



## THE MISSION

Innovation – or bringing “mind to market” – is only possible if we have the talent to put that new idea or new technology to work in our economy. So LIFT’s vision, to be the world leader in lightweight materials manufacturing, can only be realized if we develop the educated and skilled workforce necessary to use new lightweighting technologies and processes.

Our plan to develop that educated and skilled workforce is comprehensive and spans both the continuum of jobs in manufacturing where the nation is now experiencing a “skills gap,” and the continuum of education and training that must be available in communities and states seeking to sustain, grow, and attract manufacturing jobs in their economy.

### The underlying principles of our work plan are:

First, be **“demand” and data-driven**. We will educate and train to the knowledge, skills and abilities in demand by manufacturers. Our first priority is to conduct regular demand-supply-and gap analyses on workforce needs in the 5 states directly related to the jobs in our impact sectors. >

Second, be **transformational for sustainable results** in producing workers with the right skills. You can find thousands of “random acts of excellence” in workforce development with little or no impacts on the talent supply chain. >

Third, **drive from the bottom up**. Recognize that all the systems we need to engage and use – education, economic development, and the workforce investment system – are highly devolved to state and local authorities. A top-down strategy will not work. >

Fourth, **strategically focus** on opportunities, for example, target populations such as separating military personnel and “gaps” in the talent supply chain where there are clear disconnects between the demand for skills and the supply of skills. >

Finally, **link and leverage the assets** available. Capture the initiatives to build educational pathways and link them via stackable credentials and articulation agreements across the education continuum. Align strategies to gubernatorial initiatives to increase educational attainment and put people back to work. Ride the wave of bipartisan support for restoring U.S. leadership in manufacturing globally.

## PROCESS FOR IMPACTFUL INVESTMENTS

- Analyze the demand-supply-and gap data to identify where investments and strategies need to be focused. Publish bi-monthly demand-supply-gap analyses for each of the five LIFT states.
- Establish a high level Workforce & Education Working Group for the region, representing national expertise and the 5 states’ education, workforce development, economic development, and industry sectors. Charge that working group with supporting the state teams that will be designing and implementing solutions that are demand-driven, results-oriented, replicable and scalable. The Workforce & Education Working Group was launched on September 23, 2014, and set the broad agenda for our work.
- Build five state core teams that will design and implement solutions appropriate to their state assets, demand/supply analysis, and roadmap to an educated and skilled manufacturing workforce. These solutions will fill “leaks” in their pipelines delivering talent to manufacturers. The 5 State LIFT Teams have been launched, involving over 135 top officials in education, workforce development, economic development, and labor.

- Align solutions to the 11 strategic focus areas identified by the high level working group.



Understanding workforce demand-supply gaps



Reconnecting disconnected youth to high quality, middle skills jobs



Teaching the teachers



Expanding work and learn opportunities for students



Creating enhancements to engineering curriculum using lightweighting technologies



Offering on-the-job training solutions for our industry partners



Attracting students and workers to educational pathways to careers in manufacturing



Connecting separating military personnel and veterans to fast track skills development and manufacturing careers



Deploying pathways from K-12 through community colleges to university four-year degree programs, with more on and off ramps to employment



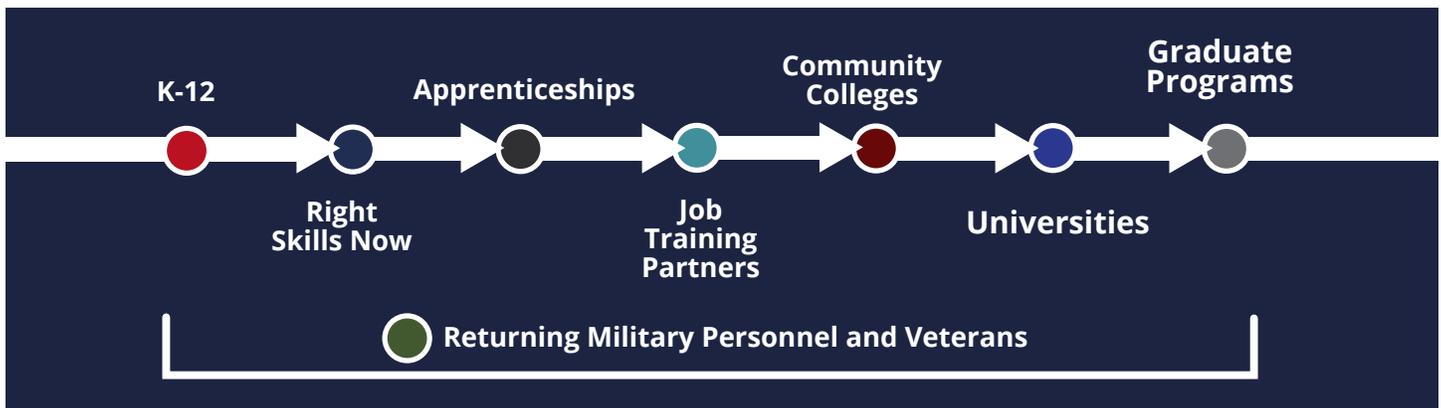
Ensuring students gain STEM foundational skills for success in manufacturing careers



Linking and leveraging resources and related initiatives on the ground today

- Identify appropriate metrics and capture data as necessary to assess success.

## INVESTMENTS AS OF NOVEMBER 2015



### LIFT Learning HUB

Across the talent continuum, with an early emphasis at university level



### Industrial Technology Maintenance Standards/Credentials/Instructor Training

Community & Technical Colleges; Incumbent Workers



### Tennessee's New ASM Bootcamps for Teachers

Community & Technical Colleges for Adult Workers and Incumbent Workers



### Kentucky's FAME 2.0 Initiative

Community & Technical Colleges for Adult Workers and Incumbent Workers



### Tennessee's Student Engagement Strategy/Video Contest

STEM Education/K-12/CTE Community & Technical Colleges



### National ASM-LIFT Materials Science Bootcamps for Teachers

Community & Technical Colleges for Adult Workers and Incumbent Workers



### Learning Blade: Mission LIFT interactive web-based curriculum (K-12)

Online curriculum for students serves k-12



### Indiana Vincennes University Right Skills NOW: Machinist training for veterans

Veterans and Right Skills NOW



### Kentucky's ExternshipsK-12

Teachers & Community College Instructors



### Virtual Reality Lightweight Vehicle Manufacturing System: Virtual reality technology to teach lightweighting principles

Across the talent continuum



### Ohio Manufacturing Careers Council: Industry-led council to inspire future manufacturing talent

Across the talent continuum



### Industrial Technology Maintenance Credential: National Institute for Metal Working Skills new credential program

Veterans, apprenticeships, community colleges





## INTRODUCTION

Lightweight Innovations for Tomorrow (LIFT) is a public-private partnership that will develop and deploy advanced lightweight materials-manufacturing technologies, and implement education and training programs to prepare the workforce. Lightweight materials are increasingly important to the competitiveness of transportation manufacturing sectors, including suppliers in the automobile, aircraft, heavy truck, ship, rail, and defense manufacturing industries. Lighter vehicles for the military, industry, and consumers alike, have better performance and use less fuel. They can carry larger loads and travel the same distances at lower cost and with fewer carbon emissions. From welding to skilled metal work, to logistics and mechanical and chemical engineering, to industrial design and manufacturing management, lightweighting-related jobs are found in nearly every manufacturing sector. A talented workforce is critical to the future of manufacturing, especially a workforce trained in lightweight materials.

## FINDINGS

### 2.65 million workers

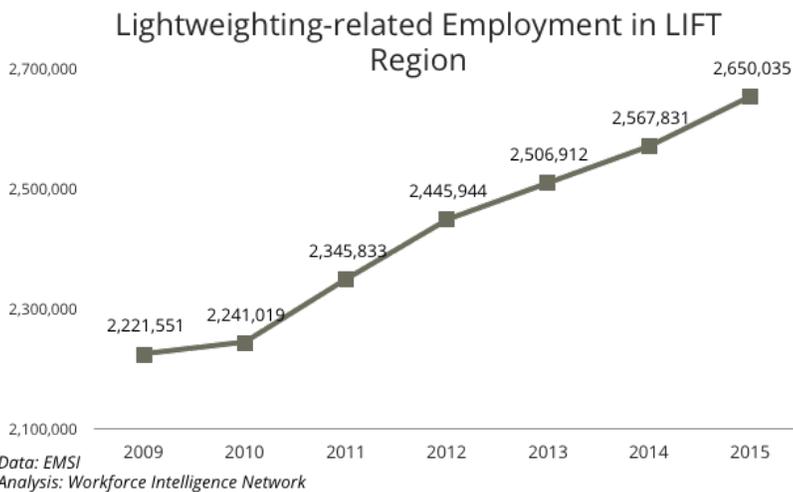
Over 2.65 million individuals are employed in lightweighting-related occupations in the 5-state LIFT region.\* These jobs represent 14.9% of all workers in the 5-state area, up from 13.7% in 2014.

### 428,500 jobs added

Like nearly every occupation, lightweighting-related jobs were lost during the 2009 recession. But, the recovery has been strong, with 428,484 jobs added since 2009 (a 19.3% employment increase) and more to come.

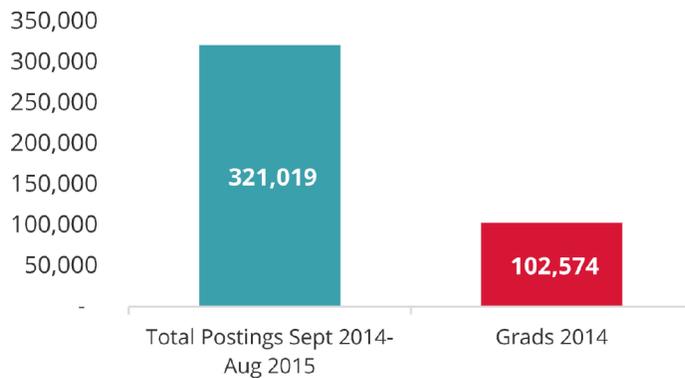
### A competitive edge

This 5-state region has a competitive edge when it comes to lightweighting talent. The LIFT region states contain 17.8% of the nation's lightweighting-related jobs with a national employment location quotient of 1.64. This means that the region has 1.64 times the employment concentration in lightweighting-related jobs compared to the rest of the United States. The concentration increased from 2014, when the location quotient was 1.44.



\* The LIFT region includes 5 states: Michigan, Ohio, Indiana, Kentucky and Tennessee

## Total Lightweighting-related Job Postings vs. Total Lightweighting-related Grads (LIFT Region)



Data: EMSI, Burning Glass, IPEDS  
Analysis: Workforce Intelligence Network

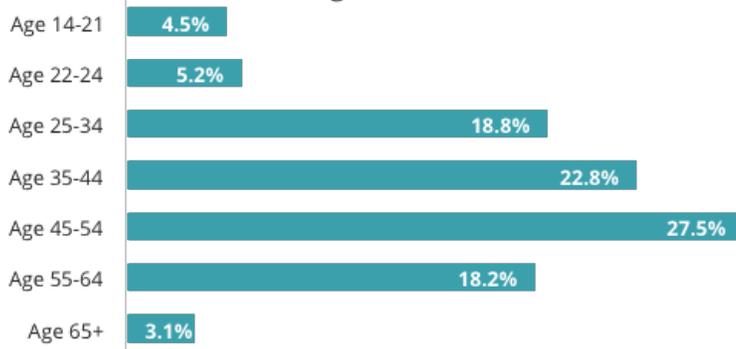
### 321,000 job postings

While employment is high, more workers will be needed soon. Between September 2014 and August 2015, employers in the LIFT region posted 321,019 jobs related to lightweighting. Right now, there are not enough graduates who have completed certificate and degree programs to fill all of these positions.

### Only 103,000 grads

In 2014, only 102,574 individuals completed lightweighting-related education programs. Completions have increased since 2013, when only 100,032 individuals completed related degrees. Despite progress, the number is not nearly enough to fill the more than 320,000 jobs posted by employers.

## Age of Lightweighting-related Workers in LIFT Region, 2015



Data: EMSI  
Analysis: Workforce Intelligence Network

### 21% set to retire soon

Lightweighting-related workers are aging, 21.3% of workers in the field are over the age of 55 and are likely to retire in the coming decade. In 2014, the share was 19.7% over age 55. Who will fill the jobs left behind?

### Opportunity for growth

New and growing employer demand coupled with coming retirements means even more lightweighting job growth in the future. The 5-state LIFT region has a unique opportunity through LIFT to grow employment and increase economic prosperity for workers and families.

2.65 million

Workers employed in lightweighting jobs in the LIFT region

321,019

2014-15 lightweighting job postings by LIFT region employers

102,574

Workers employed in lightweighting jobs in the LIFT region

21%

Of the lightweighting workforce set to retire soon

## What counts as lightweighting?

Over 140 individual occupations are related to lightweighting and can be organized into 3 main occupational groups and 10 sub-groups. (1) Skilled trades jobs include machinists, assembly and operations workers, and skilled materials workers. (2) Administration jobs include procurement and purchasing workers, human safety workers, and logistics workers. (3) Engineering & design jobs include electrical and mechanical engineers, chemical engineers & metallurgy workers, designers and drafters, and process engineers and testers.