

## Michigan's Automotive Workforce Transition

Upjohn Institute Technical Report No. 26-058

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June 2026

Produced for and funded by:

Community & Worker Economic Transition Office  
Michigan Department of Labor & Economic Opportunity

### ABSTRACT

This report examines how changes in automobile production, specifically the shift from internal-combustion-engine (ICE) vehicles toward hybrids and battery-electric vehicles (BEVs), are likely to affect employment in Michigan's automotive manufacturing and distribution system over the next decade. The goal is to quantify how many jobs in Michigan depend on the automotive supply chain today, how that employment has evolved since the early 2000s, and how it may change through 2030 under alternative production-and-demand scenarios. The results are intended to inform the workforce planning and community transition strategies of the Michigan Department of Labor and Economic Opportunity's Community and Worker Economic Transition Office. To do this, we first define the automotive supply chain as a set of 38 North American Industry Classification System (NAICS) industries, organized into 3 functional stages and 10 analytic segments. We then estimate the share of each industry that is genuinely automotive dependent, using the Impact Analysis for Planning (IMPLAN) Social Accounting Matrix (SAM) data, establishing a 2024 baseline of auto-attributed employment. Next, we project industry employment forward by applying forecast growth rates from Moody's Analytics' Michigan outlook to our 38 industries and rolling the results into segments and stages. Finally, we link industries to occupations using Michigan occupational staffing patterns published by the state of Michigan to describe how the occupational mix of the automotive workforce may change, with particular attention to differences by education and training requirements.

**JEL Codes:** J23, J24, L62, R11

**Key Words:** Automotive workforce transition; Michigan automotive industry; electric vehicles; automotive supply chain; employment projections; occupational staffing patterns; workforce development; skill requirements; education and training; advanced manufacturing

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Community and Worker Economic Transition Office of the Michigan Department of Labor and Economic Opportunity. We thank the Michigan Center for Data and Analytics and the Center for Automotive Research for their partnership and collaboration on this research. Their support and engagement were invaluable to the development of this work.



A worker in a blue uniform and yellow hard hat is welding a metal part in an industrial setting. The worker is wearing a blue long-sleeved shirt and a yellow hard hat. They are holding a welding torch and a red hose. The background shows a complex industrial environment with various pipes, cables, and machinery. The lighting is bright, and the overall scene is a blurred action shot of a manufacturing process.

This report examines how changes in automobile production, specifically the shift from internal-combustion-engine (ICE) vehicles toward hybrids and battery-electric vehicles (BEVs), are likely to affect employment in Michigan's automotive manufacturing and distribution system over the next decade. The goal is to quantify how many jobs in Michigan depend on the automotive supply chain today, how that employment has evolved since the early 2000s, and how it may change through 2030 under alternative production-and-demand scenarios. The results are intended to inform the workforce planning and community transition strategies of the Michigan Department of Labor and Economic Opportunity's Community and Worker Economic Transition Office.

To do this, we first define the automotive supply chain as a set of 38 North American Industry Classification System (NAICS) industries, organized into 3 functional stages and 10 analytic segments. We then estimate the share of each industry that is genuinely automotive dependent, using the Impact Analysis for Planning (IMPLAN) Social Accounting Matrix (SAM) data, establishing a 2024 baseline of auto-attributed employment. Next, we project industry employment forward by applying forecast growth rates from Moody's Analytics' Michigan outlook to our 38 industries and rolling the results into segments and stages. Finally, we link industries to occupations using Michigan occupational staffing patterns published by the state of Michigan to describe how the occupational mix of the automotive workforce may change, with particular attention to differences by education and training requirements.



# Michigan's Automotive Supply Chain

## Supply chain definition: 38 NAICS industries

To support Michigan's long-term workforce development strategy, our project team developed a structured view of the state's automotive supply chain built around three functional stages: 1) *Upstream*, 2) *Core Automotive*, and 3) *Downstream*, further organized into 10 analytic segments comprising 38 detailed NAICS industries. This framework intentionally expands beyond core vehicle manufacturing to capture the full constellation of industries that supply materials, components, engineering expertise, distribution, sales, and vehicle services across the automotive ecosystem.

Upstream segments encompass six industry groups: (1) *Materials and Processing*, including metals, nonmetals, coatings, rubber, plastics, and glass manufacturers; (2) *Equipment Manufacturing*, such as general-purpose and metalworking machinery; (3) *Forging and Foundries*; (4) *Parts and Machining*, which includes precision metal fabrication, machine shops, springs, and semiconductor/electronic components; (5) *Component Systems*, spanning engines, power-train systems, electrical equipment, and instrumentation; and (6) *Engineering and Design*, including architectural design, industrial design, and R&D services.

The Core Automotive stage reflects the industries directly responsible for motor vehicle and parts production in Segment (7), *Core Automotive*, comprising manufacturing of motor vehicles, bodies and trailers, and parts; NAICS 3361–3363.

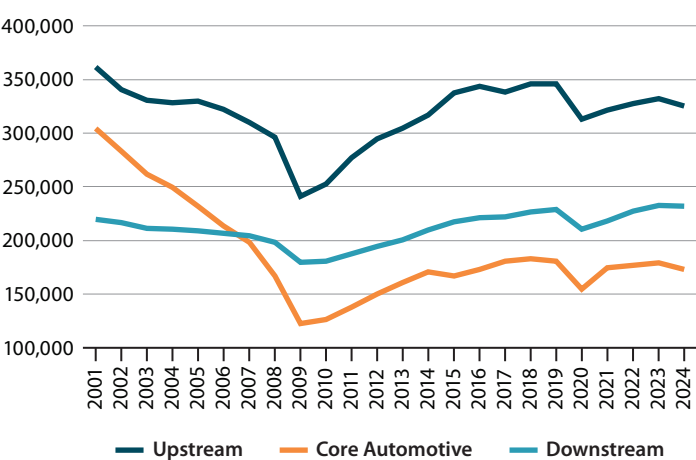
The Downstream stage captures industries connected to the sale, distribution, servicing, and movement of automotive products: (8) *Parts, Materials, and Product Sales* through wholesalers and retailers; (9) *Dealers, Maintenance, and Repair*; and (10) *Logistics*, including general and specialized freight trucking.

This framework provides a coherent lens for modeling employment, tracing supply-chain dependencies, and evaluating how shifts in automotive technology such as electrification propagate across the broader industrial base.

## Historical employment trends

Over the past 25 years, total employment in these 38 industries shows a clear downshifting of the state's automotive manufacturing base, particularly in core vehicle production, and only somewhat less so in Upstream manufacturing, while Downstream activities have been more resilient.<sup>1</sup> In 2001, Upstream industries employed about 362,000 workers, Core Automotive about 304,000, and Downstream industries roughly 220,000. By 2024, Upstream employment had fallen to 325,000 (a 10 percent decline) and Core Automotive to 173,000 (a 43 percent decline), while Downstream employment increased slightly to 232,000 (a 5.5 percent gain). The early and mid-2000s stand out as a period of steep contraction, with the Great Recession accelerating losses in core vehicle and parts manufacturing. Subsequent recovery has been partial and uneven, leaving many Upstream and Core Automotive industries well below their early-2000s employment levels (see Figures 1–3).

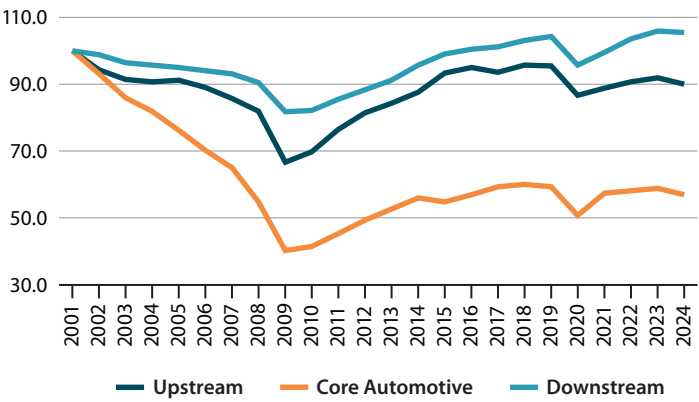
**Figure 1. Total Employment by Supply-Chain Stage, 2001–2024**



SOURCE: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

<sup>1</sup> Figures 1–3 present summary statistics of employment for Upstream, Core Auto, and Downstream supply-chain stages. Appendix A shows additional historical employment data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW), including segment and NAICS-level industry employment, 2001–2024.

**Figure 2. Total Employment by Supply-Chain Stage, 2001–2024, Index: 2001 = 100**



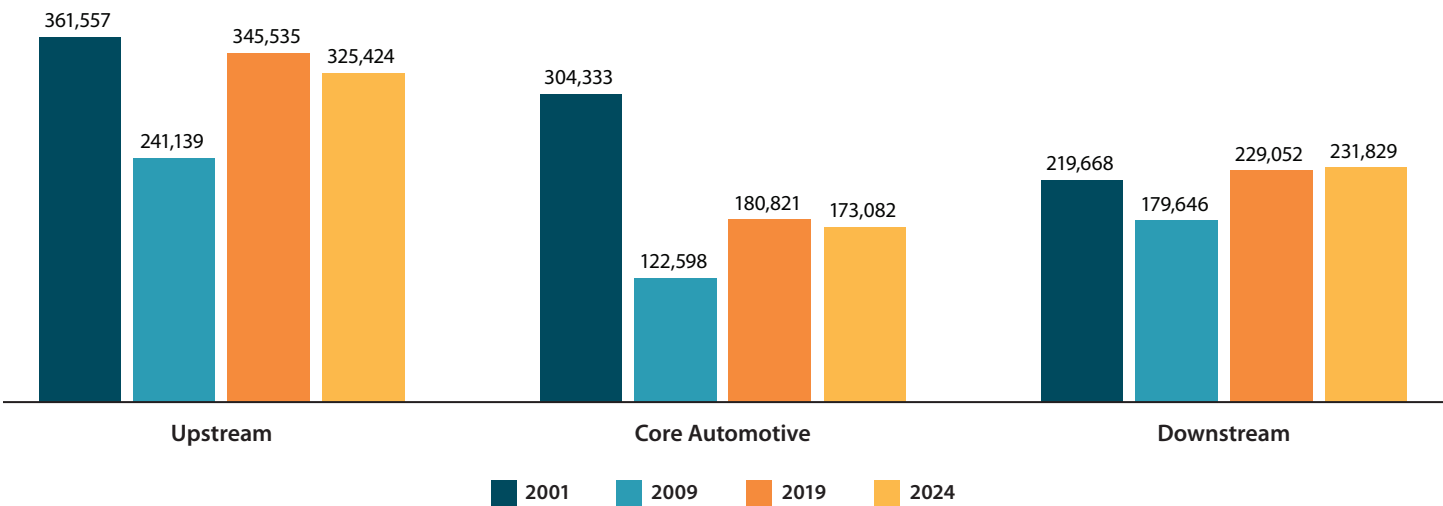
SOURCE: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

Core Automotive manufacturing (NAICS 3361–3363) shows the most dramatic long-term adjustment. Combined employment in motor-vehicle manufacturing, bodies and trailers, and parts stood near 300,000 in 2001. By 2009, it had declined to around 123,000, and although employment gradually recovered in the 2010s, total Core Automotive employment in 2024 (about 173,000) remained more than 40 percent below its 2001 level. Recent employment trends have been divergent: Motor Vehicle Manufacturing (3361) has grown by roughly 22 percent since 2019, while Motor Vehicle Parts Manufacturing (3363) continues to drift downward, declining by about 11 percent over the same period. These patterns are consistent with a sector that has consolidated assembly activity, restructured its supplier relationships, and shifted toward higher capital intensity and productivity.

Specific Upstream segments, particularly metals and materials manufacturing, have experienced substantial long-term erosion (see Appendix Table A.1). Employment in glass manufacturing (3272) has fallen by more than 60 percent since 2001, while iron and steel mills (3311) and nonferrous metals (3314) are down by roughly 50 percent. Foundries (3315) have lost over 40 percent of their employment, and metalworking machinery and coatings/heat treating (3335, 3328) have contracted by around 35–40 percent. Since 2019, many of these industries have continued to see modest declines, although a few technology- and electrification-adjacent segments buck the trend: Other Electrical Equipment and Components (3359) has more than doubled since 2001, and Semiconductor and Other Electronic Components (3344) has grown by about 34 percent, with further gains since 2019. These pockets of growth suggest a gradual reweighting of Michigan’s Upstream base toward electrical, electronic, and control systems.

Engineering and design industries included within the Upstream stage (NAICS 5413, 5414, 5417) moved counter to the broader manufacturing contraction, expanding their employment base over the 2001–2024 period. This reflects Michigan’s participation in the national trend toward a larger services-oriented economy, in which professional and technical services have expanded even as many traditional manufacturing industries have become less labor-intensive. This movement is consistent with broader structural change in the U.S. economy: over the past two decades, employment has grown steadily in professional, scientific, and technical services as firms increasingly rely on specialized design, engineering, and research and design (R&D) functions to support product development, process optimization, and technology adoption across many industries.

**Figure 3. Total Employment by Supply-Chain Stage, 2001–2024**



SOURCE: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

When examining the manufacturing-only portion of the Upstream supply chain, Segments 1 through 5, excluding engineering and design, we see that employment has fallen much more sharply than the stage-level totals suggest. Combined employment in these Upstream manufacturing segments declined from roughly 258,000 jobs in 2001 to about 208,000 in 2024, a reduction of nearly 20 percent.

Downstream industries tied to sales, service, and logistics have been comparatively stable or growing over the past two decades. Motor-vehicle and parts wholesalers (4231) and miscellaneous durable goods wholesalers (4239) have expanded meaningfully since 2001, and general freight trucking (4841) has grown by roughly 45 percent over the same period, even with a small pullback since 2019. Automobile dealers (4411) and automotive repair and maintenance (8111) show smaller long-run declines or near-flat patterns, reflecting an underlying shift toward service-oriented employment. These trends reinforce a picture in which Michigan's automotive ecosystem has shed a substantial share of its traditional manufacturing employment Upstream and at the vehicle-assembly level, even as Downstream sales, service, and logistics activities have held up or expanded modestly.

## A caveat on the measurement of contract-based labor in select manufacturing occupations

Standard establishment-based employment measures generally capture direct-hire workers on a firm's payroll, but they often miss contract workers who are legally employed by staffing firms and therefore recorded outside of manufacturing, even when they work on the factory floor. Recent work by Dey and Houseman<sup>2</sup> show that this measurement issue has grown in importance for production and material-moving occupations. They estimate the contract share in these occupations rose from 1.7 percent in 1990 to 5.8 percent in 1997 and reached 10.0 percent in 2015 before edging down slightly. In their accounting, the shift toward contract work can explain more than 22 percent of the measured decline in core manufacturing employment from 1990 to 2018, implying that headline manufacturing employment trends can understate labor used in manufacturing when outsourcing rises.

Importantly for our analysis, Dey and Houseman also find substantial geographic variation: by 2018, contract use in production and material-moving occupations was especially high in the Great Lakes region overall (10.1 percent), with meaningful within-region differences (e.g., their estimates

place Detroit-Warren-Dearborn at 7.7 percent versus Grand Rapids–Wyoming at 23.0 percent). These findings underscore a key interpretive challenge for manufacturing workforce measurement in Michigan's automotive supply chain: *changes in where workers are payroll-reported* (manufacturing establishments vs. staffing industry establishments) can shift measured employment even when work performed at manufacturing sites is more stable, complicating comparisons across industries, places, and time.

## Using IMPLAN's Social Accounting Matrix to estimate auto-related employment of Upstream industries

Collectively, the 38 industries included in our supply-chain framework represent a substantial share of Michigan's economic base. In 2024, these industries employed more than 730,000 workers, or 19.1 percent of statewide private employment. While the broad footprint hints at how Michigan's manufacturing sector is deeply intertwined into the overall labor market, these headline employment levels significantly overstate the portion directly tied to automotive production. Many Upstream industries serve a broad set of customers across manufacturing, construction, medical devices, aerospace, and consumer products. To isolate the share of each industry that is functionally part of Michigan's automotive ecosystem, we apply IMPLAN's sector-specific Social Accounting Matrix (SAM) auto shares, which estimate the proportion of each industry's output that is purchased by the state's motor vehicle manufacturing industries. (*For a detailed account of the methodology employed to estimate industry shares using the commodity-use and commodity-make tables, see Appendix B.*)

Applying these SAM-derived shares materially changes the size and composition of the automotive supply chain (see Table 1). For example, plastics product manufacturing (NAICS 3261) employs 34,371 Michigan workers, but only 23.5 percent of its output is attributable to automotive demand, yielding 8,066 auto-attributed jobs. Rubber product manufacturing (3262) similarly scales from 5,147 total jobs to 2,821 auto-attributed jobs, based on a 54.8 percent auto share. Foundries (3315), a highly automotive-oriented segment, retains 6,281 of its 9,349 total workers due to a high 67.2 percent auto share. After applying these proportional adjustments, total Upstream employment scales from 325,424 overall jobs to 58,471 auto-attributed jobs.

<sup>2</sup> Matthew Dey and Susan Houseman, "The Rise of the Contract Workforce in U.S. Manufacturing," conference draft (February 2025; revised December 2025).

**Table 1. IMPLAN Social Accounting Matrix Estimates of Upstream Automotive Employment, 2024**

| Stage, segment, or NAICS title                                                      | Michigan employment, QCEW 2024 | IMPLAN SAM automotive share of industry output (%) | Automotive-attributed employment, 2024 |
|-------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------|----------------------------------------|
| <b>Upstream</b>                                                                     | <b>325,424</b>                 | <b>18.0</b>                                        | <b>58,471</b>                          |
| <b>1. Materials and Processing</b>                                                  | <b>72,604</b>                  | <b>29.3</b>                                        | <b>21,248</b>                          |
| NAICS 3252 – Resin, Synthetic Rubber, Artificial and Synthetic Fibers and Filaments | 5,524                          | 8.9                                                | 489                                    |
| NAICS 3255 – Paint, Coating, and Adhesive Manufacturing                             | 4,347                          | 51.5                                               | 2,239                                  |
| NAICS 3261 – Plastics Product Manufacturing                                         | 34,371                         | 23.5                                               | 8,066                                  |
| NAICS 3262 – Rubber Product Manufacturing                                           | 5,147                          | 54.8                                               | 2,821                                  |
| NAICS 3272 – Glass and Glass Product Manufacturing                                  | 2,802                          | 57.5                                               | 1,610                                  |
| NAICS 3311 – Iron and Steel Mills and Ferroalloy Manufacturing                      | 3,258                          | 41.6                                               | 1,354                                  |
| NAICS 3312 – Steel Product Manufacturing from Purchased Steel                       | 1,974                          | 40.2                                               | 793                                    |
| NAICS 3313 – Alumina and Aluminum Production and Processing                         | 2,698                          | 32.1                                               | 865                                    |
| NAICS 3314 – Nonferrous Metal (except Aluminum) Production and Processing           | 1,262                          | 29.3                                               | 370                                    |
| NAICS 3328 – Coating, Engraving, Heat Treating, and Allied Activities               | 11,221                         | 23.5                                               | 2,641                                  |
| <b>2. Equipment Manufacturing</b>                                                   | <b>47,550</b>                  | <b>13.1</b>                                        | <b>6,244</b>                           |
| NAICS 3335 – Metalworking Machinery Manufacturing                                   | 29,604                         | 7.8                                                | 2,312                                  |
| NAICS 3339 – Other General Purpose Machinery Manufacturing                          | 17,946                         | 21.9                                               | 3,932                                  |
| <b>3. Forging and Foundries</b>                                                     | <b>16,337</b>                  | <b>55.2</b>                                        | <b>9,023</b>                           |
| NAICS 3315 – Foundries                                                              | 9,349                          | 67.2                                               | 6,281                                  |
| NAICS 3321 – Forging and Stamping                                                   | 6,988                          | 39.2                                               | 2,742                                  |
| <b>4. Parts and Machining</b>                                                       | <b>50,443</b>                  | <b>29.6</b>                                        | <b>14,936</b>                          |
| NAICS 3326 – Spring and Wire Product Manufacturing                                  | 2,869                          | 40.2                                               | 1,153                                  |
| NAICS 3327 – Machine Shops; Turned Product; and Screw, Nut, and Bolt                | 24,530                         | 38.0                                               | 9,319                                  |
| NAICS 3329 – Other Fabricated Metal Product Manufacturing                           | 10,865                         | 16.0                                               | 1,740                                  |
| NAICS 3344 – Semiconductor and Other Electronic Component Manufacturing             | 12,179                         | 22.4                                               | 2,724                                  |
| <b>5. Component Systems</b>                                                         | <b>18,283</b>                  | <b>32.7</b>                                        | <b>5,987</b>                           |
| NAICS 3336 – Engine, Turbine, and Power Transmission Equipment Manufacturing        | 4,970                          | 71.7                                               | 3,563                                  |
| NAICS 3345 – Navigational, Measuring, Electromedical, and Control Instruments Mfg.  | 8,867                          | 2.1                                                | 185                                    |
| NAICS 3359 – Other Electrical Equipment and Component Manufacturing                 | 4,446                          | 50.4                                               | 2,239                                  |
| <b>6. Engineering and Design</b>                                                    | <b>120,207</b>                 | <b>0.9</b>                                         | <b>1,032</b>                           |
| NAICS 5413 – Architectural, Engineering, and Related Services                       | 84,452                         | 0.7                                                | 612                                    |
| NAICS 5414 – Industrial Design                                                      | 10,458                         | 3.4                                                | 352                                    |
| NAICS 5417 – Scientific Research and Development                                    | 25,297                         | 0.3                                                | 68                                     |

SOURCE: IMPLAN Social Accounting Matrix for the state of Michigan, author calculations.

Michigan's Core Automotive manufacturers (NAICS 3361–3363) account for 173,082 jobs, and when combined with all Upstream supply industries, the Upstream plus Core Automotive total reached 231,553 jobs in 2024.

Downstream industries, including vehicle wholesalers, retailers, repair shops, gasoline stations, and freight trucking, are not adjusted using IMPLAN SAM auto shares. In these segments, either 1) the connection to the automotive sector is explicit by definition (e.g., automobile dealers, automotive parts retailers, repair and maintenance shops), or 2) IMPLAN's commodity-flow framework does not offer a forward-linkage mechanism that would allow us to reliably estimate how much of Downstream output is driven by vehicle manufacturing versus broader economic activity.<sup>3</sup> As a result, Downstream employment is held at its full QCEW levels, preserving a representation of the labor required for sales, distribution, maintenance, fueling, and logistics functions that support Michigan's automotive ecosystem and related economic activity. Downstream industry employment represents an additional 231,829 jobs, or 6.1 percent of statewide private QCEW employment in 2024.

## Industry employment projections: Methodology

We employ Moody's Analytics industry employment forecasts for Michigan to project state-level employment across our 38 detailed NAICS industries.<sup>4</sup> Moody's provides high-frequency, model-based projections for state-level employment across detailed NAICS sectors, updated regularly as macroeconomic and industry conditions change. These projections offer a state-specific assessment of structural and cyclical forces shaping Michigan's manufacturing and service economies and enable us to evaluate how workforce demand may shift in the years ahead. We begin with baseline 2024 employment for all Michigan NAICS industries, drawn from the Quarterly Census of Employment and Wages (QCEW). For Upstream industries that serve customers outside the automotive sector, we apply

Social Accounting Matrix (SAM) automotive purchase shares to determine the portion of each industry's employment attributable to automotive demand. This produces a 2024 automotive-adjusted baseline for all Upstream industries in our supply-chain definition. We then apply industry-specific growth rates from Moody's to produce projected employment levels through 2030.

Projected industry employment is aggregated to the report's 10 supply-chain segments and three production stages, producing two parallel metrics for each year:

- 1) *total employment*, representing all jobs in a segment regardless of end use; and
- 2) *automotive employment*, representing only the portion linked to automotive demand through SAM-based attribution.

These segment-level projections later serve as the basis for estimating how employment is distributed across occupations.

## Industry employment projections: Discussion of results

Moody's Michigan industry projections indicate a modest overall decline in automotive-attributed employment through 2030, concentrated primarily in the Upstream portion of the supply chain (see Tables 2–4).

Under Moody's outlook, Upstream automotive employment is predicted to fall from about 58,500 jobs in 2024 to roughly 54,400 by 2030, a decline of about 7 percent.

- Materials and Processing (Segment 1), Forging and Foundries (Segment 3), and Parts and Machining (Segment 4) each would post meaningful losses, reflecting a long-term structural decline in metals, castings, machining, and other legacy production processes.
- Component Systems (Segment 5) and Equipment Manufacturing (Segment 2) experience smaller reductions, while Engineering and Design (Segment 6) remains stable.

<sup>3</sup> Downstream industries, including NAICS 4231–Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers; 4413–Automotive Parts, Accessories, and Tire Retailers; 4411–Automobile Dealers; and 8111–Automotive Repair and Maintenance, are explicitly related to automotive activity. Downstream industries 4235–Metal and Mineral (except Petroleum) Merchant Wholesalers; 4238–Machinery, Equipment, and Supplies Merchant Wholesalers; 4239–Miscellaneous Durable Goods Merchant Wholesalers; 4247–Petroleum and Petroleum Products Merchant Wholesalers; 4571–Gasoline Stations; 4841–General Freight Trucking; and 4842–Specialized Freight Trucking serve broader markets beyond automotive.

<sup>4</sup> We also evaluated two alternative sources of industry employment projections: Michigan's 10-year industry employment projections produced by the Department of Technology, Management, and Budget (DTMB), and a scenario that applies national industry growth rates from the Bureau of Labor Statistics' (BLS) Employment Projections program to Michigan baseline employment levels. Both sets of projections assume an economy that is at full employment in the end projection year, and as such provide upper bounds on auto-related industry employment impacts. We report our results using these two additional data sources in Appendix C of this report.



**Table 2. Upstream Automotive Employment Projections, 2024–2030**

| Stage, segment, or NAICS title                                                      | Automotive employment, 2024 | Automotive employment, 2030 | Employment change, 2024–2030 | Percentage change, 2024–2030 |
|-------------------------------------------------------------------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|
| <b>Upstream industries</b>                                                          | <b>58,471</b>               | <b>54,355</b>               | <b>–4,116</b>                | <b>–7.0</b>                  |
| <b>1. Materials and Processing</b>                                                  | <b>21,248</b>               | <b>19,652</b>               | <b>–1,595</b>                | <b>–7.5</b>                  |
| NAICS 3252 – Resin, Synthetic Rubber, Artificial and Synthetic Fibers and Filaments | 489                         | 469                         | –20                          | –4.0                         |
| NAICS 3255 – Paint, Coating, and Adhesive Manufacturing                             | 2,239                       | 2,237                       | –2                           | –0.1                         |
| NAICS 3261 – Plastics Product Manufacturing                                         | 8,066                       | 7,598                       | –468                         | –5.8                         |
| NAICS 3262 – Rubber Product Manufacturing                                           | 2,821                       | 2,454                       | –367                         | –13.0                        |
| NAICS 3272 – Glass and Glass Product Manufacturing                                  | 1,610                       | 1,464                       | –147                         | –9.1                         |
| NAICS 3311 – Iron and Steel Mills and Ferroalloy Manufacturing                      | 1,354                       | 1,124                       | –230                         | –17.0                        |
| NAICS 3312 – Steel Product Manufacturing from Purchased Steel                       | 793                         | 674                         | –119                         | –15.0                        |
| NAICS 3313 – Alumina and Aluminum Production and Processing                         | 865                         | 769                         | –97                          | –11.2                        |
| NAICS 3314 – Nonferrous Metal (except Aluminum) Production and Processing           | 370                         | 308                         | –62                          | –16.7                        |
| NAICS 3328 – Coating, Engraving, Heat Treating, and Allied Activities               | 2,641                       | 2,556                       | –85                          | –3.2                         |
| <b>2. Equipment Manufacturing</b>                                                   | <b>6,245</b>                | <b>6,107</b>                | <b>–137</b>                  | <b>–2.2</b>                  |
| NAICS 3335 – Metalworking Machinery Manufacturing                                   | 2,312                       | 2,132                       | –180                         | –7.8                         |
| NAICS 3339 – Other General Purpose Machinery Manufacturing                          | 3,932                       | 3,975                       | 43                           | 1.1                          |
| <b>3. Forging and Foundries</b>                                                     | <b>9,023</b>                | <b>7,470</b>                | <b>–1,553</b>                | <b>–17.2</b>                 |
| NAICS 3315 – Foundries                                                              | 6,281                       | 4,842                       | –1,438                       | –22.9                        |
| NAICS 3321 – Forging and Stamping                                                   | 2,742                       | 2,627                       | –115                         | –4.2                         |
| <b>4. Parts and Machining</b>                                                       | <b>14,936</b>               | <b>14,209</b>               | <b>–727</b>                  | <b>–4.9</b>                  |
| NAICS 3326 – Spring and Wire Product Manufacturing                                  | 1,153                       | 1,138                       | –15                          | –1.3                         |
| NAICS 3327 – Machine Shops; Turned Product; and Screw, Nut, and Bolt                | 9,319                       | 8,704                       | –615                         | –6.6                         |
| NAICS 3329 – Other Fabricated Metal Product Manufacturing                           | 1,740                       | 1,725                       | –16                          | –0.9                         |
| NAICS 3344 – Semiconductor and Other Electronic Component Manufacturing             | 2,724                       | 2,642                       | –82                          | –3.0                         |
| <b>5. Component Systems</b>                                                         | <b>5,987</b>                | <b>5,869</b>                | <b>–118</b>                  | <b>–2.0</b>                  |
| NAICS 3336 – Engine, Turbine, and Power Transmission Equipment Manufacturing        | 3,563                       | 3,403                       | –160                         | –4.5                         |
| NAICS 3345 – Navigational, Measuring, Electromedical, and Control Instruments       | 185                         | 180                         | –5                           | –2.7                         |
| NAICS 3359 – Other Electrical Equipment and Component Manufacturing                 | 2,239                       | 2,286                       | 47                           | 2.1                          |
| <b>6. Engineering and Design</b>                                                    | <b>1,032</b>                | <b>1,048</b>                | <b>16</b>                    | <b>1.5</b>                   |
| NAICS 5413 – Architectural, Engineering, and Related Services                       | 612                         | 628                         | 17                           | 2.7                          |
| NAICS 5414 – Industrial Design                                                      | 352                         | 345                         | –7                           | –2.0                         |
| NAICS 5417 – Scientific Research and Development                                    | 68                          | 75                          | 6                            | 9.3                          |

NOTE: Figures in this table reflect the IMPLAN SAM adjusted shares to estimate the automotive-related component of Upstream industry employment.  
 SOURCE: BLS Quarterly Census of Employment and Wages, IMPLAN Social Accounting Matrix, Moody's Analytics industry forecasts, author calculations.

**Table 3. Core Automotive Employment Projections, 2024–2030**

| Stage, segment, or NAICS title                            | Automotive employment, 2024 | Automotive employment, 2030 | Employment change, 2024–2030 | Percentage change, 2024–2030 |
|-----------------------------------------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|
| <b>Core Automotive</b>                                    | <b>173,082</b>              | <b>174,973</b>              | <b>1,891</b>                 | <b>1.1</b>                   |
| <b>7. Core Automotive</b>                                 | <b>173,082</b>              | <b>174,973</b>              | <b>1,891</b>                 | <b>1.1</b>                   |
| NAICS 3361 – Motor Vehicle Manufacturing                  | 48,138                      | 61,232                      | 13,094                       | 27.2                         |
| NAICS 3362 – Motor Vehicle Body and Trailer Manufacturing | 7,921                       | 7,953                       | 32                           | 0.4                          |
| NAICS 3363 – Motor Vehicle Parts Manufacturing            | 117,023                     | 105,789                     | –11,234                      | –9.6                         |

SOURCE: BLS Quarterly Census of Employment and Wages, Moody’s Analytics industry forecasts, author calculations.

**Table 4. Downstream Employment Projections, 2024–2030**

| Stage, segment, or NAICS title                                                       | Automotive employment, 2024 | Automotive employment, 2030 | Employment change, 2024–2030 | Percentage change, 2024–2030 |
|--------------------------------------------------------------------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|
| <b>Downstream industries</b>                                                         | <b>231,829</b>              | <b>230,376</b>              | <b>–1,453</b>                | <b>–0.6</b>                  |
| <b>8. Motor Vehicle Parts, Materials, and Products Sales</b>                         | <b>115,340</b>              | <b>116,956</b>              | <b>1,616</b>                 | <b>1.4</b>                   |
| NAICS 4231 – Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers | 25,978                      | 26,939                      | 961                          | 3.7                          |
| NAICS 4235 – Metal and Mineral (except Petroleum) Merchant Wholesalers               | 6,359                       | 6,308                       | –51                          | –0.8                         |
| NAICS 4238 – Machinery, Equipment, and Supplies Merchant Wholesalers                 | 24,407                      | 24,651                      | 244                          | 1.0                          |
| NAICS 4239 – Miscellaneous Durable Goods Merchant Wholesalers                        | 8,732                       | 8,749                       | 17                           | 0.2                          |
| NAICS 4247 – Petroleum and Petroleum Products Merchant Wholesalers                   | 3,846                       | 3,627                       | –219                         | –5.7                         |
| NAICS 4413 – Automotive Parts, Accessories, and Tire Retailers                       | 18,192                      | 18,410                      | 218                          | 1.2                          |
| NAICS 4571 – Gasoline Stations                                                       | 27,826                      | 28,271                      | 445                          | 1.6                          |
| NAICS 3313 – Alumina and Aluminum Production and Processing                          | 865                         | 769                         | –97                          | –11.2                        |
| NAICS 3314 – Nonferrous Metal (except Aluminum) Production and Processing            | 370                         | 308                         | –62                          | –16.7                        |
| NAICS 3328 – Coating, Engraving, Heat Treating, and Allied Activities                | 2,641                       | 2,556                       | –85                          | –3.2                         |
| <b>9. Dealers, Maintenance, and Repair</b>                                           | <b>69,600</b>               | <b>71,696</b>               | <b>2,096</b>                 | <b>3.0</b>                   |
| NAICS 4411 – Automobile Dealers                                                      | 38,262                      | 38,415                      | 153                          | 0.4                          |
| NAICS 8111 – Automotive Repair and Maintenance                                       | 31,338                      | 33,281                      | 1,943                        | 6.2                          |
| <b>10. Logistics</b>                                                                 | <b>46,889</b>               | <b>41,724</b>               | <b>–5,165</b>                | <b>–11.0</b>                 |
| NAICS 4841 – General Freight Trucking                                                | 35,249                      | 31,830                      | –3,419                       | –9.7                         |
| NAICS 4842 – Specialized Freight Trucking                                            | 11,640                      | 9,894                       | –1,746                       | –15.0                        |

SOURCE: BLS Quarterly Census of Employment and Wages, Moody’s Analytics industry forecasts, author calculations.

Core Automotive manufacturing (NAICS 3361–3363) shows slight growth, with automotive-attributed employment rising from 173,082 in 2024 to about 175,000 in 2030. However, forecast employment trends are divergent within the segment.

- Employment in motor-vehicle manufacturing (3361) rises strongly, increasing from 48,138 jobs in 2024 to 61,232 in 2030, a gain of 27.2 percent.
- Employment in motor-vehicle body and trailer manufacturing (3362) remains essentially flat, while motor-vehicle parts manufacturing (3363) contracts significantly, falling from 117,023 to 105,789 jobs (a decline of 9.6 percent), consistent with ongoing supplier consolidation, efficiency gains, and electrification-driven shifts in component content. The modest overall increase within this segment is consistent with independent forecasts (CAR, RSQE)<sup>5</sup> that anticipate slightly higher U.S. light-vehicle production over the decade, as well as stabilization in assembly operations within Michigan.
- The overall gain in Core Automotive partially offsets declines in the Upstream segment, but not enough to reverse the downward trend in automotive-related manufacturing employment across the supply chain.

Downstream employment remains essentially flat, declining only slightly (–0.6 percent) between 2024 and 2030.

- Segments 8 and 9 (Sales and Service) show small gains, while Segment 10 (Logistics) accounts for most of the Downstream contraction, declining by more than 5,000 automotive-attributed jobs (–11 percent). This likely reflects an anticipated unwinding of the pandemic-era surge in freight movement and warehousing.

- Despite this logistics contraction, the overall stability of Downstream industries highlights the persistent labor requirements of vehicle sales, service, and distribution networks. Should freight activity stabilize at higher levels than Moody's projects, Downstream employment could outperform expectations, tilting the Downstream segment toward modest net growth by 2030 and partially offsetting contraction elsewhere in the mobility ecosystem.<sup>6</sup>

## Occupational employment patterns in Upstream, Core, and Downstream industries

The remainder of our analysis focuses on the occupations that are critical to Michigan's automotive supply chain. We begin by describing baseline occupational staffing patterns across the 10 supply-chain segments in 2024, spanning the Upstream, Core, and Downstream stages. We then examine the typical education that is required to enter these occupations and the usual training that is received after hire. Finally, we describe our approach for projecting occupational employment change from 2024 to 2030 and present the resulting estimates.

<sup>5</sup> Center for Automotive Research, *Analysis of Global Data Light Vehicle Sales by Powertrain*; and University of Michigan Research Seminar in Quantitative Economics, *Michigan Economic Forecast* (2024).

<sup>6</sup> Logistics employment in Michigan expanded significantly in the years following the pandemic, adding about 4,400 jobs (+9.9 percent) between 2020 and 2022. Recent years have shown contraction in these industries, with employment in 2024 standing near 47,000, about 2,300 jobs (–4.9 percent) below its level in 2022. Moody's industry outlook is more contractionary than alternative sources of forecasts, which hold employment in these industries essentially flat throughout the forecast window (see Appendix A.1).



# 2024 Baseline Staffing Patterns by Segment

The major occupational groups that compose the 10 supply chain segments are examined in this section, as well as how education and training requirements overlay with these occupational distributions (see Table 5).

**Table 5. Major Occupational Staffing Patterns by Segment, 2024**

| Major occupational group              | Share of segment employment (%) | Major occupational group                                    | Share of segment employment (%) |
|---------------------------------------|---------------------------------|-------------------------------------------------------------|---------------------------------|
| <b>1. Materials and Processing</b>    |                                 | <b>6. Engineering and Design</b>                            |                                 |
| Production                            | 66.0                            | Architecture and Engineering                                | 39.4                            |
| Transportation and Material Moving    | 5.2                             | Management                                                  | 11.8                            |
| Installation, Maintenance, and Repair | 5.2                             | Business and Financial Operations                           | 9.8                             |
| Office and Administrative Support     | 4.9                             | Computer and Mathematical                                   | 9.3                             |
| Management                            | 4.8                             | Production                                                  | 8.3                             |
| Architecture and Engineering          | 4.8                             | Office and Administrative Support                           | 5.8                             |
| <b>2. Equipment Manufacturing</b>     |                                 | <b>7. Core Automotive</b>                                   |                                 |
| Production                            | 50.5                            | Production                                                  | 65.0                            |
| Architecture and Engineering          | 12.5                            | Architecture and Engineering                                | 7.7                             |
| Office and Administrative Support     | 8.6                             | Management                                                  | 5.1                             |
| Management                            | 8.0                             | Installation, Maintenance, and Repair                       | 4.9                             |
| Business and Financial Operations     | 6.3                             | Transportation and Material Moving                          | 4.9                             |
| Sales and Related                     | 4.0                             | Business and Financial Operations                           | 3.5                             |
| <b>3. Forging and Foundries</b>       |                                 | <b>8. Motor Vehicle Parts, Materials, and Product Sales</b> |                                 |
| Production                            | 63.6                            | Sales and Related                                           | 35.9                            |
| Office and Administrative Support     | 6.3                             | Transportation and Material Moving                          | 17.2                            |
| Installation, Maintenance, and Repair | 6.3                             | Installation, Maintenance, and Repair                       | 11.2                            |
| Management                            | 6.1                             | Office and Administrative Support                           | 8.1                             |
| Transportation and Material Moving    | 6.1                             | Management                                                  | 7.5                             |
| Architecture and Engineering          | 4.4                             | Production                                                  | 6.8                             |
| <b>4. Parts and Machining</b>         |                                 | <b>9. Dealers, Maintenance, and Repair</b>                  |                                 |
| Production                            | 61.6                            | Installation, Maintenance, and Repair                       | 36.8                            |
| Office and Administrative Support     | 7.8                             | Transportation and Material Moving                          | 20.3                            |
| Management                            | 6.8                             | Sales and Related                                           | 19.8                            |
| Architecture and Engineering          | 6.4                             | Office and Administrative Support                           | 11.7                            |
| Transportation and Material Moving    | 4.9                             | Management                                                  | 6.2                             |
| Business and Financial Operations     | 4.5                             | Business and Financial Operations                           | 2.5                             |
| <b>5. Component Systems</b>           |                                 | <b>10. Logistics</b>                                        |                                 |
| Production                            | 36.1                            | Transportation and Material Moving                          | 71.0                            |
| Architecture and Engineering          | 18.0                            | Office and Administrative Support                           | 10.4                            |
| Management                            | 10.3                            | Installation, Maintenance, and Repair                       | 5.3                             |
| Business and Financial Operations     | 8.5                             | Management                                                  | 5.3                             |
| Office and Administrative Support     | 7.7                             | Business and Financial Operations                           | 5.0                             |
| Computer and Mathematical             | 5.8                             | Sales and Related                                           | 1.2                             |

SOURCE: Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, custom aggregations.

In the Upstream manufacturing segments, Production occupations (SOC 51-0000) dominate the workforce. Production roles account for

- 66 percent of employment in Materials and Processing
- 50 percent in Equipment Manufacturing
- 64 percent in Forging and Foundries
- 62 percent in Parts and Machining
- 36 percent in Component Systems

According to O\*NET and the Occupational Outlook Handbook, these occupations include assemblers, machinists, welders, operators, and industrial technicians responsible for transforming raw materials into finished components. They require mechanical aptitude, familiarity with industrial processes, and, increasingly, proficiency with digitally controlled equipment and automation systems.

Other major occupational groups also play important roles upstream:

- Office and Administrative Support (SOC 43-0000)—5–9 percent of jobs, supporting logistics, scheduling, and plant operations
- Installation, Maintenance and Repair (SOC 49-0000)—5–6 percent, maintaining equipment and ensuring plant operability
- Transportation and Material Moving (SOC 53-0000)—5–6 percent, manually moving input and output materials
- Architecture and Engineering (SOC 17-0000)—4–18 percent, reflecting design, quality assurance, process engineering, and industrial optimization

These patterns illustrate that Upstream industries rely on a blend of hands-on manufacturing skills and technical engineering expertise, with production roles still forming the foundation of Michigan's supplier base.

## Engineering and Design (Segment 6)

Segment 6 is dominated by architecture and engineering occupations (39 percent), supported by management (12 percent) and business and financial operations (10 percent). These analytical and R&D-oriented roles require higher levels of formal education and specialized knowledge in vehicle design, testing, simulation, and systems development.

## Core Automotive (Segment 7)

Core Automotive manufacturing remains heavily production oriented, with production occupations accounting for 65 percent of employment. Additional prominent groups include:

- Architecture and engineering (8 percent)
- Management (5 percent)
- Installation, maintenance and repair (5 percent)

This structure resembles the Upstream segments and is concentrated in assembly roles that contribute to the installation, calibration, and testing of mechanical, electrical, and software subsystems, which together form a complete vehicle.

## Downstream segments (8–10)

Downstream segments present the most heterogeneous occupational structure:

- **Segment 8: Parts, Materials and Product Sales** is anchored by Sales and Related Occupations (36 percent), supported by Transportation and Material Moving (17 percent) and Installation, Repair, and Maintenance (11 percent).
- **Segment 9: Dealers, Maintenance and Repair** is dominated by Installation, Maintenance and Repair (37 percent) and Transportation and Material Moving (20 percent), with service technicians occupying the largest share of detailed occupations.
- **Segment 10: Logistics** is overwhelmingly composed of Transportation and Material Moving occupations (71 percent), including truck drivers, freight movers, and warehouse labor, supported by Office and Administrative Support (10 percent) and Installation, Repair and Maintenance roles (5 percent).

# Typical Education and Training Requirements for Auto-Related Occupations

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Understanding the composition of Michigan's automotive supply chain workforce requires a clear view of the education and training requirements associated with the occupations that appear in each segment. The Bureau of Labor Statistics (BLS) provides a consistent national framework for classifying these requirements through its Employment Projections (EP) program, documented in the BLS *Handbook of Methods*. In this system, each occupation is assigned two primary characteristics:

- 1) Typical education needed for entry
- 2) Typical training and work experience needed to become competent in the role

These classifications allow us to evaluate not only what kinds of occupations populate each segment, but also the skill development pathways that shape employment dynamics over time.

## 1. Typical education needed for entry

BLS assigns each occupation to one of eight categories representing the most common level of formal education required to enter that occupation nationwide. These categories range from high school or less to advanced degrees:

- Doctoral or professional degree
- Master's degree
- Bachelor's degree
- Associate degree
- Postsecondary nondegree award (e.g., certificate)
- Some college, no degree
- High school diploma or equivalent
- No formal educational credential

This classification is not a requirement imposed by employers, but rather a statistical generalization reflecting the education level held by most workers recently entering the occupation.<sup>7</sup>

## 2. Typical training and work-experience requirements

In addition to formal education, BLS also assigns each occupation a category for training needed to achieve competency and a category for work experience in a related occupation, if commonly required. These categories help distinguish occupations that require extensive on-the-job learning from those with formalized entry pathways such as apprenticeships.

Training categories include:

- **Short-term on-the-job training** ( $\leq 1$  month)
- **Moderate-term on-the-job training** (1–12 months)
- **Long-term on-the-job training** ( $> 12$  months)
- **Apprenticeship** (structured multiyear programs combining paid work and instruction)
- **Internship or residency** (common in health and professional fields)

These training indicators capture the skill acquisition process, which is particularly relevant in automotive manufacturing, where many production-adjacent roles, such as industrial machinery mechanics, tool-and-die makers, or automotive body repairers, require extended employer-based training or formal apprenticeships rather than advanced degrees.

By integrating BLS's education and training assignments with Michigan's occupational employment data, we can describe the skill profile of each supply-chain segment in a standardized and policy-relevant way. This framework also helps identify where employers rely heavily on formally educated workers (e.g., engineers, software developers, business operations roles) versus where they depend on skilled trades and production occupations that require substantial on-the-job training. The classification system is foundational for interpreting both the baseline staffing patterns observed in 2024 and the projected occupational changes through 2030.

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<sup>7</sup> BLS economists assign occupations to categories based on analyses of qualitative and quantitative information. Sources of quantitative data include educational attainment data from the Census Bureau's American Community Survey (ACS); data on education, work experience, and on-the-job training requirements from the Occupational Information Network (O\*NET); and data on postsecondary program completions from the National Center for Education Statistics. In addition, economists evaluated qualitative information obtained from educators, employers, workers in the occupation, training experts, and representatives of professional and trade associations and unions ([Measures of Education and Training](#), Bureau of Labor Statistics, accessed December 2025).



# 2024 Baseline Educational and Training Characteristics by Segment

To interpret how skill requirements vary across the automotive supply chain, we combine the Bureau of Labor Statistics (BLS) classifications for *typical education needed for entry* and *typical on-the-job training need to achieve competency*. These classifications allow us to group occupations into meaningful categories of skill preparation.

For this analysis, occupations are grouped as follows:

- **Bachelor’s degree or higher (BA+):** Occupations whose typical entry requirement is at least a bachelor’s degree, including master’s, doctoral, and professional degree occupations.
- **Associate degree:** Occupations that typically require an associate degree for entry.
- **High school, some college; moderate, long-term, or apprenticeship training:** Occupations requiring less formal education than an associate degree but with significant employer-based training, including moderate- or long-term on-the-job training and registered apprenticeships. This grouping captures many skilled trades and technical production roles.
- **High school, some college; no significant employer training:** Occupations requiring less than an associate degree and short-term or no structured training, which represent jobs with the fewest formal skill requirements.

With these categories defined, we examine how education and training requirements differ across the 10 supply-chain segments (see Table 6).

## Upstream manufacturing (Segments 1–5)

The Upstream segments are characterized by high concentrations of occupations requiring significant employer-based training. Between 43 and 69 percent of workers in these segments fall into the category of *high school or some college with moderate, long-term, or apprenticeship training*. These are the skilled production and maintenance trades that underpin materials processing, machining, foundries, and component production.

The share of jobs requiring a bachelor’s degree or higher ranges from 12 to 41 percent, with the highest concentrations in Component Systems (40.8 percent), reflecting the segment’s increasing orientation toward electronics, advanced sensors, and powertrain-control technologies. Roles that explicitly require an associate degree remain relatively few throughout the Upstream segments (1–3 percent).

Table 6. Education and Training Characteristics by Segment, 2024

| Segment                                               | High school, some college; no significant employer training (%) | High school, some college; moderate, long-term, or apprenticeship training (%) | Associate degree (%) | Bachelor’s degree or higher (%) |
|-------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------|---------------------------------|
| 1. Materials and Processing                           | 21.8                                                            | 60.3                                                                           | 1.7                  | 16.2                            |
| 2. Equipment Manufacturing                            | 14.2                                                            | 57.4                                                                           | 1.8                  | 26.7                            |
| 3. Forging and Foundries                              | 18.0                                                            | 68.5                                                                           | 0.8                  | 12.7                            |
| 4. Parts and Machining                                | 16.4                                                            | 64.8                                                                           | 1.7                  | 17.1                            |
| 5. Component Systems                                  | 13.1                                                            | 42.8                                                                           | 3.3                  | 40.8                            |
| 6. Engineering and Design                             | 7.9                                                             | 13.4                                                                           | 7.3                  | 71.5                            |
| 7. Core Automotive                                    | 11.5                                                            | 70.5                                                                           | 1.6                  | 16.4                            |
| 8. Motor Vehicle Parts, Materials, and Products Sales | 57.0                                                            | 25.3                                                                           | 0.7                  | 17.0                            |
| 9. Dealers, Maintenance, and Repair                   | 73.3                                                            | 17.8                                                                           | 0.1                  | 8.8                             |
| 10. Logistics                                         | 79.0                                                            | 12.4                                                                           | 0.3                  | 8.3                             |

SOURCE: Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, custom aggregations.

## Engineering and Design (Segment 6)

Engineering and Design has a different profile. More than 71 percent of these jobs require a bachelor's degree or higher, and an additional 7.3 percent require an associate degree. Smaller shares of workers fall into the lower-skill or employer-training categories, reflecting the concentrated presence of high-skill technical occupations in this part of the supply chain.

## Core Automotive (Segment 7)

Skill requirements in Core Automotive manufacturing employment resemble the Upstream manufacturing segments, with 70.5 percent of jobs requiring significant training short of a college degree. Another 11.5 percent of jobs fall into lower-education categories with limited training requirements, while 16.4 percent require a bachelor's degree or higher.

## Downstream segments (8–10)

Across the Downstream segments, a larger share of jobs falls into the lowest education-and-training category.

- In Segment 8—Parts, Materials and Product Sales: Fifty-seven percent of jobs require only a high school degree or some college with no significant employer training, reflecting sales, customer service, and warehouse roles.
- In Segment 9—Dealers, Maintenance, and Repair: Lower-skilled service and administrative occupations make up 73.3 percent of employment, alongside a smaller concentration of skilled trades and employer-trained roles (17.8 percent).
- Segment 10—Logistics: This has the highest proportion of lower-skill jobs (79 percent) due to the dominance of freight movers, truck drivers, and warehouse labor.

Understanding these baseline differences is critical for interpreting projected occupational changes through 2030, especially as electrification, automation, and software integration place increasing emphasis on higher-skilled technical and engineering roles across the supply chain.

# Projecting Occupational Employment through 2030

Occupational forecasts in this report are based on two sources of movement:

- 1) *changes in industry employment*, as projected by Moody's Analytics for Michigan; and
- 2) *changes in the distribution of occupations within each industry*, as modeled by the U.S. Bureau of Labor Statistics' (BLS) Employment Projections program.

Together, these components allow us to understand not only how many jobs may be gained or lost in each segment, but also which occupations are likely to expand or contract as the industry evolves.

We begin with detailed staffing patterns from the Michigan Center for Data and Analytics (MCDA), which allocates 2024 employment across detailed occupations within each of the 10 supply-chain segments.

Because occupational mixes within industries evolve over time, we adjust Michigan's 2024 staffing patterns using

industry-specific occupational trends from the BLS Employment Projections (EP) program. The BLS provides national projections of occupational shares for 2024 and 2034, grounded in the agency's *Handbook of Methods*, which incorporates expectations about the following:

- technological adoption
- productivity trends
- organizational restructuring
- changing skill requirements
- shifts in industry demand

For each occupation within each segment, we calculate an annualized rate of change in national occupational share for that segment.<sup>8</sup> Occupations that are expected to grow nationally (e.g., engineering, computing, data, logistics, and technical management) receive gradually increasing shares within each segment. Occupations projected to decline nationally (e.g., many production, clerical, and routine roles) see their shares

<sup>8</sup> Specifically, we rely on BLS Employment Projections Table 1.9, which reports national occupational staffing patterns by detailed industry (primarily at the four-digit NAICS level). A national occupation-segment share is calculated for 2024 and 2034 by aggregating over the detailed industries.

decrease. This process allows Michigan’s occupational distributions to shift in line with structural forces affecting the nation’s economy, rather than remaining fixed at 2024 levels.

After adjusting the occupational mixes for each year, we multiply these shares by the segment-level job totals generated from Moody’s Michigan industry forecast. This step translates industry employment change into detailed occupational projections. If a segment grows, all occupations in that segment grow in proportion to their evolving share; if the segment contracts, occupational employment falls accordingly. The result is a full, time-series projection of occupation-level employment from 2024 to 2030 across the entire automotive supply chain.

Finally, we estimate annual job openings using baseline opening rates from MCDA. These openings combine projected growth openings (from net employment change) and replacement openings (from retirement, turnover, or internal mobility). Please note that annual job openings are not the same as job postings in a year. The latter reflect turnover across jobs within an industry or segment. Rather, annual job openings reflect the overall net addition of jobs that need to be filled owing to net employment growth in the occupation and as a

replacement for those who leave an occupation permanently. This estimate is a critical indicator of the anticipated number of individuals that will require the level of education and training associated with each occupation.

Projected trends in automotive-related employment across the supply chain

Tables 2–4, above, reported employment projections for Upstream, Core, and Downstream automotive industries in detail for the supply-chain segments and NAICS industries within each. These projections, summarized at stage level in Table 7, show the following:

- Upstream automotive employment declined by about 4,100 jobs (7.0 percent) in Michigan through 2030.
- Core Automotive employment expanded by about 1,900 jobs (1.1 percent).
- Downstream employment declined by about 1,500 jobs (0.6 percent).
- Total employment across the automotive supply chain declined by about 3,700 (0.8 percent) through 2030.

Table 7. Automotive Supply Chain Employment Projections, 2024–2030

| Stage                         | Automotive employment, 2024 | Automotive employment, 2030 | Employment change, 2024–2030 | Percentage change, 2024–2030 |
|-------------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|
| Upstream industries           | 58,471                      | 54,355                      | –4,116                       | –7.0                         |
| Core Automotive               | 173,082                     | 174,973                     | 1,891                        | 1.1                          |
| Downstream industries         | 231,829                     | 230,376                     | –1,453                       | –0.6                         |
| Total automotive supply chain | 463,382                     | 459,704                     | –3,678                       | –0.8                         |

SOURCE: BLS Quarterly Census of Employment and Wages, Moody’s Analytics industry forecasts, author calculations.

Table 8. Forecast Employment Change by Education and Training Requirements, All Segments, 2024–2030

| Education and training                                                     | Automotive–related employment, 2024 | Automotive–related employment, 2030 | Employment change, 2024–2030 | Percentage change, 2024–2030 |
|----------------------------------------------------------------------------|-------------------------------------|-------------------------------------|------------------------------|------------------------------|
| Bachelor's degree or higher                                                | 70,121                              | 71,776                              | 1,655                        | 2.4                          |
| Associate degree                                                           | 4,865                               | 4,765                               | –101                         | –2.1                         |
| High school, some college; moderate, long-term, or apprenticeship training | 204,301                             | 203,318                             | –983                         | –0.5                         |
| High school, some college; no significant employer training                | 184,094                             | 179,845                             | –4,249                       | –2.3                         |
| Total, all education and training requirements                             | 463,382                             | 459,704                             | –3,678                       | –0.8                         |

SOURCE: Moody’s Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

Trends in the education and training requirements of projected occupational employment change across the automotive sector

Our findings suggest that even as total automotive-related employment declines modestly through 2030, the composition of jobs will shift toward higher-skilled roles (see Table 8). Across all segments combined, employment in occupations requiring a bachelor’s degree or higher increases by 2.4 percent (from 70,121 to 71,776 jobs), while total automotive-related employment declines by 0.8 percent. The largest projected losses occur among the least-skilled occupations—those requiring high school or some college with no significant employer training—which decline by 2.3 percent (about 4,249 jobs). Occupations requiring moderate, long-term, or apprenticeship training remain comparatively stable (declining by 0.5 percent), while associate-degree occupations decline modestly (by 2.1 percent). The projections

indicate that even in a mildly contractionary environment, higher-skilled occupations hold ground or expand while lower-skilled roles account for a disproportionate share of net job loss.

By 2030, nearly every segment shows a higher share of employment in BA+ occupations relative to 2024 (Tables 9 and 10), including traditional Upstream manufacturing segments and the Core Automotive segment. In other words, the projected shift in skills is not limited to engineering and design segments but appears as a broad-based tilt toward more education-intensive occupational mixes throughout the automotive ecosystem.

This shift toward higher education and training requirements over the projection period is consistent with recent trends since the recession brought on by the Covid-19 pandemic. Tables 9 and 10 extend this view over time, illustrating how these occupational shares evolve within each segment across the 2021–2030 period.

Table 9. Education and Training Characteristics by Stage, 2021–2030  
Panel A: HS No Training and HS with Training

| Stage                        | High school, some college; no significant employer training |                 |                 | High school, some college; moderate, long-term, or apprenticeship training |                 |                 |
|------------------------------|-------------------------------------------------------------|-----------------|-----------------|----------------------------------------------------------------------------|-----------------|-----------------|
|                              | Share, 2021 (%)                                             | Share, 2024 (%) | Share, 2030 (%) | Share, 2021 (%)                                                            | Share, 2024 (%) | Share, 2030 (%) |
| Upstream (Segments 1–6)      | 18.6                                                        | 17.9            | 17.6            | 60.4                                                                       | 59.8            | 59.0            |
| Core Automotive (Segment 7)  | 11.4                                                        | 11.5            | 11.1            | 72.5                                                                       | 70.5            | 70.5            |
| Downstream (Segments 8–10)   | 68.6                                                        | 66.3            | 65.5            | 20.9                                                                       | 20.4            | 20.8            |
| All segments (Segments 1–10) | 40.0                                                        | 39.7            | 39.1            | 45.9                                                                       | 44.1            | 44.2            |

SOURCE: Moody’s Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

Table 9. Education and Training Characteristics by Stage, 2021–2030  
Panel B: Associate Degree and Bachelor’s Degree or Higher

| Stage                        | Associate degree |                 |                 | Bachelor’s degree or higher |                 |                 |
|------------------------------|------------------|-----------------|-----------------|-----------------------------|-----------------|-----------------|
|                              | Share, 2021 (%)  | Share, 2024 (%) | Share, 2030 (%) | Share, 2021 (%)             | Share, 2024 (%) | Share, 2030 (%) |
| Upstream (Segments 1–6)      | 1.3              | 1.8             | 1.9             | 19.8                        | 20.5            | 21.5            |
| Core Automotive (Segment 7)  | 1.6              | 1.6             | 1.6             | 14.6                        | 16.4            | 16.8            |
| Downstream (Segments 8–10)   | 0.1              | 0.4             | 0.4             | 10.4                        | 12.8            | 13.3            |
| All segments (Segments 1–10) | 0.8              | 1.0             | 1.0             | 13.2                        | 15.1            | 15.6            |

SOURCE: Moody’s Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.



**Table 10. Education and Training Characteristics by Segment, 2021–2030 Panel A: HS No Training and HS with Training**

| Stage                                                 | High school, some college; no significant employer training |                 |                 | High school, some college; moderate, long-term, or apprenticeship training |                 |                 |
|-------------------------------------------------------|-------------------------------------------------------------|-----------------|-----------------|----------------------------------------------------------------------------|-----------------|-----------------|
|                                                       | Share, 2021 (%)                                             | Share, 2024 (%) | Share, 2030 (%) | Share, 2021 (%)                                                            | Share, 2024 (%) | Share, 2030 (%) |
| 1. Materials and Processing                           | 21.9                                                        | 21.8            | 21.6            | 59.7                                                                       | 60.3            | 59.9            |
| 2. Equipment Manufacturing                            | 14.9                                                        | 14.2            | 14.0            | 58.8                                                                       | 57.4            | 56.8            |
| 3. Forging and Foundries                              | 17.5                                                        | 18.0            | 18.2            | 69.3                                                                       | 68.5            | 67.8            |
| 4. Parts and Machining                                | 17.8                                                        | 16.4            | 16.1            | 64.0                                                                       | 64.8            | 64.2            |
| 5. Component Systems                                  | 15.6                                                        | 13.1            | 12.8            | 49.2                                                                       | 42.8            | 43.0            |
| 6. Engineering and Design                             | 7.0                                                         | 7.9             | 7.6             | 12.4                                                                       | 13.4            | 13.0            |
| 7. Core Automotive                                    | 11.4                                                        | 11.5            | 11.1            | 72.5                                                                       | 70.5            | 70.5            |
| 8. Motor Vehicle Parts, Materials, and Products Sales | 56.3                                                        | 57.0            | 55.7            | 28.1                                                                       | 25.3            | 25.8            |
| 9. Dealers, Maintenance, and Repair                   | 76.4                                                        | 73.3            | 73.5            | 16.4                                                                       | 17.8            | 17.6            |
| 10. Logistics                                         | 85.0                                                        | 79.0            | 79.0            | 11.1                                                                       | 12.4            | 12.1            |

SOURCE: Moody’s Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

**Table 10. Education and Training Characteristics by Segment, 2021–2030 Panel B: Associate Degree and Bachelor’s Degree or Higher**

| Stage                                                 | Associate degree |                 |                 | Bachelor’s degree or higher |                 |                 |
|-------------------------------------------------------|------------------|-----------------|-----------------|-----------------------------|-----------------|-----------------|
|                                                       | Share, 2021 (%)  | Share, 2024 (%) | Share, 2030 (%) | Share, 2021 (%)             | Share, 2024 (%) | Share, 2030 (%) |
| 1. Materials and Processing                           | 1.3              | 1.7             | 1.7             | 17.0                        | 16.2            | 16.8            |
| 2. Equipment Manufacturing                            | 1.5              | 1.8             | 1.7             | 24.8                        | 26.7            | 27.5            |
| 3. Forging and Foundries                              | 0.4              | 0.8             | 0.7             | 12.8                        | 12.7            | 13.3            |
| 4. Parts and Machining                                | 1.3              | 1.7             | 1.8             | 16.9                        | 17.1            | 17.9            |
| 5. Component Systems                                  | 1.4              | 3.3             | 3.2             | 33.8                        | 40.8            | 41.0            |
| 6. Engineering and Design                             | 8.5              | 7.3             | 7.2             | 72.1                        | 71.5            | 72.2            |
| 7. Core Automotive                                    | 1.6              | 1.6             | 1.6             | 14.6                        | 16.4            | 16.8            |
| 8. Motor Vehicle Parts, Materials, and Products Sales | 0.2              | 0.7             | 0.8             | 15.4                        | 17.0            | 17.7            |
| 9. Dealers, Maintenance, and Repair                   | 0.0              | 0.1             | 0.1             | 7.2                         | 8.8             | 8.8             |
| 10. Logistics                                         | 0.0              | 0.3             | 0.2             | 3.8                         | 8.3             | 8.6             |

SOURCE: Moody’s Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

Between 2021 and 2024, employment in occupations that generally required a bachelor’s degree or higher in Michigan’s automotive supply chain grew by 17.8 percent, adding more than 10,600 jobs, even though BA+ occupations represented only about 13 percent of total automotive-related employment in 2021 (see Table 11). In contrast, occupations requiring no significant training from employers, which account for a much larger share of the workforce, grew by just 2.1 percent,

and occupations requiring moderate, long-term, or apprenticeship training declined slightly (by 1.2 percent). Occupations attainable with an associate degree also expanded rapidly in percentage terms (by 28.8 percent), but from a relatively small base. The historical and projected results indicate a consistent directional shift: Michigan’s automotive workforce is becoming more skill- and education-intensive, even when total employment growth is limited.

These patterns align with long-run structural forces reshaping manufacturing nationally, as documented by the Bureau of Labor Statistics.<sup>9</sup> Over multiple decades, automation, productivity gains, and offshoring have reduced the labor intensity of routine production work while increasing employer demand for workers with higher levels of technical skill, analytical capability, and formal education. As a result, the

automotive workforce is increasingly anchored by occupations in engineering, computing, data, logistics, and technical management—roles that support advanced manufacturing processes and digitally integrated production systems. These shifts have important implications for Michigan's workforce strategy, because the state's success in maintaining its competitive position in automotive manufacturing will

**Table 11. Employment Change by Education and Training Requirements, All Segments, 2021–2024**

| Education and training                                                     | Automotive-related employment, 2021 | Automotive-related employment, 2024 | Employment change, 2021–2024 | Percentage change, 2021–2024 |
|----------------------------------------------------------------------------|-------------------------------------|-------------------------------------|------------------------------|------------------------------|
| Bachelor's degree or higher                                                | 59,516                              | 70,121                              | 10,605                       | 17.8                         |
| Associate degree                                                           | 3,777                               | 4,865                               | 1,088                        | 28.8                         |
| High school, some college; moderate, long-term, or apprenticeship training | 206,788                             | 204,301                             | –2,487                       | –1.2                         |
| High school, some college; no significant employer training                | 180,259                             | 184,094                             | 3,835                        | 2.1                          |
| <b>Total, all education and training requirements</b>                      | <b>450,340</b>                      | <b>463,382</b>                      | <b>13,042</b>                | <b>2.9%</b>                  |

SOURCE: Moody's Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

**Table 12. Growing Upstream Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                                  | Auto employment 2024 | Auto employment 2030 | Change | Percentage change | Annual openings |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------|--------|-------------------|-----------------|
| 49–9041 | Industrial Machinery Mechanics<br><i>Education: High school / OJT: Long term / Salary: \$63,760</i>                                                                           | 1,463                | 1,491                | 28     | 1.9               | 141             |
| 51–2028 | Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers<br><i>Education: High school / OJT: Moderate term / Salary: \$44,040</i> | 1,233                | 1,236                | 3      | 0.2               | 137             |
| 17–2141 | Mechanical Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$102,320</i>                                                                                      | 1,068                | 1,081                | 12     | 1.2               | 63              |
| 51–9162 | Computer Numerically Controlled Tool Programmers<br><i>Education: Postsecondary nondegree award / OJT: Moderate term / Salary: \$65,670</i>                                   | 324                  | 332                  | 8      | 2.6               | 33              |
| 15–1252 | Software Developers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$133,080</i>                                                                                       | 363                  | 366                  | 4      | 1.0               | 23              |
| 13–1081 | Logisticians<br><i>Education: Bachelor's degree / OJT: — / Salary: \$80,880</i>                                                                                               | 213                  | 220                  | 7      | 3.3               | 21              |
| 17–2071 | Electrical Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$111,910</i>                                                                                      | 334                  | 337                  | 2      | 0.7               | 20              |
| 51–9141 | Semiconductor Processing Technicians<br><i>Education: High school / OJT: Moderate term / Salary: \$51,180</i>                                                                 | 139                  | 143                  | 4      | 3.1               | 16              |
| 15–2051 | Data Scientists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$112,590</i>                                                                                           | 43                   | 46                   | 3      | 6.3               | 3               |

SOURCE: Moody's Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

<sup>9</sup> Paul Garbarino and Elizabeth Cross, “As Manufacturing Sector Changes, Production Occupations Disappear: An Analysis of Employment from 2007–20,” in *Beyond the Numbers: Employment & Unemployment* 12(16), U.S. Bureau of Labor Statistics, November 2023, <https://www.bls.gov/opub/btn/volume-12/as-manufacturing-sector-changes-production-occupations-disappear-1.htm>.

increasingly depend on its ability to attract, train, and retain workers in higher-skilled occupations: both degree-intensive roles and skilled trades requiring substantial employer-based training.

The following sections present the results of the occupational employment projections through 2030, highlighting which occupations are expected to grow, which will decline, and which may generate the greatest hiring demand across the automotive supply chain.

## Upstream occupational outlook: Skilled occupations that grow even as Upstream manufacturing employment declines

Although Upstream manufacturing employment declines overall under Moody's Michigan scenario, a small but informative set of detailed occupations continues to grow between 2024 and 2030. These occupations are notable less for the size of their employment gains, which are modest, than for their education and training requirements and their role in supporting increasingly complex production environments (see Table 12).

Among the largest absolute increases are Industrial Machinery Mechanics, which add approximately 30 automotive-attributed jobs (+1.9 percent). This occupation is emblematic of the Upstream skill shift: while it does not require a four-year degree, it does rely on long-term on-the-job training and deep technical knowledge of automated and computerized equipment. Industrial Machinery Mechanics also generates a substantial number of annual openings (more than 140 automotive-related openings per year), reflecting both replacement demand and the growing importance of roles ensuring maintenance and reliability as production systems become more automated.

Several engineering and computing occupations also register positive growth, even as Upstream employment contracts. The categories for Mechanical Engineers, Electrical Engineers, Software Developers, Data Scientists, and Logisticians all expand modestly, reinforcing the trend toward higher-skilled professional roles embedded within manufacturing industries. Although these occupations account for relatively small shares of Upstream employment, they are consistently classified as BA+ roles and show rising or stable employment shares over time. Their presence underscores the increasing integration

of engineering, analytics, and supply-chain coordination functions into Upstream production environments.

Growth is not limited to degree-intensive roles. A subset of technically demanding production occupational categories, such as Computer Numerically Controlled (CNC) Tool Programmers, Semiconductor Processing Technicians, and Electromechanical Assemblers, also shows incremental gains. These occupations typically require postsecondary certificates, associate degrees, or moderate to long-term employer training, placing them squarely in the skilled traders and technician category rather than in the lowest-skill tier of the workforce. Their growth aligns with the expanding use of advanced machining, electronics, and precision manufacturing technologies within Upstream industries.

Projected declines in Upstream manufacturing employment are concentrated in a familiar set of production and plant-support occupations, particularly routine machine-operation and metalworking roles. The largest losses occur among metal and plastics processing jobs such as molding and casting machine operators and tenders; cutting, punching, and press operators; plating and grinding machine operators; and other machine-tool occupations. High-volume production roles such as the categories Miscellaneous Assemblers and Fabricators and Inspectors/Testers also decline. Many of these occupations lose employment share over time, consistent with a gradual reweighting away from labor-intensive routine production tasks (see Table 13).

A second pattern can be seen in the contraction in plant logistics and administrative support roles that scale with throughput, including shipping/receiving and inventory clerks, office clerks, stockers and order fillers, and industrial truck and tractor operators. These changes are consistent with continued adoption of lean operations, digitized inventory systems, and warehouse/process automation. Importantly, net employment declines do not imply that these occupations disappear from the workforce or cease to generate hiring demand. Many of the affected occupations still register substantial annual openings, reflecting replacement needs in large existing workforces. From a workforce-planning perspective, the Upstream projection therefore points to a dual reality: a gradual long-run decline in several traditional production and support occupations, paired with continued near-term hiring needs driven by turnover and retirements.

**Table 13. Declining Upstream Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                                       | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 51–2090 | Miscellaneous Assemblers and Fabricators<br><i>Education: High school / OJT: Moderate term / Salary: \$42,210</i>                                                                  | 5,094                      | 4,837                      | –257   | –5.1                 | 543                |
| 51–4041 | Machinists<br><i>Education: High school / OJT: Long term / Salary: \$56,150</i>                                                                                                    | 3,261                      | 3,120                      | –141   | –4.3                 | 321                |
| 51–9061 | Inspectors, Testers, Sorters, Samplers, and Weighers<br><i>Education: High school / OJT: Moderate term / Salary: \$47,460</i>                                                      | 2,670                      | 2,476                      | –194   | –7.3                 | 312                |
| 51–4072 | Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$41,230</i>               | 2,828                      | 2,509                      | –318   | –11.3                | 296                |
| 51–1011 | First-Line Supervisors of Production and Operating Workers<br><i>Education: High school / OJT: — / Salary: \$71,190</i>                                                            | 2,519                      | 2,348                      | –171   | –6.8                 | 243                |
| 53–7062 | Laborers and Freight, Stock, and Material Movers, Hand<br><i>Education: No formal education credential / OJT: Short-term / Salary: \$38,940</i>                                    | 1,421                      | 1,324                      | –97    | –6.8                 | 181                |
| 51–4031 | Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$45,590</i>                   | 1,960                      | 1,687                      | –273   | –13.9                | 172                |
| 43–5071 | Shipping, Receiving, and Inventory Clerks<br><i>Education: High school / OJT: Short term / Salary: \$43,190</i>                                                                    | 1,493                      | 1,313                      | –179   | –12.0                | 125                |
| 51–9161 | Computer Numerically Controlled Tool Operators<br><i>Education: High school / OJT: Moderate term / Salary: \$49,970</i>                                                            | 1,224                      | 1,070                      | –154   | –12.6                | 99                 |
| 43–9061 | Office Clerks, General<br><i>Education: High school / OJT: Short term / Salary: \$43,630</i>                                                                                       | 875                        | 777                        | –98    | –11.2                | 97                 |
| 41–4012 | Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products<br><i>Education: High school / OJT: Moderate term / Salary: \$66,780</i>              | 1,086                      | 1,011                      | –75    | –6.9                 | 95                 |
| 11–1021 | General and Operations Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$102,950</i>                                                                                | 1,095                      | 1,039                      | –56    | –5.1                 | 89                 |
| 11–3051 | Industrial Production Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$121,440</i>                                                                                 | 1,266                      | 1,189                      | –77    | –6.1                 | 89                 |
| 51–4121 | Welders, Cutters, Solderers, and Brazers<br><i>Education: High school / OJT: Moderate term / Salary: \$51,000</i>                                                                  | 865                        | 816                        | –50    | –5.8                 | 85                 |
| 51–4033 | Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$45,190</i> | 1,020                      | 855                        | –165   | –16.2                | 85                 |
| 51–4111 | Tool and Die Makers<br><i>Education: Postsecondary nondegree award / OJT: Long-term / Salary: \$63,180</i>                                                                         | 901                        | 806                        | –95    | –10.5                | 81                 |
| 51–4193 | Plating Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$41,600</i>                                        | 943                        | 786                        | –156   | –16.6                | 80                 |
| 53–7051 | Industrial Truck and Tractor Operators<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$46,390</i>                                                  | 814                        | 748                        | –66    | –8.1                 | 78                 |
| 49–9071 | Maintenance and Repair Workers, General<br><i>Education: High school / OJT: Moderate term / Salary: \$48,620</i>                                                                   | 713                        | 666                        | –48    | –6.7                 | 69                 |
| 51–4081 | Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$46,060</i>                                  | 666                        | 616                        | –49    | –7.4                 | 65                 |
| 53–7065 | Stockers and Order Fillers<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$37,090</i>                                                              | 369                        | 347                        | –22    | –6.1                 | 61                 |



**Table 13 (continued). Declining Upstream Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                  | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 43–4051 | Customer Service Representatives<br><i>Education: High school / OJT: Short term / Salary: \$42,830</i>                                                        | 483                        | 431                        | –52    | –10.8                | 60                 |
| 51–9011 | Chemical Equipment Operators and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$57,090</i>                                             | 486                        | 454                        | –32    | –6.5                 | 53                 |
| 51–9124 | Coating, Painting, and Spraying Machine Setters, Operators, and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$47,590</i>              | 532                        | 480                        | –52    | –9.8                 | 51                 |
| 43–3031 | Bookkeeping, Accounting, and Auditing Clerks<br><i>Education: Some college, no degree / OJT: Moderate term / Salary: \$49,210</i>                             | 442                        | 390                        | –52    | –11.7                | 48                 |
| 13–2011 | Accountants and Auditors<br><i>Education: Bachelor's degree / OJT: — / Salary: \$81,680</i>                                                                   | 604                        | 574                        | –30    | –4.9                 | 46                 |
| 51–4021 | Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$46,980</i>     | 447                        | 411                        | –36    | –8.1                 | 44                 |
| 17–3026 | Industrial Engineering Technologists and Technicians<br><i>Education: Associate degree / OJT: — / Salary: \$64,790</i>                                        | 510                        | 488                        | –22    | –4.3                 | 43                 |
| 51–9198 | Helpers—Production Workers<br><i>Education: High school / OJT: Short term / Salary: \$38,220</i>                                                              | 269                        | 238                        | –31    | –11.5                | 39                 |
| 43–5061 | Production, Planning, and Expediting Clerks<br><i>Education: High school / OJT: Moderate term / Salary: \$57,770</i>                                          | 440                        | 403                        | –37    | –8.3                 | 39                 |
| 51–4071 | Foundry Mold and Coremakers<br><i>Education: High school / OJT: Moderate term / Salary: \$45,700</i>                                                          | 459                        | 349                        | –110   | –23.9                | 37                 |
| 11–9041 | Architectural and Engineering Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$167,740</i>                                                    | 533                        | 513                        | –20    | –3.8                 | 36                 |
| 51–4023 | Rolling Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$48,630</i>                   | 388                        | 330                        | –58    | –14.9                | 34                 |
| 51–9041 | Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$45,130</i> | 378                        | 355                        | –23    | –6.1                 | 34                 |
| 13–1071 | Human Resources Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$72,910</i>                                                                | 370                        | 350                        | –20    | –5.5                 | 31                 |
| 53–3032 | Heavy and Tractor–Trailer Truck Drivers<br><i>Education: Postsecondary nondegree award / OJT: Short term / Salary: \$57,440</i>                               | 297                        | 276                        | –21    | –6.9                 | 31                 |
| 51–4051 | Metal-Refining Furnace Operators and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$55,770</i>                                         | 316                        | 270                        | –46    | –14.5                | 31                 |
| 51–4034 | Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$48,620</i>    | 361                        | 314                        | –47    | –13.1                | 31                 |
| 51–4191 | Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$47,450</i>           | 321                        | 268                        | –53    | –16.6                | 28                 |
| 43–6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive<br><i>Education: High school / OJT: Short term / Salary: \$46,290</i>         | 258                        | 237                        | –21    | –8.1                 | 27                 |
| 51–4199 | Metal Workers and Plastic Workers, All Other<br><i>Education: High school / OJT: Moderate term / Salary: \$42,750</i>                                         | 281                        | 242                        | –39    | –13.8                | 25                 |

**Table 13 (continued). Declining Upstream Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                            | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 51–4122 | Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$47,060</i>        | 285                        | 252                        | –33    | –11.4                | 25                 |
| 49–1011 | First-Line Supervisors of Mechanics, Installers, and Repairers<br><i>Education: High school / OJT: — / Salary: \$78,300</i>                             | 276                        | 257                        | –20    | –7.1                 | 23                 |
| 43–1011 | First-Line Supervisors of Office and Administrative Support Workers<br><i>Education: High school / OJT: — / Salary: \$66,140</i>                        | 248                        | 225                        | –23    | –9.2                 | 23                 |
| 51–4052 | Pourers and Casters, Metal<br><i>Education: High school / OJT: Moderate term / Salary: \$48,940</i>                                                     | 208                        | 173                        | –34    | –16.6                | 21                 |
| 51–9023 | Mixing and Blending Machine Setters, Operators, and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$47,680</i>                    | 231                        | 202                        | –29    | –12.4                | 21                 |
| 51–4022 | Forging Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$49,240</i>             | 179                        | 142                        | –37    | –20.6                | 13                 |
| 51–4035 | Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$48,310</i> | 148                        | 128                        | –21    | –14.0                | 13                 |
| 15–1232 | Computer User Support Specialists<br><i>Education: Some college, no degree / OJT: Moderate term / Salary: \$60,340</i>                                  | 203                        | 179                        | –23    | –11.6                | 12                 |
| 51–4061 | Model Makers, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$62,700</i>                                                | 108                        | 89                         | –19    | –17.9                | 11                 |

SOURCE: Moody’s Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

## Core Automotive occupational outlook: Occupations anchoring a modestly growing segment

Core Automotive employment growth is anchored in large, assembly-oriented occupations, supplemented by skill-intensive professional and technical roles. The largest gains occur in high-employment production occupations, most notably the classification Miscellaneous Assemblers and Fabricators, which is projected to add nearly 3,000 jobs by 2030 and generate substantial annual openings. This reflects the relative stability of vehicle assembly operations in Michigan over the projected period. By comparison, Upstream manufacturing employment is forecast to decline overall, so similarly large production occupations there appear predominantly among the fastest-declining roles.

The difference, therefore, is driven primarily by industry-level employment trajectories rather than by divergent occupational dynamics within each stage of the supply chain.

Core Automotive mirrors Upstream trends in the composition of growth. Many of the fastest-growing occupations (see Table 14), such as industrial and mechanical engineers, software developers, data scientists, logisticians, and project management specialists, require a bachelor’s degree and account for a disproportionate share of net employment gains despite representing only a small share of total employment. In addition, advanced skilled trades, including industrial machinery mechanics, electricians, millwrights, and plumbers/pipefitters, continue to expand and generate steady openings, underscoring the importance of long-term training and apprenticeship pathways within assembly plants.

**Table 14. Growing Core Automotive Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                             | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 51–2090 | Miscellaneous Assemblers and Fabricators<br><i>Education: High school / OJT: Moderate term / Salary: \$42,210</i>                                                        | 66,943                     | 69,901                     | 2,958  | 4.4                  | 7,135              |
| 51–1011 | First-Line Supervisors of Production and Operating Workers<br><i>Education: High school / OJT: — / Salary: \$71,190</i>                                                  | 5,085                      | 5,091                      | 6      | 0.1                  | 490                |
| 17–2112 | Industrial Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$101,140</i>                                                                                 | 5,918                      | 6,249                      | 331    | 5.6                  | 403                |
| 49–9041 | Industrial Machinery Mechanics<br><i>Education: High school / OJT: Long term / Salary: \$63,760</i>                                                                      | 4,173                      | 4,626                      | 453    | 10.9                 | 402                |
| 47–2111 | Electricians<br><i>Education: High school / OJT: Apprenticeship / Salary: \$62,350</i>                                                                                   | 3,380                      | 3,563                      | 183    | 5.4                  | 319                |
| 51–4081 | Multiple Machine Tool Setters, Operators, and Tenders,<br>Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$46,060</i>                     | 2,637                      | 2,699                      | 63     | 2.4                  | 258                |
| 11–3051 | Industrial Production Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$121,440</i>                                                                       | 3,479                      | 3,524                      | 44     | 1.3                  | 244                |
| 51–4121 | Welders, Cutters, Solderers, and Brazers<br><i>Education: High school / OJT: Moderate term / Salary: \$51,000</i>                                                        | 2,349                      | 2,466                      | 117    | 5.0                  | 232                |
| 17–2141 | Mechanical Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$102,320</i>                                                                                 | 3,668                      | 3,880                      | 212    | 5.8                  | 217                |
| 49–9044 | Millwrights<br><i>Education: High school / OJT: Apprenticeship / Salary: \$65,170</i>                                                                                    | 1,318                      | 1,399                      | 81     | 6.1                  | 115                |
| 13–1020 | Buyers and Purchasing Agents<br><i>Education: Bachelor's degree / OJT: Moderate term / Salary: \$75,650</i>                                                              | 1,090                      | 1,130                      | 40     | 3.6                  | 106                |
| 53–7065 | Stockers and Order Fillers<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$37,090</i>                                                    | 605                        | 609                        | 5      | 0.8                  | 99                 |
| 11–9041 | Architectural and Engineering Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$167,740</i>                                                               | 1,408                      | 1,435                      | 27     | 1.9                  | 94                 |
| 15–1252 | Software Developers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$133,080</i>                                                                                  | 1,398                      | 1,524                      | 126    | 9.0                  | 88                 |
| 51–9124 | Coating, Painting, and Spraying Machine Setters, Operators,<br>and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$47,590</i>                      | 912                        | 969                        | 57     | 6.2                  | 87                 |
| 13–1071 | Human Resources Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$72,910</i>                                                                           | 922                        | 933                        | 11     | 1.2                  | 77                 |
| 13–1081 | Logisticians<br><i>Education: Bachelor's degree / OJT: — / Salary: \$80,880</i>                                                                                          | 763                        | 857                        | 94     | 12.3                 | 77                 |
| 47–2152 | Plumbers, Pipefitters, and Steamfitters<br><i>Education: High school / OJT: Apprenticeship / Salary: \$62,970</i>                                                        | 892                        | 965                        | 73     | 8.2                  | 76                 |
| 49–1011 | First-Line Supervisors of Mechanics, Installers, and Repairers<br><i>Education: High school / OJT: — / Salary: \$78,300</i>                                              | 902                        | 916                        | 14     | 1.5                  | 75                 |
| 41–4012 | Sales Representatives, Wholesale and Manufacturing,<br>Except Technical and Scientific Products<br><i>Education: High school / OJT: Moderate term / Salary: \$66,780</i> | 823                        | 843                        | 20     | 2.4                  | 72                 |
| 13–1082 | Project Management Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$100,750</i>                                                                       | 823                        | 861                        | 38     | 4.6                  | 60                 |
| 11–2022 | Sales Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$138,060</i>                                                                                       | 575                        | 591                        | 17     | 2.9                  | 44                 |

**Table 14 (continued). Growing Core Automotive Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                     | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 11–3031 | Financial Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$161,700</i>                                                                           | 515                        | 545                        | 29     | 5.6                  | 41                 |
| 53–3032 | Heavy and Tractor–Trailer Truck Drivers<br><i>Education: Postsecondary nondegree award / OJT: Short term / Salary: \$57,440</i>                                  | 337                        | 346                        | 9      | 2.7                  | 35                 |
| 49–3021 | Automotive Body and Related Repairers<br><i>Education: High school / OJT: Long term / Salary: \$51,680</i>                                                       | 406                        | 455                        | 48     | 11.9                 | 34                 |
| 19–5011 | Occupational Health and Safety Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$83,910</i>                                                    | 248                        | 268                        | 20     | 8.2                  | 26                 |
| 13–2051 | Financial and Investment Analysts<br><i>Education: Bachelor's degree / OJT: — / Salary: \$101,350</i>                                                            | 377                        | 385                        | 8      | 2.1                  | 25                 |
| 11–3021 | Computer and Information Systems Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$171,200</i>                                                    | 287                        | 311                        | 23     | 8.2                  | 22                 |
| 49–3023 | Automotive Service Technicians and Mechanics<br><i>Education: Postsecondary nondegree award / OJT: Short term / Salary: \$49,670</i>                             | 248                        | 255                        | 8      | 3.1                  | 21                 |
| 17–2071 | Electrical Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$111,910</i>                                                                         | 357                        | 362                        | 5      | 1.5                  | 21                 |
| 13–1151 | Training and Development Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$65,850</i>                                                          | 218                        | 224                        | 6      | 2.9                  | 20                 |
| 17–2199 | Engineers, All Other<br><i>Education: Bachelor's degree / OJT: — / Salary: \$117,750</i>                                                                         | 327                        | 333                        | 6      | 1.9                  | 19                 |
| 13–1161 | Market Research Analysts and Marketing Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$76,950</i>                                            | 208                        | 218                        | 9      | 4.5                  | 19                 |
| 11–3071 | Transportation, Storage, and Distribution Managers<br><i>Education: High school / OJT: — / Salary: \$102,010</i>                                                 | 169                        | 176                        | 7      | 4.3                  | 14                 |
| 27–1021 | Commercial and Industrial Designers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$79,450</i>                                                           | 139                        | 150                        | 11     | 8.2                  | 11                 |
| 49–3042 | Mobile Heavy Equipment Mechanics, Except Engines<br><i>Education: High school / OJT: Long term / Salary: \$63,980</i>                                            | 129                        | 139                        | 11     | 8.2                  | 11                 |
| 49–2094 | Electrical and Electronics Repairers, Commercial and Industrial Equipment<br><i>Education: Postsecondary nondegree award / OJT: Long term / Salary: \$71,300</i> | 119                        | 129                        | 10     | 8.2                  | 9                  |
| 11–9199 | Managers, All Other<br><i>Education: Bachelor's degree / OJT: — / Salary: \$136,550</i>                                                                          | 109                        | 118                        | 9      | 8.2                  | 9                  |
| 43–6011 | Executive Secretaries and Executive Administrative Assistants<br><i>Education: High school / OJT: — / Salary: \$74,260</i>                                       | 79                         | 86                         | 6      | 8.2                  | 8                  |
| 13–1051 | Cost Estimators<br><i>Education: Bachelor's degree / OJT: Moderate term / Salary: \$77,070</i>                                                                   | 99                         | 107                        | 8      | 8.2                  | 8                  |
| 51–4192 | Layout Workers, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$61,870</i>                                                       | 69                         | 75                         | 6      | 8.2                  | 6                  |
| 51–4061 | Model Makers, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$62,700</i>                                                         | 50                         | 54                         | 4      | 8.2                  | 5                  |
| 47–2211 | Sheet Metal Workers<br><i>Education: High school / OJT: Apprenticeship / Salary: \$60,850</i>                                                                    | 59                         | 67                         | 8      | 13.1                 | 5                  |
| 13–1041 | Compliance Officers<br><i>Education: Bachelor's degree / OJT: Moderate term / Salary: \$78,420</i>                                                               | 59                         | 67                         | 7      | 12.4                 | 5                  |



**Table 14 (continued). Growing Core Automotive Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                        | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|---------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 15–1253 | Software Quality Assurance Analysts and Testers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$102,610</i> | 69                         | 75                         | 6      | 8.2                  | 5                  |
| 15–1212 | Information Security Analysts<br><i>Education: Bachelor's degree / OJT: — / Salary: \$124,910</i>                   | 59                         | 64                         | 5      | 8.2                  | 5                  |
| 17–2081 | Environmental Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$104,170</i>                         | 59                         | 64                         | 5      | 8.2                  | 4                  |
| 15–2051 | Data Scientists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$112,590</i>                                 | 50                         | 60                         | 10     | 20.7                 | 4                  |
| 15–1241 | Computer Network Architects<br><i>Education: Bachelor's degree / OJT: — / Salary: \$130,390</i>                     | 59                         | 64                         | 5      | 8.2                  | 4                  |

SOURCE: Moody's Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

Although Core Automotive employment grows modestly overall, a subset of occupations experiences meaningful employment declines between 2024 and 2030 (see Table 15). As in Upstream manufacturing, these declines are concentrated primarily in routine production, machine operation, and plant support roles, particularly those associated with metal forming, machining, casting, and

finishing processes. Occupations such as cutting, punching, and press machine operators; engine and machine assemblers; tool and die makers; molding and casting machine operators; and machinists account for the largest absolute employment losses. Many of these roles require a high school diploma and moderate to long-term on-the-job training and have historically been central to automotive production.

**Table 15. Decreasing Core Automotive Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                         | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 51–4031 | Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$45,590</i>     | 10,934                     | 9,957                      | –977   | –8.9                 | 959                |
| 53–7062 | Laborers and Freight, Stock, and Material Movers, Hand<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$38,940</i>                    | 4,282                      | 4,267                      | –15    | –0.4                 | 547                |
| 51–9061 | Inspectors, Testers, Sorters, Samplers, and Weighers<br><i>Education: High school / OJT: Moderate term / Salary: \$47,460</i>                                        | 4,600                      | 4,532                      | –67    | –1.5                 | 538                |
| 51–4111 | Tool and Die Makers<br><i>Education: Postsecondary nondegree award / OJT: Long term / Salary: \$63,180</i>                                                           | 3,856                      | 3,534                      | –322   | –8.3                 | 347                |
| 51–2031 | Engine and Other Machine Assemblers<br><i>Education: High school / OJT: Moderate term / Salary: \$52,540</i>                                                         | 3,232                      | 2,740                      | –491   | –15.2                | 263                |
| 53–7051 | Industrial Truck and Tractor Operators<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$46,390</i>                                    | 2,716                      | 2,598                      | –118   | –4.4                 | 260                |
| 51–4041 | Machinists<br><i>Education: High school / OJT: Long term / Salary: \$56,150</i>                                                                                      | 2,538                      | 2,409                      | –129   | –5.1                 | 250                |
| 51–4072 | Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$41,230</i> | 2,062                      | 1,891                      | –171   | –8.3                 | 216                |

**Table 15 (continued). Decreasing Core Automotive Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                                     | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 51–4122 | Welding, Soldering, and Brazing Machine Setters, Operators,<br>and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$47,060</i>                              | 2,230                      | 2,126                      | –104   | –4.7                 | 192                |
| 43–5071 | Shipping, Receiving, and Inventory Clerks<br><i>Education: High school / OJT: Short term / Salary: \$43,190</i>                                                                  | 1,864                      | 1,711                      | –153   | –8.2                 | 156                |
| 51–2028 | Electrical, Electronic, and Electromechanical Assemblers,<br>Except Coil Winders, Tapers, and Finishers<br><i>Education: High school / OJT: Moderate term / Salary: \$44,040</i> | 1,318                      | 1,260                      | –59    | –4.4                 | 146                |
| 17–3026 | Industrial Engineering Technologists and Technicians<br><i>Education: Associate degree / OJT: — / Salary: \$64,790</i>                                                           | 1,596                      | 1,564                      | –32    | –2.0                 | 134                |
| 43–5061 | Production, Planning, and Expediting Clerks<br><i>Education: High school / OJT: Moderate term / Salary: \$57,770</i>                                                             | 1,229                      | 1,190                      | –39    | –3.2                 | 109                |
| 49–9071 | Maintenance and Repair Workers, General<br><i>Education: High school / OJT: Moderate term / Salary: \$48,620</i>                                                                 | 1,021                      | 1,012                      | –9     | –0.9                 | 98                 |
| 43–9061 | Office Clerks, General<br><i>Education: High school / OJT: Short term / Salary: \$43,630</i>                                                                                     | 773                        | 755                        | –18    | –2.4                 | 85                 |
| 51–9198 | Helpers—Production Workers<br><i>Education: High school / OJT: Short term / Salary: \$38,220</i>                                                                                 | 416                        | 390                        | –26    | –6.3                 | 61                 |
| 43–3031 | Bookkeeping, Accounting, and Auditing Clerks<br><i>Education: Some college, no degree / OJT: Moderate term / Salary: \$49,210</i>                                                | 545                        | 514                        | –32    | –5.8                 | 59                 |
| 43–4051 | Customer Service Representatives<br><i>Education: High school / OJT: Short term / Salary: \$42,830</i>                                                                           | 357                        | 340                        | –17    | –4.8                 | 45                 |
| 51–9199 | Production Workers, All Other<br><i>Education: High school / OJT: Moderate term / Salary: \$38,820</i>                                                                           | 387                        | 376                        | –11    | –2.8                 | 42                 |
| 51–9111 | Packaging and Filling Machine Operators and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$40,900</i>                                                     | 357                        | 332                        | –25    | –7.0                 | 41                 |
| 53–7064 | Packers and Packagers, Hand<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$35,580</i>                                                           | 248                        | 236                        | –12    | –4.7                 | 32                 |
| 43–6014 | Secretaries and Administrative Assistants, Except Legal,<br>Medical, and Executive<br><i>Education: High school / OJT: Short term / Salary: \$46,290</i>                         | 268                        | 261                        | –7     | –2.6                 | 28                 |
| 11–3121 | Human Resources Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$140,030</i>                                                                                     | 297                        | 284                        | –13    | –4.5                 | 23                 |
| 51–4023 | Rolling Machine Setters, Operators, and Tenders,<br>Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$48,630</i>                                   | 188                        | 178                        | –10    | –5.4                 | 17                 |
| 33–9032 | Security Guards<br><i>Education: High school / OJT: Short term / Salary: \$38,370</i>                                                                                            | 129                        | 117                        | –12    | –9.0                 | 16                 |
| 51–9022 | Grinding and Polishing Workers, Hand<br><i>Education: No formal educational credential / OJT: Moderate term / Salary: \$41,690</i>                                               | 208                        | 177                        | –32    | –15.2                | 16                 |
| 41–9031 | Sales Engineers<br><i>Education: Bachelor's degree / OJT: Moderate term / Salary: \$121,520</i>                                                                                  | 178                        | 151                        | –27    | –15.2                | 15                 |
| 17–3023 | Electrical and Electronic Engineering Technologists<br>and Technicians<br><i>Education: Associate degree / OJT: — / Salary: \$77,180</i>                                         | 169                        | 162                        | –7     | –4.1                 | 15                 |

**Table 15 (continued). Decreasing Core Automotive Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                               | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 15–1232 | Computer User Support Specialists<br><i>Education: Some college, no degree / OJT: Moderate term / Salary: \$60,340</i>                                     | 258                        | 240                        | –18    | –7.0                 | 15                 |
| 51–4034 | Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$48,620</i> | 149                        | 126                        | –23    | –15.2                | 13                 |
| 53–7063 | Machine Feeders and Offbearers<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$39,700</i>                                  | 99                         | 90                         | –9     | –9.0                 | 11                 |
| 49–9098 | Helpers—Installation, Maintenance, and Repair Workers<br><i>Education: High school / OJT: Short term / Salary: \$38,860</i>                                | 89                         | 76                         | –14    | –15.2                | 11                 |
| 17–3013 | Mechanical Drafters<br><i>Education: Associate degree / OJT: — / Salary: \$68,510</i>                                                                      | 129                        | 122                        | –7     | –5.4                 | 10                 |
| 51–4191 | Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$47,450</i>        | 109                        | 92                         | –17    | –15.2                | 9                  |
| 43–4161 | Human Resources Assistants, Except Payroll and Timekeeping<br><i>Education: Associate degree / OJT: — / Salary: \$49,440</i>                               | 89                         | 84                         | –5     | –5.4                 | 9                  |
| 19–4099 | Life, Physical, and Social Science Technicians, All Other<br><i>Education: Associate degree / OJT: — / Salary: \$60,130</i>                                | 69                         | 50                         | –20    | –28.6                | 9                  |
| 11–1011 | Chief Executives<br><i>Education: Bachelor's degree / OJT: — / Salary: \$206,420</i>                                                                       | 119                        | 108                        | –11    | –9.0                 | 8                  |
| 51–8021 | Stationary Engineers and Boiler Operators<br><i>Education: High school / OJT: Long term / Salary: \$75,190</i>                                             | 69                         | 63                         | –6     | –9.0                 | 8                  |
| 17–3024 | Electro–Mechanical and Mechatronics Technologists and Technicians<br><i>Education: Associate degree / OJT: — / Salary: \$70,760</i>                        | 89                         | 84                         | –5     | –5.4                 | 8                  |
| 15–1244 | Network and Computer Systems Administrators<br><i>Education: Bachelor's degree / OJT: — / Salary: \$96,800</i>                                             | 159                        | 144                        | –14    | –9.0                 | 7                  |
| 49–9043 | Maintenance Workers, Machinery<br><i>Education: High school / OJT: Long term / Salary: \$60,500</i>                                                        | 69                         | 63                         | –6     | –9.0                 | 6                  |
| 51–4193 | Plating Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$41,600</i>                | 69                         | 62                         | –7     | –10.7                | 6                  |
| 51–9195 | Molders, Shapers, and Casters, Except Metal and Plastic<br><i>Education: High school / OJT: Long term / Salary: \$45,690</i>                               | 40                         | 0                          | –40    | –100.0               | 5                  |
| 17–2111 | Health and Safety Engineers, Except Mining Safety Engineers and Inspectors<br><i>Education: Bachelor's degree / OJT: — / Salary: \$109,660</i>             | 79                         | 67                         | –12    | –15.2                | 5                  |
| 51–4035 | Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$48,310</i>    | 50                         | 35                         | –14    | –28.6                | 4                  |

SOURCE: Moody's Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

## Downstream occupational outlook

Downstream occupational projections underscore the heterogeneity of Michigan’s automotive economy beyond manufacturing: they span retail and service work, parts distribution, repair activity, and transportation. The occupations projected to grow (see Table 16) include both large, customer-facing roles, such as retail salespersons

and parts salespersons, and skilled service occupations like automotive service technicians and mechanics (+860 jobs), tire repairers, and automotive body repairers. Several higher-skill or technically intensive roles also expand within downstream industries, including industrial machinery mechanics, mechanical engineers, software developers, and buyers and purchasing agents, reflecting the increasing complexity of modern distribution and service operations.

**Table 16. Growing Downstream Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                             | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 41–2031 | Retail Salespersons<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$34,580</i>                                                           | 11,078                     | 11,332                     | 255    | 2.3                  | 1,568              |
| 49–3023 | Automotive Service Technicians and Mechanics<br><i>Education: Postsecondary nondegree award / OJT: Short term / Salary: \$49,670</i>                                     | 17,425                     | 18,285                     | 860    | 4.9                  | 1,483              |
| 53–7061 | Cleaners of Vehicles and Equipment<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$35,270</i>                                            | 7,023                      | 7,302                      | 280    | 4.0                  | 944                |
| 41–2022 | Parts Salespersons<br><i>Education: No formal educational credential / OJT: Moderate term / Salary: \$37,440</i>                                                         | 7,768                      | 8,048                      | 280    | 3.6                  | 849                |
| 53–3033 | Light Truck Drivers<br><i>Education: High school / OJT: Short term / Salary: \$44,140</i>                                                                                | 7,818                      | 7,966                      | 148    | 1.9                  | 840                |
| 53–7065 | Stockers and Order Fillers<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$37,090</i>                                                    | 4,851                      | 4,938                      | 86     | 1.8                  | 795                |
| 41–4012 | Sales Representatives, Wholesale and Manufacturing,<br>Except Technical and Scientific Products<br><i>Education: High school / OJT: Moderate term / Salary: \$66,780</i> | 7,932                      | 8,105                      | 174    | 2.2                  | 694                |
| 11–1021 | General and Operations Managers<br><i>Education: Bachelor’s degree / OJT: — / Salary: \$102,950</i>                                                                      | 7,886                      | 7,998                      | 112    | 1.4                  | 641                |
| 49–3093 | Tire Repairers and Changers<br><i>Education: High school / OJT: Short term / Salary: \$37,120</i>                                                                        | 3,655                      | 3,845                      | 190    | 5.2                  | 479                |
| 49–3021 | Automotive Body and Related Repairers<br><i>Education: High school / OJT: Long term / Salary: \$51,680</i>                                                               | 4,616                      | 4,734                      | 118    | 2.6                  | 387                |
| 41–2021 | Counter and Rental Clerks<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$38,540</i>                                                     | 3,316                      | 3,435                      | 119    | 3.6                  | 367                |
| 53–7051 | Industrial Truck and Tractor Operators<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$46,390</i>                                        | 3,379                      | 3,470                      | 91     | 2.7                  | 324                |
| 49–1011 | First-Line Supervisors of Mechanics, Installers, and Repairers<br><i>Education: High school / OJT: — / Salary: \$78,300</i>                                              | 3,848                      | 3,958                      | 110    | 2.9                  | 322                |
| 51–2090 | Miscellaneous Assemblers and Fabricators<br><i>Education: High school / OJT: Moderate term / Salary: \$42,210</i>                                                        | 2,436                      | 2,546                      | 110    | 4.5                  | 260                |
| 53–6031 | Automotive and Watercraft Service Attendants<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$34,850</i>                                  | 1,664                      | 1,705                      | 41     | 2.5                  | 241                |



**Table 16 (continued). Growing Downstream Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                     | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 53–3099 | Motor Vehicle Operators, All Other<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$36,260</i>                    | 1,645                      | 1,702                      | 57     | 3.5                  | 224                |
| 49–9041 | Industrial Machinery Mechanics<br><i>Education: High school / OJT: Long term / Salary: \$63,760</i>                                              | 2,083                      | 2,392                      | 309    | 14.8                 | 200                |
| 17–2141 | Mechanical Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$102,320</i>                                                         | 3,240                      | 3,545                      | 305    | 9.4                  | 191                |
| 11–2022 | Sales Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$138,060</i>                                                               | 2,241                      | 2,249                      | 8      | 0.4                  | 173                |
| 13–1020 | Buyers and Purchasing Agents<br><i>Education: Bachelor's degree / OJT: Moderate term / Salary: \$75,650</i>                                      | 1,672                      | 1,792                      | 120    | 7.2                  | 162                |
| 13–2011 | Accountants and Auditors<br><i>Education: Bachelor's degree / OJT: — / Salary: \$81,680</i>                                                      | 1,804                      | 1,816                      | 12     | 0.7                  | 139                |
| 49–9071 | Maintenance and Repair Workers, General<br><i>Education: High school / OJT: Moderate term / Salary: \$48,620</i>                                 | 1,339                      | 1,350                      | 11     | 0.8                  | 129                |
| 53–6021 | Parking Attendants<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$34,600</i>                                    | 741                        | 768                        | 28     | 3.7                  | 99                 |
| 53–3053 | Shuttle Drivers and Chauffeurs<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$36,670</i>                        | 690                        | 713                        | 24     | 3.4                  | 99                 |
| 49–3042 | Mobile Heavy Equipment Mechanics, Except Engines<br><i>Education: High school / OJT: Long term / Salary: \$63,980</i>                            | 1,115                      | 1,226                      | 111    | 10.0                 | 95                 |
| 51–9124 | Coating, Painting, and Spraying Machine Setters, Operators, and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$47,590</i> | 989                        | 1,027                      | 38     | 3.8                  | 94                 |
| 51–1011 | First-Line Supervisors of Production and Operating Workers<br><i>Education: High school / OJT: — / Salary: \$71,190</i>                          | 759                        | 793                        | 33     | 4.4                  | 73                 |
| 13–1161 | Market Research Analysts and Marketing Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$76,950</i>                            | 775                        | 797                        | 22     | 2.8                  | 69                 |
| 51–9061 | Inspectors, Testers, Sorters, Samplers, and Weighers<br><i>Education: High school / OJT: Moderate term / Salary: \$47,460</i>                    | 583                        | 602                        | 19     | 3.3                  | 68                 |
| 11–3031 | Financial Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$161,700</i>                                                           | 850                        | 903                        | 53     | 6.2                  | 68                 |
| 13–1082 | Project Management Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$100,750</i>                                               | 852                        | 885                        | 34     | 4.0                  | 62                 |
| 51–4121 | Welders, Cutters, Solderers, and Brazers<br><i>Education: High school / OJT: Moderate term / Salary: \$51,000</i>                                | 623                        | 647                        | 25     | 3.9                  | 61                 |
| 49–3041 | Farm Equipment Mechanics and Service Technicians<br><i>Education: High school / OJT: Long term / Salary: \$52,080</i>                            | 656                        | 711                        | 55     | 8.3                  | 59                 |
| 51–4041 | Machinists<br><i>Education: High school / OJT: Long term / Salary: \$56,150</i>                                                                  | 561                        | 584                        | 23     | 4.0                  | 55                 |
| 13–1051 | Cost Estimators<br><i>Education: Bachelor's degree / OJT: Moderate term / Salary: \$77,070</i>                                                   | 701                        | 713                        | 12     | 1.7                  | 55                 |
| 11–9041 | Architectural and Engineering Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$167,740</i>                                       | 802                        | 825                        | 22     | 2.8                  | 54                 |
| 17–2112 | Industrial Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$101,140</i>                                                         | 698                        | 757                        | 59     | 8.4                  | 47                 |

**Table 16 (continued). Growing Downstream Occupations, 2024–2030, Ranked by Annual Job Openings**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                                     | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 53–7064 | Packers and Packagers, Hand<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$35,580</i>                                                           | 333                        | 348                        | 14     | 4.3                  | 43                 |
| 11–3051 | Industrial Production Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$121,440</i>                                                                               | 604                        | 634                        | 30     | 4.9                  | 42                 |
| 17–3027 | Mechanical Engineering Technologists and Technicians<br><i>Education: Associate degree / OJT: — / Salary: \$68,730</i>                                                           | 490                        | 533                        | 44     | 8.9                  | 41                 |
| 15–1252 | Software Developers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$133,080</i>                                                                                          | 632                        | 669                        | 37     | 5.9                  | 40                 |
| 17–2071 | Electrical Engineers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$111,910</i>                                                                                         | 646                        | 689                        | 43     | 6.7                  | 38                 |
| 41–1012 | First-Line Supervisors of Non-Retail Sales Workers<br><i>Education: High school / OJT: — / Salary: \$84,130</i>                                                                  | 427                        | 445                        | 17     | 4.1                  | 33                 |
| 51–9199 | Production Workers, All Other<br><i>Education: High school / OJT: Moderate term / Salary: \$38,820</i>                                                                           | 281                        | 296                        | 14     | 5.1                  | 30                 |
| 49–3022 | Automotive Glass Installers and Repairers<br><i>Education: High school / OJT: Moderate term / Salary: \$47,260</i>                                                               | 436                        | 454                        | 18     | 4.0                  | 29                 |
| 11–3021 | Computer and Information Systems Managers<br><i>Education: Bachelor's degree / OJT: — / Salary: \$171,200</i>                                                                    | 328                        | 342                        | 14     | 4.2                  | 25                 |
| 41–9031 | Sales Engineers<br><i>Education: Bachelor's degree / OJT: Moderate term / Salary: \$121,520</i>                                                                                  | 260                        | 270                        | 10     | 3.7                  | 22                 |
| 51–2028 | Electrical, Electronic, and Electromechanical Assemblers,<br>Except Coil Winders, Tapers, and Finishers<br><i>Education: High school / OJT: Moderate term / Salary: \$44,040</i> | 198                        | 211                        | 13     | 6.7                  | 22                 |
| 51–4081 | Multiple Machine Tool Setters, Operators, and Tenders,<br>Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$46,060</i>                             | 156                        | 167                        | 10     | 6.6                  | 15                 |
| 15–2051 | Data Scientists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$112,590</i>                                                                                              | 42                         | 50                         | 8      | 19.8                 | 3                  |

SOURCE: Moody's Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

The occupations projected to decline most in Downstream (see Table 17) are concentrated in a different set of high-employment roles, including heavy and tractor-trailer truck drivers (-2,776 jobs) and cashiers (-1,361 jobs), along with clerical and administrative occupations such as office clerks,

dispatchers, and bookkeeping clerks. These patterns suggest gradual consolidation and productivity gains in goods movement, retail operations, and administrative support functions, even as demand for vehicle maintenance and parts-related services remains durable.

**Table 17. Downstream Occupations with Greatest Employment Declines, 2024–2030**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                                  | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 41–2011 | Cashiers<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$31,190</i>                                                                           | 19,024                     | 17,664                     | –1,361 | –7.2                 | 3,440              |
| 53–3032 | Heavy and Tractor-Trailer Truck Drivers<br><i>Education: Postsecondary nondegree award / OJT: Short term / Salary: \$57,440</i>                                               | 29,976                     | 27,200                     | –2,776 | –9.3                 | 3,124              |
| 53–7062 | Laborers and Freight, Stock, and Material Movers, Hand<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$38,940</i>                             | 5,993                      | 5,871                      | –122   | –2.0                 | 765                |
| 43–9061 | Office Clerks, General<br><i>Education: High school / OJT: Short term / Salary: \$43,630</i>                                                                                  | 6,160                      | 5,855                      | –305   | –5.0                 | 680                |
| 41–1011 | First-Line Supervisors of Retail Sales Workers<br><i>Education: High school / OJT: — / Salary: \$47,320</i>                                                                   | 5,806                      | 5,687                      | –120   | –2.1                 | 520                |
| 43–3031 | Bookkeeping, Accounting, and Auditing Clerks<br><i>Education: Some college, no degree / OJT: Moderate term / Salary: \$49,210</i>                                             | 3,644                      | 3,461                      | –183   | –5.0                 | 395                |
| 43–4051 | Customer Service Representatives<br><i>Education: High school / OJT: Short term / Salary: \$42,830</i>                                                                        | 3,048                      | 2,914                      | –134   | –4.4                 | 381                |
| 49–3031 | Bus and Truck Mechanics and Diesel Engine Specialists<br><i>Education: High school / OJT: Long term / Salary: \$60,640</i>                                                    | 4,511                      | 4,368                      | –144   | –3.2                 | 369                |
| 35–3023 | Fast Food and Counter Workers<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$30,480</i>                                                      | 1,458                      | 1,356                      | –102   | –7.0                 | 337                |
| 53–1047 | First-Line Supervisors of Transportation and Material-Moving Workers, Except Aircraft Cargo Handling Supervisors<br><i>Education: High school / OJT: — / Salary: \$61,890</i> | 2,460                      | 2,417                      | –43    | –1.7                 | 243                |
| 43–5032 | Dispatchers, Except Police, Fire, and Ambulance<br><i>Education: High school / OJT: Moderate term / Salary: \$48,880</i>                                                      | 2,197                      | 1,944                      | –253   | –11.5                | 187                |
| 43–5071 | Shipping, Receiving, and Inventory Clerks<br><i>Education: High school / OJT: Short term / Salary: \$43,190</i>                                                               | 2,151                      | 2,073                      | –79    | –3.7                 | 180                |
| 53–3031 | Driver/Sales Workers<br><i>Education: High school / OJT: Short term / Salary: \$37,130</i>                                                                                    | 1,438                      | 1,325                      | –113   | –7.8                 | 156                |
| 13–1081 | Logisticians<br><i>Education: Bachelor's degree / OJT: — / Salary: \$80,880</i>                                                                                               | 1,508                      | 1,477                      | –31    | –2.1                 | 152                |
| 11–3071 | Transportation, Storage, and Distribution Managers<br><i>Education: High school / OJT: — / Salary: \$102,010</i>                                                              | 1,700                      | 1,635                      | –66    | –3.9                 | 141                |
| 43–6014 | Secretaries and Administrative Assistants, Except Legal, Medical, and Executive<br><i>Education: High school / OJT: Short term / Salary: \$46,290</i>                         | 1,321                      | 1,306                      | –15    | –1.1                 | 139                |
| 43–1011 | First-Line Supervisors of Office and Administrative Support Workers<br><i>Education: High school / OJT: — / Salary: \$66,140</i>                                              | 1,166                      | 1,134                      | –32    | –2.8                 | 108                |
| 43–4171 | Receptionists and Information Clerks<br><i>Education: High school / OJT: Short term / Salary: \$37,230</i>                                                                    | 673                        | 671                        | –1     | –0.2                 | 86                 |
| 51–4031 | Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic<br><i>Education: High school / OJT: Moderate term / Salary: \$45,590</i>              | 875                        | 864                        | –12    | –1.3                 | 77                 |
| 13–1071 | Human Resources Specialists<br><i>Education: Bachelor's degree / OJT: — / Salary: \$72,910</i>                                                                                | 808                        | 796                        | –12    | –1.4                 | 68                 |

**Table 17 (continued). Downstream Occupations with Greatest Employment Declines, 2024–2030**

| SOC     | Occupation title<br>education / OJT / salary                                                                                                                              | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 49–9098 | Helpers—Installation, Maintenance, and Repair Workers<br><i>Education: High school / OJT: Short term / Salary: \$38,860</i>                                               | 456                        | 455                        | –1     | –0.3                 | 54                 |
| 41–3091 | Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel<br><i>Education: High school / OJT: Moderate term / Salary: \$66,260</i> | 533                        | 488                        | –45    | –8.5                 | 53                 |
| 35–2021 | Food Preparation Workers<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$34,220</i>                                                       | 250                        | 233                        | –17    | –6.9                 | 42                 |
| 43–3021 | Billing and Posting Clerks<br><i>Education: High school / OJT: Moderate term / Salary: \$47,170</i>                                                                       | 405                        | 374                        | –32    | –7.8                 | 40                 |
| 15–1232 | Computer User Support Specialists<br><i>Education: Some college, no degree / OJT: Moderate term / Salary: \$60,340</i>                                                    | 567                        | 553                        | –15    | –2.6                 | 32                 |
| 43–3051 | Payroll and Timekeeping Clerks<br><i>Education: High school / OJT: Moderate term / Salary: \$55,290</i>                                                                   | 294                        | 251                        | –44    | –14.9                | 26                 |
| 43–4151 | Order Clerks<br><i>Education: Some college, no degree / OJT: Short term / Salary: \$44,660</i>                                                                            | 250                        | 229                        | –21    | –8.4                 | 24                 |
| 51–4122 | Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$47,060</i>                          | 271                        | 264                        | –6     | –2.4                 | 23                 |
| 51–9161 | Computer Numerically Controlled Tool Operators<br><i>Education: High school / OJT: Moderate term / Salary: \$49,970</i>                                                   | 271                        | 266                        | –5     | –1.7                 | 22                 |
| 13–1199 | Business Operations Specialists, All Other<br><i>Education: Bachelor's degree / OJT: — / Salary: \$81,270</i>                                                             | 245                        | 238                        | –7     | –2.8                 | 22                 |
| 35–1012 | First-Line Supervisors of Food Preparation and Serving Workers<br><i>Education: High school / OJT: — / Salary: \$42,010</i>                                               | 146                        | 135                        | –11    | –7.5                 | 21                 |
| 51–9198 | Helpers—Production Workers<br><i>Education: High school / OJT: Short term / Salary: \$38,220</i>                                                                          | 104                        | 102                        | –3     | –2.5                 | 15                 |
| 43–4161 | Human Resources Assistants, Except Payroll and Timekeeping<br><i>Education: Associate degree / OJT: — / Salary: \$49,440</i>                                              | 130                        | 104                        | –26    | –19.8                | 13                 |
| 43–9199 | Office and Administrative Support Workers, All Other<br><i>Education: High school / OJT: Short term / Salary: \$46,040</i>                                                | 132                        | 126                        | –6     | –4.4                 | 13                 |
| 47–2061 | Construction Laborers<br><i>Education: No formal educational credential / OJT: Short term / Salary: \$46,730</i>                                                          | 143                        | 141                        | –2     | –1.3                 | 12                 |
| 47–5022 | Excavating and Loading Machine and Dragline Operators, Surface Mining<br><i>Education: High school / OJT: Moderate term / Salary: \$52,550</i>                            | 140                        | 123                        | –17    | –12.0                | 12                 |
| 13–1041 | Compliance Officers<br><i>Education: Bachelor's degree / OJT: Moderate term / Salary: \$78,420</i>                                                                        | 130                        | 114                        | –16    | –12.0                | 10                 |
| 47–2073 | Operating Engineers and Other Construction Equipment Operators<br><i>Education: High school / OJT: Moderate term / Salary: \$58,710</i>                                   | 113                        | 112                        | –1     | –0.7                 | 9                  |
| 51–2031 | Engine and Other Machine Assemblers<br><i>Education: High school / OJT: Moderate term / Salary: \$52,540</i>                                                              | 115                        | 102                        | –13    | –11.2                | 9                  |
| 15–1244 | Network and Computer Systems Administrators<br><i>Education: Bachelor's degree / OJT: — / Salary: \$96,800</i>                                                            | 206                        | 198                        | –7     | –3.5                 | 9                  |



**Table 17 (continued). Downstream Occupations with Greatest Employment Declines, 2024–2030**

| SOC     | Occupation title<br>education / OJT / salary                                                                                         | Auto<br>employment<br>2024 | Auto<br>employment<br>2030 | Change | Percentage<br>change | Annual<br>openings |
|---------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|--------|----------------------|--------------------|
| 47–1011 | First-Line Supervisors of Construction Trades and Extraction Workers<br><i>Education: High school / OJT: — / Salary: \$78,690</i>    | 113                        | 112                        | –1     | –0.8                 | 9                  |
| 43–5111 | Weighers, Measurers, Checkers, and Samplers, Record Keeping<br><i>Education: High school / OJT: Short term / Salary: \$45,650</i>    | 63                         | 61                         | –2     | –3.1                 | 7                  |
| 43–5011 | Cargo and Freight Agents<br><i>Education: High school / OJT: Short term / Salary: \$49,900</i>                                       | 60                         | 53                         | –7     | –11.1                | 5                  |
| 43–4071 | File Clerks<br><i>Education: High school / OJT: Short term / Salary: \$41,270</i>                                                    | 51                         | 45                         | –5     | –10.5                | 5                  |
| 43–9021 | Data-Entry Keyers<br><i>Education: High school / OJT: Short term / Salary: \$39,850</i>                                              | 52                         | 44                         | –8     | –15.0                | 4                  |
| 51–9023 | Mixing and Blending Machine Setters, Operators, and Tenders<br><i>Education: High school / OJT: Moderate term / Salary: \$47,680</i> | 31                         | 31                         | –1     | –2.2                 | 3                  |
| 43–3061 | Procurement Clerks<br><i>Education: High school / OJT: Moderate term / Salary: \$48,510</i>                                          | 31                         | 31                         | –1     | –2.0                 | 2                  |

SOURCE: Moody’s Analytics Michigan industry projections, Bureau of Labor Statistics employment projections, Michigan Center for Data and Analytics, Occupational Employment and Wage Statistics, author calculations.

## Workforce development context: MICHauto and regional experts

Our findings echo concerns from industry leadership. Glen Stevens, Executive Director of MICHauto at the Detroit Regional Chamber, has repeatedly emphasized publicly that Michigan’s competitiveness now hinges on its ability to attract and retain highly skilled technical talent. “The vehicle is becoming a computer on wheels,” he says, and as a result, automakers must compete directly with Silicon Valley, Tesla, and global tech firms for software engineers, battery specialists, advanced manufacturing technologists, and systems integrators. In interviews and public forums, Stevens notes that the region’s traditional advantage in production labor is no longer sufficient: talent pipelines in software, autonomy, energy storage, power electronics, and systems engineering are now decisive for retaining Michigan’s share of vehicle development and manufacturing.

## Implications for Michigan’s automotive workforce

Together, the 2021–2024 occupational shifts, the Moody’s-based quantitative projections through 2030 for Michigan, the BLS occupational employment projections, and the qualitative

insights from regional workforce leaders all point to a fundamental transition in Michigan’s automotive labor market. In our projections, total automotive-related employment changes only modestly through 2030, but the composition of that employment shifts meaningfully: Bachelor’s degree or higher employment grows (projected at 2.4 percent from 2024 to 2030), while the largest declines are concentrated among occupations with the lowest education and training requirements (projected at –2.3 percent for roles with no significant employer training). Segment-level results similarly show broad-based increases in the BA-or-higher share of employment across much of the supply chain.

The implication is that Michigan’s future competitiveness will be shaped less by the sheer volume of traditional production roles and more by its capacity to build and sustain a highly skilled, technology-oriented workforce, alongside the skilled trades that require long-term employer training. In this environment, strategic workforce planning, talent development partnerships, and proactive retention efforts become essential for ensuring that Michigan remains a leading hub for next-generation automotive innovation and manufacturing.

<sup>10</sup> Michigan Economic Development Corporation, (2021, July 21), *Ep.20 – Glen Stevens* [[Transcript](#)]. The Michigan Opportunity.

# Appendix A: Historical QCEW Employment in Michigan by NAICS, Segment, and Stage

Appendix Table A.1. QCEW Employment in Michigan by NAICS, Segment, and Stage, 2001, 2009, 2019, 2024

| Stage, segment, or NAICS                                                            | 2001           | 2009           | 2019           | 2024           |
|-------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|
| <b>Upstream Industries</b>                                                          | <b>361,557</b> | <b>241,139</b> | <b>345,535</b> | <b>325,424</b> |
| <b>1. Materials and Processing</b>                                                  | <b>96,567</b>  | <b>59,620</b>  | <b>83,591</b>  | <b>72,604</b>  |
| NAICS 3252 – Resin, Synthetic Rubber, Artificial and Synthetic Fibers and Filaments | 4,283          | 6,523          | 7,361          | 5,524          |
| NAICS 3255 – Paint, Coating, and Adhesive Manufacturing                             | 4,166          | 2,493          | 5,075          | 4,347          |
| NAICS 3261 – Plastics Product Manufacturing                                         | 39,596         | 23,383         | 36,932         | 34,371         |
| NAICS 3262 – Rubber Product Manufacturing                                           | 6,288          | 3,601          | 5,560          | 5,147          |
| NAICS 3272 – Glass and Glass Product Manufacturing                                  | 8,879          | 4,334          | 3,279          | 2,802          |
| NAICS 3311 – Iron and Steel Mills and Ferroalloy Manufacturing                      | 7,341          | 4,547          | 5,155          | 3,258          |
| NAICS 3312 – Steel Product Manufacturing from Purchased Steel                       | 3,124          | 1,366          | 1,745          | 1,974          |
| NAICS 3313 – Alumina and Aluminum Production and Processing                         | 2,167          | 1,624          | 3,361          | 2,698          |
| NAICS 3314 – Nonferrous Metal (except Aluminum) Production and Processing           | 2,746          | 1,357          | 1,425          | 1,262          |
| NAICS 3328 – Coating, Engraving, Heat Treating, and Allied Activities               | 17,977         | 10,392         | 13,698         | 11,221         |
| <b>2. Equipment Manufacturing</b>                                                   | <b>69,888</b>  | <b>39,495</b>  | <b>53,502</b>  | <b>47,550</b>  |
| NAICS 3335 – Metalworking Machinery Manufacturing                                   | 49,161         | 27,570         | 36,498         | 29,604         |
| NAICS 3339 – Other General Purpose Machinery Manufacturing                          | 20,727         | 11,925         | 17,004         | 17,946         |
| <b>3. Forging and Foundries</b>                                                     | <b>22,569</b>  | <b>13,152</b>  | <b>19,271</b>  | <b>16,337</b>  |
| NAICS 3315 – Foundries                                                              | 16,071         | 8,174          | 10,665         | 9,349          |
| NAICS 3321 – Forging and Stamping                                                   | 6,498          | 4,978          | 8,606          | 6,988          |
| <b>4. Parts and Machining</b>                                                       | <b>53,878</b>  | <b>37,232</b>  | <b>52,591</b>  | <b>50,443</b>  |
| NAICS 3326 – Spring and Wire Product Manufacturing                                  | 4,191          | 2,144          | 3,431          | 2,869          |
| NAICS 3327 – Machine Shops; Turned Product; and Screw, Nut, and Bolt                | 26,164         | 20,427         | 27,275         | 24,530         |
| NAICS 3329 – Other Fabricated Metal Product Manufacturing                           | 15,390         | 8,191          | 11,452         | 10,865         |
| NAICS 3344 – Semiconductor and Other Electronic Component Manufacturing             | 8,133          | 6,470          | 10,433         | 12,179         |
| <b>5. Component Systems</b>                                                         | <b>16,198</b>  | <b>13,865</b>  | <b>18,237</b>  | <b>18,283</b>  |
| NAICS 3336 – Engine, Turbine, and Power Transmission Equipment Manufacturing        | 4,912          | 3,882          | 4,743          | 4,970          |
| NAICS 3345 – Navigational, Measuring, Electromedical, and Control Instruments       | 9,488          | 8,498          | 9,147          | 8,867          |
| NAICS 3359 – Other Electrical Equipment and Component Manufacturing                 | 1,798          | 1,485          | 4,347          | 4,446          |
| <b>6. Engineering and Design</b>                                                    | <b>102,457</b> | <b>77,775</b>  | <b>118,343</b> | <b>120,207</b> |
| NAICS 5413 – Architectural, Engineering, and Related Services                       | 83,373         | 55,412         | 88,076         | 84,452         |
| NAICS 5414 – Industrial Design                                                      | 3,402          | 4,079          | 8,155          | 10,458         |
| NAICS 5417 – Scientific Research and Development                                    | 15,682         | 18,284         | 22,112         | 25,297         |

**Appendix Table A.1 (continued). QCEW Employment in Michigan by NAICS, Segment, and Stage, 2001, 2009, 2019, 2024**

| Stage, segment, or NAICS                                                     | 2001           | 2009           | 2019           | 2024           |
|------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|
| <b>Core Automotive</b>                                                       | <b>304,333</b> | <b>122,598</b> | <b>180,821</b> | <b>173,082</b> |
| <b>7. Core Automotive</b>                                                    | <b>304,333</b> | <b>122,598</b> | <b>180,821</b> | <b>173,082</b> |
| 3361 Motor Vehicle Manufacturing                                             | 90,361         | 35,196         | 38,974         | 48,138         |
| 3362 Motor Vehicle Body and Trailer Manufacturing                            | 10,139         | 6,034          | 9,047          | 7,921          |
| 3363 Motor Vehicle Parts Manufacturing                                       | 203,833        | 81,368         | 132,800        | 117,023        |
| <b>Downstream Industries</b>                                                 | <b>219,668</b> | <b>179,646</b> | <b>229,052</b> | <b>231,829</b> |
| <b>8. Motor Vehicle Parts, Materials, and Products Sales</b>                 | <b>107,590</b> | <b>87,246</b>  | <b>111,802</b> | <b>115,340</b> |
| 4231 Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers | 20,063         | 15,653         | 22,848         | 25,978         |
| 4235 Metal and Mineral (except Petroleum) Merchant Wholesalers               | 7,797          | 5,564          | 7,116          | 6,359          |
| 4238 Machinery, Equipment, and Supplies Merchant Wholesalers                 | 26,299         | 20,902         | 25,229         | 24,407         |
| 4239 Miscellaneous Durable Goods Merchant Wholesalers                        | 6,498          | 6,144          | 7,737          | 8,732          |
| 4247 Petroleum and Petroleum Products Merchant Wholesalers                   | 3,190          | 2,672          | 3,529          | 3,846          |
| 4413 Automotive Parts, Accessories, and Tire Retailers                       | 13,540         | 13,018         | 17,717         | 18,192         |
| 4571 Gasoline Stations                                                       | 30,203         | 23,293         | 27,626         | 27,826         |
| <b>9. Dealers, Maintenance, and Repair</b>                                   | <b>75,615</b>  | <b>58,528</b>  | <b>68,868</b>  | <b>69,600</b>  |
| 4411 Automobile Dealers                                                      | 42,508         | 33,083         | 39,798         | 38,262         |
| 8111 Automotive Repair and Maintenance                                       | 33,107         | 25,445         | 29,070         | 31,338         |
| <b>10. Logistics</b>                                                         | <b>36,463</b>  | <b>33,872</b>  | <b>48,382</b>  | <b>46,889</b>  |
| 4841 General Freight Trucking                                                | 24,304         | 24,306         | 36,859         | 35,249         |
| 4842 Specialized Freight Trucking                                            | 12,159         | 9,566          | 11,523         | 11,640         |
| <b>Total, all segments</b>                                                   | <b>885,558</b> | <b>543,383</b> | <b>755,408</b> | <b>730,335</b> |

SOURCE: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

## Appendix B: Automotive Supply-Chain Attribution Methodology

### Overview

This appendix explains how we estimate the share of Michigan industries' output (and by extension, employment) that depends on the automotive and automotive manufacturing complex. The analysis uses input-output (I-O) relationships to measure how much of each industry's production is purchased by a defined set of automotive manufacturers. We then attribute the same proportion of each industry's jobs to the automotive supply chain.

In practice, this approach helps identify Upstream industries whose activity is partly sustained by automotive demand, even if they are not themselves classified as motor-vehicle manufacturing.

### Data and structure

We use Social Accounting Matrix (SAM) data organized into two core tables:

- *Commodity Use*: which commodities each industry purchases for intermediate inputs
- *Commodity Make*: which industries produce each commodity, and in what proportions

Because the United States and Michigan are available in the same structure, we can compute shares consistently at both geographies and compare results.

## Defining the automotive buyer set

The buyer set is defined in IMPLAN industries, chosen to align conceptually with core motor-vehicle manufacturing (NAICS 3361–3363) and the immediately related vehicle parts and assembly sectors. The buyer set contains IMPLAN codes 324–336, including the following:

- Automobile and light-duty motor-vehicle manufacturing
- Motor-vehicle body, trailer, engine, electrical/electronic, transmission/powertrain, seating/interior, metal stamping, and other motor-vehicle parts manufacturing

These sectors form the Downstream demand base to which we attribute Upstream production.

## Methodology

### *1) Measure automotive demand at the commodity level*

From the Commodity Use table, we identify all purchases made by the automotive buyer set. For each commodity, we compute the fraction of total intermediate demand that comes from the buyer set. This gives a commodity-level automotive share—the portion of demand for that commodity that is driven by automotive manufacturers.

### *2) Allocate demand to producing industries*

Using the Commodity Make table, we distribute each commodity's automotive demand to the industries that produce it, in proportion to their make shares. Summing across commodities yields each industry's automotive-attributed output. Dividing by the industry's total output yields the automotive share of output for that industry.

### *3) Express results in NAICS and automotive segments*

To report results in familiar industry language, automotive shares are mapped from IMPLAN industries to detailed NAICS industries, then rolled up to standard four-digit NAICS. These NAICS results are then aligned to the project's automotive universe (38 NAICS industries, organized by supply-chain segment and stage) to produce segment and stage totals.

### *4) Attribute employment*

Finally, we apply each industry's automotive share of output to its employment level to estimate automotive-related employment. These estimates are used for totals, comparisons, and scenario analysis.

## Interpretation

This is an attribution of dependence, not a dedicated head count. If fabricated-metals firms sell 40 percent of their output to automotive manufacturers, we attribute 40 percent of that industry's jobs to the automotive supply chain, recognizing that many establishments serve multiple end markets.

Because input-output coefficients are static for the year of the tables, results describe current structural linkages rather than behavioral adjustments to prices, technology, or policy. The method is nonetheless transparent and internally consistent across geographies and reporting levels.

## Comparison with BEA national I-O tables

As a cross-check, we implemented the same logic using the Bureau of Economic Analysis (BEA) national input-output (I-O) accounts, which also provide Commodity Use and Commodity Make tables from which industry-to-industry flows can be constructed. When we define the same automotive buyer set and follow the same two-step procedure—1) compute commodity-level shares of automotive demand and 2) allocate those shares to producing industries by make proportions—the resulting national automotive shares are highly comparable to those produced from the U.S. Social Accounting Matrix. Small differences appear where sectoring schemes or valuation conventions differ, but the overall pattern of automotive dependence across industries is consistent. This corroboration supports the robustness of the SAM-based national results and, by extension, the Michigan attribution that relies on the same framework.

# Appendix C: Alternative Employment Projections

Appendix Table C.1 presents alternative employment-projection estimates evaluated alongside the Moody’s Michigan industry forecast used in the main analysis. For each industry, an annualized growth rate is derived from two additional sources: the Michigan Department of Technology, Management, and Budget (DTMB) long-term industry and occupational projections (2022–2032) and the U.S. Bureau of Labor Statistics (BLS) Employment Projections (2024–2034). These growth rates are applied consistently to Michigan

baseline employment levels to facilitate comparison across projection frameworks. Both sets of projections assume an economy that is at full employment in the end projection year and, as such, both provide upper bounds on auto-related industry employment impacts. In the case of the BLS projections, national industry growth rates are applied to Michigan’s industry employment baseline, producing a scenario in which Michigan industries evolve in line with national structural trends rather than state-specific dynamics.

Appendix Table C.1. Alternative Employment Projections Compared to Moody’s Analytics Michigan Industry Forecast, 2024–2030

| Stage, segment, or NAICS                                                            | Automotive employment, 2024 | Projected employment change, 2024–2030 |                                               |                                                           |
|-------------------------------------------------------------------------------------|-----------------------------|----------------------------------------|-----------------------------------------------|-----------------------------------------------------------|
|                                                                                     |                             | Moody’s Analytics                      | DTMB long-term industry forecasts (2022–2032) | BLS EP (2024–2034), U.S. growth rates applied to Michigan |
| Upstream Industries                                                                 | 58,471                      | –4,116                                 | –1,084                                        | –592                                                      |
| 1. Materials and Processing                                                         | 21,248                      | –1,595                                 | –450                                          | 131                                                       |
| NAICS 3252 – Resin, Synthetic Rubber, Artificial and Synthetic Fibers and Filaments | 489                         | –20                                    | 4                                             | 6                                                         |
| NAICS 3255 – Paint, Coating, and Adhesive Manufacturing                             | 2,239                       | –2                                     | 18                                            | 29                                                        |
| NAICS 3261 – Plastics Product Manufacturing                                         | 8,066                       | –468                                   | –145                                          | 210                                                       |
| NAICS 3262 – Rubber Product Manufacturing                                           | 2,821                       | –367                                   | –51                                           | 25                                                        |
| NAICS 3272 – Glass and Glass Product Manufacturing                                  | 1,610                       | –147                                   | –42                                           | 14                                                        |
| NAICS 3311 – Iron and Steel Mills and Ferroalloy Manufacturing                      | 1,354                       | –230                                   | –66                                           | 12                                                        |
| NAICS 3312 – Steel Product Manufacturing from Purchased Steel                       | 793                         | –119                                   | –39                                           | 9                                                         |
| NAICS 3313 – Alumina and Aluminum Production and Processing                         | 865                         | –97                                    | –42                                           | –8                                                        |
| NAICS 3314 – Nonferrous Metal (except Aluminum) Production and Processing           | 370                         | –62                                    | –18                                           | 4                                                         |
| NAICS 3328 – Coating, Engraving, Heat Treating, and Allied Activities               | 2,641                       | –85                                    | –69                                           | –172                                                      |
| 2. Equipment Manufacturing                                                          | 6,245                       | –137                                   | –112                                          | –80                                                       |
| NAICS 3335 – Metalworking Machinery Manufacturing                                   | 2,312                       | –180                                   | –42                                           | –88                                                       |
| NAICS 3339 – Other General Purpose Machinery Manufacturing                          | 3,932                       | 43                                     | –71                                           | 8                                                         |
| 3. Forging and Foundries                                                            | 9,023                       | –1,553                                 | –379                                          | –731                                                      |
| NAICS 3315 – Foundries                                                              | 6,281                       | –1,438                                 | –308                                          | –572                                                      |
| NAICS 3321 – Forging and Stamping                                                   | 2,742                       | –115                                   | –71                                           | –159                                                      |
| 4. Parts and Machining                                                              | 14,936                      | –727                                   | –274                                          | –209                                                      |
| NAICS 3326 – Spring and Wire Product Manufacturing                                  | 1,153                       | –15                                    | –30                                           | –67                                                       |
| NAICS 3327 – Machine Shops; Turned Product; and Screw, Nut, and Bolt                | 9,319                       | –615                                   | –242                                          | –224                                                      |
| NAICS 3329 – Other Fabricated Metal Product Manufacturing                           | 1,740                       | –16                                    | –45                                           | –101                                                      |
| NAICS 3344 – Semiconductor and Other Electronic Component Manufacturing             | 2,724                       | –82                                    | 44                                            | 183                                                       |



**Appendix Table C.1 (continued). Alternative Employment Projections Compared to Moody's Analytics Michigan Industry Forecast, 2024–2030**

| Stage, segment, or NAICS                                                      | Automotive employment, 2024 | Projected employment change, 2024–2030 |                                               |                                                           |
|-------------------------------------------------------------------------------|-----------------------------|----------------------------------------|-----------------------------------------------|-----------------------------------------------------------|
|                                                                               |                             | Moody's Analytics                      | DTMB long-term industry forecasts (2022–2032) | BLS EP (2024–2034), U.S. growth rates applied to Michigan |
| <b>5. Component Systems</b>                                                   | <b>5,987</b>                | <b>–118</b>                            | <b>80</b>                                     | <b>272</b>                                                |
| NAICS 3336 – Engine, Turbine, and Power Transmission Equipment Manufacturing  | 3,563                       | –160                                   | –64                                           | –103                                                      |
| NAICS 3345 – Navigational, Measuring, Electromedical, and Control Instruments | 185                         | –5                                     | 3                                             | 4                                                         |
| NAICS 3359 – Other Electrical Equipment and Component Manufacturing           | 2,239                       | 47                                     | 141                                           | 372                                                       |
| <b>6. Engineering and Design</b>                                              | <b>1,032</b>                | <b>16</b>                              | <b>52</b>                                     | <b>26</b>                                                 |
| NAICS 5413 – Architectural, Engineering, and Related Services                 | 612                         | 17                                     | 12                                            | 14                                                        |
| NAICS 5414 – Industrial Design                                                | 352                         | –7                                     | 37                                            | 8                                                         |
| NAICS 5417 – Scientific Research and Development                              | 68                          | 6                                      | 3                                             | 3                                                         |
| <b>Core Automotive</b>                                                        | <b>173,082</b>              | <b>1,891</b>                           | <b>–5,366</b>                                 | <b>–14,801</b>                                            |
| <b>7. Core Automotive</b>                                                     | <b>173,082</b>              | <b>1,891</b>                           | <b>–5,366</b>                                 | <b>–14,801</b>                                            |
| 3361 Motor Vehicle Manufacturing                                              | 48,138                      | 13,094                                 | –1,492                                        | 1,540                                                     |
| 3362 Motor Vehicle Body and Trailer Manufacturing                             | 7,921                       | 32                                     | –246                                          | 158                                                       |
| 3363 Motor Vehicle Parts Manufacturing                                        | 117,023                     | –11,234                                | –3,628                                        | –16,500                                                   |
| <b>Downstream Industries</b>                                                  | <b>231,829</b>              | <b>–1,453</b>                          | <b>–1,501</b>                                 | <b>792</b>                                                |
| <b>8. Motor Vehicle Parts, Materials, and Products Sales</b>                  | <b>115,340</b>              | <b>1,616</b>                           | <b>–1,783</b>                                 | <b>–477</b>                                               |
| 4231 Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers  | 25,978                      | 961                                    | –260                                          | 701                                                       |
| 4235 Metal and Mineral (except Petroleum) Merchant Wholesalers                | 6,359                       | –51                                    | –64                                           | 127                                                       |
| 4238 Machinery, Equipment, and Supplies Merchant Wholesalers                  | 24,407                      | 244                                    | –244                                          | 586                                                       |
| 4239 Miscellaneous Durable Goods Merchant Wholesalers                         | 8,732                       | 17                                     | –87                                           | 175                                                       |
| 4247 Petroleum and Petroleum Products Merchant Wholesalers                    | 3,846                       | –219                                   | –35                                           | 27                                                        |
| 4413 Automotive Parts, Accessories, and Tire Retailers                        | 18,192                      | 218                                    | –36                                           | 327                                                       |
| 4571 Gasoline Stations                                                        | 27,826                      | 445                                    | –1,057                                        | –2,421                                                    |
| <b>9. Dealers, Maintenance, and Repair</b>                                    | <b>69,600</b>               | <b>2,096</b>                           | <b>–327</b>                                   | <b>894</b>                                                |
| 4411 Automobile Dealers                                                       | 38,262                      | 153                                    | –77                                           | 612                                                       |
| 8111 Automotive Repair and Maintenance                                        | 31,338                      | 1,943                                  | –251                                          | 282                                                       |
| <b>10. Logistics</b>                                                          | <b>46,889</b>               | <b>–5,165</b>                          | <b>610</b>                                    | <b>375</b>                                                |
| 4841 General Freight Trucking                                                 | 35,249                      | –3,419                                 | 458                                           | 282                                                       |
| 4842 Specialized Freight Trucking                                             | 11,640                      | –1,746                                 | 151                                           | 93                                                        |
| <b>Total, All Segments</b>                                                    | <b>463,382</b>              | <b>–3,678</b>                          | <b>–7,950</b>                                 | <b>–14,601</b>                                            |

SOURCE: BLS Quarterly Census of Employment and Wages, Moody's Analytics industry forecasts, Michigan DTMB long-term industry projections (2022–2032), Bureau of Labor Statistics employment projections (2024–2034), author calculations.