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Forging the Future: Manufacturing Growth and Its Effects on North American Industrial Markets

By Lisa DeNight and Elizabeth Berthelette

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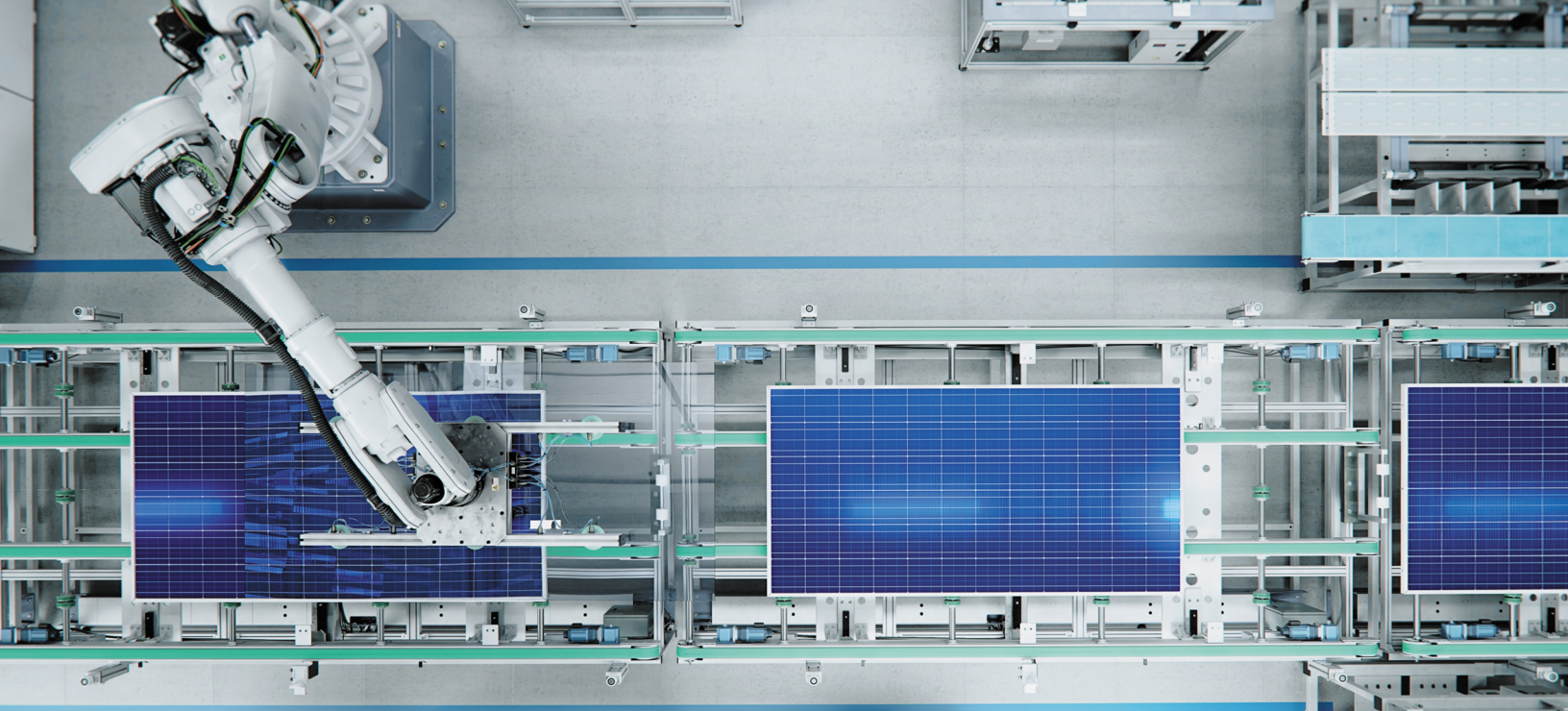
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Executive Summary

The recent experience of pandemic-related supply chain disruptions and continued trade tensions between China and the United States have made just-in-time logistics and sprawling global supply chains less attractive to manufacturers than they once were. Coinciding with this shift, the U.S. federal government has created large new incentives for industries associated with electrification, green energy and strategically important technologies to locate new manufacturing facilities in the U.S. and is investing in infrastructure that will support an expansion of the nation's industrial capacity. Manufacturers have responded to these incentives by announcing investments in new plants nationwide, reshaping the market for industrial real estate as manufacturing construction accelerates and the pace of new warehousing and distribution projects slows. At the same time, firms are also investing in new manufacturing facilities in Mexico and Canada to increase the speed and reliability of their supply chains.

The NAIOP Research Foundation commissioned this report to examine the trends behind reshoring and nearshoring and to evaluate how related investments in manufacturing are affecting North American markets for industrial real estate and its two largest components: warehousing/logistics space and manufacturing space. The study draws from secondary sources, Newmark market data and interviews with commercial real estate professionals to identify major new manufacturing announcements, quantify related construction activity and evaluate effects on adjacent real estate markets. Findings from this report include:

- Firms in the high-tech, automotive, energy and biomanufacturing sectors are making the largest investments in new manufacturing in the U.S. New construction is expected to expand the footprint of U.S. manufacturing space by 6 to 13 percent over the next ten years.
- New manufacturing plants have been announced in every U.S. state, but investment has been concentrated in Midwestern and Southeastern states. Most new construction is expected to be in secondary or tertiary market locations that can offer adequate supplies of affordable energy and skilled labor.
- Most of the new manufacturing construction will be build-to-suit or owner-built, but demand will also exist for speculative manufacturing space. The expansion of domestic manufacturing is also expected to generate demand for logistics space and other types of commercial real estate in the communities surrounding new plants. The amount of additional demand generated by this construction will vary depending on a project's sector, existing supply chains and local market dynamics.
- Several of the trends driving onshoring in the U.S. are also contributing to nearshoring of manufacturing to Mexico and Canada, with Mexico attracting the most nearshoring investment. This investment is generating demand for logistics and complementary manufacturing facilities along the U.S. border with Mexico, pushing down vacancy rates and spurring new construction near key border crossings such as Laredo, Texas.

Introduction

Since the beginning of the twenty-first century, e-commerce has caused a major shift in the North American industrial market, affecting the type, volume and location of warehousing and logistics space needed to support changing consumer habits. Of the approximately 11.0 billion square feet of warehousing/logistics space in the U.S., 25 percent was constructed in just the last decade.¹ The industrial market is poised to again benefit from another engine of secular growth: the manufacturing sector.

In 2023, Newmark Research conducted a study that found that the expansion of manufacturing capacity has led to unprecedented growth in manufacturing real estate development. Since 2020, over 300 major manufacturing facility announcements have been made across North America, representing approximately \$400 billion in pledged project investment, at least 210,000 new proposed jobs, and a minimum of 250 million square feet of new development over the next decade.²

This growth is occurring across a range of industries, but innovative, future-oriented segments of the manufacturing industry have emerged as the focus of new investment. Four advanced manufacturing sectors have captured over 90 percent of the major investments pledged since 2020. All four sectors have been incentivized through recent legislation to expand their presence in the U.S. and partner countries. The sectors currently experiencing growth and demand are:



High-tech/Digitalization: This includes the production of chips, semiconductors, sensors, devices, satellites and more.



Automotive/Transportation: This includes the production of vehicles and their components, with a focus on electric vehicles (EVs), batteries, charging infrastructure and fuel cells.



Energy: This includes the production of green energy and transmission solutions, such as batteries, solar panels and wind turbines.



Biomanufacturing: This includes the production of pharmaceuticals, food ingredients, fuel enzymes, cosmeceuticals and more.

The most significant impacts on North American manufacturing will come from the high-tech/digitalization and automotive/transportation sectors, which represent the greatest volume of new projects and proposed jobs and the largest average manufacturing project size as measured in square feet. Automotive projects are also often the largest contributors to warehousing and logistics demand.

While this is a watershed moment for the domestic manufacturing sector, with impacts already visible across North American industrial markets, it faces significant challenges because business models and technologies are in constant evolution. Additionally, the strategies of governments, corporations, investors and developers are subject to the vicissitudes of the global economy, labor markets, access to capital, and the constraints of power and land availability. Not every project announced will come to fruition, but many will.

This report, sponsored by the NAIOP Research Foundation, identifies the sectors spurring manufacturing growth, where growth is occurring, and why. It also examines how this activity is affecting demand for commercial real estate and explores the challenges and risks associated with reconfiguring supply chains.

Manufacturing's (Re)Ascendancy: Why Now?

From the invention of the modern intermodal shipping container in the 1950s to the implementation of the North American Free Trade Agreement in the 1990s and China entering the World Trade Organization with subsequent U.S. trade policy changes in the early 2000s, the pursuit of low-cost, scalable consumer goods production, combined with a transformative revolution in technology and automation, has shaped more than half a century of globalizing supply chains. The collective impact is visible in approximately 71,000 fewer U.S. manufacturing facilities in 2020 than in 2000 due to offshoring, technological advancement and consolidation.³ In the years leading up to the pandemic in 2020, trade tensions between the U.S. and China, plus the rising costs of Chinese labor, were already creating headwinds for the status quo in global production. The ensuing two years of unprecedented upheaval associated with COVID-19 revealed the fragility of the global supply chain. Geopolitical tensions, natural disasters, climate concerns and a general increase in instability have further aligned U.S. economic aims with national security goals.

The shifting landscape has led to a resurgence of government-led industrial policy and an effort to realign supply chains to favor the U.S. and its partners, particularly North American and South American nations. Many private-sector firms are increasingly considering a “make where you sell” strategy and acting to bring production closer to consumption through reshoring, nearshoring/near sourcing, foreign direct investment and domestic expansion. Additionally, federal legislation is supporting public and private strategy by funneling billions of dollars into building manufacturing facilities through direct spending and tax incentives, with a limited horizon on when corporations can claim the largest financial benefits. This has prompted a proliferation of manufacturing announcements in the past few years. These are likely to peak within the next few years due to the long timelines required to complete such large-scale projects.

TABLE 1

Mega Deals in Key Sectors, 2020 – Midyear 2023



Intel
NEW ALBANY, OH

Investment: \$20.0 B
Planned Industrial SF: 2.5 MSF
Announced Jobs: 3,000

Intel could invest up to \$100B in Ohio to build the world’s largest chip-making complex. This initial \$20B investment—the largest in Ohio’s history—is in addition to another \$20B project in Arizona and a \$3.5B project in New Mexico as well as a recently opened \$3B expansion in Oregon.



TSMC
PHOENIX, AZ

Investment: \$40.0 B
Planned Industrial SF: 5.0 MSF
Announced Jobs: 4,500

TSMC is building two fabrication plants to manufacture 3-nanometer chips, the most advanced currently in production.



Micron
CLAY, NY

Investment: \$20.0 B
Planned Industrial SF: 2.4 MSF
Announced Jobs: 9,000

Micron will manufacture memory chips for digital electronics at this plant, announced following a \$15B investment into a fabrication plant in Boise, ID.



Ford Motor Co. & SK Innovation
HARDIN COUNTY, KY & STANTON, TN

Investment: \$11.4 B
Planned Industrial SF: 3.4 MSF
Announced Jobs: 11,000

This joint venture will produce the largest EV battery production complex in the U.S. with annual production capacity at 129 GWh. Ford has also announced major investments in Michigan and Ontario, Canada.



Hyundai
BLACK CREEK, GA

Investment: \$5.5 B
Planned Industrial SF: 17.0 MSF
Announced Jobs: 8,100

This will be Hyundai’s first EV plant in the U.S., producing both EVs and batteries. This is a critical part of Hyundai’s effort to launch 11 new electric models by 2030.



LG Energy Solution
QUEEN CREEK, AZ

Investment: \$5.5 B
Planned Industrial SF: 4.0 MSF
Announced Jobs: 5,600

This investment will create two battery facilities, one to manufacture EV batteries and another to produce lithium iron phosphate, or LFP, batteries for energy storage systems.



Qcells
CARTERSVILLE, GA

Investment: \$2.4 B
Planned Industrial SF: 0.6 MSF
Announced Jobs: 2,030

Qcells is expanding its solar module manufacturing operations in Georgia, building a new facility in Cartersville and adding a third facility to its Dalton location.



Enel
INOLA, OK

Investment: \$1 B
Planned Industrial SF: 2.0 MSF
Announced Jobs: 1,400

The Italian green energy company will manufacture solar cells and panels at this planned facility, which is the largest economic development project in Oklahoma history.



Invenergy & LONGi
PATASKALA, OH

Investment: \$600 M
Planned Industrial SF: 1.1 MSF
Announced Jobs: 850

This planned solar panel production facility will produce up to 5 GW of solar module capacity per year, capable of powering nearly one million American homes.



Eli Lilly
LEBANON, IN

Investment: \$3.7 B
Planned Industrial SF: 1.0 MSF+
Announced Jobs: 700

Multiple facilities planned in this investment will expand manufacturing capacity for active ingredients and new therapeutic modalities like genetic medicines.



Fujifilm Dyosynth
HOLLY SPRINGS, NC

Investment: \$2.0 B
Planned Industrial SF: 0.8 MSF
Announced Jobs: 725

This new facility will be the largest cell culture biopharmaceutical CDMO facility in the U.S. and will offer manufacturing of bulk drug substance production.



Agilent
DENVER, CO

Investment: \$725 M
Planned Industrial SF: 0.2 MSF
Announced Jobs: 160

This investment will double manufacturing capacity of therapeutic nucleic acids through expanding an existing manufacturing facility in Colorado.



High-Tech/Digitalization



Automotive/Transportation



Energy

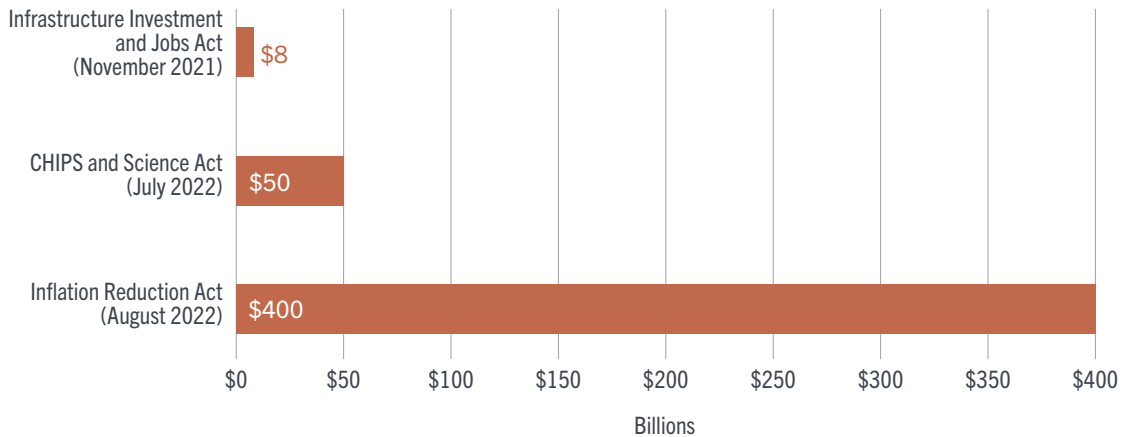


Biomanufacturing

The Incentives Spurring Manufacturing Construction

The Infrastructure Investment and Jobs Act (IIJA) signed in November 2021, the Inflation Reduction Act of 2022 (IRA), and the CHIPS and Science Act signed in the summer of 2022 have made available a half a trillion dollars through federal funding and tax credits to attract, grow and support key sectors of manufacturing in the U.S. These acts include significant provisions for materials to be sourced and produced in the U.S. and partner countries for firms to receive the maximum possible incentives. Collectively, discretionary spending associated with these three acts is expected to accelerate over the next few years, peaking in 2026 when many of the identified projects will either be coming online or under construction.⁴

FIGURE 1: Recent Federal Financial Incentives for Manufacturing



Source: McKinsey, The White House. Estimates may vary.

The largest source of incentives for manufacturing comes from the IRA and is designed to support the U.S. achieving its 2030 target of reducing greenhouse gas emissions 50-52 percent below 2005 levels⁵ by rapidly expanding the deployment of cleaner technologies like EVs. Nearly \$400 billion via the IRA will spur production and adoption of clean energy initiatives, with electricity and transmission commanding the biggest slice of spending, followed by clean transportation, including EV tax incentives for consumers and corporations.

Approximately \$50 billion is flowing to semiconductor manufacturing, research and development (R&D) and workforce investment. The investment includes \$39 billion in direct manufacturing incentives, including \$2 billion for legacy chips used in automobiles and defense systems—notable because the automobile sector recently experienced high-profile chip shortages.

The IIJA, a roughly \$1.2 trillion piece of legislation, has some specific subsidies for manufacturing that supports new infrastructure, particularly in the EV/energy space. However, the act's greater significance for manufacturing resides in its investments in infrastructure, as they will support an increase in domestic industrial capacity and supply chain efficiency by improving hard infrastructure (physical transportation networks such as roads, rail, ports and waterways, airports and public transit) and water, power and internet infrastructure, among other initiatives.

In addition to these three acts, various other federal funding opportunities have been announced to provide subsidies to critical manufacturing sectors. For instance, a \$2 billion executive order was signed in September 2022 to enhance and expand domestic biomanufacturing production capacity and innovation.



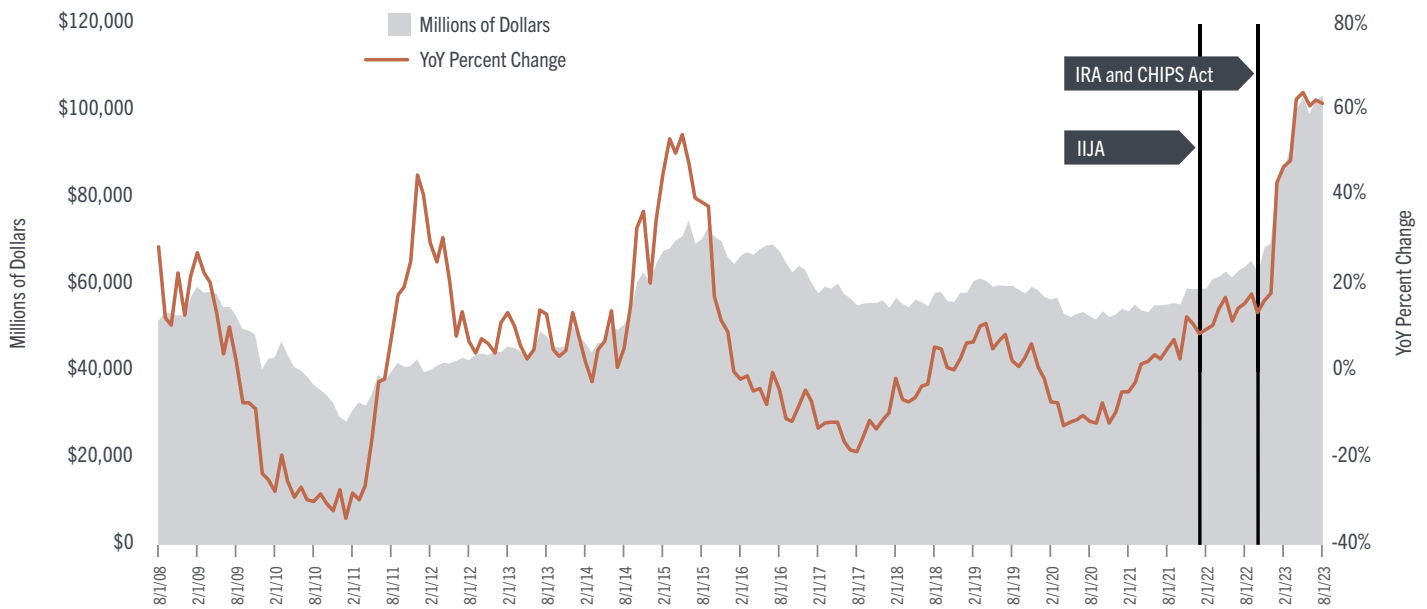
While estimates vary, tax credits and direct federal spending from the IRA, IIJA and CHIPS Act are predicted to furnish, at minimum, 15 percent of costs for some manufacturing projects.⁶ These costs go beyond construction expenses and include outlays for equipment, infrastructure and intellectual property. Some companies will choose to pursue a greater balance of private capital versus public funding for various reasons including regulation, speed to market and overall strategy.

In addition to federal financial support, billions of dollars of state and local incentives have been awarded to major manufacturing projects. State-level incentive packages have bolstered numerous mega-investments: Georgia awarded Hyundai Motor Group \$1.8 billion in benefits;⁷ South Carolina awarded Volkswagen-backed Scout Motors \$1.3 billion;⁸ and North Carolina awarded VinFast \$1.2 billion;⁹ all for EV manufacturing, and all the largest incentive packages ever awarded by their respective states. Among the largest state incentive packages disclosed was \$5.5 billion, awarded to Micron for its \$20 billion semiconductor facility in upstate New York, which helped Micron choose New York over Texas for the project.¹⁰ In Texas, Samsung's \$17 billion semiconductor factory announcement is the largest foreign direct investment in the state's history. The amount of state and local incentives awarded also broke records.¹¹

While megaprojects and smaller-scale manufacturing projects uniformly have some component of federal and state incentives, they do not happen without private capital investment. To put capital expenditures into context, the CHIPS Act is funneling \$50 billion into the semiconductor sector—approximately the same amount that 15 leading U.S. firms in the semiconductor sector spent collectively on capital expenditures in 2022 alone.¹²

The effect of government incentives on manufacturing investment is visible in real private manufacturing construction spending, which grew at an annualized rate of 62 percent in August 2023, after having eclipsed \$100 billion for the first time ever in April 2023. Within U.S. manufacturing construction spending, the computer/electronic/electrical subsector has emerged as the dominant player, boasting the largest investment of any sector on a per project basis. The subsector's share of overall manufacturing construction spending surged to 56 percent by August 2023, a remarkable increase from the 10 percent share observed in 2019. Notably, since 2020 and especially since the enactment of the CHIPS Act, over 50 new or expansionary semiconductor projects have been announced, with 18 currently underway. The automotive/transportation sector has seen approximately twice as many announcements as the semiconductor sector over the same period, although the average investment per project is lower.

FIGURE 2: U.S. Total Private Manufacturing Construction Spending



Source: St. Louis Federal Reserve, U.S. Census Bureau, U.S. Bureau of Labor Statistics

Note: Seasonally adjusted annualized rate of construction spending deflated by New Industrial Building Construction PPI

To contextualize this soaring growth, international data revealed no similar sustained growth pattern in manufacturing construction spending in developed economies outside North America such as Japan, Germany, Australia and the U.K.;¹³ however, many countries are introducing new subsidies for their own manufacturing sectors, especially to address vulnerabilities in semiconductor supply chains in the face of a more adversarial China and regional competitiveness. For example, in 2023, the European Union unveiled the European Chips Act, a 43-billion-euro package of public and private investments that aims to secure its supply chains.

Spotlight on the Automotive/ Transportation and High-Tech/ Digitalization Sectors

The automotive/transportation and high-tech/digitalization sectors are attracting the most manufacturing investment and have unique and complementary drivers that will propel further manufacturing growth. However, both also face challenges to realizing that growth.

To fund capital-intensive projects in the U.S., private firms are adopting a growing variety of funding models. For example, Intel entered a partnership with the infrastructure affiliate of Brookfield Asset Management to jointly invest up to \$30 billion in the announced manufacturing expansion at Intel’s Ocotillo campus in Chandler, Arizona, with Intel funding 51 percent and Brookfield funding 49 percent of the total project cost. Companies can also access a range of funding options, such as venture capital or sovereign wealth funds, to finance smaller-scale investments in R&D, pilot plants and production facilities. They may also seek to engage with real estate investment firms as a pathway to secure the necessary space and equipment for new manufacturing plants without the trade-off of equity ownership dilution typical with venture capital and private equity sources of capital.

The Evolving EV Supply Chain is Driving the Automotive/Transportation Sector

Since Tesla announced in 2006 that it would produce an all-electric car, continuous improvement in battery technology and reduced costs, combined with rising gasoline prices and environmental concerns, have significantly increased the appeal of electric cars for consumers.¹⁴ Federal and state regulations and the attractive financial incentives to build now are pushing new EV-related projects forward. The federal government aims to have 50 percent of all new vehicle sales be zero emission by 2030.¹⁵ California's Advanced Clean Cars II rule is demanding even more, requiring all new cars and light trucks sold in the state to be 100 percent zero-emission vehicles by 2035. IRA tax credits start to phase down in 2030, with program termination at the end of 2032. General Motors reported the potential tax benefits from the production of EVs to be \$3,500 to \$5,500 per vehicle produced, which is a powerful financial carrot to get production facilities up and running as soon as possible.¹⁶

While this sector is contributing the most to manufacturing's expansion in terms of the number of announcements and jobs and promises to generate the most additional industrial demand, its future over the next decade is in flux. It faces rival technologies (and the possibility of disruptive emergent technologies), raw-material constraints and a potential for oversupply in relation to demand. EV sales are growing, capturing 8.9 percent of 3Q 2023 auto sales, up from 6.2 percent in 3Q 2022. There is a long runway ahead to reach certain federal and state goals, and it is unclear if consumer demand will rise quickly enough to meet both targeted mandates and increasing production from numerous auto manufacturers with megaprojects currently underway. Sales forecasts vary, perhaps most so in adoption rates across the U.S., with those states more aggressively offering incentives and building infrastructure to support EVs forecasting much higher projections. For example, California's forecast is for EVs to capture 94 percent of the state's new auto market by 2035.¹⁷

The Evolving Semiconductor Supply Chain is Driving the High-Tech/Digitalization Sector

Over the past few decades, the U.S. has shifted from producing semiconductors domestically to focusing primarily on R&D, with firms outsourcing their manufacturing offshore.¹⁸ Two companies, TSMC and Samsung, produce nearly 100 percent of the global supply of advanced chips, with most of the production occurring in Taiwan, raising concerns about the security of the semiconductor supply chain. Considering China's growing military and economic power, the U.S. is seeking to reinvigorate its domestic production of semiconductors and redirect supply chains to allied global partners. Chips have also become more specialized as they are integrated into a broader variety of manufactured goods. According to the World Intellectual Property Organization, approximately 70,000 global semiconductor patents were filed in 2022, up 59 percent from five years ago. The growing complexity of and demand for artificial intelligence (AI) applications are set to encourage further semiconductor customization and heighten security concerns around preserving intellectual property.

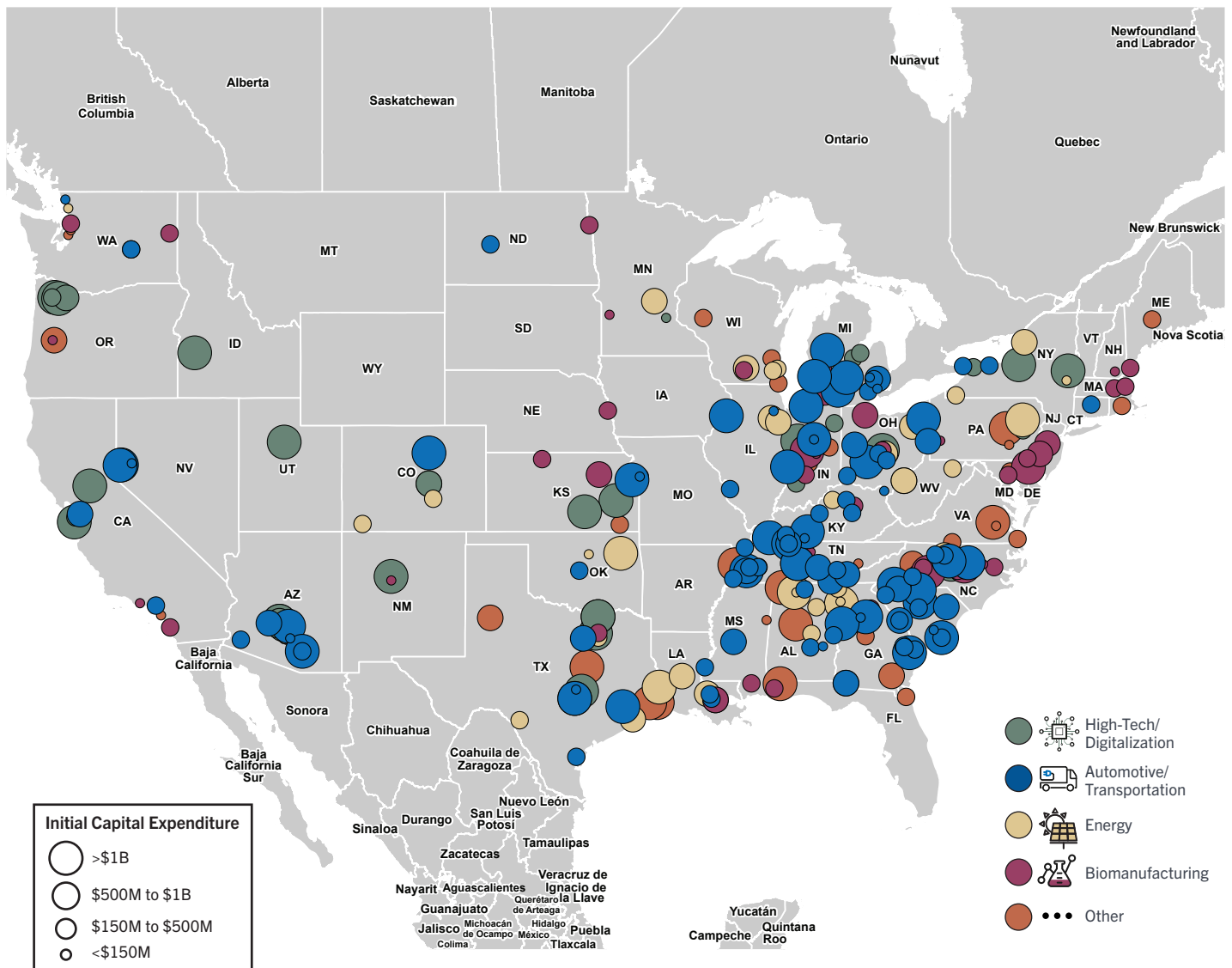
These trends are encouraging growth in planned semiconductor fabrication plant construction in the U.S. among large semiconductor firms. Additionally, some smaller specialized semiconductor firms do not sell enough chips for their orders to be prioritized by international contract manufacturers and are therefore compelled to find their own production space in the U.S. In September 2023, the White House announced \$500 million in CHIPS Act funds were being directly earmarked for semiconductor manufacturing projects that require less than \$300 million in capital expenditures to encourage smaller-scale projects such as these.

The availability of skilled labor is a significant limiting factor for new semiconductor fabrication plant construction. Plants need workers with advanced technical skills to train new recruits, and manufacturing construction projects must compete with others for a limited supply of construction workers. Labor shortages have resulted in some high-profile delays, such as for the construction and staffing of TSMC's Arizona semiconductor plant. In addition to these challenges, unforeseen technological advances could make some facilities obsolete before they produce a return on investment.

Locational Considerations for New Manufacturing Construction

What Are the Top Growth Markets?

FIGURE 3: U.S. Major Manufacturing Announcements, 2020-Midyear 2023





















Source: Newmark Research, Various press and media sources

Expansion in the manufacturing sector promises to deliver significant economic benefits to the localities that host new plants and to surrounding areas in the form of added jobs, infrastructure improvements and substantial capital investments. New manufacturing clusters are forming and existing clusters are expanding as a record number of new projects are either underway or set to break ground in the next decade.

Major manufacturing announcements over the past three years reveal that nearly every U.S. state has been a beneficiary of this growth, with a plurality of projects located in Midwestern and Southeastern states. The regions poised to benefit most from advanced manufacturing employment projections, development and attendant economic growth are predominantly secondary and tertiary markets with higher-than-average levels of preexisting advanced manufacturing talent, relatively lower-cost energy supplies and abundant, affordable land.

TABLE 2

Top Growth Markets by Manufacturing Jobs Announced

Markets	# of Jobs Announced	# of Facility Announcements	Market Size	Industrial Construction Pipeline as % of Inventory, 3Q23	Key Sector Manufacturing Labor Pool, July 2023	Industrial Energy Cost (Avg. Cents per Kilowatthour), 2Q23	Driving Sector
Phoenix, AZ MSA	15,466	14	Large Metro	11.8%	74,316	7.67	
Atlanta, GA MSA	12,713	7	Large Metro	3.9%	41,325	7.01	
Austin, TX MSA	11,465	6	Large Metro	13.5%	43,209	6.74	 
Raleigh, NC MSA	8,580	3	Large Metro	6.1%	16,205	6.88	 
Detroit, MI MSA	6,462	6	Large Metro	1.2%	131,427	8.29	
Syracuse, NY MSA	9,000	1	Mid-Sized Metro	0.0%	11,020	6.65	
Columbia, SC MSA	4,300	2	Mid-Sized Metro	3.1%	8,286	6.79	
Albany, NY MSA	2,633	2	Mid-Sized Metro	0.8%	12,317	6.65	 
Greensboro, NC MSA	2,520	4	Mid-Sized Metro	1.9%	9,912	6.88	
Charleston, SC MSA	2,075	3	Mid-Sized Metro	10.8%	17,801	6.79	
Savannah, GA MSA	8,840	2	Small Metro/Micro	13.9%	10,761	7.01	
Brownsville, TN Metropolitan Area	7,490	3	Small Metro/Micro	0.0%	158	6.41	
Reno, NV MSA	5,600	3	Small Metro/Micro	5.6%	14,874	11.82	
Elizabethtown, KY MSA	5,120	2	Small Metro/Micro	9.9%	3,007	6.36	
Sherman, TX MSA	4,500	2	Small Metro/Micro	61.1%	2,042	6.74	

Sources: JobsEQ, Moody's Analytics, U.S. Energy Information Administration, Newmark Research
Industrial energy cost averages quoted on statewide basis.





 High-Tech/Digitalization  Automotive/Transportation  Energy  Biomanufacturing

Table 2 lists the five large, mid-sized and small markets that are expected to create the most jobs from new manufacturing projects. These 15 markets collectively represent nearly 50 percent of the manufacturing jobs announced in recent years. Large, relatively low-cost metropolitan areas such as Atlanta; Raleigh, North Carolina; and Detroit are ranked among the top markets for projected job growth, garnering 14 major facilities announcements since 2020 with a potential for close to 28,000 new jobs. Despite their slightly higher business costs, manufacturers have also targeted Phoenix and Austin, Texas, for new projects due to their skilled labor forces, favorable business climates, abundant and affordable power, and development opportunities. The tenth-largest metropolitan area in the U.S., Phoenix has attracted 14 major project announcements—the most of any single market examined. The projects are expected to generate close to 15,500 additional advanced manufacturing jobs for the metropolitan area.

Mid-sized markets such as Syracuse and Albany, New York; Greensboro, North Carolina; and Columbia, South Carolina, offer greater cost savings for manufacturing operators while still supplying the skilled workforce needed for manufacturing. Twelve new manufacturing sites, with the potential to create up to 21,000 additional jobs focused in the automotive/transportation and high-tech/digitalization sectors, have been proposed within the top five mid-sized markets. Micron’s proposed semiconductor complex is slated to bring up to 9,000 new jobs to the Syracuse region alone, with tens of thousands of additional jobs anticipated from suppliers co-locating near the proposed facility.

Based on recent announcements, the smallest markets, including Brownsville, Tennessee; Elizabethtown-Fort Knox, Kentucky; and Sherman-Denison, Texas, are all slated for new facilities with thousands of job openings in the coming years. Individually, each of these five markets’ projected employment gains will surpass all but one of the top mid-sized markets, suggesting that these new facilities have the potential to disproportionately impact smaller economies. Savannah, Georgia, and Reno, Nevada, also stand out. While they are geographically small, both are well-established U.S. logistics hubs with extensive industrial infrastructure and real estate. New manufacturing users will also benefit from comparatively deeper talent pools in these two markets.

Manufacturing Locational Strategies and Labor Needs

While the top growth markets demonstrate the forecasted impact of mega-investments, the manufacturing narrative is not all about gigafactories. Among projects with a minimum expected investment of \$100 million, the average project is 1.45 million square feet in size, but over the last three years, the average amount of manufacturing space rented per lease has been approximately 45,000 square feet, with space, labor and locational requirements varying substantially between different industries.¹⁹

In general, manufacturing users operate within three distinct types of facilities:



Highly innovative, young companies with growing talent and small-scale manufacturing needs navigate toward R&D sites with small footprints. These users tend to concentrate in high-barrier-to-entry markets that may carry higher costs due to their proximity to specific talent, educational institutions and economies that support innovation. Initial capital investments are usually less substantial than for the mega-facilities that have recently been announced. Boston, the Bay Area and Raleigh (Research Triangle Park) are examples of markets benefiting from a growing number of these types of operations.



As these startups mature, many will move on to a “pilot plant” facility, which maintains proximity to an initial R&D site and provides manufacturers with the space needed to execute a proof of concept on a smaller scale. The location strategy for companies entering this next phase of growth is likely very similar to companies in earlier stages.



Once manufacturers reach commoditization, their operations will move into plants designed for mass production, which range from mid-sized factories to gigafactories and other large-scale production facilities. At this point, the need for significant cost savings while maintaining access to abundant, inexpensive, reliable power and a deep labor pool becomes critical for users to be competitive. Locations with affordable land, lower construction costs, favorable tax structures and generous incentives become attractive choices. Accordingly, areas in Southern and Midwestern states with large swaths of available land have attracted a significant amount of proposed capital investment from the manufacturing sector.

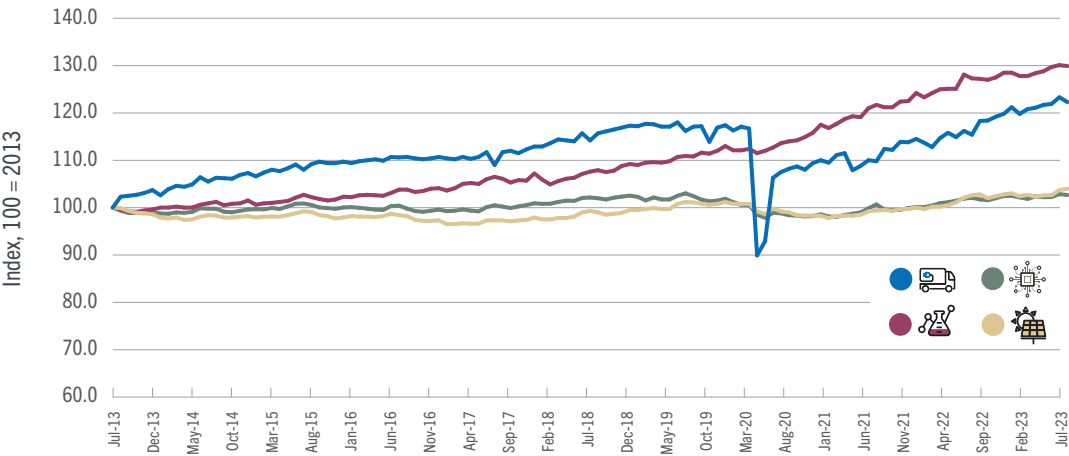
Given the level of investments announced since 2020, the four key manufacturing sectors noted earlier (high-tech, automotive, biomanufacturing, energy) should expect stronger labor growth in the coming years as proposed projects become reality and facilities commence production. Manufacturers have pledged 210,000-plus new jobs since 2020, representing 1.7 percent of total manufacturing and 5.4 percent of key-sector manufacturing employment in the U.S. Nearly 80 percent of estimated job gains are related to the automotive/transportation or high-tech/digitalization sectors, which will make the need for more skilled labor most acute in those sectors. These forecasts do not include construction workers, who would contribute incremental demand for commercial real estate while projects are under construction. Nor do the forecasted job figures include the job multiplier effect, which will occur as other businesses expand in the region to support the projects, growing populations, or both. The Semiconductor Industry Association has estimated a job multiplier of 6.7x for new semiconductor facilities, meaning 5.7 incremental jobs for each new job created.²⁰ Motor vehicle manufacturing has been estimated to have a multiplier of 4.1x, with Ford estimating a slightly higher 4.38x for its BlueOval (EV) Battery Park in Michigan.²¹

Where Is the Existing Workforce Concentrated?



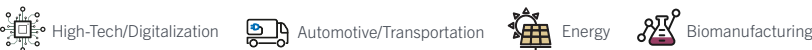
Access to a skilled workforce is often the most critical factor for manufacturing users, alongside the need for sufficient power. In the U.S., the manufacturing workforce measured approximately 13 million employed as of July 2023, with the four key sectors identified in this report accounting for over 30 percent of all manufacturing jobs. Following a nearly 12 percent decline—equating to roughly 450,000 jobs—during the pandemic, key-sector manufacturing payrolls have increased by more than 600,000 jobs since bottoming out in 2020. Employment levels are now 4.1 percent above the year-end 2019 peak. The cumulative 18.2 percent employment growth in key sectors through mid-2023 has outpaced overall manufacturing job growth, which has increased 13.7 percent since the pandemic low.

FIGURE 4: Historical Employment by Key Manufacturing Sector



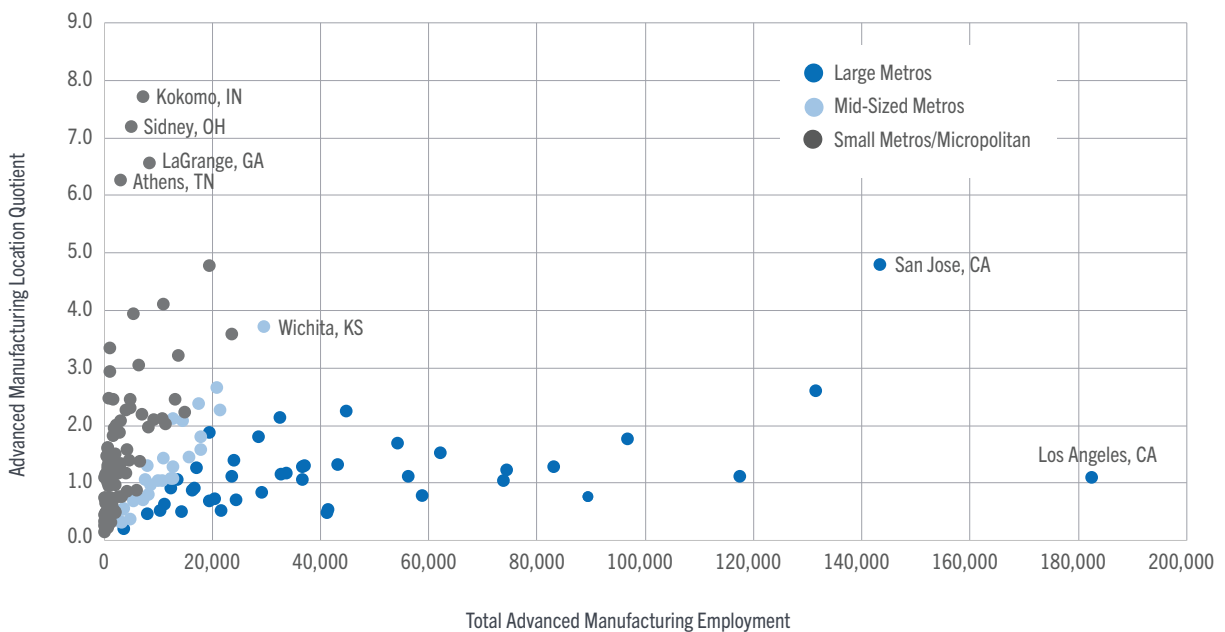
Sources: Moody’s Analytics, BLS, Newmark Research

Sources: Newmark Research, Moody’s Analytics. Indexed to 2013. NAICS codes for employment in the key sectors were determined as follows: Automotive/Transportation (Transportation equipment manufacturing [336]); High-tech/Digitalization (Computer and electronic product manufacturing [334]) Biomanufacturing (Pharmaceuticals and medicines [3254]) and Energy (Electrical equipment [3353], Other electrical equipment and components [3359], and Power generation and supply [2211]).



A discernible pattern has emerged regarding existing key-sector manufacturing employment levels among markets in which projects have been announced. Larger metropolitan areas generally have nominally larger workforces and more diverse economies. In comparison, smaller metropolitan and micropolitan areas exhibit greater comparative labor concentrations in key industries such as automotive/transportation manufacturing and biomanufacturing, as evidenced by the lower total employment pool combined with above-average location quotients (LQ).²² More than half of the markets slated for future operations already possess high concentrations of the necessary labor force, with 90 metropolitan and micropolitan areas having key-sector location quotients above 1.0.

FIGURE 5: Key-Sector Manufacturing Employment and Location Quotient by Market Size



Markets With Announced Manufacturing Projects

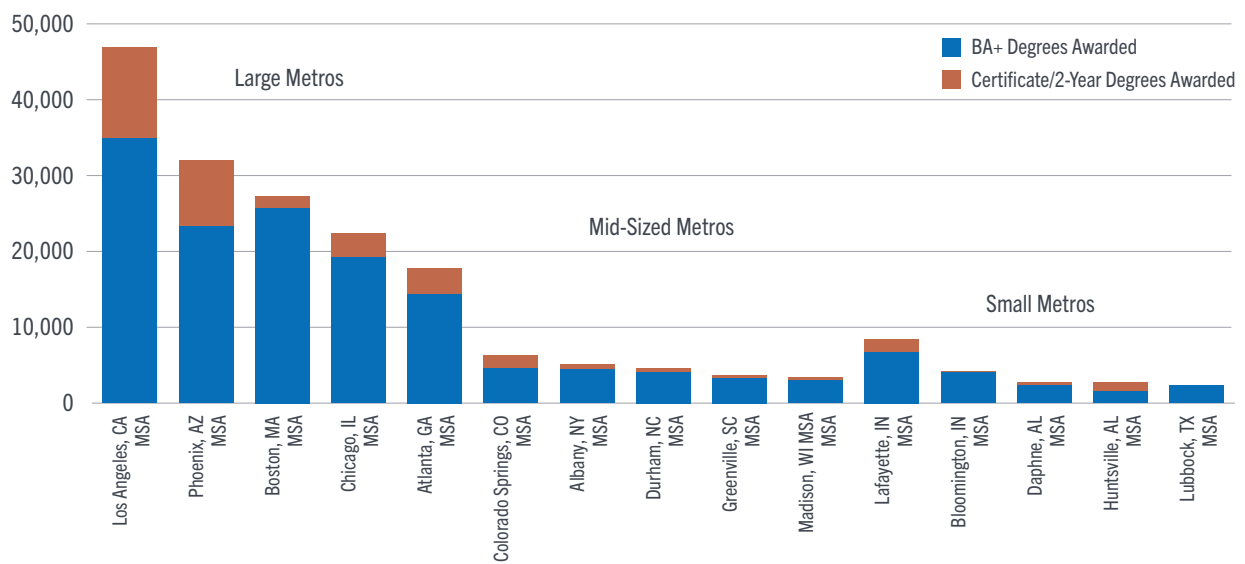
Sources: JobsEQ, Newmark Research

Greater Kokomo, Indiana (LQ of 7.7), and the Sidney, Ohio, micropolitan area (LQ of 7.2) are home to some of the highest concentrations of jobs within the markets examined, largely due to the existing clustering of several major automotive/transportation, food, raw material and plastics manufacturing operations. Based on recent announcements, three EV battery manufacturers are expected to bring up to 1,000 new jobs to each of these markets in the coming years. Among the largest markets, San Jose, which boasts one of the most innovative economies in the world, and Detroit, a bastion of automotive production, rank as key employment hubs based on their LQ. In the Motor City, EV battery production is set to expand by several thousand jobs from companies such as Ford, General Motors and Lear.

In many cases, however, demand for labor will exceed supply. It is worth noting that the key-sector manufacturing labor pools in Brownsville and Sherman-Denison are relatively constrained, which may limit new plants' ability to attract and retain talent. Firms may experience significant wage pressure or need to draw employees from farther away or both. According to a recent report from the Center for Manufacturing Research,²³ existing manufacturers in rural areas identified difficulty attracting new employees to the area as the top labor force challenge. However, many rural manufacturing respondents noted that the cost-of-living advantage is enticing to potential employees. These firms are more likely to offer incentives, including sign-on bonuses and paid relocation expenses, to attract new talent. Manufacturers can also adapt to talent scarcity by increasing their investment in automation technologies that boost productivity per worker.

Manufacturing ecosystems depend on a robust pipeline of highly skilled talent and the ability to capitalize on innovations and R&D taking place at universities, colleges and trade schools. Markets with robust higher education systems provide a recruitment pipeline for advanced manufacturing. While many of the top occupations associated with key-sector manufacturing require an advanced degree, certificates and training programs are becoming increasingly more common to help fill the skills gap in these industries.

FIGURE 6: Postsecondary Credentials Awarded in Key Manufacturing Occupations by Market Size, 2021



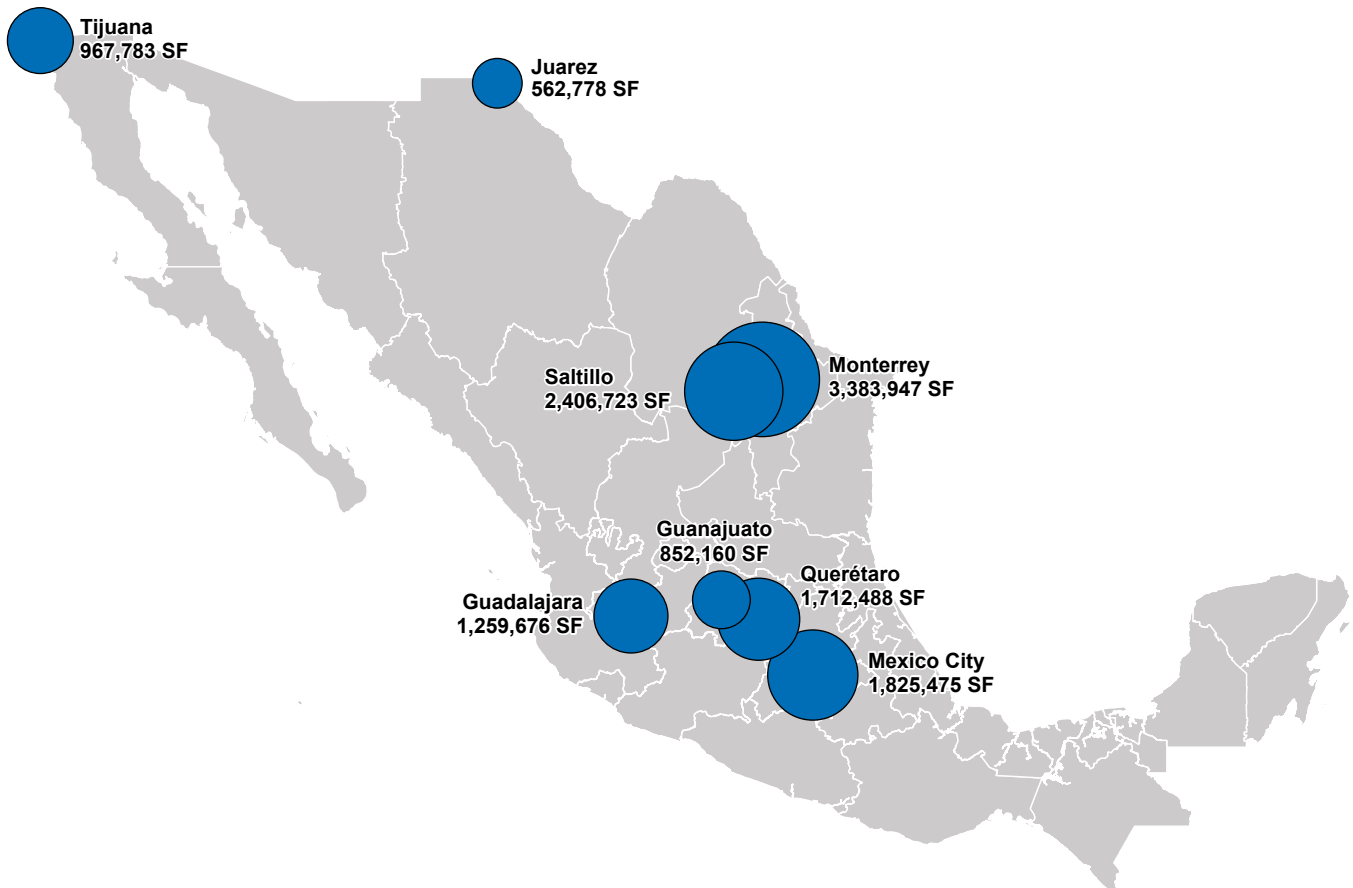
Sources: JobsEQ, National Center for Education Statistics IPEDS Data Collection System, Newmark Research. The authors identified top occupations in key-sector manufacturing by analyzing real-time job postings by key manufacturers in the surveyed announcements and comparing the occupations to analogous degrees awarded. Top occupations in key-sector manufacturing include the following: computer and information systems managers, and all other computer occupations; architectural and engineering managers; electrical, industrial and mechanical engineers; management analysts; network and computer systems administrators; software developers; industrial engineering technologists and technicians; first-line supervisors of production and operating workers. Undergraduate degrees and certificates in fields such as business administration and management, computer science, mechanical engineering, and information technology account for a large share of awards related to these top occupations.

Sourcing talent globally will also be critical in relation to attracting labor with specialty skill sets (as in certain semiconductor production processes). Immigrants account for about 40 percent of highly skilled workers in America's semiconductor industry.²⁴

A Note on Nearshoring

This report has predominantly focused on manufacturing growth in the U.S., but Canada and Mexico are integral partners in North American manufacturing. Both are experiencing dynamic nearshoring activity and foreign direct investment in manufacturing projects, especially to benefit from the United States-Mexico-Canada Agreement (USMCA), which was ratified in 2020 and replaced the North American Free Trade Agreement. The agreement supports the trilateral goal of a more integrated North American supply chain by incentivizing greater sourcing and production in North America (and maintaining duty-free flows of products meeting those sourcing requirements), updating logistics and customs procedures to facilitate cross-border trade, and improving intellectual property flows. Already, the impacts of nearshoring are visible and measurable. In Canada, foreign direct investment has been increasing substantially, with annualized investment 36 percent higher in the first quarter of 2023 than the annual average from 2012 to 2019.²⁵ Key-sector manufacturing imports from both Canada and Mexico into the U.S. have accelerated. In the first half of 2023, Mexico outpaced China to become the top advanced manufacturing exporter to the U.S., with imports from China declining 23 percent from the first half of 2022.²⁶

FIGURE 7: Direct Nearshoring Absorption in Key Mexican Markets, 2022



Source: Newmark Mexico Research

Recent industrial real estate market trends corroborate these indicators. An analysis conducted by Newmark Mexico Research determined that during 2022, more than 13 million square feet of manufacturing absorption directly attributable to nearshoring occurred in Mexican industrial markets—a significant portion of overall annual industrial absorption.²⁷ A report from Prologis found that absorption in Mexico indirectly related to nearshoring of manufacturing (i.e., domestic suppliers and third-party logistics providers) grew from 15 million square feet in 2019 to 29 million square feet in 2022, or nearly half of gross industrial absorption.²⁸ This figure is expected to rise even further, with announcements such as Tesla’s \$10 billion gigafactory in Monterrey (announced in 2023). The same Prologis report proposed that every \$1 billion of auto manufacturing investment in Mexico generates 5 million to 10 million square feet of logistics demand in adjacent markets. Announcements regarding new expansion into Mexico, or expansion of preexisting operations, have proliferated from logistics providers such as Redwood Logistics, BlueGrace and DHL. The latter announced a \$556 million investment in Latin America as it seeks to get closer to consumers and provide more sector-specific logistics services to its shipper partners.²⁹

Further increases in exports, absorption and industrial output are likely to accelerate starting in 2025 due to the time required to establish operations and ramp up production in the market. This can be just as, if not more challenging in Mexico as in the U.S., with infrastructure and power constraints limiting project feasibility. Manufacturing development is on the rise in Mexico, but timelines associated with getting projects up and running can be long, and industrial real estate is growing more expensive. Young and skilled labor, a significant advantage for the country, is also becoming more expensive, which will motivate cost-conscious firms to evaluate alternative locations in other countries. Costa Rica, for example, is parlaying a robust medical device manufacturing sector to attract other advanced manufacturing industries, including semiconductor manufacturers.

Nearshoring is also increasing demand for warehousing, logistics and manufacturing real estate in U.S. border towns, particularly along the Mexico-U.S. border, which is the most traversed border in the world, with over 350 million documented crossings every year.³⁰ Traditional U.S. border markets such as El Paso and Laredo, Texas, and San Diego have witnessed expansion in demand and development owing to growth in cross-border trade.³¹ Laredo, which dominates North American border markets but has less of an established population base compared to El Paso or San Diego, has witnessed a boom in international trucking volumes. Almost half of U.S.-Mexico land-based trade goes through Laredo, where loaded trucking traffic through the third quarter of 2023 was up 38.5 percent since 2019. By comparison, in Detroit, the second-most-active North American land port of entry by truck traffic and the most active along the U.S.-Canada border, loaded truck container crossings have increased 10.3 percent over the same period.³² Increased truck traffic is supporting demand growth in Laredo, with 2023 on track to be the market’s second-best year for industrial net absorption, after 2021. A persistent lack of space, visible in an industrial third-quarter vacancy rate of 3 percent, is supporting new development. As of the third quarter of 2023, Laredo’s market of approximately 40 million square feet of industrial space had a construction pipeline equal to 10 percent of its inventory after hitting an all-time high in new development volume earlier in the year.³³ Freight and logistics operators specializing in imports/exports, cold storage, complementary manufacturing where components made in Mexico may move across the border for final assembly, and a variety of other businesses supporting Mexican manufacturing operations are increasingly driving industrial demand in U.S.-Mexico border markets like Laredo.

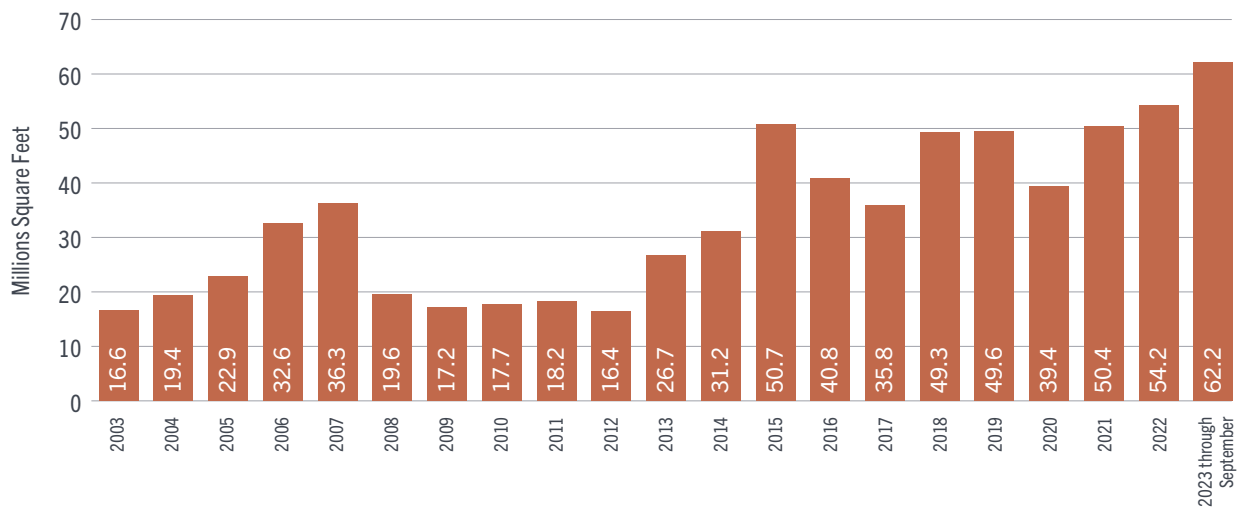
Rapid growth in these traditional U.S. border markets has strained infrastructure and the labor supply, leading to increasing interest in alternative border markets such as Nogales, Arizona, and Eagle Pass, Texas. Proposed industrial parks such as the Puerto Verde Binational Industrial Complex in Eagle Pass, spanning approximately 8 million square feet between the U.S. and Mexico, have the potential to reshape these developing border markets.³⁴

How Manufacturing Is Affecting Demand for Industrial Real Estate

The volume of proposed manufacturing projects has the potential to reshape the U.S. manufacturing base, which currently measures approximately 4 billion square feet.³⁵ Of the approximately 300 major manufacturing projects announced since 2020, just over half have publicly released details about the size of the facility. These collectively represent 250 million square feet in aggregate. Thus, the announced projects could increase the size of the U.S. manufacturing building stock by 6-13 percent in just a decade. These estimates are based on projects with a minimum investment of \$100 million; the impact on the U.S. manufacturing base is likely to be larger after accounting for smaller projects.

Although most of the projects announced over the past three years are planned for completion between now and 2032, fewer than a third have already broken ground, suggesting that the manufacturing development pipeline will continue to grow. At the end of 3Q 2023, manufacturing construction reached 62.2 million square feet, a record high in data going back to 2003, representing 11.5 percent of the total national industrial pipeline (540 million square feet).

FIGURE 8: U.S. Manufacturing Construction Pipeline



Source: Newmark Research, 10,000 square feet minimum and exclusive of flex/R&D product.

This comes as development for many other commercial real estate sectors (including logistics) wanes due to the slowing economy and difficulty in sourcing construction loans, especially for speculative construction. Market participants note that logistics projects increasingly face strong community opposition in some regions, especially in relation to heavy truck traffic. Entitlements and incentives are generally easier to obtain for manufacturing projects, which often yield higher paying jobs and provide a positive future-forward story that communities and local governments seek to tout. But this is not always the case; some megaprojects may face community or regulatory opposition due to environmental or safety concerns. For example, the aforementioned \$2 billion Scout Motors EV plant in South Carolina has faced delays due to concerns from environmental groups and state and federal agencies around wetland conservation, although permitting is moving forward.³⁶

In other cases, a project has the potential to completely reshape an existing population and landscape with little preexisting exposure to commercial development activity, causing community excitement and anxiety alike. The Brownsville, Tennessee, micropolitan area, noted as a top growth market earlier in this report, has attracted media attention for being an example of how mega EV projects are transforming rural Southern towns.³⁷ When Ford's 2.4 million-square-foot BlueOval manufacturing complex is completed and operational in 2025, it is projected to employ 6,000 workers, or more than the micropolitan area's entire existing labor pool in 2023. And that is just the largest of three manufacturing announcements made in this small area. South Korea-based Enchem America will construct a \$152.5 million manufacturing plant to produce electrolytes for EV batteries, and Magna International will construct a new plant to manufacture battery enclosures, frames and seats for EV trucks. Both firms expressly chose the region to support geographically proximate automotive manufacturing partners—the industrial market “multiplier effect” in action.

The multiplier effect as it relates to demand for industrial space (both manufacturing and warehouse/logistics space) is real but will be uneven across projects, depending on the project's sector, existing supplier ecosystem and supply chains, market and labor demographics, development dynamics and logistics infrastructure, among other factors. Global supply chains are sticky and hard to move; even the construction of a major project in North America does not guarantee that a new plant's upstream supply chain will notably adjust. In one example, a large commercial equipment manufacturer chose a Southeastern U.S. market in which to construct a production facility in the mid-2010s. To date, the multiplier effect has led to only one supplier moving into a distribution facility in the vicinity.³⁸

The automotive/transportation sector, where firms source parts and materials in large quantities and from many suppliers, is poised to create the most additive industrial demand. Many of these announced projects are in regions with established, mature auto ecosystems, although not necessarily for new EV technologies and associated processes, such as battery recycling. Battery recyclers Ascend Elements and Redwood Materials announced major new facilities near EV manufacturing installations to reduce the transportation costs associated with shipping hazardous materials from a factory to a recycling plant.

Two major automotive/transportation sector plants opening in the Texas Triangle during 2022 illustrate the potential effect of new plant construction on adjacent industrial market demand. Following the construction of the 10 million-square-foot “Gigafactory Tesla” and Navistar's 900 thousand-square-foot commercial EV truck production facility, a minimum of 3 million square feet of warehousing/manufacturing absorption (leasing and build-to-suit activity alike) attributable to siting near these two new facilities has occurred in the same region, from occupiers such as ElringKlinger AG, Saueressig, CelLink and Plastikon Industries. Tesla has also expanded numerous times since opening, occupying warehousing/distribution space as a part of that expansion. In addition, the impact of new EV manufacturing plants setting up production in the region has spurred complementary companies to cluster nearby, including some that are not direct participants in the EV ecosystem. Continental Automotive, for example, opened a \$110 million, 215,000 square-foot manufacturing facility in New Braunfels, Texas, in 2022 to produce components for autonomous vehicles.

Population and wage growth attributable to hiring by new facilities will also increase demand for adjacent commercial real estate, especially in smaller communities that attract large plants. This multiplier effect is not limited to industrial real estate; there are significant implications for multifamily and retail, hospitality (to a lesser extent) and perhaps even office. During peak construction phases for large projects, thousands of workers could be on-site, increasing short-term demand for housing and hospitality space. Longer term, many regions will benefit from an influx of highly skilled, highly paid workers; the average salary for key occupations across the four manufacturing sectors (automotive/transportation, high-tech/digitalization, biomanufacturing and energy) is over \$100,000.³⁹

The Speculation Conversation

Of the megaprojects surveyed, most facilities will be owner-occupied or build-to-suit.⁴⁰ This stands in line with historical norms; approximately half the existing occupied manufacturing base is either built-to-suit or owner-built. With a panorama of industries and operational stages, leasable manufacturing space is becoming increasingly important as demand rises, particularly in the R&D/pilot plant phase. Leasing simply provides more flexibility for companies to scale up or down their operations.



Image courtesy of King Street Properties.

Aerial rendering of Pathway Devens, a speculative advanced manufacturing campus developed and owned by King Street Properties and located in Devens, Massachusetts.

Speculative manufacturing does have a presence in the construction pipeline. Some speculative industrial projects are being marketed to both logistics and manufacturing users, although only projects structurally designed for heavier loads, with appropriately configured loading docks and other key design features, are likely to prove potentially viable for manufacturers—and then only if power needs are met. Users are focused on how much power is currently available, how much capacity will expand and on what timeline.

Developers of speculative life science/biomanufacturing projects have also found success pivoting to other manufacturing uses. Boston-based real estate investment management firm King Street Properties has two such projects underway, one just outside of Boston in Devens, Massachusetts, and another in North Carolina's Research Triangle. While the Devens campus was initially intended to be a life sciences project, King Street recognized that manufacturing demand in the area was diversifying and that manufacturers were operating in buildings not designed for that use. The firm's emphasis on a campus format to accommodate future growth resonated with a wide variety of manufacturers interested in tapping the local talent market. Total leasing at the Devens campus has exceeded 550,000 square feet in the three years since the project launched. Tenants include Ascend Elements, an EV battery materials manufacturer, and Electric Hydrogen, which leased a building to construct an electrolyzer factory.⁴¹

CMP's speculative development on Southport Drive, at the edge of the Research Triangle Park in Morrisville, North Carolina, was originally designed for biomanufacturing users but garnered significant attention from a broader tenant base. Battery maker Forge is slated to occupy a sizable footprint in the development, with the planned gigafactory bringing 200 jobs and a \$165 million investment to Morrisville.⁴² Similar projects marketed to a variety of life sciences and manufacturing users are in the works, including NexPoint's Texas Research Quarter, a proposed life sciences campus in Plano, Texas, that has significant manufacturing space planned across the multiphase project.

Scalable, campus-based projects with proper design, zoning and utilities considerations may continue to enter the pipeline as purely speculative projects, projects that are subsequently tailored to an occupant, or even as shovel-ready sites. Unlike logistics space, where design specifications for new warehouses are quite uniform across the country and new speculative construction offers tenants with immediate occupancy requirements the agility to move in swiftly, speculative manufacturing space remains an expensive and risky proposition considering how much design needs vary between different manufacturing uses. The time needed to complete purpose-built construction will continue to be a constraint on small and mid-sized manufacturers' ability to scale up in size.

Conclusion: Challenges Lie in Wait Over the Next Decade and Beyond

The effects of the current phase of manufacturing expansion in North America are large and wide-ranging. Nearshoring and onshoring are less a sign that globalization is ending than being reshaped, with public and private interests focused on de-risking critical supply chains. While the pace of new announcements has slowed somewhat since the initial wave that followed passage of the IJJA, the IRA and the CHIPS Act, major announcements and smaller scale project starts are expected in the coming months and years as federal priorities, geopolitics, climate instability and consumer demand continue to favor a more regionalized approach to manufacturing. The opportunities for industrial real estate market stakeholders are exciting, but several obstacles may limit future growth.

As noted earlier, the availability of construction and skilled labor are often the biggest constraints on manufacturing development. These projects will need to compete for construction trade workers with infrastructure projects funded by federal IJJA funds, and a preexisting labor shortage for highly technical workers may worsen without an increase in skilled worker immigration or strong public and private sector partnerships to train new skilled workers domestically.

Local energy capacity and transmission also constrain manufacturing development, and manufacturing will need to compete with more energy-intensive and AI-driven industries in the future. For individual projects, power cost, access, reliability and sustainability (i.e., green power) can make or break a project. A 25MW power requirement, for example, could mean a difference of millions of dollars in cost from one region to the next, and there are limited sites that can even accommodate such a requirement today. Some manufacturers are exploring non-grid-related solutions to supplement the grid or even supply their own power needs. Persistent delays related to the supply chain compounded with higher competition for electrical equipment such as switchgear can also lead to longer construction timelines for manufacturing projects.

Finally, with massive new federal incentive programs, the risk of wasting money and time is significant, and some projects that are currently chasing incentives may be mired in delay or end in failure. It is also unclear what changes might be enacted to existing federal programs following the 2024 election.

While challenges and obstacles exist, a structural shift in where goods are produced and how they are distributed to the end consumer is driving a wave of manufacturing growth in North America that will shape the years and decades to come. Manufacturing as a share of total U.S. gross domestic product has remained at a narrow band of 10.5 percent to 10.9 percent from mid-2020 to the first quarter of 2023, but the amount of investment and construction already underway suggests that percentage is likely to rise as new facilities are delivered to the market and get up to speed. This growth will increase the diversification of North American economies, contributing to their resiliency and a more stable market for industrial real estate.

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