



COLUMBUS 2020 INDUSTRY PROFILE: AUTOMOTIVE SUPPLY CHAIN

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This report on the automotive supply chain is the second of Columbus 2020's profiles on niche industries important to the Columbus Region economy. The presence of Honda has fostered a significant base of automotive suppliers in the Region, including foreign direct investment from Japanese and other companies.

The automotive industry has recovered significantly since the recession. In 2014, Honda and other automotive OEMs hit all-time highs in North American production and sales. To better understand the trends behind the automotive industry, regionally and globally, Columbus 2020 has collected and analyzed a variety of industry, employment and business data. In addition to information from secondary data sources, Columbus 2020 and local economic development organizations conducted interviews in person with six companies. This report also incorporates information from other recent business retention outreach, including 13 automotive company interviews from the market assessment of foreign direct investment for Columbus Global Connect.

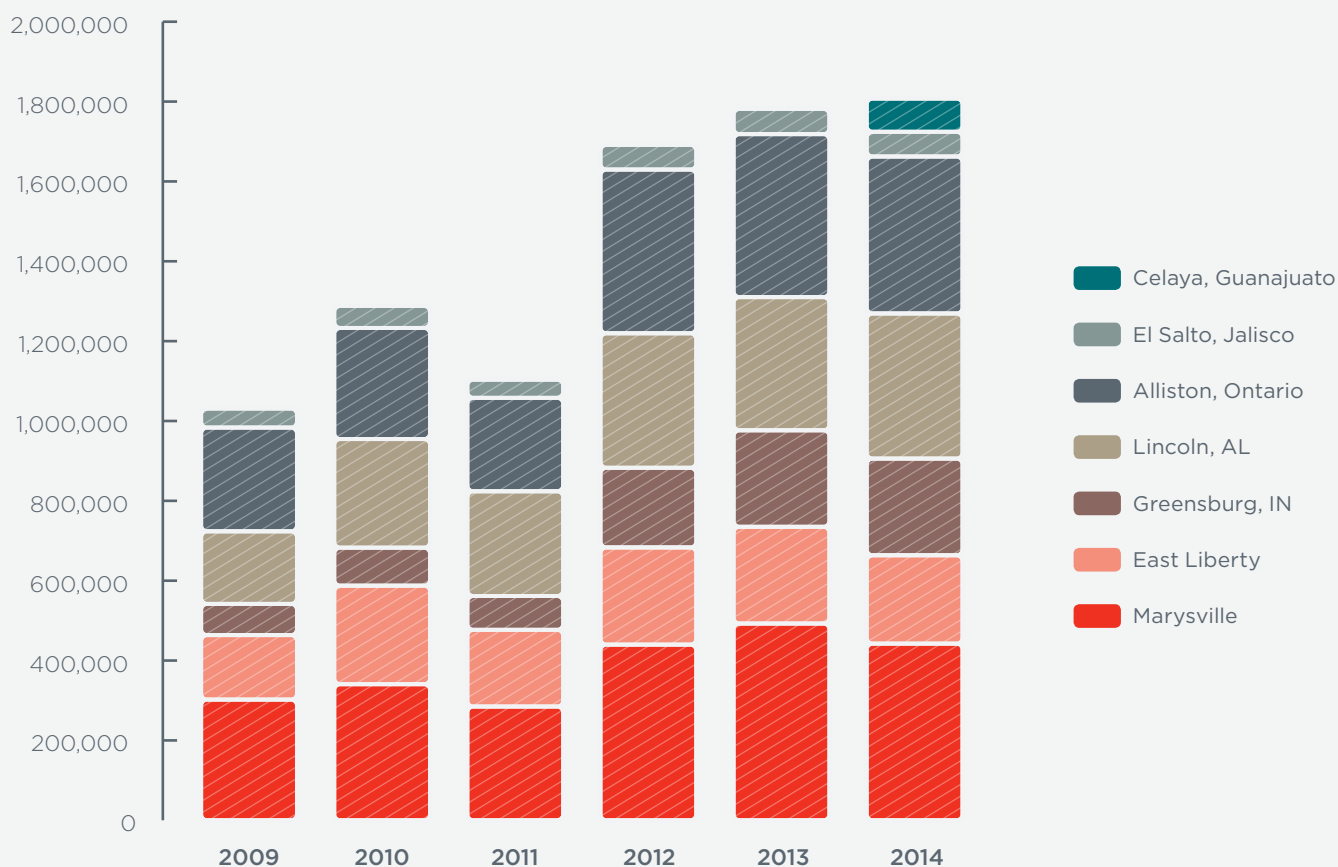
GENERAL TRENDS

PRODUCTION



Honda's North American production increased from 1.03 million vehicles in 2009 to 1.81 million in 2014. In 2013, Honda spent \$25.5 million with 652 suppliers across the United States, \$9.7 million and 158 suppliers of which were Ohio-based. In the Columbus Region, the Marysville and East Liberty plants saw an increase from 463,596 in 2009 to 734,772 in 2013, but production fell back 10 percent in 2014 to 663,424. Automotive production has seen a significant boost since 2011 and the Columbus Region has seen its share, but there are competitive pressures from elsewhere in the U.S. and Mexico.

Honda vehicles produced by North America plants, 2009-2014



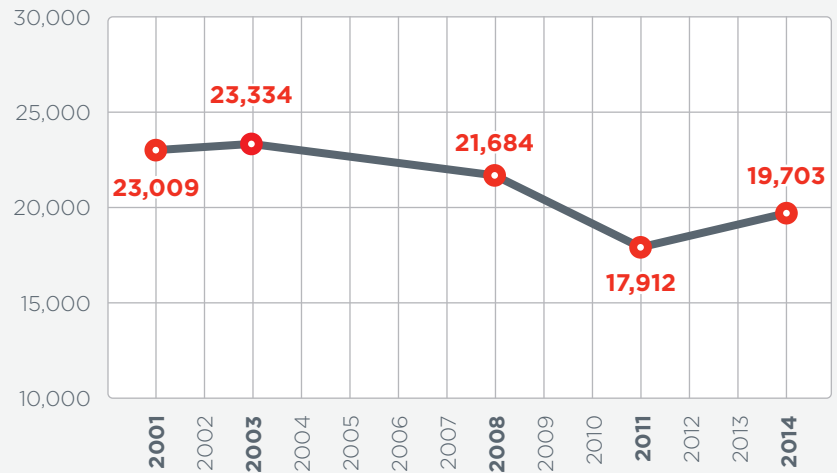
Source: Automotive News

EMPLOYMENT



With the resurgence of production, Columbus Region employment in transportation equipment manufacturing has grown from 17,912 in 2011 to 19,703 in 2014, an increase of 10 percent. However, employment levels remain below pre-recession figures, signifying that productivity gains have also been a factor in driving manufacturing output growth.

Columbus Region employment in transportation equipment manufacturing, 2001-2014



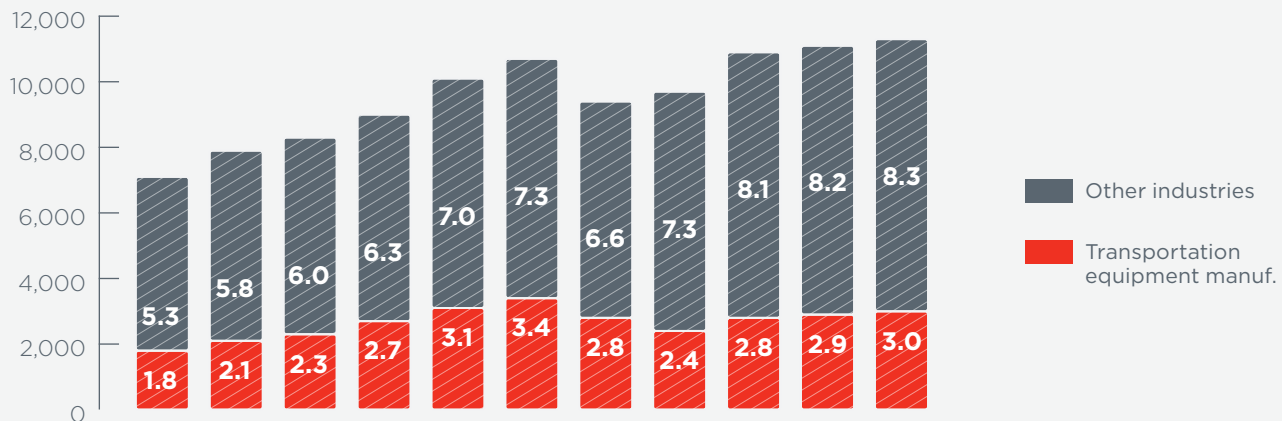
Source: EMSI

EXPORTS



In 2013, Columbus Region companies in transportation equipment manufacturing exported more than \$3 billion in goods, 27 percent of the Region's \$11.4 billion in exported goods and services. From 2003 to 2013, the value of transportation equipment exports from the Region increased 73 percent (in inflation-adjusted 2013 dollars), compared to 57 percent for exports by the Region's other industries. As Honda and its suppliers increase exports out of the U.S., whether as part of the production process or the final product, the export value should continue to grow in the years ahead.

Columbus Region exports (\$ million), transportation equipment manufacturing vs. other industries, 2003-2013



Source: Brookings Institution

THE COLUMBUS REGION AUTOMOTIVE SUPPLY CHAIN

Honda's presence in the Columbus Region leads an automotive OEM (original equipment manufacturer) presence whose share of regional employment is 5.8 times greater than automotive OEMs' share of U.S. employment. Tier 1-related industries have a regional employment concentration 2.1 times greater than their share of U.S. employment.

Tier 2 and Tier 3-related industries are also included in the chart below. These industries include suppliers in textiles, raw steel or aluminum and other materials that are not exclusive to automotive and can encompass customers across a broader range of industries. This in part explains the lower Tiers 2 and 3 employment concentrations in the Region of 0.8 times the national share.

As an example, the Columbus Region has a significant Tier 1 concentration for interior trim and parts, but not in the production of fabrics (e.g., textile mills) that are inputs. Within the aggregate data are other nuances, such as the Region's strength in electrical/electronics, where higher employment by vehicle lighting suppliers outweighs lower concentrations in electrical wiring, electronics and controls.

Industry concentration by part category and material type: Industry share of Columbus Region employment vs. share of U.S. employment

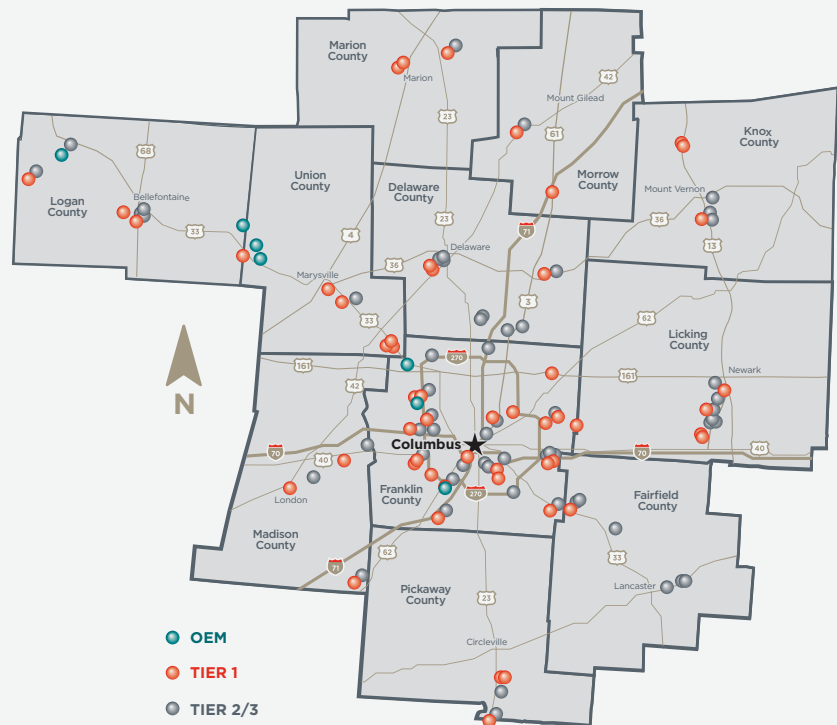


Source: Columbus 2020 analysis of EMSI data

While the manufacturing facilities of Honda and some suppliers are concentrated in Union and Logan counties, the automotive supply chain is dispersed throughout the Columbus Region. Outer parts of Franklin County and the Newark-Heath area of Licking County also have notable concentrations of suppliers.

A number of suppliers have noted that locations elsewhere in the Region away from Marysville can provide a good balance between proximity to Honda and access to alternative labor-sheds.

Automotive manufacturing locations in the Columbus Region



Source: Columbus 2020

Columbus Region’s largest Tier 1 manufacturing operations

RANK	COMPANY	REGION EMPLOYMENT	PARTS SUPPLIED
1	TS Tech Co., Ltd. (multiple sites in Region)	2,078	car seats, door and roof trim
2	Cardington Yutaka Technologies, Inc.	725	converters, exhaust systems, powertrain
3	Jefferson Industries Corp.	700	structural/body, dashboard, rear panels, floor
4	AGC America, Inc. (multiple sites)	692	glass, windows
5	Parker Hannifin	636	hydraulic components and systems, tube fittings
6	Stanley Electric U.S. Co., Inc.	630	automotive and motorcycle lighting
7	PPG Industries, Inc. (multiple sites)	554	chemicals for use in paints for automotive and other applications
8	American Showa, Inc. (multiple sites)	550	shock absorbers, power steering, prop shafts
9	Keihin North America, Inc. (multiple sites)	425	thermal technologies for engines, transmissions
10	FT Precision, Inc.	365	engine rocker arms
11	Meritor, Inc.	362	axles, housings, bevel gear
12	Marion Industries, Inc.	330	brakes, brake modules
13	Nifco America Corp	300	plastic fasteners, buckles
14	Plaskolite, Inc.	268	injection-molded acrylics, plastics
15	Tigerpoly Manufacturing, Inc.	260	air induction and engine parts
16	ArcelorMittal	237	galvanized pipes, plates
17	McNaughton-McKay Electric Company	230	electrical products for automation
18	US Yachiyo, Inc.	220	fuel tanks
19	Nissen Chemitec America	210	door trim
20	Florida Production Engineering (FPE)	204	wheel hubcaps, grills

Source: Columbus 2020

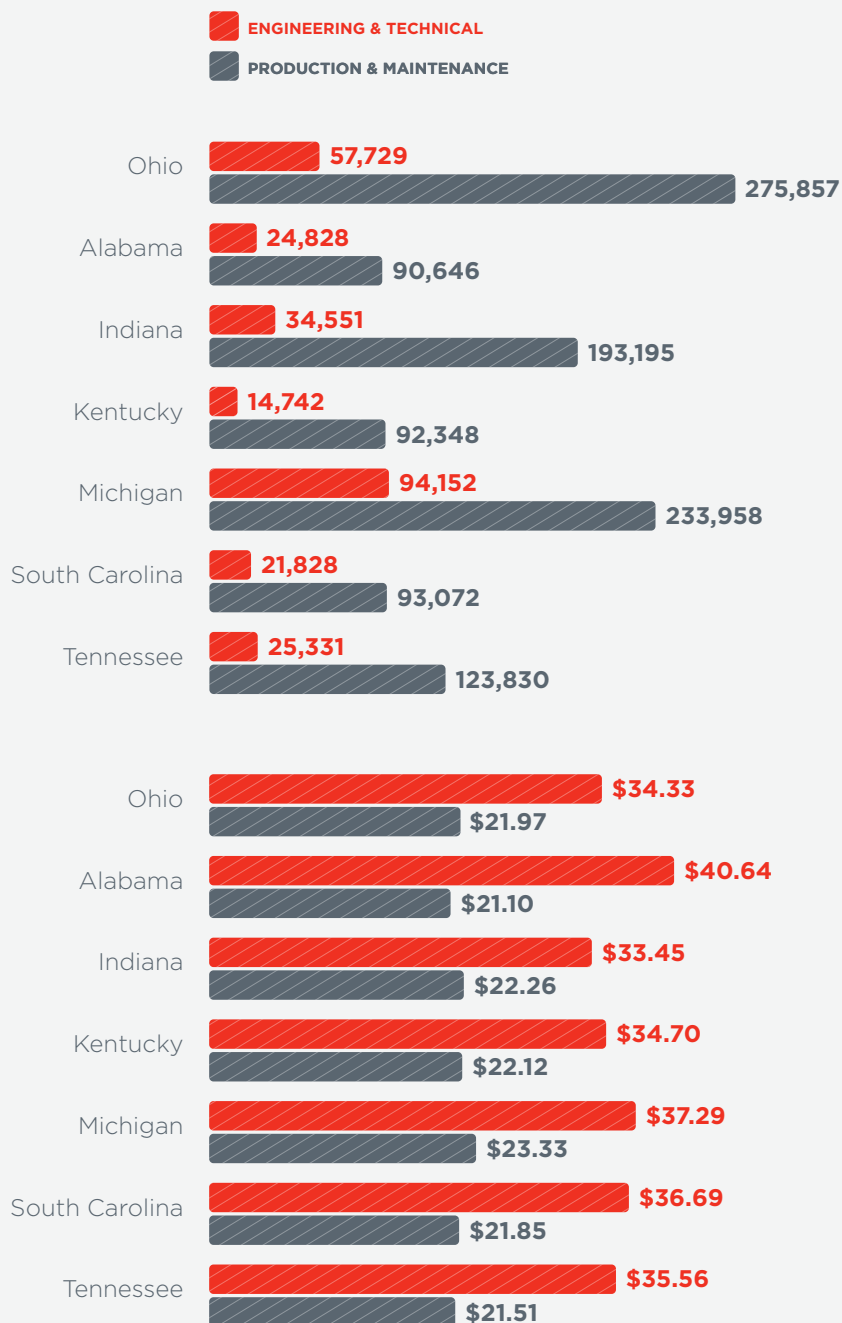
COLUMBUS REGION AND OHIO AUTOMOTIVE TALENT BASE

With several centers of automotive production within the Columbus Region and around the state, Ohio has a significant edge in the supply of production and maintenance workers compared to other states. The concentration of other industries requiring similar skills, such as machinery manufacturing, also contributes to this advantage. Ohio also fares strongly in automotive-related engineering and technical occupations, though it lags Michigan which has R&D facilities across multiple OEMs and Tier 1 suppliers.

The depth of the labor pool helps to curb cost pressures from demand. Ohio wages are competitive with southern states in production and maintenance occupations, while offering significant savings on the engineering and technical side.



Automotive-related occupations, number of workers and average hourly wages

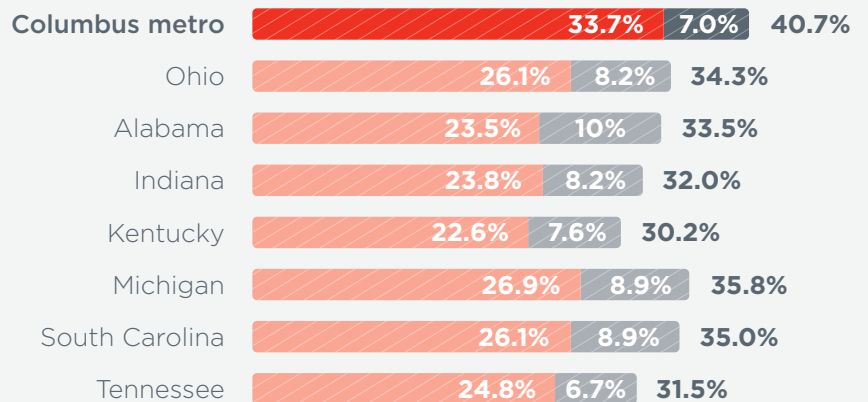


Source: Columbus 2020 analysis of EMSI data

The Columbus Region offers scale in population size plus a number of higher educational institutions to support the ongoing workforce needs of the automotive supply chain. As the manufacturing workforce ages in the Region as it is elsewhere around the U.S., this pipeline will be especially important in replenishing the labor pool required by automotive OEMs and suppliers.



Educational attainment of persons age 25 and over



Source: Columbus 2020 analysis of American Community Survey 2013

Columbus Region higher education institutions with programs related to automotive engineering and production

	VOC/TECH	ASSOCIATE	BACHELOR'S	GRADUATE
The Ohio State University				
Capital University				
Columbus College of Art & Design				
DeVry University-Ohio				
Mount Vernon Nazarene University				
Ohio Christian University				
Otterbein University				
Park University-DSCC				
Central Ohio Technical College				
Columbus State Community College				
ITT Technical Institute				
Ohio University-Lancaster				
Marion Technical College				
American School of Technology				
Career and Technology Education Centers of Licking County				
Delaware Area Career Center				
Eastland-Fairfield Career and Technical School				
Knox County Career Center				
Ohio Hi-Point Career Center				
Pickaway-Ross Career and Technology Center				
South-Western Career Academy				
Tolles Career & Technical Center				
Tri-Rivers Career Center / RAMTEC				

Source: Columbus 2020

KEY TAKEAWAYS

Interviewed suppliers provided a range of insights on the automotive supply chain in the Columbus Region, the Midwest and beyond. In many cases, their perspectives on issues such as industry trends and workforce align with the preceding findings. Below are key takeaways from the interviews and data analysis.



TAKEAWAY 1: THE ROLES AND RESPONSIBILITIES OF TIER 1 ARE CHANGING DRAMATICALLY.

OEMs are increasingly pushing R&D and innovation down the supply chain, in part driven by compression of model design and development timelines, with the lead time for significant model refreshes down to 18 months rather than five years. These pressures require a closer relationship

In the Columbus Region, the presence of Honda R&D Americas helps attract suppliers' R&D activities. Proximity fosters greater involvement in the design phase, helping both the OEM and supplier to address issues and specifications upfront.

between the OEM and Tier 1 suppliers to coordinate development and engineering. In the Columbus Region, the presence of Honda R&D Americas helps attract suppliers' R&D activities. Proximity fosters greater involvement in the design phase, helping both the OEM and supplier to address issues and specifications upfront.

Current and prospective Tier 1 and 2 suppliers can gain competitive advantages by tapping into Columbus Region resources such as the Ohio Supercomputer Center, Edison Welding Center, Center for Design and Manufacturing Excellence, and The Ohio State University Center for Automotive Research (CAR). One

interviewee noted that every major supplier in the Region with R&D-related needs should leverage OSU's CAR which, along with the other research centers, offer cost effective R&D and cutting edge technology and talent.





TAKEAWAY 2: OHIO AND THE MIDWEST IN GENERAL OFFER SIGNIFICANT ADVANTAGES IN LABOR QUANTITY AND QUALITY.

Ohio and other parts of the Midwest offer greater production and engineering talent than the South and Mexico, especially as one moves up the innovation ladder into higher skill activities. In part, this is due to the manufacturing legacy in the Midwest, not just in automotive but in industries that can require similar capabilities such as machinery and aerospace. Compared to the Midwest, the South and Mexico have skills gaps which, as a result, carry over into the supply chain and may affect the types of suppliers that can be supported.

With the manufacturing workforce aging across the U.S., the Columbus Region presents an advantage in its depth of higher education institutions available to help replenish the labor pool. As illustrated on page 7, the Region is home to a variety of certificate, two- and four-year institutions providing education and training for automotive talent, from hard-to-find maintenance technicians and skilled trades to advanced engineering.

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TAKEAWAY 3: OEMS AND TIER 1S SEEK TO DIVERSIFY AND LOCALIZE THEIR SUPPLY CHAINS.

The impact of the 2011 tsunami in Asia on the automotive industry highlighted the need to diversify within a global supply chain. The Tier 1 companies interviewed expressed an increasing preference among their OEM customers to source more locally where possible. Likewise, these Tier 1 companies are also looking to source more locally among their Tier 2 suppliers.

Relatively stable locations such as the Midwest can help mitigate various supply chain risks. The Columbus Region's status as a logistics hub, with direct rail and truck connections to Mexico and to coastal ports, offers additional options for companies looking to balance different supply chain considerations.

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TAKEAWAY 4: STRONG REGIONAL SPECIALIZATIONS AND PROXIMITY TO RAW MATERIALS CAN ATTRACT SUPPLIERS.

As much as OEMs and Tier 1 suppliers seek to localize and diversify supply chains, the world isn't flat - there remain real limitations of infrastructure, workforce and industrial capability across different regions. For certain regions with strong specializations and proximity to raw material, there is opportunity to grow the supply chain.

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In the long run, the development of Utica and Marcellus shale may provide opportunities for geographical integration within plastics in Ohio. Currently, the production of raw resins and other hydrocarbons are concentrated near oil refineries in Texas, but the Columbus Region and Ohio offers capabilities for later-stage processing of these materials as well as the customer base in automotive and other industries. As Ohio's oil and gas industry grows, increasing volumes of low-cost petroleum can provide benefits for manufacturing proximity, including greater local plastics production.

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