



Advanced Manufacturing  
Training Expansion Program



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2020-2022

## VISION

The Advanced Manufacturing Training Expansion Program (AMTEP) is a collaborative, systems-based workforce development initiative that will ready people for the future. By increasing the region's training footprint and program capacity, and building state-of-the-art infrastructure, AMTEP is targeted to train 900 adult learners and high school students and create a ready-to-work pipeline for manufacturing employers on the North Shore of Massachusetts.



GE Foundation

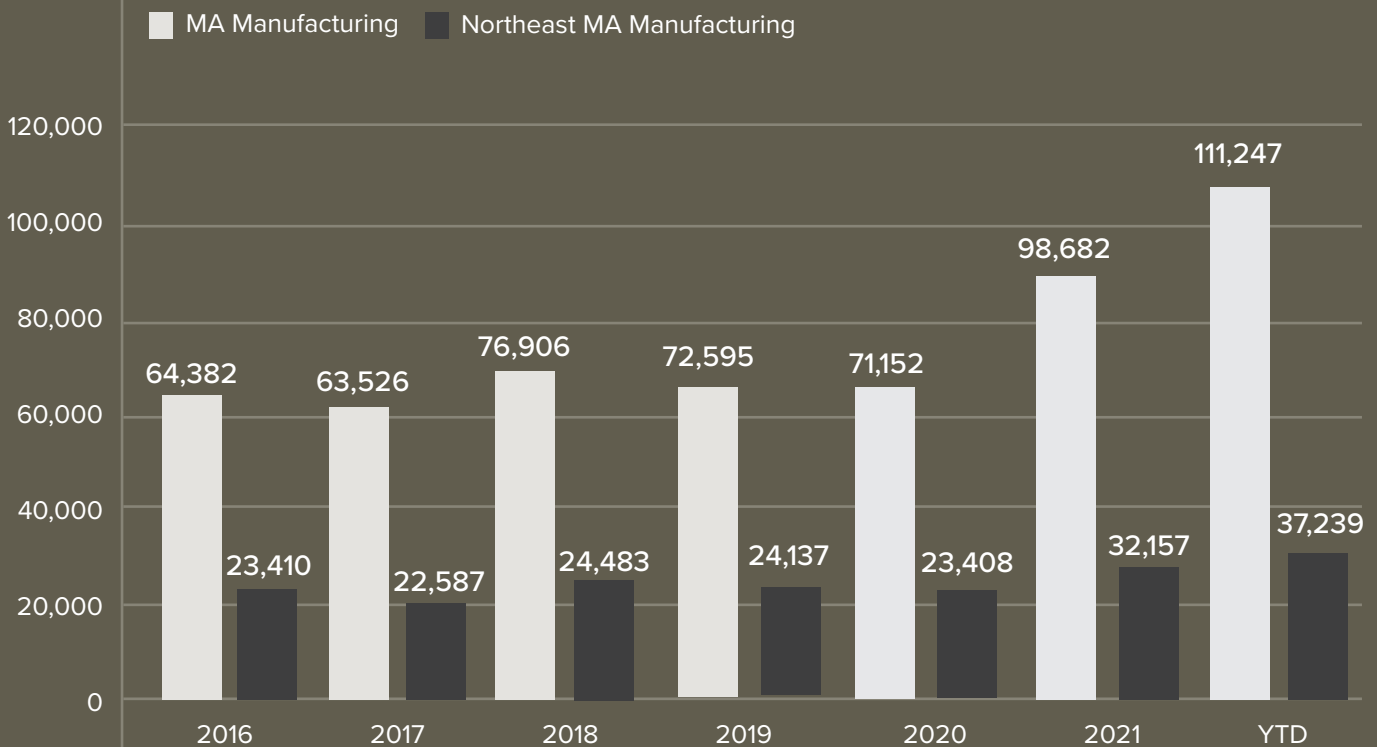


**“ THE PROGRAM IMPACTED MY LIFE TREMENDOUSLY. IT OPENED OPPORTUNITIES FOR JOBS THAT I COULDN’T GET INTERVIEWED FOR BEFORE. I ALWAYS FEEL LIKE I’LL HAVE A JOB AND I’VE BEEN ABLE TO SAVE MONEY TOO. THE DAY I GRADUATED, MY KIDS WERE THERE AND THEY WERE SAYING, ‘DADDY, WE’RE SO PROUD OF YOU.’ THAT FELT GREAT AND NOW I’M ABLE TO BUILD A FUTURE FOR ME AND FOR THEM. I’M VERY HAPPY I DID THIS PROGRAM. ”**

– Joan, Graduate of AMTEP Machining

### SIGNIFICANT DEMAND GROWTH IN MANUFACTURING JOB POSTINGS

Manufacturing Online Job Postings by Year:



## HOW WE GOT HERE

# INTRODUCTION

Funded by the GE Foundation, AMTEP was established to support the manufacturing industry by closing the talent gap local employers are experiencing due to an increase in demand for highly skilled workers and a significant number of anticipated retirements. Manufacturing is one of the highest paid industries in the region with entry points that may or may not require a college degree. By substantially increasing the pipeline of trained workers on the North Shore, this systems-based solution ensures that the talent needs of area manufacturing employers are supported and that the industry can thrive. The intent of the initiative is to harness the collaborative spirit of educational organizations, state agencies, nonprofits, philanthropy and employers to provide education and training for area residents, both high school youth and adults, so that quality careers remain available and attainable to people of all ages.

Below are select key industry metrics that reflect the need for this collaborative initiative:

### INDUSTRY GROWTH

Manufacturing is adding \$60 billion to the Massachusetts economy, employing 242,800 workers across the state.

### LIVING WAGE JOBS

In the first quarter of 2022, the manufacturing industry paid \$2.5 billion in overall wages across Northeast Massachusetts, and entry level salaries for AMTEP graduates averaged \$48,692 per year- 14% above the MA living wage for an adult.

### EMPLOYER DEMAND

There are 1,902 manufacturing companies that employ 78,034 people across Northeast Massachusetts.

### HIGH JOB OPPORTUNITY

- Northeast Massachusetts had 37,239 job postings through 2022
- 10% of all industry job postings in Northeast are manufacturing
- 1,755 manufacturing jobs were posted in November 2020, compared to 2,649 jobs posted in November 2022.





# \$7.96 MILLION COMMITMENT

## AMTEP STRATEGY

AMTEP is a multi-year, **\$7.96 million** commitment to empower residents to access living wage jobs and multiple career pathways in the advanced manufacturing industry. By working collaboratively across the entire ecosystem, AMTEP aims to:

1. Increase awareness of opportunities and expand recruitment.
2. Establish a robust academic program and build state-of-the-art infrastructure.
3. Train 900 youth and adult learners.
4. Engage manufacturing employers to ensure an 85% employment rate post-graduation.



# STRATEGY 1

## EXPAND AWARENESS & RECRUITMENT

Key obstacles to developing quality trainees ready to enter the manufacturing industry include educating local communities about what an advanced manufacturing career looks like and building awareness that free programming exists at local colleges and vocational schools. As a result, AMTEP has focused time, energy and resources on creative, community-based marketing and recruitment strategies. These strategies are ongoing and to date have encompassed:

## RESOURCES & COLLATERAL

[ECCF](#)  
[Salem News](#)  
[Boston Globe](#)  
[Rumba 97.7](#)  
[WZLX 100.7](#)  
[NSCC Martin Trice interview](#)  
[ECCF North Shore Chamber Magazine](#)  
[YouTube videos by Sperling](#)  
[Spark article](#)  
[IUE -CWA](#)

## PARTNER NAMC LINKS TO MANUFACTURING ARTICLES

[Andover](#)  
[Woburn](#)  
[Arlington](#)  
[Lowell Sun](#)  
[Everett](#)



### CONSISTENT BRANDING

With logo, power points and videos.



### VIDEO CONTENT

A library of success stories and programming content to use for student and teacher recruitment. Click here for [videos](#).



### MEDIA CONTENT

Including published articles by AMTEP partners and local news and radio appearances focused on promoting a collaborative approach and increasing program awareness.



### GRASSROOTS

Strategies cross all media, including social, emails, MBTA ads, radio, flyers, banners, Lynn Spanish-speaking station, and student feedback.

## Community Targeted Online Search and Social Media Results

### Social Media and Google Analytics from Sperling Interactive:



### DISPLAY ADS

5x increase from 355,000 in 2021 to 2.1 million in 2022 due to a full-year run, decrease in cost per click and optimization of audiences. Cost per click on display ads lowered from \$.80 to \$.20 per click.



### SEARCH

The Northeast Advanced Manufacturing Consortium (NAMC) website has experienced a 76% increase in organic traffic, year over year.



### KEYWORDS

The top five search terms are 'CNC training,' 'machinist courses,' 'What is a CNC machinist,' 'machinist school' and 'manufacturing training program.'



### CLICK THRU RATE

A higher CTR indicates campaign ads are on target. A baseline CTR target search campaign is 1 - 1.5%. In 2021, the CTR was 12% on paid search and increased to 16.6% in 2022.

# STRATEGY 2

## ESTABLISH A ROBUST ACADEMIC PROGRAM & INFRASTRUCTURE

The bulk of AMTEP's work focused on investing in critical infrastructure at local technical schools, including Essex North Shore Agricultural & Technical School (Essex Tech), Lynn Vocational Technical Institute (LVTI), which houses the adult E-Team program, and Gloucester High School.

Highlights of this program work include:

### INFRASTRUCTURE

\$5.1M was invested in the infrastructure at Essex Tech and LVTI, where 70 total pieces of equipment were acquired. The GE Foundation provided \$1M for the build and modification of the shop floor at LVTI, and \$4.1M in capital skills grants was funded by the state for the installation of equipment at the two institutions. The GE Foundation also provided \$45,000 for the creation of an electromechanical assembly shop, while the training dollars (about \$100,000 over two cycles) came from the Massachusetts Career Technical Initiative.

### PROGRAM EVALUATION

In the spring of 2020, Rebekah Lashman Consulting performed a program evaluation on the machining curriculum content and timeline, resulting in the widespread adoption of a standard 415-hour curriculum, run twice per year by Essex Tech, E-Team and Gloucester.

### CREDIT FOR PRIOR LEARNING

For the first time, AMTEP graduates are eligible to receive six credits upon matriculation to North Shore Community College, thanks to the school's prior learning assessment program.





## CURRICULUM ROADMAP

Bevan Weissman and his instructor team developed a modularized Curriculum Roadmap for CNC and manual machining in late 2020 (revised in 2021) and shared it with industry leaders and educators across the state. A contextualized curriculum was developed for Foundations, HiSet and ESL by North Shore Community College. Instructors are building a curriculum roadmap for electromechanical assembly.

## INSTRUCTOR CAPACITY

AMTEP increased instructor capacity with a 48-hour instruction program, training seven industry machinists to teach in AMTEP programs from 2020-2022. Two additional instructors will complete training in 2023, which will create the appropriate bandwidth for the longevity of the program.

## MASSHIRE EXPANDED SUPPORT

The AMTEP program manager leveraged budgeted grant resources raised for the state career support staff. AMTEP collaborated with the MassHire Career Center director and as a result doubled the team.

2020: 3 FTEs (1 career coach, 1 employment counselor, 1 business service rep)

2021: 5 FTEs (2 career coaches, 1 employment counselor, 1 business service rep, 1 marketing coordinator)

2022: 6.5 FTEs (2 career coaches, 2 employment counselors, 1 business service rep, 1 marketing coordinator and .5 career prep specialist)





## NORTH SHORE COMMUNITY COLLEGE CONTRIBUTIONS AND DELIVERABLES

### CURRICULUM

NSCC created a contextualized advanced manufacturing curriculum to address two educational barriers faced by students: a lack of a high school diploma and the need for stronger English-speaking skills. Students who successfully passed the HiSet and ESL courses were able to move on to the foundational courses and then, hands-on training.

### COVID-19

NSCC quickly pivoted the foundational courses to remote classes during the COVID-19 pandemic and continued to pursue a vigorous marketing campaign during the fear and uncertainties of the time.

**Please note:** The pandemic disproportionately impacted the target audiences of immigrants and low-income students so much that enrollment in ESOL classes at NSCC dropped significantly. One thousand students were enrolled pre-pandemic, compared to 117 students post-pandemic. To date in FY23, 253 students are enrolled in ESOL, consequently making it nearly impossible to execute the original ESOL goals.

### MARKETING

Significant efforts to build awareness among target communities and recruit a diverse student body continue.

- NSCC increased views of their manufacturing web page by 635% from 2020 to 2022 (3,493 views in CY2020; 18,861 views in CY2021 and 22,146 views in CY2022).
- Social media and email to community-based organizations and students.
- Other marketing efforts include: Instructors/ partners, MBTA ads, radio ads, flyers, banners

(some bi-lingual), Spanish-speaking station in Lynn, and continuous student feedback collected that helps redirect marketing ads (ie. responses concentrated on free, personal success, and career) while word of mouth from successful students has supported the widening of the net.

### INFO SESSIONS

NSCC's model starts with info sessions that outline the depth of the training, the commitment needed and how the program is a fit for adult prospects, all key for the college to select who will go onto the testing and evaluation stage. They continue to grow the info-session model with ongoing marketing, in order to recruit large enough numbers to offset attrition and feed the vocational school pipeline.

#### Info sessions over the 3 years:

- 56 info sessions over 3 years, all yielding the required 28-32 students for the vocational portion for the Essex Tech spring and fall programs, as well as the required 12-15 for the Gloucester High School summer program

### TOTAL SERVED

From 2020-2022, NSCC has enrolled 223 students, and graduated 192 students from their foundational programming in preparation for the vocational portion.

### CREDIT FOR PRIOR LEARNING

NSCC created 6 credits for prior learning assessment attributed to the AMTEP certificate program, so that students can receive the 6 credits upon matriculation to the community college.

**“ I WAS ALWAYS SKEPTICAL ABOUT PEOPLE WHO LOVED THEIR JOB AND SAID IT DIDN'T FEEL LIKE WORK, UNTIL I FOUND THIS PROGRAM. IF YOU LIKE TO SOLVE PROBLEMS AND CREATE SOMETHING OUT OF NOTHING, I IMPLORE YOU TO TAKE THIS COURSE. YOU WON'T REGRET IT. ”**

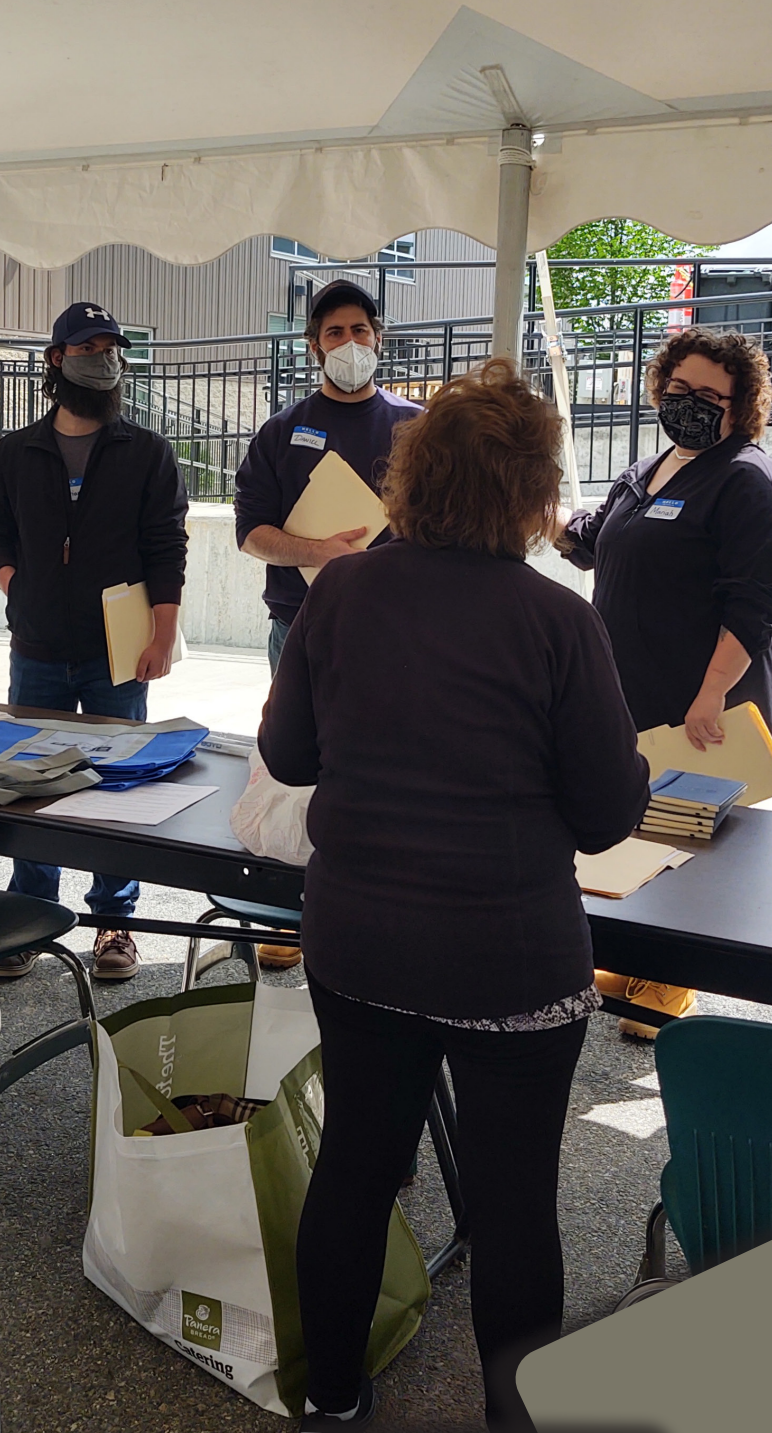
— James, AMTEP Machining Graduate

**“ AMTEP IS HELPING FILL A VOID OF TRAINED MANUFACTURING STAFF FOR INDUSTRY AS WELL AS PROVIDING A CAREER PATH FOR THESE TRAINEES. SUCCESSFUL GRADUATES FROM THESE PROGRAMS HAVE DEMONSTRATED THEIR COMMITMENT TO THEIR CRAFT, WHICH IN TURN, MINIMIZED THE RISK TO THEIR FUTURE EMPLOYERS. WE AS EMPLOYERS CAN BE COMFORTABLE KNOWING THAT THESE CANDIDATES ARE WORTH THE INVESTMENT IN THEIR FUTURE DEVELOPMENT! ”**

— Charlie Anastos | VP of Operational Excellence | Harmonic Drive, LLC



## COVID-19 RESPONSE SUMMARY



School closures, industry devastation, digital inequities and behavioral health challenges are all examples of the socio-economic impacts of the COVID-19 pandemic that were devastating and are still being tackled today.

The AMTEP Team on the North Shore was persistent, pivoting to virtual learning almost instantaneously, hand-delivering Chromebooks to students, creatively addressing the lack of in-person training with simulators on zoom, and attending to individuals who were falling behind with expertise and care. This resulted in the ability to continue to reach learners throughout the pandemic and keep teachers and the program fully operational.



AMTEP conducted a program model evaluation in spring of 2022 to evaluate response to COVID.

<b>Core Remote Learning Technologies</b>	Edmodo, Smart Notebook, Khan Academy and Zoom all support both synchronous and asynchronous remote instruction
<b>Virtual Tours</b>	Students and employees connect in virtual sessions, where students are able to engage and ask questions
<b>Virtual Job Fairs</b>	Online job fairs include Zoom sessions and breakout rooms
<b>Videos</b>	Worksheets and videos were created with CNC Coding exercises
<b>Virtual NIMS Test</b>	Students take NIMS knowledge test in classroom -- program staff worked with NIMS to get approval for remote knowledge test, using an instructor as a remote proctor
<b>Edulastic</b>	Instructors provided students with practice problem sets to assess how much students had learned and retained after class and to determine whether a large number of students hadn't captured a concept
<b>Tooling U</b>	Instructors reported leaning on Tooling U more heavily once the programs moved to remote instruction to continue learning and practicing concepts that would previously have been reinforced in the shop classes
<b>CNC Viewer</b>	An instructor used CNC Viewer (a software program that supports shared CNC programming development) to support real-time G-Coding instruction and practice with students
<b>Click Safety</b>	Programs had previously used Click Safety for OSHA Training, which is an online course suitable for remote learning
<b>Haas Simulators</b>	Used on the front-end of program to prepare students for hands-on instruction, mitigating the impact of reduced hours for in-person shop time. Instructors filmed themselves conducting set up, tool selection and milling a part; provided students with links to Haas instructional videos created by a Haas Applications Engineer

# STRATEGY 3

## LEARNER TRAINING IMPACT: BY THE NUMBERS

A core output to this ecosystem work is measuring the number of students impacted by the foundation course work at NSCC and the technical programs.

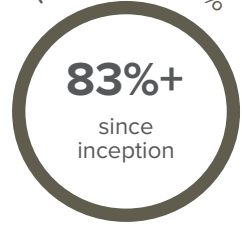
### DEMOGRAPHICS

ADULT	2020	2021	2022
FEMALE	15%	13%	18%
MALE	85%	87%	80%
UNKNOWN			2%
PEOPLE OF COLOR	61%	61%	58%
UNDER 30	48%	43%	40%
30-39	33%	39%	38%
40-49	13%	9%	8%
50+	6%	7%	13%
AVG POST-TRAINING WAGE	\$19.00	\$22.02	\$23.41
AVG PRE-TRAINING WAGE	\$16.90	\$16.10	\$19.47
INCREASE IN WAGE	13%	37%	25%

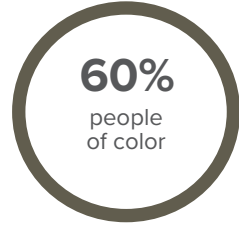
STARTING WAGE



PLACEMENT %



DIVERSITY



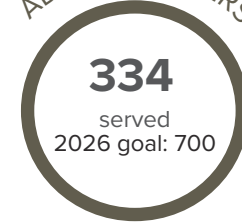
HS GRADUATES



YOUTH ENGAGED



ADULT LEARNERS



## ADULTS & YOUTH SERVED COMBINED

### PROJECTED

ADULT	2020	2021	2022*	TOTAL TO DATE	2023	2024	2025	PROJECTED TOTAL	TOTAL LIFE OF GRANT
ENROLLED	41	106	187	334	120	130	130	380	714
COMPLETED	34	96	169	299	108	117	110	335	634
PLACED	29	79	141	249	88	95	90	273	522

\*Final CY2022 cycle numbers have 54 currently in process

## YOUTH DAYTIME VOCATIONAL STUDENTS

### PROJECTED

YOUTH	2020	2021	2022	TOTAL TO DATE	2023	2024	2025	PROJECTED TOTAL	OVERALL TOTAL
DAYTIME	127	143	133	403	135	140	150	425	828
AFTER DARK	7	13	20	40	16	16	18	50	90
TOTALS IN QUEUE PER YEAR	134	156	153	443	151	156	168	475	918
GRADUATES PER YEAR	31	22	40	97	33	54	40	127	224
ADDITIONAL COMMUNITY YOUTH ENGAGEMENT		20	50	70	170	200	225	595	665



## COMPLETED CLASSES AT NSCC

		ENROLLED	COMPLETED
FOUNDATIONS AT NSCC	7/2020- 8/2020	46	41
FOUNDATIONS AT NSCC	01/20/21-02/26/21	32	27
NSCC MINI FOUNDATIONS FOR GHS	05/24/21-06/18/21	18	10
NSCC FOUNDATIONS FOR ESSEX	08/09/21-09/10/21	35	33
NSCC FOUNDATIONS FOR ESSEX	01/24/22-03/04/22	45	39
NSCC FOUNDATIONS FOR GHS	05/23/22-06/17/22	18	14
NSCC FOUNDATIONS FOR ESSEX	08/08/22-09/09/22	29	28
TOTAL TO DATE		223	192

## OTHER YOUTH ACTIVITIES

AMTEP continues to grow the Youth “expanded awareness initiative” beyond the vocational students:

YOUTH MANUFACTURING AWARENESS	2021	2022	2023 PLAN
AMTEP was not allowed into schools during the 2020/2021 pandemic as they were overwhelmed with managing remote learning, feeding their students, and overcoming digital equity.	2 Guidance Committee virtual group meetings 1 Virtual Industry Panel for Youth audience  Note: COVID impact still a factor	Thurgood Marshall Middle School STEM Class of 25 used Spark Photonics*  2-day Manufacturing Event for LEAP** class of 25: manufacturing games and tour of LVTI shop and GE Lynn plant	8 Events for ~170-200 students, mapping out junior and high school plan  AMTEP staff is developing tools and Training for MHNSYCC(MassHire North Shore Youth Career Center)

\* SparkAlpha is a project-based learning program that introduces students to advanced manufacturing and entrepreneurship through the lens of integrated photonics. The program culminates a live business plan pitch.

\*\*LEAP for Education (LEAP) runs free, after-school and summer programs designed to bridge the opportunity gap for students from underserved communities across Essex County MA.

AMTEP has discussed a state manufacturing curriculum from The Center for Advanced Manufacturing (CAM) at Mass Tech Collaborative (MTC), which has piloted a high school manufacturing curriculum for comprehensive high schools in the state. This curriculum is due to be released to targeted schools on January 24, 2023. AMTEP will review their google classroom and curriculum to see if it's suitable to be utilized more widely.





# STRATEGY 4

## EMPLOYER ENGAGEMENT

Critical to the success of both the adult and youth students' educational journey is the ability to gain immediate employment upon graduation. Employers represent the demand side of the workforce equation. Therefore, local employer engagement is a necessity. Employers are essential to post-program hiring, as well as curriculum feedback and identification of new programming.

Due to the exceptional number of classes per year, AMTEP is structured in a three-pronged simultaneous service model:

- 1** recruiting  
interviewing  
testing  
enrolling
- 2** case manage supporting  
monitoring  
evaluating  
teaching
- 3** career prep workshops  
grad panels  
tours  
job fairs  
placement activities

Key Employer Successes:

### VIRTUAL

MassHire pivoted to all virtual events during COVID, using a new PREMIERE platform that allows employers to have their own break-out rooms and provides post-event analytics. They eventually held outside job fairs in the summer and spring.

### INCREASE IN INDUSTRY ENGAGEMENT

The more exposure the adult students have to industry, and vice versa, the faster the job placement task is achieved. AMTEP increased class engagement activities with local industry **3.5 times over 3 years**. (12:17:44 respectively, 2020-2022). These numbers represent the employer visits, tours and job fairs for the training classes.

### MANUFACTURER CONTACTS

The AMTEP program manager and business service team at the MassHire North Shore Career Center have increased industry engagement on the North Shore by **60%** since the inception of this program. This is up from 79 manufacturing companies in 2020, to 127 manufacturing companies in 2022.

### AMTEP INDUSTRY ADVISORY FORUMS

AMTEP's program manager developed an Industry Advisory Committee to gain key insight into hot topics.

- Dec. 8, 2020: Virtual Meeting | COVID Impact
- Dec. 9, 2021: Interactive Breakout Session Meeting Group's Goals
- Oct. 27, 2022: Extended to Northeast Partners | 2 Panels of Experts on Training & Apprenticeships, Students & Apprentices Included

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– Toccara, AMTEP Machining  
Graduate





## LESSONS LEARNED, BEST PRACTICES DEVELOPED

### RESPONDING TO COVID

The AMTEP Team on the North Shore was the only workforce program in the Northeast region that continued to service their adult classes during early COVID. With great persistence and expertise, the teams pivoted to virtual learning solutions.

### CONSISTENT FUNDING

The success of AMTEP's ecosystem-focused programming stems from the continual commitment of funding from the GE Foundation. The "start and stop" approach from other traditional funders, as well as inefficient funding and contracting mechanisms, did not have the necessary impact to the workforce pipeline.

### MANAGING STUDENT ATTRITION

AMTEP partners are continuously evaluating and improving the vetting, interviewing and selection process. For example, NSCC implemented the GRIT assessment, which evaluates the intent to which you are able to pursue your long-term goals.

### SUPPORTING BEHAVIORAL HEALTH

COVID's impact on social-emotional health is also impacting retention rates. When a student faces challenges or communicates specific problems, coaches at the Career Center guide them to local support services.

### INCREASING MARKETING

Due to the workforce shortage and the pandemic impact, the need for investment in creative and improved marketing and awareness campaigns is critical to the ongoing recruitment of new students. AMTEP will continue the pursuit of the community-based awareness and recruitment campaign.

### MANAGING TRAINING CAPACITY

Machining instructor burnout has been addressed with the Train the Trainer program. We have added seven industry trainers (78% increase in training capacity), totaling 16, with two more targeted for 2023.

### INVESTING IN CAREER COACHING AND PREP

MassHire North Shore Career Center increased resources to better prepare classes for the workplace, ensuring the sustainability of a strong employment rate.

### MANUFACTURING WORKFORCE ADVOCACY

To meet the state- and nation-wide needs of the industry, the scale of the manufacturing skills gap deserves more political and industry-driven attention. The AMTEP Steering Committee will continue to pursue opportunities with the Executive Office of Labor & Workforce Development, while encouraging our industry partners to take a lead in advocacy.

### BACKBONE STEERING TEAM

GE Foundation, MassHire North Shore Workforce Board, the AMTEP program manager and Essex County Community Foundation have dedicated resources, time and met bi-weekly to ensure effective project coordination and execution.

### ADDITIONAL RESOURCES AVAILABLE UPON REQUEST

- Sperling Interactive Report 2022
- New Equipment Added Inventory
- MassHire North Shore Workforce Board Data Analyst Report 2022
- Employer Engagement Detail 3 yr
- North Shore Community College 2022 Report





**“ THANKS TO AMTEP WE HAVE DIVERSIFIED OUR STAFF AND GROWN A MORE INCLUSIVE CULTURE ”**

– Tony Dunn, Director E-Team



## NEXT STEPS

### SUSTAINABILITY STRATEGY



ECCF and the MassHire North Shore Workforce Board are developing sustainability strategies for funding future AMTEP cycles. Some examples being researched include Sustainable Federal Funding Options-Pell, Sustainable State Funding Options-Match and private fundraising.

### MANUFACTURING AWARENESS



AMTEP will continue to invest in the advanced manufacturing awareness campaign on the North Shore to cultivate the appropriate recruitment strategies to secure trainees for the manufacturing industry.

### YOUTH ENGAGEMENT

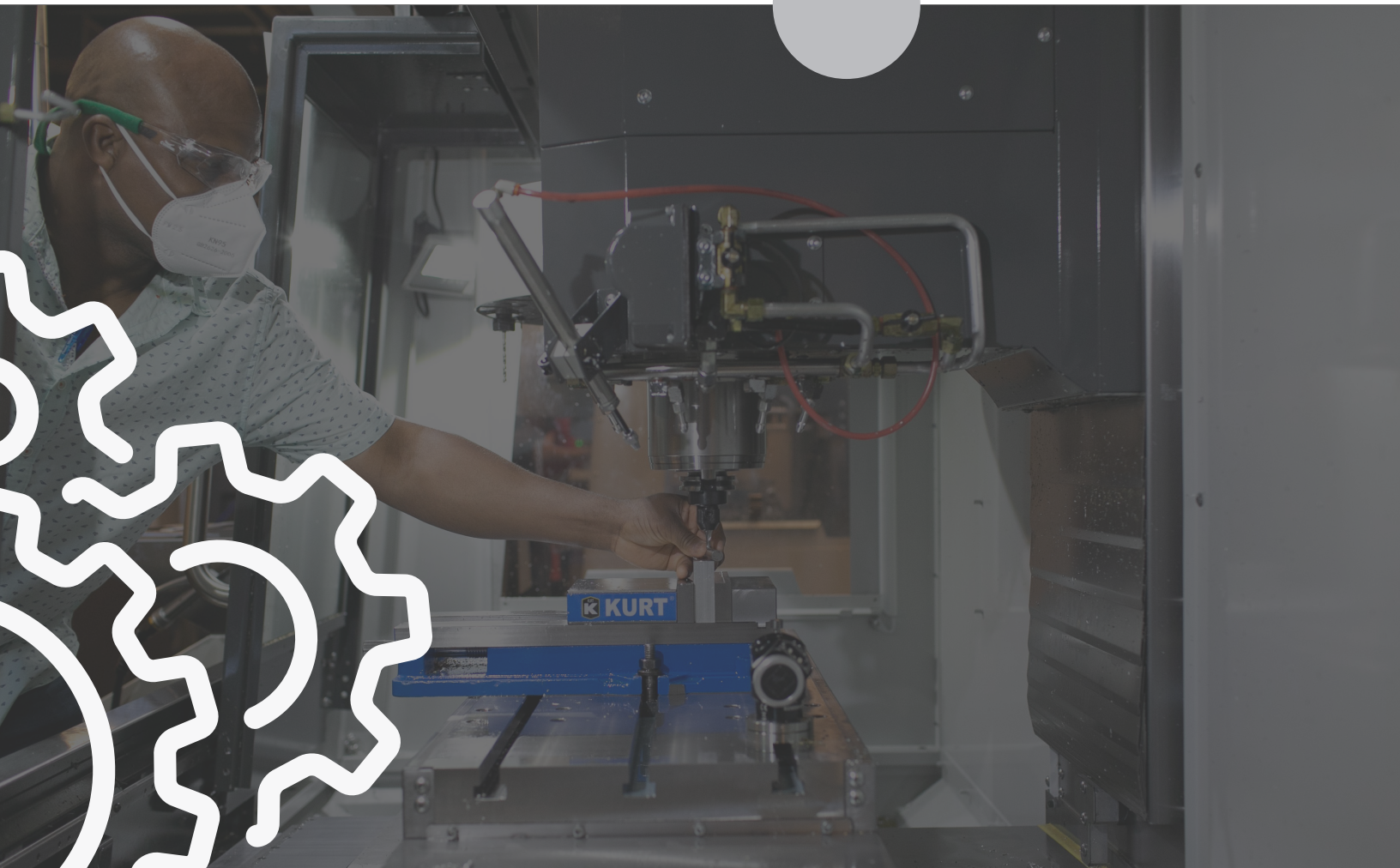


AMTEP is working with the MassHire North Shore Youth Workforce Board and Youth Career Center to create a larger number of engagements, outside the vocational schools, in 2023.

### EMPLOYER ENGAGEMENT



AMTEP partners will continue to engage and recruit new employers as part of the ecosystem, encouraging them to be part of the solution. They will also continue to inform and educate the North Shore and the business community about the reasons behind the labor shortage.





“ THE COMMITMENT AND COLLABORATION FROM ALL IS A MODEL FOR WORKFORCE DEVELOPMENT AND ONE TO REPLICATE FOR ALL INDUSTRIES IN NEED OF A SKILLED WORKFORCE ”

– Bonnie Carr, Director, Essex Tech



# AMTEP PARTNERS

**GE FOUNDATION**

**ESSEX COUNTY COMMUNITY FOUNDATION**

**NORTH SHORE COMMUNITY COLLEGE**

**ESSEX NORTH SHORE AGRICULTURAL & TECHNICAL SCHOOL**

**E-TEAM & LYNN VOCATIONAL TECHNICAL INSTITUTE**

**GLOUCESTER HIGH SCHOOL CTE**

**MASSHIRE NORTH SHORE CAREER CENTER**

**MASSHIRE NORTH SHORE WORKFORCE BOARD**

**MASSHIRE NORTH SHORE YOUTH CAREER CENTER**

**NORTH SHORE AMTEP INDUSTRY ADVISORY COMMITTEE**

**NORTHEAST ADVANCED MANUFACTURING CONSORTIUM**

**NORTHEAST MANUFACTURING INDUSTRY**



GE Foundation

