CENTER FOR AUTOMOTIVE RESEARCH

Michigan Automotive Workforce Needs Assessment

Part F Interim Report

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Michigan Automotive Workforce Needs Assessment

Executive Summary (1 of 5)

- **Building a scaled and skilled automotive workforce in Michigan requires an understanding of the automotive industry representation and the changing needs for jobs**. To capture a comprehensive awareness of Michigan's automotive workforce needs, CAR identified businesses across the extended supply chain in the following 10 industry sectors (grouped into upstream, core auto and downstream segments below):

Upstream Segment
- Materials & Processing
- Equipment Manufacturing
- Forging & Foundries
- Parts & Machining
- Component Systems
- Engineering & Design

Core Automotive Segment
- Automotive Parts Manufacturing
- Vehicle Assembly

Downstream Segment
- Parts & Product Sales
- Dealers, Maintenance & Repair
- Logistics

- **Employers across the 10 industry sectors above provided insights to the CAR team through a combination of surveys and interviews.** A total of **67 businesses across 20 Michigan counties participated in the assessment**, representing small, medium, and large employers across the state of Michigan. Industry professionals from leadership, management, human resources, and technical roles joined the assessment. **The assessment focused on the following key areas** to inform state policy makers and workforce development agencies.

- ***Industry shifts impacting business***
- ***Opportunities & Challenges with Industry shifts***
- ***EV transition impact on jobs***
- ***Upskilling Needs & Hiring Challenges***
- ***Skills Gaps & Challenges***
- ***New Roles & Credentials in Demand***
- ***Education & Training Resources***
- ***Finding Talent***
- ***Policy Needs***

- **Industry Shifts Impacting Michigan Businesses**

Across all businesses, multiple industry shifts were rated as impactful, with the EV transition reported as the most impactful shift from both survey and interview participants. Survey participants rated the EV transition as having the most impact on business, along with other impactful shifts including economic factors, federal policy changes, and global markets and competition. Interview participants most frequently described technical shifts as the most impactful industry shift for business, with the EV transition being the most impactful technical shift. Additionally, interviewees described other impactful technical industry shifts, general auto industry shifts, shifting production needs, and policy shifts.

Industry shift impact ratings varied between survey and interview participant groups. Survey participants in upstream and downstream segments viewed economic factors, federal policy, and the EV transition as the most impactful, whereas the Core Auto segment view the EV transition, global markets and competition, federal policy, and economic factors as being the most impactful. Interview participants in upstream sector businesses found the EV transition, increasing technical complexity, artificial intelligence (AI) and energy storage solutions (ESS) as the most impactful. Core Auto businesses are most impacted by the EV transition, increasing technical complexity, and non-electric vehicle (EV) propulsion technology development. Downstream businesses are most impacted by advanced manufacturing, AI, and online sales.

Michigan Automotive Workforce Needs Assessment

Executive Summary (2 of 5)

Opportunities & Challenges with Industry Shifts

Across all businesses, current challenging industry shifts noted by survey participants include economic factors and federal policy change, global markets & competition as the most challenging. Interview participants view technical shifts including the EV transition as being challenging and posing current opportunity, along with AI implementation, auto industry and policy shifts.

Current opportunities among survey participants include the EV transition, automation & advanced manufacturing, and changing workforce skills and roles. Interview participants identified technical shifts (including the EV transition), the shift to AI, shifting production needs, and financial shifts as providing both challenges and opportunities.

Future challenges focused on economic factors and global competition among survey participants and focused on general technical shifts among interviewees. **Future opportunities** noted by survey participants include automation, advanced manufacturing and the EV transition and were more general among interviewees. Overall, **businesses reported more opportunities for the future relative to future challenges.**

Industry segment perspectives varied for survey participants, with upstream businesses viewing economic factors, federal and state policy changes and the most impactful. Core Auto businesses also viewed the same industry shifts as impactful along with global competition. Downstream businesses shared perspectives with upstream businesses on the impact of the first three shits along with the EV transition.

Impact of EV transition on Businesses

Overall, survey participants are somewhat equally divided in their perception of the current impact of the EV transition on their businesses, with slightly more businesses viewing the transition as posing challenges and opportunities compared to having a neutral impact. Nearly half of businesses completing the survey view the EV transition to provide more opportunity in the future (next 1-3 years), with roughly one third expecting future challenges with the EV transition.

Industry segments held different views about the impact of the EV transition on current and future business. Upstream businesses report similar challenges and opportunities now but expect more future opportunities. Core Auto businesses view current impacts as more neutral to challenging but expect slightly more opportunities in the future. Downstream businesses also report more current challenges and future opportunities tied to the EV transition.

Impact of Industry Shifts on Jobs: Current and Future

Interview participants report technical shifts are impacting hiring and workforce uncertainty, whereas reshoring policies are impacting hiring.

Just over half of interview participants reported they are currently hiring, with the remaining businesses reporting uncertain employment needs, reductions or hiring pauses. Future workforce needs included both anticipated hiring and uncertainty about staffing directions.

Industry segment perspectives about workforce impacts showed that upstream businesses report slightly more hiring and expansions than reductions, Core Auto reporting more uncertainty, reductions, and pauses, and Downstream businesses reporting equal amounts of hiring, uncertainty and reductions.

Michigan Automotive Workforce Needs Assessment

Executive Summary (3 of 5)

Upskilling Needs and Hiring Challenges

A large share of all businesses (68%) reported a low proportion of their current employees (40% or less of current employees) need to update their skills, with the remainder of businesses reporting moderate to extensive upskilling needs (only survey responses available). Industry segments varied with upskilling needs among current employees, with upstream businesses reporting the most moderate needs, Core Auto reporting the highest share of extensive needs, and downstream businesses reporting the greatest range of very low to extensive upskilling needs.

All businesses also reported a range of hiring challenges related to skills gaps, with the largest proportion of businesses reporting moderate challenges (43%), with the remainder of businesses reporting significant and few challenges. Industry segments varied, with upstream businesses reporting the broadest range of hiring challenges related to skills gaps, Core Auto businesses reporting few to significant challenges, and Downstream reporting the largest share of significant skills gaps in hiring new employees.

Skills Currently in Demand

Across all businesses and participants, ***top skills in demand*** among current employees included

- Advanced software & programming skills
- Automation & robotics operation
- Digital skills (data management, AI, software development)
- Equipment testing & analysis leadership skills
- Mechanical assembly
- Prototyping and CAD
- Soft skills (including basic business skills, professionalism, communication skills, & engagement)
- Testing, calibration, tolerancing, & failure analysis
- Vehicle diagnostics, repair & maintenance

Skills Currently in Demand (*continued*)

Industry segments varied for ***top skills in demand among current employees***, with Upstream and Core Auto businesses noting soft skills, automation & robotics, and interdisciplinary skills, Downstream businesses reporting manufacturing & production planning, system operation, vehicle diagnostics, repair,& maintenance, and sales.

Skills in Demand for the Future

Across all businesses, ***top skills anticipated in the next 1-3 years*** included (interview responses only):

- Digital skills (digital mindset, data management, and AI)
- Soft skills (passion, agility)

Among industry segments, Upstream and Core Auto businesses anticipate a significant need for soft skills, whereas Downstream businesses anticipate more automation and sales skills needs.

Skills Gaps Expectations for the Future

Across all businesses taking the survey, employers expect to experience a range of few to significant skills gaps among workers in the next 1-3 years.

Skills gap expectations vary by industry segment, with moderate skills gap expectations in Upstream businesses, moderate skills gaps in Core Auto businesses (among more employers), and more extensive skills gaps among Downstream businesses.

Michigan Automotive Workforce Needs Assessment

Executive Summary (4 of 5)

New Roles: Current and Future

Current New Roles in New Hires

Across all businesses, most survey businesses reported a relatively small proportion of new roles in their new hires (based on survey responses only), with the remainder of businesses reporting moderate levels of new roles in new hires. Among businesses from interviews, a slight majority stated they are developing new roles

Survey participants report current roles in demand to include general technicians, manufacturing engineers, and industrial technicians. Interview participants report new roles in digital areas and engineering roles.

Future New Roles Expected

Most businesses also expect a low proportion of new roles in the future (survey only). Upstream and Downstream businesses expect a low proportion of new, whereas Core Auto sectors report a low and moderate proportion. A slight majority of interview participants expect to need new roles in the future.

Future roles reported by interviewees included general and specialized engineering roles (including manufacturing, electrical, and mechanical) and digital roles. Upstream business expect new engineering roles, whereas Core Auto business expect more digital roles, and Downstream businesses expect new technician roles.

New Credentials in Demand

Across all businesses, about one third of both survey and interview participants reported seeking employees with new credentials, with most employers not seeking new credentials. Interviewees emphasized seeking out experience over specific credentials.

Industry segments differ based on the proportion of businesses that are looking for employees with new credentials (survey responses only). Upstream businesses report the lowest share of businesses seeking out new credentials, followed by Core Auto and Downstream businesses.

Specific new credentials reported by businesses include soft skills, vehicle service and repair certifications, digital skills (including programming, cybersecurity, and analysis), and engineering credentials (mechanical, electrical, manufacturing and general credentials). Upstream businesses emphasized a broader range of certifications and engineering credentials, whereas Core Auto emphasized more automation, soft skills, production, digital skills, and vehicle component experience. Downstream businesses emphasized service repair for ADAS, EV, and engineering credentials.

Education & Training Resource Utilization

Across all businesses, employers reported using on-the-job and internal training most frequently (among survey and interview participants) and internal training (both formal and informal training programs). Some businesses noted this is for their specific needs and others to help with retention and job security.

Other education and training resources included four-year degrees, apprenticeships, certificates, community college courses and programs, university courses or programs, and project-based learning experiences.

All industry segments most frequently rely upon on-the-job training, while Upstream businesses rely upon four-year degrees mentoring, and internal training, while Core Auto businesses rely upon internal training, apprenticeships and project-based learning. Downstream businesses utilize both internal and external training, along with partnerships, community colleges, and apprenticeships.

Michigan Automotive Workforce Needs Assessment

Executive Summary (5 of 5)

Resources Businesses Use to Find Top Hires

Businesses report success using different sources to find their top hires, with the greatest reliance on online job postings, colleges, community colleges, other employers, and recruiters. Businesses also rely upon on career fairs, contract workers, technical schools, internal pipelines and referrals, immigrant workers, internships, startups, veterans, returning citizens programs, internal pipelines, word-of-mouth, and trade shows to a lesser degree.

Industry segments varied with Upstream businesses relying on online job postings, colleges, networking, referrals, co-op programs, word-of-mouth, and technical schools for talent. Core Auto businesses rely on online job postings, universities, and community colleges, along with recruiters and referrals. Downstream businesses rely on in-house training and online recruiting tools, followed by universities, word-of-mouth, in-person hiring events, and local job postings.

Challenges to Talent Attraction

Interview participants provided insights about challenges with attracting talent to jobs, to Michigan, and to the auto industry in general. Factors associated with talent attraction challenges included living in Michigan and the attractiveness of the automotive and manufacturing industries.

Roles with Limited Entrants

Businesses that completed interviews also provided insights about job roles that are in demand but have limited methods to bring in new entrants. Roles with limited entry included automotive technicians, truck drivers, project managers, mechanical engineers, software engineers, design technicians, control technicians, and powertrain engineer/engineers in ICE-related roles.

Policies Needed to support Businesses and Workers

Businesses described policy needs that referenced workforce support as well as industry support and other types of support to boost consumer EV adoption.

Workforce policy needs focused on training support for basic job skills, battery and EV technicians, lean manufacturing, continuous improvement, ADAS, CNC machining, electronics and high-voltage skills, EV infrastructure maintenance and safety training, mechatronics, production technicians, and general skilled trades.

Additional policy needs expressed by all businesses included support for apprenticeships, technical program support, industry-education alignment for technical training and STEM, talent attraction for engineering, talent retention, training support for job skills, skilled trades, mechatronics technicians, training grants, funding state programs like the GoingPro program, messaging to support Michigan's standing as a leading state for industry and automotive, and support to increase workforce availability.

Industry policy needs focused on EV battery recycling, flexible incentives for EV competitiveness, focus on all propulsion systems, EV safety standards, reduced red tape for site development, reshoring tax credits, R&D and pilot line support, and tax abatements.

Businesses that participated in interviews also noted the **policies with positive impact** include reshoring policies and the R&D tax credit. More **negative impacts from policy** include general policy shifts, rate of policy changes, lack of EV infrastructure policy, tariffs, and the complexity of grant and apprenticeship funding applications.

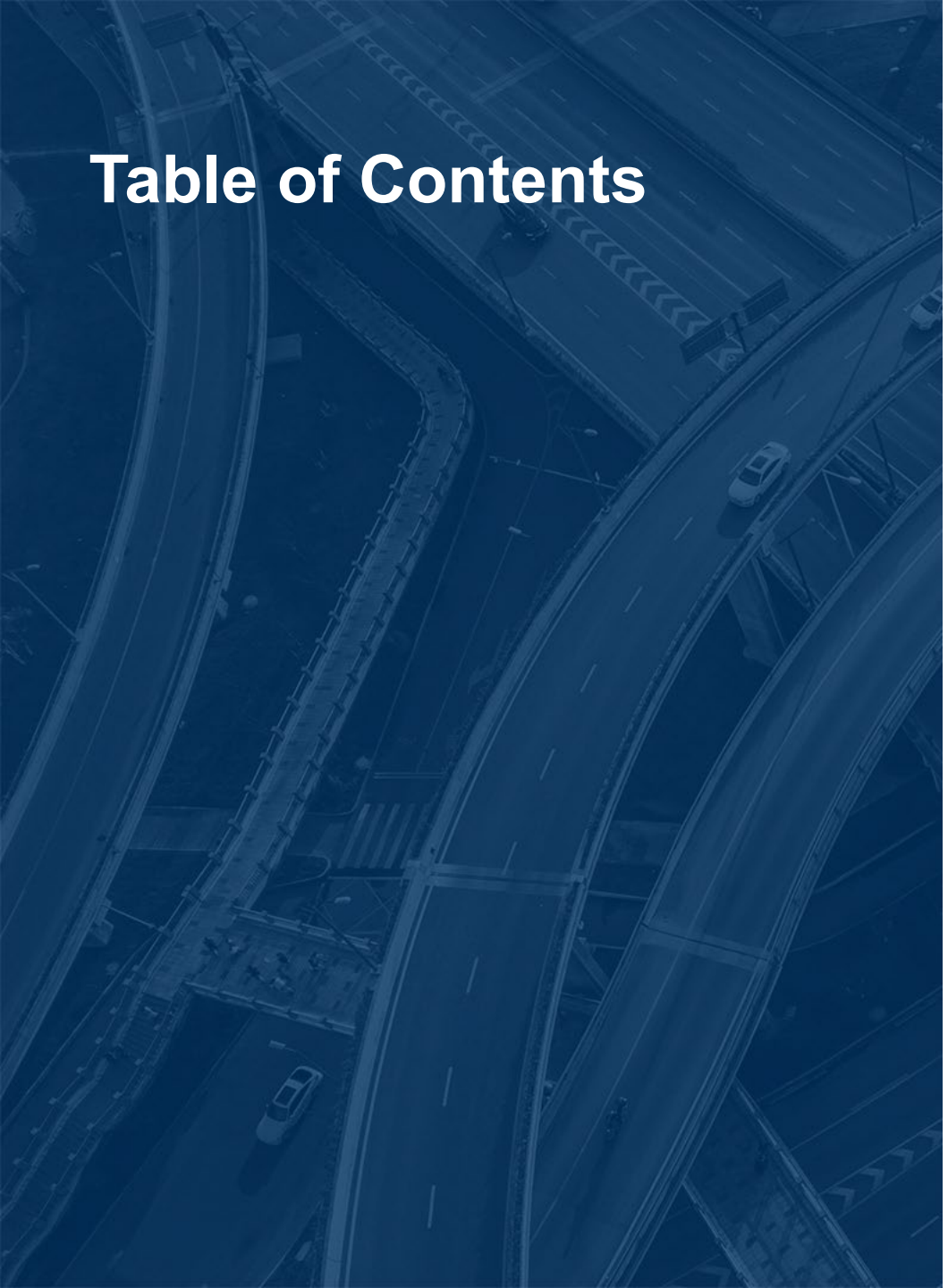


Table of Contents

Michigan Automotive Workforce Needs Assessment

Michigan Automotive Workforce Needs Assessment

Assessment Objectives

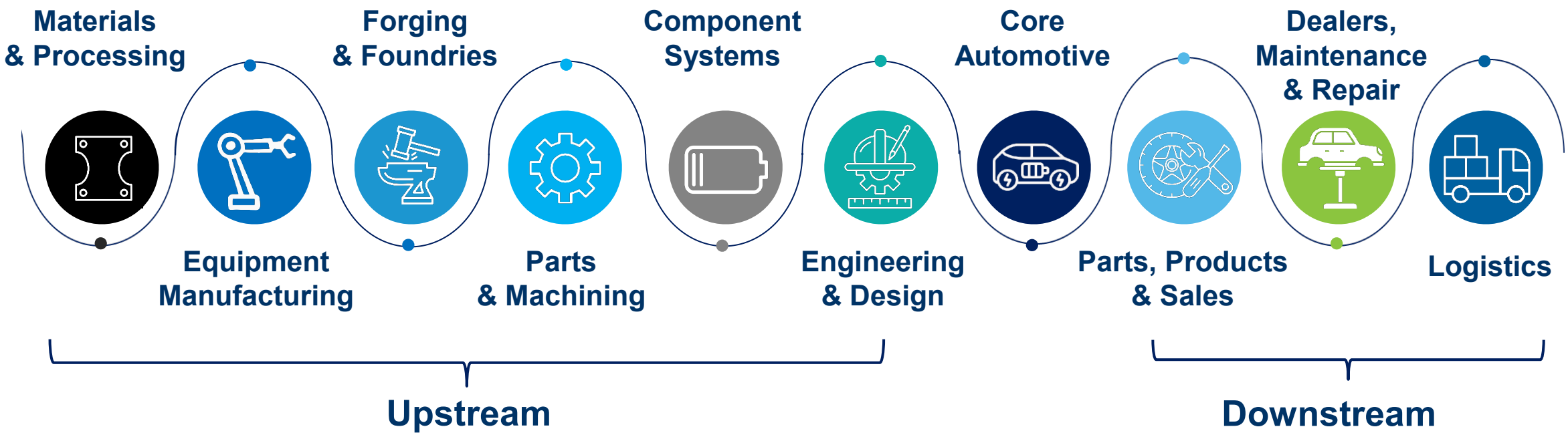
Gather insights from Michigan automotive employers regarding current and future workforce needs:

- Capture auto industry shifts with most impact on business, skills gaps, roles in demand, training resources, talent pipelines, and policies needed
- Gather perspectives from business across the extended automotive supply chain
- Incorporate perspectives from small, medium and large businesses
- Gather perspectives across all regions of Michigan
- Focus on current and future needs (next 1-3 years)
- Utilize an approach to capture confidential feedback from businesses, through direct interviews and surveys

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Extended Automotive Supply Chain



Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Overall Assessment Method and Survey Details

Method

To capture a representative description of the automotive industry workforce needs in Michigan, CAR utilized a qualitative and quantitative (mixed methods) approach to gather employer perspectives.

Procedure. The CAR team conducted a combination of confidential interviews and an online survey to capture feedback from industry leaders across Michigan automotive businesses.

First, the CAR team identified businesses in the extended automotive supply chain according to North American Industry Classification (NAICS) codes and conducted direct and promotional outreach to recruit participants. CAR identified over 1300 businesses across Michigan. Businesses were contacted by CAR directly via email and survey and interview promotions were shared via social media, CAR email distributions, industry association newsletters, economic development organizations, local municipalities, and workforce development agencies.

Participants. Individuals from executive management, human resources, technical roles were recruited. Respondents were asked to participate in an online survey, providing demographic details about their business location (county, city), number of employees, primary industry sector, number of Michigan facilities, proportion of business activity in automotive industry, job title, and organization name (optional). A total of 48 participants completed the online survey from 20 different counties in Michigan.

Key focus areas for the Survey and Interviews:

- Automotive industry shifts impacting business (ranking)
- Challenges and Opportunities associated with Industry shifts (current and future)
- Extent of Challenge/Opportunity associated with the EV transition on Jobs (current and future)
- Upskilling needs among current employees
- Skills gap challenges in current and future hiring
- Skills gaps in Demand
- New roles in current and future hires
- Roles currently in Demand
- New credentials being prioritized
- Education and training resource utilization
- Sources of top hires (e.g., talent pipeline)
- Policies needed to support Michigan businesses and workers

Confidentiality and Incentivizing Participation. All participants were informed that their responses would remain confidential, meaning no organization or individual names are associated with the results. Participants volunteered to complete surveys and interviews and will receive a preliminary copy of the report as incentive.

Survey data analysis and presentation. Data are analyzed based on the entire survey sample as well as by industry sector groups (e.g., upstream, core automotive, and downstream sectors). Responses are reported as percentages of the sample, based on total responses per question. Open-ended responses are summarized and paraphrased.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Interview Assessment Method and Analysis

Interview Method

Participants. Individuals from executive management, human resources, technical roles were recruited for interviews. A total of 20 participants from businesses in 7 different counties in Michigan spoke to the CAR team.

Interview Procedure. Professionals voluntarily consented to meet with the CAR team during a 30 to 45-minute semi-structured, confidential interview. All meetings were conducted virtually with one to two members of the CAR research team. Participants were provided with the interview questions in advance, which correspond to the survey questions. In contrast to the survey, interview questions were open-ended to allow participants to provide their own responses. All participants were asked the same questions, but responses varied by participants.

Interview Data Collection. All participants were reminded that their responses are confidential, meaning their names, organizations, and quotes would not be used in the report. During the interviews, one member of the CAR team led the discussion while another took notes. Both team members took notes to be coded separately.

Interview Analysis Technique: Qualitative Data Analysis

Qualitative Data Analysis has four steps:

1. **Dividing the data into segments** – Involves interview notes into segments that express a meaningfully distinct participant response.
2. **Creating the codebook** – involves taking a sample of the data (5 segmented interview notes), reading through it and identifying themes that meaningfully capture the findings and nuance of the data.
3. **Coding the qualitative data** – involves labeling (coding) the data (interview notes) with the codes developed in Step 2.
4. **Analyzing the coded data** – Involves finding patterns in the coded data – frequencies can be examined, relationships among themes can be found.

Structure of Interview Results:

- Interview results will begin with a top-level review of themes, then proceed to examples of participant responses. When applicable, current and future responses will then be reported, and finally results will be broken down by segment.

A Note on Interview Quotes:

- Interview quotes shared in this report have been paraphrased and anonymized in order to protect participant confidentiality. To reflect this, they are displayed without quotation marks.

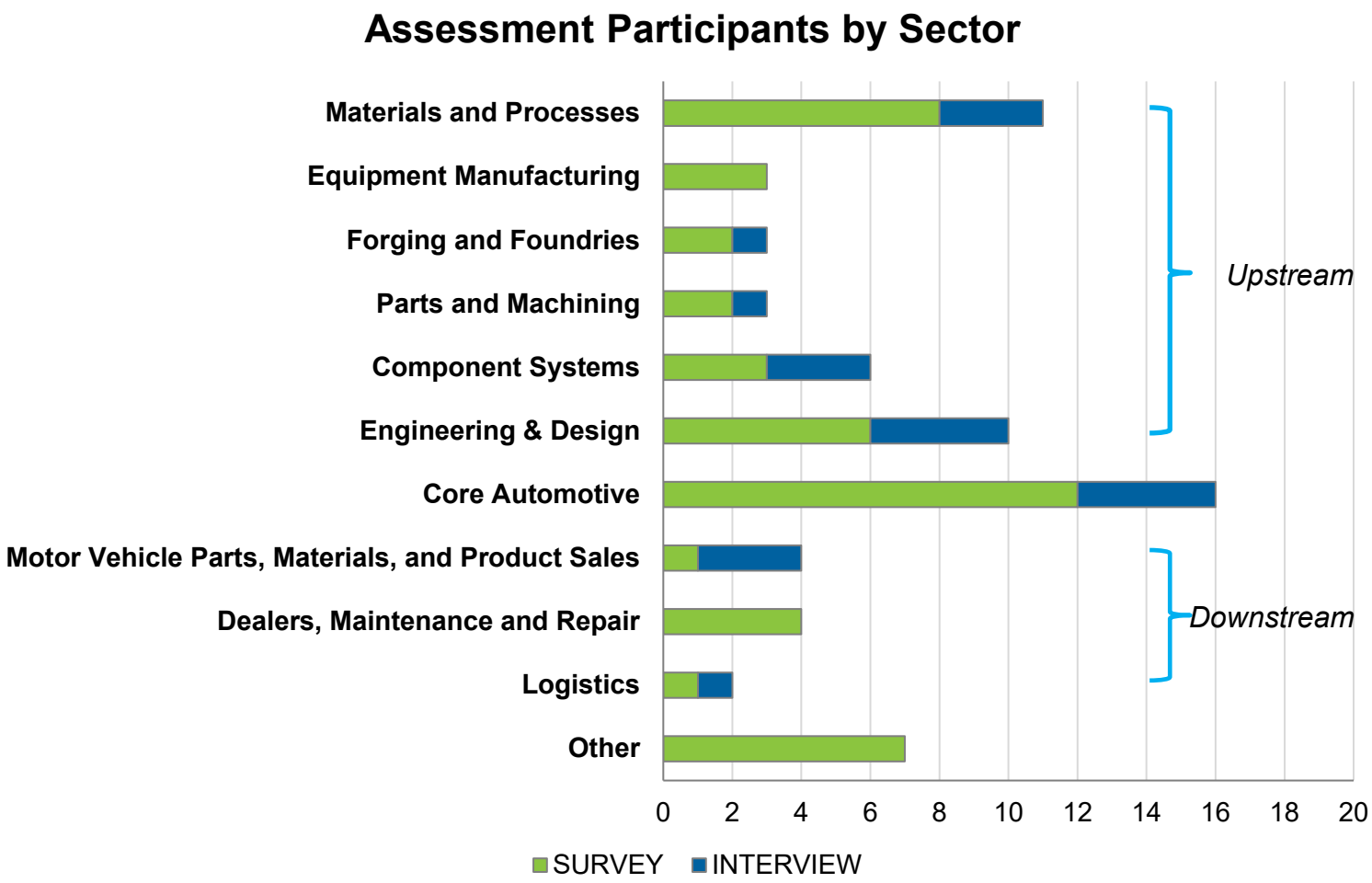
Benefits of Qualitative Data Analysis:

- Allows data to drive analysis.
- More structured way of looking at qualitative data, preserves complexity while helping preserve rigor and reducing researcher bias.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Participant Demographics: Automotive Sector Distribution



SURVEY & INTERVIEW RESPONSES

Assessment Participants

- Survey: 48
- Interviews: 20

Other participating businesses include Academic institutions, Economic Development organizations, and Industrial digital solutions providers

Businesses from all industry sectors participated in the survey and interviews, forming a representative sample across the auto industry.

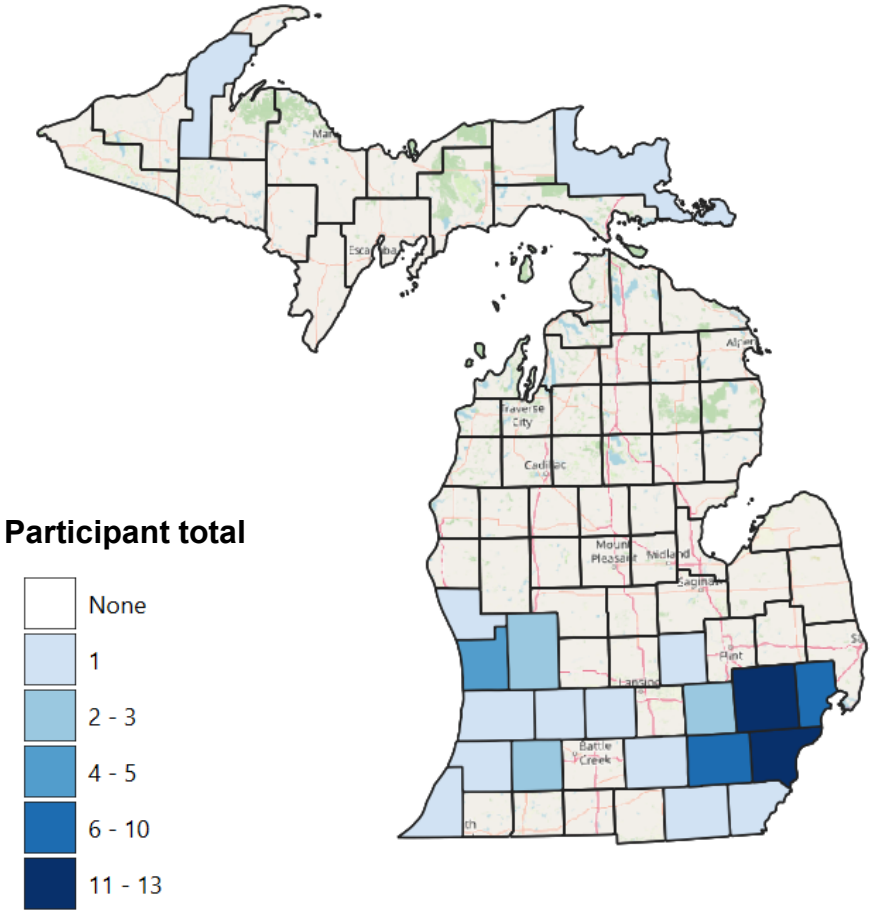
Note: Given that participation was voluntary, it is not possible to gather a sample that aligns with the number of makeup of all businesses.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

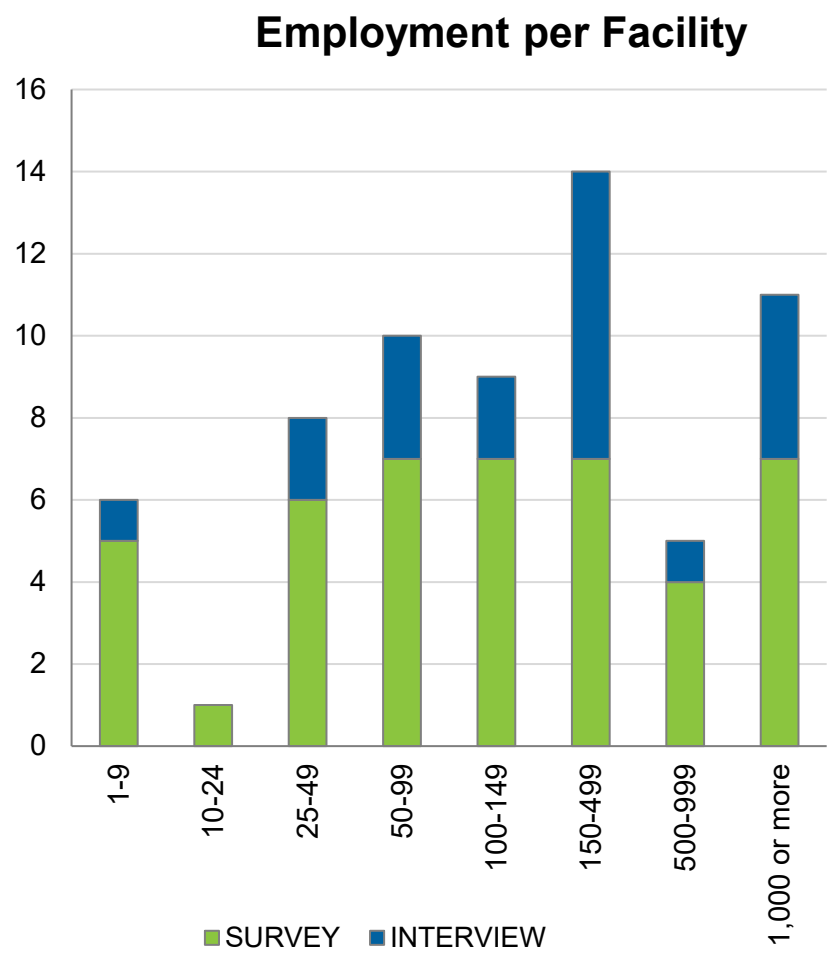
Participating Business Demographics

SURVEY & INTERVIEW RESPONSES



Michigan Automotive Workforce Assessment Demographics

- Businesses from 20 Michigan counties participated in the survey and interviews.
- Participating businesses were more concentrated in Southeast and Southwest regions despite recruiting across the state.
- Businesses of all sizes participated in the assessment, with a median of 100-149 employees, and an average of 336 employees per facility.



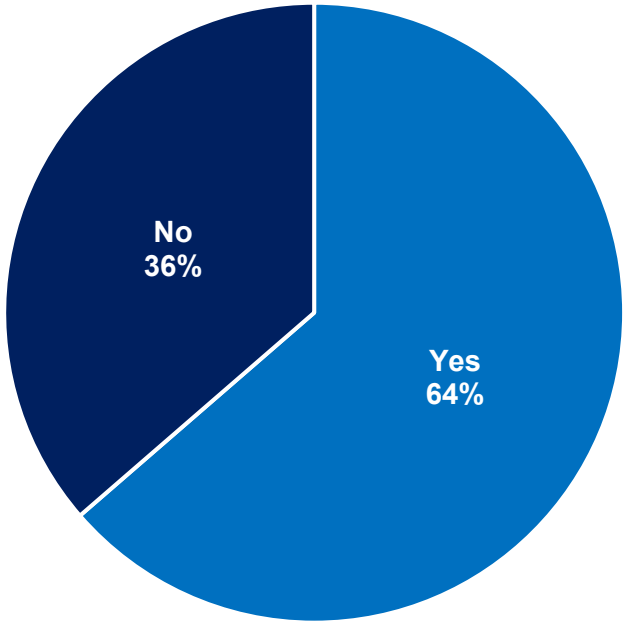
Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Participating Business Demographics

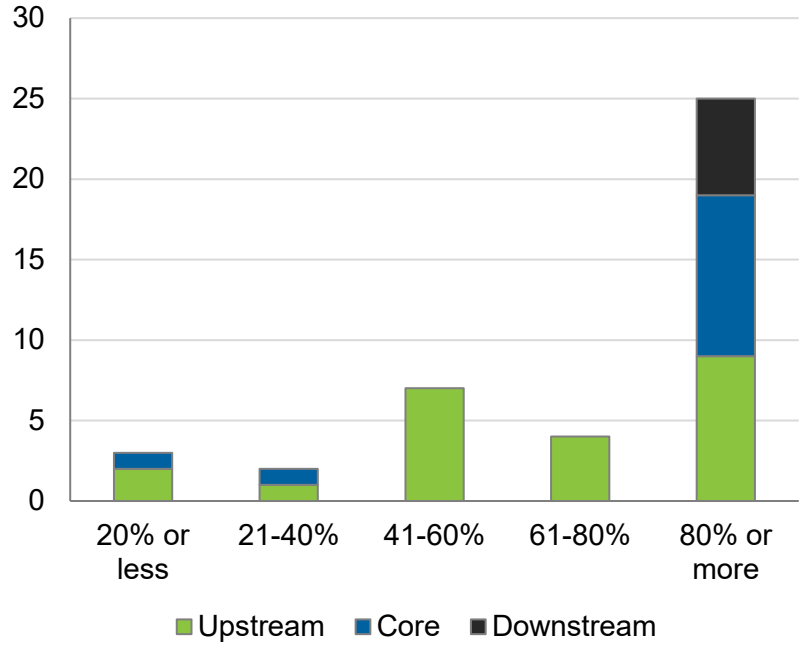
SURVEY RESPONSES

Automotive Organizations with Multiple Michigan facilities



- Over 60% of survey participant businesses have more than one Michigan facility (left).
- Overall, the largest share of participating businesses have 80% or more of business activity tied to automotive industry (right). These data reflect survey participants only.
- When considering automotive business activity by segment, upstream businesses had more diversified industry activity. A small proportion of core automotive businesses have activities that span outside of automotive.

Proportion of Business Activity in Auto Industry

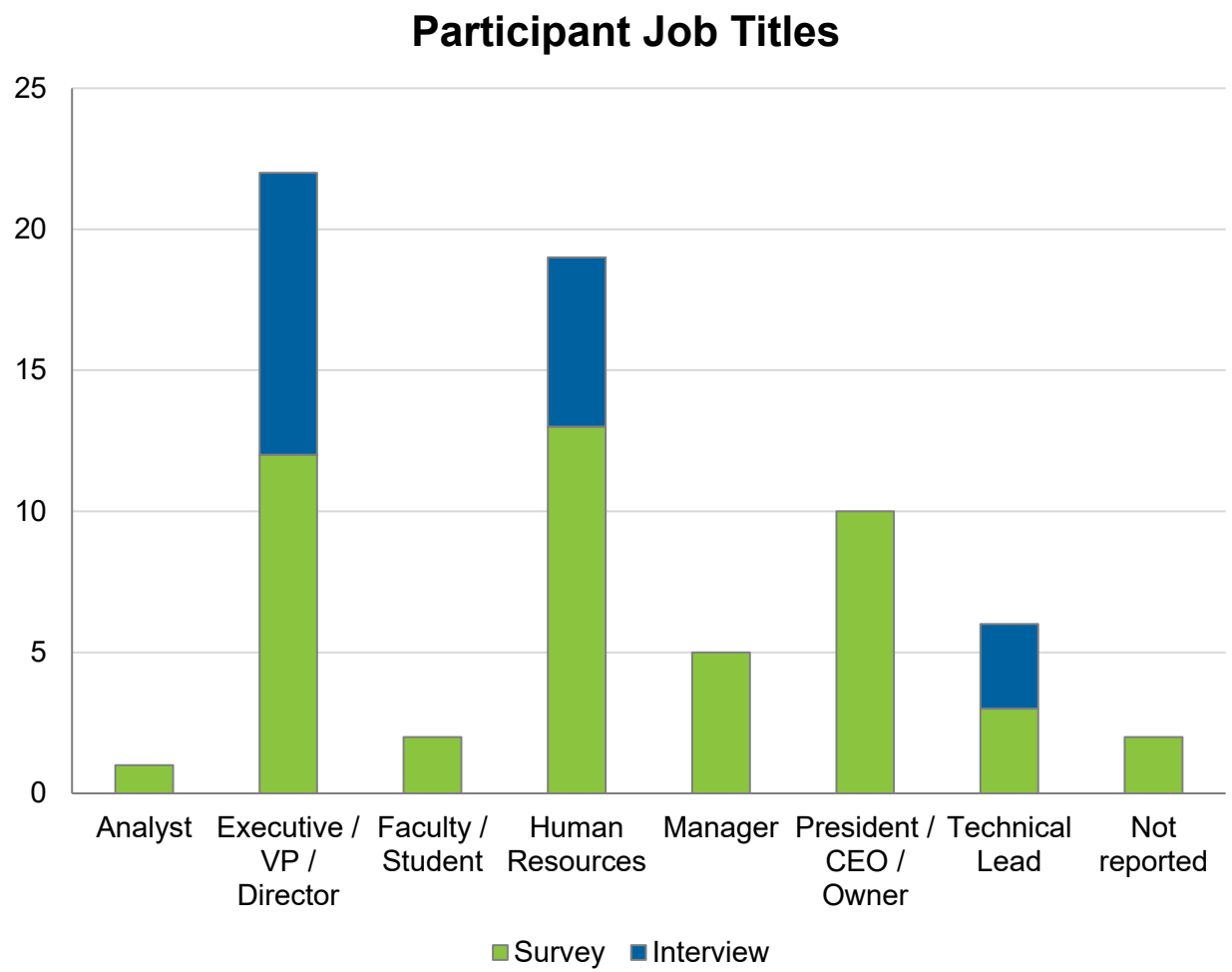


Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Participant Demographics: Job Titles

SURVEY RESPONSES



Participant job roles from the online survey and interviews

Across all participants:

- Nearly 30% of participants were from Human Resources roles
- Significant participation from leadership roles
- Other participants included Academic faculty and students

Interview participants:

- Participants were from more consolidated roles, including leadership, human resources and technical roles

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: Participant and Business Demographics

Survey Participant Demographics

- A total of **48 participants** completed the online survey.
- Businesses from **all ten industry sectors** participated in the survey, with a **larger proportion of upstream participants** (and upstream sector also included a larger number of sectors).
- Businesses from **34% of Michigan counties (20 total)** participated in the survey and interviews. The largest concentration of businesses were in the Metro Detroit, Southeast, Southwest and Western Michigan Prosperity regions.
- **Businesses of all sizes participated in the survey**, with 39% from small businesses (<100 employees), 36% from medium-sized businesses (100-499 employees), and 25% from large businesses (500+ employees).
- A larger proportion of participating businesses have operations at **more than one Michigan facility** (64% of survey participants).
- **Over half of participating businesses (52%) conduct most of their activity in the automotive industry** (meaning 80% or more of their business is in automotive). This varies by industry segment and reflects survey participants only.
- **Professionals from a variety of roles completed the survey**, with the largest proportion being from human resources and executive leadership roles.

Interview Participant Demographics

- A total of **20 businesses** participated in the confidential interviews.
- Businesses from **eight industry sectors** participated in the interviews, with 60% from upstream sectors, 20% in core automotive, and 20% from downstream sectors.
- Businesses from **12% of Michigan counties (10 total)** participated in the interviews.
- **Businesses of all sizes participated in interviews**, with 30% from small businesses (<100 employees), 45% from medium-sized businesses (100-499 employees), and 20% from large businesses (500+ employees).
- Most interview participants were from businesses with **more than one Michigan facility**.
- Most interview participants were from businesses that conduct the majority of their business activity in the automotive industry, except upstream businesses.
- **Professionals from a variety of roles participated in the interviews** and there was often **more than one representative** from each company involved in the interviews.

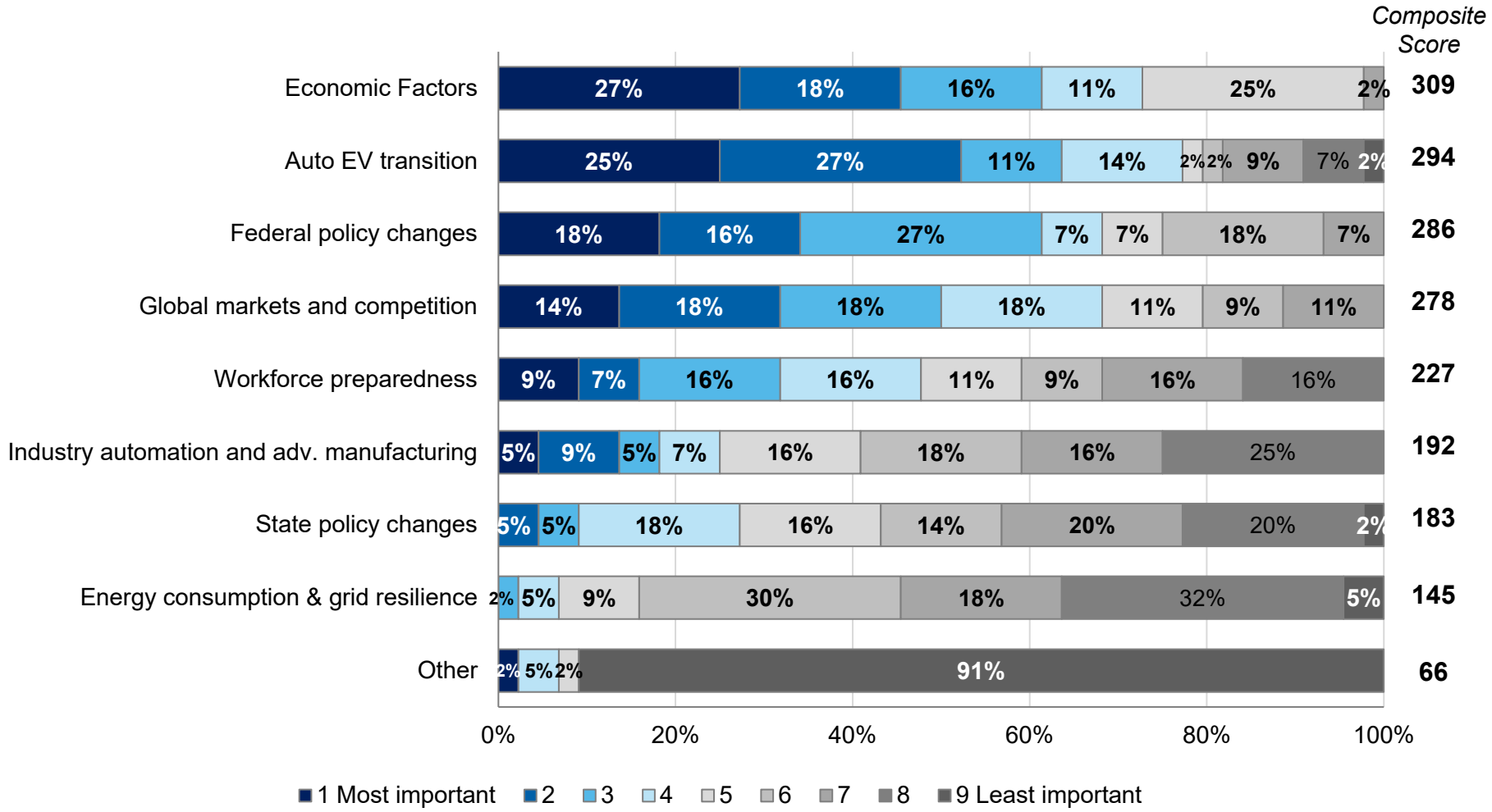
Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Industry shifts with Greatest Impact on Business (1 of 6)

SURVEY RESPONSES

Which automotive industry Shifts have the most impact on your business right now?



- Industry shifts were ranked from most to least important
- Composite scores represent weighted ranking sum, higher represents greater business impact
- **Industry shifts with most impact on businesses (composite score):**
  - Economic factors
  - EV transition
  - Federal policy changes
  - Global competitiveness
  - Workforce preparedness
- **Other industry shifts reported:**
  - Supply chain concerns (3)
  - Cybersecurity (1)
- **Sector Differences (top 3 impactful shifts):**
  - **Upstream and Downstream**: Economic factors, Federal policy, EV transition
  - **Core Auto**: EV transition, Global competitiveness, Federal policy & Economic factors

**Based on 44 responses*

Return to Table of Contents

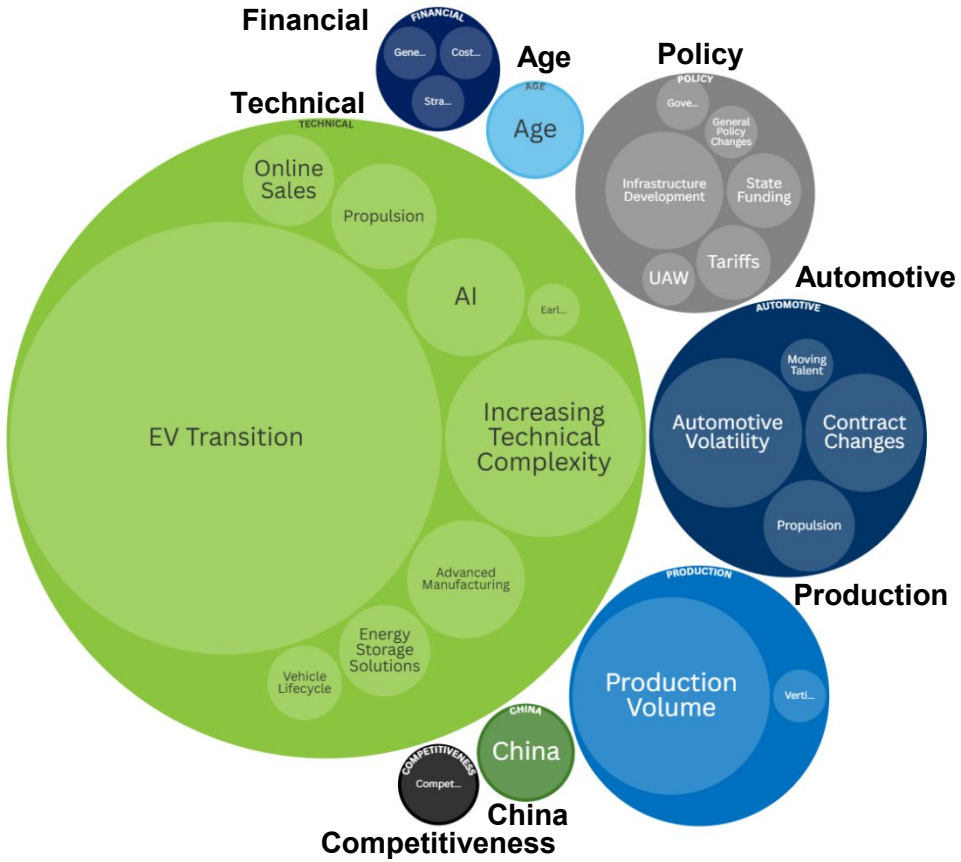
Michigan Automotive Workforce Needs Assessment

Industry shifts with Greatest Impact on Business (2 of 6)

INTERVIEW RESPONSES

What are the most important auto industry shifts impacting your facility today? In the future?

All Businesses Impactful Shifts



All Businesses Impactful Shifts

A **variety of changes** are impacting businesses, primarily driven by **technical shifts** (especially the **EV (Electric Vehicle) transition** and **increasing technical complexity**), **automotive industry shifts, policy shifts, and production shifts**.

Most Impactful Shifts

- **Technical shifts** include
  - EV transition
  - Increasing vehicle technical complexity
  - AI (Artificial Intelligence)
  - Advanced Manufacturing
- **Automotive shifts** include
  - Automotive industry volatility
  - Contract changes
  - Propulsion Preferences
  - Moving Talent
- **Production shifts** include
  - Decreasing production volume demand
  - Vertical integration
- **Policy shifts** include
  - State support of EV charging infrastructure
  - Tariffs
  - State funding changes
  - General Policy changes
  - UAW policies
- **Other industry shifts impacting businesses include China's impact on the US auto industry, age-related changes in the workforce,** and **competitiveness shifts.**

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Industry shifts with Greatest Impact on Business (3 of 6)

INTERVIEW RESPONSES

What are the most important auto industry shifts impacting your facility today? In the future?

Interview participants described experiencing volatility in the automotive industry that is driven by a wide range of shifts, particularly technical shifts including the EV transition.

Example Interview Responses (Paraphrased):

Participant K: *There's a lot of uncertainty right now – around economic policies, tariffs, what the future of EVs looks like and how quickly (or slowly) the transition happens, do we continue to invest in SDV skills or slow that and build up ICE competencies.*

Participant M: *We were making a leap to electric vehicles. Much like the rest of the industry, we've taken a step back. Hybrid powertrain topology is becoming more important. We ramped down some development in EV, moved back toward ICE, but now we're ramping some of those things back up but bringing ICE experts along with us. Long-term, it's necessary to have ICE experts alongside us.*

Participant A: *It's unclear whether OEMs will invest more in EV or ICE technology. When they have a difficult time deciding, we have a difficult time preparing.*

Participant E: *We know our manufacturing facilities have to be flexible. We need multiple facilities with multiple products, more of a campus. Some things come, some things go.*

Note: Participants were assigned identification letters - the letters you see here bear no relation to participant names or organizations.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

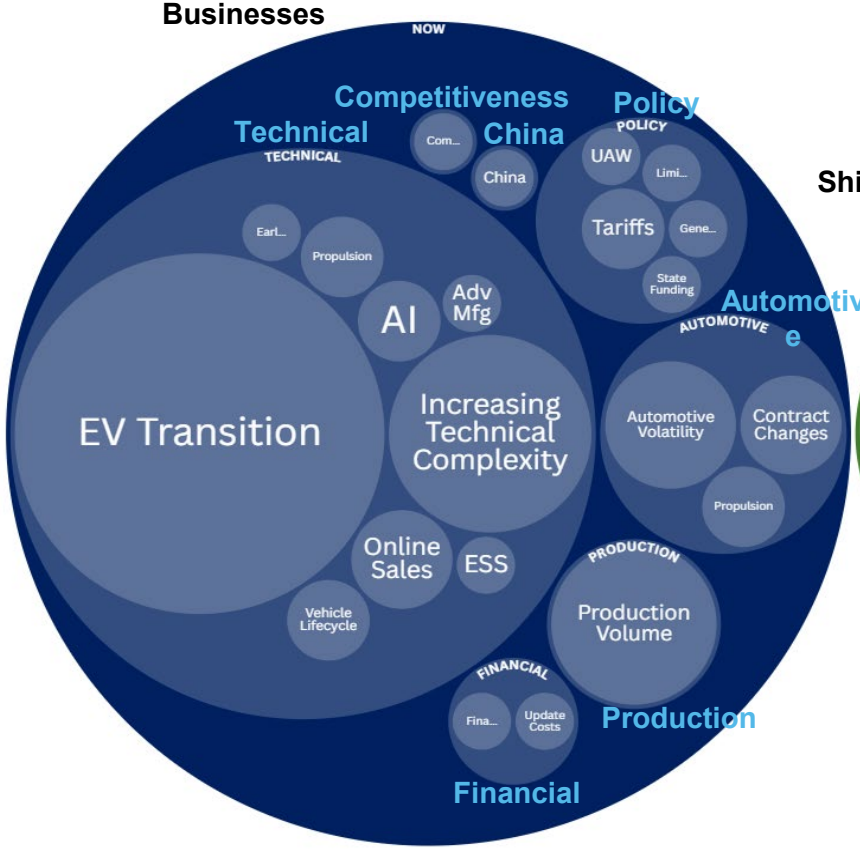
Industry shifts with Greatest Impact on Business (4 of 6)

INTERVIEW RESPONSES

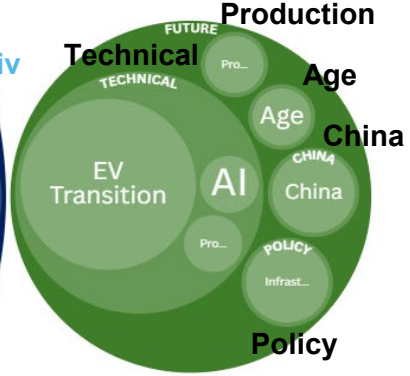
What are the most important auto industry shifts impacting your facility today? In the future?

All Businesses Impactful Shifts Current and Future

Shifts CURRENTLY Impacting Businesses



Shifts Impacting Businesses in the FUTURE



All Businesses Impactful Shifts Current & Future

Businesses had **more to say** about the **current impact** of industry shifts than the **future impact** of industry shifts**. Technical shifts (particularly the EV transition)** are expected to have the most impact **now** and in the **future.**

Shifts CURRENTLY Impacting Businesses

- **Technical shifts most impactful, followed by automotive industry shifts, production shifts, and policy shifts.**
- Most impactful **technical shifts** include
  - EV transition
  - Increasing vehicle technical complexity
  - Online sales
- Most impactful **automotive shifts** include
  - Automotive industry volatility
  - Contract changes
  - Business policies around propulsion technologies
- **Production volume shifts** are **currently** impacting businesses
- Most impactful **policy shifts** include
  - Tariffs
  - Changes to State funding
- Other changes impacting businesses include **competitiveness changes, financial changes,** and **changes related to China.**

Shifts Impacting Businesses in the FUTURE

- **Technical shifts most impactful, followed by infrastructure development policy shifts and shifts related to China.**
- Most impactful **technical shifts** include EV transition and AI
- Other shifts anticipated to impact businesses **in future** include **workforce age shifts** and **shifts in production volumes**.

Return to Table of Contents

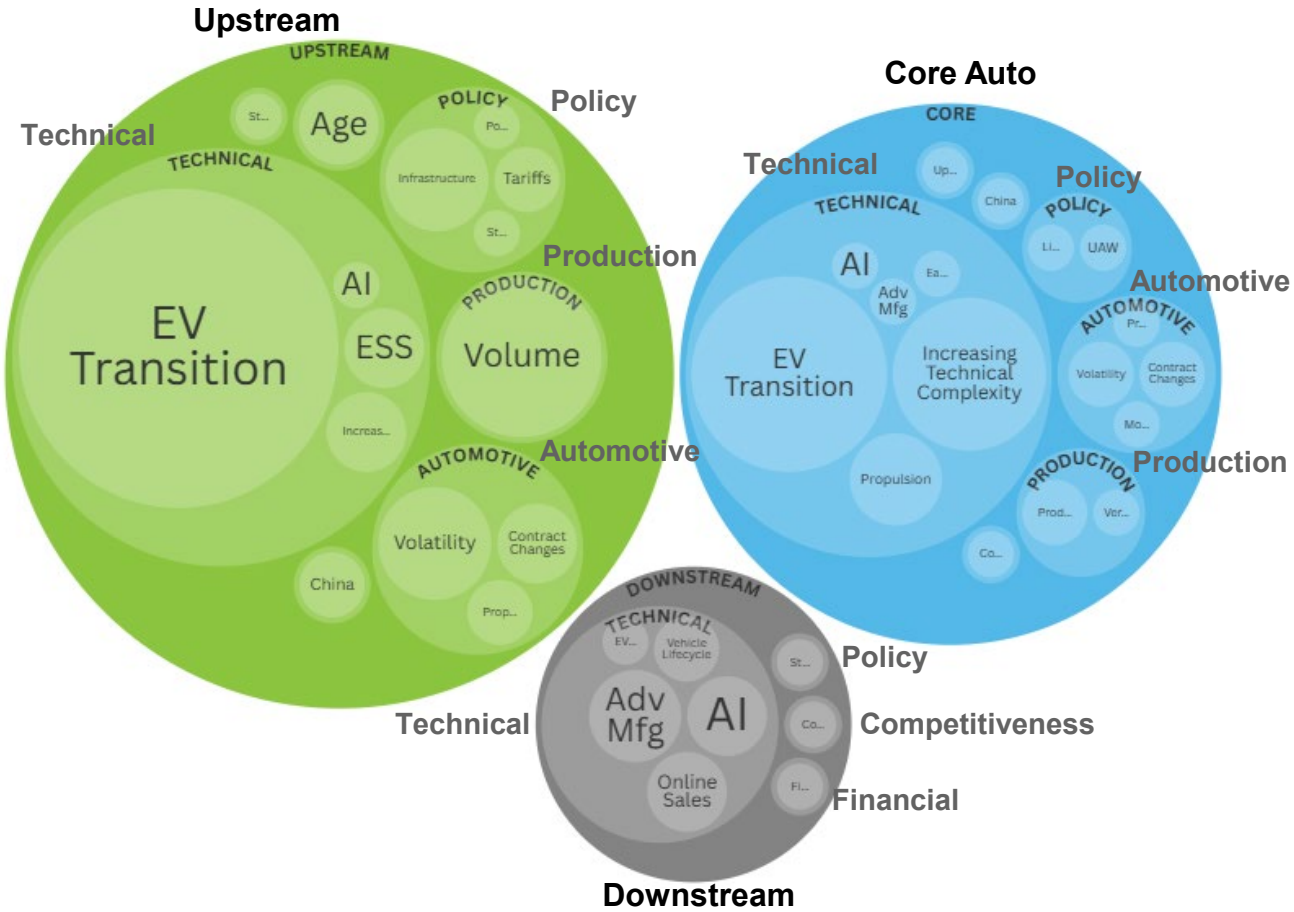
Michigan Automotive Workforce Needs Assessment

Industry shifts with Greatest Impact on Businesses (5 of 6)

INTERVIEW RESPONSES

What are the most important auto industry shifts impacting your facility today? In the future?

Impactful Shifts by Segment



Impactful Shifts by Segment

Technical shifts are impacting businesses across segments the most, but the **most impactful technical shifts vary with segments. Upstream businesses** are most impacted by the **EV transition, Core businesses** by the **EV transition** and **increasing technical complexity,** and **Downstream businesses** by **advanced manufacturing** and **AI.**

Upstream

- Most impacted by **technical shifts**, also heavily impacted **by production, automotive,** and **policy shifts**.

Core Auto

- Most impacted by **technical shifts**, also heavily impacted by **automotive, Policy,** and **production shifts.**

Downstream

- Most impacted by **technical shifts**, also heavily impacted by **policy, competitiveness,** and **financial shifts.**

Segment Similarities

- **All segments** impacted by **technical** and **policy shifts.**
- **Upstream** and **Core** heavily impacted by **production** and **automotive shifts.**

Segment Differences

- **Technical shifts**: **Upstream** segment most impacted by **EV Transition**. **Core** impacted heavily by **EV transition** and **increasing technical complexity**. **Downstream** impacted by **advanced manufacturing technology, AI,** and **online sales**.
- **Policy shifts: Upstream** segment most impacted **by infrastructure development policies, tariffs,** and **sate funding**, while **Core** segment most impacted by **limits on apprenticeship programs** and **UAW policies**, and **Downstream** segment most impacted by **state funding**.
- **Downstream** impacted by **policy, competitiveness**, and **financial shifts**, while **Upstream** and **Core** are more impacted by **production** and **automotive shifts.**

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: Industry Shifts Impacting Businesses (6 of 6)

Survey Summary

- Participants ranked a pre-selected group of eight different industry shifts to indicate impact on their businesses and provided open-ended responses about other industry shifts with impact.
- Overall, participants rated the **economic factors as having the most impact** on their businesses. Other high impact shifts included the **automotive EV transition, federal policy changes, and global markets and competition**.
- **Other industry shifts** reported by participants included **supply chain concerns and cybersecurity**.
- The **industry shifts with relatively lower impact ratings (beginning with the most impactful)** included **workforce preparedness, automation & advanced manufacturing, state policy changes, and energy consumption & grid resilience**.
- Sectors showed slightly different perspectives about impactful industry shifts, with upstream and downstream sectors both viewing economic factors, federal policy and EV transition as most impactful and core auto viewing the EV transition, global markets and competition, federal policy and economic factors as most impactful.
- **Based on the overall ratings, the data suggest that businesses are affected by multiple industry factors**, with economic factors, the EV transition, federal policy change, and global markets and competitiveness as the top industry shifts.

Interview Summary

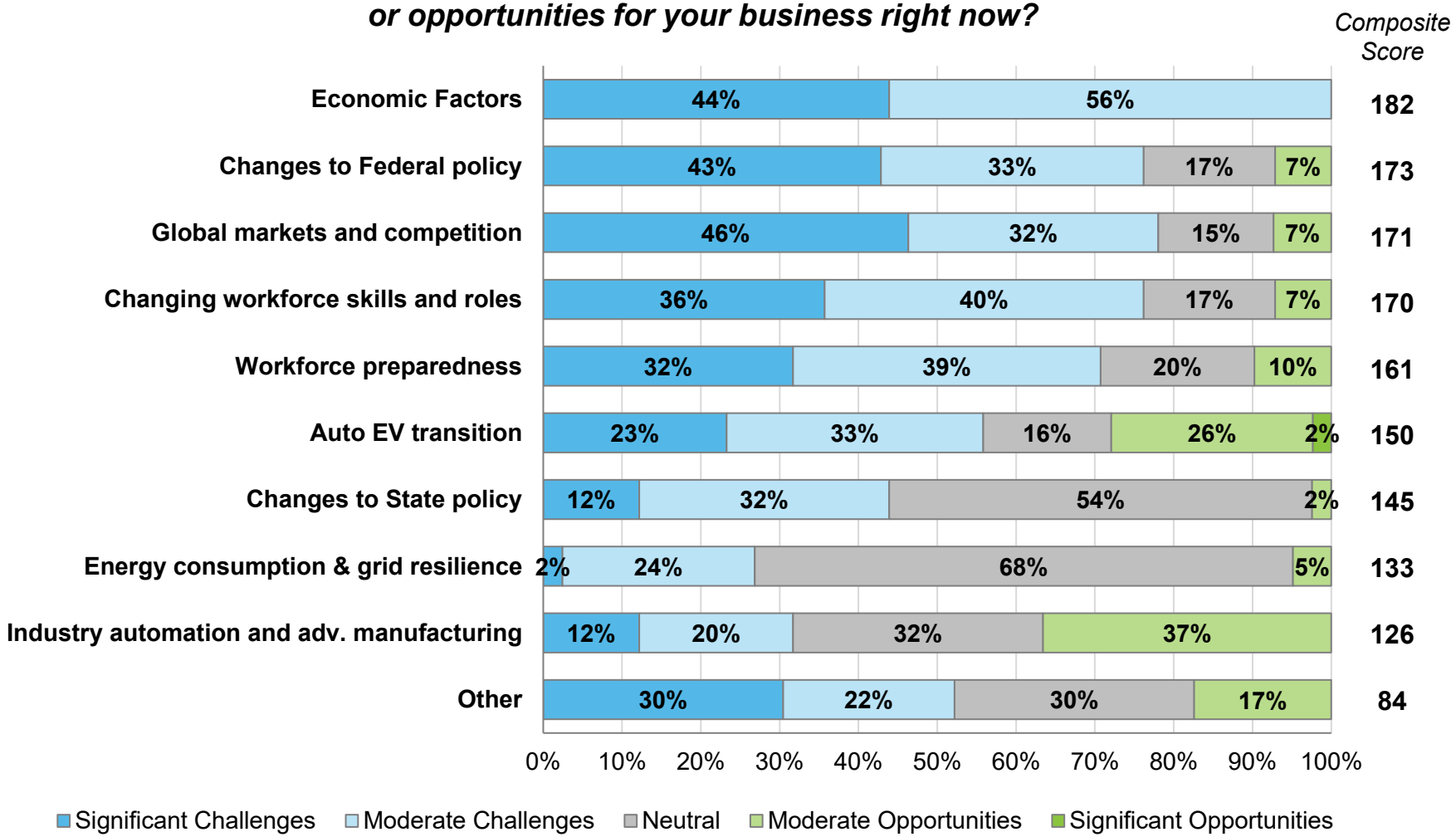
- **Technology shifts** were described as having the most impact on businesses, particularly the EV transition and the increasing technical complexity of vehicles.
  - **The most impactful additional technical shifts include** AI, advanced manufacturing, new (EV) propulsion technologies, and energy storage solutions.
  - **All segments** described being impacted by advances in AI.
  - **Upstream segments** were most impacted by the EV transition, increasing technical complexity, AI, and ESS (Energy Storage Solutions).
  - **Core segments** were most impacted by the EV transition, increasing technical complexity, and non-EV propulsion technology development.
  - **Downstream segments** were most impacted by advanced manufacturing, AI, and online sales.
- **Other shifts** affecting businesses include changes in the automotive industry, production, policy, finances, competitiveness, workforce age, and shifts related to China. Automotive industry shifts described by participants included themes such as contracts being cancelled or demanding less volume than expected, businesses moving automotive talent, and the general volatility of the automotive industry.
  - **Shifts in production needs** described by participants included themes such as changes in production volume, shifts in production lead time, and vertical integration.
  - **Policy shifts** described by participants included policies such as Infrastructure development, tariffs, and state funding.
- Overall, interview participants described a wide range of shifts impacting their businesses. Technical shifts, particularly the EV transition, had the most impact on businesses. Participants had more concrete impacts to discuss about the current impact of industry shifts than the future impact of industry shifts.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Industry Shifts posing Current Opportunities and Challenges (1 of 7)

Are the following automotive industry shifts posing challenges or opportunities for your business right now?



SURVEY RESPONSES

- Composite scores represent weighted sum of challenge (higher score=higher challenge)
- **Shifts currently posing greatest *challenges*:**
  - Economic factors
  - Federal policy changes
  - Global markets and competition
  - Changing workforce skills and roles
  - Workforce preparedness
  - **Other *challenging* shifts:**
    - Supply chain and supplier concerns (5)
    - Tariffs and trade (3)
    - Workforce motivation, availability & layoffs
    - Hiring & wage competition
    - Economic downturn
    - OEM focus on cost over quality
    - AI implementation
    - EV manufacturing slowdown & contract cancellations
- **Shifts currently posing *opportunities*:**
  - Automation and advanced manufacturing
  - EV transition
  - **Other** (Collaboration with academic institutions, exchange rate, policy driving domestic manufacturing)
- **Sector differences:**
  - **Upstream:** Economic factors, Federal & state policy
  - **Core Auto:** Similar with Global competition included
  - **Downstream:** Similar with EV transition included

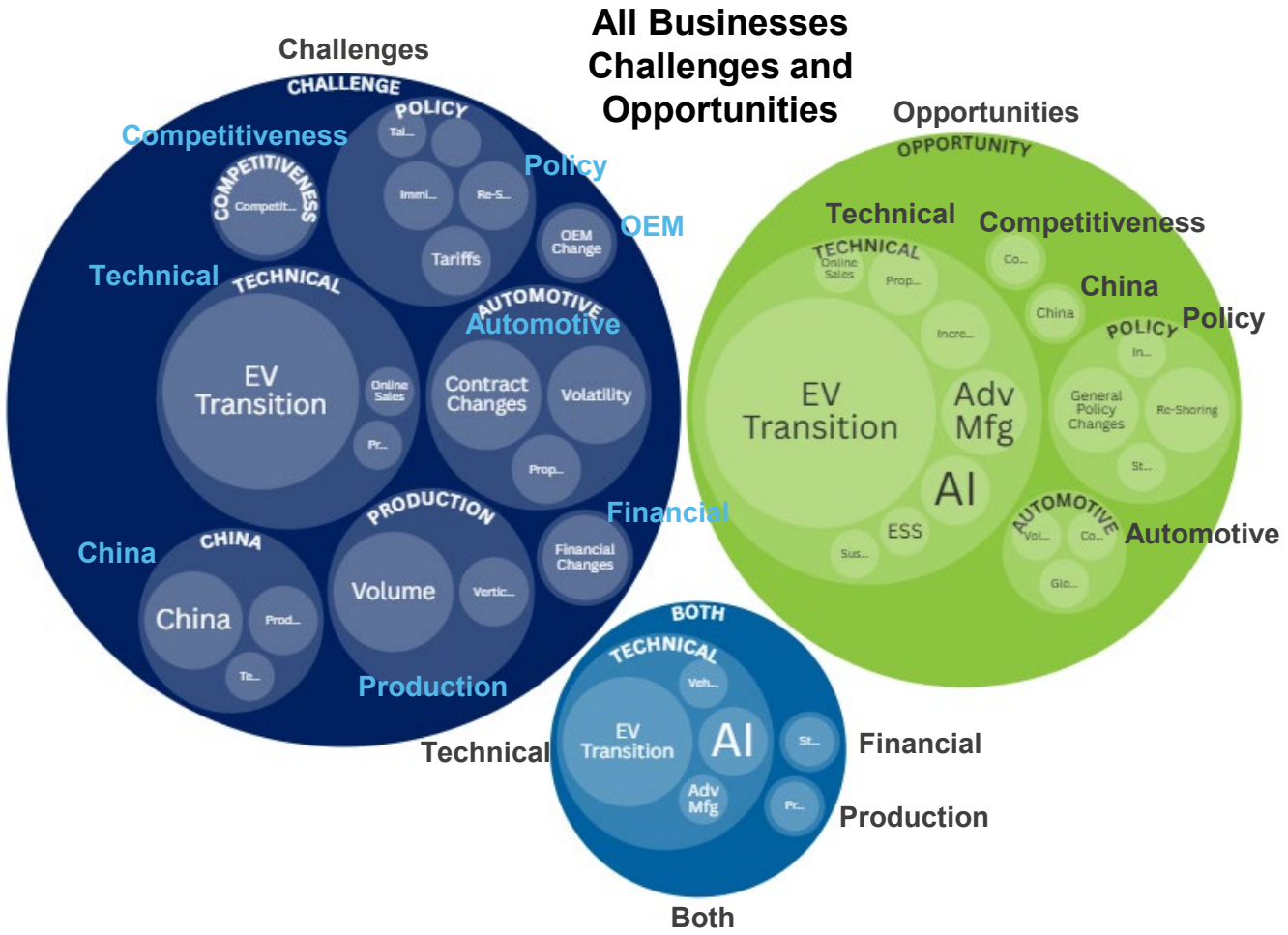
**Based on 43 responses*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Industry Shifts posing Current Opportunities and Challenges (2 of 7)

What challenges and opportunities is your facility experiencing related to auto industry shifts?



INTERVIEW RESPONSES

All Businesses Challenges and Opportunities

Technical shifts, particularly the **EV transition**, were described as providing the **greatest challenges and opportunities** for businesses. Participants described a **wider range of challenges than opportunities**.

Challenges

- **Technical shifts** include
  - EV transition
  - Online sales
  - Non-ICE/EV propulsion technologies
- **Automotive shifts** include
  - Contract changes
  - Automotive industry volatility
  - Propulsion preferences

Opportunities

- **Technical shifts** providing opportunities include
  - EV transition
  - Advanced manufacturing
  - AI
  - Increasing technical complexity
- **Policy shifts** providing opportunities include
  - State support of EV charging infrastructure
  - Re-shoring
  - State funding

Both

- **Technical shifts** providing both challenges and opportunities include
  - EV transition
  - AI

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Industry Shifts posing Current Opportunities and Challenges (3 of 7)

INTERVIEW RESPONSES

What challenges and opportunities is your facility experiencing related to auto industry shifts?

When describing challenges and opportunities, participants more frequently discussed current challenges and opportunities than anticipated challenges and opportunities. Challenges were described with a wider range of themes, most driven by Technical, Automotive, Policy, and Production changes. Opportunities were more concentrated among Technical, Policy, Automotive, Competitiveness, and China related changes. Technical, Financial, and Production changes were described as providing both challenges and opportunities.

Example Interview Responses (paraphrased):

Current Challenges:

Participant S: *The back-and-forth between EV and ICE is one of our biggest stumbling blocks. We are not seeing a lot of new components to release as companies aren't sure which platforms to prioritize.*

Participant F: *OEMs have changed their terms and conditions, we have to understand how we can safeguard against volume shifts that don't occur and vertical integration.*

Participant E: *We're seeing delays from OEMs as they're re-deciding what programs they're going to launch. It's challenging, programs are getting canceled, this doesn't happen in our other industries, I have to explain this to our executives. Historically programs would run for 5-10 years, they were consistent, volume was almost guaranteed. Since COVID, this hasn't been the case.*

Current Opportunities:

Participant T: *Data analytics is shaping automated vehicles. When thinking about the future generation of technicians, we're going from ICE engines to more automated. We need to think about how to manage LIDARS, cameras.*

Participant M: *Hybrid market is growing like crazy. Expect to have more offerings in hybrid market over next ~5 years, it's a big growth area for us.*

Participant M: *Localization is an opportunity for us. Customers are willing to fund moving back to the US to save money, I've never seen that. OEMs are willing to pay money to make sure we have localized production in the Americas.*

Participant A: *One OEM facility was stocked with our competitor's equipment, after the slowdown the new people working at the facility are interested in using our equipment.*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Industry Shifts posing Current Opportunities and Challenges (4 of 7)

INTERVIEW RESPONSES

What challenges and opportunities is your facility experiencing related to auto industry shifts?

All Businesses Current and Future Challenges and Opportunities

CURRENT Challenges and Opportunities

FUTURE Challenges and Opportunities

All Businesses Current and Future Challenges and Opportunities

Participants discussed **current challenges and opportunities more concretely than future challenges and opportunities**. **Technical shifts** pose both challenges and opportunities now and are anticipated to pose most **opportunities** in **the future**. The **EV transition** drives **current challenges** and **opportunities**, while **future opportunities** are driven by **AI** and **advanced manufacturing.**

Current Challenges and Opportunities: Currently more Challenges than Opportunities

- **Current Challenges**
  - **Technical shifts** most challenging, followed by **automotive, production, China related,** and **policy shifts.**
  - Most challenging **technical shifts** include:
    - EV transition
    - Online sales
- **Current Opportunities**
  - **Technical shifts** providing the most opportunities, followed by **policy, automotive, competitiveness**, and **China related shifts.**
  - Technical shifts providing most opportunities include the EV transition and online sales.

Future Challenges and Opportunities: More Opportunities anticipated than Challenges

- **Future Challenges**
  - **Policy shifts** most challenging, followed by **production** and **technical shifts**.
    - Most challenging **policy shifts** include **re-shoring policies and changes to USMCA.**
- **Future Opportunities**
  - **Technical shifts** anticipated to provide most **opportunities** in future, particularly **AI, advanced manufacturing, the EV transition**, and **ESS**.
  - **Automotive** and **policy** changes also anticipated to provide **opportunities**.

Return to Table of Contents

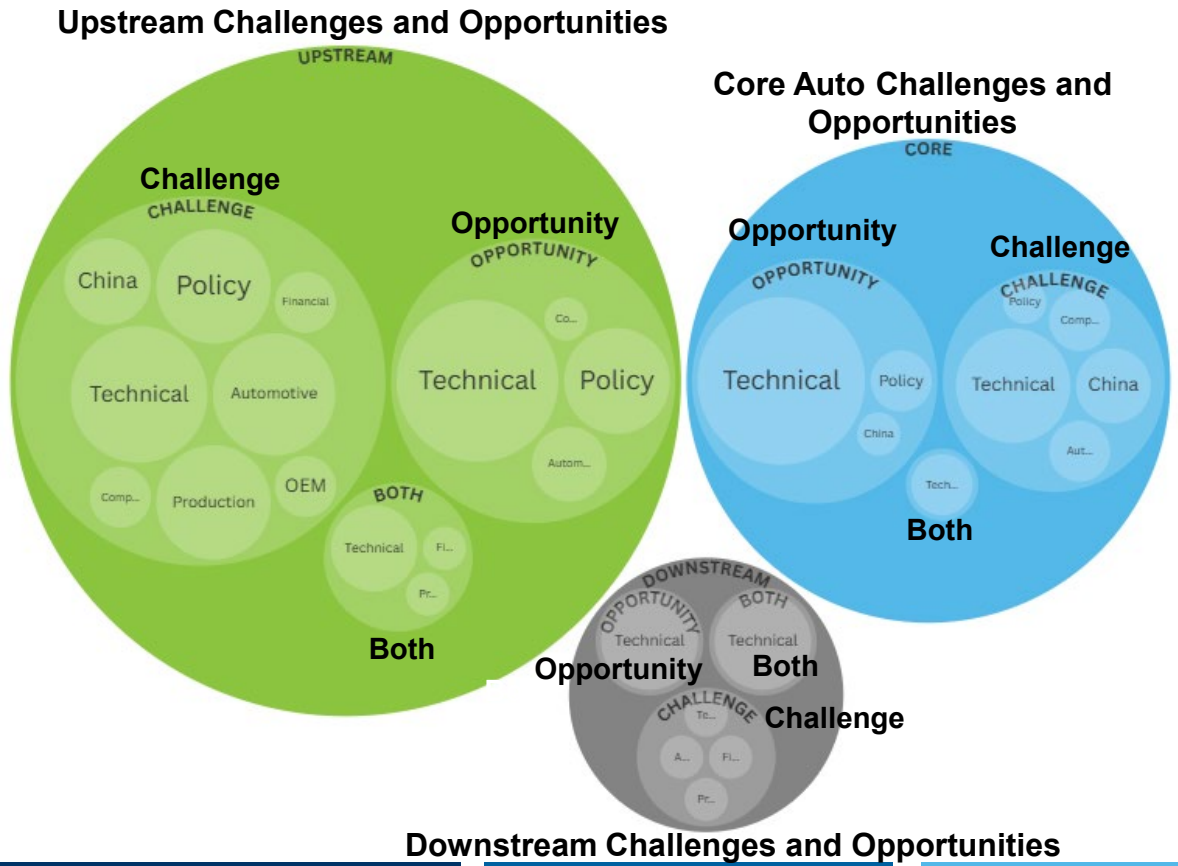
Michigan Automotive Workforce Needs Assessment

Industry Shifts posing Current Opportunities and Challenges (5 of 7)

What challenges and opportunities is your facility experiencing related to auto industry shifts?

INTERVIEW RESPONSES

Challenges and Opportunities by Segment



Challenges and Opportunities by Segment

Participants across **all segments** described **challenges** with the **most diversity,** while **opportunities** tended to be **technical** or **policy driven.** The **EV transition** drives **challenges and opportunities** across the **Upstream** and **Core Auto segments,** while **Downstream opportunities** are driven by **advanced manufacturing, AI,** and **online sales.**

Upstream Challenges and Opportunities

- **Challenges**
  - **Technical shifts** most challenging, followed by **automotive, production,** and **policy shifts.**
- **Opportunities**
  - **Technical shifts** providing most opportunities, followed by **policy** and **automotive changes.**

Core Auto Challenges and Opportunities

- **Challenges**
  - **Technical shifts** most challenging, followed by **automotive** and **China related shifts.**
  - **EV transition** most challenging **technical shift.**
- **Opportunities**
  - **Technical shifts** providing most opportunities, followed by **policy** and **China related shifts.**
  - **EV Transition technical shift** posing most opportunities.

Downstream Challenges and Opportunities

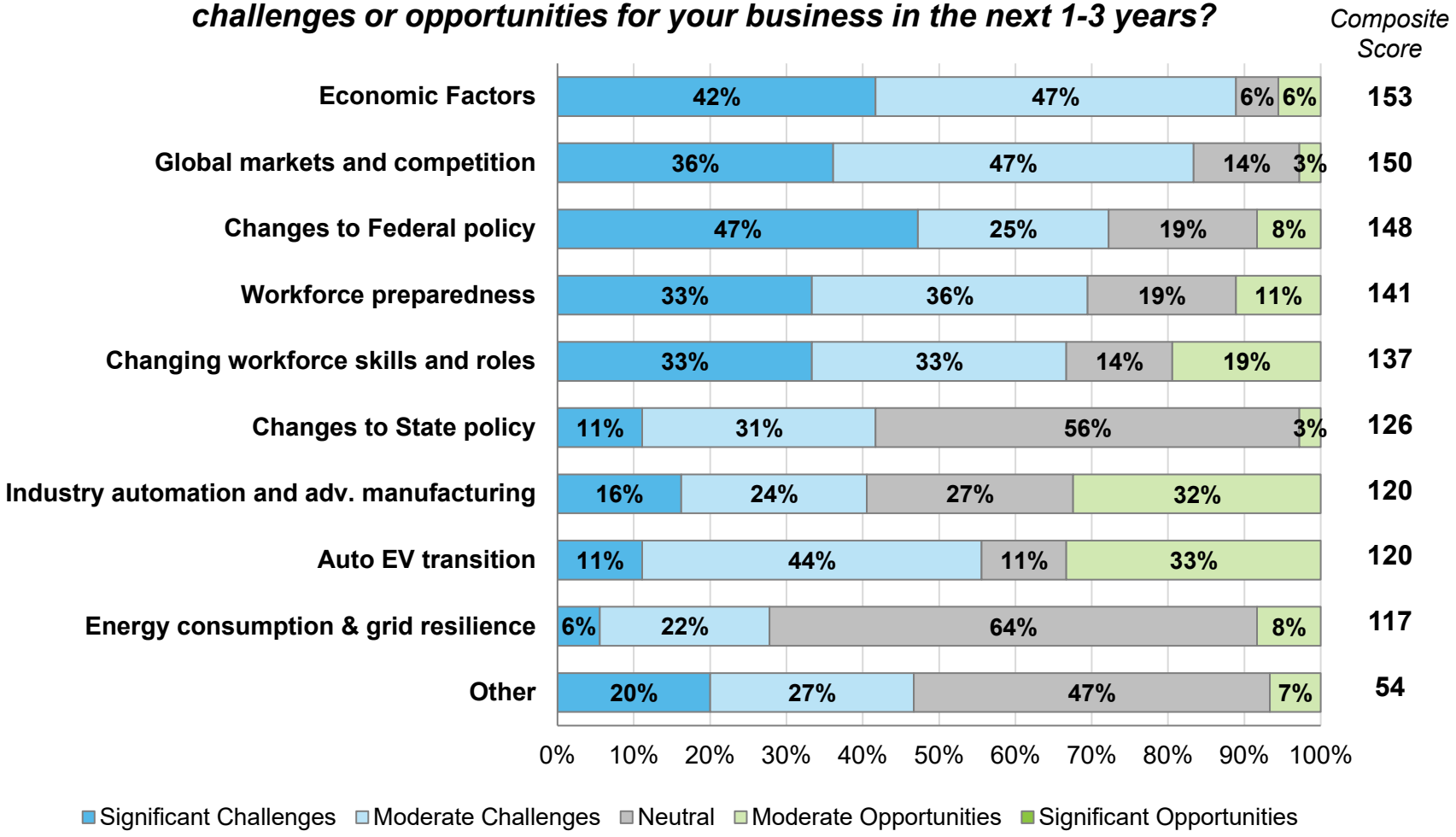
- **Challenges**
  - **Evenly split** among **technical, automotive, financial,** and **production shifts.**
- **Opportunities**
  - **Technical shifts** providing opportunities.
  - **Technical shifts** posing opportunities include **advanced manufacturing, AI**, and **online sales**.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Industry Shifts posing Future Opportunities and Challenges (6 of 7)

To what extent will these automotive industry shifts pose challenges or opportunities for your business in the next 1-3 years?



SURVEY RESPONSES

- **Shifts posing greatest *challenges* in the *future*:**
  - Economic factors
  - Global markets and competition
  - Federal policy changes
  - Workforce preparedness
  - Changing workforce skills and roles
  - **Other challenging shifts:**
    - Supply chain (3)
    - Workforce availability (2)
    - Supplier dynamics
    - Battery circularity
- **Shifts posing greatest *opportunities* in the *future*:**
  - Auto EV transition
  - Industry automation and advanced manufacturing
  - Changing workforce skills and roles
  - **Other future opportunities*:***
    - Expansion of domestic manufacturing
    - Collaborations with academic institutions
- **Sector differences:**
  - **Upstream:** Economic factors, Global competitiveness
  - **Core Auto:** Federal policy change, Economic factors, Global competitiveness
  - **Downstream:** Workforce preparedness, Federal policy change, Economic factors

**Based on 36 responses*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: Industry Opportunities and Challenges (7 of 7)

Survey Summary

- Overall, participants reported **economic factors as *currently* posing the greatest challenges** for their businesses. Other shifts with higher challenge ratings included **federal policy changes, global markets & competition, changing workforce skills & roles, and workforce preparedness**.
- Other currently challenging industry shifts included (in no order of importance) supply chain & supplier concerns, tariffs and trade, workforce availability, motivation, & layoffs, hiring & wage competition, economic downturn, OEM cost focus, AI, and EV manufacturing slowdowns & contract cancellations.
- Industry shifts posing current opportunities included automation & advanced manufacturing, the EV transition, collaboration with academic institutions, foreign exchange rates, and domestic manufacturing support.
- Participants also rated **economic factors as most challenging for the *future*,** along with **global markets & competition, federal policy changes, workforce preparedness, and changing skills & roles**.
- Other shifts noted as future challenges include supply chain, workforce availability, supplier dynamics, and battery circularity.
- Industry shifts with the greatest future opportunities included the EV transition, automation & advanced manufacturing, changing workforce skills & roles, domestic manufacturing expansion, and academic collaborations.
- **Overall, businesses *currently* view economic factors and federal policy change as the most challenging now and in the future.** Other current challenges are focused on global competition, changing workforce roles, and a broad array of economic, workforce, and technology challenges. Current opportunities focus on automation, advanced manufacturing, and the EV transition.
- ***Future* challenges** focused on economic factors and global competitiveness, and future opportunities include automation & advanced manufacturing and the EV transition.

Interview Summary

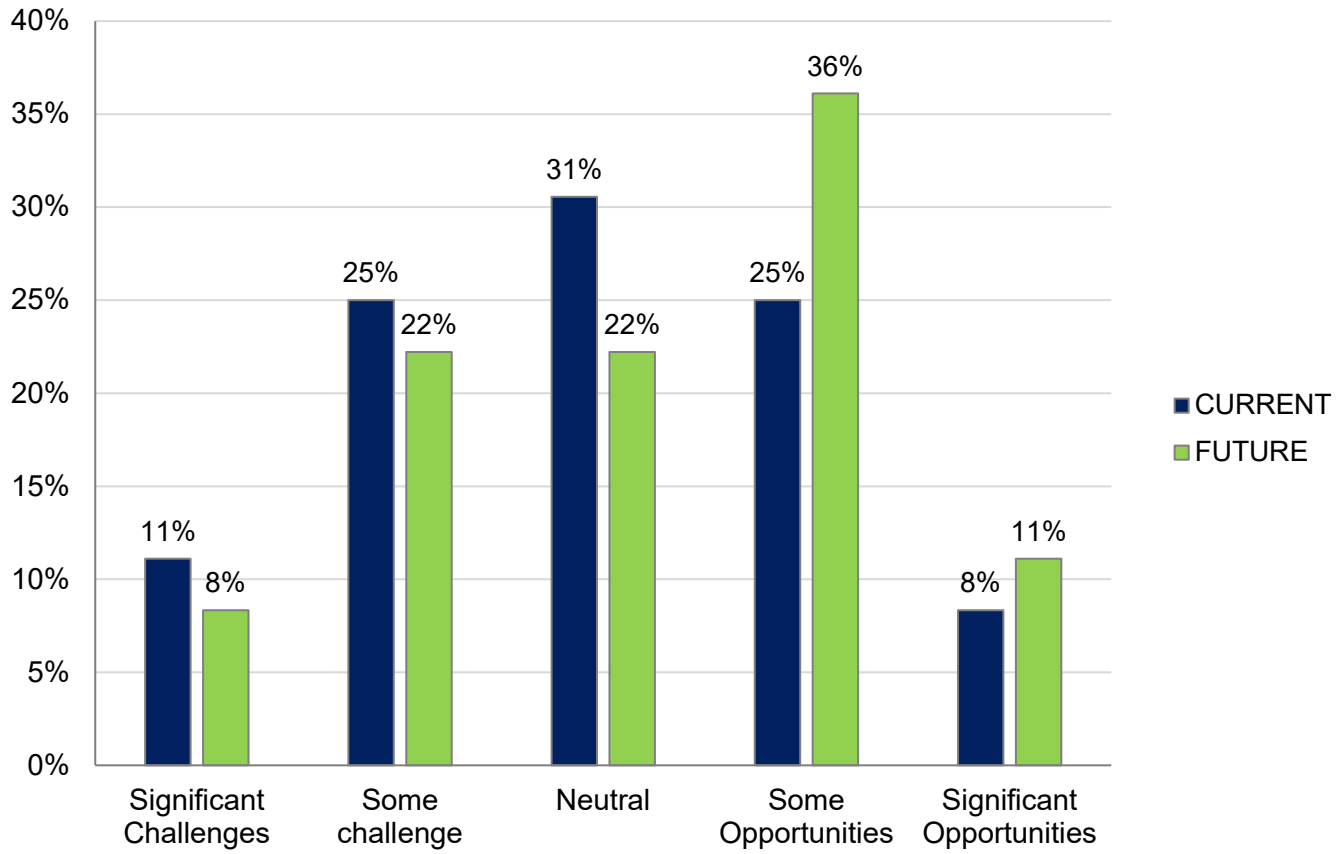
- Technical shifts posed the greatest challenges and opportunities for businesses.
- **Technical shifts providing challenges and opportunities for businesses:**
  - **EV transition:**
    - Provides the greatest challenges and opportunities
    - Opportunities include both technical advancements and products able to be offered, particularly hybrid vehicle products.
    - Challenges focused on the uncertain rate of the transition which, for some, has led to decreased demand and project delays. Participants also described reductions in demand for products resulting from EV component needs differing from ICE component needs as challenges of the EV transition.
  - **AI:**
    - Opportunities include streamlined supply chains and more advanced data analysis capabilities, while challenges include the implementation challenges and uncertain workforce impacts.
- **Other shifts posing challenges and opportunities for businesses:**
  - **Automotive industry shifts:**
    - Contract changes, industry volatility, and production demand decreases provided challenges and opportunities for businesses, but were more frequently described as challenges
  - **Policy shifts:**
    - Re-shoring policies, general policy shifts, infrastructure development, and state funding provided opportunities, while tariffs, immigration policies, cuts to TalentFirst, USMCA uncertainty, and re-shoring policies provided challenges for businesses.
- Overall, participants described a wide range of impactful industry shifts, the majority of which provided both challenges and opportunities. Technical shifts posed both the greatest challenges and opportunities for businesses. Participants had more concrete opinions about the current impact of industry shifts than the future impacts of industry shifts.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Impact of EV transition on Jobs: Current and Future (1 of 6)

How much of a challenge or opportunity does the EV transition pose for jobs at your facility today and in the next 1-3 years?



SURVEY RESPONSES

Current impact of EV transition on jobs

- Businesses currently view the EV transition as posing slightly more challenges than opportunities, with 36% reporting challenges, 33% reporting opportunities, and 30% reporting neutral impact.

Future impact of EV transition on jobs

- In the future, businesses expect the EV transition will pose slightly more opportunities than challenges for jobs, with 47% reporting more opportunities, 22% reporting neutral impact, and 30% reporting challenges.

Sector differences:

- **Upstream** sectors currently expect more challenging impacts on jobs compared to more opportunities in the future.
- **Core Auto** sectors currently expect more neutral (67%) to challenging (34%) impacts, and slightly more opportunity for job impacts in the future (17%).
- **Downstream** sectors currently expect more challenging (66%) to neutral (33%) impacts, and slightly more opportunity for job impacts in the future (17%).

**Based on 36 responses*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Impact of EV transition on Jobs: Current and Future (2 of 6)

Is the EV transition currently impacting jobs at your facility? In the future?

INTERVIEW RESPONSES

All Businesses Impact of Industry Shifts on Workforce Needs

All Businesses Impact of Industry Shifts on Workforce Needs

A slim majority of employers reported that they were **hiring and/or expanding** their workforce, while **other employers** reported **uncertainty** about their employment needs or **workforce reductions.**

- **Just over half** of businesses (12/20) were **hiring**.
  - **Two businesses** report that **regional expansion** may be on their horizon.
- **Uncertainty** about employment needs was reported by **7/20 employers.**
- **Reductions** in workforce were reported by **4/20 businesses**.
- **Pauses in hiring** were reported by **2/20 businesses.**

Note: Values to the left represent only whether or not a business mentioned a job need. The frequency with which businesses discussed these needs were not included, as each category either was or was not happening. Employers could however mention multiple categories of job need in their responses.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Impact of EV transition on Jobs: Current and Future (3 of 6)

INTERVIEW RESPONSES

Is the EV transition currently impacting jobs at your facility? In the future?

A slim majority of employers are hiring, but uncertainty around several industry shifts is causing others to be uncertain of their workforce needs, or to pause hiring or reduce their workforce.

Example Interview Responses (Paraphrased):

Growth:

Participant E*: We're watching to see what will happen with re-shoring policies. They could lead to more positions in Michigan.*

Participant K: *Our organization is in a different position than other R&D centers. We are experiencing a significant growth period. Part of the reason for this growth is demand for software engineers that is expanding despite the slowdown in EV and SDV. It's complicated.*

Participant H: *We're looking for software, mechanical, and electrical engineers to design the products that will be brought to market by our customers. Workforce development is very important.*

Uncertainty:

Participant E: *Unfortunately, we've had layoffs because the volume expected never happened. That's challenging for real people depending on those paychecks.*

Participant D: *We were awarded a project 2 years ago, told the volume would be through the roof. We made significant investments into our manufacturing capabilities and workforce, it was a huge investment for us. This project is doing a quarter of the volume we expected, we had to lay people off for the week because of low business.*

Participant S: *With the amount of help we have on hand, I think it would be a hiring freeze in a sense. We're not looking to bring people on because there isn't extra work. We're steady and making do with what we have.*

Return to Table of Contents

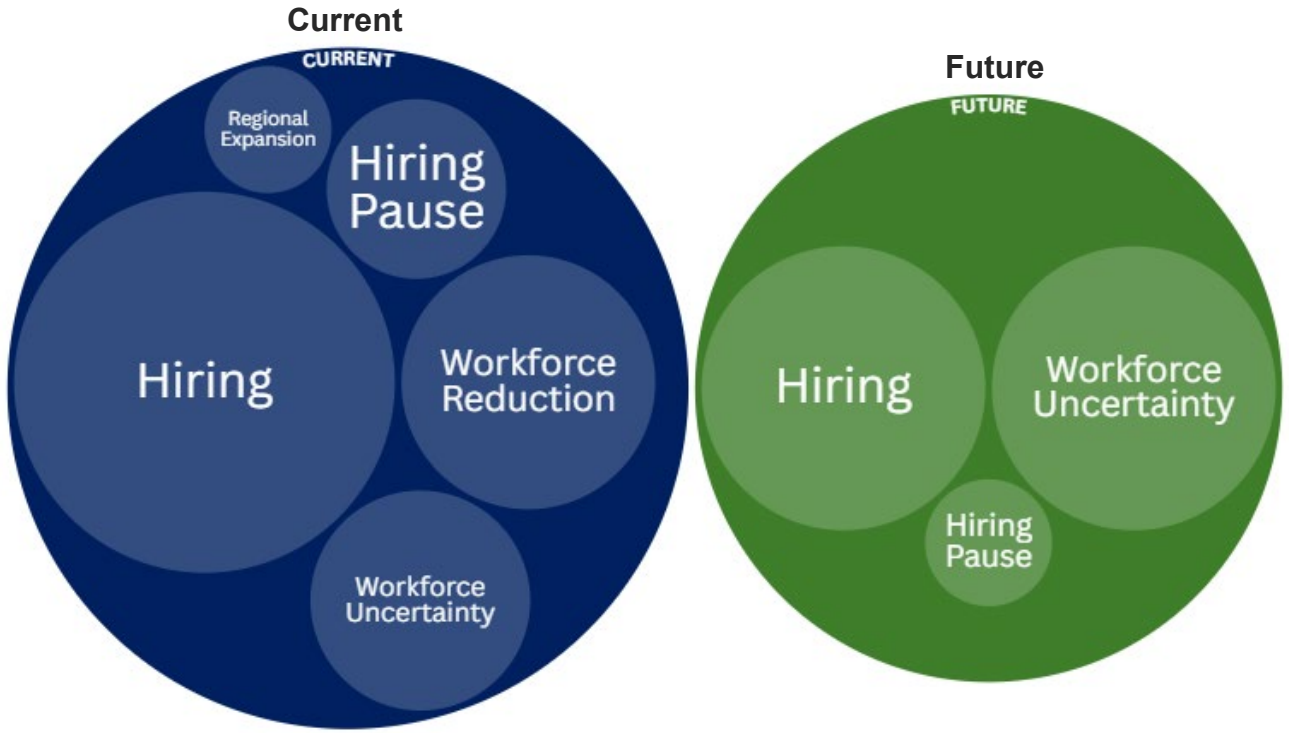
Michigan Automotive Workforce Needs Assessment

Impact of EV transition on Jobs: Current and Future (4 of 6)

INTERVIEW RESPONSES

Is the EV transition currently impacting jobs at your facility? In the future?

All Businesses Current and Future Workforce Needs



All Businesses Current and Future Workforce Needs

A **slight majority** of companies are **currently hiring or expanding,** while the **rest reported workforce reductions, hiring pauses,** or **general workforce uncertainty. In the future, workforce needs are split between hiring and uncertainty.**

Current workforce needs

- A **slim majority** of employers reported that they are **currently hiring or expanding** their workforce, while **other employers** reported **uncertainty** about their employment needs.
- Five businesses stated they were currently hiring.
- Three businesses stated they were currently reducing their workforce.
- Two employers stated they were currently not hiring.
- Two employers reported uncertainty about their workforce needs.

Future workforce needs

Future workforce needs are **split** between **hiring** and **uncertainty**.

- Five reporting they **anticipate hiring** in the next 1-3 years
- Five report they are **uncertain** how industry shifts will impact workforce needs in the next 1-3 years

Note: Values to the left represent only whether or not a business mentioned a job need. The frequency with which businesses discussed these needs were not included, as each category either was or was not happening. Employers could however mention multiple categories of job need in their responses.

Return to Table of Contents

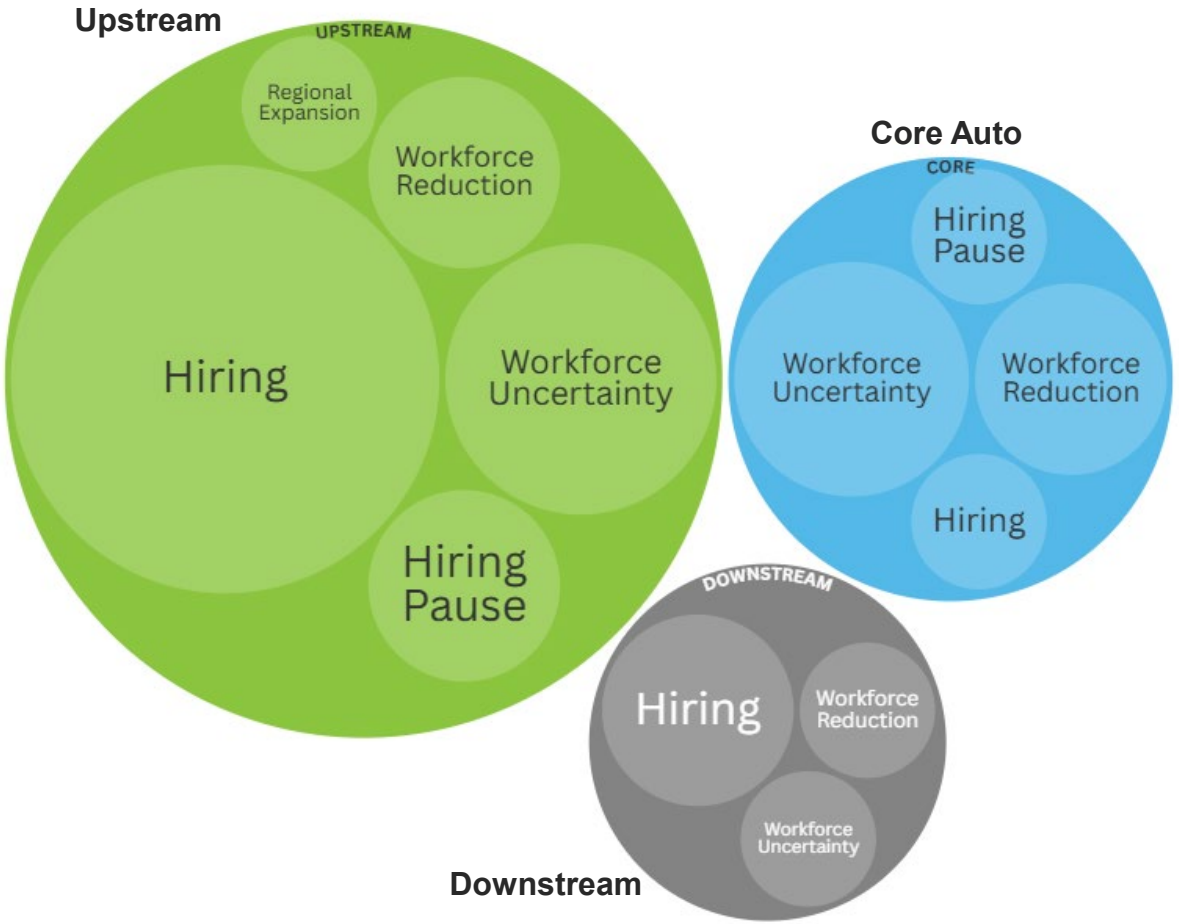
Michigan Automotive Workforce Needs Assessment

Impact of EV transition on Jobs: Current and Future (5 of 6)

Is the EV transition currently impacting jobs at your facility? In the future?

INTERVIEW RESPONSES

Workforce Needs by Segment



Workforce Needs by Segment

The **Upstream** segment **reported slightly more hiring or expansion than uncertainty, reductions, or hiring pauses**. The **Core** Auto segment reported **more uncertainty, reductions, and hiring pauses than hiring**. The **Downstream** segment is **split** between **hiring and uncertainty and reductions.**

Upstream workforce needs

- **Eleven** businesses report **hiring and/or expanding**
- **Four** businesses report **workforce uncertainty**
- **Two** report recent **workforce reductions**

Core Auto workforce needs

- **Three** businesses report **workforce uncertainty**
- **Two** report recent **workforce reductions**
- **One** reports they are on a **hiring pause**
- **One** reports they are **hiring**

Downstream workforce needs

- **Two** businesses report they are **hiring**
- **One** reports **workforce uncertainty**
- **One** reports recent **workforce reductions**

Segment Similarities

- **Approximately half** of **Upstream and Downstream** businesses report **hiring.**
- **Workforce uncertainty** and **reductions** were reported **across segments.**

Segment Differences

- **Core Auto businesses** reported **more uncertainty, reductions,** and **hiring pauses** than **hiring.**

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: Impact of Industry shifts on Jobs (6 of 6)

Survey Summary

Challenges and Opportunities with EV Transition

- **Currently, 36% of all businesses reported that the EV transition poses more challenges for their businesses**. A slightly lower proportion of businesses (33%) report current opportunities associated with the EV transition, and about 30% of businesses report neutral impact.
- **In the *future*** (next 1-3 years), a larger proportion of businesses expect that the EV transition will provide moderate to significant job opportunities (47%) in comparison to 30% that expect the transition to pose moderate to significant future challenges for their businesses.
- **Industry segments varied according to current and future impact** on business, with upstream businesses reporting more balance between current challenges opportunities and more future opportunities. Core auto businesses expect more neutral to challenging current impacts and slightly more future opportunities. Downstream businesses report more current challenges and slightly higher opportunities in the future.
- Overall, current perspectives suggest a slightly more challenging impact on their businesses and expect more future opportunities associated with the EV transition. Upstream sectors showed the most balance between current challenges and opportunities, with core auto and downstream reporting more current challenges. All sectors expect more future opportunities with the EV transition.

Interview Summary

- **Technical shifts** seem to be driving both hiring and workforce uncertainty, while re-shoring policies are linked to hiring.
- **Slightly over half (12/20)** of employers reported that they were hiring, while the rest of the interview participants reported uncertainty about their employment needs, workforce reductions, or hiring pauses.
- **When describing current workforce needs**, a slim majority of interviewees reported they were hiring or expanding, while the rest of the interviewees reported uncertainty, workforce reductions, or hiring pauses.
- **When describing anticipated future workforce needs**, reported needs were split between anticipating hiring in the future and uncertainty about their future workforce needs.
- **The Upstream segment** reported slightly more hiring or expansion than uncertainty, reductions, or hiring pauses.
- **The Core Auto segment** reported more uncertainty, reductions, and hiring pauses than hiring.
- **The Downstream segment** is split between hiring and uncertainty and reductions.
- Overall, a slim majority of employers are hiring, but uncertainty around several industry shifts is causing others to be uncertain of their workforce needs, or to pause hiring or reduce their workforce.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Upskilling Needs among Current Employees (1 of 3)

What proportion of your employees need to update their skills?

Proportion of Current Employees that need to Update skills	All Businesses	Upstream	Core Auto	Downstream
20% or less	35%	29%	33%	50%
21-40%	29%	35%	33%	17%
41-60%	24%	29%	17%	17%
61-80%	6%	0%	17%	0%
80% or more	6%	6%	0%	17%

SURVEY RESPONSES

Upskilling Needs among Current Employees

- Participants reported the proportion of current workers that need to update skills.

All businesses

- Overall, the largest share of businesses (35%) report that 20% or less of their employees need to update skills, followed by another 29% that report some upskilling needs (21-40% of current employees) and 24% that report moderate upskilling needs (41-60% of current employees).

Segment differences

- **Upstream sector** businesses show a larger share with low to moderate upskilling needs compared to all businesses combined.
- **Core auto** sector businesses most frequently report lower upskilling needs, with 66% reporting that 40% or fewer of employees need to update skills.
- **Downstream sector** businesses most frequently report the largest share of very low upskilling needs (50%) as well as very high upskilling needs(17%).

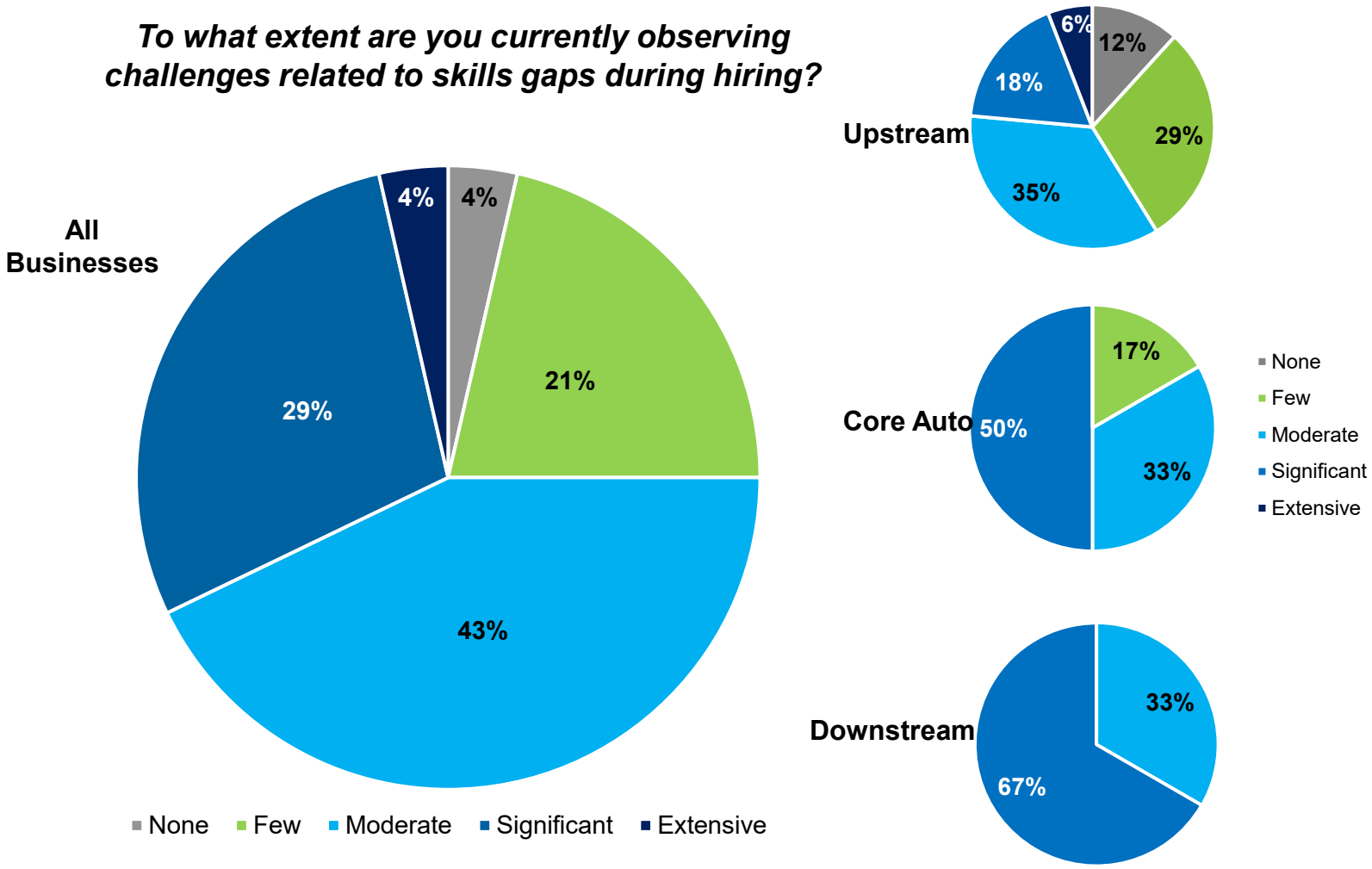
**Based on 34 responses*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Hiring Challenges related to Skills Gaps (2 of 3)

To what extent are you currently observing challenges related to skills gaps during hiring?



SURVEY RESPONSES

Degree of Skills Gap challenges with new applicants

- Participants rated the degree of challenge with skills gaps in hiring.

All businesses

- Overall, 43% of businesses report moderate skills gaps when hiring new employees, while 33% reporting significant to extensive gaps, and one quarter report few to no challenges.

Sector differences

- **Upstream sector** businesses report a range of few to extensive skills gaps with new applicants, with the largest share showing moderate gaps (35%).
- **Core auto** sector businesses report relatively higher level of upskilling needs, with 50% reporting significant needs and 33% reporting moderate needs.
- **Downstream sector** businesses report the largest share of significant upskilling needs(67%), and another 33% reporting moderate needs.

**Based on 34 responses*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: Upskilling Needs and Hiring Challenges (3 of 3)

Survey Summary

Upskilling Needs

- **Overall, a large proportion of businesses (68%) report that 40% or less of their current employees need to update their skills.**
- The largest share of businesses (35%) reported that a low proportion of their employees need to update their skills (e.g., 20% or less), followed by 29% reporting 21-40% of employees need to upskill. About one quarter of businesses report moderate upskilling needs for their employees (41-60%). Another 6% report a significant proportion of their employees need to upskill (61-80%) with 6% reporting extensive upskilling needs (80% or more of employees).
- **Segments varied according to reported upskilling needs**, with Upstream sector businesses reporting the highest share of moderate upskilling needs, core auto reporting the highest share of significant needs, and downstream reporting the greatest share of very low and extensive upskilling needs.

Hiring Challenges related to Skills Gaps

- Overall, businesses report a range of few to significant hiring challenges related to skills gaps, with the largest proportion of businesses reporting moderate hiring challenges related to skills gaps (43%). Another 29% of businesses report significant hiring challenges related to skills gaps, and 21% of businesses report few hiring challenges.
- Segments varied according to skills gaps challenges with hiring, with upstream businesses reporting the broadest range in challenges, core auto reporting a range of few to significant challenges, and downstream reporting the largest share of significant skills gaps in hiring.

Taken together, these data suggest that while businesses currently perceive their employees to have lower need to update their skills, they are experiencing a broader range of skills gap challenges when they are hiring new employees. Sectors varied according to current employee skills gaps and hiring challenges.

Interview Summary

- In the interest of time interviews did not ask the additional questions related to the quantitative proportion of current employees that need to update skills or the degree of hiring challenges related to skills gaps.
- Interviews included questions about the specific skills gaps, reviewed in the questions to follow.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Skills in Demand among Current Workers: All Sectors (1 of 15)

What types of skills are in short supply at your facility?

Auto-related Sales & Customer Interface	All Businesses
EV charging infrastructure knowledge	3
Fuel systems knowledge	2
Sales & product knowledge (including financing)	2
Vehicle parts identification and compatibility	2

Commercial Freight & Supply Chain	All Businesses
Supply chain, inventory, and logistics management	4
Tech-enabled fleet operations (telematics, navigation, warehouse mgmt.)	2
Commercial driving, safety, and compliance	0
Freight handling, load management and route optimization	0

Cross-cutting Skills	All Businesses
Soft skills (problem-solving, critical thinking, listening)	18
Advanced software and programming skills	10
Basic computer skills	2

Production & Equipment	All Businesses
Automation and robotics operation	12
Testing, calibration, tolerancing, and failure analysis	9
Mechanical assembly, hydraulics, and pneumatics,	8
Equipment assembly, installation, maintenance, or repair	7
Manufacturing and production planning & systems operations	7
Quality control, precision measurement, or inspection	7

Engineering & Design	All Businesses
Product design, prototyping, and computer-aided design	8
Electronics	5
Powertrain and vehicle systems (internal combustion engine vehicles)	5
Automated vehicle (AV) and advanced driver assistance system (ADAS) design, integration	4
Vehicle body, chassis design, and lightweighting	3
Battery electric, hybrid, and electric vehicle systems	2
Vehicle interior, exterior systems integration	1

Materials & Processing	All Businesses
Machining and fabrication	6
Metals processing, metallurgy, forming, casting, welding, or finishing	4
Non-Metals processing, polymer, ceramics, or glass production	4
Surface treatment, coatings, adhesives, or paint processing and production	4
Recycling, reuse, & circularity	2

Vehicle Technical Skills	All Businesses
Diagnostics, repair & maintenance	8
Electrical and battery repair & maintenance	5
Assembly	2

SURVEY RESPONSES

Skills currently in Demand

- Participants selected all skills currently in demand from a list across eight categories, including other skills (open-ended response).

All Businesses

- **Top skills groups in demand**
  - Cross-cutting skills
  - Production & equipment
  - Engineering & design
  - Vehicle technical skills
  - Materials & processing
  - Other skills (leadership skills)

- **Top skills in demand: All Businesses**
  - Soft skills
  - Automation & robotics operation
  - Advanced software & programming skills
  - Testing, calibration, tolerancing & failure analysis
  - Vehicle diagnostics, repair & maintenance
  - Product design, prototyping & CAD
  - Mechanical Assembly, hydraulics, & pneumatics

**Note: Participants selected multiple responses, therefore data are shown in frequencies.*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Skills in Demand among Current Workers: By Sector (2 of 15)

What types of skills are in short supply at your facility?

Auto-related Sales & Customer Interface	Upstream	Core Auto	Downstream
Fuel systems knowledge	1	0	2
EV charging infrastructure knowledge	0	0	3
Sales & product knowledge (including financing)	0	1	1
Vehicle parts identification and compatibility	0	0	1

Commercial freight & supply chain	Upstream	Core Auto	Downstream
Supply chain, inventory, and logistics management	2	1	0
Tech-enabled fleet operations (telematics, navigation, warehouse mgmt.)	1	0	0
Commercial driving, safety, and compliance	0	0	0
Freight handling, load management and route optimization	0	0	0

Cross-cutting skills	Upstream	Core Auto	Downstream
Soft skills (problem-solving, critical thinking, listening)	10	3	4
Advanced software and programming skills	7	2	1
Basic computer skills	1	0	1

Production & equipment	Upstream	Core Auto	Downstream
Automation and robotics operation	9	3	0
Manufacturing and production planning & systems operations	6	1	6
Equipment assembly, installation, maintenance, or repair	5	2	0
Mechanical assembly, hydraulics, and pneumatics,	5	3	0
Testing, calibration, tolerancing, and failure analysis	5	3	0
Quality control, precision measurement, or inspection	4	2	0

Engineering & Design	Upstream	Core Auto	Downstream
Product design, prototyping, and computer-aided design	5	2	1
Automated vehicle (AV) and advanced driver assistance system (ADAS) design, integration	3	0	1
Electronics	3	1	1
Powertrain and vehicle systems (internal combustion engine vehicles)	3	1	1
Battery electric, hybrid, and electric vehicle systems	1	0	1
Vehicle body, chassis design, and lightweighting	1	1	1
Vehicle interior, exterior systems integration	0	0	1

Materials & Processing	Upstream	Core Auto	Downstream
Machining and fabrication	4	1	1
Surface treatment, coatings, adhesives, or paint processing and production	4	0	4
Metals processing, metallurgy, forming, casting, welding, or finishing	3	1	0
Non-Metals processing, polymer, ceramics, or glass production	3	1	0
Recycling, reuse, & circularity	2	0	0

Vehicle Technical Skills	Upstream	Core Auto	Downstream
Assembly	2	0	0
Diagnostics, repair & maintenance	2	0	5
Electrical and battery repair & maintenance	1	0	3

SURVEY RESPONSES

Top Skills in Demand by Sector

Upstream Segment Skills in Demand
- Cross-cutting skills (soft skills, advanced software & programming)
- Automation and robotics operation
- Manufacturing and production planning & systems operation
- Production equipment assembly & maintenance
- Mechanical assembly, hydraulics, & pneumatics
- Quality control, measurement & inspection
- Testing, calibration, etc.
- Product design, prototyping, & CAD

Core Auto Segment Skills in Demand
- Cross-cutting skills (soft skills)
- Automation and robotics operation
- Mechanical assembly, hydraulics, & pneumatics
- Testing, calibration, etc.

Downstream Segment Skills in Demand
- Manufacturing and production planning & systems operation
- Vehicle diagnostics, repair, & maintenance
- Surface treatment, paint & production
- Cross-cutting skills (soft skills)

**Note: Participants selected multiple responses, therefore data are shown in frequencies.*

Return to Table of Contents

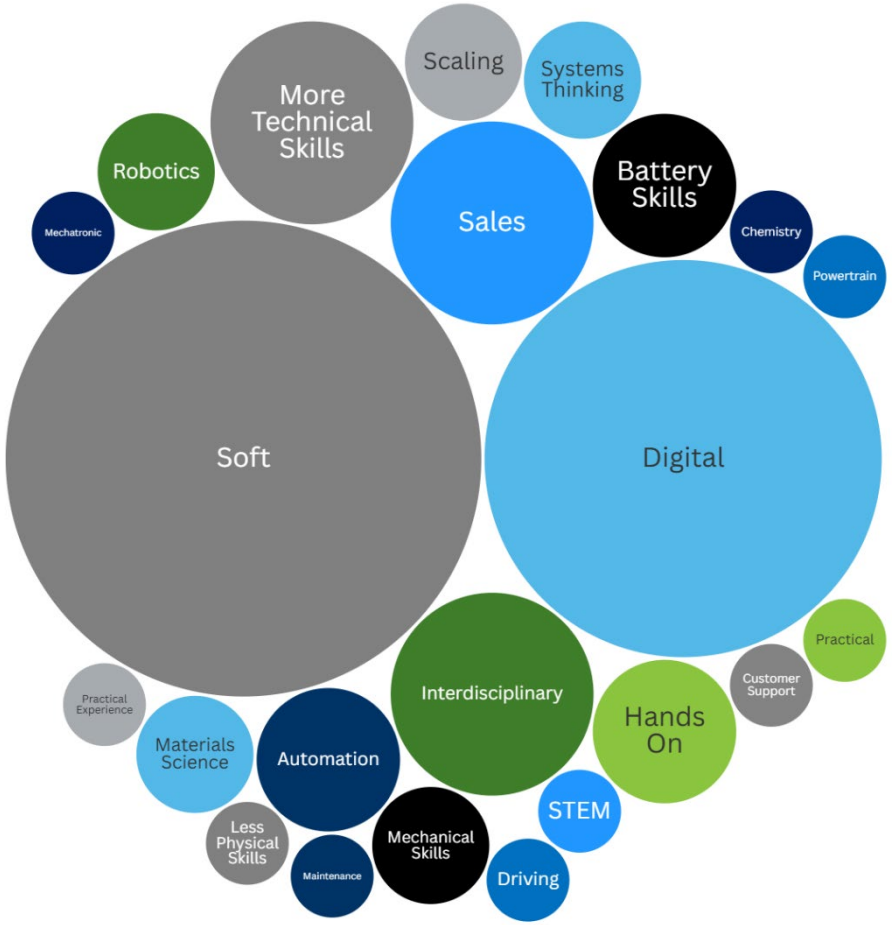
Michigan Automotive Workforce Needs Assessment

Skills gaps among current workers (3 of 15)

Are you observing skills gaps among current employees at your facility? What are they?

INTERVIEW RESPONSES

All Businesses Skills Gaps Among Current Employees



All Businesses Skills Gaps Among Current Employees

Employers described **soft skills** and **digital skills** as the skills with the **largest skills gaps** among **current employees.**

Other top skills gaps among current employees include

- Interdisciplinary skills
- Sales skills
- More technical skills

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Skills gaps among current workers (4 of 15)

INTERVIEW RESPONSES

Question 1: Are you observing skills gaps among current employees at your facility? What are they?

Question 2: Are you observing skills gaps among job candidates at your facility? What are they?

Soft and Digital skills have the largest gaps among both current employees and job candidates. Soft skills such as basic professionalism, communication skills, engagement, passion, and agility are needed to keep up with changing industry needs.
Digital skills needs are changing rapidly and there is a need for more advanced digital skills among both current employees and job candidates.

Example Interview Responses (Paraphrased):

Skills Gaps Among Current Employees and Job Candidates:
Participant D: *Our Processing engineers, maintenance technicians, manufacturing engineers are seeing more changes – there's a whole new set of robots and sophisticated camera systems. Either we found the talent we needed or we put people through college courses at the local Community College to learn these technologies.*

Participant N: *We've automated our warehouse – we're not eliminating roles, but the type of work is different. People we hire HAVE to understand how technology works – hand scanners, digital stations, etc. Of the people currently working in our warehouse, we are probably at half the talent level we need to be.*

Participant K: *It's one thing to get an engineer who can build something in CAD, a different kind of engineer who can think about the implications of what they're designing from a UX standpoint, how it integrates with the rest of a very complex vehicle. Think about the ramifications of what they're designing for the rest of the vehicle. Difficult skillset to build, incredibly useful when you can find it.*

Participant Q: *The newer generation, their bedside manner, reliability, engagement, connection, eye contact are lacking. They can crunch an Excel macro, program something so fast, they're up on technology, it's great. Presenting results, taking feedback, working under pressure, there's a gap. More seasoned employees, it's vice versa, they don't want to learn new tools. Another gap is the ability to think outside the box, problem solve. Not unique to job candidates or current employees. I don't know that you can ever get rid of that, people are people, they get rigid, fixated, can't see the vision to grow beyond a certain point.*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

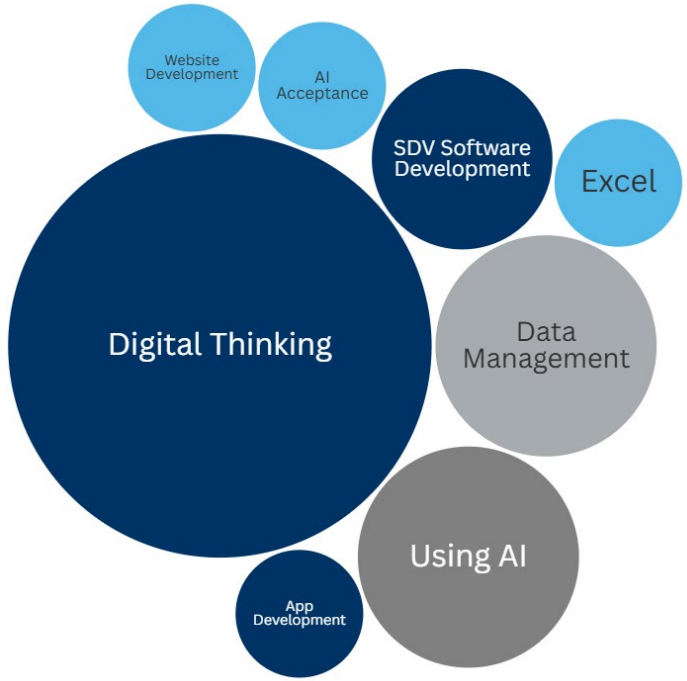
Skills gaps among current workers (5 of 15)

Are you observing skills gaps among current employees at your facility? What are they?

All Businesses Current Employee Soft and Digital Skills Theme Breakdowns

Soft Skills Gaps Among Current Employees

Digital Skills Gaps Among Current Employees



INTERVIEW RESPONSES

All Businesses Current Employee Soft and Digital Skills Theme Breakdowns

Current employees have **gaps** among a **diverse** set of **soft skills**, particularly **communication skills, employee engagement,** and **basic business skills. Skills gaps** in **digital skills** are **more concentrated** among gaps in **digital thinking, data management, using AI,** and **SDV software development.**

Top Soft Skills Gaps Among Current Employees

- Communication skills
- Employee engagement
- Basic soft skills
- Basic business skills
- Passion
- Leadership
- Problem solving

Top Digital Skills Gaps Among Current Employees

- Digital thinking
- Data management
- Using AI
- SDV software development

Return to Table of Contents

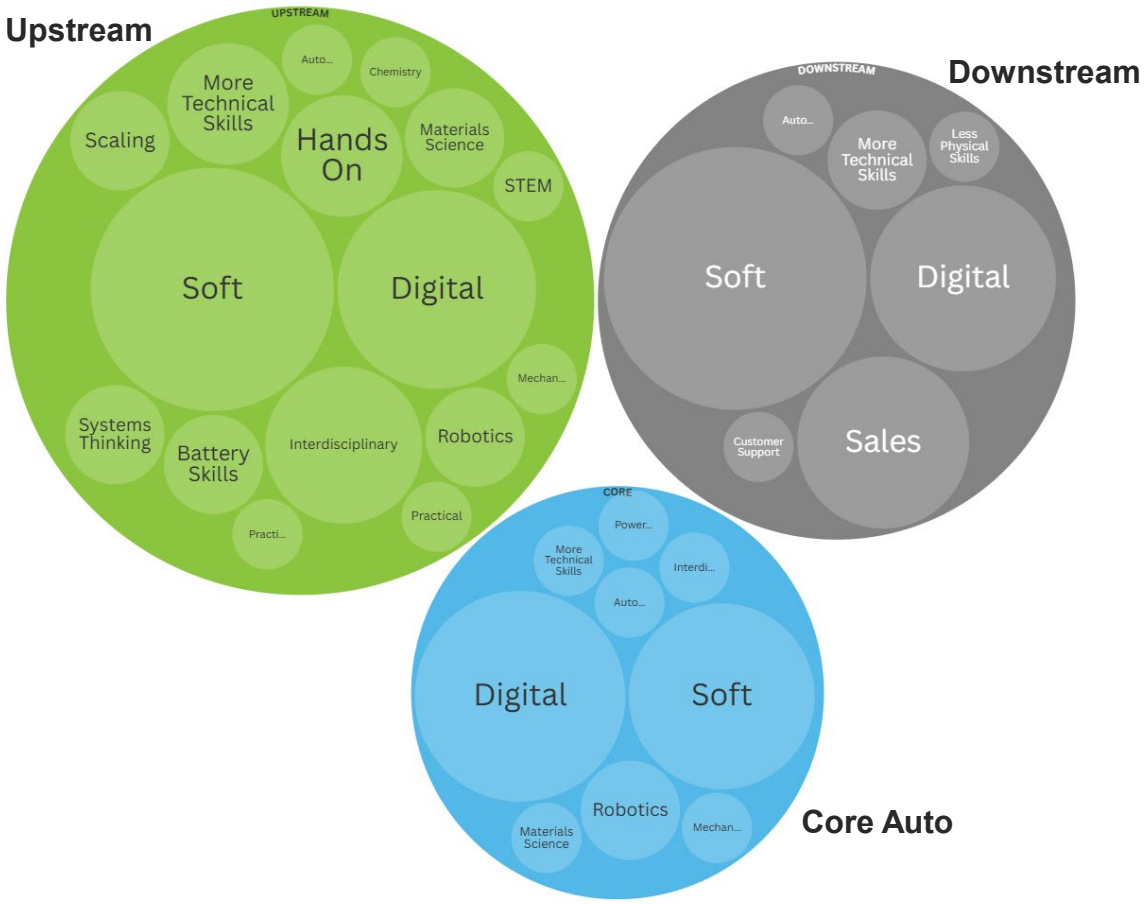
Michigan Automotive Workforce Needs Assessment

Skills gaps among current workers (6 of 15)

INTERVIEW RESPONSES

Are you observing skills gaps among current employees at your facility? What are they?

Skills Gaps Among Current Employees by Segment



Skills Gaps Among Current Employees by Segment

The largest **skills gaps** among **all segments** were in **soft** and **digital** skills**.**

Upstream

- Also had **gaps** in **interdisciplinary, hands-on, more technical, robotics, materials science, battery, scaling,** and **systems thinking skills**.

Core Auto

- Also had **gaps** in **robotics, materials science, mechanical, powertrain, interdisciplinary, automation**, and **more technical skills**.

Downstream

- Also had **gaps** in **sales, more technical, less physical, automation**, and **customer support skills**.

Segment Similarities

- **Skills gaps** were the **largest** among **soft and digital skills** across **all segments.**
- **More technical skills (generally)** had **gaps** across **all segments.**

Segment Differences

- In the **Core Auto** segment, **digital skills** had **larger gaps** than **soft skills**, while the **Upstream** and **Downstream** segments had **larger soft skills gaps** than **digital skills** gaps.
- The **Downstream** segment required more **sales skills** than the **Upstream** or **Core** segments.
- The **Upstream** and **Core Auto** segments had **gaps** in **interdisciplinary skills**, while the **Downstream** segment **did not**.

Return to Table of Contents

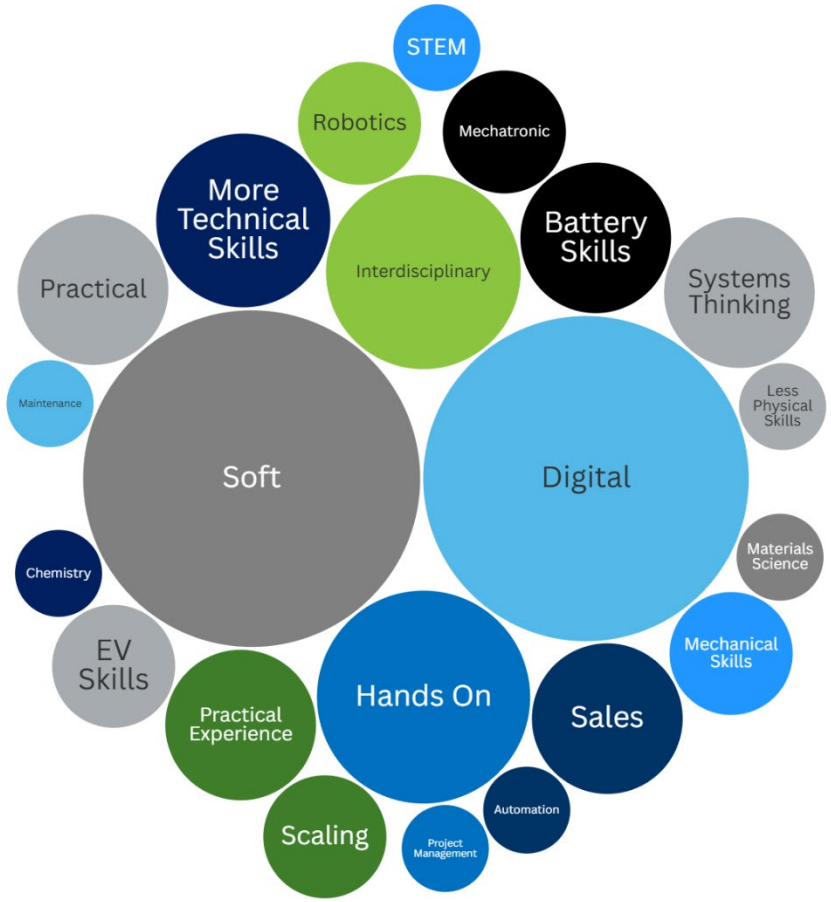
Michigan Automotive Workforce Needs Assessment

Skills gaps among job candidates (7 of 15)

Are you observing skills gaps among job candidates at your facility? What are they?

INTERVIEW RESPONSES

All Businesses Skills Gaps Among Job Candidates



All Businesses Skills Gaps Among Job Candidates

Employers described **soft skills** and **digital skills** as the skills with the **largest skills gaps** among **job candidates.**

Other top skills gaps among job candidates include

- Interdisciplinary skills
- Hands-on skills
- More technical skills
- Practical skills more generally
- Practical experience
- Sales skills
- Battery skills
- Systems thinking

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Skills gaps among job candidates (8 of 15)

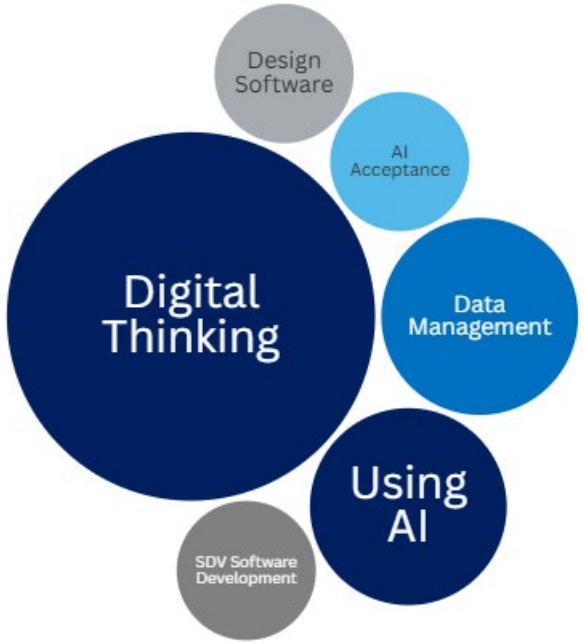
INTERVIEW RESPONSES

Are you observing skills gaps among job candidates at your facility? What are they?

All Businesses Job Candidate Soft and Digital Skills Theme Breakdowns

Soft Skills Gaps Among Job Candidates

Digital Skills Gaps Among Job Candidates



All Businesses Job Candidate Soft and Digital Skills Theme Breakdowns

Job Candidates have **skills gaps** among a **diverse** set of **soft skills**, particularly **passion, agility,** and **willingness to learn. Skills gaps** in **digital skills** are **more concentrated** among gaps in **digital thinking, data management,** and **using AI.**

Top Soft Skills Gaps Among Job Candidates

- Passion
- Agility

Top Digital Skills Gaps Among Job Candidates

- Digital thinking
- Data management
- Using AI

Return to Table of Contents

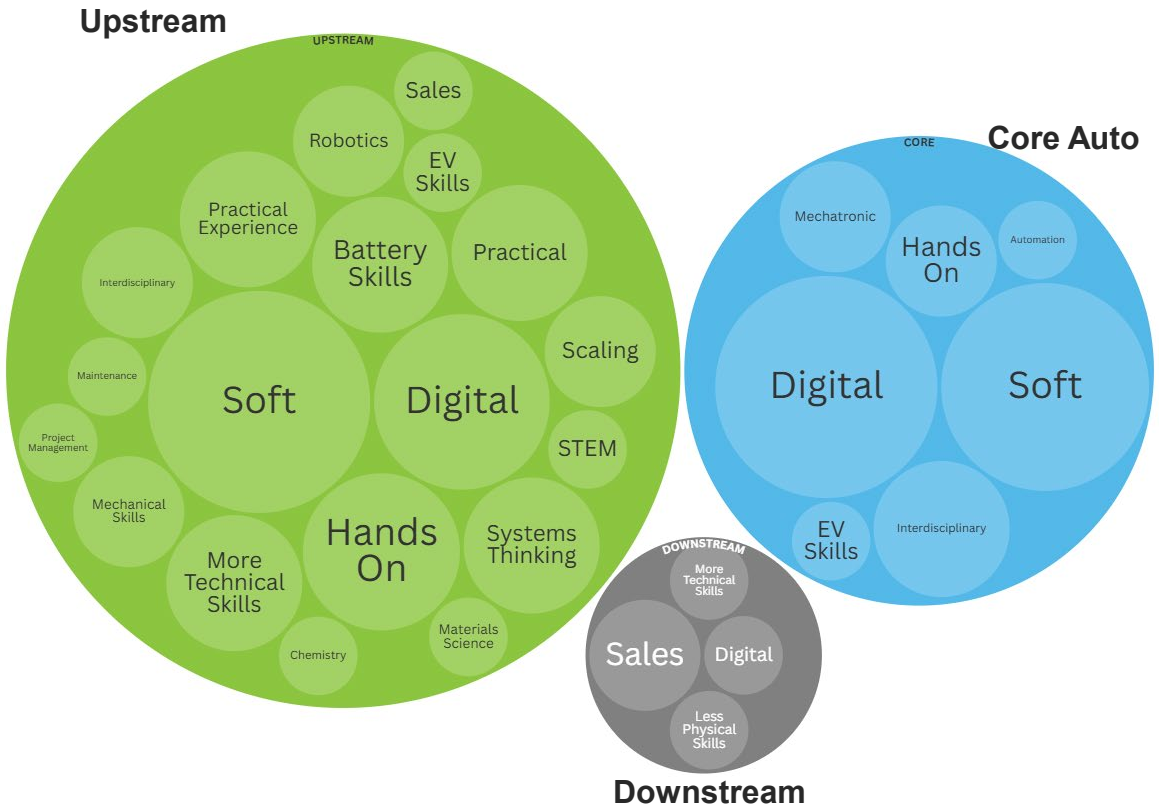
Michigan Automotive Workforce Needs Assessment

Skills gaps among Job Candidates (9 of 15)

INTERVIEW RESPONSES

Are you observing skills gaps among job candidates at your facility? What are they?

Skills Gaps Among Job Candidates by Segment



Skills Gaps Among Job Candidates by Segment

All segments had **large gaps** in **digital skills among job candidates**. The **Upstream** and **Core Auto** segments had **large skills gaps** in **soft skills**, while the **Downstream** segment had a **large gap** in **sales skills**. **Upstream** businesses described the **widest range of skills gaps**, while the **Core** and **Downstream** segments described **more concentrated skills gaps**.

Upstream

- In addition to large **soft** and **digital** skills gaps, also had **gaps in hands-on, battery, practical, practical experience, more technical,** and **systems thinking skills.**

Core Auto

- In addition to large **soft** and **digital** skills gaps, also had **gaps** in **interdisciplinary, hands-on, mechatronic, automation,** and **EV skills.**

Downstream

- Had the **largest skills gap** in **sales skills**, followed **by digital, more technical,** and **less physical skills.**

Segment Similarities

- **Digital skills gaps were large across segments.**

Segment Differences

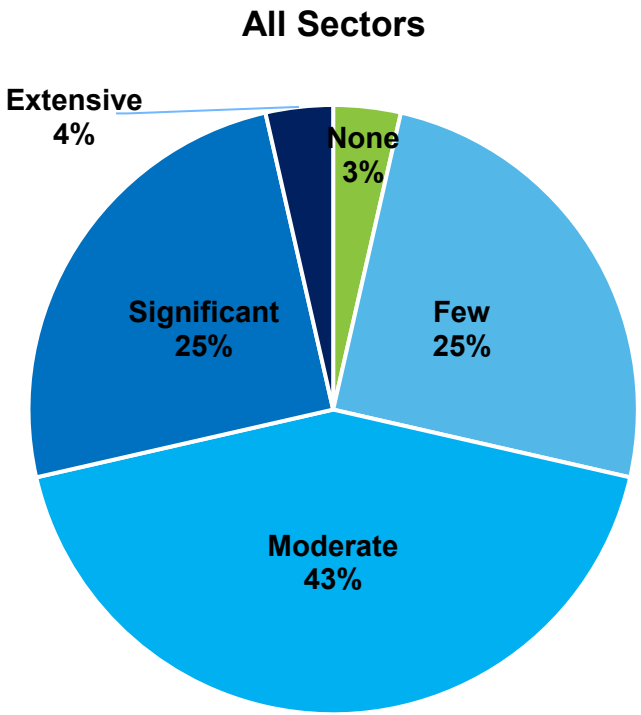
- The **Upstream** and **Core Auto** segments had **large skills gaps** in **soft** and **digital skills.**
  - **Upstream** had **more soft skills gaps** than **digital skills gaps**, while **Core Auto** had **evenly split** skills gaps among **digital** and **soft skills**.
- The **Downstream** segment's **largest skills gaps** were in **sales skills**, and they were the **only segment** with **gaps in sales skills**.

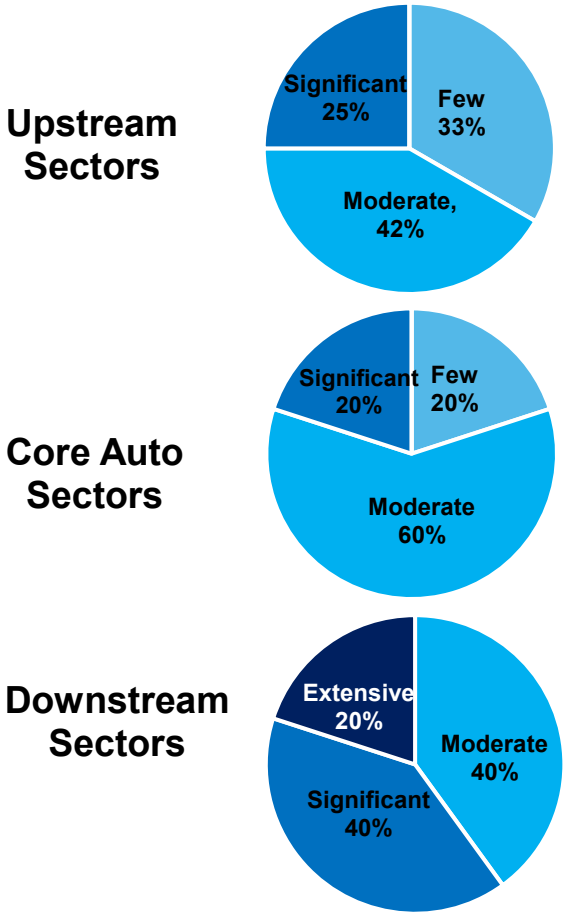
Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Skills Gap Expectations for the Future (10 of 15)

To what extent do you expect to have challenges related to skills gaps at your facility in the next 1-3 years?





SURVEY RESPONSES

All Sectors Skills gap expectations:

- Overall, automotive employers expect to observe skills gaps in the coming 1-3 years.
- Over 40% of employers reported they expect moderate skills gaps in the next 1-3 years, with another 29% expecting significant to extensive skills gaps.
- Nearly 30% of businesses expect few to no skills gap challenges in the future.
- This group includes perspectives from other sectors.

Upstream sectors:

- Nearly 70% of upstream employers expect to have moderate to significant skills gaps.

Core Automotive sectors:

- Eighty percent of core auto employers expect moderate to significant skills gaps.

Downstream sectors:

- These sectors expect the highest degree of skills gaps across all segments, with 20% of downstream employers expecting extensive skills gaps.

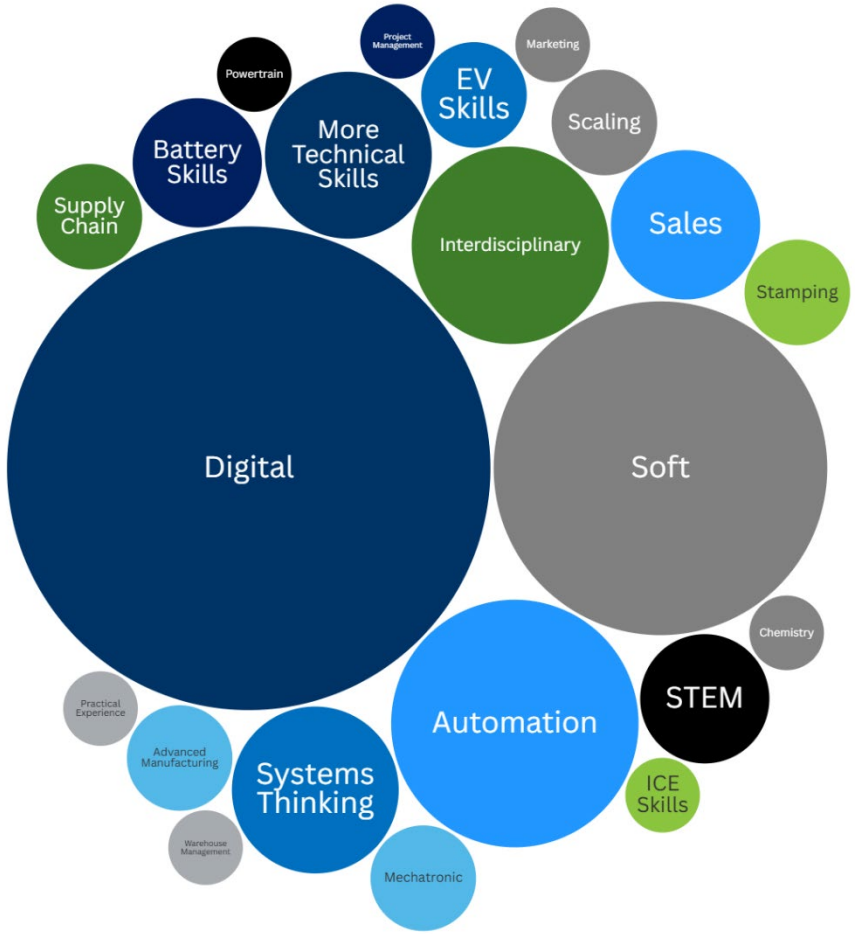
Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Skills Gap Expectations for the Future (11 of 15)

What new job skills will be needed at this facility in the next 1-3 years?

All Businesses New Job Skills Needed in 1-3 Years



INTERVIEW RESPONSES

All Businesses New Job Skills Needed in 1-3 Years

Employers anticipated that **digital** and **soft skills** would be the most **in demand** in the next **1-3 years.**

Other top skills they anticipated being in demand in 1-3 years include

- Automation skills
- Interdisciplinary skills
- More technical skills
- Systems thinking
- Sales skills

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Skills Gap Expectations for the Future (12 of 15)

INTERVIEW RESPONSES

What new job skills will be needed at this facility in the next 1-3 years?

Interviewees anticipated needing digital and soft skills in the next 1-3 years. Digital skills needs are focused on advanced digital skills, while soft skills needs are more diverse.

Example Interview Responses (Paraphrased):

Skills Needed in Next 1-3 Years:

Participant B: *AI is going to become key for future workers, in Michigan and everywhere. We need a good understanding of how to use different tools for productivity. We have many local and global projects using AI, it's growth is going to be exponential.*

Participant T: *We need people with data conversion, electrical, automation, and disruptive technology skills. But, even with the AI and data changes that are coming, we don't want to lose sight of how important hands-on skills are.*

Participant P: *Digital skills will be needed over the next few years. Automotive industry is cutthroat, to be competitive we need an advantage – automation, technology, something different from international competitors. We need to integrate new technology, automation, vision inspection, ML, requires a different skillset than making stamped parts on the press. We can't lose sight of how to make stamped parts on a press though, we need to integrate new technology to old processes to improve throughput.*

Participant F: *How do we develop system architects/solution architects? We need software engineers who can think like mechanical engineers, bring everything together.*

Participant F: *Leaders of the future need to have stronger perseverance, judgement, and resilience.*

Participant O: *Having open-mindedness and humility will be crucial to being able to adapt & thrive in incredibly fast passed multi-cultural environments.*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

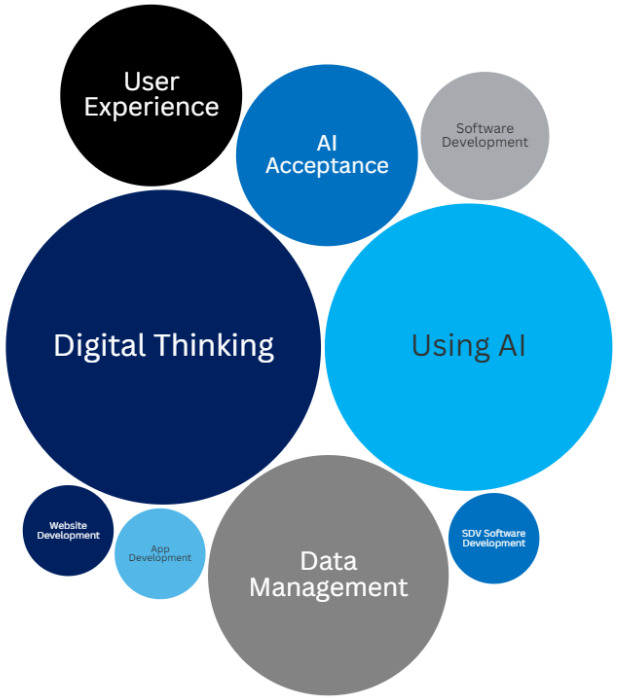
Skills Gap Expectations for the Future (13 of 15)

INTERVIEW RESPONSES

What new job skills will be needed at this facility in the next 1-3 years?

All Businesses Future Job Skills Digital and Soft Skills Theme Breakdowns

Future Digital Skills



Future Soft Skills

All Businesses Future Job Skills Digital and Soft Skills Theme Breakdowns

New digital skills anticipated to be in demand are focused around **digital thinking** and **AI-related skills, including both using and accepting AI. New soft skills** anticipated by participants to be in demand are **more wide-ranging,** and include skills such as **passion, perseverance, communication skills, leadership skills,** and **interacting with multiple Cultures.**

Top New Digital Skills

- Digital thinking
- AI skills, including using AI and Accepting AI
- Data management
- User experience

Top New Soft Skills

- Passion
- Perseverance
- Communication skills
- Leadership skills
- Interacting with multiple cultures

Return to Table of Contents

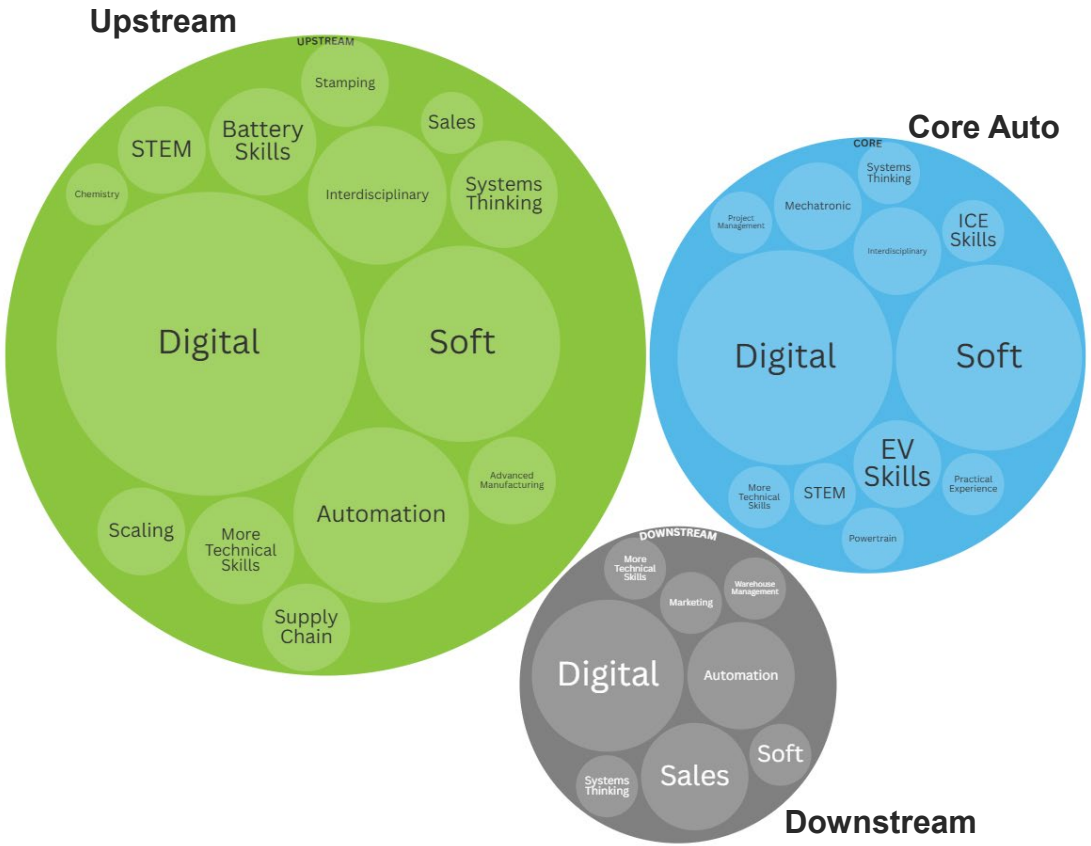
Michigan Automotive Workforce Needs Assessment

Skills Gap Expectations for the Future (14 of 15)

INTERVIEW RESPONSES

What new job skills will be needed at this facility in the next 1-3 years?

New Job Skills Needed by Segment



New Job Skills Needed by Segment

All segments anticipated needing new Digital skills in the next 1-3 years.. The **Upstream** and **Core Auto** segments also anticipated needing more **soft and interdisciplinary skills in the next few years**, while the **Downstream** segment also expected to need more Automation and Sales skills in the next few years. Across segments, the interdisciplinary skills employers are most interested in are skills bridging mechanical, electrical, and software disciplines. Employers are looking for these skills in engineers and technicians.

Upstream

- In addition to expecting to need new **soft** and **digital** skills, also anticipated needing Automation, Interdisciplinary, Systems thinking, Battery, and more Technical skills in the next 1-3 years.

Core Auto

- In addition to expecting to need new **soft** and **digital** skills, also anticipated needing Interdisciplinary, Mechatronic, and EV skills in the next 1-3 years.

Downstream

- In addition to expecting to need new digital skills, also anticipated needing Sales and Automation skills in the next 1-3 years.

Segment Similarities

- Across **all segments, digital skills** were expected to be **needed** in the next 1-3 years.

Segment Differences

- The **Upstream** and **Core Auto** segments expected to need more Soft and Interdisciplinary skills.
- The **Upstream** and **Downstream** segments expected to need **more Automation skills**.
- The **Core** segment expected to need more **skills related to the powertrain – EV skills, ICE skills,** and general **powertrain skills.**

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: Skills Gaps Current and Future (15 of 15)

Survey Summary

Skills Gaps Among Current Employees

- Participants indicated what skills are in short supply at their facility from a group of 33 skills across eight categories: cross-cutting skills, production & equipment, vehicle skills, engineering & design, materials & processing, auto-related sales & customer interface, commercial freight & supply chain, and other skills.
- **Across all businesses, the top skills in demand included soft skills, automation & robotics operation, a**dvanced software & programming skills, testing, calibration, tolerancing, & failure analysis,. vehicle diagnostics, repair & maintenance, product design, prototyping, & CAD, and mechanical assembly.
- **Top skills gaps from Upstream businesses** included soft skills, automation & robotics testing, and advanced software & programming. **Core auto businesses** highlighted soft skills gaps, automation & robotics testing, and mechanical assembly. **Downstream businesses** highlighted manufacturing & production planning, systems operation, vehicle diagnostics, maintenance, & repair, surface treatments, and soft skills.

Skills Gaps Expectations for Future

- Across all businesses, employers expect to observe a range of few to significant skills gaps in the next 1-3 years. Upstream businesses report moderate skills gap expectations, although a larger proportion of core auto businesses expect moderate to significant skills gaps. Downstream businesses expect more extensive skills gaps compared to the other segments.

Interview Summary

Skills Gaps Among Current Employees

- Interview participants described the soft skills with the largest gaps as communication, employee engagement, basic business skills, basic soft skills, passion, leadership, and problem solving.
- Interview participants described the digital skills with the largest gaps as having a digital mindset, data management, AI, and SDV software development skills.
- Upstream and Core segments reported gaps in interdisciplinary skills, while the Downstream segment reported gaps in sales skills.

Skills Gaps Among Job Candidates

- Interview participants described the soft skills with the largest gaps as passion, agility, and willingness to learn.
- Interview participants described the digital skills with the largest skills gaps as having a digital mindset, data management, and AI skills.
- The Downstream segment did not report gaps in soft skills but did report gaps in sales skills.

Skills Gaps Expectations for Future

- The digital skills participants most expected to need in the next 1-3 years include having a digital mindset, AI, and data management skills.
- The soft skills participants most expected to need in the next 1-3 years include passion, perseverance, communication skills, leadership, and multicultural skills.
- All segments reported an anticipated need for digital skills, but while the Upstream and Core segments also reported a strong anticipated need for soft skills, the Downstream segment reported more anticipated need for automation and sales skills**.**

Digital and soft skills had the most gaps among current employees and job candidates, and were also the skills employers most anticipated needing in the next 1-3 years.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

New Roles in Recent Hires (1 of 12)

What proportion of your recent hires at your facility are for new roles?

Proportion of New Roles In Recent Hires	All Businesses	Upstream	Core Auto	Downstream
20% or less	79%	76%	83%	83%
21-40%	12%	24%	0%	0%
41-60%	9%	0%	17%	17%
61-80%	0%	0%	0%	0%
80% or more	0%	0%	0%	0%

SURVEY RESPONSES

New Roles in Recent Hires

- Participants rated the proportion of new roles that make up new hires.

All Businesses

- Overall, most businesses (79%) report that new roles comprise 20% or less of their new hires. The remaining businesses report that 21% of new roles comprise between 21-60% of their new hires.

Upstream sectors:

- Most Upstream employers (76%) report that 20% or less of new hires are new roles, while the remainder of upstream businesses report 21-40% of new hires are new roles.

Core Automotive sectors:

- Most Core auto employers (83%) report that 20% or less of new hires are new roles and the remaining businesses report 41-60% of new hires are new roles.

Downstream sectors:

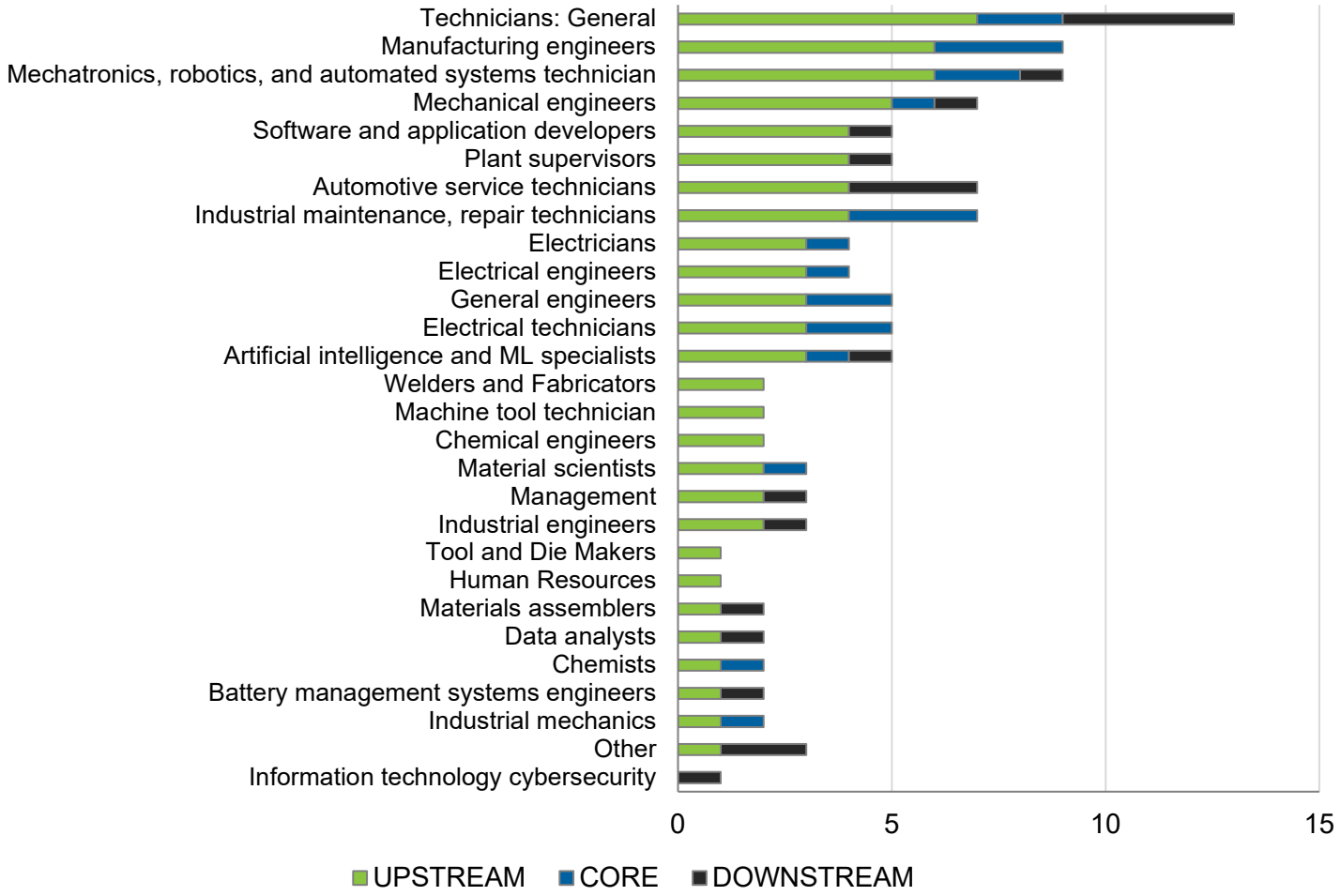
- While most Downstream employers report 20% or less of new hires are new roles (83%), the remainder of businesses 41-60% of new hires are new roles.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

New Roles Currently in Demand: By Industry Segment (2 of 12)

What are the new roles that your facility currently needs?



SURVEY RESPONSES

New Roles Currently in Demand

- Participants indicated new roles currently in demand at their facilities.

Top Roles in demand (All Businesses)

- General technicians, Manufacturing engineers, Mechatronics technicians, Mechanical engineers, Auto service technicians, Industrial technicians, Other (CNC Machinists)

Upstream Top Roles in Demand

- General technicians, Manufacturing engineers, Mechatronics technicians, Software & application developers, Plant supervisors, Auto service technicians, Industrial technicians

Core Automotive Top Roles in Demand

- Manufacturing engineers, Industrial technicians, Mechatronics technicians, General engineers, Electrical technicians

Downstream Top Roles in Demand

- General technicians, Auto service technicians, and other (material handlers, forklift operators)

Return to Table of Contents

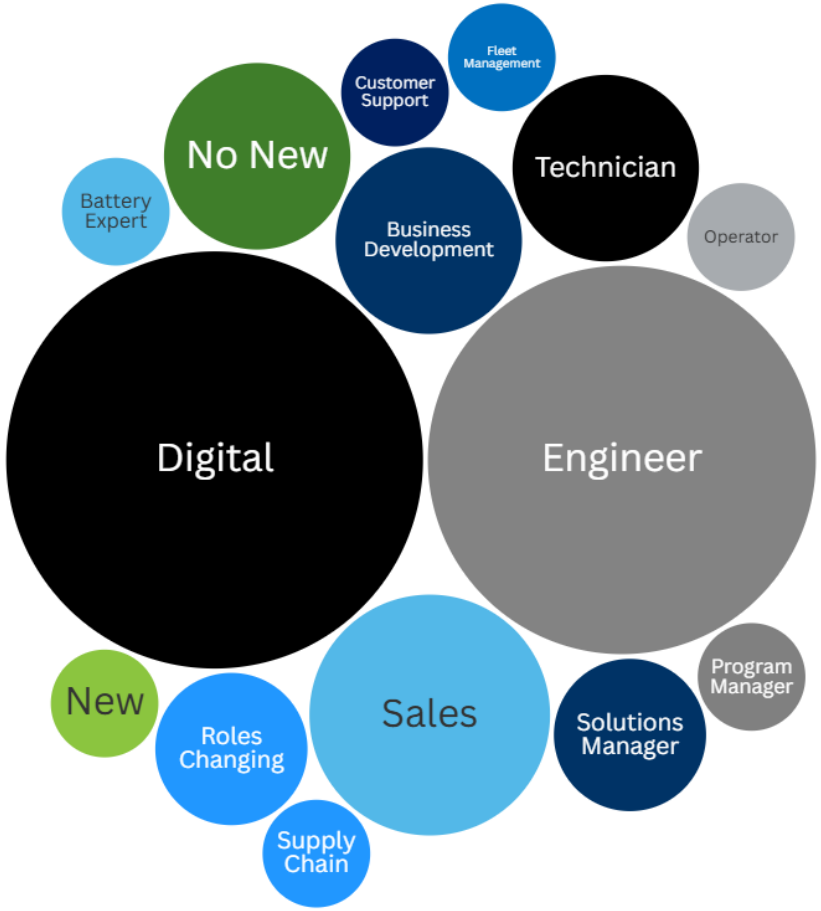
Michigan Automotive Workforce Needs Assessment

New Roles Currently in Demand (3 of 12)

INTERVIEW RESPONSES

Are you developing new roles because of the EV transition? What are they?

All Businesses New Roles Being Developed



All Businesses New Roles Being Developed

Digital and **engineering roles are the roles employers most frequently** report developing.

- Among all interviewees, 13/20 of employers stated they were developing new roles as a result of industry shifts.
- **Other roles employers frequently reported developing include**
  - Sales roles
  - Business development roles
  - Technician roles

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

New Roles Currently in Demand (4 of 12)

INTERVIEW RESPONSES

Are you developing new roles because of the EV transition? What are they?

Interviewees reported developing a variety of roles in response to industry shifts, but digital and engineering roles were most frequently reported.

Example Interview Responses (Paraphrased):

New roles being developed:

Participant P: *In the last 4 years, we've grown our manufacturing engineering team from 1 person to 6, they're mostly controls engineers. They understand how to integrate the digital wide of things with the mechanical side of things.*

Participant H: *We need additional engineers and software developers to support our business.*

Participant K: *We're expanding our software organization despite slowdowns on EV and SDVs.*

Participant T: *Data analytics roles are still a big need. How do we harvest data and use it? AI is big, but we're high on the hype curve. We want to lean into AI quality, ingestion and analysis of data. How can we recognize and build in quality control to datasets.*

Participant Q: *We need an analog manager, e-commerce catalog managers, AI strategists, e-commerce marketplace managers. We need to know how to gain sales online.*

Participant O: *We need technicians and engineers who have smart factory abilities, who can do diagnostic runs on machines and fix them.*

Return to Table of Contents

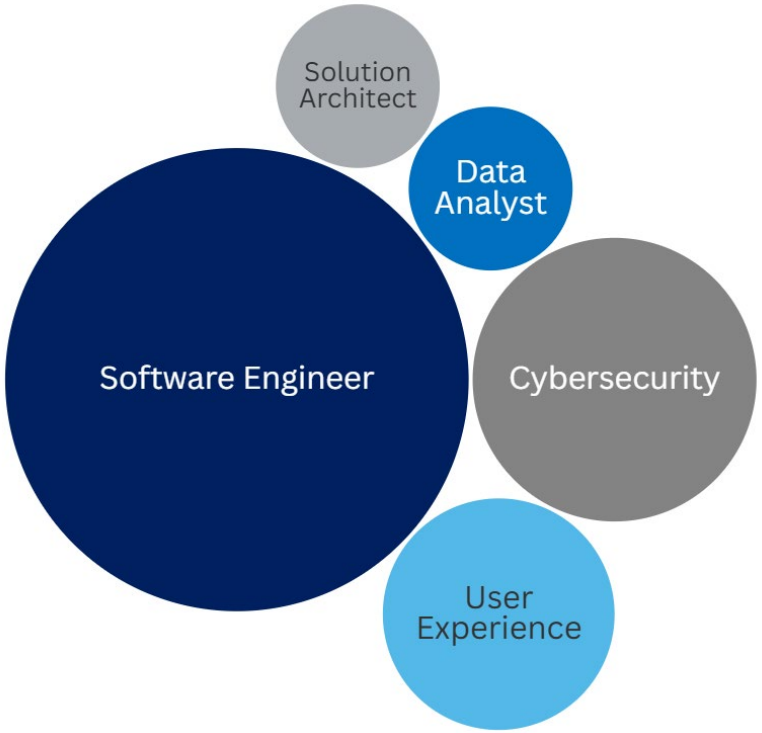
Michigan Automotive Workforce Needs Assessment

New Roles Currently in Demand (5 of 12)

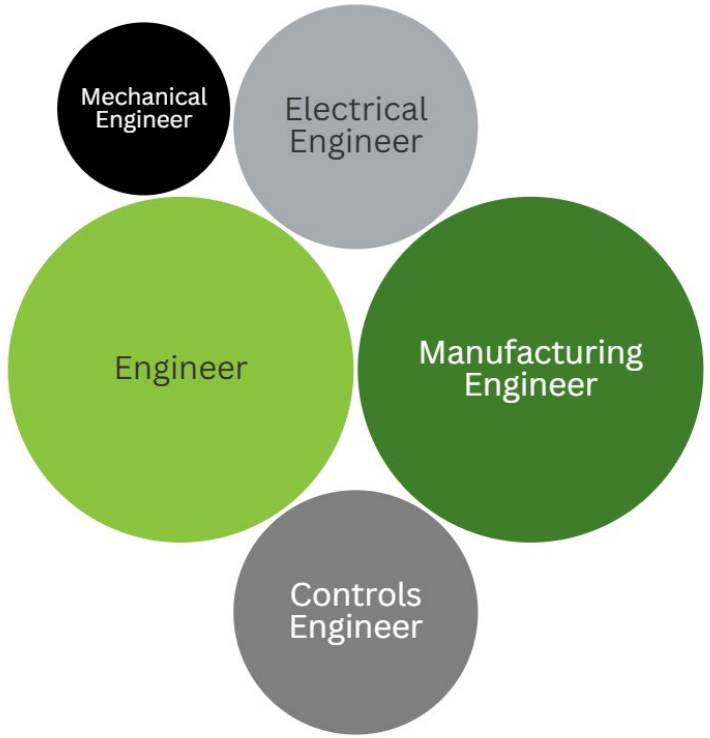
Are you developing new roles because of the EV transition? What are they?

All Businesses New Digital and Engineering Roles Theme Breakdowns

Digital Roles Being Developed



Engineering Roles Being Developed



INTERVIEW RESPONSES

All Businesses New Digital and Engineering Roles Theme Breakdowns

Software engineering roles made up **most of the digital roles** employers reported developing, while most **engineering roles** being developed were either **general engineering roles** or **manufacturing engineering roles.**

Digital Roles Being Developed

- Software engineer
- Cybersecurity
- User experience
- Data analyst
- Solution architect

Engineering Roles Being Developed

- Manufacturing engineer
- General engineer
- Controls engineer
- Electrical engineer
- Mechanical engineer

Return to Table of Contents

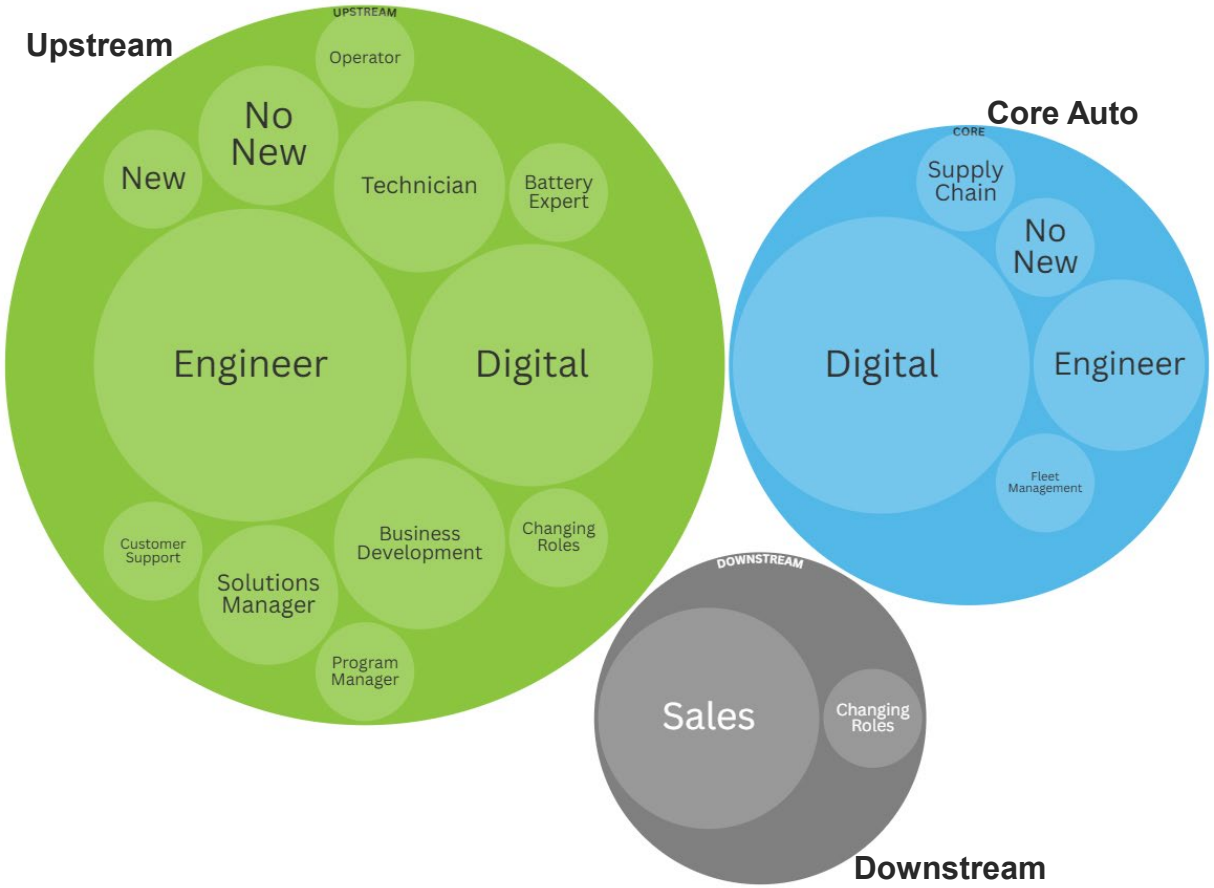
Michigan Automotive Workforce Needs Assessment

New Roles Currently in Demand (6 of 12)

INTERVIEW RESPONSES

Are you developing new roles because of the EV transition? What are they?

New Roles being Developed by Segment



New Roles being Developed by Segment

New roles being developed vary by segment. The **Upstream** and **Core** segments report developing more **engineer** and **digital roles,** and the **Downstream** segment reports developing more **sales roles.** The **Upstream** segment reports developing the widest range of roles overall.

Upstream

- In addition to developing new **engineering and digital roles**, also frequently described developing technician, business development and solutions manger roles. Several did report not developing any new roles.

Core Auto

- In addition to developing new **digital and engineering roles**, also frequently described developing supply chain and fleet management roles. Several did report not developing any new roles.

Downstream

- Downstream roles being developed were primarily **sales roles**, or downstream businesses reported that **roles were changing**, not being developed.

Segment Differences

- The **Upstream** and **Core** segments reported developing more **engineering** and **digital roles**, although **Upstream** reported developing **more engineering roles** and **Core** reported developing **more digital roles**.
- The **Upstream** segment reported developing a **wider range of roles** than either the **Core** or **Downstream** segments.
- The **Downstream** segment reported developing more **sales roles**.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

New Roles expected in Future Hiring (7 of 12)

What proportion of new hires at your facility in the next 1-3 years will be for new roles related to industry shifts?

Proportion of New Roles Expected in Future Hires	All Businesses	Upstream	Core Auto	Downstream
20% or less	76%	76%	83%	67%
21-40%	18%	18%	0%	33%
41-60%	6%	6%	17%	0%
61-80%	0%	0%	0%	0%
80% or more	0%	0%	0%	0%

SURVEY RESPONSES

New Roles in Expected in Future Hires

- Participants indicated the proportion of new roles they expected to hire in the next 1-3 years.

All Businesses

- Overall, most businesses (76%) report that future hires will only include a small proportion of new roles (e.g., 20% or less). Another 18% report that 21-40% of new hires will include new roles in the future and a small proportion expect between 41-60% of future hires to be for new roles.

Upstream Segment

- Most Upstream businesses (76%) report that future hires will include a small proportion of new roles (e.g., 20% or less). Another 18% report that 21-40% of new hires will include new roles in the future and a small proportion (6%) expect between 41-60% of future hires to be for new roles.

Core Auto Segment

- Most Core auto businesses report that future hires will include a small proportion of new roles (e.g., 20% or less). Another 17% report that 41-60% of new hires will include new roles in the future.

Downstream Segment

- Most downstream businesses (67%) also report that 20% or less of future hires will be for new roles, with the remaining 33% of businesses reporting they expected 21-40% of future hires to include new roles.

Return to Table of Contents

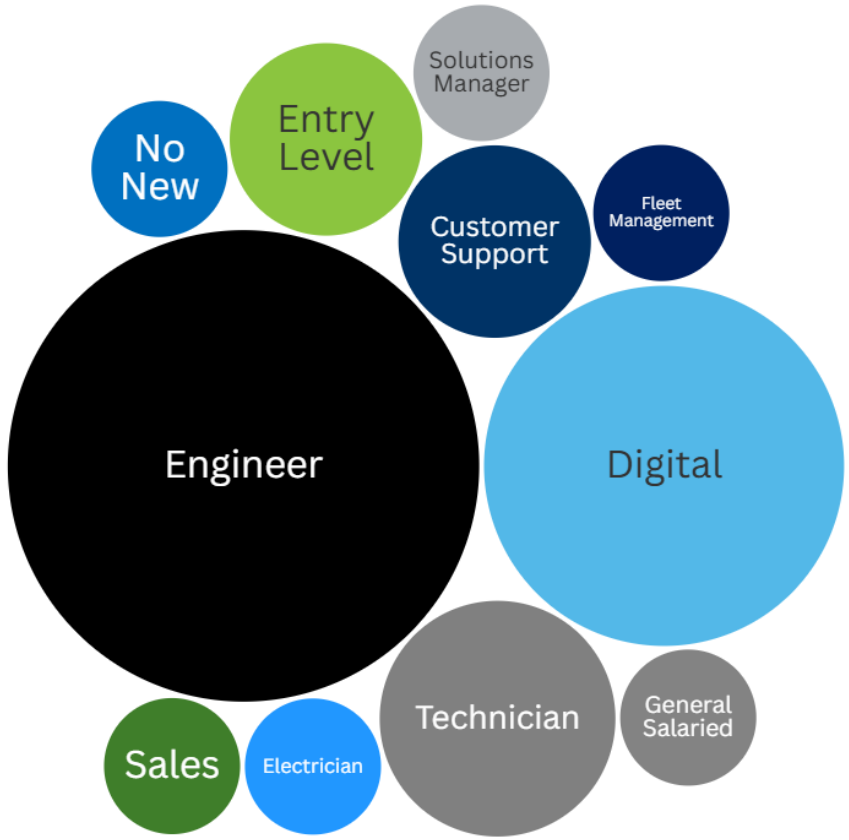
Michigan Automotive Workforce Needs Assessment

New roles expected in Future Hiring (8 of 12)

INTERVIEW RESPONSES

Do you expect to require new roles in the next 1-3 years?

All Businesses Roles Expected to be Required in Next 1-3 Years



All Businesses Roles Expected to be Required in Next 1-3 Years

Employers anticipated that **engineering roles** and **digital roles** would be the roles they **most need** in the next **1-3 years.**

- Among all interviewees, 9/20 employers stated they expected to require new roles in the next 1-3 years.

- **Other roles employers expect to require include**
  - Technicians
  - Customer support
  - Entry level
  - Fleet management
  - Solutions manager
  - General salaried
  - Electrician
  - Sales

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

New roles expected in Future Hiring (9 of 12)

Do you expect to require new roles in the next 1-3 years?

INTERVIEW RESPONSES

Interviewees also reported expecting to need a variety of roles in the next 1-3 years, and again employers most frequently described expecting to need digital and engineering roles.

Example Interview Responses (Paraphrased):

New roles required in 1-3 years:

Participant F: *Solution architects will be in high demand while we continue developing associates.*

Participant H: *As we grow our market, we'll need a combination of mechanical engineers, electrical engineers, software developers, and customer success people.*

Participant L: *With the journey we're on, we'll continue to need more data, computing, electrical, test engineer, and fleet management roles.*

Participant A: *About 5 years ago, we created a solutions manager role – they're responsible for their solution, engine test systems, battery systems, hardware in the loop systems. It's hard to find people who can do that, there aren't many educational programs that train that. We're going to need more of these roles in the future.*

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

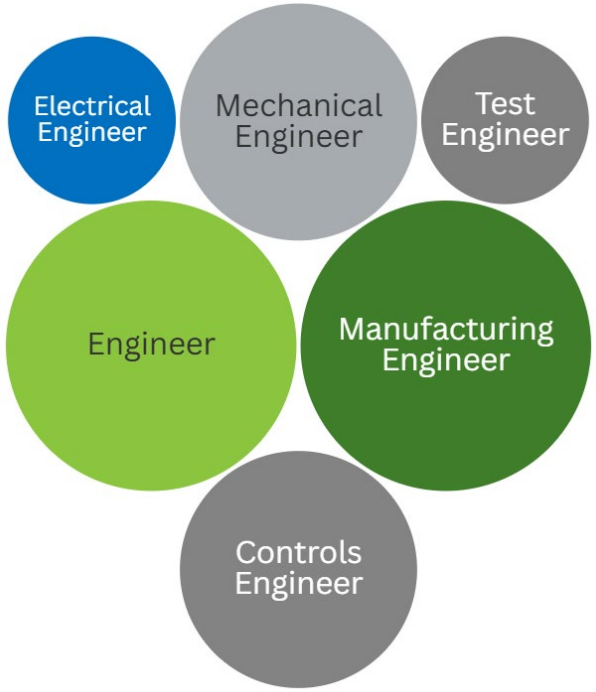
New roles expected in Future Hiring (10 of 12)

INTERVIEW RESPONSES

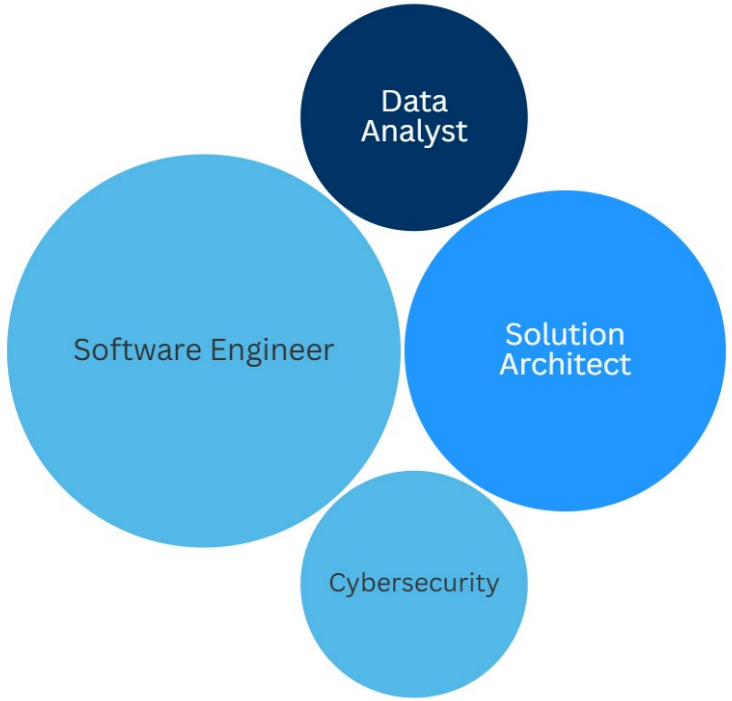
Do you expect to require new roles in the next 1-3 years?

All Businesses Expected Digital and Engineering Roles Theme Breakdowns

Engineering Roles Expected in 1-3 Years



Digital Roles Expected in 1-3 Years



All Businesses Expected Engineering and Digital Roles Theme Breakdowns

The **engineering roles** expected to be needed were varied, while **digital roles** expected to be needed were **software engineer** and **solution architect roles.**

Engineering Roles Expected in 1-3 years

- Manufacturing engineer
- General engineer
- Controls engineer
- Mechanical engineer
- Electrical engineer

Digital Roles Expected in 1-3 years

- Software engineer
- Solution architect
- Cybersecurity
- Data analyst

Return to Table of Contents

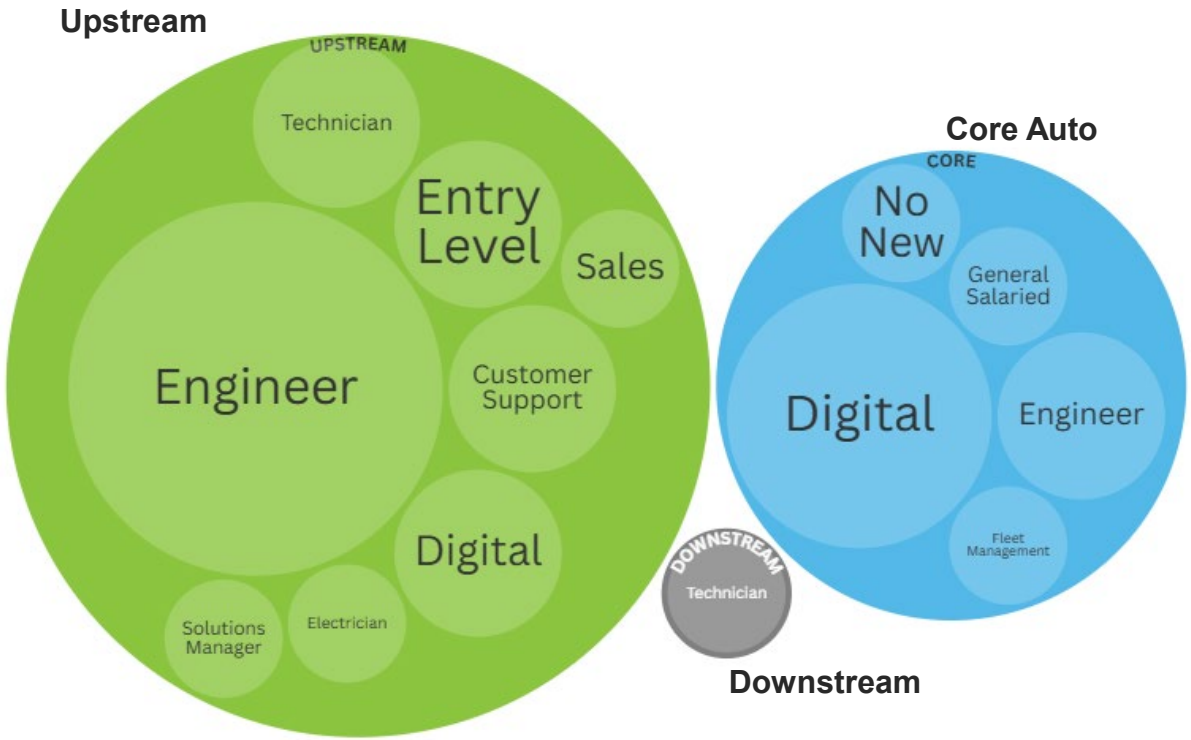
Michigan Automotive Workforce Needs Assessment

New roles expected in Future Hiring (11 of 12)

INTERVIEW RESPONSES

Do you expect to require new roles in the next 1-3 years?

Expected New Roles by Segment



Expected New Roles by Segment

New roles expected to be needed in the next 1-3 years vary by segment. The **Upstream** segment reports expecting to need **new engineering roles** the most, the **Core Auto** segment reports expecting to need **new digital roles** the most, and the **Downstream** segment **only reports** expecting to need **new technician roles**.

Upstream

- In addition to expecting to need new **engineering roles**, also described expecting to need new technician, entry level, customer support, digital, electrician, solutions manager, and sales roles.

Core Auto

- In addition to expecting to need new **digital roles**, also described expecting to need new engineer, general salaried, and fleet management roles.

Downstream

- Only reported expecting to need new **technician roles**.

Segment Differences

- While both the **Upstream** and **Core Auto** segments report expecting to need new **engineer** and **digital roles**, the **Upstream** segment reported a **stronger expected need** for new **engineer roles**, and the **Core Auto** segment reported a **stronger expected need** for new **digital** roles.
- The **Downstream** segment **did not** report expecting to need new **digital** or **engineer roles**.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: New Roles Now and in the Future (12 of 12)

Survey Summary

New Roles in Recent Hires

- **Across all businesses, most employers (79%) reported that 20% or less of their current new hires include new roles**. Another 12% have between 21-40% of new roles in recent hires, with 9% reporting 41-60% new roles.
- Most **upstream businesses** (76%) primarily report a low proportion of their current hires (≤20%) include new roles, with the remaining participants reporting that 21-40% of their new hires are for new roles**.** A large share of **Core auto businesses** (83%) reported a low proportion (≤20%) of their current hires involve new roles and the remaining have moderate levels of new roles (17%). **Downstream businesses** (83%) primarily report a low proportion (≤20%) of their new hires include new roles. with the remaining participants reporting that 41-60% of their new hires are for new roles.

Roles in Demand

- **Across all businesses, top roles in demand** include general technicians, manufacturing engineers, mechatronics technicians, auto service technicians, and industrial technicians.
- **Upstream and core auto sector roles in demand** reflect similar priorities to the roles highlighted above, whereas **downstream sectors** also report auto service technicians, and other (material handlers, forklift operators).

New Roles in Future Hires

- Across all businesses, most employers (76%) expect a low proportion of new hires to include new roles (≤20%). Upstream businesses expect a similar proportion of new roles in the next 1-3 years, whereas core auto sectors report future new hires will include a low and moderate proportion of new roles. Downstream businesses expect future hires to include a low level of new roles (40% or fewer).

Interview Summary

New roles in Development

- **A slight majority of employers (13/20)** reported they were developing new roles.
- A wide variety of roles are being developed, particularly digital and engineering roles. Other roles participants described developing include sales, business development, and technician roles.
- **Most digital roles being developed** were software engineering roles, while additional digital roles being developed include cybersecurity roles, user experience, data analyst roles, and solution architect roles.
- **Engineering roles being developed** included manufacturing engineering, general engineering, electrical engineering, controls engineer, and mechanical engineering roles.
- The Upstream and Core Auto segments report developing more engineer and digital roles, and the Downstream segment reports developing more sales roles. The Upstream segment reports developing the widest range of roles overall.

New Roles in Future Hires

- **A slight minority of employers (9/20)** expected they would need new roles in the next 1-3 years.
- Employers anticipated that engineer and digital roles would be the most needed in the next 1-3 years.
- **Engineering roles most anticipated** to be needed were general engineering and manufacturing engineering roles, while additional engineering roles expected to be needed include mechanical engineering, controls engineering, test engineering, and electrical engineering roles.
- **Digital roles most expected** to be needed were software engineering roles, followed by solution architect, cybersecurity, and data analyst roles.
- The Upstream segment reports expecting to need new engineering roles the most, the Core segment reports expecting to need new digital roles the most, and the Downstream segment only reports expecting to need new technician roles.

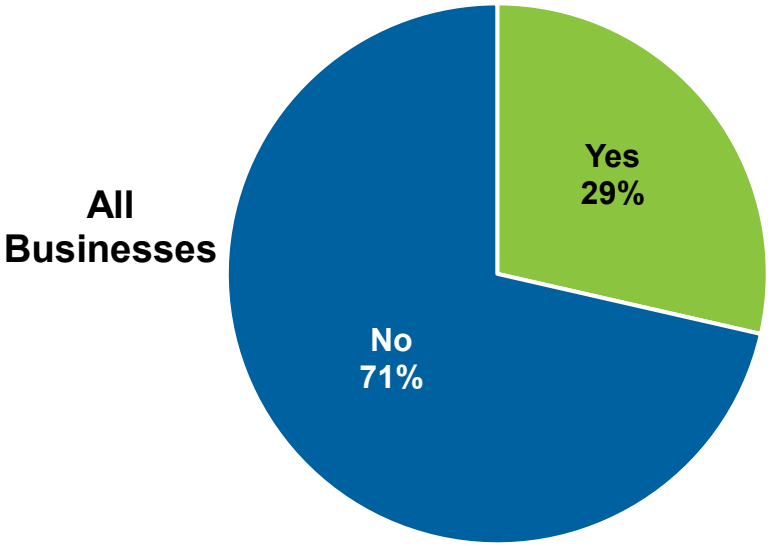
Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

New Credentials in Demand (1 of 6)

SURVEY RESPONSES

Are you currently seeking employees with new education and training credentials?



Proportion of Businesses seeking employees with new credentials		
Upstream	**Core Auto**	**Downstream**
24%	33%	50%

What credentials are you currently prioritizing in new hires?

New credentials in Demand - All Businesses

- ADAS repair
- Ambition
- Automation
- Automotive Service Excellence (ASE) certification
- Basic programming skills, data structures
- Collaborative skills
- Controls engineers
- Controls technicians
- CNC Machining certification
- Electrician
- EV certifications
- EV mechanical and body repair
- Machine learning
- Maintenance technician
- Manufacturing experience
- Mechanical engineering for automotive assembly
- Plastics engineering
- Production technicians
- Professionalism, attendance
- R&D engineers
- Running a header
- Safety engineering
- Vehicle systems integration compliance (ADAS, Safety performance engineering)
- Willingness to learn

Upstream

- Attendance
- Automation
- Basic programming skills
- CNC Machining
- Controls technicians, engineers
- Electrician
- Maintenance technician
- Mechanical engineering for automotive assembly
- Plastics engineering
- Production technicians
- Professionalism, attendance
- R&D engineer

Core Auto

- Automation
- Collaborative skills
- Production skills
- Experience running a header

Downstream

- ADAS repair
- Ambition
- Automotive Service Excellence (ASE) certification
- EV mechanical and body repair
- Machine learning
- Mechanical engineering for assembly
- Safety engineering
- Vehicle systems integration compliance (ADAS, Safety performance engineering)
- Willingness to learn

Return to Table of Contents

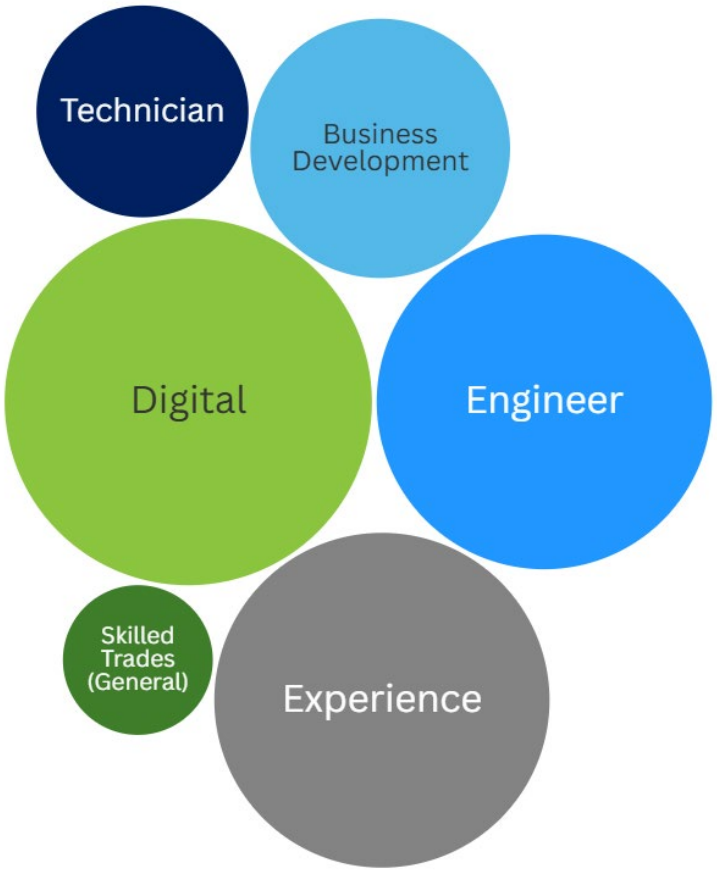
Michigan Automotive Workforce Needs Assessment

New Credentials in Demand (2 of 6)

INTERVIEW RESPONSES

Are you seeking employees with new credentials? What are they?

All Businesses New Credentials in Demand



All Businesses New Credentials in Demand

- **Digital** and **engineering** credentials make up the majority of new credentials employers are looking for. Digital credentials are sought slightly more than engineering credentials. **Experience** is also an in-demand credential.
- Among all interviewees, 7/20 of employers stated they were seeking employees with new credentials.

Other credentials in demand

- Business development
- Technician
- Skilled trades (general)

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

New Credentials in Demand (3 of 6)

INTERVIEW RESPONSES

Are you seeking employees with new credentials? What are they?

Interviewees reported that they were looking for a range of new credentials, focused primarily on digital and engineering credentials. Interviewees also reported focusing more on experience than exact credentials.

Example Interview Responses (Paraphrased):

New Credentials Sought by All Businesses:

Participant H: *The credentials we need for our next hires are going to be custom. Our current engineer will let us know what he needs, probably someone with electrical engineering skills and software engineering skills, so they can integrate systems.*

Participant F: *We're looking for information security and user experience people, we're hiring from other industries.*

Participant P: *We don't have anything we're looking for specifically in terms of certifications or apprenticeships, that's not what is at the forefront of identifying candidates. It's more about the general experiences and expertise of the person.*

Michigan Automotive Workforce Needs Assessment

New Credentials in Demand (4 of 6)

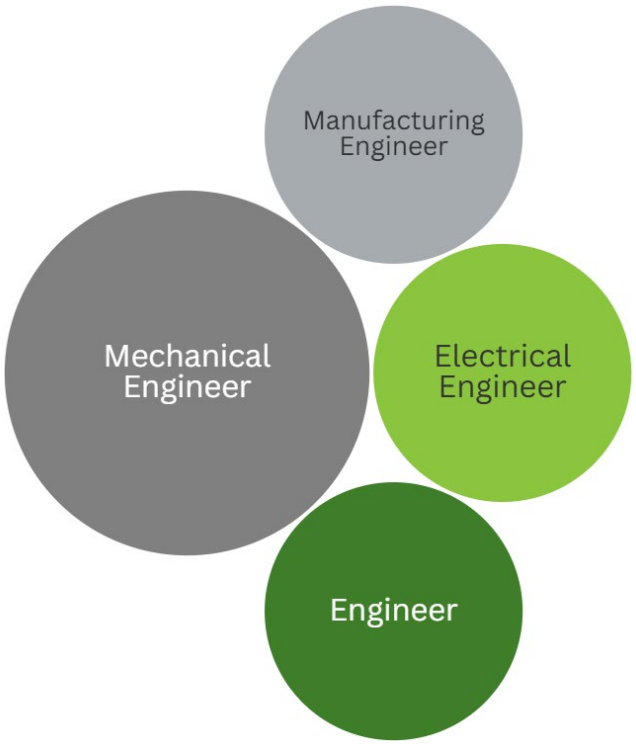
INTERVIEW RESPONSES

Are you seeking employees with new credentials? What are they?

All Businesses New Digital and Engineering Credentials Theme Breakdowns

New Digital Credentials

New Engineering Credentials



All Businesses New Digital and Engineering Credentials in Demand Theme Breakdowns

New **digital** and **engineering** credentials sought varied, although **cybersecurity credentials** were the **most sought digital credentials** and **mechanical engineering credentials** were the **most sought engineering credentials**.

New Digital Credentials

- Cybersecurity
- Software engineer
- User experience
- Data analyst
- Solution architect

New Engineering Credentials

- Manufacturing engineer
- General engineer
- Controls engineer
- Mechanical engineer
- Electrical engineer

Return to Table of Contents

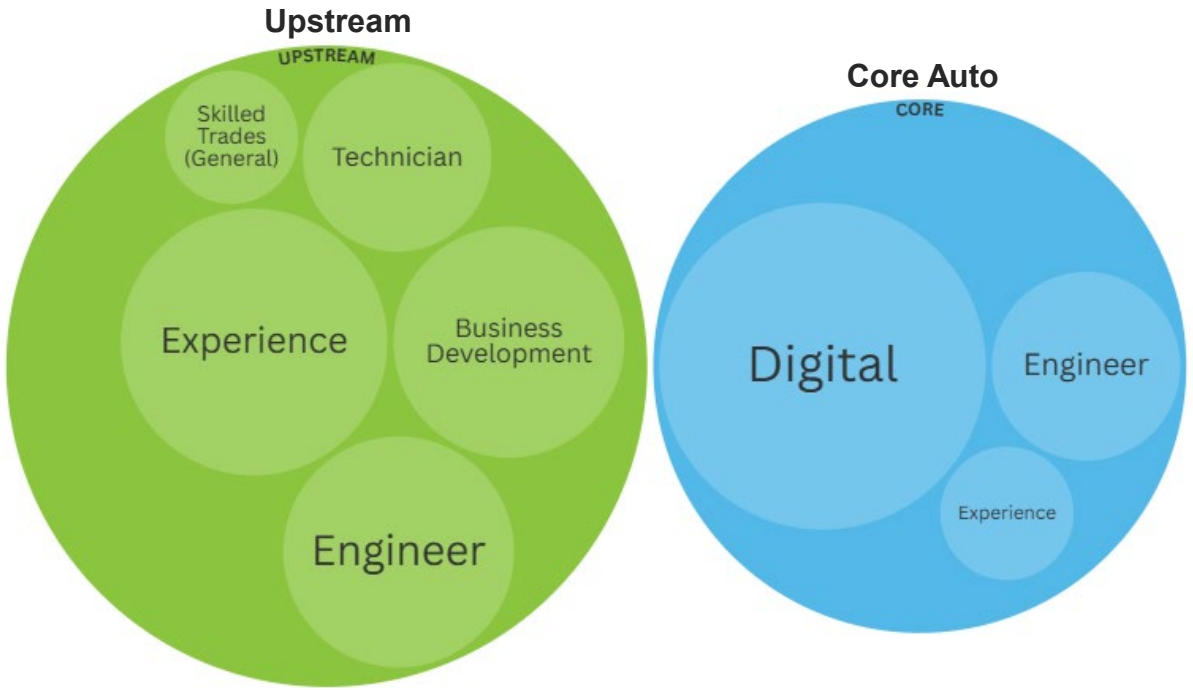
Michigan Automotive Workforce Needs Assessment

New Credentials in Demand (5 of 6)

INTERVIEW RESPONSES

Are you seeking employees with new credentials? What are they?

New Credentials in Demand by Segment



New Credentials in Demand by Segment

Both the **Upstream** and **Core Auto** segments reported seeking employees with new **engineering credentials**. **Digital credentials** were more sought by the **Core Auto** segment, and **experience, business development**, **and technician credentials** were sought by the **Upstream** segment. The **Downstream** segment **did not report seeking any new credentials.**

Upstream

- Experience
- Engineer
- Business development
- Technician
- Skilled trades

Core Auto

- Digital
- Engineer
- Experience

Segment Differences

- While both the **Upstream** and **Core Auto** segments report seeking new **engineering credentials and experience**, the **Core Auto** segment was **more interested** in new **digital credentials**, while the **Upstream** segment was **more interested** in **experience, new engineering** and **business development credentials**.
- The **Downstream** segment **did not** report seeking new credentials.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: New Credentials (6 of 6)

Survey Summary

Businesses seeking New Credentials among workers

- Across all businesses, **most employers (71%) reported that they are not seeking employees with new education and training**, the remaining 29% report they are seeking new credentials.
- A relatively lower proportion of upstream businesses (24%) are seeking employees with new education and training credentials, whereas 33% of core automotive and 50% of downstream sectors report they are seeking employees with new credentials.

New Credentials in Demand

- Of those businesses reporting they are seeking employees with new credentials, the new credentials in demand spanned from soft skills including ambition, collaboration, and willingness to learn, vehicle and technology service and repair certifications, basic programming, machine learning, controls, electricians and EV certifications, manufacturing, engineering, and safety.
- **Upstream businesses** reported a range of needs for credentials in automation, basic programming, CNC machining, control technician and engineering, machine learning, maintenance, mechanical engineering in auto assembly, plastics engineering, production, R&D engineering and soft skills.
- **Core auto businesses** report seeking credentials in automation, collaboration, production, and vehicle component experience (e.g., headers).
- **Downstream businesses** report seeking credentials in ADAS repair, automotive service certifications, EV mechanical and body repair, mechanical engineering for assembly, safety engineering, and willingness to learn new skills.

Interview Summary

Businesses seeking New Credentials among workers

- A minority of participants (7/20) reported they were seeking employees with new credentials, while 5 participants reported they were more interested in experience than specific credentials.

New Credentials in Demand

- Digital and engineering credentials were the most in demand among employers, although employers also reported looking for experience in place of credentials.
- **Most new digital credentials** participants were seeking were cybersecurity credentials, although they were also looking for data analyst credentials, software engineer credentials, solution architect credentials, and user experience credentials**.**
- **Mechanical engineering credentials** were the most frequently sought engineering credentials, although employers also reported seeking electrical engineering credentials, manufacturing engineering credentials, and general engineering credentials.
- **Other types of credentials** sought include business development, technician, and skilled trades (general) credentials.
- Both the Upstream and Core segments reported seeking employees with new engineering credentials. Digital credentials were more sought by the Core segment, and experience, business development, and technician credentials were more sought by the Upstream segment. The Downstream segment did not report seeking any new credentials.

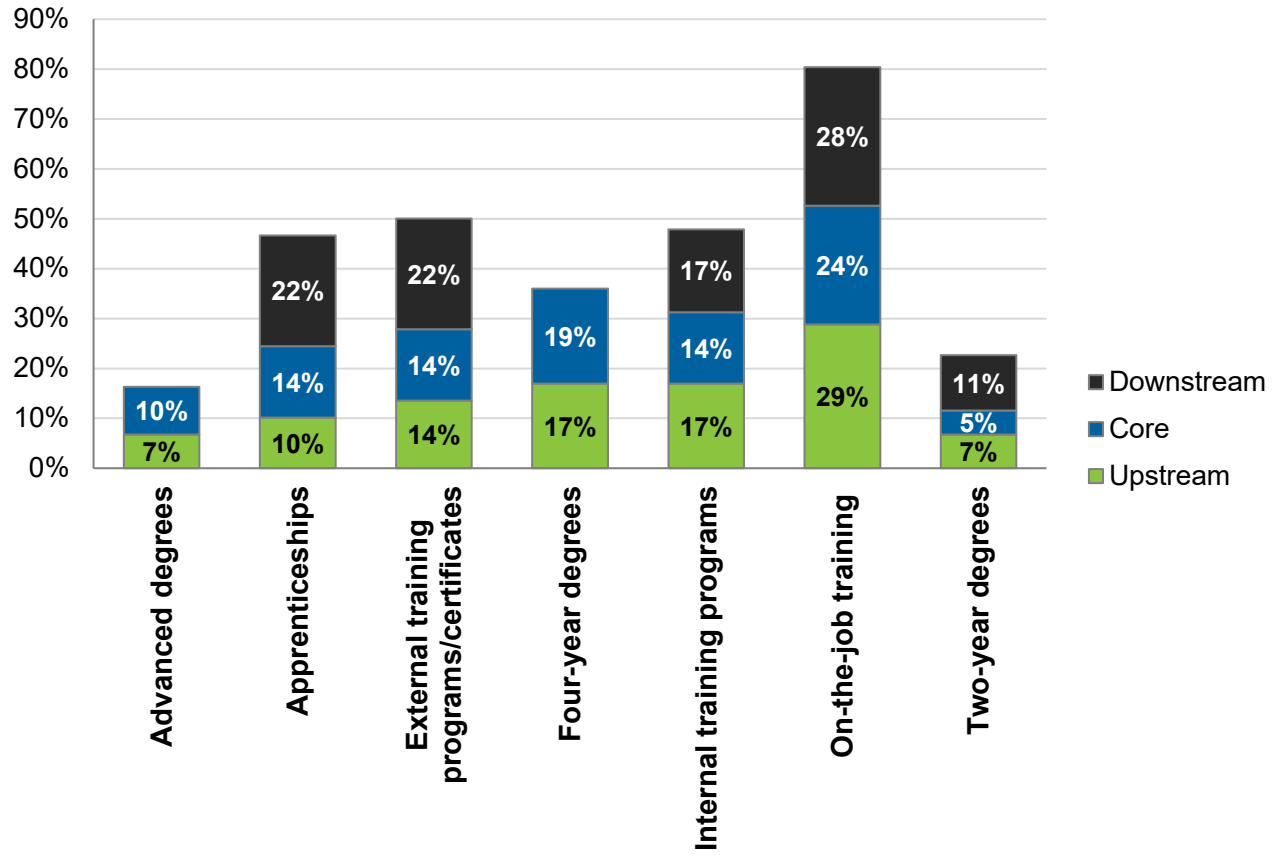
Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Education and Training Resource Utilization (1 of 5)

SURVEY RESPONSES

What types of education and training resources are you currently relying on at your facility?



Education and Training Resources Used by Businesses

- Participants indicated what education and training resources they utilize.

All Businesses

- Across all sectors, businesses report they most frequently rely on on-the-job training (27%) followed by 4-year degrees (16%), external training (15%), internal training (15%) and apprenticeships (13%) as resources.

Upstream Segment

- Businesses in upstream sectors reported most frequently relying upon on-the-job training (29%), internal training programs (17%), and four-year degrees (17%).

Core Auto Segment

- Businesses in core automotive sectors reported most frequently relying upon on-the-job training (24%) and four-year degrees (19%) as resources.

Downstream Segment

- Businesses in downstream sectors reported most frequently relying on on-the-job training (28%), apprenticeships (22%), and external training (22%).

Return to Table of Contents

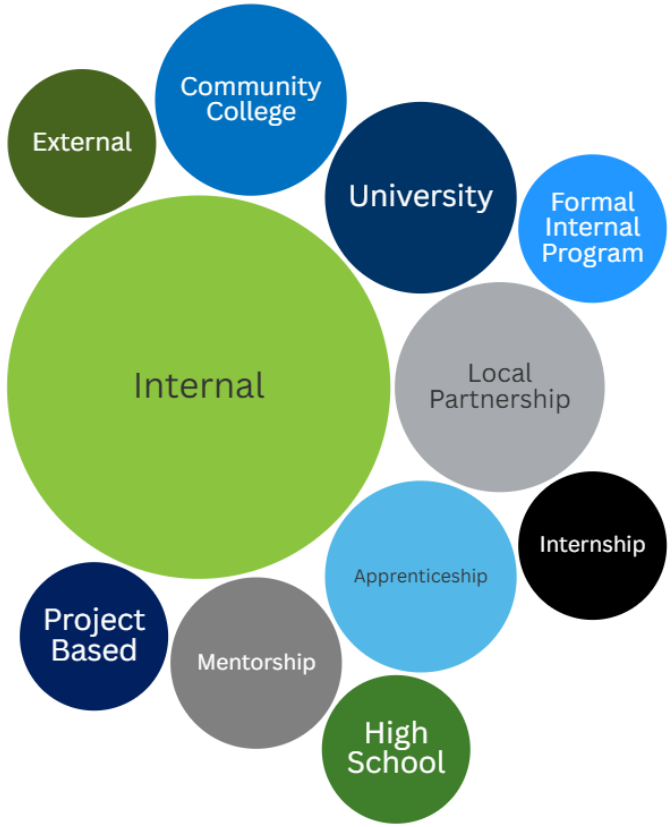
Michigan Automotive Workforce Needs Assessment

Education and Training Resource Utilization (2 of 5)

INTERVIEW RESPONSES

What types of training resources are you currently using at your facility?

All Businesses Training Resources Used



All Businesses Training Resources Used

Employers relied the most on **internal training programs** and **local resources, such as training partnerships with local institutions** and **community colleges** and **universities more generally.**

Internal Training Resources

- Internal training resources – described by all participants
- Formal internal training programs (such as internal universities)
- Mentorships

Other Training Resources

- Training partnerships with local institutions
- Universities
- Community colleges
- Apprenticeship programs
- Internships
- High schools
- Project-based learning experiences
- Other external resources

Note: Values to the left represent only whether a business mentioned using a training resource. The frequency with which businesses discussed their use of training resources was not included, as each category either was or was not being used. Employers could however mention multiple categories of training resource in their responses.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Education and Training Resource Utilization (3 of 5)

INTERVIEW RESPONSES

What types of training resources are you currently using at your facility?

Participants most frequently used internal training programs and resources such as training partnerships with local institutions, community colleges, universities, and apprenticeships. However, participants described using a wide array of training resources.

Example Interview Responses (Paraphrased):

Training Resources Used:

Participant E*: We've built our own internal training, using the Michigan TalentFund to support the cost of it. It primarily trains equipment maintenance and repair skills.*

Participant L*: Two years ago, I got HR to approve us to hire interns enrolled in 2-year degree programs, so we can have technician internships. It's a win-win-win situation. The students can get experience working with highly talented technicians and have the flexibility to go to class, the school can say they have a partner program with us, and we can teach interns skills we need. We try to hire the interns directly after they finish their programs. We treat the interns as closely as possible to full time, they get a 401K, healthcare benefits, etc.*

Participant D*: We partner with a local community college a lot to send our employees through their robotics courses. We also tap into a local high school with a great mechatronics program.*

Return to Table of Contents

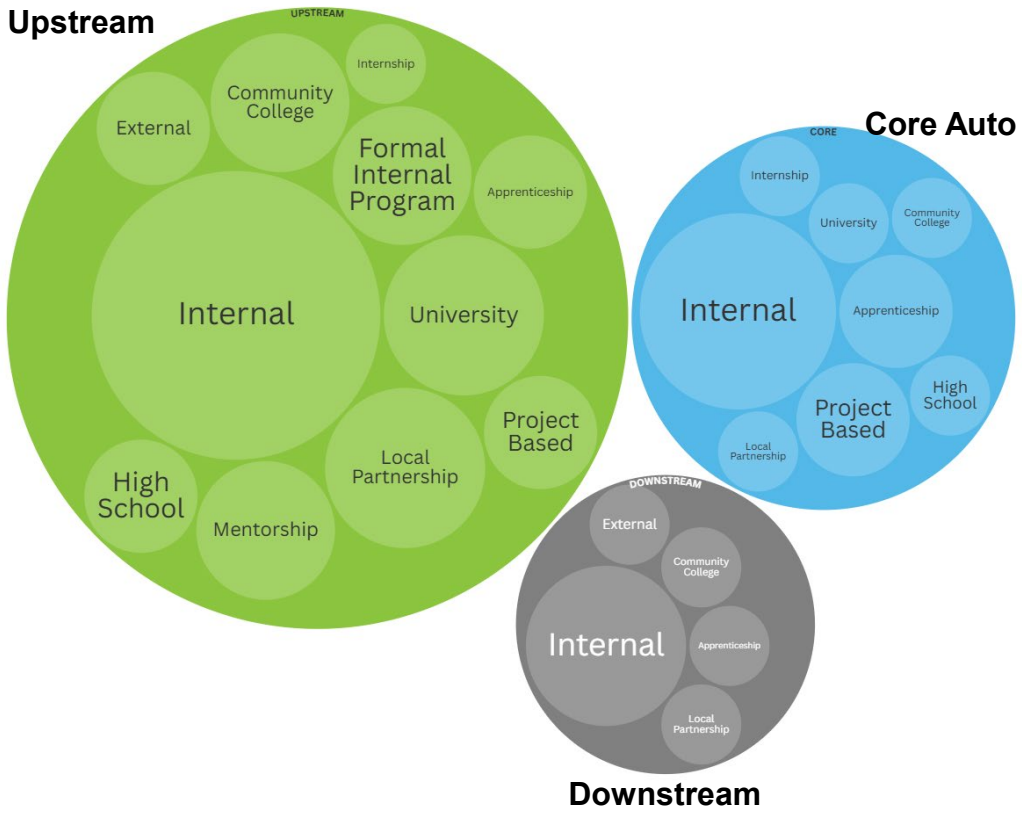
Michigan Automotive Workforce Needs Assessment

Education and Training Resource Utilization (4 of 5)

INTERVIEW RESPONSES

What types of training resources are you currently using at your facility?

Training Resource Use by Segment



Training Resource Use by Segment

Internal training resources are relied on across all segments. The **Upstream** and **Downstream** segments also rely on **partnerships with local institutions**, while the **Core Auto** segment relies on **project-based learning experiences**. The **Core Auto** and **Downstream** segments rely on **apprenticeships**. The **Upstream** and **Core Auto** segments also use **University training resources**.

Upstream Segment

- In addition to **internal training resources, mentorships,** and **formal internal programs,** the **Upstream** segment relies heavily on **partnerships with local institutions, universities,** and **community colleges.**

Core Auto Segment

- In addition to **internal training resources,** the **Core Auto** segment relies heavily on **apprenticeships** and **project-based learning experiences.**

Downstream Segment

- In addition to **internal training resources,** the **Downstream** segment relies on **partnerships with local institutions, community colleges, apprenticeships,** and **other external programs.**

Segment Similarities

- **All segments use internal training resources.**
- **All segments also make use of partnerships with local institutions, community colleges, and apprenticeships.**

Segment Differences

- The **Upstream** and **Core Auto** segment used **university** training resources, while the **Downstream** segment **did not.**
- The **Upstream** segment used **formalized internal training programs** and **mentorships,** while the **Core Auto** and **Downstream** programs did not have as structured internal training resources.
- The **Core Auto** segment had a **stronger preference** for **project-based learning experiences** than the other segments.

Michigan Automotive Workforce Needs Assessment

Summary: Education and Training Resources Utilized (5 of 5)

Survey Summary

Education and Training Resources being Utilized

- Across all businesses, the largest share of businesses reported they utilize on-the-job training, followed by followed by 4-year degrees, internal and external training, and apprenticeships.
- **Upstream businesses** report also most frequently report relying upon on-the-job training, and equally upon internal training programs and four-year degrees.
- **Core auto businesses** reported most frequently relying upon **on-the-job training and four-year degrees** as resources and equally upon apprenticeships, internal training, and external training & certificates.
- Businesses in the **downstream segment** reported most frequently utilize on-the-job training, followed by apprenticeships and external training programs & certificates.

- Taken together, all businesses rely upon a variety of education and training resources, with the most reliance on on-the-job training, four-year degree education, internal and external training, and apprenticeships. Businesses utilize two-year and advanced degrees to a lesser degree.
- Industry segments all relied most upon on-the-job training and varied in other resources. Upstream businesses also focus on four-year degrees, whereas Core auto and Downstream businesses also use apprenticeships and external training.

Interview Summary

Education and Training Resources being Utilized

- Internal training resources are used across all segments, with 100% of businesses reporting that they make use of some kind of internal training program at their facility.
  - Three businesses reported using formal internal programs, such as internal universities.
  - Four businesses reported using internal mentorships.

- Partnerships with local institutions, community colleges, and apprenticeships are also relied on across industry segments.
- The Upstream Segment relied on internal training resources, mentorships, and formal internal programs, and still heavily, but less frequently, on partnerships with local institutions, universities, and community colleges.
- The Core Auto segment relied on internal training resources, as well as apprenticeships and project-based learning experiences.
- The Downstream Segment relied heavily on internal training resources, as well as partnerships with local institutions, community colleges, apprenticeships, and other external programs.

- Overall, businesses make use of a wide range of education and training resources, and rely the most heavily on internal training programs, partnerships with local institutions, apprenticeships, community colleges, and universities.

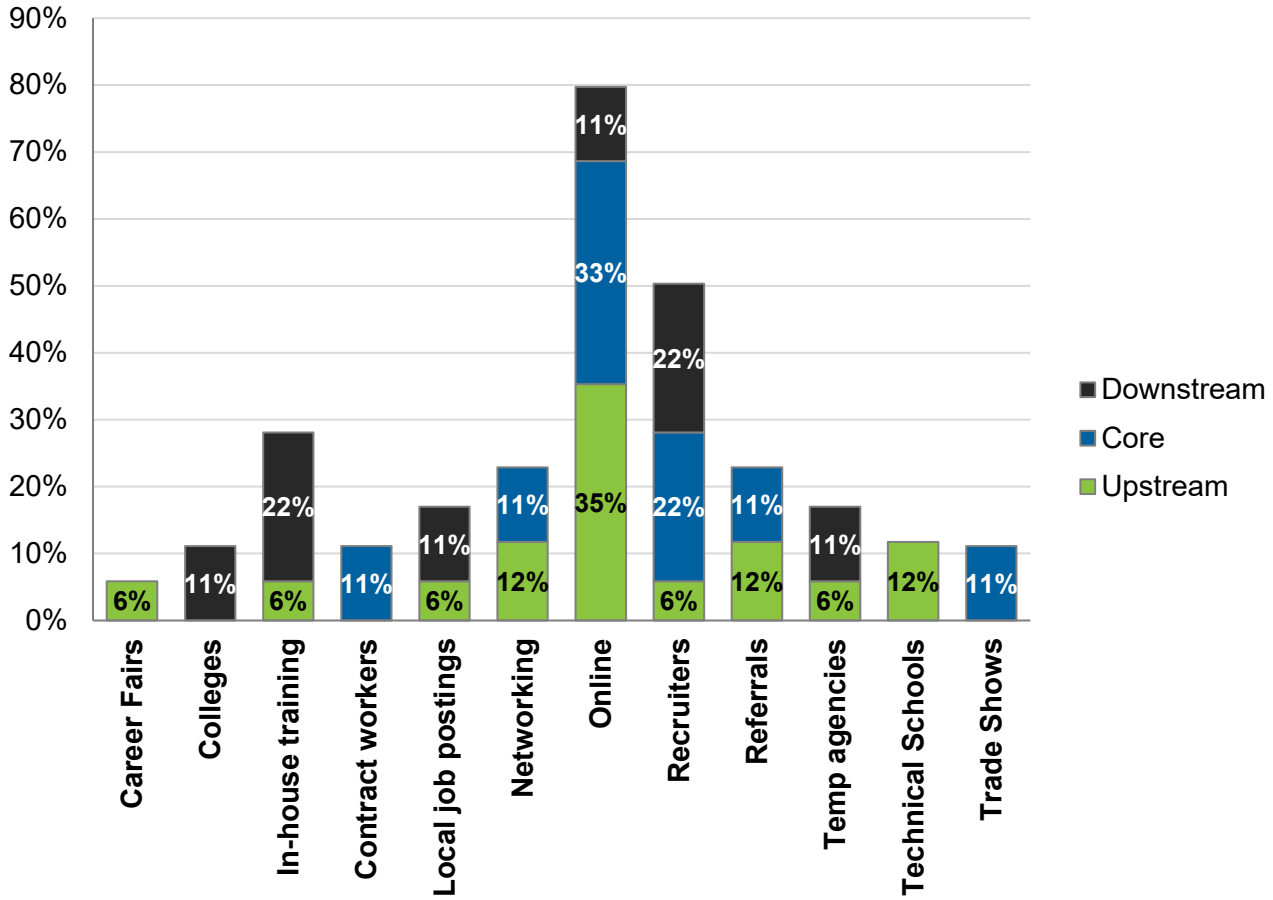
Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Resources Businesses Use to Find Talent (1 of 8)

SURVEY RESPONSES

Where does your facility find your top hires?



Resources Businesses Used to find Top Talent

All Businesses

- Across all segments, businesses report they most frequently rely on online job postings (31%), colleges (20%), recruiters (8%), in-house training (6%), local job postings (6%), networking (6%), referrals (6%), and technical schools (6%) to find their top hires.

Upstream Segment

- Businesses in Upstream sectors reported relying on online job postings (35%), networking (12%), referrals (12%), and technical schools (12%) to find their top hires.

Core Auto Segment

- Businesses in Core automotive sectors most reported relying on online job postings (33%) and recruiters (22%), followed by contract workers, networking, referrals, and trade shows (all 11%) to find their top hires.

Downstream Segment

- Businesses in Downstream sectors reported relying on in-house training (22%) and recruiters (22%) most frequently to find their top hires. Downstream businesses also rely upon colleges, local job postings, online postings, and temp agencies (all 11%).

**Note: Response options included colleges and technical schools were provided but did not always distinguish between institutions.*

Return to Table of Contents

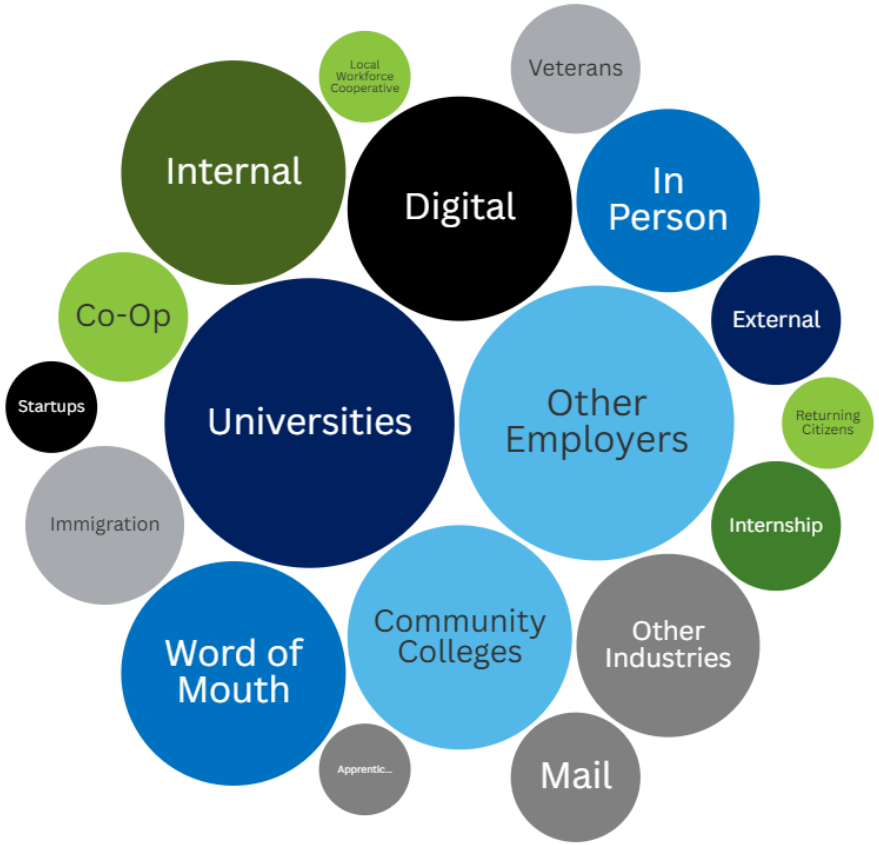
Michigan Automotive Workforce Needs Assessment

Resources Businesses Use to Find Talent (2 of 8)

INTERVIEW RESPONSES

Where do you currently find your top hires?

AI Businesses Resources Used to find Talent



All Businesses Resources Use to Find Talent

Employers find employees in a wide variety of places. Participants recruited most frequently from Universities and other employers.

Other top ways employers frequently find talent include

- Digital recruiting boards
- Community colleges
- Internally
- Word of mouth
- In-person events
- Other industries
- Immigration pipelines

Note: Values to the left represent only whether a business mentioned recruiting at a location. The frequency with which businesses discussed their use of recruiting locations was not included, as each category either was or was not being used. Employers could however mention multiple categories of recruiting location in their responses.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Resources Businesses Use to Find Talent (3 of 8)

INTERVIEW RESPONSES

Where do you currently find your top hires?

Participants reported most frequently hiring through universities, from other employers, and online. However, when discussing hiring, they also described challenges they face to attracting talent, and a handful of roles without enough new entrants coming in.

Example Interview Responses (Paraphrased):

Employer experiences around hiring – where they are hiring, challenges to talent attraction, and roles with insufficient new entrants*:*

- Participant D: *We have long-standing partnerships with universities, including a co-op with an engineering program, but when I think about skilled technician roles, plastics processing, maintenance technicians, a lot of the time our pipeline is other employers.*
- Participant A: *We've had to hire some recent retirees from the automotive industry with ICE skills. For our sales roles, we hire through Sales Navigator.*
- Participant M: *We recruit from universities where we've had good experiences. Their curriculum matches our expectations, we've placed students from them successfully. We do have some of the big names. We try to make our presence known at more than just the career fairs, try to market ourselves as a desirable place for students to work.*
- Participant S: *From what I see, we recruit through word of mouth. If they have a connection with someone we've worked with in the past, relevant work experiences and skillsets.*
- Participant K: *It's difficult to attract the best in software or electrical engineering because these new workers are intrigued by tech jobs at software companies. The automotive industry isn't top of the list when it comes to industries for talent attraction. This will continue to be challenging into the future.*
- Participant F: *The ability of Michigan to attract talent is lacking. When we were trying to attract people to Michigan, after visiting, they asked "What do people do after work? Where do they go?". That was telling. They went elsewhere. Michigan has a lot to offer, but it has to set up infrastructure for the next generation. It's not just the work culture, it's the work environment. People live in communities, they need to want to go back there.*
- Participant I: *It's a tough environment, hot, dirty, not a place someone coming out of college wants to work. Another issue, for engineers and hourly workers, is the shift schedule. Sometimes 16-hour days happen because of production needs.*
- Participant C: *The automotive repair & maintenance technician base is a massive opportunity to backfill. It's been an opportunity for 30-40 years, but now it's at a critical mass because the people retiring are 2-5 times the people coming into the business.*
- Participant A: *There's a massive demographic draught occurring in powertrain engineering roles. People are retiring, it's hard to backfill the technical know-how.*

Return to Table of Contents

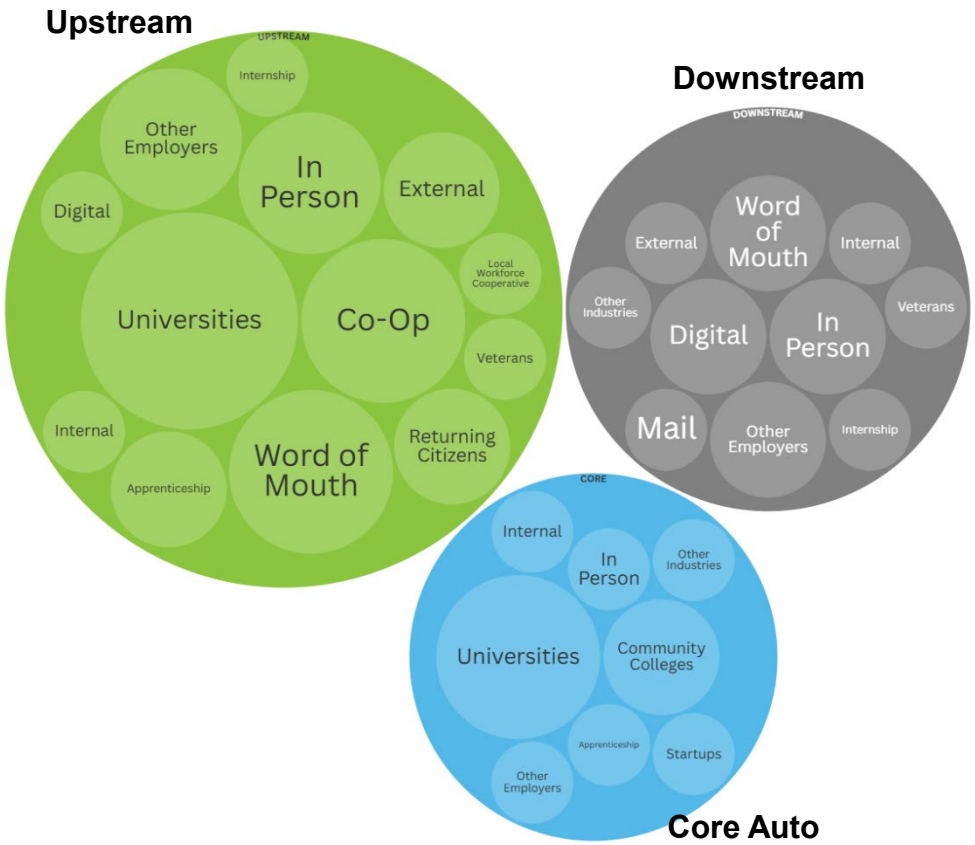
Michigan Automotive Workforce Needs Assessment

Resources Businesses Use to Find Talent (4 of 8)

INTERVIEW RESPONSES

Where do you currently find your top hires?

Hiring Location by Segment



Hiring Location by Segment

The **Upstream** and **Core Auto** segments most frequently **hire** through **universities.** The **Downstream** segment most frequently **hires** through **digital recruiting tools, word of mouth, in-person events,** and **from other employers.**

Upstream Segment

- Most frequently finds hires through **universities,** followed by **co-op programs, word of mouth, in-person events,** and **other employers.**

Core Auto Segment

- Most frequently finds hires through **universities,** followed by **community colleges.**

Downstream Segment

- Most frequently finds hires through **digital recruiting tools, word of mouth, in-person events,** and **from other employers.**

Segment Similarities

- **All segments** find hires through **word of mouth, in-person events,** and **other employers.**

Segment Differences

- The **Upstream** and **Core Auto** segments more frequently **hire** through **universities.**
- The **Upstream** and **Downstream** segments more frequently **hire** through **word of mouth** than the **Core Auto** segment.
- The **Upstream** segment recruits more frequently from more **specific local talent pools**, such as **veterans, returning citizens, nearby apprenticeship programs,** and **local workforce cooperatives.**
- The **Core Auto** segment recruits more from **startups** and **community colleges.**
- The **Downstream** segment is the only segment to recruit via **mail.**

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Resources Businesses Use to Find Talent (5 of 8)

Where do you currently find your top hires?

All Businesses Themes Related to Hiring

INTERVIEW RESPONSES

All Businesses Themes related to Hiring

While discussing hiring, businesses described where they were finding their top hires, but also described difficulty finding talent in certain roles, as well as several factors impacting their ability to attract talent.

Return to Table of Contents

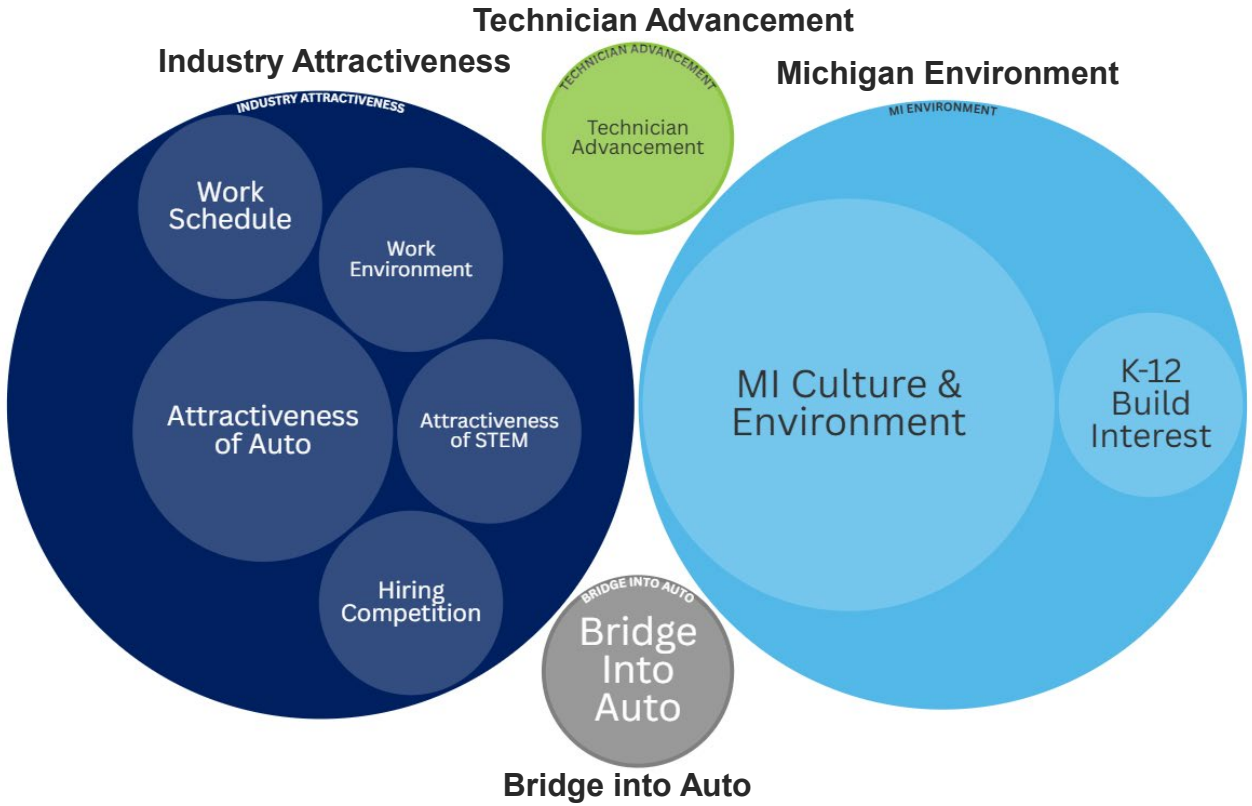
Michigan Automotive Workforce Needs Assessment

Resources Businesses Use to Find Talent (6 of 8)

INTERVIEW RESPONSES

Where do you currently find your top hires?

All Businesses Challenges to Talent Attraction



All Businesses Challenges to Talent Attraction

When describing challenges businesses face when attracting talent, they described Michigan's culture and environment as their largest barrier, followed by a lack of attractiveness of the automotive industry.

Michigan's culture & environment challenges

- Need to reinforce Michigan's strength as a center for manufacturing and vehicle development
- Need to build interest in the automotive industry and manufacturing earlier in Michigan students.

Industry attractiveness challenges

- Automotive industry is not as attractive as it used to be.
  - The automotive work environment does not appeal to young workers.
  - Manufacturing work schedules do not appeal to young workers.
- STEM fields are less attractive to the next generation of workers.
- The automotive industry faces steep competition with other industries when recruiting top talent.

Other challenges

- Reduced advancement opportunities for skilled technicians.
- Need to support workers hired from other industries as they transition to the automotive industry.

Return to Table of Contents

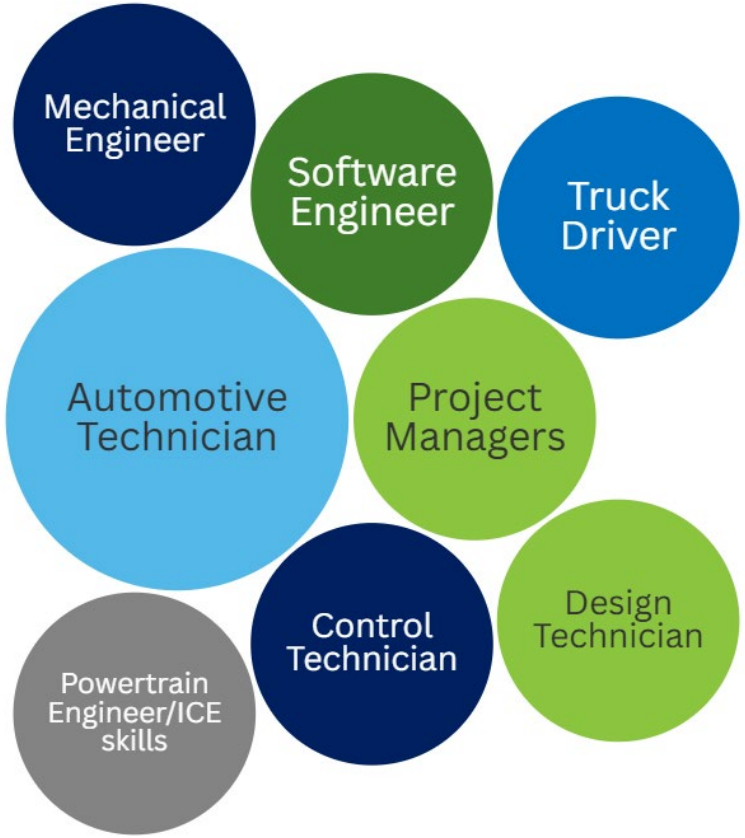
Michigan Automotive Workforce Needs Assessment

Resources Businesses Use to Find Talent (7 of 8)

INTERVIEW RESPONSES

Where do you currently find your top hires?

All Businesses Roles with Not Enough New Entrants



All Businesses Roles with Limited New Entrants

When describing roles they were struggling to fill, businesses **most frequently discussed automotive technicians** when discussing roles without enough new entrants.

Other roles with limited new entrants

- Truck driver
- Project manager
- Design technician
- Control technician
- Mechanical engineer
- Software engineer
- Powertrain engineer/engineer with ICE skills

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: Resources Businesses Use to Find Talent (8 of 8)

Survey Summary

Resources that Businesses Currently Use to Find Top Hires

- **Across all sectors,** businesses report they most frequently rely on online job postings, colleges, and recruiters to find their top hires. To a lesser extent businesses also use in-house training, local job postings, networking, referrals, and technical schools to find talent.
- **Upstream businesses** report reported relying on online job posting, networking, referrals, and technical schools to find their top hires.
- **Core auto businesses** reported relying on online job postings, recruiters, referrals, contract workers and networking most often to find their top hires.
- **Businesses in downstream sectors** reported relying on in-house training and recruiters most frequently to source their top hires. Downstream businesses also similarly utilized colleges, local job postings, and temp agencies.

- Taken together, all businesses rely upon a variety of resources to find their top hires, with the highest reliance on online job postings, recruiters, and in-house training. Businesses also relied upon on referrals, networking, local job postings, temp agencies.
- Both upstream and core auto businesses relied most upon online job postings and differ in their reliance on other sources of talent. Downstream businesses rely most on in-house training and recruiters.

Interview Summary

Resources that Businesses Currently Use to Find Top Hires

- **Across all businesses,** participants recruited most frequently from universities or other employers**.**
  - Other frequently relied on hiring resources include community colleges, online job postings, word of mouth, in-person events, and internal pipelines.
- **The Upstream segment** most frequently finds hires through universities, followed by co-op programs, word of mouth, in-person events, and other employers.
- **The Core segment** most frequently finds hires through universities, followed by community colleges.
- **The Downstream segment** most frequently finds hires through digital recruiting tools, word of mouth, in-person events, and from other employers.

Challenges to Talent Attraction

- The two factors most negatively impacting employers' ability to attract talent include Michigan's culture and environment and the attractiveness of the automotive and manufacturing industries.

Roles with Not Enough Entrants

- Automotive technicians were most often discussed when discussing roles without enough new entrants.
- Other roles without enough new entrants include truck driver, project manager, mechanical engineer, software engineer, design technician, control technician, and powertrain engineer/engineers with ICE skills roles.

- Businesses report finding talent primarily through universities, from other employers, or online. When discussing hiring, they also described challenges they face when attracting talent and roles with limited new entrants.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Policies Needed to support Workers and Businesses (1 of 6)

What policies are needed to support Michigan's workforce and employers in response to industry shifts, including the EV transition?

Workforce		Industry	Other
• Apprenticeship and grant program support for applicants • Battery and EV technician training • Certification programs for lean manufacturing, continuous improvement, & ADAS • CNC Machinist programs in high schools • Policy and industry support for apprenticeships • EV infrastructure maintenance training • Funding for skilled trades positions • Policy reform for Immigration, public assistance, and sick leave policies to boost workforce availability • Increase workforce availability via public assistance reform • Industry-Education alignment supporting new vehicle technology training • Policy and industry support for apprenticeships • Reduced red tape for policy	• Skilled trades education • Support for basic job skills training • Support for broader training grant funds • Support for Mechatronics technician training • Support for Michigan grants (e.g., Going Pro) • Support for regional talent collaboratives • Support for skilled trades training (high school and after) • Talent attraction for engineering • Training for electronics and high voltage skills • Training for production technicians • Training grant resources for management and leadership roles • Transferable credentials for auto, energy, & manufacturing sectors	• EV battery recycling support • Flexible industry incentives to support EV competitiveness • Focusing on other propulsion systems besides EV • Investment in other areas besides EV • Reduction in red tape for business site development • Reduction in tariffs on automotive industry • Reshoring tax credits • Support for R&D and industry pilots • Tax abatements	• Consumer EV home charging incentives • Consumer EV tax credits • EV infrastructure deployment

SURVEY RESPONSES

Policies Needed to Support Workers and Businesses

All Businesses Policy Needs

- Businesses from all sectors highlighted needs for workforce support, industry support, consumer EV incentives, and EV infrastructure deployment as key policy needs.

Workforce Policy Needs

- Policy needs focused on specific training needs and apprenticeships, industry-education alignment for training, support for apprenticeship and grant applicants, support for Michigan grants, regional collaboratives, talent attraction, and transferable credentials between auto and other industries.

Industry Policy Needs

- Businesses reported needs for battery recycling, incentives for EV competitiveness, broad propulsion system investments, economic support for site development, tariffs, reshoring, R&D, and industry pilots

Other Policy Needs

- Businesses reported needs to support consumer home charging, EV tax credits, and infrastructure deployment.

Return to Table of Contents

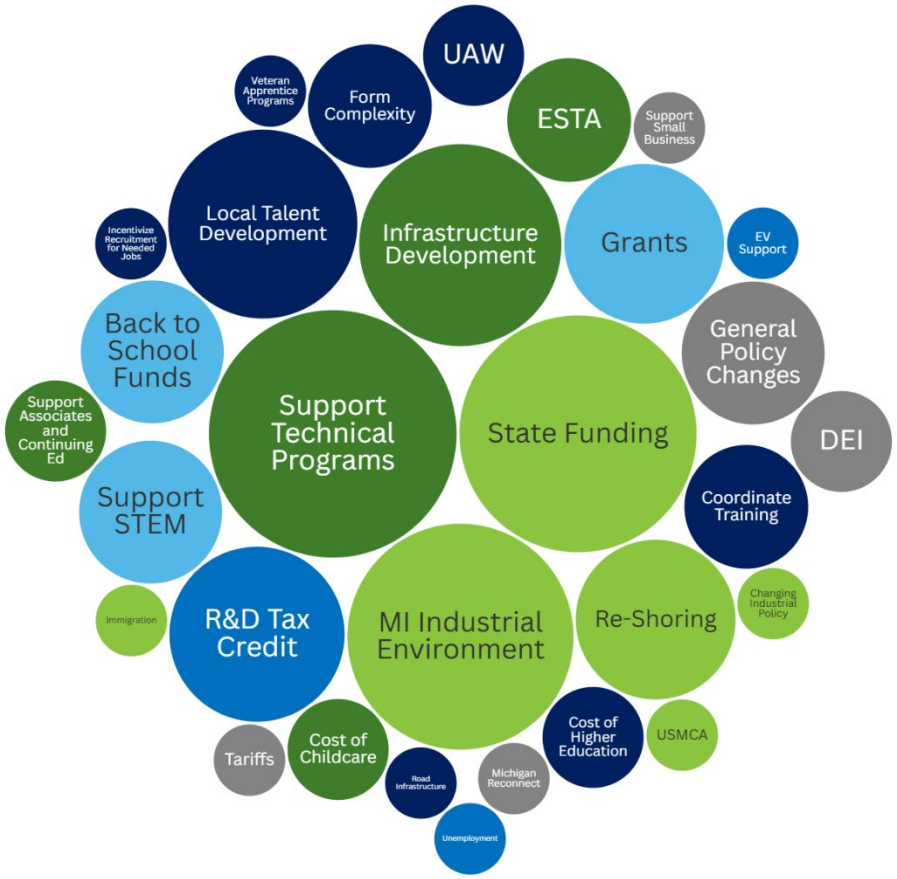
Michigan Automotive Workforce Needs Assessment

Policies Needed to support Businesses and Workers (2 of 6)

What workforce-related policies are needed to support workers and employers in the EV transition?

INTERVIEW RESPONSES

All Businesses Policy Needs



All Businesses Policy Needs

Employers had **diverse policy needs**, but the **most frequently desired** policies include **state support of technical programs, state funding, policies to support Michigan's standing as an industrial and automotive center**, and **state EV infrastructure development.**

Other top policy needs

- Development of local talent
- R&D tax credit
- Grants
- Re-shoring policies
- Policies to support STEM education
- Funds to support re-education of current workers

- Employers described not only their policy needs, but also how some current policies positively or negatively impacted them.

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Policies Needed to support Businesses and Workers (3 of 6)

What workforce-related policies are needed to support workers and employers in the EV transition?

INTERVIEW RESPONSES

Interviewees described a diverse range of state policy needs, but most frequently requested support of technical programs, state funding, policies to support Michigan's standing as an industrial and automotive center, and state EV Infrastructure development.

Example Interview Responses (Paraphrased):

Policies needed to support workers and employers:

- Participant C: *EV is very different than ICE. If you touch the wrong part of the car, you end up dead. From a safety standpoint, you need infrastructure. Risks are being communicated by OEMs, but not clearly, it would be helpful to have standards from state or local governments.*
- Participant D*: We apply for these GoingPro funds every year, we've been lucky enough to be awarded them for many years. We understand something is going on that may result in these funds being cut. This would affect us a great deal.*
- Participant F: *Michigan just lost a lot of funding for economic development, this is alarming. GoingPro is leveraged highly for a local apprenticeship program. Another apprenticeship program just got zeroed out of the Michigan budget. Cutting GoingPro is the WRONG way to go.*
- Participant T: *There are a lot of great programs out there, how can we connect them? Everyone has their own initiatives, but they don't often collaborate. How can we work together to provide students incentives to engage with STEM, how can we keep them here after they graduate, we're being out-recruited by flashier careers elsewhere, how can we ensure diversity, make sure everyone has the opportunity for future mobility jobs. The Washtenaw millage for STEM went through, that's great,*
- Participant J: *Part of our need is for investment in STEM education in the state. There is a gap in state funding for educational resources in the state, which shows in the talent pool. STEM education in the middle and high schools is critical for automotive industry and manufacturing industry success in Michigan.*
- Participant P*: How do we address supporting manufacturing in Michigan? We have infrastructure to manufacture cars, as well as other things, if we lose sight of that, we become a service based economy, that's not sustainable, businesses won't want to invest. We need to bring manufacturing to Michigan, be competitive with South Carolina and Tennessee. The UAW on the East side of the state isn't helping.*
- Participant M: *We need to make sure we're set up for the right education, skillsets, and opportunities. Are we looking to much at automotive? We need to be thinking about the critical competencies we have as a state and evolving our skills. Automotive is key to Michigan's economy, but there are a lot of parallel paths – tourism, drone manufacturing, airport skills – where we could build new innovation hubs. What can we learn from other innovation hubs in other areas.*

Return to Table of Contents

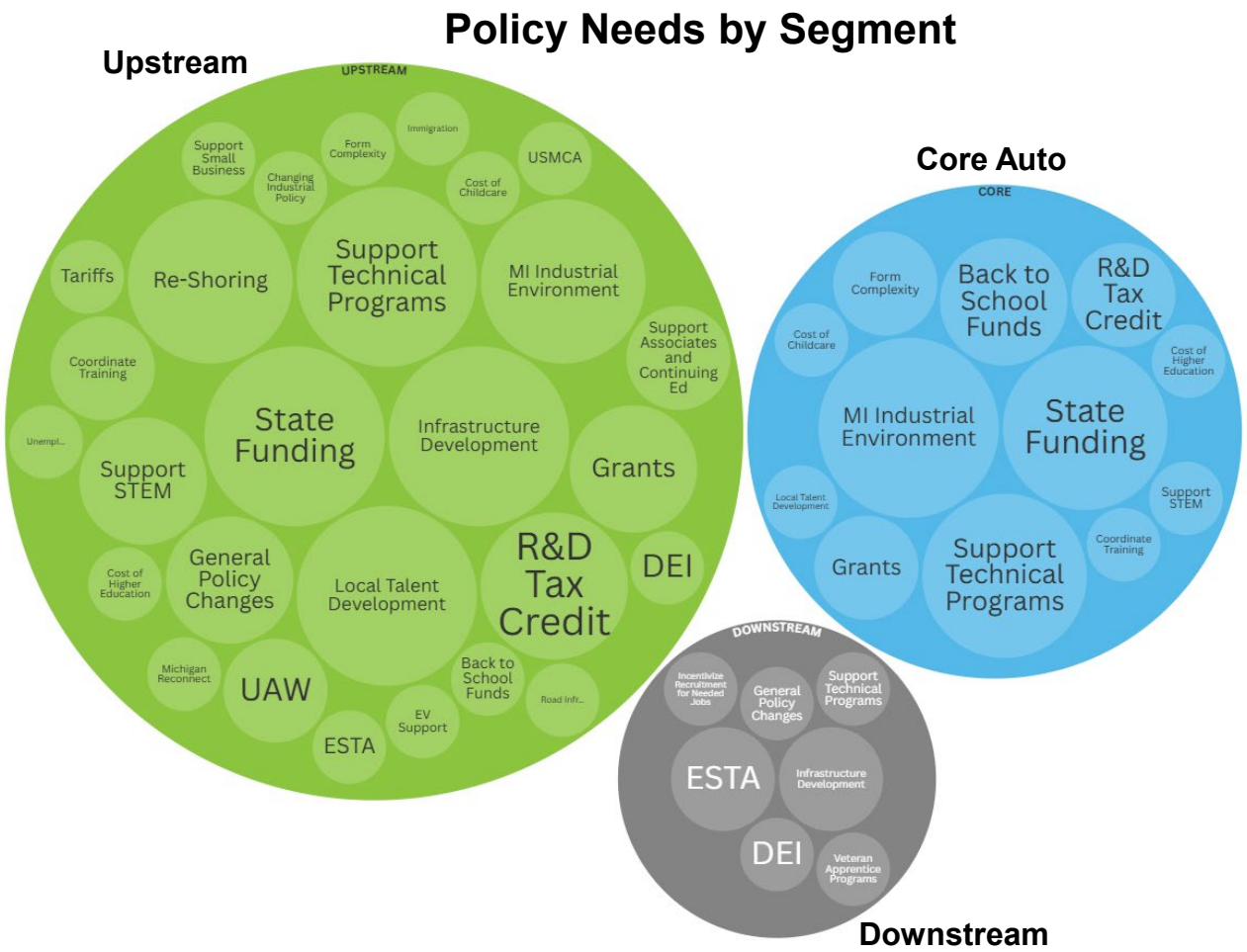
Michigan Automotive Workforce Needs Assessment

Policies Needed to support Businesses and Workers (4 of 6)

What workforce-related policies are needed to support workers and employers in the EV transition?

INTERVIEW RESPONSES

Policy Needs by Segment



Policy Needs by Segment

Policies to support technical programs are needed across all segments.

Upstream policy needs

- Support for technical programs
- State funding
- Local talent development
- EV infrastructure development
- Re-shoring
- Policies to support Michigan's standing as an industrial and automotive center

Core Auto policy needs

- State funding
- Policies to support Michigan's standing as an industrial and automotive center
- Support for technical programs
- Funds to re-educate current workers

Downstream policy needs

- Loosening of ESTA policies
- EV Infrastructure development
- Return of DEI policies
- Support for technical programs
- Incentivize recruitment for jobs in demand
- Veteran apprenticeship programs

Return to Table of Contents

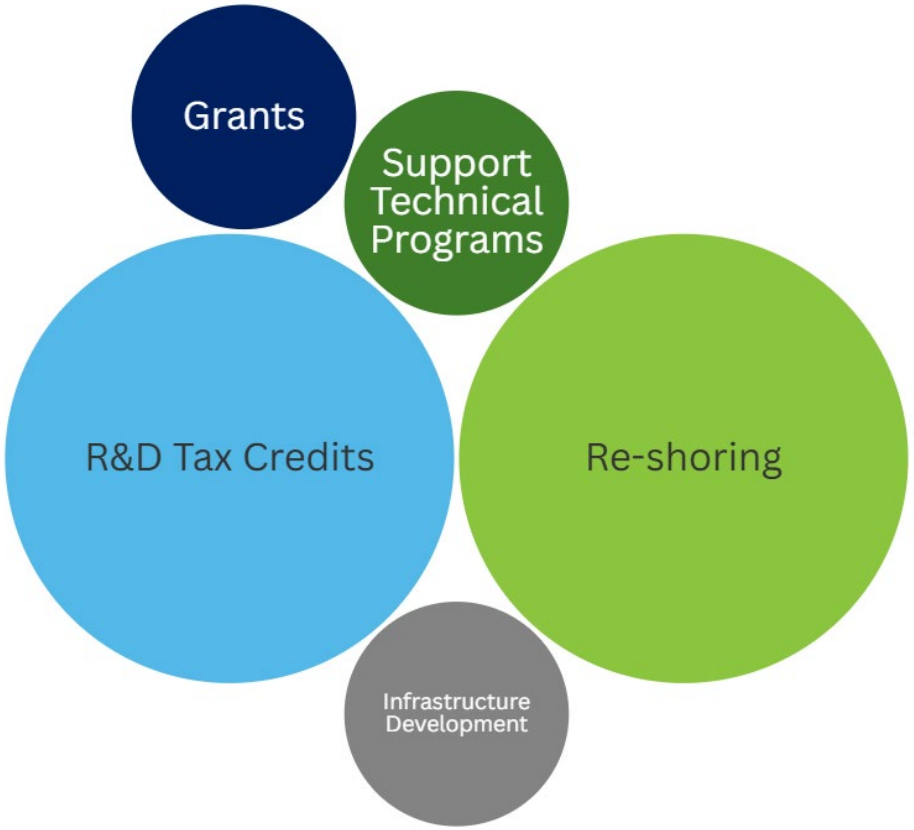
Michigan Automotive Workforce Needs Assessment

Policies Needed to support Businesses and Workers

What workforce-related policies are needed to support workers and employers in the EV transition?

INTERVIEW RESPONSES

All Businesses Current Policies Described Positively



All Businesses Current Policies Described Positively

The **R&D tax credit** and **Re-shoring policies** were the most frequently positively discussed current policies by employers.

Other policies employers felt positively about include

- EV infrastructure development
- Support for technical programs
- Grants

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Policies Needed to support Businesses and Workers (5 of 6)

What workforce-related policies are needed to support workers and employers in the EV transition?

All Businesses Current Policies Described Negatively

INTERVIEW RESPONSES

All Businesses Current Policies Described Negatively

The amount of policy changes happening and the **current amount of State support for EV infrastructure (participants wanted more support)** were described as the policy shifts **most negatively impacting employers.**

Other top policy-related challenges mentioned by employers include

- Tariffs
- Complexity of the forms used to access funding
- Cuts to GoingPro
- Cuts to other State funding
- Current amount of support for technical programs (participants wanted more)

Return to Table of Contents

Michigan Automotive Workforce Needs Assessment

Summary: Policies Needed (6 of 6)

Survey Summary

Policies needed to Support Businesses and Workers in Michigan

- **Across all businesses,** employers reported a variety of policy needs primarily focused on workforce, along with industry policy needs and other needs related to consumer EV incentives and EV infrastructure.
- **Workforce-related policies** emphasized need for training support in ADAS, basic job skills, battery and EV technicians, CNC machining, continuous improvement, electronics and high voltage skills, EV infrastructure maintenance, management and executive skills, lean manufacturing, mechatronics technicians, production technicians, and all skilled trades training at the high school level and beyond. Other workforce policy needs included combined policy and industry support for apprenticeships, industry-education alignment related to new vehicle technology, state grant fund increases, talent attraction for engineering, broader training grants, reduced red tape for policies, public assistance, sick leave, and immigration reform to increase workforce availability, regional talent collaborative support, and transferable credits between auto and adjacent industries..
- **Industry-focused policy needs** highlighted EV battery recycling, flexible incentives to support EV competitiveness, focus and investments for propulsion systems and other areas besides, EV tariff reduction for the industry, reshoring tax credits, support for R&D and pilots, and tax abatements.
- **Together, all businesses emphasized a need for workforce-related policies** that support industry-education and policy alignment, talent attraction, training across skilled trades, technician and engineering roles, increased workforce grants, and policies that boost workforce availability.
- While businesses largely focused on policies that support workforce needs, they also brought up areas to support business competitiveness in both the EV and other propulsion systems, along with economic support in response to current tariff, taxes, and reshoring concerns.

Interview Summary

Policies needed to Support Businesses and Workers in Michigan

- **Employers reported diverse policy needs, but most frequently described a need for support of technical programs, state funding, policies to support Michigan's standing as an industrial and automotive center, and EV infrastructure development.**
- When describing their need for policies to **support technical programs**, employers requested policies to support the coordination of education curricula with industry needs, particularly around teaching STEM and technician skills, as well as policies to aid in retaining students in Michigan after graduation.
- Employers reported making use of and desiring more **state funding** and were concerned about recent cuts to state funding, particularly the GoingPro program.
- Businesses also reported needing policies to support the **development of EV infrastructure**, noting that the lack of this infrastructure is a barrier to further EV adoption as well as a safety concern for those working on testing, repairing, or maintaining EVs. Participants requested more formalized EV safety standards and training.
- Employers also reported needing policies to **support Michigan's standing as an industrial and automotive center.**

Current Policy Impacts

- **In addition to describing policies participants would find helpful, participants also discussed how they are being impacted by current policies.**
- Employers were positively impacted by re-shoring policies and the R&D tax credit.
- Employers were negatively impacted by the current speed with which policies are changing, state funding cuts, the lack of policies to support EV infrastructure development, tariffs, and the complexity of the forms used to access funding.

Return to Table of Contents

About the Authors

The Center for Automotive Research (CAR) is an independent, non-profit organization conducting industry-driven research and analysis. Focusing on critical areas like Energy & Sustainability, Technology, and Labor, Economics, and Policy, CAR has been a trusted resource for the automotive industry for over twenty years.

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