



## **PROJECT BRIEF**

# Scaling Transformative Advanced Manufacturing Pathways

April 2022





The Scaling Transformative Advanced Manufacturing Pathways (STAMP) project will serve secondary students enrolled in manufacturing pathways that articulate to community college programs and employment opportunities, with a particular focus on under-represented secondary students with one or more barriers to education, training, and employment.

STAMP is designed to help meet the demand for skilled manufacturing workers in Illinois while advancing equity. Manufacturing is a cornerstone of the Illinois economy. According to the State's five-year Economic Development Plan released in 2019, Illinois manufacturers account for more than 13 percent of the State's economic output and employ 10 percent of the State's workforce, with manufacturing exports in Illinois growing faster than the national average. These occupations are spread across a breadth of manufacturing employer types, including metalworking, automotive production, plastic, food processing, and chemical processing.

The Illinois Manufacturers' Association (IMA) publishes a bi-annual economic analysis report titled "Manufacturing Matters: Our Impact in Illinois" that provides a summary of its economic analysis on the impact of the manufacturing industry on Illinois and its communities. IMA's economic analyses demonstrate that the labor market remains tight and manufacturers continue to report large numbers of open positions. As of June 2021, the manufacturing industry had more than 800,000 unfilled positions nationally.

Participating STAMP districts will align their manufacturing pathway programs to the Manufacturing & Engineering Model Programs of Study, developed by Education Systems Center at Northern Illinois University (EdSystems) with sponsorship from ICCB using a data-driven, backward-mapping approach that extended from the areas of job growth down through the high school course sequence. The first step in the Model's development was the identification of high-priority occupations in the industry sector that are high-skill, high-wage, and in-demand based on federal Department of Labor data for the State of Illinois and related IDES projections. Each high priority occupation has both a positive growth outlook in the State of Illinois and has median salaries near or greater than the living wage for one adult and one child in Illinois (quantified as \$22.33/hour in the Model Programs of Study). The analysis identified high-priority occupations in four separate manufacturing areas: (1) Welding; (2) Machining & Production; (3) Maintenance & Process Operations; and (4) Engineering & Automation. This analysis was reviewed and verified by a stakeholder advisory committee from the secondary, postsecondary, and private sectors.

For an industry sector of such critical importance to Illinois, the State needs a comprehensive, coordinated strategy to foster and expand quality college and career pathways leading to priority manufacturing occupations. The structure and supports provided through STAMP will accelerate and expand manufacturing pathways across numerous population centers in the State and establish a foundation for broader scaling in future years.



## STAMP PROJECT GOALS

Led by the IMA with support from EdSystems, STAMP will seed the launch, enhancement, and expansion of high-quality manufacturing college and career pathway programs in regions across Illinois. STAMP will enable local partnerships among employers, school districts, community colleges, and workforce boards to:

- » Establish a Manufacturing College and Career Pathway Endorsement (CCPE) program pursuant to the Postsecondary and Workforce Readiness (PWR) Act that includes dual credit and opportunities to earn industry credentials.
- » Incorporate both in-person and virtual work-based learning into Manufacturing CCPE programs.
- » Target engagement and recruitment efforts to student populations that are underrepresented in manufacturing and face barriers to training and employment, including females and students of color.

The overarching goals of STAMP are to:

- » Increase secondary enrollment in manufacturing pathways, particularly by underrepresented students.
- » Increase dual credit offerings and enrollment in manufacturing pathways.
- » Increase the number of students who complete a manufacturing pathway, earning a College and Career Pathway Endorsement (CCPE) and/or industry credential.
- » Increase matriculation into postsecondary manufacturing programs and the workforce.

STAMP will enhance and expand the reach of manufacturing pathway programs and establish a foundation for supporting high-quality manufacturing pathways across the State of Illinois in future years.

## THE WORK PLAN

STAMP relies both on IMA's data and analysis on manufacturing business trends, and the extensive labor market analysis recently performed by EdSystems for the State of Illinois Model Programs of Study Guide: Manufacturing & Engineering sponsored by the Illinois Community College Board.

Each STAMP participating high school and community college partnership must use a backward-mapping approach from high-demand, living-wage manufacturing occupations to develop high-quality career pathways for youth in the community, with a focus on at-risk youth. This process and pathways delivery model consists of:

- » Identifying manufacturing industry certifications and postsecondary credentials (degrees or certificates) that are accessible through the community college that lead into the high-priority occupations.
- » Mapping the stackable credential sequence that leads to the credentials needed for high priority occupations;
- » Identifying the strategic community college courses that appear across multiple manufacturing credential areas, provide a broad foundation of knowledge, and are feasible for dual credit delivery.
- » Mapping a manufacturing course sequence from secondary to postsecondary that incorporates strategic early college credit and related industry credentials.
- » Integrating a continuum of work-based learning as defined in the Illinois Career Pathways Dictionary that addresses the expectation for students to earn a CCPE.
- » Ensuring students are prepared for non-remedial, college-level coursework as they transition from high school into postsecondary, with an emphasis on literacy and numeracy skills needed for success in both college and the workplace.



All steps of the pathways development process will be informed by the employer partners for the region. Once complete, STAMP communities will be required to apply with the Illinois State Board of Education for the CCPE.

In addition, STAMP communities will:

- » Target engagement and recruitment efforts to student populations that are under-represented in manufacturing and face barriers to training and employment, including females and students of color.
- » Offer supportive services to pathway participants to earn the CCPE, successfully attain industry and postsecondary credentials, and transition into postsecondary education or employment.
- » Establish “currency” with community college, university, and employer partners for students graduating high school with a manufacturing endorsement.

To support local partnerships, IMA and EdSystems will provide:

- » A community of practice across all participants to support peer-to-peer learning including strategies for pathways design, work-based learning, outreach and recruitment, advancing equity in pathways, employer engagement, career planning, supportive services, barrier reduction, placement services, and follow-up services.
- » Technical assistance on pathway design, course sequencing, job readiness training, and incorporation of industry credentials.
- » Support for scaling work-based learning, including the documentation of templates for manufacturing work-based learning across the State’s work-based learning continuum and ready-to-launch virtual career development experience templates utilizing Practera, an internationally leading virtual work-based learning platform.
- » A new scholarship program, administered by the IMA, for students earning a manufacturing CCPE and continuing into a related postsecondary education program in Illinois.



The IMA will undertake additional employer outreach, focused on its membership of over 4,000 companies and facilities, to grow the employer base that is supporting STAMP initiatives in addition to the local manufacturing employers that have already committed to supporting STAMP and the program's success through existing partnership in the identified regions. The IMA's outreach initiatives will include working with regional members and nonmembers to coordinate employer voice, and support STAMP as follows:

- » Employers will serve as advisors to high schools and community colleges on the industry credentials and competencies that should be incorporated into pathways courses to meet local employer needs relating to entry-level positions.
- » Employers will participate in Career Exploration experiences, including as guest speakers and hosting site visits and job shadows for students in manufacturing orientation courses to build students' pathway awareness, excitement, and foundational knowledge in the field.
- » Employers will participate in Team-Based Challenges, serving as mentors and advisors for student projects and after-school activities, such as robotics teams or SkillsUSA competitions, that enable students to work in teams to

apply their knowledge to an authentic project relevant to employer needs.

- » Sponsoring students to participate in Career Development experiences such as internships, cooperative education programs, and youth apprenticeships in which students obtain manufacturing experience under authentic working conditions to prepare them for success in entry-level positions. STAMP's development of templates for virtual career development experiences will enable employers to support greater numbers of students by enabling them to blend in-person and virtual work experiences to meet the State's minimum threshold of 60 hours for student participation in Career Development Experiences to earn the CCPE.

In addition, STAMP will include an employer training program that IMA and EdSystems will co-develop to support employers' successful hosting of students in Career Development Experiences, thereby promoting equity in placement opportunities and career advancement. To support student awareness of manufacturing career opportunities, the IMA will work with its employer partners to offer school districts a variety of career awareness and career exploration opportunities.

## APPENDIX I: COHORT 1 TIMELINE

The term for the first STAMP cohort is May 1, 2022 through April 30, 2024. Participating regions will take part in a series of community of practice convenings:

- » **September 2022: Community of Practice 1**  
Focused on building pathway course awareness, pathway course sequencing, quality orientation courses, and equity in pathway design
- » **February 2023: Community of Practice 2**  
Focused on WBL, emphasizing career exploration and team-based challenges, introducing first virtual Quote to Production CDE template
- » **May 2023: Community of Practice 3**  
Focused on pathway course sequencing and incorporating early college credit and industry credentials
- » **July 2023: Community of Practice 4**  
Focused on career development experiences (CDEs); determining model for second virtual CDE template
- » **October 2023: Community of Practice 5**  
Focused on postsecondary transitions in manufacturing pathways and currency models for Endorsements
- » **February 2024: Community of Practice 6**  
Focused on youth apprenticeships; launch of second virtual CDE template
- » **May 2024: Community of Practice 7**  
Celebration of progress across the STAMP cohort

In addition, IMA will conduct site visits for Manufacturing Month and support the creation of the Employer Training Program.

- » **October 2022:** Formation of the Employer Training Program Advisory Committee, to include employer partners from the Cohort 1; Manufacturing Month site visits
- » **November 2022 – March 2023:** Development of initial training program materials
- » **March – April 2023:** Advisory Committee feedback and refinement of materials
- » **May 2023:** Launch of the Employer Training Program
- » **October 2023:** Manufacturing Month site visits

EdSystems will offer quarterly technical assistance sessions, monthly office hours, and at least one in-person site visit per year, and will lead the design and implementation of new resources.

- » **May 2022 – December 2023:** Develop and distribute career exploration and career development experience models
- » **November 2022:** Establish an educator and employer team to collaborate on the design and piloting of a virtual Career Discovery Experience and End-to-End Project Plan template
- » **January – April 2023:** Develop a mentorship program model for young women in manufacturing
- » **February 2023:** Pilot the Career Discovery and End-to-End Project Plan templates
- » **June 2023:** Engage Cohort 1 to inform and refine Supply Chain Disruption template.
- » **November 2023:** Establish an educator and employer team to collaborate on the design and piloting of Supply Chain Disruption template
- » **February 2024:** Pilot the Supply Chain Disruption template



## APPENDIX II: ENGAGING MANUFACTURING EMPLOYERS

### MANUFACTURING MONTH

The IMA's signature career exploration initiative will be supporting employers to offer site visit opportunities each October, which has been designated by the Governor as Manufacturing Month. IMA will expand Manufacturing Month site visit opportunities in participating regions, and EdSystems will support high school teachers in STAMP communities to support students to prepare for the site visit through research on the company and the development of questions. The site visits will also be coordinated with STAMP community college partners so that students are presented with tangible information on postsecondary pathways for the entry-level positions available at the hosting employer.

### YEAR-ROUND EMPLOYER ENGAGEMENT

To support career awareness and exploration activities throughout the school year, the IMA will engage employers in STAMP participants' job fairs and trade shows to both market the profession and target future manufacturing employees who are currently students in both high school and enrolled in local community colleges, coordinating with current manufacturing employees to serve as guest speakers for classes, and developing and supporting job shadowing opportunities.

The IMA's outreach initiatives will include working with regional members and nonmembers to coordinate employer voice and support STAMP in the following ways:

- » Employers will serve as advisors to high schools and community colleges on the industry credentials and competencies that should be incorporated into pathways courses to meet local employer needs relating to entry-level positions.
- » To support Career Exploration, employers will participate as guest speakers and host site visits and job shadows for students in manufacturing orientation courses to build

students' pathway awareness, excitement, and foundational knowledge in the field.

- » To support Team-Based Challenges, employers will serve as mentors and advisors for student projects and after-school activities, such as robotics teams or SkillsUSA competitions, that enable students to work in teams to apply their knowledge to an authentic project relevant to employer needs.
- » To support Career Development Experiences, employers will sponsor students to participate in internships, cooperative education programs, and youth apprenticeships in which students obtain manufacturing experience under authentic working conditions to prepare them for success in entry-level positions. STAMP's development of templates for virtual career development experiences (see Appendix IV) will enable employers to support greater numbers of students by enabling them to blend in-person and virtual work experiences to meet the State's minimum threshold of 60 hours for student participation in Career Development Experiences to earn the CCPE.

## APPENDIX III: EMPLOYER TRAINING PROGRAM

STAMP will include an employer training program that IMA and EdSystems will co-develop to support employers' successful hosting of students in Career Development Experiences, thereby promoting equity in placement opportunities and career advancement. To develop this program, EdSystems and IMA will form an advisory committee of school district representatives and employers, including human resource professionals from manufacturing companies. This training program will include materials adapted from the State of Illinois Career Development Experience Toolkit and from training developed for the Greater Peoria Essential Abilities and Knowledge (GPEAK) program. It will include a module developed for STAMP on how employers can support job placement activities for students after the Career Development Experience, whether at that employer or with other area employers. All modules will include presentations from exemplar employer models. The planned content for the STAMP employer training modules are described below.

### *Getting to Know Your Participants:*

- » Onboarding new students
- » Setting up expectations for communication and regular check-ins
- » Integrating students into the team and culture of the organization
- » Understanding students' skills and areas for growth to provide targeted supports and resources

### *Engaging in Meaningful Feedback Conversations:*

- » Best practices for providing feedback and engaging in dialogue with students to strengthen mentor-mentee relationships
- » Utilizing observations and formal assessments to build awareness for students and mentors on current skill levels

- » Connecting students with resources and opportunities to strengthen areas of growth

### *Supporting Ongoing Career Development:*

- » Providing guidance for students to update their resume and portfolios to reflect tasks they engaged in and skills gained during their work-based learning experience
- » Engaging in mock interviews with students to prepare to connect them with opportunities internally or externally
- » Staying connected through professional organizations and platforms, as well as inviting to industry events



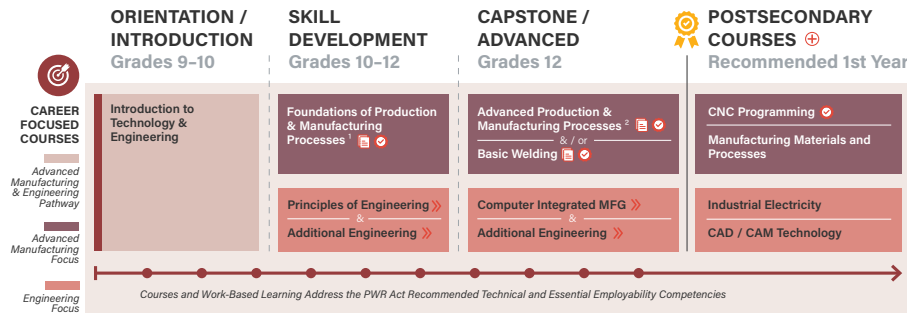
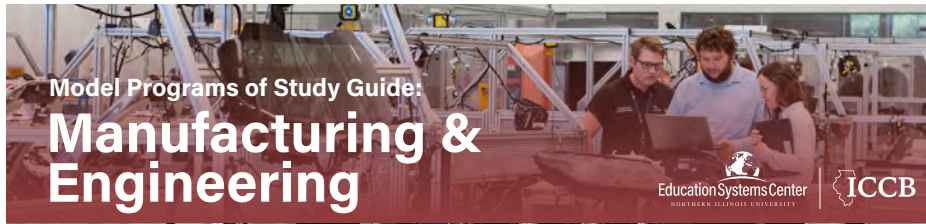
## APPENDIX IV: VIRTUAL EXPERIENCES

EdSystems will lead the development of two customized templates for a 30-hour, virtual Career Development Experience (CDE) that can be used to complement a 30-hour in-person CDE to fulfill the 60-hour CDE requirement for an Endorsement. The templates will be developed with support of Practera, a contractor for the project who is also developing the career discovery experience described in Section 3, Question 3. One template will be for an end-to-end product planning virtual CDE that can be deployed in the 22-23 School Year. This CDE will incorporate content from the Quote to Production project initially developed by the Golden Corridor Advanced Manufacturing Partnership (GCAMP) (a STAMP partner organization) and deployed during the 20-21 School Year to support student understanding of all aspects of the manufacturing process from design through assembly. This project will include the following components that can be customized by employer partners to meet the specifics of their manufacturing operations: materials procurement, parts warehousing, line setup and scheduling, quality assurance, and shipping and distribution.

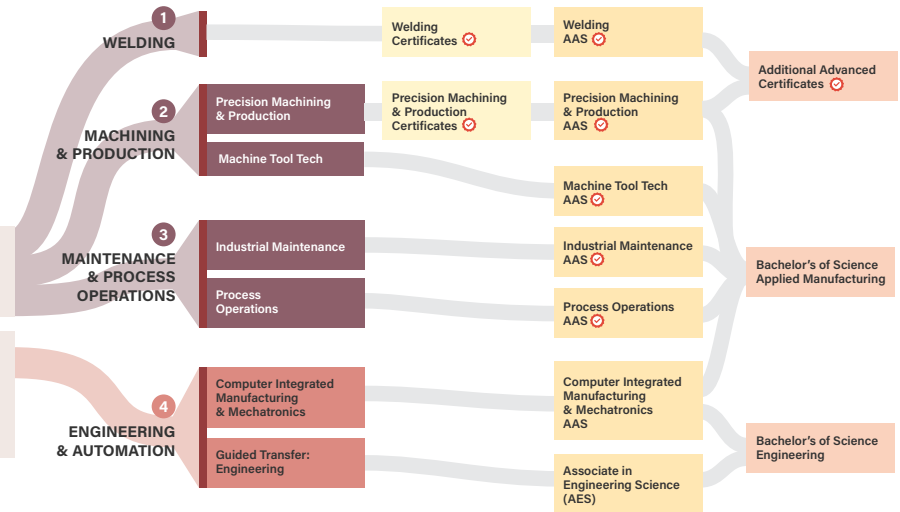
A second virtual CDE template will be developed by EdSystems and Practera, in partnership with IMA and STAMP school district and employer partners, for deployment in the 23-24 School Year. EdSystems and IMA propose that this template address supply chain planning and potential supply disruptions, where students are required to research alternatives and propose solutions in the event of a supply chain disruption for a particular part. For each of the virtual CDE templates developed for STAMP, EdSystems, IMA, and Practera will form an advisory group of educators and employers to initially develop the templates. After each template is piloted for a school year, the advisory group will support its refinement for a broader launch. In addition to the two CDE templates developed specifically for STAMP, EdSystems and Practera have established

and are currently piloting a social media virtual CDE where students advise on how companies are presenting themselves to the public. This existing template could be used for manufacturing companies with an expanding social media presence.

# APPENDIX V: MODEL PROGRAMS OF STUDY IN MANUFACTURING & ENGINEERING DIAGRAM



## POSTSECONDARY OPTIONS



## SELECTED OCCUPATIONS, WAGES, & JOB GROWTH

Program	Typical Job	Near or Above Living Wage Threshold for 1 Adult + 1 Child <sup>3</sup>	Median Hourly Wage <sup>4</sup>	Growth in IL: Annual Job Openings <sup>4</sup>	Growth in IL: % Change Over 10 years <sup>4</sup>	Stackable?
1 Welding	Welders, Cutters, Welder Fitters	N	\$19.28	1,540	5%	Not Typically Stackable
2 Machine Tool Technology	Tool and Die Makers	Y	\$25.34	450	-5%	Typically Stacks to Related Bachelor's Program at Select IL Universities
	Machinists	N	\$19.44	3,630	4%	Typically Stacks to Further Certificates or an AAS
3 Precision Machining	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	Y	\$25.65	160	18%	Typically Stacks to Related Bachelor's Program at Select IL Universities
	Industrial Machinery Mechanics	Y	\$26.41	1,240	10%	
4 Process Technology	Chemical Equipment Operators and Tenders, Biofuels Processing Technician	Y	\$24.95 - \$33.87	200	1% - 3%	Typically Stacks to Related Bachelor's Program at Select IL Universities
Computer Integrated Manufacturing & Mechatronics	Manufacturing Engineering Technologists, Electromechanical Engineering Technologists, Robotics Technicians	Y	\$30.26 - \$30.48	460	5%	Typically Stacks to Related Bachelor's Program at Most IL Universities
	Guided Transfer: Engineering	Engineers in Various Branches: Mechanical, Civil, Electrical, Chemical, Mechatronics, Industrial	Y	\$40.65 - \$44.51	3,760	

1. For machining-focused programs, equivalent to ISBE CTE Courses – Beginning Machining and Machine Shop Technology I  
 2. For machining-focused programs, equivalent to ISBE CTE Course – Machine Shop Technology II  
 3. Living wage calculations are based on MIT's Living Calculator ([livingwage.mit.edu](http://livingwage.mit.edu)), where the "Living Wage" for 1 Adult + 1 Child is \$26.27/hour for the state of Illinois. "Near" defined as 85% of the statewide living wage, which is \$22.33/hour  
 4. U.S. Department of Labor, CareerOnestop ([careeronestop.org/explore Careers](http://careeronestop.org/explore Careers))

WORK-BASED LEARNING	SCIENCE	SOCIAL SCIENCE	MATH	ENGLISH
Career Exploration (2) Team-Based Challenge	Science Sequence	Social Science Sequence	Algebra Geometry	English Sequence
Team-Based Challenge Career Development Experience or Youth Apprenticeship	Science Sequence	Social Science Sequence	Geometry Algebra 2 Pre-Calculus	English Sequence
Team-Based Challenge Career Development Experience or Apprenticeship	Physics General Physics	Social Science Social Science	Transitional Math: Technical Transitional Math: STEM College Algebra / Trigonometry Calculus	Transitional English English Composition Oral Communication

AP or Dual Credit  
 Dual Credit Course  
 Dual Credit Course Affiliated With IAI Code  
 Course or Program Prepares for Industry Credential  
 Postsecondary Course Affiliated with IAI Code  
 College and Career Pathway Endorsement Earned  
 If courses in this column were accomplished through early college credit, students should take the next required course in the sequence or, if none, additional AAS or Major Courses

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