MICHIGAN ECONOMIC DEVELOPMENT CORPORATION

The New Foundations of Defense Competitiveness

As the mission evolves, this is what U.S. defense and aerospace leaders need to compete

Insights from a national industry survey, and how Michigan's industrial environment aligns with the priorities shaping the future of defense and aerospace.

Preface

This report was produced in collaboration with the Michigan Economic Development Corporation (MEDC). In preparation, a survey was conducted of senior U.S. leaders in defense and aerospace, manufacturing, engineering, supply chain, and logistics. To better understand these responses, defense and aerospace manufacturing executives, innovation and R&D professionals, and key defense players were interviewed.

The interview subjects include:

John T. Gutierrez	Colonel, U.S. Marine Corps (Ret.), executive director of the Michigan Office of Defense and Aerospace Innovation (ODAI)
Bill Rapp	Global strategic sourcing manager for supply chain management at General Dynamics Land Systems, a global defense contractor specializing in the design, engineering, manufacturing, and support of tracked and wheeled military vehicles
Matthew Warnick	CEO of American Rheinmetall, a company that specializes in advanced combat vehicles, weapons, ammunition, and robotic systems
Colleen Hau	Managing director at Newlab, a Detroit innovation hub and venture platform
Erin Strang	President and CEO of the Central Michigan University Research Corporation, a nonprofit organization and business accelerator that fosters technology-based businesses and regional economic growth

About the survey

This report is based on a survey conducted in December 2025.

The survey sample consists of 150 manufacturing executives from across the United States, with 51% working directly in defense and aerospace, 38% in manufacturing and industrial products, and 11% in engineering or supply chain logistics.

All respondents hold senior roles: 34% are executives or C-levels, 30% are VPs or department heads, 21% are senior managers, and 15% are directors. Nineteen percent work at companies employing less than 250 people, 30% between 250-999, and 16% employing between 1,000 and 4,999. The remainder (14%) work within companies employing over 5,000 individuals.

Executive Summary

As the Department of Defense increasingly looks to states as active partners in national security, regions are being evaluated not only by their individual assets but also on how effectively their systems work together.

Through original research and a survey of senior defense and aerospace leaders, supported by subject matter expertise, this analysis examines four interdependent pillars that shape the competitiveness of the defense and aerospace sector and are increasingly prioritized in decisions on where to invest and scale operations: **workforce development, infrastructure, advanced manufacturing and supply chain, and innovation**. The survey captures perspectives from leaders across company sizes and roles, with respondents spanning both defense-specific and adjacent commercial sectors.

Across all pillars, the findings support one conclusion: ecosystem-level readiness now matters as much as any individual advantage. Weaknesses in one area can undermine strength in another.

To show how these dynamics align in practice, this white paper uses a reference example in Michigan, where the state's manufacturing DNA, workforce and research institutions, testing environments, and collaborative approach show how such coordinated ecosystems can support defense and aerospace needs with adaptability. Michigan offers a practical example of how system-level alignment is increasingly shaping defense and aerospace competitiveness.

Three core themes surface:

Access to workforce is proving to be a constraint, with 90% of respondents reporting recruiting difficulties, highlighting the strategic importance of long-term talent strategies.

Resilience has overtaken efficiency in supply chain localization and reshoring, which nearly all respondents are preparing for.

Innovation is increasingly judged by its ability to move from concept to capability.

The U.S. defense and aerospace industry is at an inflection point

The Department of Defense no longer views states as passive defense participants. It expects proactive partners. But strategic competition, supply chain pressure, and technological change have exposed vulnerabilities in the national industrial base that can only be closed by evaluating regions holistically, considering not just their individual assets but their overall ecosystem capabilities. To understand how regions can more effectively support defense and aerospace, this report examines sector needs through four interdependent pillars:

1 Workforce Development

2 Infrastructure

3 Advanced Manufacturing

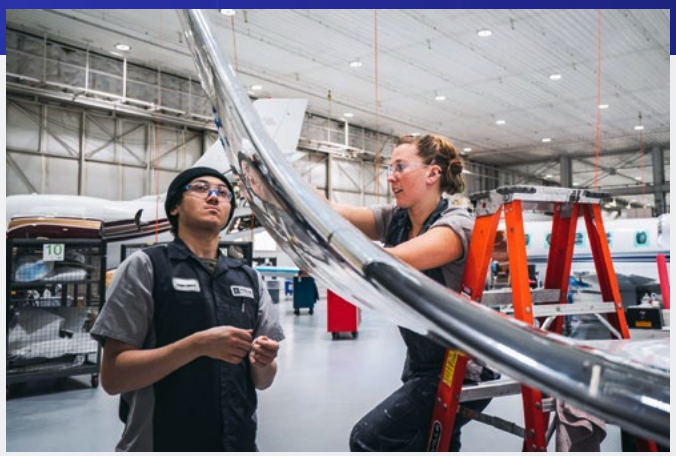
4 Innovation

These pillars reflect leadership priorities when evaluating locations. Each section explores the challenges and opportunities shaping that pillar, supported by original survey insights and additional subject-matter expertise.

To contextualize this analysis, this report uses Michigan as a reference example, showing how the state has brought both assets and partnerships together with its underlying manufacturing DNA to align with industry demands.

01

Workforce Development



Neither defense nor aerospace is immune to a challenge facing general U.S. manufacturing: sourcing a skilled workforce. Deloitte predicts that half of open commercial manufacturing jobs, about 1.9 million, could remain unfilled by 2033 if skills and applicant gaps aren't addressed.[1]

Bill Rapp, global strategic sourcing manager for supply chain management at General Dynamics Land Systems, believes these concerns are even more acute for defense and aerospace industries, where the high demand for specialized trades makes access and costs a major constraint. **"The skilled labor workforce is a vulnerability,"** he said.

"Shortages in essential areas like welding, machining, and foundry create significant challenges for defense manufacturers."

The survey findings agree. 9 in 10 respondents reported difficulty recruiting for their current needs, with talent availability as one of the most widely shared challenges. Labor and production costs were identified by 89% as critical to site selection decisions. Workforce considerations were the single most influential factor in new location choices (43%). Overall, 41% of respondents — and 51% among larger organizations — indicated that labor constraints could drive relocation.

1 "Skills, applicant gaps threaten US manufacturing growth."

Factors which influence new location choices by defense manufacturers:

43%
Workforce availability

39%
Security and compliance requirements

36%
Cost of operations

35%
Access to capital, financing, or incentives

31%
Infrastructure and connectivity constraints

31%
Regulatory and permitting challenges

30%
Supply chain gaps

28%
Limited testing or airspace access

26%
Utility capacity and reliability

25%
Political or policy uncertainty

1%
Other

Defense-specific requirements intensify these challenges. **"A defense-ready workforce is one that is technically skilled, security-cleared or clearable, digitally fluent, and trained in the manufacturing and engineering disciplines that underpin many of our modern dependent systems,"** said Col. John T. Gutierrez, U.S. Marine Corps (Ret.), executive director of the Michigan Office of Defense and Aerospace Innovation (ODAI). **"It's also a workforce that understands compliance, quality, and mission impact."**

Gutierrez described the most pressing challenges as demographic decline in the skilled trades, a loss of mid-career technical talent, insufficient cybersecurity and digital engineering skills, and competition with commercial sectors for the same workers, amplified by security clearance bottlenecks. This can limit the effectiveness of traditional labor retention efforts, such as wage competition, and places a greater emphasis on cultivating internal talent from trusted ecosystems.

Across sectors, there is difficulty filling advanced manufacturing (50%) and AI (51%) roles, with pressures even more pronounced for defense and aerospace, where regulatory and security requirements further narrow the pool of eligible candidates.

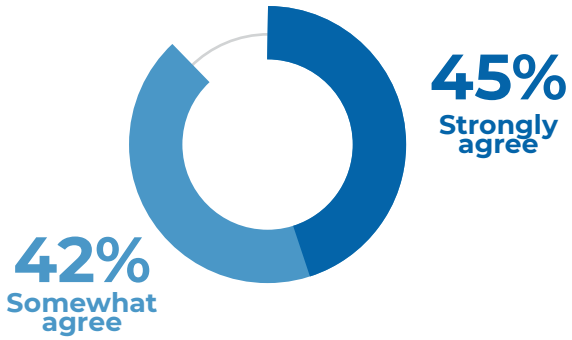
Michigan offers a strong example of how the right talent environment can meet these workforce challenges. Michigan's long history of manufacturing has produced a concentration of engineers and skilled tradespeople alongside established partnerships between enterprise and educational institutions. Matthew Warnick, CEO of American Rheinmetall, said that Michigan's automotive heritage had created a workforce whose skills could transfer between industries, citing, for example, a group of software engineers with infotainment experience shifting into production of user interfaces for command and control platforms.

"Michigan benefits from a skilled workforce and strong academic base to pull new workers from," Warnick explained.

His experience aligned with the wider survey results, which indicated that automotive and mobility expertise was important to 87% of respondents for advancing defense innovation, and innovation clusters were important to 88%.

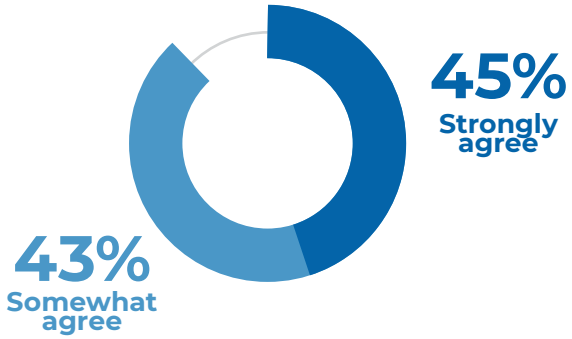
87% agree

Proximity to automotive/mobility expertise is important for advancing defense innovation



88% agree

Regional innovation corridors (where R&D, manufacturing and testing are co-located) are critically important to our business strategy



Future skills

Respondents see these same core skills remaining constrained over the next decade, with advanced manufacturing at 41% and AI at 37%. Workforce planning increasingly requires balancing immediate hiring needs with long-term talent development, as projected skill gaps extend well beyond current demand.

Cybersecurity was another concern, with twice as many defense sector organizations reporting recruiting difficulties vs. other sectors (62% vs. 32%), joining advanced manufacturing as a defense-specific priority. Emerging technologies aren't so much reducing labor dependence as reshaping the expertise and labor needed.

Difficulty recruiting and retaining talent by skill area

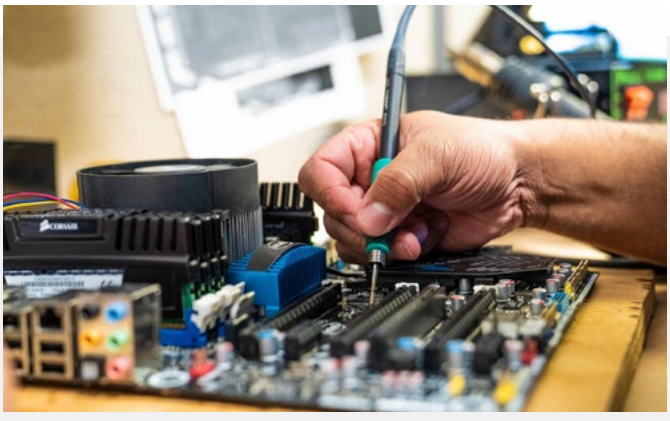
Artificial intelligence / machine learning (AI/ML)	6%	14%	29%	37%	13%
Advanced manufacturing (automation, CNC, robotics)	6%	11%	33%	37%	13%
Engineering (e.g., aerospace, mechanical, electrical, systems)	8%	20%	24%	38%	10%
Cybersecurity	7%	15%	31%	32%	15%
Skilled trades (e.g., welding, machining, maintenance)	9%	16%	33%	33%	9%

"Non-traditional pipelines, such as skilled trades, veterans, and career switchers, are not only helpful. They're essential to sustaining industrial capacity."

— John T. Gutierrez, executive director of the Michigan Office of Defense and Aerospace Innovation

Recruitment difficulty for defense / aerospace vs. other sectors

Skill Area		
Cybersecurity	62%	32%
Artificial intelligence / machine learning (AI/ML)	58%	42%
Advanced manufacturing (automation, CNC, robotics)	58%	41%
Engineering (e.g., aerospace, mechanical, electrical, systems)	51%	45%
Skilled trades (e.g., welding, machining, maintenance)	49%	36%



Erin Strang, president and CEO of the Central Michigan University Research Corporation, described a generational divide within the workforce, in which younger workers raised with technology found it difficult to connect with leadership. "We need to establish how to best work together to understand and enhance each other's capabilities," Strang said.

Workforce ecosystems like Michigan's, which support both immediate needs and long-term talent development, are now critically important to support defense and aerospace needs.

Training pipelines for resilience

"Non-traditional pipelines, such as skilled trades, veterans, and career switchers, are not only helpful," said Gutierrez. **"They're essential to sustaining industrial capacity."**

Forty-one percent of respondents said that workforce could drive relocation, which marks a shift in how defense and aerospace organizations evaluate opportunity. Facilities, equipment, and technology may not be easy or quick to deploy in any traditional sense, but they cannot deliver value without the right workforce. When regions can show credible, sustainable workforces and pipelines, they are better positioned as strategic partners than locations whose primary advantage is lower cost.

"There are two ways to go: organically building talent or buying existing capability," said Warnick. **"We chose to vertically integrate."** American Rheinmetall made this choice to help control all the constraints in the supply chain, handling apprenticeships and development in-house, and partnering with academic universities and local trade schools for a conduit to future talent. **"There's a competitive advantage, both in the ability to deliver and in terms of pricing. We have cross-pollination and capability that can immediately be brought to bear."**

Established collaborations help align curricula with real-world requirements, reducing friction between training and employment. While similar models exist in other states, Michigan's scale and density clearly show how workforce ecosystems can be structured to support both immediate hiring needs and long-term talent development.

"This is why states like Michigan must act now," said Gutierrez. **"That means expanding apprenticeship programs, accelerating veteran hiring pathways, investing in mid-career reskilling and aligning community colleges and universities around defense-relevant curricula."**

The Michigan Maritime Manufacturing (M3) Initiative further illustrates how states can build the long-term workforce pipelines that defense and aerospace leaders say they need. Announced in 2024, the more than $50 million initiative is designed to train workers in critical skills such as maritime welding and machining through Michigan's community colleges. With more than 166,000 defense-related jobs and a deep manufacturing heritage, Michigan is leveraging its educational institutions, veteran population, and industrial base to meet the U.S. Navy's growing workforce demands while strengthening the broader defense industrial ecosystem across the Great Lakes region.

02

Infrastructure

A skilled workforce is essential, but it also needs modern infrastructure to support testing and collaboration. The overlap between infrastructure and innovation was also particularly pronounced in the survey data, where the dual importance of modern regional infrastructure (52%) and access to research institutions (45%) surfaced. AI-enabled testing ranges were given even more prominence (57%) by respondents.

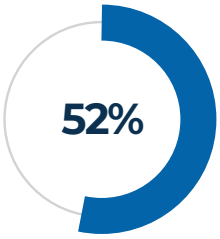
This shows how innovation does not happen in isolation from physical systems, although this report analyzes them separately for ease.

"Defense readiness is a system-level challenge," said Gutierrez, **"and states are the connective tissue that bind together suppliers, infrastructure, workforce, research institutions and testing environments."** A state that is defense-ready can offer something that no single company can: a coherent, integrated industrial ecosystem capable of supporting missions from ideation through production.

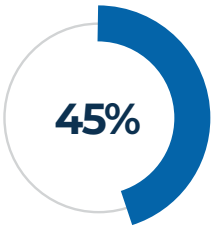
Without infrastructure that supports these needs, however, innovation efforts risk stalling at the pilot or migrating to environments better equipped to support scale, especially as technology like AI-enabled systems matures.

The regions that invest in testing facilities are those best positioned to serve as long-term partners in defense and aerospace ecosystems. As Strang said, **"The last thing you want to do is put a technology in the hands of somebody on the front line and have it not work."**

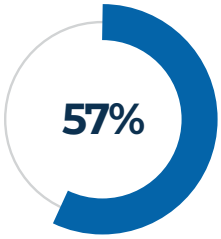
What infrastructure elements do respondents look for?



Modern regional infrastructure



Access to research institutions



AI-enabled testing ranges

Testing environments

Up to 45% of survey respondents see testing environments as a factor in long-term competitiveness. As Rapp noted, geographically distant or administratively constrained testing slows down iteration, pushing up costs, especially where products or systems need repeated validation under varied conditions.

"If you've got somebody that is 30 minutes down the road and our engineers can be at their facility immediately," said Rapp, **"that allows for a quick transition and reduces costs. Proximity is key. Having advanced manufacturing facilities within the state of Michigan, and also so close to our facilities and engineering staff, is critical."**

Multi-domain capabilities that can support testing over different conditions are essential to the Department of Defense. Four-season testing, in particular, allows organizations to test temperature, terrain, and weather variables, but can become dispersed over sites and even states, slowing innovation and development.

This must be further supported by secure facilities and ranges, modernized instrumentation and data systems, and a strong transportation and logistics network. More than three-quarters (77%) of respondents said that proximity to defense installations influenced their current location decisions. Proximity was also cited as important to innovation by 43% and as key to competitiveness by 42%, underscoring its importance.

The survey results also show that 42% of defense and aerospace respondents see on-base maker spaces as valuable for innovation. Secure, mission-adjacent environments are critical for hands-on development. Gutierrez praised Michigan's array of testing locations, mentioning the state's National All-Domain Warfighting Center, Camp Grayling, Selfridge Air National Guard Base, and the Great Lakes Maritime Domain.

"This allows Michigan to support land, air, maritime, space, and cyber testing in one state, something that very few regions can compete with," Rapp said.

Defense and aerospace facilities are very expensive to build, maintain, and operate, and the associated costs can prevent many companies from accessing new customers or opportunities, creating a roadblock to developing solutions for national security problems.

"To address this shortfall, Michigan's ODAI is exploring partnerships with the Sensitive Compartmentalization Information Facility to study and secure space developers, establish lease options, and remove barriers to entry so local organizations can be even more competitive," said Gutierrez, noting it will further boost the state's ability to compete for classified contracts and program participation.

Paired with the state's unique public-private partnerships and evolving consortium-based coordination, this level of infrastructure support helps to further reduce friction across design, testing, and manufacturing, while still supporting current operational needs and future expansion.

> "Defense readiness is a system-level challenge, and states are the connective tissue that bind together suppliers, infrastructure, workforce, research institutions, and testing environments."
>
> — John T. Gutierrez, executive director of the Michigan Office of Defense and Aerospace Innovation (ODAI)

Site readiness and future capacity

Site readiness serves as a critical long-term viability signal for manufacturers, and Michigan has made it a strategic priority through initiatives like the MI Sites program. By proactively identifying and developing sites with necessary utilities, appropriate zoning, transportation access, and capacity for expansion, the state helps reduce time-to-deployment while preserving flexibility for future growth. Programs such as MI Sites focus on preparing and certifying locations to meet the needs of complex, large-scale projects, enabling companies to move quickly from site selection to operation.

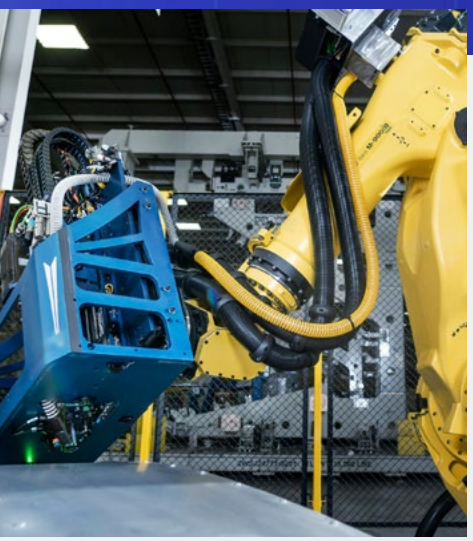
Energy and digital capacity remain central to modern defense and aerospace systems, requiring reliable power, resilient grids, and secure connectivity. Michigan's site readiness efforts emphasize these capabilities, aligning infrastructure investments with the demands of advanced manufacturing and national security industries. When American Rheinmetall was seeking a location, Warnick noted that the company selected Michigan not only for its proximity to key logistics routes, including railheads, but also for the state's commitment to development-ready sites that support rapid deployment and long-term scalability.

For many defense manufacturers, this kind of integrated assessment is now standard, especially as advanced manufacturing becomes the heart of the defense and aerospace industry.

> **"If you've got somebody that is 30 minutes down the road and our engineers can be at their facility immediately, that allows for a quick transition and reduces costs."**
>
> **— Bill Rapp, global strategic sourcing manager for supply chain management at General Dynamics Land Systems**

03

Advanced Manufacturing



"If your car breaks down, you're having a bad day. If an armored vehicle breaks down in combat, it's life or death," said Rapp, highlighting the importance manufacturers play in defense and aerospace.

Until recently, U.S. manufacturing strategy focused on narrow optimization goals, improving efficiency at the cost of fragility that has been exposed by the pandemic and recent geopolitical events. Defense models have shifted to systems that can absorb shocks by design.

According to Gutierrez, **"Defense and aerospace supply chains require visibility into activity, risks, and performance at multiple levels. Defense supply chains are fundamentally different, because they must be resilient, secure, and surge capable, not just efficient."**

Supply chains built primarily for efficiency are ill-suited to face the sector's uncertainty. In their place, organizations are prioritizing manufacturing environments that combine physical capability, data-driven visibility, and the flexibility to respond

under pressure. Advanced manufacturing, in this sense, is less about adopting the latest technology and more about restoring balance between efficiency and resilience, a balance that will shape defense and aerospace supply chains for the decades ahead.

This is evident in the survey data. Nearly all respondents (98%) report that they are actively preparing for supply chain localization or reshoring, showing a reassessment of how and where production capacity should sit. Supply chain considerations were one of the leading potential factors influencing relocation decisions as well, beating out labor costs, incentives, and even proximity to customers.

Primary consideration in site selection

When asked where their supply chain investments deliver the greatest value, resilience was most cited (43%), even ahead of cost savings or throughput gains. Among larger organizations, it was 41%, showing that size and scale do not eliminate vulnerability.

Warnick added practical context, suggesting that over-consolidation and shrinking domestic industrial bases have created scaling constraints.

"We need more players, and we need new entrants to help competition," Warnick said. "We want partners that are flexible. Partners that you can work with, but who can adapt with program evolution."

He explained that over-consolidation can lead to failures in surge capacity, because the slack needed to respond quickly is missing. Resilience is the key to protecting our pathways to scale, even under stress, while wider supplier options prevent monopolies or duopolies that limit competition and sector effectiveness.

Gutierrez emphasized how civilian ecosystems matter to the defense and aerospace environment. "The United States has long relied on commercial industry to surge in times of crisis," Gutierrez said. "Michigan's automotive and advanced manufacturing sectors are a strong example."

Indeed, Michigan offers an example of how transferable production expertise, experience supporting complex and regulated supply chains, and a broad supplier base that meets defense and aerospace's low-volume, high-complexity needs can better support the sector.

Colleen Hau, managing director at Newlab, shared details about Connects, a database that connects stakeholders searching for specific capabilities or parts with Michigan-based manufacturers.

"With a localized supply chain," Hau said, "you can shorten your design cycles and iterations, and you can get to a commercialized product faster."

She has seen increased crossover between advanced manufacturing for defense and commercial applications, such as cooperation between Michigan's drone and automotive industries. Such overlap promotes faster commercialization through dual-use strategies. Michigan's success in this area provides further insight into the ecosystem approach now central to success — one used to operating under demanding quality and certification regimes and able to support transitions between commercial and defense production.

"With a localized supply chain, you can shorten your design cycles and iterations, and you can get to a commercialized product faster."

— Colleen Hau, managing director at Newlab

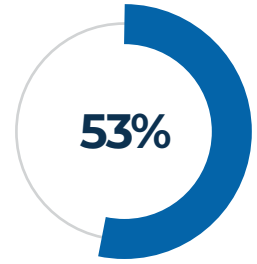
Localization and advanced manufacturing as a readiness requirement

The United States is currently in the midst of a localization and reshoring drive. Defense and aerospace supply chains, however, face unique constraints.

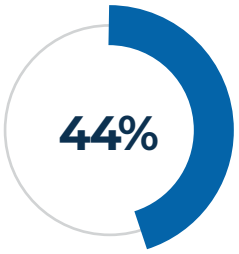
Gutierrez said, **"There's heavy compliance onboarding. Supplier intake processes demand extensive regulatory, security, and documentation checks, often driven by defense and export control or cybersecurity requirements."** The other consulted experts supported this, noting these primary constraints: federal security compliance and certification needs, long-cycle production, complex engineering and specialized materials, export controls, and secure production and data environment demands and safeguards.

All limit how quickly suppliers can be replaced or added. However, action is being taken: 53% of respondents are investing in supply chain technology, while 44% are expanding their U.S. production capacity.

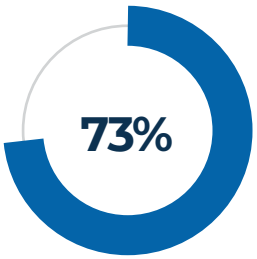
More than seven in ten respondents (73%) identified advanced manufacturing as a strategic asset to improve their competitiveness, reinforcing the link between production capability and strategic positioning. As Rapp said, **"It's key to any prime defense contractor's success. Advanced manufacturing significantly helps reduce developmental time, bringing products to market faster, getting them into the testing environment, and transitioning to the production arena."**



53% of respondents are investing in supply chain technology



44% of respondents are expanding their U.S. production capacity



73% of respondents identified advanced manufacturing as a strategic asset to improve competitiveness

Manufacturing specialization and readiness

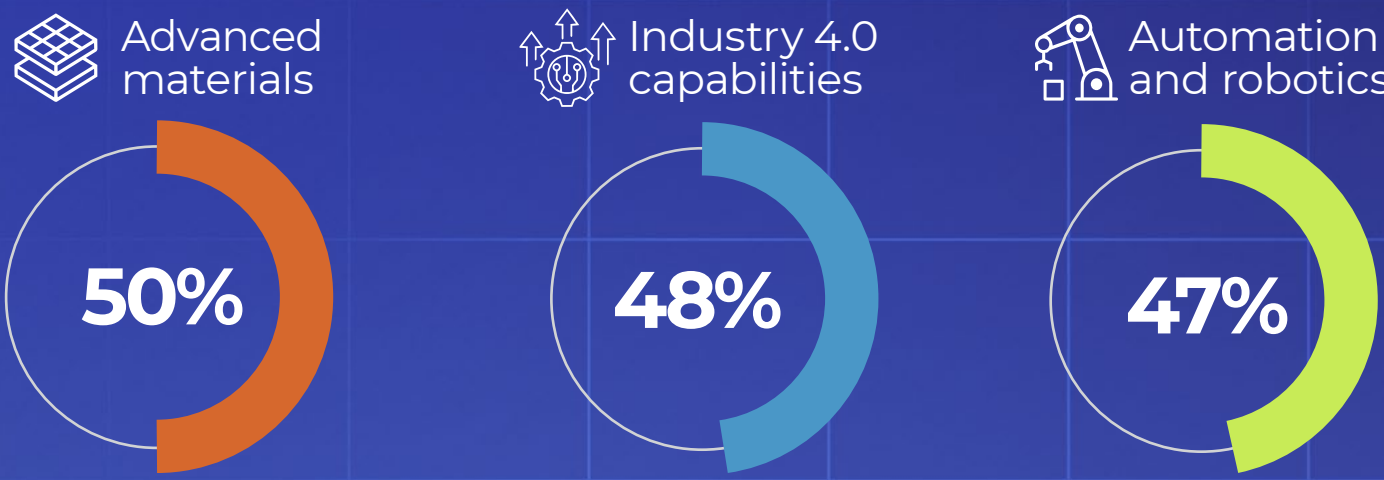
The survey data also showed which manufacturing capabilities organizations see as most critical for future success, with automation the priority for larger organizations: advanced materials (50%), industry 4.0 capabilities (48%), and automation and robotics (47%)

These capabilities cannot be developed in a vacuum. Advanced materials introduce sourcing and qualification challenges. Automation and digital tools can improve throughput and consistency, but only when supported by production environments that meet regulatory and security requirements. The challenge isn't adopting isolated capabilities, but rather integrating them into disruption-proof supply chains that keep quality and compliance.

Michigan's advanced manufacturing ecosystem demonstrates the depth and diversity of capabilities that defense and aerospace leaders increasingly depend on. General Dynamics Land Systems and BAE Systems anchor the state's ground vehicle production base with precision machining, digital engineering, and classified integration environments. American Rheinmetall leverages Michigan's automotive engineering heritage to accelerate prototyping for next-generation combat vehicles, while Williams International produces turbine engines in one of the nation's most advanced aerospace propulsion facilities and Moeller Aerospace adds further depth through five-axis machining, additive manufacturing, and advanced metrology for turbine components. These capabilities are reinforced by Newlab at Michigan Central, where companies access robotics, CNC machining, rapid prototyping, and autonomy testbeds that shorten development cycles and support dual-use innovation. Together, these assets illustrate how Michigan's industrial base is already delivering the secure, resilient, and technologically advanced manufacturing capacity that the defense and aerospace sectors require.

Hau said, **"I do think now is the moment. There are certain policies in place. There is a movement, and people are interested in re-industrialization."**

What manufacturing capabilities are most important for future success?



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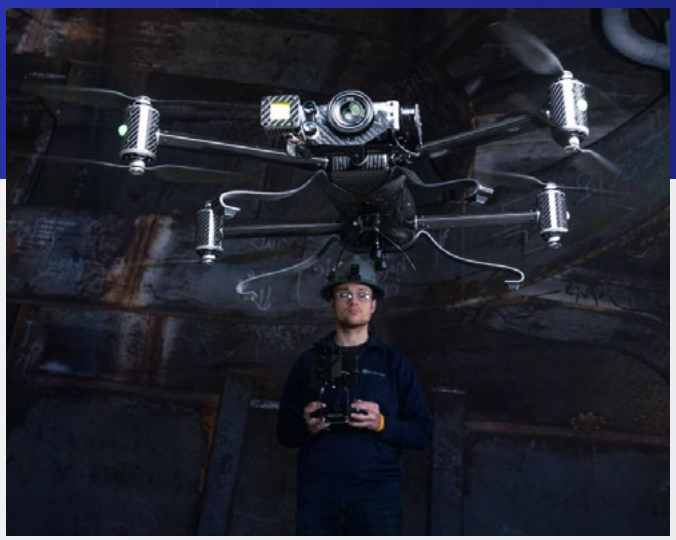
Innovation

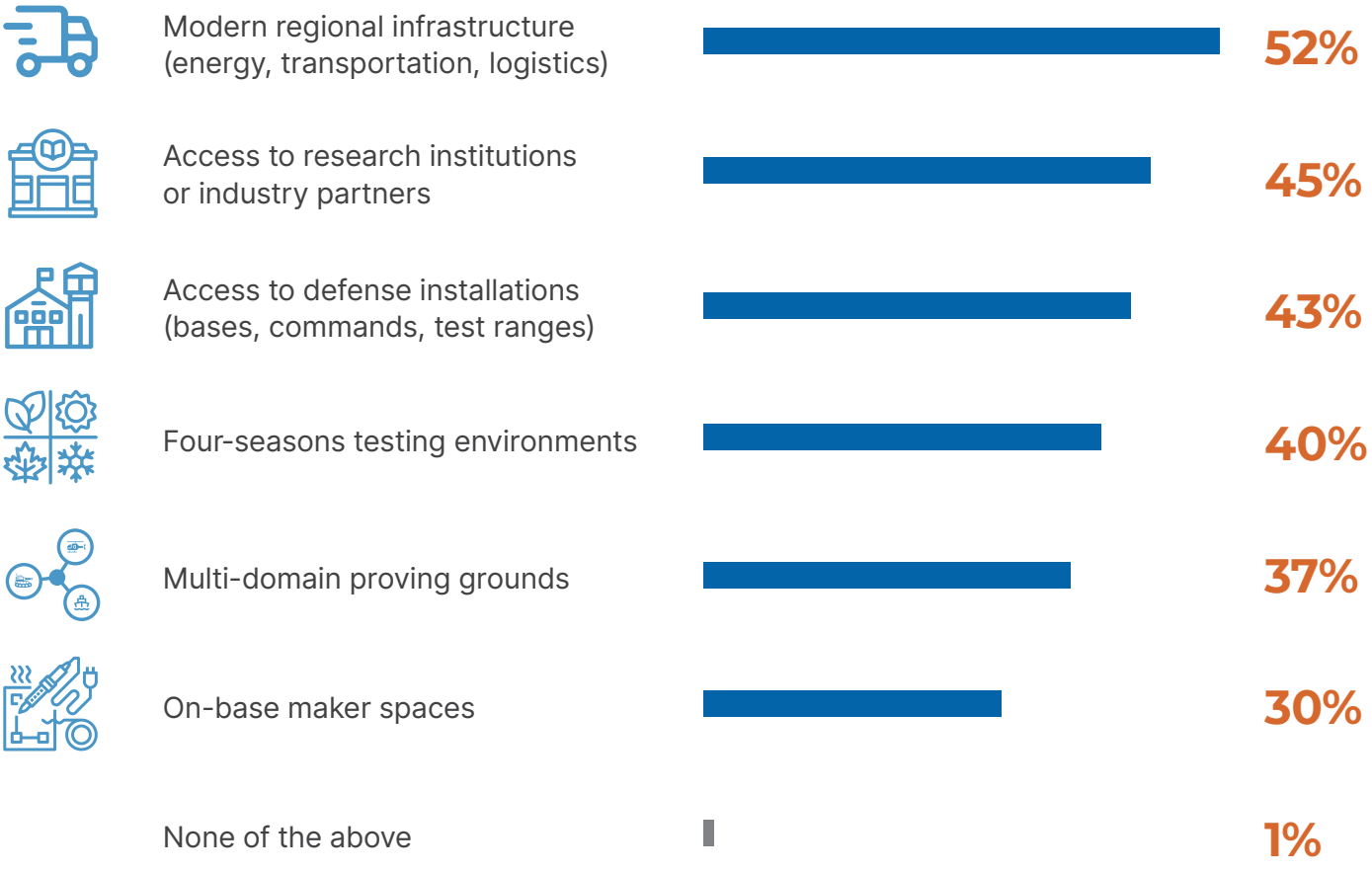


Innovation has always been a hallmark of both defense and aerospace, but the character of that innovation is changing, with new emphasis being given to applied research and development. Technological promise must translate into usable capability.

Survey findings reflected this shift toward practical innovation. Respondents consistently valued modern regional infrastructure (52%) and access to research institutions (45%) as among the most valuable contributors to innovation environments, pointing to the importance of coordinated partnerships and infrastructure.

Notably, access to applied R&D and university or industry research partnerships was ranked as important by 82% of the respondents when asked how they evaluate both innovation potential and site selection, with an additional 45% citing targeted upskilling and interest in maker spaces.

Most valuable factors for innovation environments



"When universities, industry, and military users collaborate early, they de-risk technology, accelerate validation, and shorten the pathway to adoption. Applied research partnerships are essential."

— John T. Gutierrez, executive director of the Michigan Office of Defense and Aerospace Innovation (ODAI)

Commercialization gaps

"The real challenge in advanced manufacturing is moving promising prototypes to reliable, scaled production that meets stringent defense specifications," said Rapp. "Production requirements are very rigid."

Strang agreed. "We see a challenge there all the time, called the Valley of Death, or TRL (technology readiness level) cliff. Most projects stall from TRLs four to six because lab validation is successful, but field validation needs money, integration, and risk tolerance, and that needs funding. Securing that can dilute ownership and accountability."

Ecosystem-level support structures matter, both to simplify this entrance into defense spheres and to democratize access to testing and facilities. As many as 90% of survey respondents indicated that such programs have value in helping civilian manufacturers enter defense supply chains, while 89% say state-level government programs offer real competitive advantages.

"Some of my smaller Michigan suppliers, which have grown over the years, relied on those programs," said Rapp, "to obtain necessary loans for additions and facility expansion to make them more efficient and effective."

Dual-use innovation: the defense and aerospace bridge

Dual-use innovation acts as another bridge between commercial markets and defense applications, with 83% of respondents seeing dual-use innovation bridges as critical to both site selection and growth.

When technologies are made viable across sectors, it reduces reliance on single-customer demand. Hau said, "The Department of Defense itself wants companies that have a diversified portfolio, that are thinking of dual use, so as defense spending fluctuates, these companies can thrive and survive." For the Department, dual-use innovation means faster adoption, lower cost, and access to a broader industrial base. And for individual states, it means job creation, investment attraction, and resilience.

"The engine in our platform is a commercial dual-use item," said Warnick. "We made that decision on purpose because then you can scale. When we look at developing a new product, we take into consideration commercial applications, to keep developments at the speed of the commercial market."

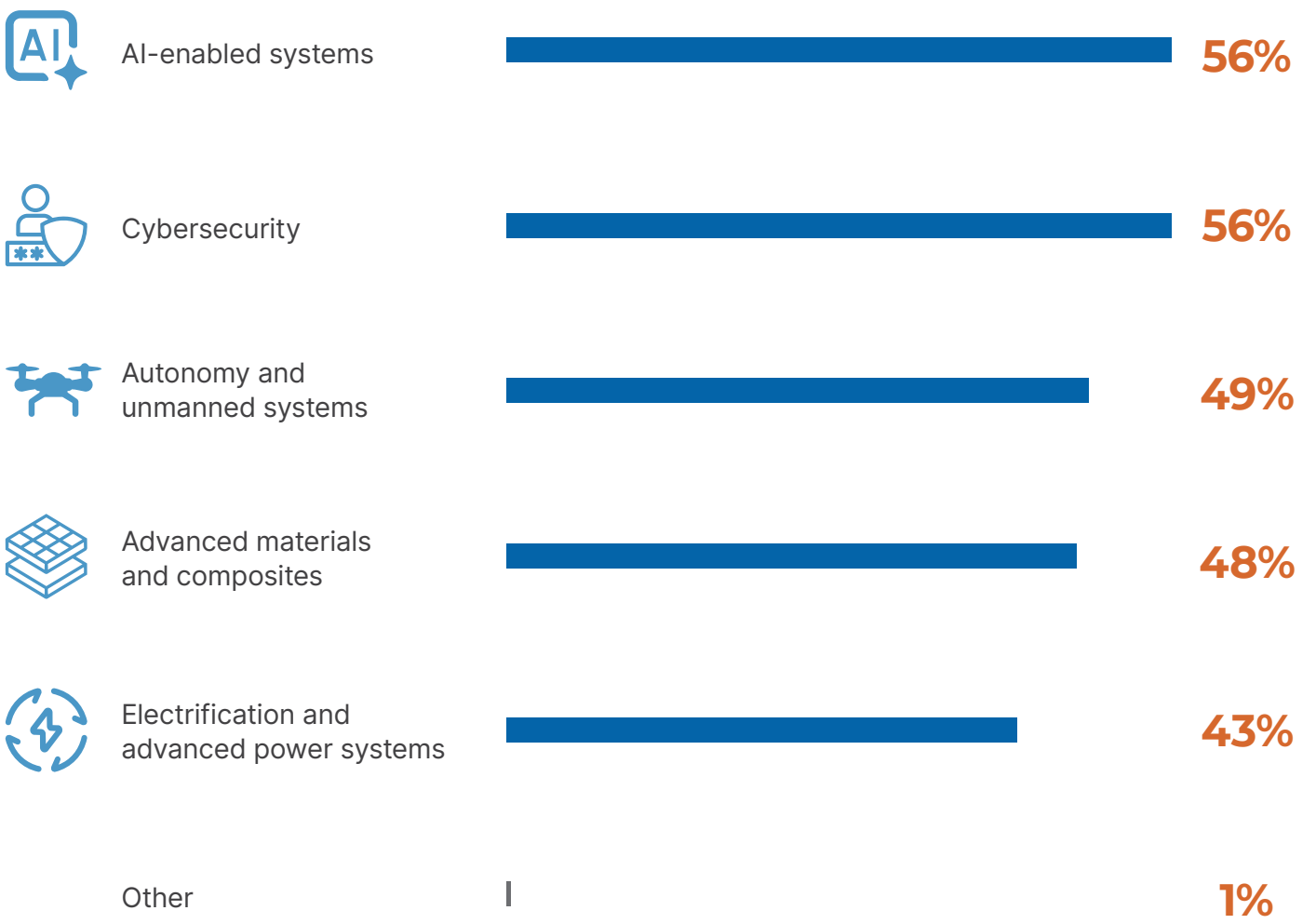
Michigan's Space Innovation Hub will help accelerate space-related technologies across defense, commercial, and dual-use markets. Building on the ODAI Space Sector Plan, the Hub will be a focal point for advancing capabilities in space research, while also supporting the manufacturing that underpins Michigan's space economy. By serving as a statewide center for business activity, the Hub will provide access to training, mentorship, market navigation, and connections to federal, state, and private programs. It will also help innovators translate research into deployable products by offering business development services, road-mapping support, and talent-attraction tools. Together, these efforts will allow Michigan to convert its research heritage and industrial capacity into space-driven opportunities that align with national security needs and commercial market growth.

AI as an innovation accelerant and constraint

Automation and AI now have a central role in any defense and aerospace innovation conversation. Survey respondents identified AI-enabled systems and cybersecurity as the fastest-growing technology areas in the sector, tying at 56%. It's not just shaping development, Warnick noted, but also how organizations manage their data and decision processes.

"It's hard to start internally without people who are developed externally from your organization," Warnick said. "A university has the ability to move more quickly with tools and tool sets, matching the speed with which innovation takes place."

Fastest growing technological areas for the defense and aerospace sector



Innovation must be a system, not a silo

As with the other pillars, innovation is only possible when approached as a whole. Applied R&D, dual-use paths, AI development, and commercialization are interdependent and so need coordinated support. Individual manufacturers play an important role but cannot be the only drivers. When research institutions, industry partners, testing infrastructure, and workforce development are all coordinated at a broader ecosystem level, the risk of promising technologies stalling is significantly reduced. For competitive readiness, the whole ecosystem must support applied, defense-relevant innovation.

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— Matthew Warnick, CEO of American Rheinmetall

Spotlight:

Michigan's defense and innovation ecosystem

Thanks to a mobilization of both public and private sectors, along with military and educational institutions, Michigan offers one of the nation's largest defense supplier networks. The state has over **4,000 defense-aligned companies,**[2] more than **900 aerospace suppliers,**[3] around **300 maritime suppliers**, and an **emerging space sector**. It is also home to the U.S. Army's Tank Automotive and Armaments Command (TACOM), and the Ground Vehicle System Center (GVSC). Coordinated by the Michigan Strategic Plan for Defense and Aerospace and guided by a uniquely collaborative statewide strategy, the state is a strong test case for how the needs of the defense and aerospace sector can be met through state-level ecosystems.

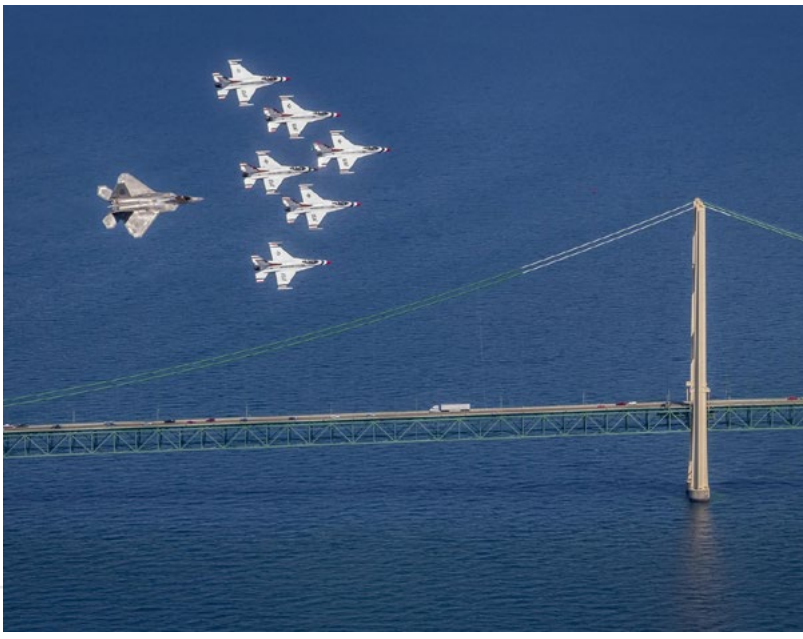
To foster this system of innovation, Michigan has established "SmartZones," where tech firms, entrepreneurs, and researchers work in close proximity and as part of a state-wide network. These collaborative spaces help prepare entrepreneurs and university faculty for commercialization across specific fields, including defense and aerospace.

Their efforts are further supported by the Office of Defense and Aerospace Innovation (ODAI), which prioritizes fostering business growth across the sector, amplifying Michigan's unique advantages, and advancing innovation through such partnerships, platforms, and policy environments. They work to catalyze growth within the statewide defense and aerospace sector, advancing industrial capacity, innovation, and research. The office offers the state continuity of strategy and stability, even during times of political transition.

Hau notes that the ODAI and collaborative entities, including the MEDC and Newlab, also offer practical guidance and education, as well as connections on aspects such as certification and funding access, that new entrants often lack. Together, they help new entrants better understand their opportunities and how to focus on Department of Defense priorities. Once a market fit is found, they help create the connections to move projects forward.

Michigan's National Security Consortium, which has secured the cooperation of eight local universities, promotes research directly tied to needs identified by the Department of Defense. Their goal is to further align Michigan's academic resources to help solve national security problems.

"When universities, industry and military users collaborate early," said Gutierrez, "they de-risk technology, accelerate validation, and shorten the pathway to adoption. Applied research partnerships are essential."



2 "Major industries: defense and aerospace."
3 "Focus industry: aerospace."

Conclusion

The question for defense and aerospace business leaders is not simply where to invest today, but which environments will support their sustained capability over time. This survey confirms that competitiveness is increasingly defined by ecosystem-level readiness and support, not isolated strengths. Resilience is now just as important as raw efficiency. Individual facilities are still critical, but to thrive, they need to be part of an ecosystem that supports talent, infrastructure, production capability, and innovation pathways as a coherent, "big picture" whole. There is no other way to limit friction between designing, testing, manufacturing, and deployment.

Workforce strategies have moved past mechanical hiring to fostering long-term talent development. Infrastructure is no longer a background thought, but an asset that shapes where and how capability can be developed or scaled. Supply chains are being redesigned to meet localization and reshoring drives, without neglecting surge capacity, and innovation demands application, validation, and commercialization, rather than leaving individual organizations stalled between prototype and production.

Michigan illustrates how such alignment can take shape in practice. The state's established manufacturing base supports production for regulated environments, with a deep commercial manufacturing heritage that offers both transitional skills and dual-use pathway potential.

Key takeaways:

1 **Ecosystem over individual**

Competitiveness is now defined by the strength of the entire regional network, not isolated assets.

2 **Resilience is the priority**

Security is more important than pure cost efficiency, making localization and reshoring key concerns.

3 **Workforce as strategic infrastructure**

Long-term talent development is no longer optional; it is a critical deciding factor for industry site selection.

4 **Applied innovation**

Success requires closing the gap between prototype and production through dual-use pathways and applied R&D.

Local research institutions, incubators, and consortium-based models bridge the needs of applied R&D and commercialization with defense rigor and compliance, while testing environments and site-ready infrastructure support rapid iteration and validation, with direct pipelines to the defense personnel who will use these innovations. And the state's workforce is bolstered by both leading educational institutions and deeply-ingrained manufacturing heritage, providing the backbone needed for success.

Beyond individual factors, what differentiates Michigan's ecosystem is the degree of coordination between stakeholders, from the industry and government to the educators and research facilities that support their efforts and their ability to evolve as mission requirements do. It's an environment shaped not by single advantages, but all-around adaptability and supportive versatility.

For a sector with long timelines, high stakes, and little margin for error, readiness doesn't just happen. It must be systematically built, piece by piece, to ensure national security.

As Gutierrez said, **"The future of American defense manufacturing will belong to the states that can integrate innovation, industrial capacity, and workforce readiness into a single coherent strategy."** The regions and the organizations that recognize that reality and plan accordingly will be those who best compete, adapt, and deliver in the new defense and aerospace environment that lies ahead.

The Michigan Economic Development Corporation's (MEDC) role is not to prescribe outcomes. Rather, it is to connect organizations to the infrastructure, talent, and partnerships they need to operate effectively. For decision-makers evaluating future potential, engaging early with the ecosystem surrounding the sector in each state offers critical insight into how readiness is being built and supported and, of course, where it can be strengthened. The MEDC and Michigan's Office of Defense and Aerospace Innovation stand ready to support those looking to further explore Michigan's defense and aerospace potential.

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