



MxD Strategic Investment Plan Feedback Survey

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SIP Strategy Survey Goals:

- Provides project prioritization targets for MxD
- Aligns our project portfolio to the needs of the Gov't/DIB
- Aligns our project portfolio with investment direction of the Ecosystem
- Highlights potential gaps
- Provides new project ideas

SIP Strategy Feedback Surveys:

Cybersecurity Survey

Supply Chain Survey

Digital Engineering Survey

Future Factory Survey

SIP Strategy Instructions:

- Each survey provides a brief description of a project
- Can be cascaded through your organization to capture opinions from varied groups
- Rank project alignment with organizational needs
- Rank project urgency
- “Other” option is available to provide feedback on the project
 - Technology interest but application is not in alignment
 - Interested in output but not so much the project
- At the end of each section optional text box to provide overall feedback or new project ideas on the project portfolio

2023 SIP Refresh Timeline

- **September 29** | Q3 EC Meeting – Review Project Prioritization & Investment Strategy Discussion
- **October 14** | SIP Feedback sessions conclude
- **November** | Draft SIP Refresh Release for Comment
- **November 16** | Q4 TAC Meeting – Prep for 2023
- **December** | Q4 EC Meeting – SIP Refresh Approval
- **January 2023** | 2023 SIP Refresh Released

MxD Project Focus

MxD projects focus on the biggest pain points experienced in manufacturing:

- **Workforce and Workforce Skills:** Development of workers and augmentation to the workforce
- **Change Management:** Providing organizations with knowledge before a major undertaking to equip the organization prior to investment.
- **Change Implementation:** Using technology to minimize disruptions following a change in process/technology/etc.
- **Supply Chain:** Using digital technologies to inform an organization of its supply chain and potential disruptions
- **Digital Thread Integration:** Applying digital technologies to advance information on products throughout the supply chain and product lifecycle.
- **Connectivity:** Exploring existing and new protocols in data and information transfer. This includes system and data interoperability
- **Security:** Includes information and operational technology frameworks, also extends to security challenges for workplace safety and assurance.

MxD Technology Roadmap – Design

ID#	Program Name	2022				2023				2024			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
21-01	AI design advisor												
21-30	Digital data management for transcribing structural part performance across manufacturing platforms												
22-01	Technical data as a service												
22-05	Digital twin of product sustainment phase												
22-09	2022 design project - virtual verification, validation, and certification												
PP-079	Rapid innovation with digital technologies												
22-02	Model-based-enterprise readiness index and maturity model upgrade and harmonization												
PP-076	Virtual cradle to grave design environment												
PP-080	Design for sustainability in products and supply chains												
PP-090	Design for sustainment in products and supply chains												

MxD Technology Roadmap – Future Factory

ID#	Program Name	2022				2023				2024			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
20-13-01	Docent technology transfer (Follow-on to 17-04-01)	█											
19-02-01	Closed-loop measurement control for enhanced robotic performance	█	█										
19-13-05	Operator 4.0 via fatigue and motion analyses in a human digital twin enabled framework for smart manufacturing	█	█	█									
20-02-07	Smart monitoring and automated real-time visual inspection of sealant application	█	█	█									
20-04-01	Maximizing your ROI from digital technology as a small manufacturer	█	█	█	█								
21-19	Paladin Howitzer Model Based Enterprise R&D Demonstration	█	█	█	█	█	█						
21-36	Rock Island Arsenal modernization		█	█	█	█	█						
21-18	5G manufacturing testbeds for military and dual-use applications			█	█	█	█	█	█	█	█		
21-06	Dynamic scheduling & control for factory operations optimization	█	█	█	█	█	█						
21-14	Predictive maintenance in manufacturing	█	█	█	█	█							
22-03	Digital manufacturing playbooks - Implementation guideline and demonstration at SMMs			█	█	█	█	█					
22-06	Operator health tracking				█	█	█	█	█				
22-07	Track and trace spanning the factory and supply chain				█	█	█	█	█	█			
PP-010	Digitalization and visualization of component defects					█	█	█	█	█	█		
PP-100	Data interoperability for industry 4.0					█	█	█	█	█	█		
PP-041	Unifying the model-based definition and the digital twin						█	█	█	█	█	█	█
PP-017	Predictive maintenance in a process environment using a digital twin							█	█	█	█	█	█
PP-077	Virtual inspection of manufacturing								█	█	█	█	█
PP-011	Integrated CNC digital twin										█	█	█
PP-019	Real-time inventory tracking										█	█	█
PP-102	AR/VR in maintenance											█	█

MxD Technology Roadmap – Supply Chain

ID#	Program Name	2022				2023				2024			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
20-16-01	Supply chain risk alert 2 (SCRA 2)	█	█										
20-17-01	Rapid and secure deployment of medical devices and instrumentation	█	█	█									
20-18-01	Capacity and mobilization assessment of the pharmaceutical industry	█	█										
20-05-01	Achieving resilience through proactive supply chain risk management	█	█	█	█								
22-08	Blockchain for supply chain exploration				█	█	█	█	█	█			
PP-119	Framework for interoperability and integration (Phase 0: discovery)					█	█	█	█	█			
PP-120	Framework for interoperability and integration (Phase 1: data strategy)						█	█	█	█	█		
PP-121	Framework for interoperability and integration (Phase 2: data cleanse)								█	█	█	█	█
PP-106	Deploying digital technologies in SMMs								█	█	█	█	█
PP-075	Cross-enterprise advanced planning and optimization									█	█	█	█
PP-104	Data collection for maintenance and sustainment										█	█	█
PP-021	Impact of climate change on the supply chain											█	█

MxD Technology Roadmap – Emerging Technology

ID#	Program Name	2022				2023				2024			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
20-11-09	Model-based systems engineering for digital manufacturing: a proof-of-concept	█											
20-11-11	Development of manufacturing equipment digital twin and integration with cyber-physical emulation test range	█	█										
20-11-13	Privacy-preserving analytics for smart manufacturing	█	█	█									
20-11-01	Securing voice control technology in manufacturing via cross-domain low-effort authentication	█	█	█	█								
20-11-04	Physics-guided machine learning for CNC milling	█	█	█	█	█							
20-11-10	Cyber threat mission builder	█	█	█	█	█							
21-10-02	Machine learning-based quality improvement for thermal energy cutting processes	█	█	█	█	█							
21-10-03	Product lifecycle data analysis and error identification using deep learning	█	█	█	█	█							
21-10-04	Secure digital twin incorporating physics-aware machine learning for additive manufacturing	█	█	█	█	█							
21-10-06	Understanding discrepancy between design and implementation of inventory policies	█	█	█	█	█							
22-04	Emerging technology and cybersecurity research in manufacturing						█	█	█				
PP-044	Emerging technology and cybersecurity research in manufacturing									█	█	█	█
PP-044	Emerging technology and cybersecurity research in manufacturing											█	█

MxD Technology Roadmap – Cybersecurity

ID#	Program Name	2022				2023				2024			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
20-25-01	Pathfinder phase II: securing 3D printers in manufacturing	█				█							
21-39	Cybersecurity Roadshows	█				█				█			
21-40	Cybersecurity Tabletop Exercises	█				█				█			
21-07	Secure wireless for factory operations	█											
21-11	Security solutions for OT factory equipment	█	█			█							
22-10	Operational technology test methods		█		█	█							
22-11	Strategies to Address OT Resiliency to Minimize Operational Downtime			█		█	█			█			
22-12	Cybersecurity Standard and Guidelines for Protecting Operations Technology (OT)			█		█	█						
22-13	Attack simulation using AI and digital twins				█	█		█		█			
PP-109	Application of existing standards and guidelines to OT					█		█		█			
PP-111	Managed detection and response for OT						█		█	█			
PP-027	Cybersecurity in a process environment using a digital twin								█	█			█
PP-118	Approaches to address insecure operational protocols in OT									█		█	
PP-026	Authentication and validation of endpoints for wireless-enabled factory operations										█		█
PP-113	Protecting OT data with edge computing												█

MxD Technology Roadmap – Workforce Development

ID#	Program Name	2022				2023				2024			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
19-06-01	Advanced manufacturing high school curriculum – Waukegan High School												
19-09-01	Community college advanced manufacturing and cybersecurity apprenticeships – College of Lake County												
20-21-01	The Connecticut Defense Manufacturing Community Consortium (CDMCC)												
19-08-01	FlexFactor: Introducing students to advanced manufacturing engineering education												
20-22-01	Introduction to Digital Manufacturing Workforce Development Program (Drexel) (DERISC)												
21-20-01	Sinclair Community College Digital Manufacturing Training												
21-03-01	Virtual Training Center Platform												
21-08-01	Digital and Cybersecurity Awareness for the Blue Economy/Water Workforce												
21-22-01	TRACKS-CN												
21-35-01	Hiring Guide Phase III												
22-TBD	CyMOT Phase II												
22-TBD	CyMOT Phase 1C												
22-TBD	Apprenticeship Expansion												