

CLUSTERS & DISRUPTORS:

Envisioning Central Indiana's Economic Future in a Time of Change



Prepared for: The Central Indiana Corporate Partnership
Prepared by: TEconomy Partners LLC



TEconomy Partners, LLC (TEconomy) endeavors at all times to produce work of the highest quality, consistent with our contract commitments. However, because of the research and/or experimental nature of this work, the client undertakes the sole responsibility for the consequence of any use or misuse of, or inability to use, any information or result obtained from TEconomy, and TEconomy, its partners, or employees have no legal liability for the accuracy, adequacy, or efficacy thereof.

Executive Summary

Introduction

Publicly traded investments are required to highlight that “past performance does not guarantee future returns.” Certainly, past performance may be an indicator of quality decision-making and sound fund management strategies; but, the disclaimer inherently recognizes that the world of business is dynamic and subject to change. The same disclaimer should be used by those decision-makers concerned with the performance of the economy. Economies, whether national or regional, are intrinsically dynamic—subject to internal and external forces of change that influence key factors such as market demand, competition, capital availability, labor supply, public policy, and technological innovation.

Economic development is a discipline that works to help economies adapt to and leverage forces of change and realize their potential in terms of expanding business output, wealth, prosperity, and quality job generation. A subset of the discipline is technology-based economic development (TBED), an advanced form of economic development that recognizes the central role played by innovation and technological advancement in successful modern economies.

The Central Indiana Corporate Partnership (CICP) is an economic development and strategy organization, founded in 1999, with a strategic focus on TBED. CICP has experienced considerable success in bringing key regional stakeholders and innovative organizations together to effect the successful growth of technologically oriented, advanced industry clusters in Central Indiana (for the counties included in the region, see Figure ES-1). Through deployment of rigorous analysis and a sustained commitment to stakeholder dialogue, CICP has formed a series of well-informed cluster-oriented initiatives that have served the region well—working to ensure that key elements of a complete TBED ecosystem are in place to support forward-looking research and development (R&D) growth and innovation, skilled workforce development, support for entrepreneurship, facilitated access to risk capital, and informed public policy. Facilitated by the work of CICP, Central Indiana’s existing businesses have been joined by regional start-up ventures and new business recruits. The region has been acknowledged by outside

Figure ES-1: Central Indiana Study Area



observers¹ as being among the pioneers of collaborative, cluster-focused economic development—providing a case study in the development and execution of strategically planned TBED.

As an informed and purposeful regional investor of funds provided by leading companies, philanthropy, academia, and other key stakeholders, CICIP well recognizes that its past performance and strategy execution are not a guarantee of future success. Indeed, change appears to be accelerating rapidly as the emerging forces of convergence (the tendency for novel innovation to occur at the intersection of previously distinct business sectors), the rapid pace of disruptive technology development, and new business models individually, and in combination, shape the marketplace. Being strategic and working a plan, at the direction of its member organizations, to achieve a prescribed vision has worked for CICIP, and the organization does not intend to change that way of working. Rather, CICIP understands that the pace of change and need for global relevance now call for revisiting its strategy, reevaluating regional clusters, and gaining understanding of the forces of change likely to drive Central Indiana's economy for the next decade.

To address these and other issues, CICIP commissioned this “Clusters and Disruptors” report. It contains in-depth quantitative and qualitative analytics to identify key advanced industry clusters for the region; provides a detailed situational assessment of these clusters and the associated regional TBED ecosystem (including benchmarking against aspirational competitors); and gives robust consideration to megatrends, convergence forces, and disruptive technologies likely to shape the regional economic landscape over the forthcoming decade. Ultimately, the work leads to a series of strategy and action concepts designed to supplement (not replace) the successful ongoing work of CICIP and its core initiatives, and to help position Central Indiana's economy for success in the global economy as industries and their associated markets evolve.

¹ See, for example, the recent write-up of the Central Indiana success story in Bruce Katz and Jeremy Nowak, 2018. *The New Localism: How Cities Can Thrive in the Age of Populism*. Brookings Institution Press. Washington, DC.

Central Indiana's Evolving Advanced Industry Clusters

Indiana's industry clusters have advanced and evolved since the original Battelle strategy performed for CICP in 2001. Today, based on the analytical work outlined herein, six clusters of technology-oriented industry (Figure ES-2) stand out as critically important drivers of regional economic progress:

Figure ES-2: Central Indiana's Advanced Industry Clusters²



Source: TEconomy's analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced file from IMPLAN.

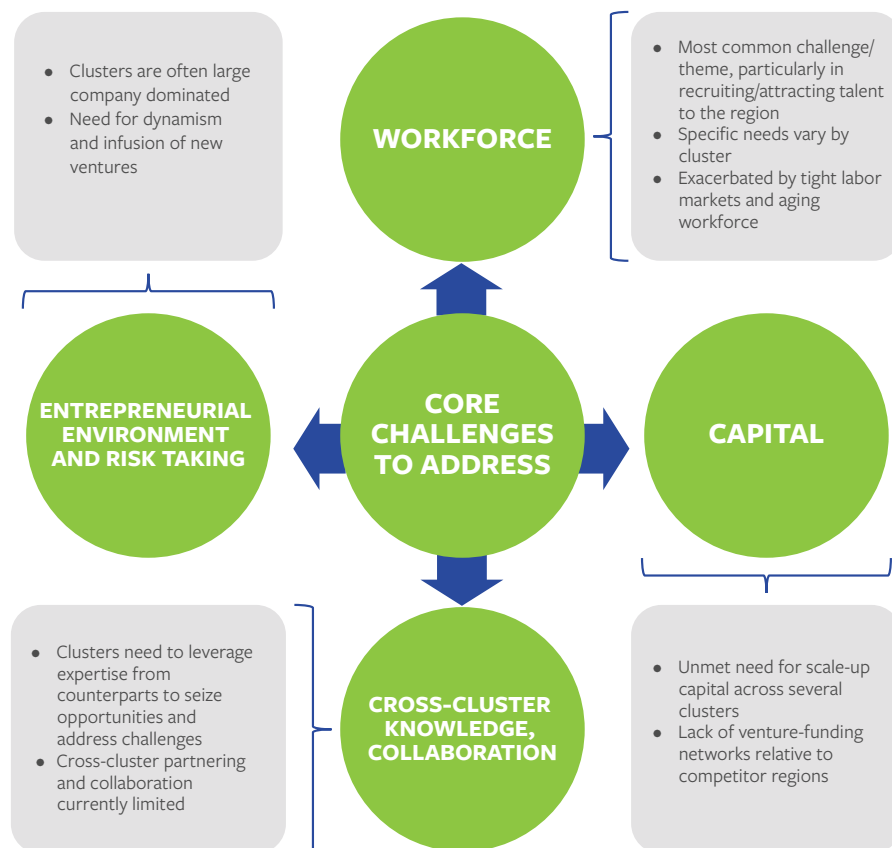
² LQ = Location Quotient. This is a measure of the degree of regional industry specialization. A location quotient greater than 1.0 indicates the industry is present in a higher concentration than it is in the nation. A location quotient less than 1.0 indicates a lower concentration than the nation.

There are many positives to highlight across Central Indiana's six advanced industry clusters.

- **They are Diverse.** Central Indiana does not face a situation of having all its eggs in one basket. Its advanced industry clusters are diverse, serve a broad cross-section of markets, and are each in sectors likely to experience sustained demand into the foreseeable future (although several are facing disruptive technologies and other forces of change discussed in this report).
- **They Support Higher-than-Average Levels of Compensation.** All six of the clusters have average annual pay levels that exceed the average for private sector industry overall in Central Indiana.
- **They Employ Significant Volumes of Personnel.** Combined, the six clusters directly employed 239,452 personnel in 2016; and all, except the smallest of the clusters, increased their regional employment levels from 2010–2016. Technology-intensive, supporting major supply chains, and paying high wages, the employment multiplier is strong and more than doubles the total regional employment driven by economic activity in the clusters.
- **Innovation Activity is Evident in All:** R&D-based innovation is robust across industry and academia in the clusters, spanning both patenting and burgeoning venture-backed new business venture formation.

While fundamentals are strong for the clusters, and most currently have momentum, interviews and focus groups identify ongoing challenges for CICIP to continue to help address, most notably in relation to those highlighted in Figure ES-3.

Figure ES-3: Common Challenges and Areas of Need for Central Indiana's Industry Clusters

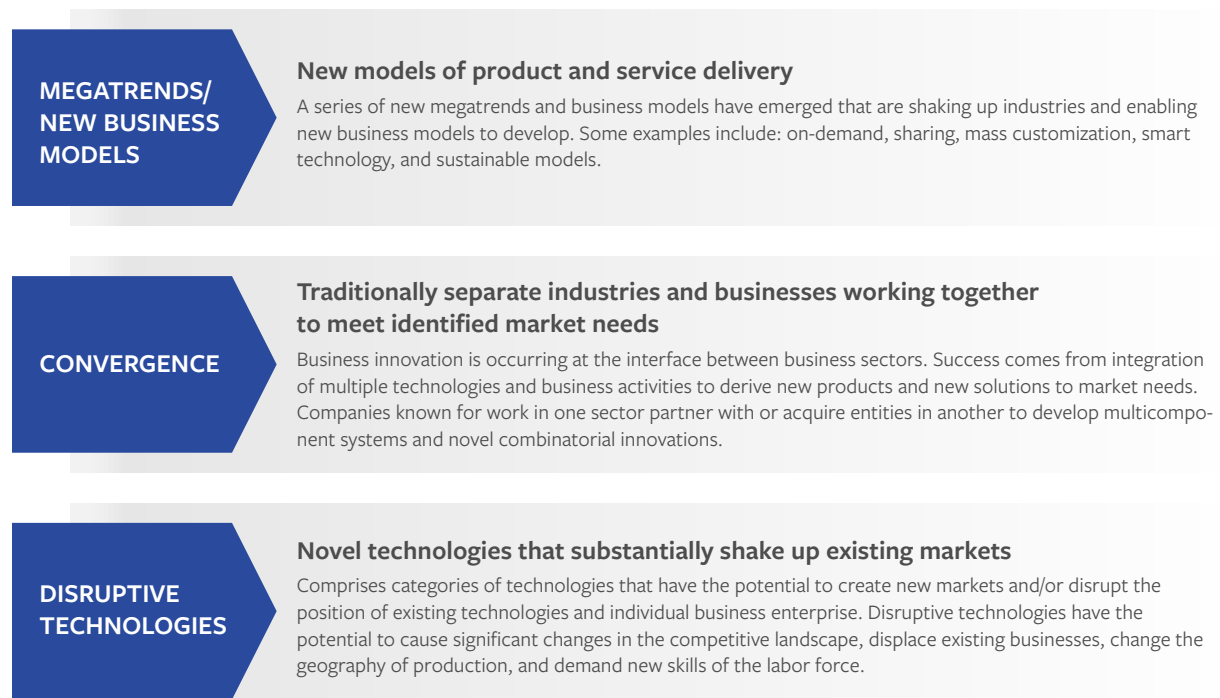


Facing Change: Convergence, Disruptive Technologies, and Megatrends Impacting Central Indiana's Advanced Industry Clusters

Dynamic market forces, rapid technological advancements, rising global competition, and other factors can conspire to wrong-foot companies and entire industries. Previously renowned companies such as BlackBerry, Kodak, Xerox, Toys “R” Us, Borders, and Blockbuster, for example, have seen their economic fortunes hammered by a variety of changes or events that they failed to either anticipate or adjust to appropriately. Similarly, multiple regional economies, caught overly dependent on the fortunes of individual sectors, have experienced wrenching business losses and unemployment—places like Detroit in motor vehicles; Pittsburgh in steel; and Rochester, NY, in photographic film products. Pittsburgh has adjusted, but it has been a 35+-year climb out of the doldrums created by the crash of the steel industry in the 1980s. Central Indiana needs to avoid these fates.

While it is fair to say that change is a constant, it is equally true that the pace of change is not. In this report, considerable attention is paid to a combination of three forces of change that are reshaping, or have the potential to reshape, entire industries and the fortunes of individual business enterprise. These forces, depicted on Figure ES-4, both work individually and interact with each other to generate fast-moving and strong tidal forces that will have impacts across Central Indiana's advanced industry clusters.

Figure ES-4: Three Forces of Change Impacting Central Indiana Business Clusters



The analysis performed, and input received, across the project result in the following broad diagnosis of the changes that may be expected in the six Central Indiana clusters over the next decade related to these forces. It is particularly notable that the impact of disruptive technologies and other forces of change will be experienced in all six of the clusters.

- Agbiosciences**—This cluster is likely to experience significant change from multiple forces. Convergence is occurring between traditional biological-input providers (seed and agrichemicals), agricultural equipment manufacturers, and IT/informatics companies working to deliver packaged digital and precision agriculture solutions to producers. This model seeks to increase production yields through highly precise spatial diagnosis of field conditions combining real-time sensing and predictive analytics delivered through both on-equipment and remote cloud-based systems. Indiana companies are already engaging in development of strategic partnerships and taking part in acquisitions activity.
- Aircraft and Aerospace**—Because of regulatory and existing specification barriers, the cluster is unlikely to see large-scale change attributable to the three forces of change. High level of tech awareness and engineering capabilities in the cluster, however, will likely make it important to engage with other clusters through cross-cutting initiatives. New cybersecurity regulations are an immediate area of need and focus.
- Automotive and Mobility**—There is potential for significant change to occur over the next decade or two through both individual disruptive technologies (such as electric vehicles and autonomous vehicles) and through fast-developing new mobility business models (such as mobility as a service and the sharing economy). Major companies within the cluster in Central Indiana will need to make significant changes to their product lines to adapt, and significant impacts and implications for the cluster workforce are likely. Changes may substantially affect vehicle manufacturing futures and the fortunes of companies in the engine, transmission, and emissions control sectors (which are significant parts of the automotive sector in Central Indiana). Convergence between multiple companies and sectors spanning vehicles and components, electronics, artificial intelligence (AI) and automation controls, cybersecurity, etc., will be influential.
- Information Technology (IT)**—Focused around the development of customer relationship management (CRM), marketing technology, and customer experience applications, the Central Indiana region has a distinctive and growing IT cluster. Because digital/IT capabilities are so central to many convergence, megatrend, and disruptive technology spaces impacting other clusters, it is imperative for the IT cluster to become engaged in broader convergence-oriented IT activity outside of its more focused market space.
- Life Sciences**—The Indiana Biosciences Research Institute (IBRI) will play a key role in facilitating convergence activity and attracting talent that can leverage disruptive technologies to boost the R&D and product pipelines of cluster companies. Threats are observable to cluster elements through various disruptive technologies (such as regenerative medicine to the devices industry and gene editing to the biopharma industry).
- Logistics**—Employment across this cluster may be significantly disrupted as advanced robotics and autonomous vehicles provide alternatives to human labor. Augmented reality (AR) technology may, however, extend the competitiveness of human labor versus automated solutions.

Based on input received through project interviews and focus groups, it is evident that clusters demonstrate awareness that there are coming risks from change, but business leaders are primarily heads-down dealing with their daily business challenges (and, to be fair to Indiana, this is not unlike much of the rest of the world).³ Overall, urgent attention seemingly is not being paid to the pending threats and opportunities associated

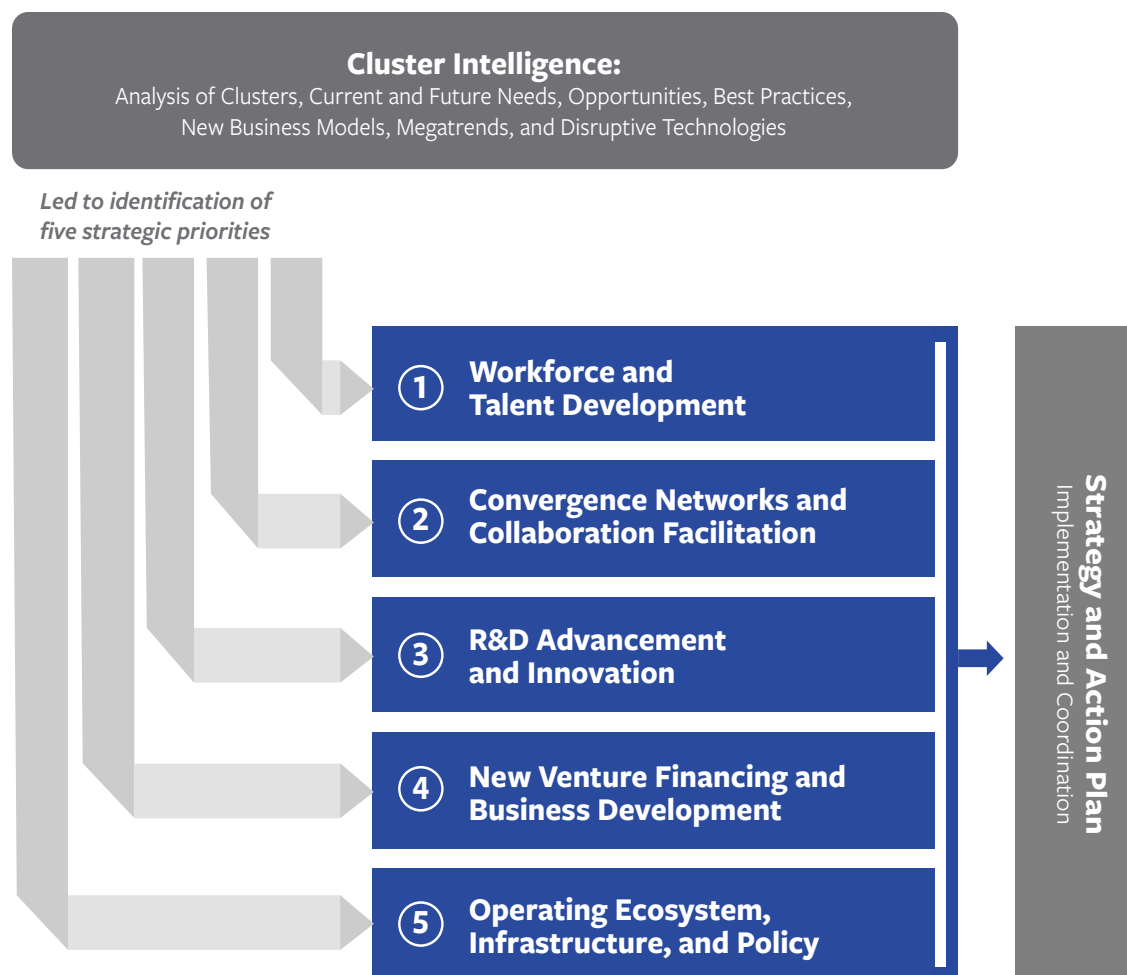
3 For discussion, see McKinsey and Company, 2018. *Disruptive forces in the industrial sectors. Global executive survey. March 2018.*

with disruptive forces. This finding is not universal, however; and, within each cluster, some participants made observations regarding actions taken relating to disruptives or awareness of opportunities and threats associated with them. It is a key finding, therefore, that, to compete in the global economy and to ensure long-term prosperity of the state, CICP must be proactive in bringing parties together to strategically consider the implications of change, offset threats, and identify opportunities that may be realized for the region through new business and technology models.

Additional Strategies and Actions for the CICP Portfolio

The analysis of Central Indiana advanced industry clusters, the situational assessment, the benchmarking analysis, and the assessment of forces of change combined to drive the identification of a series of strategic recommendations to improve cluster-based economic development and associated technology-based economic development within Central Indiana. Figure ES-5 illustrates the process of identification and the five “strategic priorities” that become clear from input received across both the quantitative and qualitative analysis phases.

Figure ES-5: Cluster Identification and Associated Research Led to Identification of Five Core Strategies



Guided by these strategic priorities, and the input received across the project, a series of strategy and action recommendations are outlined within the report (Chapter V). The strategies are as follows:

- **Strategy One:** [Focus=Workforce] Sustain and expand CICP initiatives aimed at ensuring a reliable flow of talent to cluster industries and talent that can understand/facilitate convergence for both current and anticipated future needs.
- **Strategy Two:** [Focus=Collaboration] Proactively develop events, programming, and other activities to raise awareness of convergence, promote capabilities and interests to participate in partnerships, and raise awareness of depth of expertise and activities in other sectors to realize convergence opportunities.
- **Strategy Three:** [Focus=Innovation] Develop novel programs to enhance applied R&D activity in the clusters and promote the advancement of innovation toward commercialization.
- **Strategy Four:** [Focus=Capital] Substantially increase awareness of Central Indiana with venture capital (VC) groups with stated interest in investing in companies relevant to each cluster and build robust relationships with these venture firms.
- **Strategy Five:** [Focus=Ecosystem] Ensure Central Indiana is at the forefront of aligning ecosystem elements to make the region the recognized go-to location for early-stage commercialization of new business models and convergence-based enterprises.

It should be noted that these proffered strategies and actions are designed to supplement the existing work being performed by CICP and its initiatives that is found to be very much on-point and on-target from the perspective of regional stakeholders. Overall, it is clear that CICP is well structured to continue to advance TBED in Indiana and that the leaders of CICP initiatives maintain expert knowledge of their respective sectors and technology frontiers. In fact, this expertise is a major strength for the region from both a cluster and a broader economic development perspective. In implementing future strategies, CICP should not lose sight of the expertise and core competencies of its branded initiatives and their respective leadership as providing a fundamental value for the region. Moving forward, however, more attention will need to be paid to standing up formal structures and programs to facilitate cross-cluster convergence and be strategic in approaches to megatrends and disruptive technologies.

Conclusion

CICP has been, and is, an effective organization, helping to guide Central Indiana's emergence and ongoing evolution as a home to TBED and a hub for advanced industry cluster development. It is found that CICP initiatives are well structured and demonstrate a good tactical alignment with the needs of the clusters they support and that are identified herein. The pioneering work of CICP in facilitating key stakeholder collaborations and developing robust initiatives to support cluster development across the region is well recognized and acknowledged within the region, and increasingly recognized outside the region.

That said, times are changing, and past performance is not a guarantee of future success. The emergence of multiple new business megatrends, combined with fast-moving disruptive technologies, and an increasing tendency for innovation to emerge through convergence of previously separated business sectors, mean that standing still is not an option. The forces of change present opportunities for cluster advancement and new innovation-based business growth for those that are agile and able to effectively adapt. They also, however, represent threats to those businesses or sectors unable to adjust appropriately to the changes wrought upon their existing business models, markets, and competitor profiles.

This report presents a considerable volume of data and information regarding the current status of Central Indiana's advanced industry clusters. It also directly addresses the forces of change impacting these clusters now and into the future and makes a series of strategy and action recommendations designed to help address these forces and supplement (not replace) CICP's existing highly effective work. CICP has worked well for the region; but, additions to its mission-based activities are required to help the region optimally navigate the period of change ahead.

The good news for the region is that CICP and its initiatives are well positioned to facilitate and convene business, education, philanthropic, and public-sector leaders in setting course for the economy of the future. **The rapid pace of technological change requires action now; and the CICP Board, and Central Indiana leadership more generally, should start making choices and adopting strategies for intentional economic development that will create sustainable prosperity and quality of life for the region's citizens and future generations. This report provides a key resource to empower these deliberations.**

