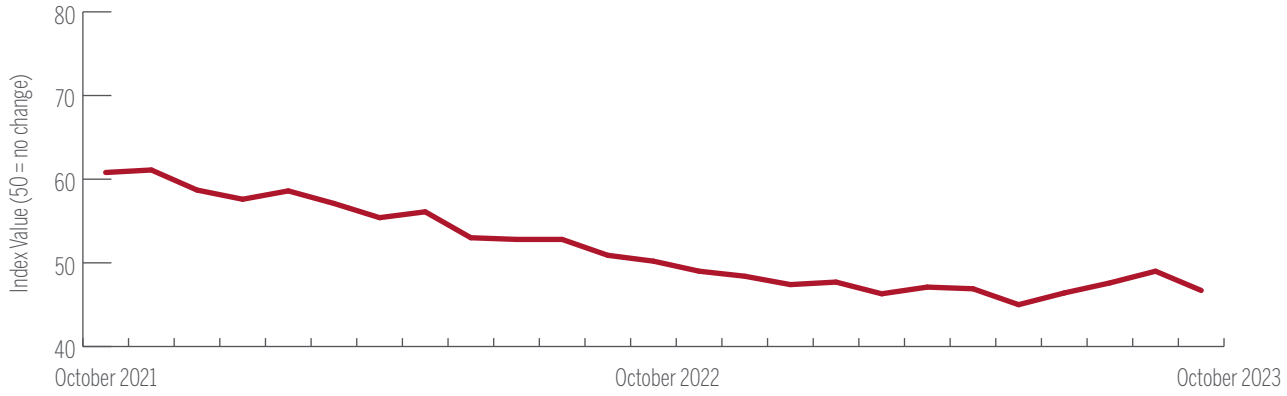
**Bank Prime Loan Rate Changes: Historical Dates of Changes and Rates**



The U.S. bank prime loan rate which is the lending rate for most commercial loans was 8.25% in 2007, and the bank prime loan rate was as low as 3.25% between 2020 and 2022. Unfortunately, the current bank prime loan rate is 8.25%.

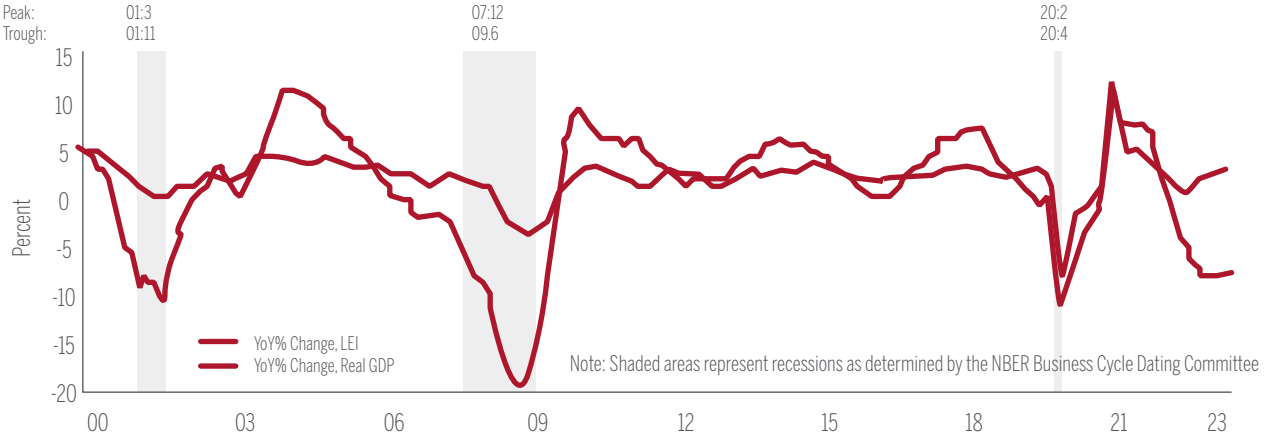
A slowing by the Federal Reserve of new interest rate hikes will not reverse the damage done to the U.S. economy in 2024. Economic measures illustrate a tough road ahead in 2024. The Purchasing Managers' Index (PMI) is an index of the prevailing direction of economic trends in the manufacturing and service sectors based upon a survey of supply chain managers across 19 industries, and it consists of a diffusion index that summarizes whether market conditions are expanding, staying the same, or contracting as viewed by purchasing managers. The purpose of the PMI is to provide information about current and future business conditions to company decision-makers, analysts, and investors. As illustrated by the chart below, In October 2023, the value of the PMI in the United States stood at 46.7. An index value above 50 percent indicates a positive development in the manufacturing sector, whereas a value below 50 percent indicates a negative situation. As manufacturing is a major driver of corporate site location projects, the current PMI is not good news for near-term economic growth.

**Manufacturing Purchasing Managers' Index (PMI) in the United States from October 2021 to October 2023 (50 = no change)**




Finally, economists expect economic challenges in 2024. "The US LEI trajectory remained negative, and its six- and twelve-month growth rates also held in negative territory in October," said Justyna Zabinska-La Monica, Senior Manager, Business Cycle Indicators, at The Conference Board. "Among the leading indicators, deteriorating consumers' expectations for business conditions, lower ISM® Index of New Orders, falling equities, and tighter credit conditions drove the index's most recent decline. After a pause in September, the LEI resumed signaling a recession in the near term. The Conference Board expects elevated inflation, high-interest rates, and contracting consumer spending—due to depleting pandemic saving and mandatory student loan repayments—to tip the US economy into a very short recession. We forecast that real GDP will expand by just 0.8 percent in 2024."

## The annual growth rate of the LEI continues to be negative, but may have reached a bottom

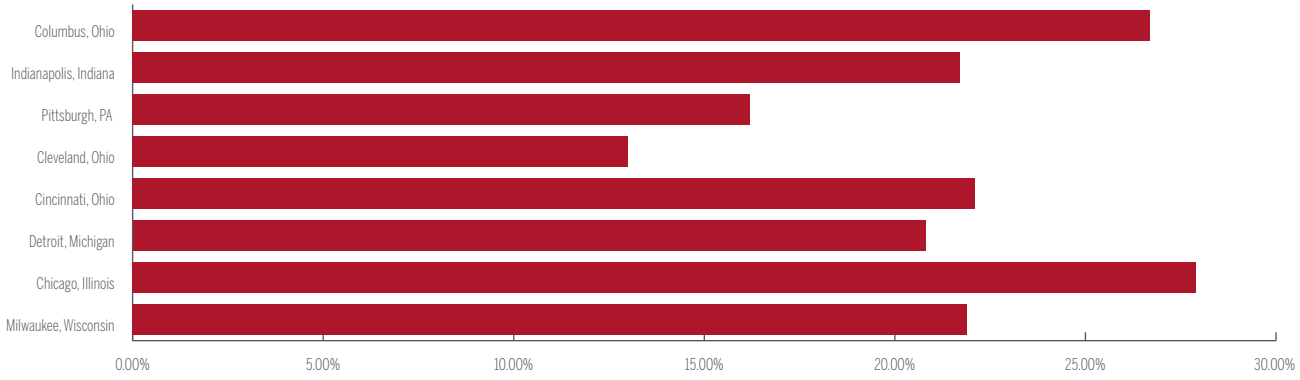



Rising interest rates responding to government-driven economic and social policy flooding the U.S. economy with unprecedented levels of money will slow the corporate site location project deal flow in 2024. The United States remains the world's largest economy and the long-term impact of this economic cooling is unlikely to stop future growth once inflation gets closer to the 2% goal of the Federal Reserve.

## Office Market Doom Loop Illustrates Challenges for 2024 Corporate Site Location Projects

The urban Downtown office market is facing a crisis that is only going to get worse. The Downtown office vacancy rates from Cushman and Wakefield's 2023 analysis as outlined in the chart below in the major urban markets throughout the Great Lakes illustrate substantial struggles with the current Downtown office markets. This data is of more concern when looking at the number of tenants attempting to sublease their current space—which is very high across the United States. It is clear the U.S. Downtown office market is not in good shape and is going to get worse as many companies will not renew Downtown office leases and seek much smaller spaces.

### Downtown Office Vacancy Rate




*Source: Cushman & Wakefield*

This high office vacancy rate may well trigger a "Doom Loop" in urban and suburban Central Business District and suburban office parks respectively. A "Doom Loop" is a downward economic spiral triggered by remote work, which makes office towers less valuable and results in reduced city tax revenues which begins a domino effect in which workers who no longer need to live in a city leave for cheaper housing, causing retail businesses to shutter and city services such as police and utilities are reduced by the cash-strapped municipality, causing even more residents to leave the downtown core.


Rents in urban centers are falling as well. A Columbia University study for the National Bureau of Economic Research found that central city rents have been in a decline. The relationship between rent growth and distance from the city center is steeply upward sloping with rents declining sharply near the center and growing rapidly far away from the center.[i] The same pattern holds for prices.[ii] Office valuation is another series of concerns. A recent paper suggested that in New York City alone, office value destruction could total $453 billion and that values could remain around 45% below pre-pandemic levels in the long run driven by the office vacancy rate expansion.[iii]

| Doom Loop Tax Impact |
| --- |
| • Property Tax Decline<br>• Municipal Income Tax Decline<br>• TIF Revenue Decline<br>• Sales Tax Decline |

While it is too early to measure the loss in property taxes from this drop in value it will be substantial a recent New York City Comptroller report found that the estimated New York City property tax revenue shortfall relative to our current projections is $1.1 billion in FY 2027 but that constitutes only 3% of the total property tax levy, or 1.4% of City tax revenues, and 1.0% of total revenues, which include state and federal grants in the largest US office market.[iv] The Tax Policy Center found that the decline in office values is projected to cost D.C. $464 million in combined tax revenue over the next three fiscal years, and San Francisco could lose $150 to $200 million annually by 2028, about 5-6% of all current property taxes.[v] The negative impact for states that permit cities to charge a municipal income tax for those that live or work in their city such as Ohio will be harmed even more by the high office vacancy rates in the Central Business District as they will lose out on a

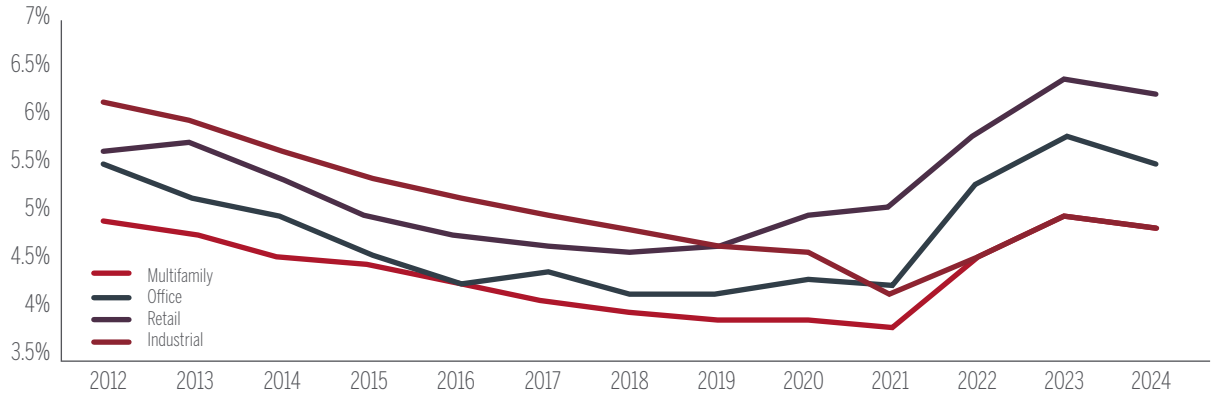
substantial amount of income tax they collected on workers who live in suburban communities but now no longer work in the big city. In addition, the decline in property tax values that will happen with high office vacancy rates will negatively impact the collection of Payments in Lieu of Taxes (PILOTs) that provide public infrastructure revenues for economic development projects or districts through Tax Increment Financing (TIF) agreements like Downtown Columbus that has a TIF District over the entire Downtown. Sales tax is another source of government funding that will be impacted by the high office vacancy rates as the lack of office workers has a direct impact on the decline of Downtown retail and restaurants.

This associated drop in local property tax, income tax, and TIF revenues will have some unknown impact on public services unless there is enough growth and development in other parts of the city to make up for the loss in a city's Central Business District. With the number of suburban workers in Downtown office towers it is doubtful that the revenue in other parts of the city will make up for the loss in Downtown revenue. The loss in local tax revenue and the decline of public services will impact the overall quality of life in the community. Parks, public infrastructure, police, and fire services all cost money and the Downtown which has been "cash cows" for decades for local governments and school districts will shift in their tax status—and not in a good way for Downtown neighborhoods.

High office vacancy rates spell trouble for corporate site location projects that are heavy office users like advanced services, corporate headquarters, and professional service firms as these projects are not producing jobs in an office that are critical for the collection of local and state economic development incentives. Local and state government economic development incentives are driven by a Return on Investment (ROI) analysis that determines if a company will create more taxes than they take from economic development incentives.

The timing of debt due on U.S. office buildings also spells challenges coming. $1.5 trillion in commercial real estate debt owed before the end of 2025. Also, commercial real estate capitalization rates are going through the roof. Capitalization rates are an indication of return and risk, and higher cap rates have a higher return, but they also have a higher risk due to higher interest rates.

**Commerical real estate capitalization rates in the United States from 2012 to 2022 with a forecast until 2024, by property type**




2024 will not see improvement in the "Doom Loop" challenge. In fact, the "Doom Loop" will likely worsen in 2024. COVID-19, and Artificial Intelligence (AI) all spell the launch of urban doom loops in Downtown urban markets across the United States. COVID-19 continues to provide a substantial hangover for the U.S. economy—that is devasting the U.S. office market. Forbes reported that 12.7% of full-time employees work from home, while 28.2% work at a hybrid model. Currently, 12.7% of full-time employees work from home, illustrating the rapid normalization of remote work environments. Simultaneously, a significant 28.2% of employees have adapted to a hybrid work model. Researchers from Ladders have been carefully tracking remote work availability from North America's largest 50,000 employers since the pandemic began. Remote opportunities leaped from under 4% of all high-paying jobs before the pandemic to about 9% at the end of 2020, and to more than 15% today.

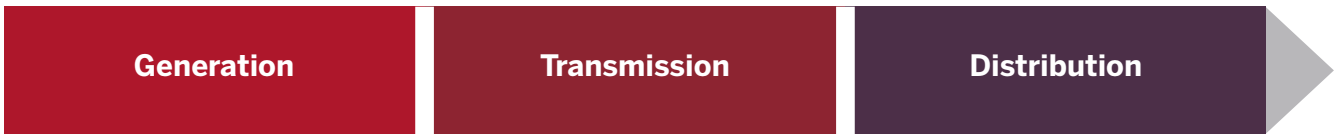
AI is going to impact the U.S. office market as well. AI is going to be the next great disruption of the global economy. Just as automation disrupts the global manufacturing industry, AI is going to disrupt the advanced services or white-collar industries. A Pew Research study found that workers with a bachelor's degree or more (27%) are more than twice as likely as those with a high school diploma only (12%) to see the most exposure. Jobs are considered more exposed to artificial intelligence if AI can either perform their most important activities entirely or help with them. AI could well replace the tasks of "getting information" and "analyzing data or information," or it could help with "working with computers." These are also among the key tasks for lawyers, software engineers, accountants, customer service representatives, and other white-collar workers—all these occupations currently fill many global offices. AI will likely create more jobs than it eliminates but in the near term, AI will hurt urban office markets.

2024 will not be a winning year for corporate site location projects tied to major office expansions, but hopefully, this will create opportunities for communities to transform these distressed office buildings into new and better uses.

# BUDDING ENERGY CRISIS TO SLOW 2024 CORPORATE SITE LOCATION PROJECTS

It seems like everything we use requires more electricity to run. As shopping becomes an experience on our smartphones with fewer trips to the mall, cars transition to electricity, and automation takes over manufacturing and logistics, the electricity demand is going up. At the same time, energy demand is increasing, and the supply of energy is under assault and impacted by public policies on the right and the left. A budding energy crisis is brewing as utilities struggle to meet surging demand driven by industrial, data center, and consumer demands for electricity. The installation of renewables as the chief energy source is not keeping pace with demand, and giga-factories are driving the need for more power. U.S. energy challenges are likely to be a 2024 corporate site location trend for both the generation and distribution of electricity to energy-intensive projects.

**Electricity Delivery System**




Electricity is delivered to customers through a system of generation, transmission, and distribution. Electricity generation is the process of converting primary energy sources such as coal, natural gas, or wind into electrical power. Electricity is produced when a magnet is moved near a wire to create a steady flow of electrons. The flow of electrons is an electrical current or electricity. Any device that completes this task is a "generator." Primary energy sources, such as wind or natural gas, power these generators by rotating a turbine that is attached to the shaft of the generator. For example, wind blows and rotates those huge turbines seen in wind farms. The turbines then rotate the shaft of the generator, which causes the magnet to rotate inside the wires and create electrical energy. This process is the first step in delivering electricity to consumers and is performed by electricity generators at power plants. From power plants, electricity is then transported to homes, schools, and businesses through transmission and distribution wires. Primary sources of energy can be divided into conventional and renewable fuel types.

Transmission and distribution refer to the different stages of carrying electricity over poles and wires from generators to a home or a business. The primary distinction between the two is the voltage level at which electricity moves in each stage. After electricity has been generated, a system of electrical wires carries the electricity from the source of generation to customers. These lines can be found overhead or sometimes in the ground, and combined, transmission and distribution lines make up what is commonly called "the grid." Transmission and distribution are two separate stages or systems on the grid. Transmission is the "interstate highway" of electricity delivery. It refers to the part of electricity delivery that moves bulk electricity from the generation sites over long distances to substations closer to areas of electricity demand. Consumers may recognize transmission lines as larger, taller poles/towers carrying many wires over longer distances.

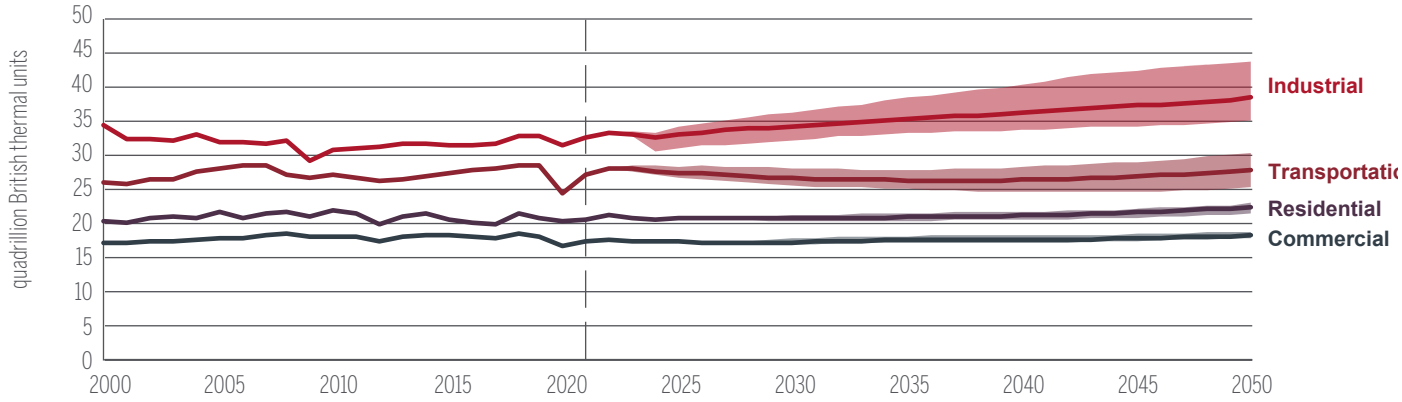
Transmission lines move large amounts of power at a high voltage level – a level that is too much to be delivered directly to a home or business. Transmission lines, transformers, substations, and other equipment have voltages of 100 kV (100,000 volts) and above. In most cases, the power moving through the transmission system must be reduced to lower voltage levels by electricity distributors before it can be delivered to a residence or business. Power, specifically the voltage level, sent through transmission lines is reduced, or" stepped down," via transformers and sent through distribution lines, which are then connected to homes and businesses.

If transmission is the interstate highway of the grid, distribution is the city street. It is the last leg of the delivery of electrical power from generation to the consumer. Power travels on the distribution system at a voltage level that can be delivered directly to a home or business. Distribution lines are the lines many people see along streets. Distribution is the power that turns on and runs the appliances we use every day to keep food fresh, our clothes clean and our homes either cool or warm. The voltage of distribution lines – the lines many people see in their neighborhoods – is approximately 13 kV (13,000 volts); a typical household runs on 110 volts.

First, for the last several years, electric utilities throughout the United States have been facing COVID-19-based supply chain challenges for the materials needed to distribute electricity to customer sites. Some of the primary areas of concern include distribution transformers, conductors, utility poles, and large transformers. Utilities seeking to acquire all these components are seeing significant delays and steep price increases: a pad-mount distribution transformer, for example, now costs close to three times more than it did pre-pandemic, and lead times for delivery have increased by 12 months. Large transformer manufacturing will also have major long-term issues, with demand expected to double by 2027 and the steel industry already hitting maximum capacity. According to Deloitte, a combination of disruptors is driving supply chain gridlock and impacting end-to-end operations in the electric power sector. Pre-pandemic supply chain vulnerability, due largely to the geographic concentration of component manufacturing and critical minerals mining, has been compounded by the effects of the pandemic and the Russian invasion of Ukraine. California is even considering state legislation that would mandate utilities to connect development projects to the electric grid within eight weeks. This backlog can be credited in part to a shortage in labor and parts, but it is being exacerbated by a growing need for equipment driven by population growth, an abundance of infrastructure funding, broadband deployment, and pole attachment shot clocks increasing demand at a level that production cannot maintain.

At the same time electric utilities are facing distribution supply chain challenges, the consumption of all forms of energy is increasing in the United States according to the U.S. Department of Energy. Combined energy consumption in four U.S. end-use sectors—industrial, transportation, residential, and commercial—includes primary energy consumption, electricity use, and electricity-related losses. In the industrial sector, energy consumption will increase between 5% and 32% between 2022 and 2050, and, in the transportation sector, energy consumption ranges from a decrease of 10% between 2022 and 2050 to an increase of 8% as outlined in the chart below. Both sectors are heavily influenced by assumptions of economic growth; as the economy grows, they consume more energy.

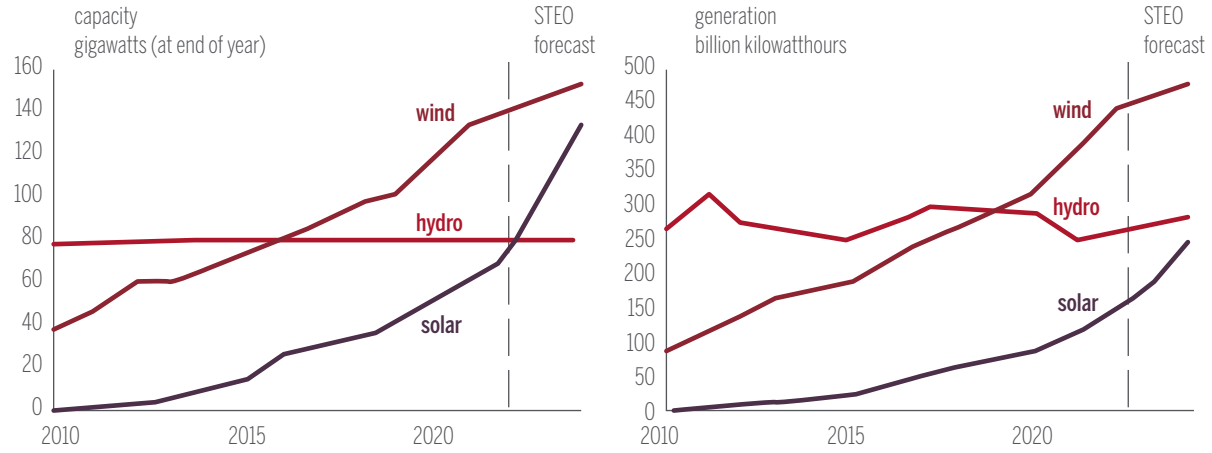
## Total energy consumption by end-use sector




The share of U.S. electricity consumed in the transportation sector is also increasing electric vehicles enter the marketplace. In 2022, electric vehicles made up about a 6%–7% share of the U.S. vehicle market. As the adoption of EVs increases, electricity purchased for transportation reaches between about 0.6 quads and 1.3 quads in 2050, from 0.1 quads of purchased electricity in 2022, about a 900% to 2,000% increase across all cases.

How the U.S. generates electricity is changing. According to the U.S. Department of Energy, in 2022, about 4,231 billion kilowatt-hours (kWh) (or about 4.23 trillion kWh) of electricity were generated at utility-scale electricity generation facilities in the United States. About 60% of this electricity generation was from fossil fuels—coal, natural gas, petroleum, and other gases. About 18% was from nuclear energy, and about 21% was from renewable energy sources.

## U.S. power sector generating capacity and electricity generation (2010-2024)

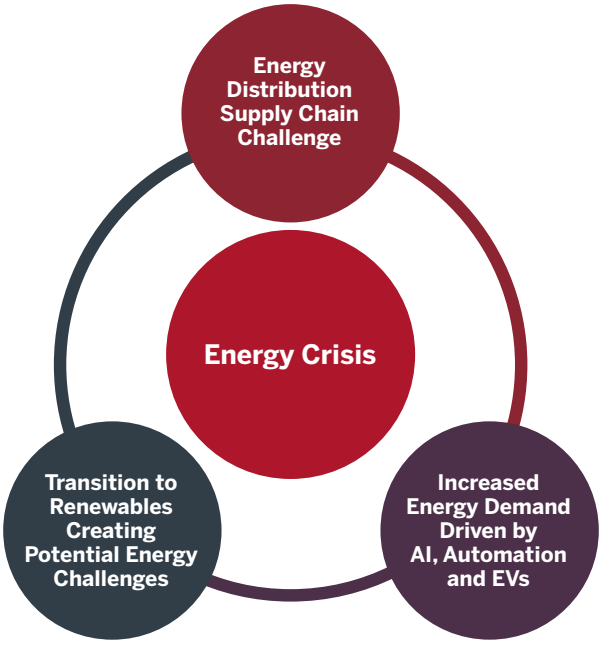


The U.S. Department of Energy expects that new renewable capacity—mostly wind and solar—will reduce electricity generation from both coal-fired and natural gas-fired power plants in 2023 and 2024. Wind and solar accounted for 14% of U.S. electricity generation in 2022, and their growth is expected to be 16% of total generation in 2023 and 18% in 2024. Electricity generation from coal falls from 20% in 2022 to 17% in both 2023 and 2024. Natural gas accounted for 39% of electric power sector electricity generation last year, and we forecast its share to be similar in 2023 and then fall to 37% in 2024 according to the U.S. Department of Energy.

A 2023 report from the power generation organization PJM, outlined some troubling energy generation trends illustrating increasing energy reliability risks during the power source transition that is facilitating decarbonization policies reliably and cost-effectively,
planning/operating the grid of the future, and fostering innovation driven by a potential timing mismatch between resource retirements, load growth and the pace of new generation entry under a possible "low new entry" scenario:

- The growth rate of electricity demand is likely to continue to increase from electrification coupled with the proliferation of high-demand data centers in the region.
- Thermal generators are retiring at a rapid pace due to government and private sector policies as well as economics.
- Retirements are at risk of outpacing the construction of new resources, due to a combination of industry forces, including siting and supply chain, whose long-term impacts are not fully known.
- PJM's interconnection queue is composed primarily of intermittent and limited-duration resource, and, given the operating characteristics of these resources, the PJM region will need multiple megawatts of these resources to replace 1 MW of thermal generation.[vi]

The PJM analysis shows that 40 GW of existing generation are at risk of retirement by 2030.[vii] This figure is composed of: 6 GW of 2022 deactivations, 6 GW of announced retirements, 25 GW of potential policy-driven retirements and 3 GW of potential economic retirements. Combined, this represents 21% of PJM's current installed capacity.[viii] In addition to the retirements, PJM's long-term load forecast shows demand growth of 1.4% per year for the PJM footprint over the next 10 years driven by the expansion of highly concentrated clusters of data centers, combined with overall electrification, pushing certain individual zones to exhibit more significant demand growth – as high as 7% annually.[ix] Also, PJM's New Services Queue consists primarily of renewables (94%) and gas (6%), but, despite the sizable nameplate capacity of renewables in the interconnection queue (290 GW), the historical rate of completion for renewable projects has been approximately 5%.[x] The projections in this study indicate that the current pace of new entry would be insufficient to keep up with expected retirements and demand growth by 2030.[xi] The completion rate (from queue to steel in the ground) would have to increase significantly to maintain the required reserve margins.[xii]



Now for the challenge. Not every state is running to develop renewable energy projects. A recent Columbia University study found that renewable energy projects have encountered significant opposition in at least 45 states with at least 228 local laws, ordinances, and policies being enacted in 35 states to restrict renewable energy projects. Many farmers do not like wind and solar projects taking up their neighbor's farmland.

In an age of political disruption and populism, many states are working to oppose the expansion of wind and solar projects.

- Ohio changed state law to give unique powers to townships and counties to decide if wind and solar projects will be able to be in their communities. This unprecedented move is leading to the decline in wind and solar projects located in Ohio which was the clear goal of the law change. Again, a Columbia University study pointed out that until October 2022, the Ohio Power Siting Board had never rejected an application for a solar energy project. Since October 2022, however, the Board has rejected at least three such applications (Birch Solar, Cepheus Solar, and Kingwood Solar). In addition, between April 2022 and March 2023, at least 11 counties in Ohio adopted binding resolutions to prohibit large renewable energy projects in all their unincorporated territories or very large swathes of those territories. There are now at least 13 counties in Ohio that have adopted such resolutions since October 2021, when a state law allowing counties to establish restricted areas went into effect (these include Allen, Auglaize, Butler, Crawford, Columbiana, Hancock, Knox, Logan, Marion, Medina, Ottawa, Seneca, and Union).
- In March 2023, Buffalo County, Nebraska, adopted an exceptionally restrictive wind ordinance, which requires that turbines be set back 3 miles from the nearest property lines and 5 miles from any village or city. At least 8 other Nebraska counties also require that wind turbines be set back by at least 1 mile from either property lines or dwellings, including Wheeler (5 miles from dwellings), Thomas (3 miles from property lines), Hamilton (2 miles from property lines), Dakota (2 miles from dwellings), Brown (1 mile from property lines), Gage (1 mile from property lines), Otoe (1 mile from property lines), and Jefferson (1 mile from dwellings). Meanwhile, Stanton County has effectively banned commercial wind projects altogether.
- In Virginia, at least 7 counties adopted restrictive solar ordinances or moratoria between June 2022 and May 2023 (these include Charlotte, Culpeper, Franklin, Halifax, Page, Pittsylvania, and Shenandoah). Some of these are exceptionally burdensome. For example, Pittsylvania County now prohibits the construction of any solar farm within 5 miles of any other solar farm and limits utility-scale solar projects to 2% of the total acreage of any zoning district. Franklin County has imposed a countywide cap of 1,500 acres for all ground-mounted solar projects.
- Since September 2022, at least two Michigan townships (LaSalle and Milan) have adopted ordinances limiting utility-scale solar energy projects to industrial districts and prohibiting such projects on land zoned for agricultural use.
- In Wisconsin, four towns in Dane County (Deerfield, Dunn, Springfield, and Westport), have policies to restrict solar from agricultural land.

The delegation of state energy policy and regulation happens at the same time national energy policy is closing all the coal power plants that have kept the Industrial Midwest running at full steam. Add in data centers and continued manufacturing growth with some EVs on the streets and you have a disaster looming in America's industrial heartland from an electricity generation standpoint that will likely impact corporate site location projects as energy-intensive companies continue to work to address electric distribution and potentially generation issues in 2024.

# 2024 ELECTIONS IMPACTING 2024 CORPORATE SITE LOCATION PROJECTS

It was the best of times... it was the worst of times... to quote Charles Dickens speaking of life during the French Revolution has an interesting application tied to the impact of the 2024 U.S. election on corporate site location projects. While the U.S. is not experiencing the Reign of Terror it just feels like it some days if you watch too much cable news. Technology and innovation are transforming the global auto industry, and the U.S. has a major push to reshore semiconductor manufacturing. However, political populism has invaded both political parties and could be putting efforts to develop these industries in jeopardy.

Populism is a political program or movement that champions, or claims to champion, the common person, usually by favorable contrast with a real or perceived elite or establishment. Populism usually combines elements of the left and the right, opposing large business and financial interests but also frequently being hostile to the established Republican or Democratic party candidates and positions. Big corporations have taken a hit as populism is on the rise whether it is from a Democratic or Republican candidate. A 2022 Gallup survey found, that after a decade when Americans' overall views of big business tilted positive or were about evenly split, the slight majority (53%) now view this business category negatively and 46% positively. Only 26% of Republicans and 25% of Democrats say large corporations have a positive effect on the United States in a Pew Research Center survey. The fact is Donald Trump and Joe Biden understand public opinion and their shift to populism reflects a desire to align with their voting base. The election of Democrat or Republican populist candidates is not good news for corporate America or corporate site location projects. These candidates are aligned with members of the public unhappy with corporations.

2024's election will serve as a major disruption for the growth of corporate site location projects based on the lack of predictability of the outcome. The 2024 Presidential, Congressional, and state elections will have a major impact on corporate site location projects. Uncertainty with the direction of policies causes companies and developers to pause projects and not make decisions until the result is known. Two clear examples of how uncertainty about elections is impacting two big corporate site location markets: semiconductor manufacturing and Electric Vehicle manufacturing.

The reshoring of semiconductor manufacturing or "fab" facilities are massive corporate site location projects and have been announced throughout the United States. The federal government's CHIPS Act creates major incentives designed to reshore the semiconductor manufacturing industry back to the United States. Americans have learned that lots of consumer goods run on computer chips—think cars. Unfortunately, according to the Semiconductor Industry Association, the U.S. share of commercial semiconductor manufacturing has declined from 37% in 1990 to 12% today. Congressional Republican Leadership opposed the CHIPS Act during its legislative debate. Only seventeen Senate Republicans voted in favor of the legislation, and twenty-four House Republicans also voted for the bill, bucking party leadership who attempted to whip against the bill as part of a political fight over a Democratic deal on a climate and tax bill.

Public policy designed to support the development of Electric Vehicles (EVs) and the EV charging station networks is spurring billions of dollars in corporate site location projects. The Inflation Reduction Act of 2022 promoted by President Biden and Congressional Democrats is perhaps the most significant legislation to accelerate transportation electrification in U.S. history. Again, Republican leadership opposed the Inflation Reduction Act.

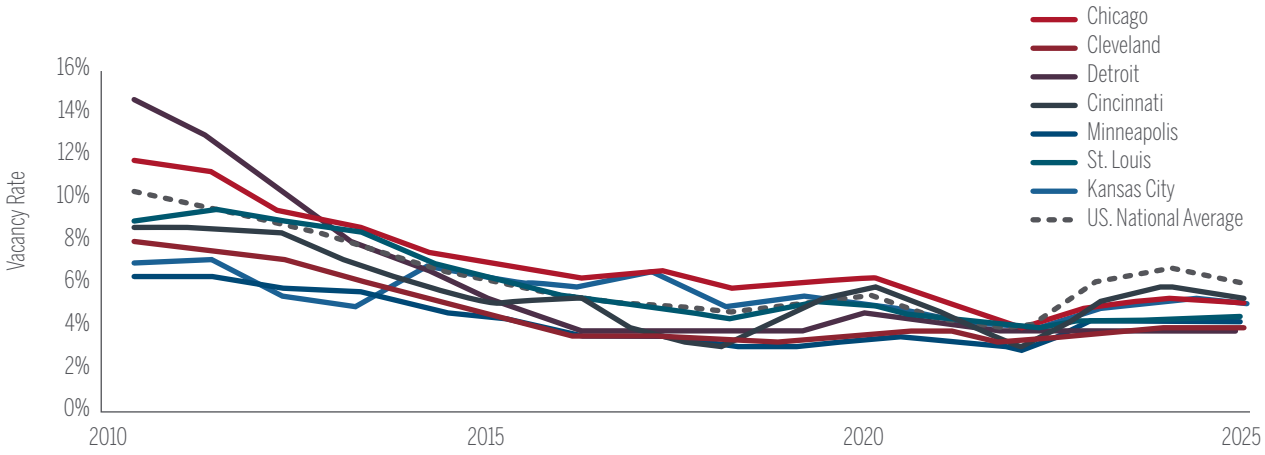
Political populism and the 2024 election bring in all sorts of questions impacting the growth of semiconductor manufacturing and EV corporate site location projects. If President Biden is not re-elected will the CHIPS Act and Inflation Reduction Act be modified or repealed? Will the federal government remain focused on reshoring semiconductor facilities and supporting the transition of the global auto industry to EVs? Will Republicans keep the incentives to support domestic growth of semiconductors and EVs but go after the social policy agenda provisions in the bill on renewable energy and semiconductor manufacturing? Questions about the federal government's economic development incentive programs regarding these two major global industries may not be answered until the November election but the election will slow the growth of corporate site location projects in targeted industries during 2024.

# PUBLIC INDUSTRIAL PARKS IMPACTING 2024 CORPORATE SITE LOCATION MARKET

Rising interest rates have slowed to a crawl the development of private sector speculative industrial space. This presents an opportunity for communities to use an "old" tool to create public sector industrial parks to capture the manufacturing product that remains strong throughout the United States.

Industrial developers across the Country, and in particular Midwest markets (Chicago, Indianapolis, Kansas City, Columbus) have consumed large tracts of industrial land over the past 5-7 years. Across the 87 markets that make up CoStar's National Index, there are 483 million SF of projects under construction, and vacancy rates have been rising for the last 5 quarters driving down rent growth across the country. The oversupply of speculative industrial buildings and increasing industrial vacancy rates is an opportunity for communities to form public-private partnerships to fill the gaps in attracting end users for FDI, food and beverage manufacturers, and Giga factories.

**Midwest Markets Get Industrial Vacancies Below US Average**



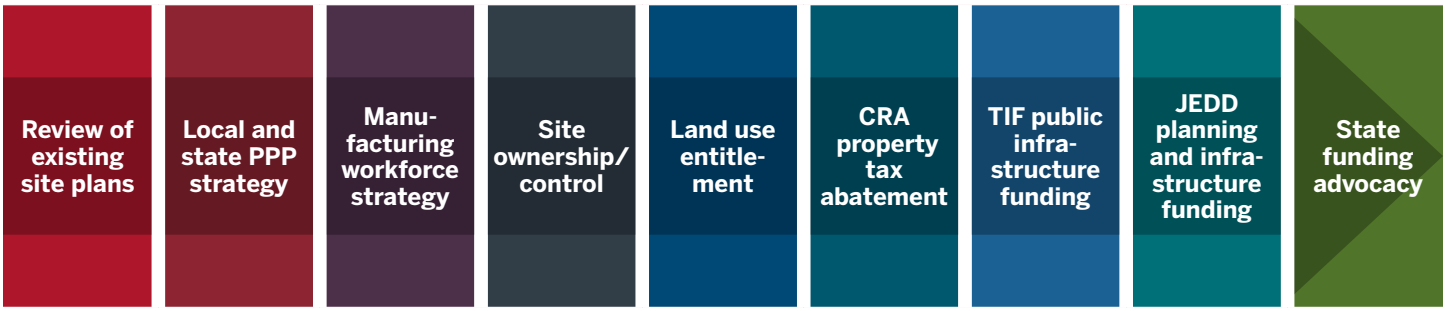

As illustrated by the Costar chart above, the Midwest market's industrial vacancy rates are below the U.S. average illustrating there is an opportunity for growth based upon new investment. Including Chicago, seven of the 20 largest industrial inventories by square footage reporting vacancy rates below the national average are in the Midwest: Cleveland is at 3.6%, Minneapolis is at 3.8% and Detroit is at 3.8% vacancy.

Manufacturing construction starts are likely to continue to grow with the onshoring of production improving supply chains and significant new federal funding assisting those efforts according to the Dodge Construction Network Report. In 2024, Dodge anticipates that construction starts will again outperform most other sectors with a 16% increase in dollar value and a 10% gain in square footage. Since 2020, manufacturing construction starts have grown from 63 million square feet to more than 156 million square feet in 2023. Continued growth is expected in 2024.

Demand for U.S. industrial space remains strong. Lee & Associates reports demand for industrial space remained positive in the United States and Canada in the third quarter, but growth this year has lost steam compared to the strong net absorption totals of the last two years. U.S. net growth in the third quarter totaled 29.9 million SF compared to 94 million SF for the same period last year. Year-to-date net absorption is 110.2 million SF, down 62% from the same period last year. There was 411.7 million SF of growth in 2022. The 524.7 million SF of net absorption in 2021 stands as the record, but the current pace of tenant expansion is the slowest since 2012 and comes as a quarterly record of new inventory is set for delivery.

Not all manufacturers will grow in 2024. Deloitte reports, that in 2024, manufacturers are expected to face economic uncertainty, the ongoing shortage of skilled labor, lingering and targeted supply chain disruptions, and new challenges spurred by the need for product innovation to meet company-set net-zero emissions goals. Deloitte's analysis of Purchasing Managers' Index (PMI) data reveals that the manufacturing sector was in contraction for most of 2023. The 2024 reality is regions need sites and workers to retain and attract growing manufacturing companies.

**Montrose Group Industrial Site Development Strategy**




The Montrose Group suggests a thoughtful approach to create a public-private partnership (PPP) to support the development of public sector industrial parks that could lead to the creation of a small-scale or large, mega site for public sector entities.

***Review of existing site plans.*** Review existing engineering plans, land use entitlements, and real estate plans and define the political jurisdictions related to the mega-site planning for the Cincinnati area to gain a further understanding of the steps needed to develop a public sector industrial park to outline the potential uses of local and state government funding;

***Local and State PPP Strategy.*** Develop a local and state PPP strategy to prepare the public sector industrial site for global competition through appropriate real estate strategies, Community Improvement Corporation or other public entity ownership of the public sector industrial park, land use entitlements, property tax abatement, TIF, and state funding;

***Manufacturing Workforce Strategy.*** Tight manufacturing labor markets demand communities prepare a workforce strategy for this industry before the company even comes to town. Partnerships with local educational institutions and local companies is the place to start and retention of young workers is the number one priority.

***Site Ownership/Control.*** Gain the necessary site development organization that may need to be formed by the public entities tied to the public sector industrial park;

***Utility Negotiations.*** Gain the needed utility infrastructure to prepare the site for global competition;

Land Use Entitlements. Negotiate and adopt the needed annexation, zoning, or other land use entitlements for the public sector industrial park;

***CRA Property Tax Abatement.*** Negotiate and adopt the appropriate Ohio tax abatement program, term, and amount that the site needs to be globally competitive and support the negotiations of local school compensation agreements if required;

***TIF Public Infrastructure Funding.*** Negotiate and adopt the appropriate public infrastructure programs like tax increment financing to fund the infrastructure needed to make the site globally competitive and support the negotiations of local school compensation agreements if required;

***JEDD Planning and Infrastructure Funding.*** Create a working partnership between a county, township, and city if needed if the state permits the use of Joint Economic Development Districts or other tools to provide joint economic and public service planning between relevant cities and townships to provide needed infrastructure funding; and

***State Funding Advocacy.*** Identify potential sources and uses of funding for the development of the public sector industrial park that include the programs outlined above, support the creation of the funding applications, and advocate for their adoption.

The Great Lakes states have a range of government and economic development programs designed to prepare industrial sites primarily for development.

**Sample State Site Development Funding Programs**

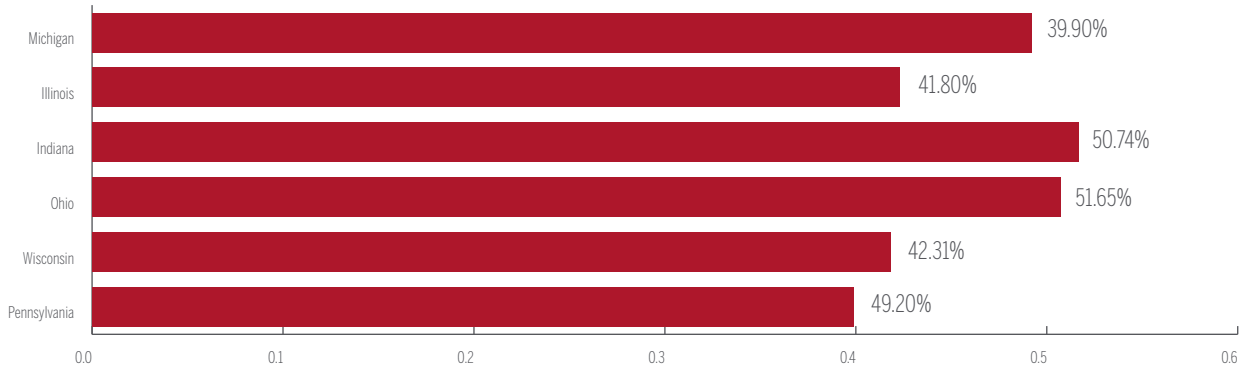
- Ohio All Future Ohio Fund is a $750 Million Ohio Department of Development fund created to prepare job-ready sites for mega-projects for infrastructure improvements, wetland mitigation measures, and other one-time site enhancements and to attract new business, workforce, and residents to Ohio and efforts to expand and advance business, workforce, community and economic development opportunities in the state,
- Ohio Brownfield Redevelopment Fund is a $350 M Ohio Department of Development program that provides up to $10 M in funding to prepare a contaminated industrial site for redevelopment,
- Kentucky Product Development Initiative. $100 million state funding allocated for transformative site and infrastructure projects. Maximum of $2 million per county per project
- Indiana Regional Economic Acceleration and Development Initiative (READI) provided $500M to its 17 regions to fund transformative projects including redevelopment and infrastructure.
- Michigan Strategic Site Readiness Program provides financial incentives to communities to fund development of Strategic Sites and Mega-Strategic Sites in Michigan, for the purpose of creating a state-wide inventory of investment-ready sites to attract and promote investment in Michigan
- Ohio Rural Industrial Park Loan Program ("RIPL") is a $30M Ohio Department of Development program providing low-interest direct loans to assist eligible applicants in financing the development and improvement of industrial parks and related off-site public infrastructure improvements.
- Construction materials sales tax exemption is awarded by local port authorities that permits the exemption of sales tax on the construction material for economic development projects, and
- Ohio Site Inventory Programs (OSIP) is a JobsOhio program that provides grants to developers for speculative industrial park development of up to $2 million.

Plenty of opportunities exist for industrial site development in 2024 but communities need to focus on a strong site development and workforce development strategy to retain and attract high-wage manufacturing jobs.

# RISE OF THE GREAT LAKES CONTINUES AS BATTLE FOR 2024 CORPORATE SITE LOCATION PROJECTS

The Great Lakes states are primed for an economic renaissance. The Great Lakes Region includes eight states (Minnesota, Wisconsin, Illinois, Indiana, Michigan, New York, Ohio, and Pennsylvania) and two Canadian provinces (Ontario and Quebec) that surround the five interconnected freshwater bodies known as the Great Lakes. The area is home to 107 million people, 51 million jobs, and a GDP of US$6 trillion – making the Great Lakes Economy a powerhouse on an international level.[xiii] The GDP of the Great Lakes of Indiana, Illinois, Michigan, Ohio, and Wisconsin has grown by 22% since 2018.

**Great Lakes States GDP Growth 2012-22**



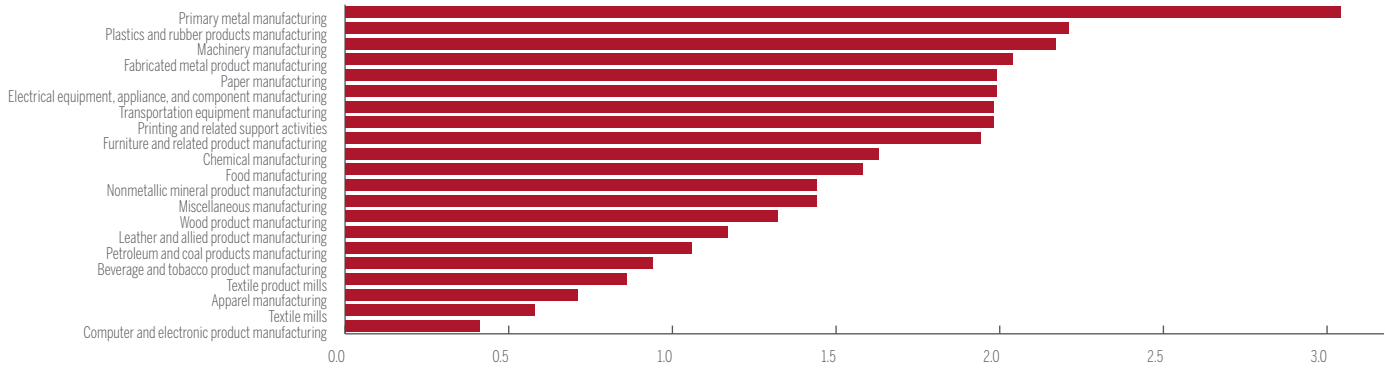

*Source: St. Louis Federal Reserve FRED*

As the table above illustrates, Pennsylvania, Wisconsin, and Illinois enjoyed growth in their GDP from 2012 to 2022 but the state's overall does not compare well to other Great Lakes states such as Ohio, Indiana, and Michigan.

The Great Lakes states remain a manufacturing powerhouse. Manufacturing remains at the center of the Great Lakes economy. An important measure for these regions is their concentration in the company's industry. Industry clusters are regional concentrations of related industries.[xiv] Clusters consist of companies, suppliers, and service providers, as well as government agencies and other institutions that provide education, information, research, and technical support to a regional economy.[xv] Clusters are a network of economic relationships that create a competitive advantage for the related firms in a particular region, and this advantage then becomes an enticement for similar industries and suppliers to those industries to develop or relocate to a region.[xvi] Clusters exist in all types of economies and are more prevalent in locations that achieve better performance relative to their overall stage of development.[xvii] It is useful to view economies through the lens of clusters rather than specific types of companies, industries, or sectors because clusters capture the important linkages and potential spillovers of technology, skills, and information that cut across firms and industries.[xviii] Viewing a group of companies and institutions as a cluster highlights opportunities for coordination and mutual improvement. A Location quotient is an indicator of the economic concentration of a certain industry in a state, region, county, or city compared to a base economy, such as a state or nation that measures industry clusters in a region. A location quotient greater than 1 indicates the concentration of that industry in the area. A location quotient greater than 1 typically indicates an industry that is export oriented. An industry with a location quotient of 1 with a high number of jobs present is likely a big exporter and is bringing economic value to the community feeding the retail trade and food services sectors.

The Great Lakes states maintain a substantial manufacturing strength in a range of industries. The Great Lakes states of Indiana, Illinois, Michigan, Ohio, Pennsylvania, and Wisconsin have at or near double the national average of jobs in primary metal, plastics, and rubber products, machinery, fabricated metal product manufacturing, paper, electrical equipment, appliance and component, transportation equipment, printing and related support activities, and furniture and related product manufacturing as illustrated by the table below. In fact, these states are above the national average in nearly every industry category measured by the Bureau of Labor Statistics, and with the development of the Intel "fab" project in Ohio and several Electric Vehicle battery and supply chain projects in the region, the manufacturing base of employers should remain strong for the Great Lakes states.

**Great Lakes States Manufacturing Industry Strengths**




*Source: Bureau of Labor Statistics*

Measuring the economic opportunity of the Great Lakes States is best done from the perspective of a company considering the region for a corporate site location project. Corporate site location projects involve the process where companies decide where to grow or retain jobs and make capital investments. This process is influenced by macroeconomic, demographic, workforce, quality of life, cost of doing business, and industry

cluster research as these companies want to invest in growing regions, with lower poverty rates and higher population growth, a competitive cost of doing business and a high quality of life attractive to a skilled workforce connected to common industries with this company. The Great Lakes States of Indiana, Illinois, Michigan, Ohio, Pennsylvania, and Wisconsin compete not just globally for high-wage jobs and capital investment but often with the Southern U.S. states to serve as the manufacturing heartland of the nation.

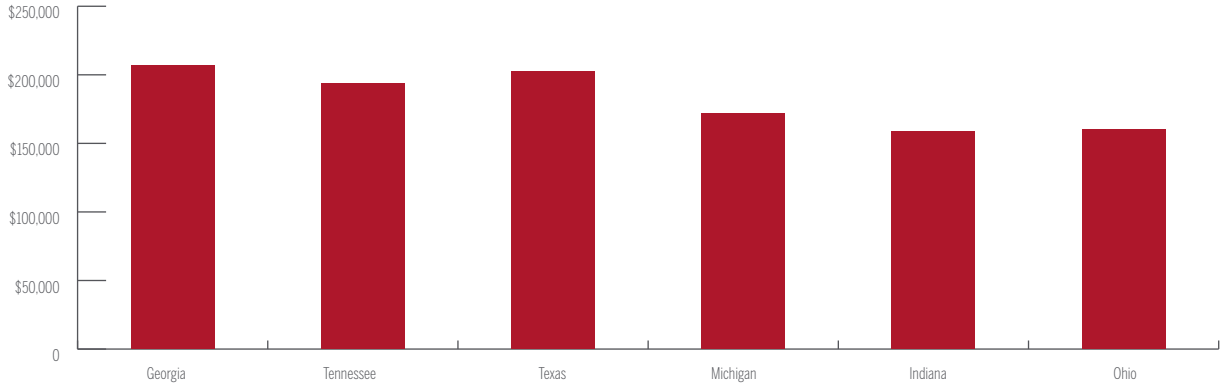
The Great Lakes Region's demographic data offers a mixed bag for corporate site location projects. Key demographic measures that impact corporate site location decisions include total population and population growth which impact the ability of a region to provide skilled workers—the larger the population pool the more chances for creating a skilled worker. Also, homeownership and median home value illustrate whether workers will be able to afford housing. Labor issues such as the level of higher education degree attainment and how many workers are in the active workforce impact a region's ability to attract certain types of companies and companies at all if they have no room for growth in the active labor market. Quality of life issues such as commute times to work matter as well and overall wealth measures such as median household income and poverty rate impact company location decisions.

| Great Lakes Demographic Profile | | |
|---|---|---|
| Fact | Great Lakes States | United States |
| Population | 60069787 | 333287557 |
| Population Growth 2020-22 | -0.0035 | 0.006 |
| Home Ownership Rate | 68% | 64% |
| Median Home Value | $183,467 | $244,900 |
| Bachelor's Degree Rate | 31% | 33% |
| Civilian Labor Participation Rate | 63.75% | 63.10% |
| Commute Time | 24.98 | 26.8 |
| Median Household Income | $65,719 | $69,021 |
| Poverty Rate | 12.20% | 11.60% |

As the table above illustrates, the Great Lakes states of Indiana, Illinois, Michigan, Ohio, Pennsylvania, and Wisconsin are home to over 60 M residents, but the region is not growing from a population standpoint which is troubling. Homeownership rates in the Great Lakes are higher than the national average. The median home value is lower than the national average, which is an advantage, but the bachelor's degree attainment rate is lower than the national average. Commuting times are below the national average, but the median household income is below the national average. Finally, the poverty rate in the Great Lakes Region is slightly higher than the national average.

However, the Great Lakes states remain a more affordable place for workers to live as the chart shows the housing costs of regions across the United States.

## Median Home Value




Six economic conclusions about the growth prospects of the Great Lakes states compared to the South are crystal clear.

1. The Great Lakes states are not growing as quickly as Southern states related to population and macroeconomic measures as the long-term Southern and Southwest U.S. state expansion continues in 2023, and this slower population and economic growth serve as a threat to future economic expansion in the Great Lakes Region.
2. The Great Lakes States have a large pool of manufacturing companies and workers, but their manufacturing labor wage rates remain higher than their Southern State competitors.
3. The Great Lakes States have become a less costly place to do business as state income taxes have been reduced but still ensure residents and not just companies bear the burden for the cost of local and state government operations than states that lack an income tax at all.
4. The Great Lakes States have enhanced their quality of life but also have more affordable housing than faster-growing Southern markets which can have an outsized influence on corporate site location decisions as companies remain concerned about the lack of available and affordable workforce housing for their workers.
5. The Great Lakes states remain an industrial powerhouse with every state in the region having an above-average base of manufacturing workers and Indiana leading the way as the number one state in the nation on a per capita basis for manufacturing.
6. The Great Lakes States benefit from highly function regional and state economic development organizations and usually aggressive economic development incentives that can make up for higher labor wage rates for competitive corporate site location projects.

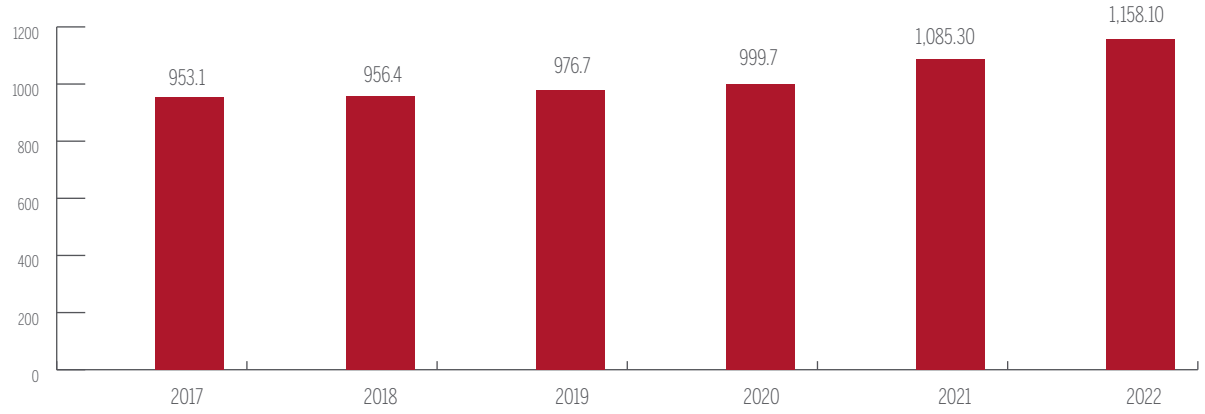
Indiana, Illinois, Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin remain economic powerhouses but operate in a highly competitive market to retain and attract high-wage jobs and capital investment impacting the chances for a positive year for the region in the 2024 hunt for corporate site location projects.

# FOOD AND BEVERAGE INDUSTRY GROWTH WILL BE A 2024 CORPORATE SITE LOCATION BRIGHT SPOT

While many industries will struggle to launch corporate site location projects in 2024, that should not be the case for the U.S. food and beverage industry. Food and beverage manufacturing plants transform raw food commodities into products for intermediate or final consumption by applying labor, machinery, energy, and scientific knowledge. Some products may serve as inputs for further processing, such as syrup for manufacturing soda.

The U.S. food and beverage manufacturing industry provides 1.2% value added to the US GDP, and the only manufacturing sector higher is chemical manufacturing at 1.9%. The U.S. food and beverage gross economic output is $1.16 trillion in 2022 and this gross output has grown from $950 billion in 2017 illustrating a 22% increase in gross economic output over 5 years. More importantly, the U.S. food and beverage market are projected to grow 3.79% annually over the next 5 years.

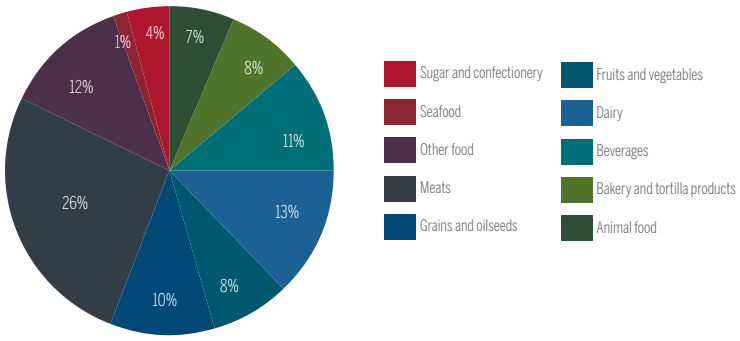
**Manufacturing Output of Food and beverage and tobacco products**




*Source: U.S. Bureau of Economic Analysis*

Based on data from the U.S. Department of Commerce, Bureau of the Census's Annual Survey of Manufactures, these plants accounted for 16.8 percent of sales and 15.4 percent of all employees from all U.S. manufacturing plants in 2021. Because intermediate inputs (primarily food commodities) account for a relatively large share of food and beverage manufacturers' costs, value added in food and beverage manufacturing represents a slightly smaller share (15.0 percent) of value added in all manufacturing.

## Components of US Food & Beverage Manufacturing

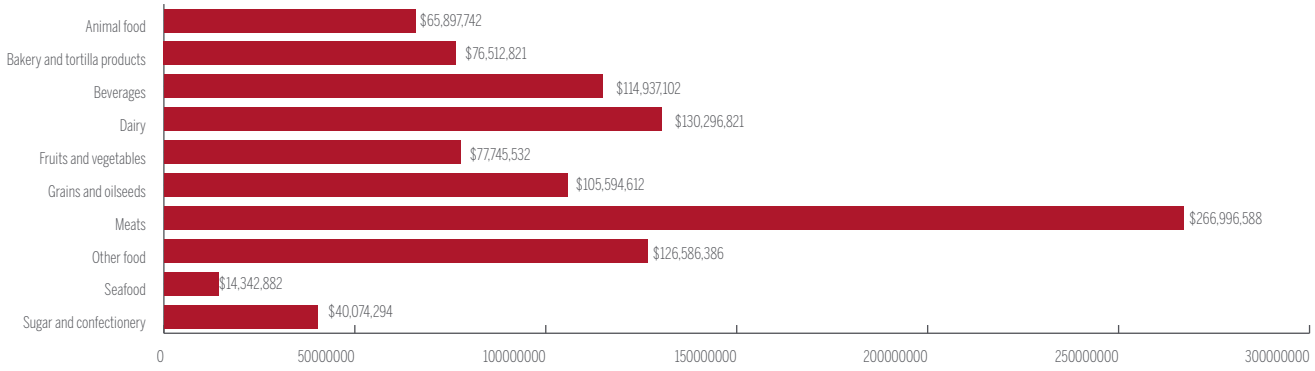



*Source: USDA*

Meat processing is the largest industry group in food and beverage manufacturing based on sales, value-added, and employment. Meat processing includes livestock and poultry slaughter, processing, and rendering. It is the largest industry group in food and beverage manufacturing, with 26.2 percent of sales in 2021. Other important industry groups by sales include dairy (12.8 percent), other foods (12.4 percent), beverages (11.3 percent), and grain and oilseeds (10.4 percent).

Meat processing (22.2 percent) and other food (15.4 percent) are the largest industry groups in the food sector's total value added.6, 144 dpi), followed by dairy, beverages, and grains as outlined in the U.S.D.A. chart below.

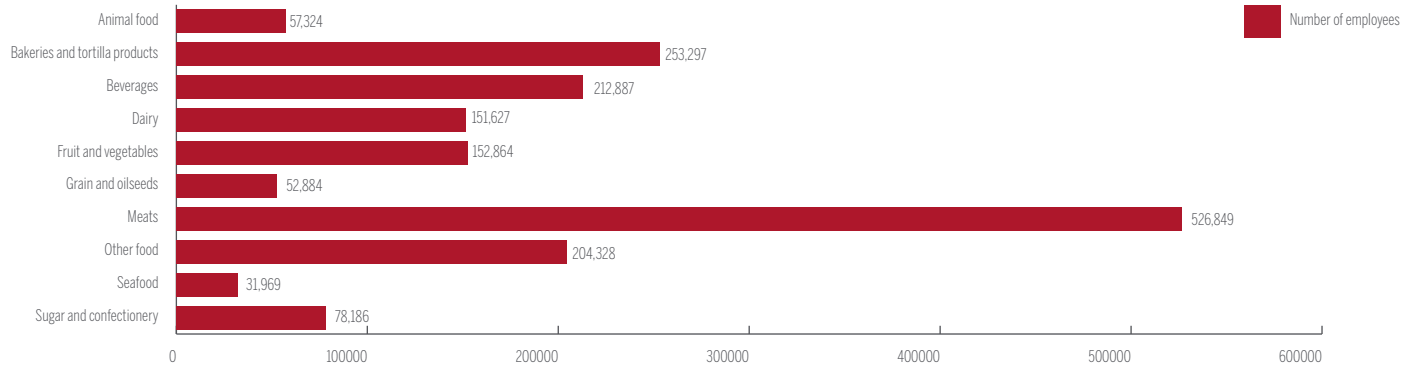
## Food & Beverage Components by Sales, Value of Shipments & Revenues




*Source: USDA*

Food and beverage processing establishments (plants) employed 1.7 million workers in 2021 (about 15.4 percent of all U.S. manufacturing employment and just over 1.1 percent of all U.S. nonfarm employment). The meat processing industry employed the largest percentage of food and beverage manufacturing workers in 2021 (30.6 percent), followed by bakeries and tortilla producers (14.7 percent).

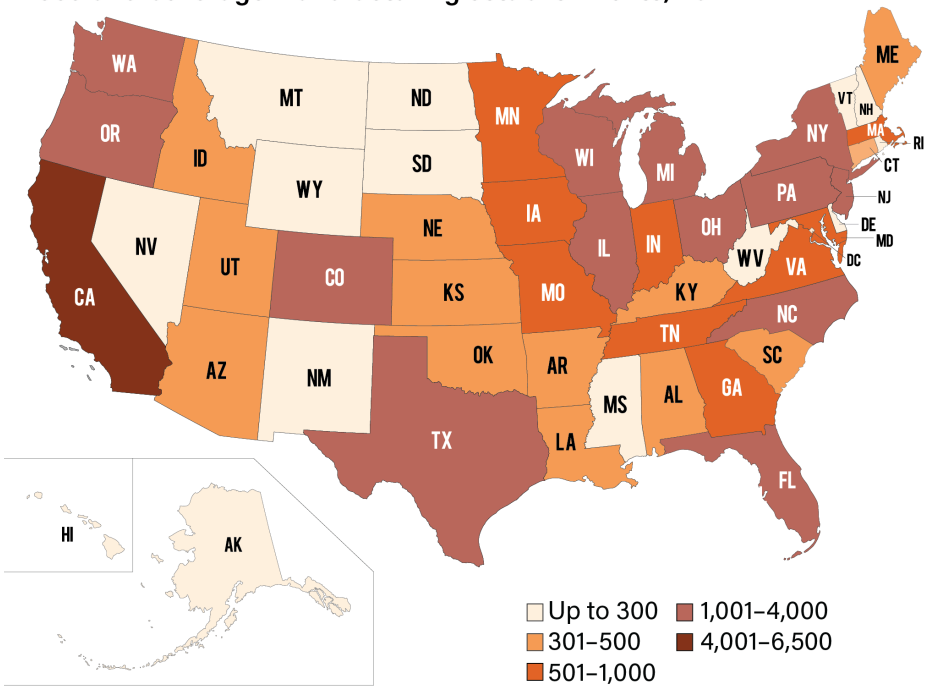
## US Food & Beverage Industry by Number of Employees




*Source: USDA*

There are many food and beverage processing plants in the United States—41,080 in 2021, according to the U.S. Department of Commerce, Bureau of the Census's County Business Patterns. Food and beverage processing plants are located throughout the United States. California had the most food and beverage manufacturing plants (6,301), whereas Texas (2,782) and New York (2,662) were also leading food and beverage manufacturing States. Pennsylvania, Illinois, Washington, Florida, Ohio, New Jersey, and Wisconsin round out the top 10 states with the largest base of food and beverage manufacturing companies. The Ohio Center for Innovative Food Technology noted that Ohio's food and beverage industry employs nearly 126,000 people across the state and invests over $100 million in food-related research and development (R&D), Ohio's food industry sectors include food and beverage machinery and packaging; food and beverage processing and manufacturing; and food and beverage wholesale and warehousing. Ohio's food industry performs 43% more R&D than the national average and hires more high-skill workers to advance the sector. For instance,

**Food and beverage manufacturing establishments, 2021**




Source: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census, 2021 County Business Patterns; data as of April 2023.

Ohio's broad food packaging, processing, manufacturing, and distribution sector boasts 60% more engineers than the U.S. average, 40% more engineering technicians, and 38% more food scientists and technologists.

The food and beverage processing industry may well prove one of the few 2024 corporate site location project bright spots driven by increased demand for locally produced food.

# FOREIGN DIRECT INVESTMENT REMAINS A 2024 CORPORATE SITE LOCATION SUCCESS STORY

Foreign Direct Investment (FDI) should continue to be good business for corporate site location projects in 2024.

FDI is investments made by foreign companies or individuals in the United States. FDI or direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise resident in another economy. Ownership or control of 10 percent or more of the voting securities of an entity in another economy is the threshold for separating direct investment from other types of investment. A foreign affiliate is a foreign business enterprise that is at least 10 percent owned by a single U.S. person or entity.

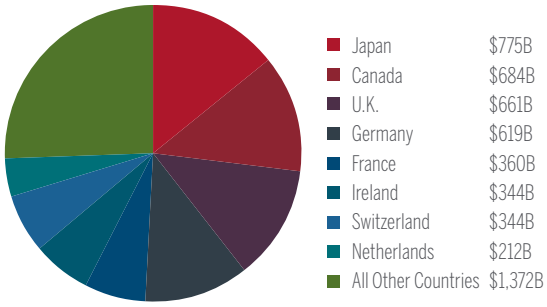
According to the United Nations' statistics on FDI, the United States was the world's largest recipient of foreign investment from 1985–2016. However, the U.S. share of global FDI declined from nearly 40 percent in 1999 to 24 percent in 2016. More recent data from July 2023 reports from the U.S. Bureau of Economic Analysis (BEA) reveals a significant increase in FDI in the United States. FDI grew by $216.8 billion, reaching $5.25 trillion at year-end 2022, compared to $5.04 trillion at the end of 2021.

**FDI in the United States (in millions of dollars)**

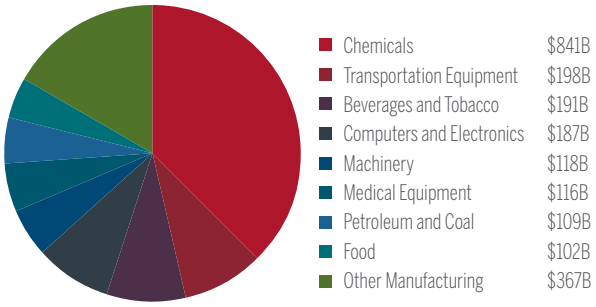

*Source: St. Louis Federal Reserve, FRED*

Where FDI is coming from to the United States is a critical issue to understand. Five countries accounted for more than half of the total foreign direct investment in the United States position at the end of 2022. Japan remained the top investing country with a position of $712.0 billion, followed by the United Kingdom ($663.4 billion), the Netherlands ($617.1 billion), Canada ($589.3 billion), and Germany ($431.4 billion).

## Cumulative FDIUS by Country Through 2022




## Cumulative FDIUS in Manufacturing Through 2022




By country of the ultimate beneficial owner (UBO), the entity at the top of the global ownership chain, Japan ($775.2 billion) remained the top investing country in terms of position at the end of 2022. Canada ($683.8 billion) was second, and the United Kingdom ($660.6 billion) was the third-largest investing country. On the UBO basis, investment from the Netherlands and Luxembourg was much lower than by the country of foreign parents, indicating that much of the investment from foreign parents in these countries was ultimately owned by investors in other countries. The increase mainly reflected a $142.2 billion increase in the position from Europe, with the largest increases from the United Kingdom and Germany. By industry, affiliates in manufacturing and wholesale trade accounted for most of the increase. 200 international companies in the US provide 8 M jobs and FDI constitutes 23% of the U.S. manufacturing jobs. FDI employment grew by 11% from 2016 to 2021 in the United States-- outpacing overall private-sector employment growth at 2%.

Business retention matters with FDI as many of these projects will be centered on existing global companies with U.S. locations. Greenfield investment expenditures—expenditures to either establish a new U.S. business or to expand an existing foreign-owned U.S. business—were $8.1 billion in 2022. By industry, greenfield expenditures were largest in manufacturing, totaling $5.3 billion, led by computer and electronic products ($1.8 billion). By region of UBO, Asia and Pacific ($3.4 billion) and Europe ($2.9 billion) had the largest expenditures. By state, California received the highest level of greenfield investment ($1.5 billion). In 2022, total planned employment, which includes the current employment of acquired enterprises, the planned employment of newly established business enterprises when fully operational, and the planned employment associated with expansions, was 185,600. Manufacturing accounted for the largest number of employees followed by professional, scientific, and technical services.

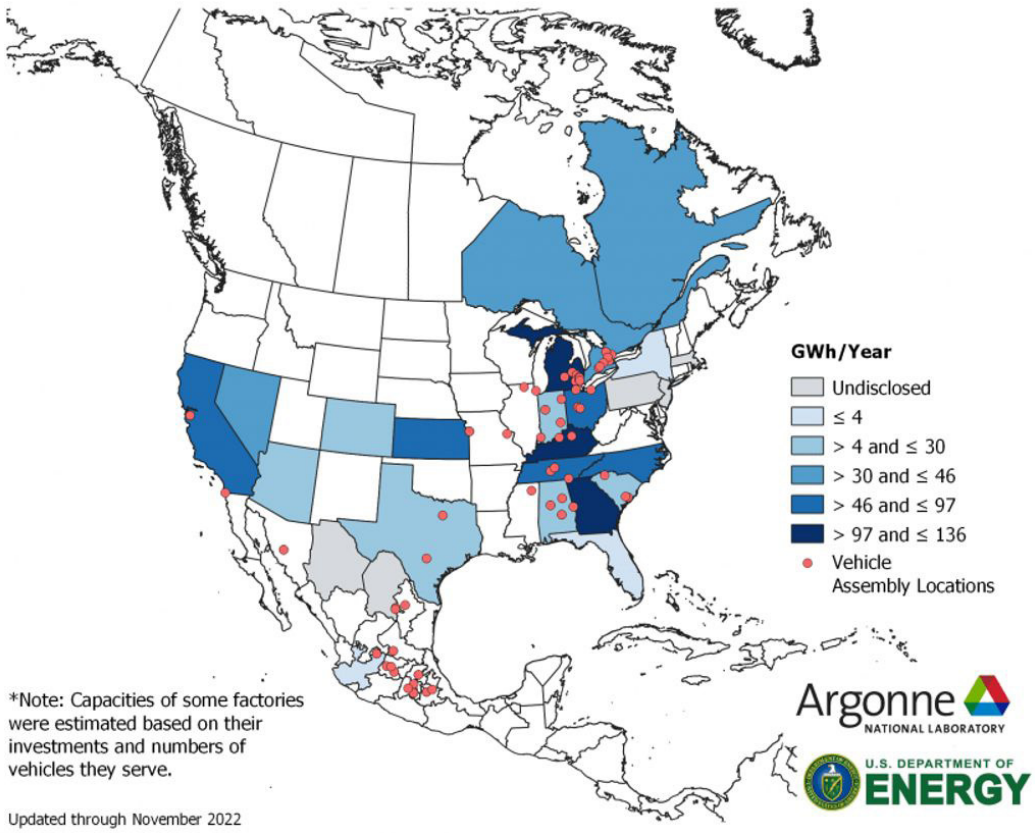
FDI will remain a growth prospect for 2024 corporate site location projects with the expansion of existing foreign-owned manufacturing companies are the prime target for economic growth.

# GIGA FACTORIES SUPPLY CHAIN GROWTH EXPECTED IN 2024 CORPORATE SITE LOCATION PROJECTS

2024 will see the implementation of announced large-scale industrial projects around Electric Vehicles (EVs) and semiconductor chip manufacturing facilities as the supply chain needs to be developed for these "giga factories" on mega sites.

The global auto industry announced a massive transition to EVs a couple of years ago. 2022 and 2023 saw the start of that transition in the production of the components of EVs primarily the EV battery used to operate these cars. According to the US Department of Energy planned battery production capacity will support the manufacture of 10 million to 13 million vehicles by 2030. Between 2021 and 2030 battery manufacturing capacity will increase from 55 Gigawatt-hours per year (GWh/year) in 2021 to nearly 1,000 GWh/year by 2030. As the map below indicates a Battery Belt is developing in Kentucky, Ohio, Tennessee, Georgia, and Michigan.

**Planned Battery Plant Capacity in North America by 2030**




The EV battery projects will bring a supply chain of new companies needed to serve these facilities as well as the transformation of the domestic auto assembly industry to reduce employment and facilities around Internal Combustion Engines (ICE) facilities and shift this workforce and facilities to the production of components for the EVs. The announcement of the Honda LG joint venture in Ohio illustrates the opportunities for job creation and retention these EV projects bring. Honda and LG Energy Solution in February of 2023 held the official groundbreaking ceremony for a new joint venture EV battery plant over 2 million square feet in size, to be in Fayette County, near Jeffersonville, Ohio. The two companies have committed to investing $3.5 billion in the new joint venture (JV) facility, with their overall investment projected to reach $4.4 billion. The facility is scheduled to be completed by the end of 2024, with plans to create 2,200 jobs, and the aim for approximately 40GWh of annual production capacity. The JV company will deliver lithium-ion batteries with cutting-edge technology to support Honda's plan to build battery-electric vehicles (EV) in North America. The location of the joint venture between Honda and LGES was announced on Oct.11, 2022, and was formally established on Jan. 12, 2023. The plant aims to start mass production of pouch-type lithium-ion batteries by the end of 2025,

to be provided exclusively to Honda auto plants to produce EVs to be sold in North America. Honda also has announced plans to invest $700 million to re-tool several of its existing auto and powertrain plants in Ohio for production* of electric vehicles that will utilize the batteries made at the new JV facility. Honda plans to begin production and sales of Honda EVs in North America in 2026, based on its new Honda e: Architecture. As part of its goal to achieve carbon neutrality for all products and corporate activities by 2050, Honda has a vision to make battery-electric and fuel-cell electric vehicles represent 100% of its vehicle sales by 2040. Backed by the largest global battery manufacturing network it has established, LG Energy Solution has been carrying out its initiative to expedite the global EV transition, with its annual production capacity of 200GWh to further expand to 300GWh by the end of this year.

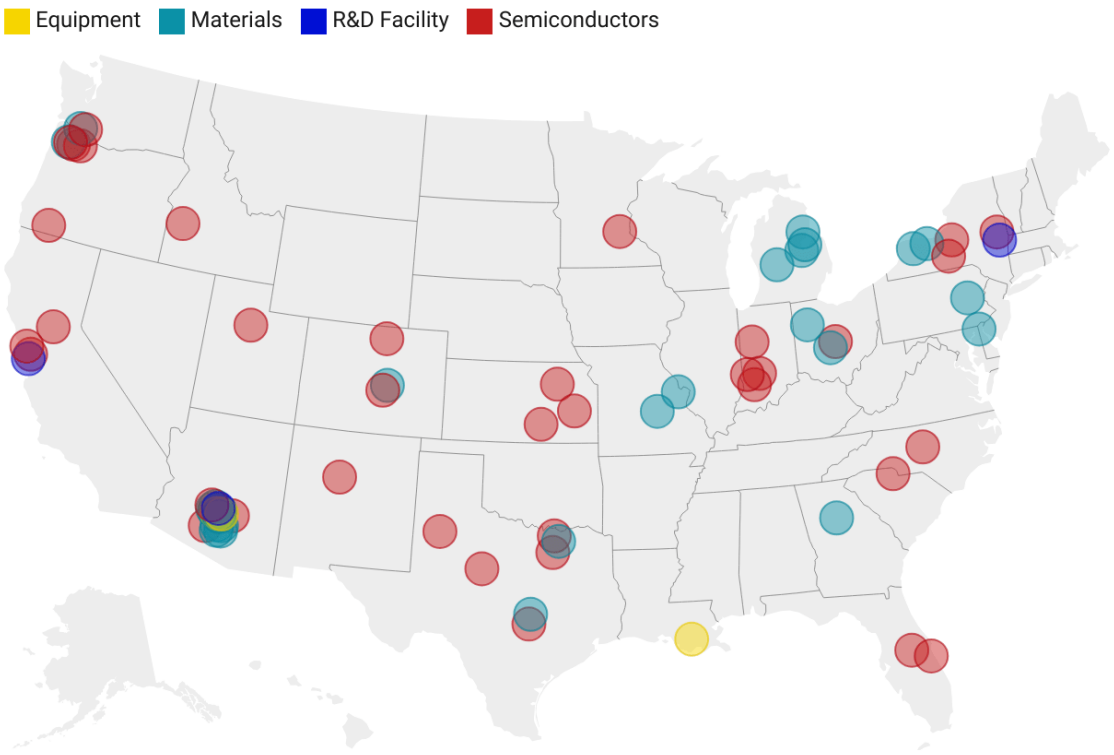
The supply of power is a major concern for the development of additional giga factories and their supply chain. An all-time high of 2,287.6 MW was under construction in primary markets, a 25% year-over-year increase. Strong demand and developer appetite continue to drive new construction. However, a lack of readily available power and extended lead times for key pieces of electrical infrastructure are delaying construction timelines. Most major markets are grappling with power constraints. Data center operators are prioritizing power availability, rather than selecting markets based on location, connectivity, water, and land pricing. AI is driving demand across most major markets. Many AI startups are seeking large requirements between 5 to 25 MW.

Semiconductor chip manufacturing facility announcements following large federal economic development incentives to reshore these important facilities dominated 2023 corporate site location projects and the development of their supply chain will likely make news in 2024. Following the enactment of the federal CHIPS and Science Act in August 2022, 70 new semiconductor ecosystem projects were announced across the U.S. according to the Semiconductor Industry Association. These new semiconductor manufacturing facilities (fabs), expansions of existing sites, and facilities that supply the materials and equipment used in chip manufacturing constitute $220 billion in private investments announced across 22 states to increase domestic manufacturing capacity, 44,000 new high-quality jobs announced in the semiconductor ecosystem as part of the new projects, which will support hundreds of thousands of additional jobs throughout the broader U.S. economy. A 2021 SIA-Oxford Economic study found that for each U.S. worker directly employed by the semiconductor industry, an additional 5.7 jobs are supported in the wider U.S. economy.

These new projects cover a range of activities needed to bolster the U.S. chip ecosystem, including new, expanded, or upgraded fabs in various semiconductor segments (e.g., advanced logic, memory, analog, and legacy chips), semiconductor equipment facilities, and facilities to produce key materials used in the chip manufacturing process. In anticipation of CHIPS Act incentives, some projects have already begun groundbreaking and construction activities, with production to start as early as the end of 2024, other projects began construction in 2023, and some projects incentivized by the CHIPS and Science Act may operate on an even quicker timeline, including such projects as tool upgrades or additions. The announced projects include the construction of 23 new chip fabs and the expansion of 9 fabs.

## The CHIPS Act in Action

Semiconductor supply chain manufacturing investments announced from May 2020 to December 2023




Source: Semiconductor Industry Association analysis • Created with Datawrapper

Increased fab construction spurs investments by suppliers of materials, chemicals, and equipment. As a result, companies that supply semiconductor manufacturing equipment and the materials used in the production of chips—including high-purity chemicals, specialty gases, and wafers—announced plans to invest in several facilities to support increased domestic manufacturing capacity.

In addition to the Commerce grants, the CHIPS Act also includes the "Advanced Manufacturing Investment Credit" for semiconductor manufacturing facilities and facilities that produce semiconductor manufacturing equipment. Taken as a whole, these incentives are expected to generate significant investment in the semiconductor ecosystem in the U.S., and both are sorely needed to close the significant cost gap between the U.S. and global competitors.

2024 should prove to be the year when more of these announced "fab" projects begin to come to life and their supply chain begins to take shape around these massive industrial projects.

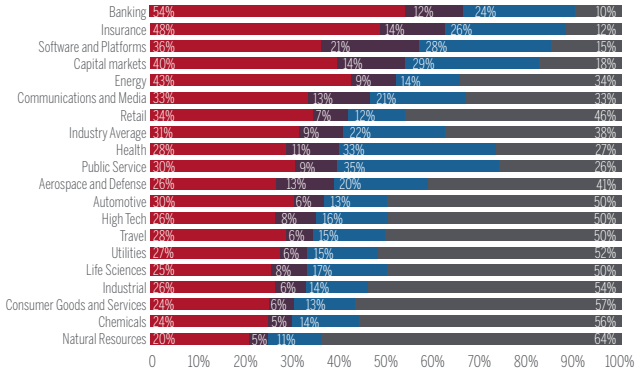
# AI SHOCK TO IMPACT 2024 CORPORATE SITE LOCATION PROJECTS

Artificial Intelligence (AI) is changing the U.S. economy and will begin to have an impact on economic development in 2024. AI shock is the term used to define the industry and occupation changes in the predominately white-collar industries where computers do the work of college-educated, often skilled workers.

AI can mean many things. AI refers to algorithms that teach machines how to complete tasks by identifying statistical patterns in data, rather than following preset instructions provided by humans, the basis of the technology developed during the automation revolution according to the Dallas Federal Reserve Bank. Unlike computerization and automation, which forged tools good at performing repetitive, routine tasks at scale, the algorithms employed in AI technologies can perform highly nonroutine tasks previously only performed by highly skilled workers with sophisticated training. For example, AI could rapidly analyze a massive volume of financial data to identify data points indicative of likely fraudulent transactions, a task that simple automation technologies cannot perform. A human auditor, who has accumulated years of training and job experience in fraud detection, could become vulnerable once such an AI application comes online.

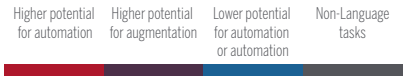
AI can be broken into three categories: machine learning where computers provide analysis and prediction; deep learning where computers provide vision and speech; and generative AI which leads to language mastery. Large Language Models (LLMs) are a class of Generative AI foundation models used to capture knowledge in human language and generate text, and current applications include meal planning, document summaries, negotiation simulation, invention, and computer code development. AI technologies developed before 2022 were mainly limited to predictive AI, which analyzes data to recognize patterns and is largely geared toward functional tasks such as detection or forecasts according to the Dallas Federal Reserve Bank. The recent advent of applications like ChatGPT (short for Chat Generative Pre-trained Transformer) radically expanded the range of applicability of AI because the GPT-based AI is generative which means that the AI can generate creative content based on big data. Generative AI can write articles, compose music, and create art, all almost indistinguishable from those created by human beings, and that capability means generative AI applications such as ChatGPT will likely expand the list of vulnerable occupations.

## Generative AI will transform work across industries




**Work time distrubuted by industry and potential AI impact**

Based on their employment levels in the US in 2021




**40% of working hours across industries can be impacted by Large Language Models (LLMs)**

Why is this the case? Language tasks account for 62% of total work time in the US. Of the overall share of language tasks, 65% have high potential to be automated or augmented by LLMs.

**Source**: Accentrure Research based on analysis of Occupational Information Network (O*NET), US Dept. of Labor; US Bureau of Labor Statistics.

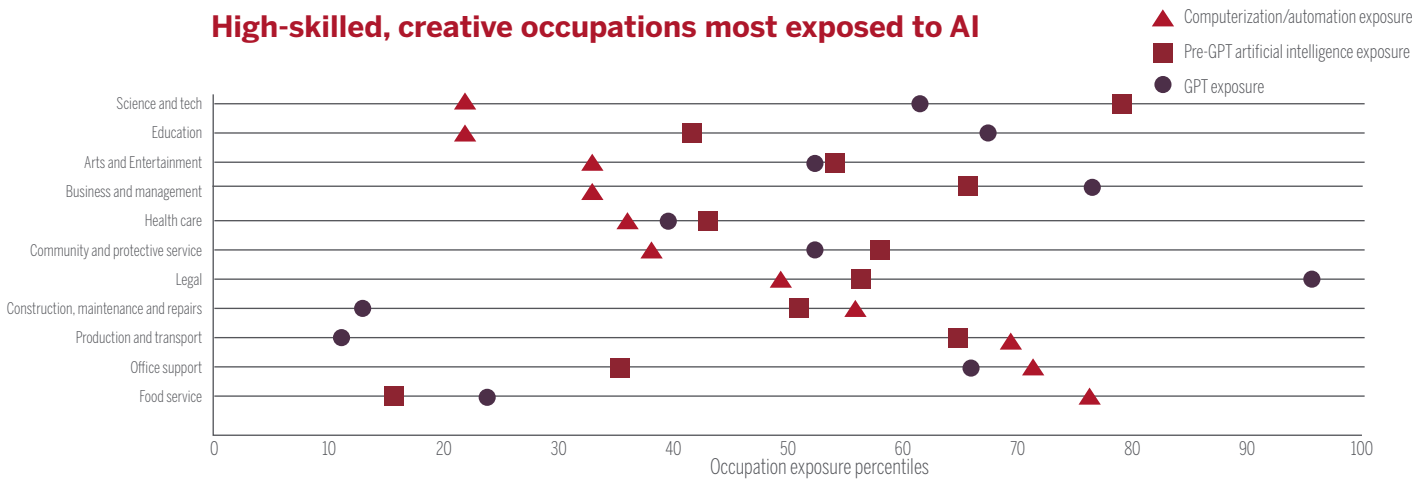
**Notes**: We manually identified 200 tasks related to language (out of 332 included in BLS), which were linked to industries using their share in each occupation and the occupations' employment level in each industry. Tasks with higher potential for automation can be transformed by LLMs with reduced involvement from a human worker. Tasks with higher potential for augmentation are those in which LLMs would need more involvement from human workers.

*Source: Accenture*

Occupations commonly believed to be safe from replacement—such as language teachers, legal professionals, and artists—may now face stiff competition from the superhuman performance of GPT services at scale. Generative AI is not a replacement for the current workforce, but it does give today's knowledge worker a new co-pilot and will free up employees from automatable, routine tasks, and redirect energy and focus to more

strategic creative work that requires human intuition, decision-making, and problem-solving skills. The reality is that 40% of working hours across industries can be automated or augmented by Large Language Models according to Accenture research, and Goldman Sachs estimates that 300 M global jobs will be exposed to AI automation.

## High-skilled, creative occupations most exposed to AI



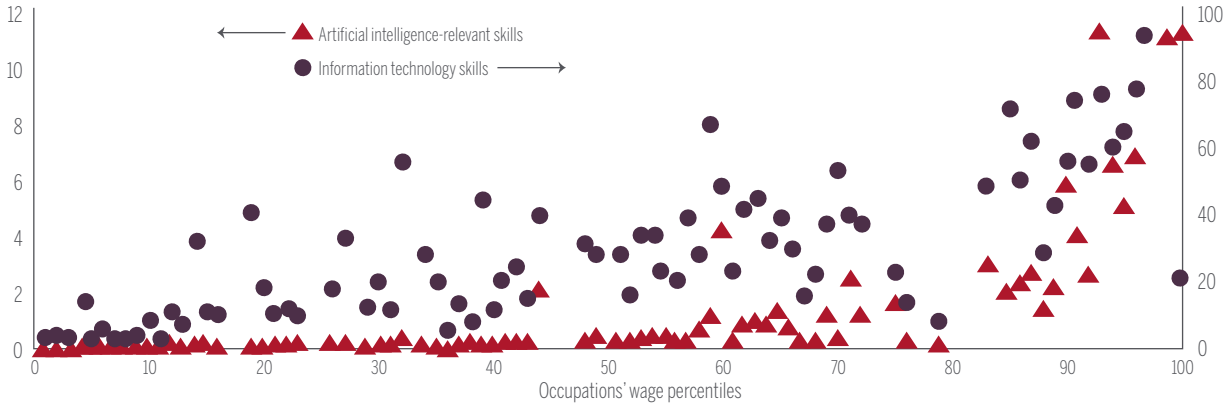

**Notes**: Values shown are the averages of occupations' exposure percentiles for 11 occupation categories. Exposure percentiles are calculated by ranking occupations by their exposure measures

**Source**: Lightcast; "The Future of Employment," by Carl Benedikt Frey and Michael Osborne, Oxford Martin School working paper, 2017; "The Impact of Artificial Intelligence on the Labor Market, by Micheal Webb, Stanford University dissertation, 2020; "How will Language Modelers like ChatGPT Affect Occupations and Industries," by Edward W. Felton, Manav Raj and Robert Seamans, available at SSRN, 2023; Authors' calculations.

The Dallas Federal Reserve Bank identified three types of technological shocks to gauge AI's impact on targeted occupations—automation, pre-GPT AI and GPT AI. Occupations less likely to be impacted by AI are job attributes that create bottlenecks to computerization, such as social perceptiveness and manual dexterity, and combine these attributes with engineers' assessments to predict whether an occupation is exposed to computerization and automation. The chart above shows the degree of exposure to automation, pre-GPT AI and GPT AI across the major occupation categories, and blue-collar occupations such as food service and production tend to be most exposed to the automation shocks, while the higher-skilled white-collar jobs such as science and technology and education jobs tend to be much less exposed.

Not all the AI news is bad for job creation and corporate site location development. The Dallas Federal Reserve Bank reviewed job postings to determine which occupations tied to AI are growing. The chart below shows the share of job postings requiring AI-relevant (broadly defined) or IT skills by occupation wage percentile. Higher-wage occupations disproportionately require the ability to use both IT and AI technologies, and the prevalence of AI technology usage appears highly concentrated in occupations above the top 10 percent of the wage distribution and is much more skewed than the prevalence of IT usage.

## Occupations at the top of the wage distribution likely complemented by AI technologies




**Notes**: The horizontal axis represents the precentile bins (1 to 100) of occupations' posted wages measured in job postings. The vertical axes represent the fraction of job postings within each percentil bin that require AI-relevant skills and IT skills.Each dot or triangle represents the average percent of the relevant skills within a wage percentile bin.

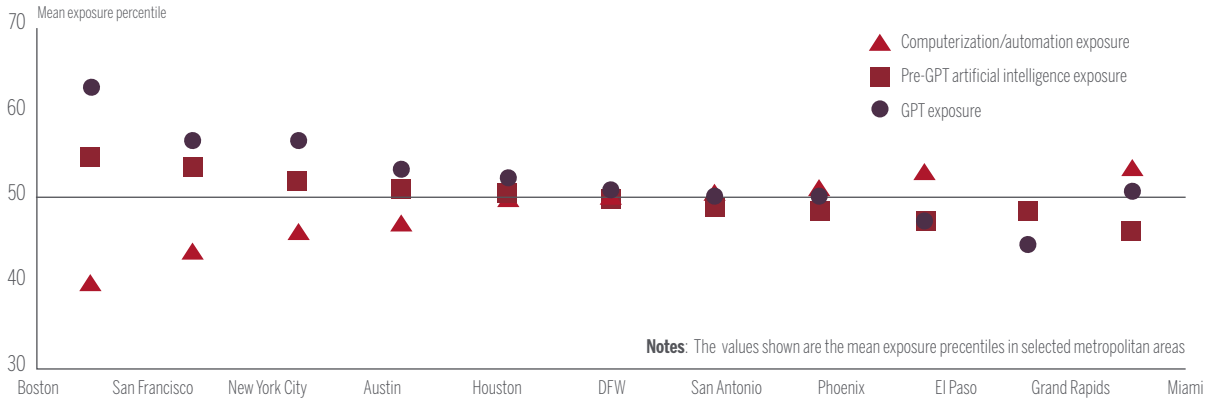
**Source**: Lightcast; authors' calculations.

This Dallas Federal Reserve data suggests that workers at the very top of the wage distribution may be complemented by AI advancement, making them its beneficiaries, while the high-skilled workers outside of the very top may have their jobs rendered vulnerable to AI.

Not all regions will be impacted the same by AI. The automation of the manufacturing industry hit the Industrial Midwest much harder than the coasts which had little auto, steel, and other heavy manufacturing left. However, the AI shock is expected to render the workforce in the large high-skilled cities vulnerable while leaving the smaller and lower-skilled cities relatively unaffected. The Dallas Federal Reserve chart below shows select cities' exposure to the three technological shocks, shown as the mean exposure percentile of the job postings in the metro to each shock. Higher percentiles mean more of the jobs posted in the metro are vulnerable or exposed to the new technology. Cities such as New York, Boston and San Francisco are the least exposed to automation but are much more exposed to AI shocks, especially to the shocks from generative AI, because of these cities' large workforces in high-skilled and creative professions. By comparison, in cities such as Grand Rapids, Michigan, which is a major manufacturing center in the Midwest, the exposure profile is entirely reversed: Exposure to automation tends to be much higher, while exposure to AI, in particular generative AI, is low.

As a state, Texas is ranked in the middle of the pack in terms of exposure to any of these technological shocks. This is largely because the composition of the Texas workforce mimics that of the nation, but Austin is less exposed to automation but more exposed to AI, while El Paso is the reverse. This is because Austin has a large presence of AI-exposed occupations such as tech and professional services, while El Paso hosts more automation-exposed occupations such as food services and office and administrative support. Occupational exposure to either automation or AI in Dallas–Fort Worth, Houston and San Antonio tends to be close to the national median.

**Major Texas cities are similarly exposed to tech shocks as the nation**

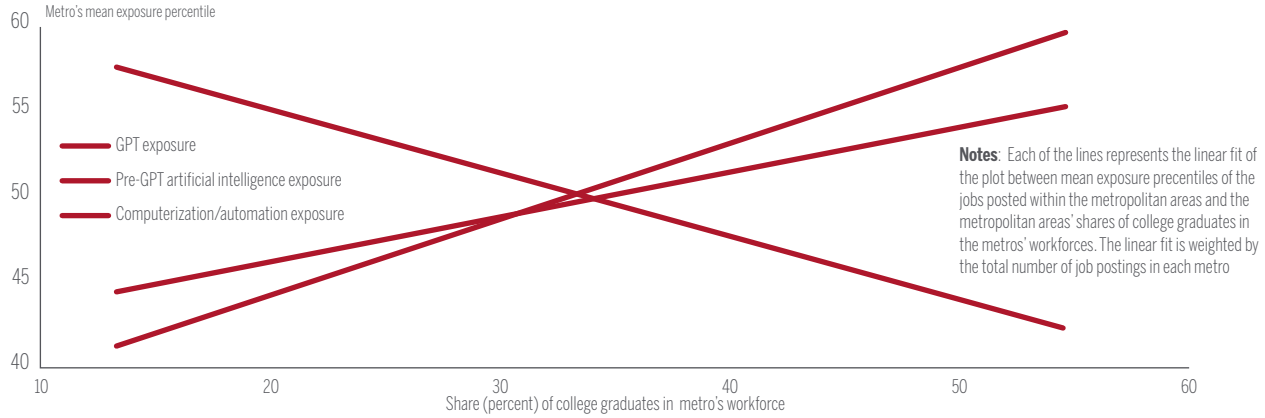



**Source**: Lightcast; "The Future of Employment," by Carl Benedikt Frey and Michael Osborne, Oxford Martin School working paper, 2017; "The Impact of Artificial Intelligence on the Labor Market, by Micheal Webb, Stanford University dissertation, 2020; "How will Language Modelers like ChatGPT Affect Occupations and Industries," by Edward W. Felton, Manav Raj and Robert Seamans, available at SSRN, 2023; Authors' calculations.

Across the nation, cities with high concentrations of college-educated workers tend to be more exposed to AI technologies, especially the generative AI shock in the chart below. This distribution is the opposite of the automation shock, which disproportionately hit cities with significant shares of noncollege-educated workforces. AI shocks may potentially reverse some of the well-documented geographic disparity in wage and job opportunities as well.

AI shock is real and is going to be a 2024 corporate site location trend.

## Metro areas with high-skilled workers exposed to AI shocks




**Source**: Lightcast; "The Future of Employment," by Carl Benedikt Frey and Michael Osborne, Oxford Martin School working paper, 2017; "The Impact of Artificial Intelligence on the Labor Market, by Micheal Webb, Stanford University dissertation, 2020; "How will Language Modelers like ChatGPT Affect Occupations and Industries," by Edward W. Felton, Manav Raj and Robert Seamans, available at SSRN, 2023; Authors' calculations.

The caveat of this prediction is that while higher-skilled cities, on average, tend to be more exposed to AI shocks, the few elite cities with the highest concentration of highest-skilled workers are likely home to most of the workers whose productivity will be augmented by rather than displaced by AI advancement. The Brookings Institution suggested in a 2021 analysis what looks like a "winner-takes-most" outcome as cities compete for AI dominance.

An outgrowth of the AI explosion is the development of data centers. Cloud infrastructure will be essential for deploying generative AI while managing costs and carbon emissions. Data centers will need retrofitting. New chipset architectures hardware innovations, and efficient algorithms will also play a critical role according to Accenture. Spending in the global AI infrastructure market is expected to grow at a compound annual rate of 44% over the next six years, according to Data Bridge Market Research. AI Data Centers use more electricity to run their servers than conventional data centers.

AI will have a major impact on corporate site location projects in 2024 to roll back existing and future office-related expansion projects but also to drive substantial data center development.

# ENDNOTES

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