



Beyond the Shortage

How Coordination Can Power the Future of America's Workforce

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Executive Summary

America's workforce challenge is significant and growing. There are fewer births while the retiring population is increasing. Employers struggle to find technicians, healthcare workers, cybersecurity professionals, advanced manufacturing talent, and workers prepared for emerging industries.

In response, America has invested heavily in workforce development efforts. Yet workforce shortages persist. This paper argues that the challenge is not simply a shortage of talent. It is a shortage of coordination infrastructure.

While substantial resources have been invested in training programs, apprenticeships, credentials, and workforce pathways, comparatively little has been dedicated to the infrastructure needed to connect those efforts into effective workforce ecosystems. Employers, educators, workforce

organizations, philanthropies, and community organizations often work toward shared goals through disconnected systems and funding streams.

This paper examines three symptoms of fragmented workforce ecosystems:

- **The Awareness Gap:** People cannot pursue opportunities they don't know about.
- **The Preparation Gap:** Training systems struggle to keep pace with workforce demand.
- **The Collaboration Gap:** Fragmented efforts limit impact and sustainability.

The common thread across all three challenges is the absence of sufficient coordination infrastructure: the organizations, systems, partnerships and shared processes that can sustain collaboration over time.

For workforce investment leaders, investing in coordination infrastructure may be one of the highest-leverage workforce investments available. The future of workforce development may depend less on creating new programs and more on strengthening the infrastructure that enables existing programs to work together as effective workforce ecosystems.





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Introduction

America's Workforce Challenge is Bigger than a Talent Shortage

From advanced manufacturing and biotechnology to healthcare and information technology, employers across sectors report difficulty finding qualified workers. At the same time, workforce systems are being reshaped by artificial intelligence, automation, electrification, demographic shifts, and rapidly evolving skill requirements. Despite significant investments in workforce development, employers continue to face workforce shortages, and many workers remain disconnected from economic opportunity.

The challenge is not a lack of effort. Across the country, employers, educational institutions, workforce agencies, philanthropies, and community organizations have invested substantial resources in training programs, apprenticeships, career pathways, and workforce initiatives. Yet many of these efforts struggle to achieve lasting, system-wide impact.

The question is not whether investment is occurring. The question is whether investments are being connected, aligned, and sustained in ways that produce stronger workforce outcomes.

Through conversations convened as part of FHI 360's Empowering the Future initiative, leaders from industry, education, philanthropy, workforce development, and social impact organizations identified a

Empowering the Future

Empowering the Future is a thought leadership and peer learning initiative convened by the Institute for Work & Learning (IWL) at FHI 360 that brings together nearly 40 leaders from corporations, foundations, higher education, workforce organizations, research institutions, and social impact organizations to address the workforce challenges shaping the future of work. Participants include representatives from organizations such as Amazon, CVS Health, Novartis US Foundation, Caterpillar, IBM, Tata Consultancy Services, Strada Education Foundation, community colleges, universities, and workforce intermediaries.

Designed as a trusted space for cross sector dialogue and collaborative problem solving, participants meet quarterly to explore how rapid changes in technology, AI, labor market demand, education, and workforce systems are reshaping pathways to opportunity, and to identify practical opportunities for collective action, partnership, and systems change that can strengthen workforce ecosystems and better prepare learners and workers for the jobs of today and tomorrow.

common challenge: workforce systems are often fragmented. Organizations pursuing similar goals frequently operate through separate funding streams, governance structures, planning processes, and information systems. As a result, valuable investments often function as isolated initiatives rather than components of a coordinated workforce strategy.

This fragmentation creates real costs. Learners struggle to navigate pathways into careers. Employers find it difficult to

communicate evolving workforce needs. Education and training providers face challenges keeping pace with changing labor market demand. Successful pilot programs frequently struggle to scale, while promising initiatives often disappear when short-term funding ends.

These challenges point to a frequently overlooked reality: workforce development depends not only on programs, but also on the infrastructure that connects them.

This paper argues that coordination infrastructure is one of the most important and underfunded components of workforce development.

Coordination infrastructure includes the organizations, systems, governance structures, partnerships, and shared processes that align stakeholders around common goals. Successful coordination, with the infrastructure needed to support it, can translate employer demand into workforce pathways. Without sufficient coordination support, even effective workforce programs can struggle to produce lasting impact.

The need for investment in coordination infrastructure has become increasingly urgent. Employers face growing pressure to build future-ready talent pipelines. Funders are expected to demonstrate measurable outcomes and long-term value. Educational institutions are increasingly accountable for employment, earnings, and economic mobility outcomes. Meeting these expectations requires workforce ecosystems

that can align stakeholders, adapt quickly to changing conditions, and coordinate action across sectors.

For workforce investment leaders, this presents a significant opportunity. Rather than funding only individual programs or short-term pilots, investments in coordination infrastructure can strengthen the performance of entire workforce ecosystems, improving the effectiveness, scalability, and sustainability of existing workforce investments.

In this publication, we explore three key challenges (“gaps”) in workforce development and examine how stronger coordination, supported by effective coordination infrastructure and cross-sector partnerships, can help regions build more connected, responsive, and future-ready workforces.



1 The Awareness Gap

People won't pursue the pathways they can't see

Aerospace manufacturers, employers in skilled trades, and healthcare systems are all struggling to attract the next generation of workers, despite these careers offering strong wages, clear advancement pathways, and growing demand (see inset).^{1,2,3,4,5}

However, millions of Americans have no visibility into these high opportunity fields. Pathways into careers like these can be life-changing, particularly for career changers, adults returning from military service, individuals reentering the workforce after incarceration, or the more than five million Opportunity Youth in the U.S., but many are unaware these opportunities exist. As a result, employers are missing out on the workforce of tomorrow simply because the positions they are trying to fill are invisible to would-be workers.

Students are more likely to discover high-opportunity career pathways when employers, educators, and workforce organizations work together to make those opportunities visible and accessible.

Structured coordination can turn individual outreach efforts into coherent career awareness strategies. Workforce intermediaries, community colleges, workforce boards, and other organizations can serve as the coordinating bodies. They can provide the structure needed to bring employers and educators together to connect students with high-demand career pathways. Manufacturers can host

Demand for skilled workers is growing:

- Engineering Technicians (+15%)
- Biotechnology (+7–10%)
- Pharmaceutical Manufacturing (+6–8%)
- Healthcare & Nursing (+8.4%)
- AI Specialists/Data Analysts (+22%)
- Cybersecurity/Information Security Analysts (+29%)
- Quantum Technicians (+14%)
- Semiconductors workforce (+33%)
- Clean Energy jobs (+4.2–4.9%)

Sources: Talenbrium, Bureau of Labor Statistics, CHIPS Act projections, U.S. Department of Energy.



plant tours, healthcare providers can offer job-shadowing experiences, community colleges can introduce career pathways, and schools can partner with employers to connect classroom learning to real-world careers. Together, these efforts help

How Coordination Infrastructure Can *Build Career Awareness and Opportunity Visibility*

- **Career awareness campaigns and employer storytelling:** Employers and partners make careers relatable, highlight workplace culture, and shift outdated perceptions of trades.
- **Early career exploration:** Schools introduce middle and high school students to career interests through mapping tools and career linked courses.
- **Workplace visits and job shadowing:** Employers host students onsite to observe daily tasks, workplace culture, and the real world skills used by professionals.

students and families understand the opportunities available to them and the steps needed to pursue them. By making high-demand careers easier to see and access, communities can strengthen talent pipelines while expanding economic opportunity.

Career awareness improves when employers, K-12 systems, community colleges, and workforce organizations work together around a common strategy. Partners can collaborate with schools to identify when and how students can be exposed to technical careers, then collaborate to make career pathways visible and aspirational for students and families.

Examples: Coordinated Career Awareness

Career pathway exploration beginning early in high school.

At Niagara Falls High School, career exploration begins early. In ninth and tenth grade, students complete career interest inventories and gain exposure to different career options. By junior year, every student

selects one of five career pathways spanning fields such as business, finance, design, and engineering. The district has also expanded employer partnerships to help students connect their education to career opportunities. This intentional focus on career exploration helps students better understand workforce opportunities and make more informed decisions about their futures.⁶

Industry campaigns that make technical careers visible and attractive.

The National Association of Manufacturers (NAM) runs several employer-led awareness campaigns designed to reshape public perceptions of manufacturing and attract new talent into the industry. The centerpiece of this effort is the Creators Wanted initiative, the largest manufacturing workforce campaign in the U.S., aimed at recruiting 600,000 new workers by 2025. While NAM and the Manufacturing Institute coordinate the national strategy, local manufacturers carry out direct, community level engagement by opening their facilities, supplying equipment and expert mentors, and shaping career messaging to match real industry needs. National-level research



on their efforts since 2017 has found that perceptions of manufacturing jobs have significantly improved during that same period: 84% of participants report improved views of manufacturing careers⁷, and the percentage of surveyed parents who are likely to encourage their child or other youths to pursue a career in manufacturing rose from 27% to 40%.⁸

Hands-on exposure to careers and workplaces.

Shaw Industries, a large flooring manufacturer in Georgia, provides a work-based learning program that allows high school students to earn income and gain hands-on work experience while working toward completing their high school diplomas. Students are offered structured, paid, on-the-job training, mentoring, and real-world skill-building across multiple departments—from manufacturing and maintenance to logistics, quality control, and business operations—allowing them to rotate through real job functions while supported by supervisors and mentors. Shaw partners with local chambers of commerce and area school districts to provide training

and link graduates to full-time jobs with regional employers. In 2023, Shaw reported that every participating senior chose to stay through graduation, and more than 50 students transitioned directly into full time roles or apprenticeships, demonstrating the program's strong retention and workforce impact.⁹

Direct support to schools through STEM learning tools and engagement.

The Caterpillar Foundation is honoring America's 250th anniversary by launching its Our Shared Future: 250 initiative. Through this initiative, the Foundation is investing \$2.3 million over three years to expand STEM and AI education for K-12 students nationwide through the Smithsonian Science Education Center, supporting a cohort of schools in the new Smithsonian STEAM Schools of Distinction program, providing educators with professional development and hands on resources, creating an AI focused STEM learning guide, and delivering virtual training in 40 communities. As part of its efforts, Caterpillar employees will be encouraged to contribute 250,000 volunteer hours in their communities by April 2027.¹⁰

2 The Preparation Gap

Training can't keep pace when skills outrun programs

Demand for skilled trades is rising so quickly—and the technological requirements of those jobs are evolving so rapidly—that training programs can no longer keep pace in preparing workers. This creates a disconnect between what employers need and what training programs are preparing workers to do.

The demand mismatch is clear: manufacturing vacancy estimates show 350,000–400,000+ open positions across the sector,¹¹ while U.S. education and training programs produce only about 70,000 precision production and skilled trade graduates each year.¹² At the same time, the number of graduates from community colleges has declined by nearly 40%. And a large portion of those credentials

(more than one-third, according to the Community College Research Center) are unlikely to lead directly to living-wage jobs or bachelor's degrees that open doors to them.¹³

But the preparation gap is not about numbers alone. As employers increasingly seek skills related to automation, robotics, AI, and digital manufacturing, workforce requirements are evolving faster than training programs can update their curricula.¹⁴ Community colleges can play an essential role in creating this alignment, but many employers only engage intermittently. Without sustained coordination, curricula become outdated, skill gaps emerge, and workforce investments lose their effectiveness.

Preparation succeeds when education and industry remain aligned: aligning training and preparation with actual workforce needs requires active and ongoing coordination between employers and training programs.



Community colleges are most effective when employers actively participate in designing curricula and informing workforce preparation. As workforce hubs and talent connectors in their communities, community colleges can coordinate with employers to translate labor market demand signals into training programs that directly prepare students with the skills they need to succeed.

How Coordination Infrastructure Can *Strengthen Employer-Education Alignment*

- **Co-designed curricula:** Employers and schools jointly build course content that reflects real equipment, processes, and skill needs.
- **Industry-recognized credentials:** Schools partner with industry leaders to embed certifications that employers value into training programs.
- **Apprenticeships:** Colleges blend classroom instruction with paid on-the-job training for employees that builds their competency on the job toward full technical roles.
- **Internships and work-based learning:** Employers host students in short term, structured workplace experiences to apply skills in real work environments.
- **Faculty industry collaboration:** Instructors partner with company experts to stay current on emerging technologies and update labs.

Examples: Emerging Models for Employer-Education Partnerships

Education-industry partnerships building coordinated skills pathways.

NJBioFutures is a statewide public private partnership that aligns education and industry to build a skilled, job-ready workforce for New Jersey's fast-growing cell and gene therapy and biomanufacturing sector. The coalition connects high schools, community colleges, and universities with leading employers to co-design curricula, credentials, and training pathways that reflect real labor market needs and prepare learners for roles across the industry. Flexible on-ramps and off-ramps allow students and workers to enter or advance at any stage, supported by career counseling, job

shadowing, and mentorship. With strategic partners like BioNJ and HINJ and active engagement from employers including Johnson & Johnson, Bristol Myers Squibb, and Novartis, NJBioFutures ensures that education programs are tightly aligned to skill requirements and that New Jersey's biomanufacturing employers have access to a strong, sustainable talent pipeline.^{15,16}

Employer led coordination driving demand responsive training systems.

The Siemens Foundation's Careers Electric™ initiative is meeting the nation's accelerating electrification demands by partnering directly with community colleges and employers to build coordinated, industry aligned electrical training pathways. As electrification expands across data centers, AI infrastructure,



advanced manufacturing, and new energy systems, the foundation is investing \$9.25 million in North Carolina to enable the Community College System to modernize electrical curricula, expand training capacity, and provide student supports such as stipends, coaching, and no-cost training materials. Founding employers—including ABB, Amazon Web Services, Duke Energy, JetZero, Hitachi Energy, and Siemens—work

hand-in-hand with colleges and workforce organizations to align programs with real skill needs and strengthen sector coordination. Together, they are creating multiple entry points from high school through youth apprenticeships, community college credentials, and advanced electrical training. The initiative aims to train 25,000 people over the next decade and position North Carolina as a scalable model for other states.¹⁷

3 The Collaboration Gap

Disconnected systems don't deliver results.

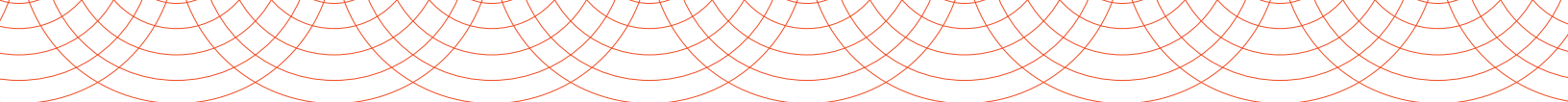
Many workforce initiatives exist and are individually effective. The challenge is that they frequently operate separately, with limited mechanisms for collaboration and alignment. There are few formal structures that force or facilitate integration across the entire workforce ecosystem. Workforce boards, chambers, and regional partnerships often have different goals and incentives, separate funding streams, and disconnected data systems. Fragmentation can result in confusing pathways for students, duplicated efforts across stakeholders, and/or misalignment between training programs and labor market needs.

Grant funding from public and private sources can help to fill gaps—but disconnected pilot projects or “innovation challenges” only add to the fragmentation problem, and don't produce lasting results. Additionally, when workforce development programs are based on grant funding, they start and stop based on funding cycles, not employer demand. For example, a college may decide to launch a drone technician program because a federal grant is available, even though regional employers need HVAC technicians. Or a successful manufacturing apprenticeship pilot program might shut down after a three-year grant completes, despite strong outcomes—leaving students without a pathway and employers without a pipeline, just as they begin to rely on it.

When stakeholders partner to align and synchronize efforts, a coordinated workforce ecosystem emerges that can accelerate workforce development.

Within an effective workforce ecosystem, different partners can each play an essential role that informs and reinforces the efforts of other partners (See table below). Coordination infrastructure ensures that all actors work towards shared goals, coordinate efforts, and sustain alignment over time.





Stakeholder	Role
Employers	Shape demand signals and provide work-based learning
Community colleges	Prepare talent and connect learning to employment
K–12 education	Build awareness and career exploration
Universities	Provide advanced workforce and research capacity
Workforce boards	Manage labor market intelligence and workforce funding
Community Organizations	Support learner recruitment, connection, navigation
Philanthropy	Invest in innovation and infrastructure
Coordination Infrastructure	Coordinates all partners and sustains alignment

How Coordination Infrastructure Can *Strengthen Workforce Ecosystem Collaboration*

- **Cross sector coordination and partner alignment:** Convene partners, steward relationships, and coordinate roles and priorities so employers, educators, and workforce organizations operate as a unified ecosystem.
- **Governance and accountability:** Establish shared decision making, accountability systems, and formal coordination structures that replace ad hoc efforts and maintain long term alignment.
- **Alignment on shared priorities and workforce gaps:** Use labor market analysis, employer engagement, and ecosystem mapping to surface where demand, awareness, and training capacity are misaligned; establish shared goals, metrics, and accountability so partners operate as one coordinated talent pipeline.
- **Unified data and measurement systems:** Integrate data across institutions, create common metrics and reporting structures, and ensure partners can see the same labor market signals, track outcomes consistently, and make evidence based decisions.
- **Communications and knowledge sharing:** Disseminate insights, results, and promising practices; keep partners informed and aligned around what works.



Examples: Emerging Models for Ecosystem Collaboration

Scalable work-based learning through effective coordination infrastructure. CareerWise Colorado has shown that modern youth apprenticeship systems only work when strong coordination infrastructure sits between schools and employers. As the statewide intermediary, CareerWise centralizes work-based learning coordination across a pool of employers, managing student matching, school communication, documentation, and compliance, so individual employers aren't burdened with administrative tasks that often make offering WBL out of reach. This shared coordination infrastructure reduces administrative

burdens, keeps programs aligned with industry talent needs, and enables Colorado to scale youth apprenticeships across more than 100 employers and multiple sectors, demonstrating how coordinated systems make work-based learning accessible and sustainable for both schools and industry.¹⁸

Ecosystem partnerships to drive emerging workforce pipelines.

Central New Mexico Community College Quantum Technician Training Program is helping New Mexico address a major coordination gap between fast-moving quantum R&D investment and the technicians needed to deploy emerging technologies. CNM is closing that gap by building shared coordination infrastructure anchored by its Quantum Technician Bootcamp and Quantum Learning Lab, which provide hands-on training with quantum hardware, photonics, vacuum systems, and cryogenics. This infrastructure is powered by a deeply collaborative ecosystem: Sandia National Laboratories co-develops the technical training framework and lab specifications; Elevate Quantum supports CNM as the workforce lead for a multi-state Tech Hub; and Los Alamos National Laboratory, regional startups, and statewide economic organizations help shape curriculum, provide internships, and signal employer demand. Together, these partners form a unified talent engine connecting learners to high-growth workforce pathways, and early results show graduates earning \$65,000–\$85,000 in entry-level roles and being actively recruited by employers across the region.

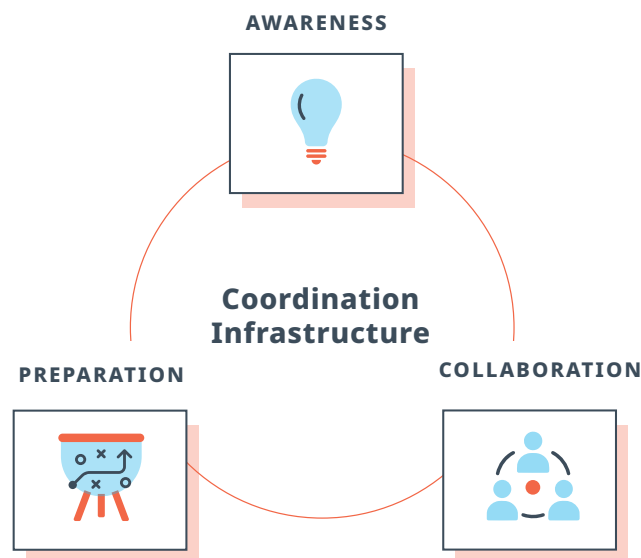
Making Workforce Systems Work

Why to Invest in Coordination Infrastructure

To address these barriers, America needs better talent coordination that aligns training with market demand (preparation), not more disconnected credentials. It needs clear pathways from education to careers, and the ability to promote these pathways to students and families (awareness). And it needs institutions capable of aligning and coordinating stronger workforce ecosystems and continuously adapting them to changing workforce needs (collaboration).

A highly performing workforce ecosystem operates as a coordinated engine rather than a collection of isolated programs:

- **Shared goals** and **shared metrics** across partners ensuring everyone is working toward the same outcomes and measuring progress the same way.
- **Aligned investments** allow resources to flow toward strategies that benefit the whole system rather than individual institutions.
- **Continuous employer engagement** in shaping training priorities and validating skill needs in real time.
- **Responsive training systems** adapt quickly to changing technologies and labor market demands.
- **Durable partnerships** provide the long term stability needed to sustain collaboration and deliver reliable talent pipelines.



Workforce development systems need sustained support for collaboration infrastructure, governance, and communication channels for stable partnerships, including long-term maintenance of shared data systems to sustain the work. It is essential to incorporate the voices of job seekers, industry, education, municipalities, and others to ensure solutions are community grounded. But coordination does not happen automatically: someone must be responsible for making it happen.



A workforce ecosystem without coordination infrastructure is like a supply chain without a logistics hub: every actor may be working hard, but the system cannot consistently produce results.

Strong regional workforce systems depend on organizations capable of connecting stakeholders, aligning priorities, and translating shared goals into collective action. Coordination infrastructure provides the leadership, coordination, and behind-the-scenes support that keeps multi-partner initiatives aligned, effective, and moving toward shared goals.¹⁹ In workforce ecosystems, this function integrates employer needs with education and training providers, aligns incentives, manages shared data systems, and coordinates efforts so the entire system operates as a unified talent engine.

There is no single model for effective coordination infrastructure. Various types of organizations can provide coordination infrastructure, often referred to as a “backbone” organization²⁰, and the role can even be shared by multiple organizations²¹, providing flexibility for diverse partnership ecosystems and contexts. This function may be performed by workforce intermediary organizations (such as FHI 360 and similar nonprofit conveners), community colleges, workforce development boards, regional economic development partnerships, industry associations, chambers of commerce, public-private partnerships, and other trusted organizations with the capacity to convene stakeholders and coordinate action.

For workforce investment leaders seeking measurable, scalable impact, investing in coordination infrastructure may be one of the highest-leverage workforce investments available.

Corporate funders are increasingly redesigning their giving to serve core business priorities, shifting from broad altruistic “purpose” efforts toward strategies that directly reinforce enterprise goals, strengthen competitiveness, and create measurable business value—all while still aiming to support communities and nonprofits.²² As corporate giving faces increasing pressure to align giving with their “bottom line” priorities, investing in workforce ecosystems is both a

high-impact community investment and a strategic business imperative.

Funding the coordination infrastructure for workforce ecosystems requires resources, but it is one of the most efficient investments a region can make. With a relatively small annual budget, a backbone organization can coordinate hundreds of partners, amplifying and aligning millions—sometimes billions—of dollars already flowing through the system.²³

Below are concrete recommendations for workforce investment leaders who are interested in investing in strong workforce ecosystems.

How to Support Coordination Infrastructure for Workforce Ecosystems: Investment Guidance

1. **Fund ecosystem** mapping before launching new training programs to identify gaps, bottlenecks, and misalignment between employer demand and training capacity.
2. **Invest in coordination infrastructure**, not just direct service pilots, including project management, staffing, convening capacity, and partner engagement.
3. **Require meaningful employer participation** and shared metrics so programs reflect real skill needs and partners operate as a coordinated talent pipeline.
4. **Build and maintain unified data, governance, and communication systems** that allow partners to share evidence, track outcomes, and make joint decisions.
5. **Provide multi-year funding for coordination**, replacing one-off innovation grants with sustained support that allows ecosystems to mature.
6. **Align and braid funding across agencies and workforce boards** to stabilize high-value pathways, reduce stop-start cycles, and ensure programs persist beyond grant periods.
7. **Support long-term ecosystem stewardship** to maintain momentum, partner alignment, and durable collaboration over time.

Conclusion

America's workforce challenge is not simply a shortage of talent: it is a shortage of coordination. Students need visibility into careers, employers need reliable talent pipelines, and community colleges need strong connections to industry. Regions depend on organizations capable of aligning partners around shared goals, shared metrics, and aligned investments. Community colleges serve as essential workforce hubs and talent connectors, but they cannot meet this moment alone. Durable partnerships, continuous employer engagement, responsive training systems,

and backbone organizations that provide coordination infrastructure are all required to bring educators, employers, government, philanthropy, and community stakeholders into a unified strategy. When awareness, preparation, and coordination work together, regions build workforce ecosystems that connect learning with opportunity and strengthen economic competitiveness for the long term. The organizations that embrace this collaborative model today will help build the workforce, and the economy, of tomorrow.

About the Authors



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