



# Ohio BOLD:

## A Blueprint for Accelerating the Innovation Economy

Performed For: Ohio Chamber of Commerce Research Foundation  
Performed By: TEconomy Partners, LLC

**JULY 2018**



**Research  
Foundation**



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## Ohio BOLD

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# Foreword

Ohio's future in the innovation economy is at a pivotal point. Even with Ohio's economic development initiatives, cutting-edge innovation, and business-friendly tax incentives and regulation reforms, the speed of technological advancements requires Ohio to embrace a new paradigm. Disruptive technology is changing the face of every industry and will be the competitive strength needed to accelerate in this new economy. As innovation's role in driving economic growth continues to increase, Ohio's statewide macroeconomics fall further behind. Despite pockets of success, this slower pace manifests itself in the following categories:

- Slower population growth
- Slower growth in income and wages
- Increased poverty
- An aging and nondiverse population.

Ohio BOLD creates a blueprint for success in accelerating Ohio's economy. As a new governor assumes office in January, significant bold steps are required to leverage and build upon existing efforts to catalyze long-term economic growth. At the heart of this blueprint is the recommendation for a statewide organizational approach to pursuing strategic innovation opportunities around four opportunity platforms:

- NextGen Manufacturing
- Future Health
- Smart Infrastructure
- Data Analytics.

These four opportunities emerged through months of research, benchmarking Ohio against eight peer and aspirational states, leveraging its core competencies, and assessing areas of potential exponential growth.

Each of these platforms would be represented by newly created statewide Innovation Hubs through which Ohio would foster the infusion of advanced innovation processes, products, and techniques. Ohio already is home to several successful initiatives that would benefit the entire state if scaled up. Examples include the following:

- The America Makes facility in Youngstown provides a significant stake in the ground in terms of signature research in NextGen Manufacturing and Materials.
- The Research, Entrepreneurship, Discovery, and Innovation Zone (REDIzone®) located on the campus of Northeast Ohio Medical University in Rootstown enables innovators of biotechnology to take their research from concept to capital.

## FORWARD

- Smart Columbus, DriveOhio, and the Transportation Research Center are paving the way for the entire state to succeed and lead with smart infrastructure design and models.
- The University of Cincinnati's 21st Century co-op experience breaks down the walls between being a college student and being an employee by exploring creative opportunities for workforce development.

While statewide strategies are being proposed, it must be noted that one-size-fits-all models do not generally work. The recommendation for Innovation Hubs relies on local relevancy, existing strengths, and a strong connected ecosystem. Statewide Innovation Hubs will support current innovation while bringing together industrial partners, research institutions, and the public sector in a new unique partnership to accelerate Ohio's economy. The Innovation Hubs will advance technological convergence and capacity; attract and generate a skilled technical workforce; and foster the growth, attraction, and creation of businesses. The Innovation Hubs will focus on industry-facing activities and specialized shared-use facilities to advance new product development, process improvements, and commercialization of new technologies.

In addition, Ohio needs to further elevate an entrepreneurial and risk capital ecosystem to drive future economic growth by doing the following:

1. Expanding the role of regional Entrepreneurial Signature Programs to ensure that the opportunities generated by the future Innovation Hubs are scaled statewide.
2. Focusing additional efforts to create early-stage risk capital on funding the creation of emerging firms from the four opportunity platforms.
3. Stimulating the creation and attraction of later-stage risk capital financing to ensure that emerging opportunities can grow and scale in Ohio.

While past and current initiatives to catalyze entrepreneurial development have obtained significant returns on investment, the overall macro entrepreneurship needle isn't moving fast enough. Ohio must nurture a risk capital community that is both oriented toward early-stage financing and committed to indigenous investment. Such indigenous funds would help to identify promising discoveries, support new ventures, and facilitate their connection to outside capital.

Ohio must also achieve improved talent. Human capital is one of the few market factors that are locally based and have the potential to create significant advantages and disadvantages. Ohio needs to develop, retain, and attract the talent that its industries demand by pouring significant talent development into both the Data Analytics and the NextGen Manufacturing Innovation Hubs, offering financial incentives for Ohio graduates pursuing careers in any of the opportunity platforms, and creating an Ohio Alumni Outreach Program.

The cost to implement this blueprint is quite significant; however, funding streams already exist that could provide resources for these efforts. The price of not investing is even higher. Failure to advance the four innovation platforms identified will have significant long-term ramifications. First movers in creating the next-generation environments based around these Innovation Hubs will enjoy disproportionate advantages and economic growth. Now is the time for Ohio to be **BOLD**.

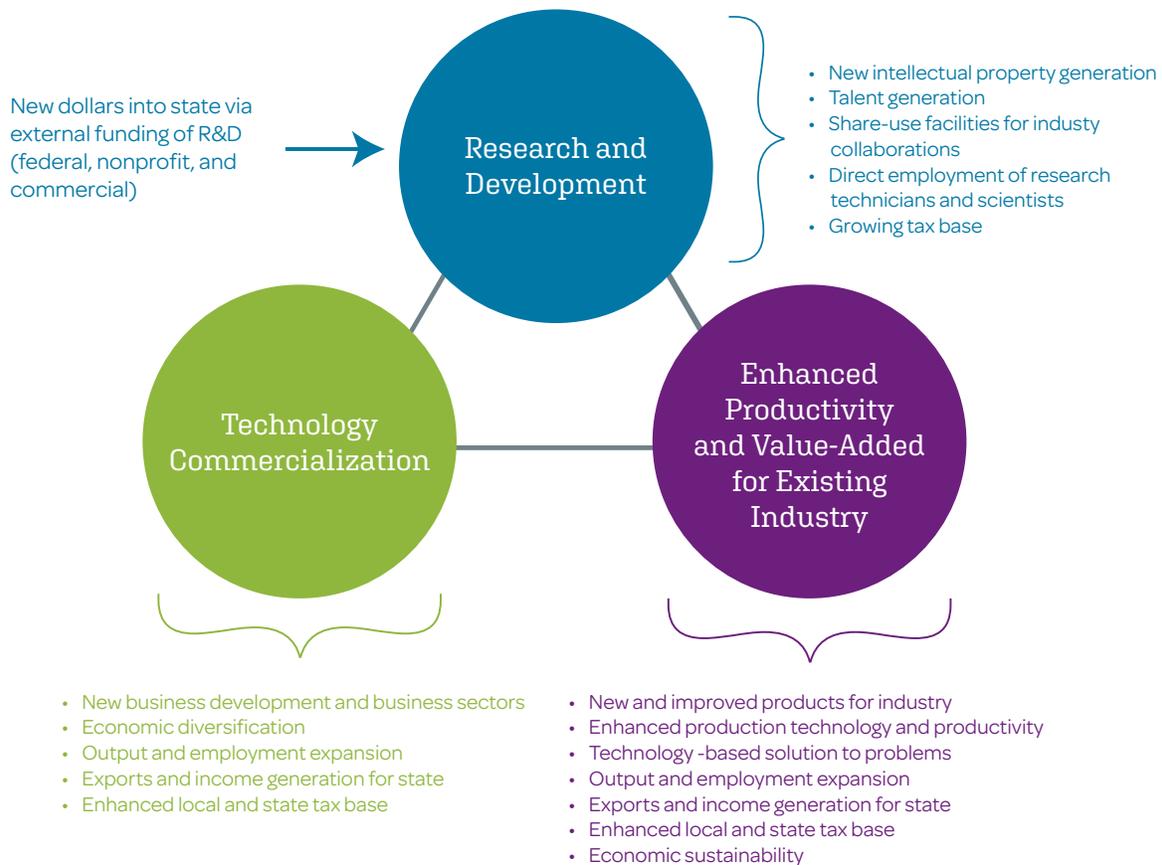
## Executive Summary

### A Call to Action

Innovation is the key driver of economic growth (Figure ES-1)—leading to high-quality jobs and rising standards of living. As the World Economic Forum in its highly touted Global Competitiveness Report explains:

*In the long run, standards of living can be expanded only by technological innovation ... This requires an environment that is conducive to innovative activity, supported by both the public and the private sectors.<sup>1</sup>*

**Figure ES-1. Innovation-Led Development is a Key Driver of Economic Growth**



Source: TEconomy Partners, LLC

<sup>1</sup> World Economic Forum, *The Global Competitiveness Report 2010–2011*, page 8.

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Understanding the importance of advancing innovation to help ensure economic prosperity, the State of Ohio has a long history of investing significant resources in innovation-based investments that have helped strengthen the state's key economic industrial drivers. Beginning in the 1980s with investments in the Thomas Edison Program and continuing through today with investments in both the Ohio Third Frontier and JobsOhio, the state has been heralded by many as a pioneer in innovation-based economic development.

However, there is great concern that the past decades' economic success may have been part of a nonsustainable bubble, hiding the fact that Ohio's economic competitive strength was being eroded by changing economic drivers, including outsourcing, declining real-dollar investment in domestic research and development (R&D), and the rise of a new breed of technology-savvy global competitors. ***In this fast-paced, global economic paradigm, innovation initiatives are no longer just an important endeavor, but an absolute necessity for the state's economic competitiveness moving forward.*** In an interesting paradox, the more global and integrated the economy becomes, the more local R&D know-how, entrepreneurial culture, workforce skills, and manufacturing competencies matter for economic success. Even with Ohio's proactive stance in cutting-edge innovation and economic development initiatives, global competition and continued technological advancements requires Ohio to embrace new paradigms to ensure its investments are impactful and far reaching.

Today, Ohio's citizens are concerned that the state's economy is not as strong as it needs to be and, as a result, is falling behind the nation and competitor states. Since 1968, often thought to be the height of the industrial economy, Ohio's gross domestic product (GDP) per capita (a leading indicator of a region's standard of living) has remained stagnant while the nation's continues to increase, indicating that Ohio is losing ground.

As innovation's role in driving economic growth continues to increase, Ohio's economy falls further behind. Ohio's private sector average annual GDP growth rate from 1991–2016 was 6.7 percent compared with the U.S. average annual GDP growth rate of 8.8 percent—behind by more than 2 percent per year over the 26-year period. This slower economic pace, directly or indirectly, manifests itself in the following:

- **Slower population growth**—Ohio's total population during the 1991–2016 period grew by 6.1 percent, compared with 27.7 percent for the United States overall.
- **Slower growth in per capita income**—Ohio's per capita income, in real terms (USD 2016), grew by 1.38 percent from 1991–2016, to \$44,593, compared with the U.S. growth rate of 1.63 percent reaching \$49,246.
- **Slower growth in real wages**—Ohio's average wage, in real terms (USD 2016) grew by 17 percent from 1991–2016, compared to U.S. average wages that grew by 26 percent over the same period.
- **Lower median household income**—Ohio's median household income grew by 3.2 percent during the 1991–2016 period, compared with the United States growing at 3.8 percent during the period.
- **Increase in levels of poverty**—Ohio's share of people in poverty increased by 0.3 percentage points from 1991–2016, reaching 13.7 percent, while the U.S. levels saw a decline of 1.5 percentage points to 12.7 percent.

These key economic indicators are of grave concern to key thought leaders across the State of Ohio. Recognizing the opportunity to rethink strategic public policy initiatives in light of a new administration coming into office, the Ohio Chamber of Commerce Research Foundation, in partnership with regional Chambers of Commerce, commissioned this study to develop a blueprint for public policies that will help secure Ohio's position as a leader in the tech-based/innovation economy.

## Shifting Ohio's Innovation Paradigm to Catalyze Economic Growth

While manufacturing has been, is, and will continue to be, a significant driver of Ohio's economy, the state continues to diversify, adding additional industrial drivers within various services sectors, including healthcare, insurance, and financial services. However, each of Ohio's industry clusters has had varied growth rates, impacted by specific circumstances related to broad market factors, as well as the following:

- Lagging investment in R&D,
- Trailing levels of innovation as measured by patenting activities, and
- Lower productivity levels.

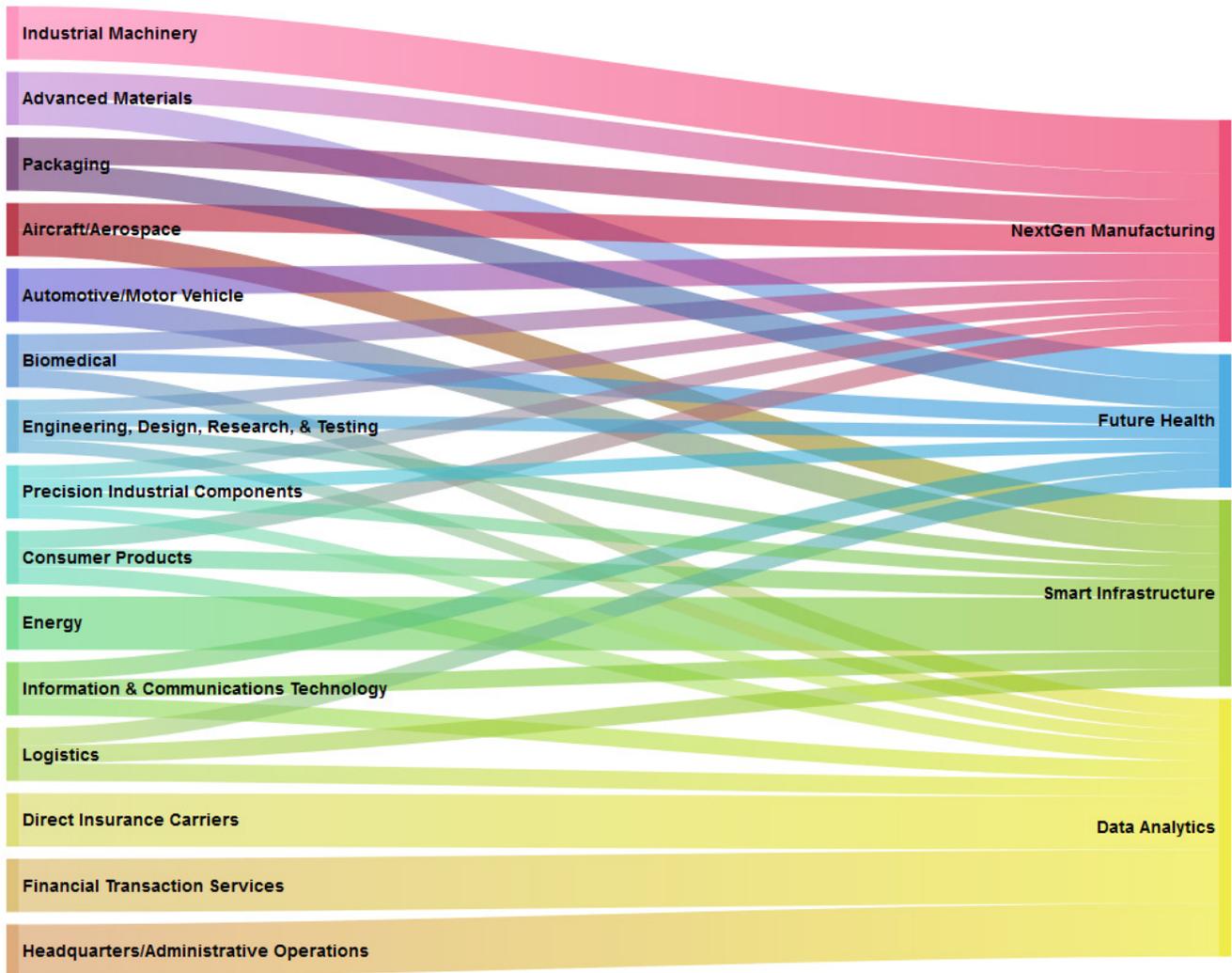
Together, these factors—the diversification of Ohio's economic drivers, uneven growth rates across many clusters, significant concerns over levels of research, innovation, and productivity growth—warrant a new approach to fostering innovation. It is paramount that Ohio embrace the increasing role that both innovation and technological convergence will play across all sectors of the economy and treat it as an opportunity—or risk Ohio's industrial and economic future.

To elevate and accelerate Ohio's economy, this new paradigm seeks to strategically realign Ohio's innovation investments to focus not on industry clusters, but instead on transformational innovation platforms—areas of convergence, where innovation and disruptive technologies can and will impact many of Ohio's traditional industry clusters. After a thorough analysis of the state's competitive position, including an examination of Ohio's performance against eight benchmark states as well as assessing where it has the opportunity for significant future growth, four key innovation platforms emerged. As Figure ES-2 visually illustrates, these four innovation platforms are impacting Ohio's key industry drivers and will accelerate their future growth and ensure their economic viability:

- **Next-Generation Manufacturing and Materials**
- **Future Health**
- **Smart Infrastructure**
- **Data Analytics.**

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Figure ES-2. Mapping Key Industry Clusters to Ohio's Innovation Opportunity Platforms

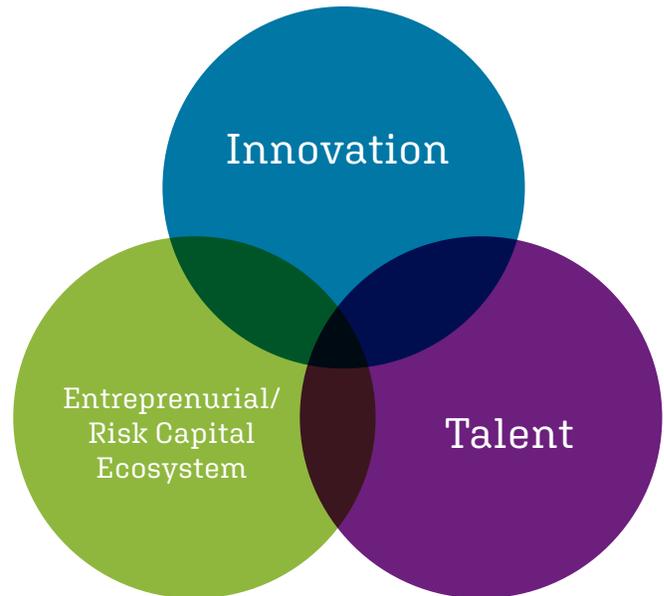


Source: TEconomy Partners, LLC

## Strategic Recommendations to Accelerate Ohio’s Economy

The State of Ohio has a critical role to play in ensuring its innovation ecosystem is structured to leverage disruptive change and adapt to it. To accelerate Ohio’s economy, it is proposed that the state focus its innovation investments on three strategic priorities. The emphasis should be on leveraging and complementing existing efforts while catalyzing long-term economic growth across the state. Specifically, the three strategies should focus on the following:

- **Infusing cutting-edge innovation into Ohio’s industrial economic drivers through focus on the four identified platforms to ensure existing industries remain globally competitive and new industries emerge;**
- **Further elevating the entrepreneurial/risk capital ecosystem to drive future economic growth; and,**
- **Developing, retaining, and attracting talent that Ohio’s industry demands.**



**The primary recommendation is that Ohio should create four statewide Innovation Hubs that address the full innovation ecosystem of needs by advancing and deploying cutting-edge innovation within the opportunity platforms.**

This statewide organizational approach to pursuing strategic innovation opportunities offers the advantage of supporting strategic areas of innovation, while bringing together numerous industrial partners, public and private research institutions, and the public sector in a unique partnership to advance Ohio’s economy.

While Ohio has already made significant investments in a number of these innovation platforms, the activities are often not connected nor of a scale to have statewide impact. The proposed Innovation Hubs will work statewide to leverage these disparate efforts to develop critical mass and statewide relevance. The statewide Innovation Hubs will focus on “industry-facing” activities and specialized shared-use facilities to advance new product development, process improvements, and commercialization of new technologies through active connections to serial entrepreneurs, angel investors, and seed-stage venture capital funds. By focusing on specific areas of innovation that are relevant to large sectors of Ohio’s industrial economy and encompasses numerous projects and organizations, these targeted development initiatives will accomplish the following:

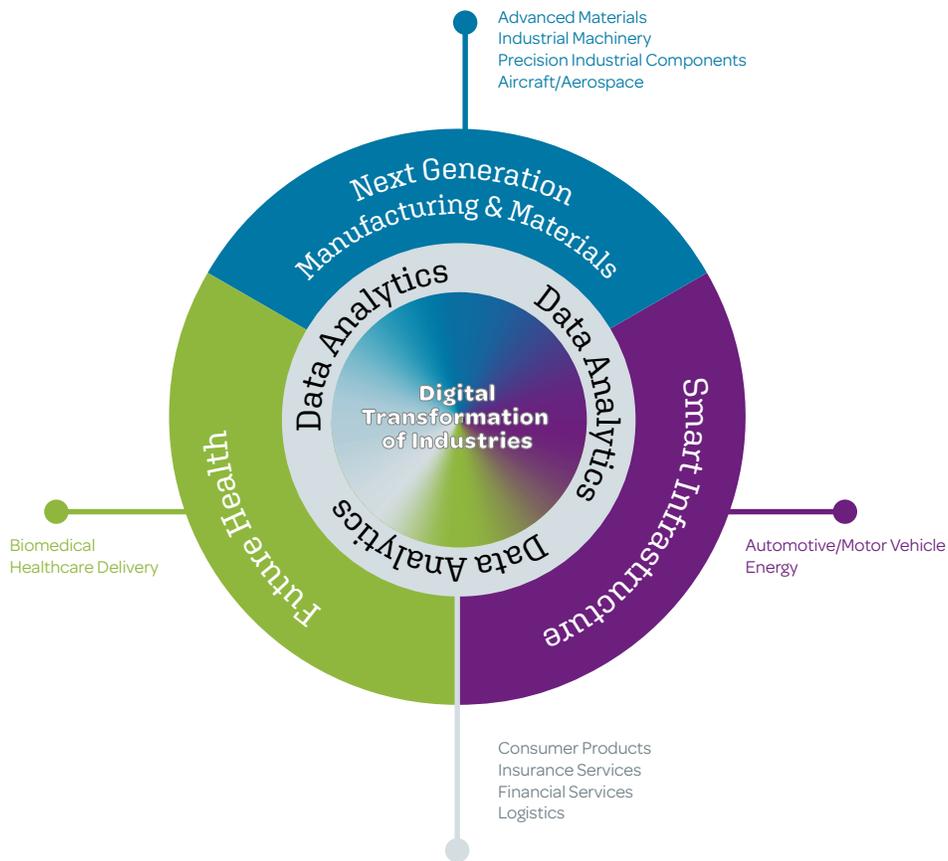
- **Advancing technological convergence and innovation capacity**, with a strong focus on building innovation capacity across Ohio’s economic industrial drivers;
- **Attracting top talent** that industry needs; and
- **Fostering the growth of existing firms, creation of new firms, and attraction of firms.**
- Additional benefits of these dedicated Innovation Hubs are their ability to support the following:

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- **Branding and proactive outreach** that creates and sustains a market leadership position for Ohio and helps generate business attraction leads for Ohio.
- **Addressing workforce and new talent generation** from development of new curriculum and degree programs at the postsecondary level to experiential learning and internships that connect students with industry to creating career academies, summer programs, and career awareness at the K-12 education level.

These four innovation opportunity platforms (Figure ES-3) incorporate multiple state industry clusters into a new innovation investment strategy that seeks to accelerate the transformation of Ohio's industries and position the state for future economic growth.

**Figure ES-3. Ohio's Four Innovation Opportunity Platforms**



Source: TEconomy Partners, LLC

The four innovation platforms demonstrate opportunities for convergence in the ways they interact with one another to create combination technology solutions, driven by the underlying digitization of industries. Each platform can have profound impacts on the future of the state's economy and quality of life:

- **Investing in next-generation manufacturing and materials can allow the state to create a world-class “smart” manufacturing environment that serves a variety of industry verticals and maintains Ohio’s specialized workforce advantages.** Industry will be able to produce highly customized products with minimal waste using on-demand, cloud-based design templates and design consultants. Workers will experience large increases in the level of technical skills and be able to utilize more flexible training and continuing education models.
- **Organizing the medical and healthcare industries around an integrated future health vision will allow the state to spur development of integrated care environments and see the widespread adoption of digital health platforms.** Increases in connected health will allow high-quality treatment to be delivered remotely within patients’ homes and cut down on medical product abuse while improving early diagnoses of problems. The state can eventually implement a true population health system of networked industries and healthcare data that demonstrates long-term reductions in levels of serious disease and attracts skilled workforces eager to take advantage of the availability of high-quality healthcare options.
- **Successfully branding Ohio as a world-class smart city and smart infrastructure test-bed environment and widespread investment in connected infrastructure will make the state a regional hub for new innovation opportunities.** The state will build a reputation as a signature destination for testing unmanned and automated systems, as well as pioneering approaches to revitalize aging infrastructure and energy grids while incorporating advanced data collection systems that allow advancements in civil engineering and utilities management. The overall perception of the state’s focus on smart infrastructure will attract skilled talent bases that want to take advantage of highly connected and sustainable live-work-play environments and further reinforce the brand of the state as an innovation hub.
- **Creating a high-quality data analytics innovation ecosystem will result in improved business intelligence and insights for the companies of the state, in turn leading to improvements in customer products and services that generate industry growth.** The presence of visionary thought leaders in specialized areas of data science will create a more vibrant entrepreneurial ecosystem around next-generation finance, insurance, digital marketing, consumer experience, logistics, and health IT companies that sustains a broad base of tech start-ups.

Achieving this aspirational vision of the future where digital transformation has spread across Ohio’s industries is within reach if the state adopts a forward-thinking focus on innovation platforms.

While the creation of four statewide Innovation Hubs is the anchor recommendation, it is not alone sufficient to accelerate Ohio’s economy. Other important strategies and critical actions must be pursued to ensure long-term economic growth and vitality. Table ES-1 provides a summary of the recommended action plan to accelerate Ohio’s innovation economy.

**Table ES-1. Recommended Action Plan: Accelerating Ohio's Economy**

**Strategy One: Foster the Infusion of Advanced Innovation Processes, Products, and Techniques throughout Ohio's Industrial Base**

**Action 1: Create four statewide Innovation Hubs that focus on the innovation opportunity platforms and represent public-private partnerships.**

See above narrative that summarizes the proposed action.

**Action 2: Review and update Ohio tax code to create additional ways to incent Ohio companies to invest in new products and process improvements.**

- Increase level of R&D credit for companies within the four innovation platforms and expand definition of research to be more encompassing of digital transformation product and process improvements.
- Emphasize R&D Sales Tax Exemption for those technologies that are tied to digital transformation innovations and suggest local taxing authorities provide exemption as well.
- Make greater use of New Markets Tax Credit to invest in companies within the four innovation platforms that locate in rural or distressed areas.
- Expand Ohio's Job-Creation Tax Credit program to use payroll, in addition to the number of jobs created, as a trigger measure.
- Develop financial incentives for companies that support skills-building investments for their mid-career workforces that can accelerate the process of transitioning existing workers toward new skills sets more aligned with innovation needs.
- Increase the level of funding available for the JobsOhio R&D grant program and focus targeted efforts on companies within the four innovation platforms.
- Tie international trade mission efforts to attracting new investments to the state related to the four innovation technology platforms.
- Develop a dedicated funding stream to enable rural communities to develop sites to pursue attraction and expansion opportunities within the four innovation platforms.

**Strategy Two: Further Elevate the Entrepreneurial/Risk Capital Ecosystem to Drive Future Economic Growth**

**Action 3: Continue to invest in the regional Entrepreneurial Signature Programs (ESPs), and expand their role to ensure that innovation opportunities generated by the four Innovation Hubs are scaled in Ohio.**

- Continue to invest in the regional ESPs, recognizing that the services these organizations provide are a critical component of the successful implementation of this innovation strategy.
- Leverage the ESP infrastructure to support the efforts of the four Innovation Hubs to create new start-ups/scale-up emerging companies that are commercialized as a result of their activities.
- Link emerging companies to Ohio's anchor industries as first customers and early adopters so that innovations can be deployed into the field to prove their efficacy and firmly establish these companies' roots in Ohio as they grow and scale at a more rapid pace.
- Create a Serial Entrepreneur Attraction Program to attract talent from outside the state to support emerging opportunities by offering personal income tax and/or investment incentives thereby de-risking the perceived costs of relocating to the state.
- Focus additional efforts around culture-building activities across the state by stimulating entrepreneurial networking, holding meet-up events, and promoting success stories so that entrepreneurship is more widely embraced in every region of the state.

**Action 4: Continue to foster the creation of early-stage risk capital by focusing additional efforts on funding the creation of emerging firms from the four innovation platforms.**

- Create pre-seed/seed/seed-plus funds specifically focused on the four innovation opportunity platforms to support new product development.
- Reinstate the Technology Investment Tax Credit to catalyze the investment of angel funding across the state focused, in particular, around the four innovation platforms.
- Create an SBIR/STTR Phase III funding program as a source of nondilutive early-stage risk capital that supports successful Phase II grantees in their efforts to commercialize their technologies.
- Provide nondisputable clarification of Ohio law to allow for public universities and entrepreneurial service/ risk capital grantees to take equity positions.

**Action 5: Stimulate creation/ attraction of later-stage risk capital financing to ensure emerging opportunities are able to grow and scale in Ohio.**

- Create a state-sponsored and/or supported equity investment fund to create/attract Series A and B funds to Ohio (through a fund-of-funds (FoF) co-investment model) by engaging corporations, foundations and other major investors as limited partners (LPs).
- Create a Venture Capital Managerial Attraction Program to increase the investment talent in the state.
- Create venture debt funds to provide nondilutive working capital (growth capital) that is targeted at both high-growth companies that are in need of additional financing between venture rounds as well as companies that do not meet the traditional investment profile for venture capital but represent promising opportunities within the four innovation platforms.

**Strategy Three: Develop, Retain, and Attract the Talent that Ohio's Industry Demands**

**Action 6: Encompass significant talent development efforts into the Data Analytics Innovation Hub.**

- Focus the Data Analytics Innovation Hub, in part, on supporting the human capital that will drive the adoption of innovative processes and products by:
  - Developing professional networks where executive management can gain knowledge about implementing analytics solutions that drive innovation in their firms,
  - Developing training/skill retraining programs to meet the mid-career needs of data analytics professionals, and
  - Developing the connections between industry and academia to help design specific data analytics programs to ensure that the needs of Ohio industry are met, including the creation of a Summer Institute for Data Analytics for rising college juniors to provide them with a unique experiential learning experience as well as the establishment of a statewide Data Analytics Internship/Co-Op Program.
- Support the efforts of the Innovation Hub with a comprehensive state focus on upgrading data analytics skilled talent pools, including:
  - Leveraging the coordinating power of Office of Workforce Transformation and utilizing federal funds allocated by the Ohio Department of Job and Family Services (ODJFS) and the Ohio Department of Higher Education (ODHE), create funding mechanisms for the talent programs of the Innovation Hub as well as company-specific training programs.
  - Expanding career center/vocational training offerings to encompass additional digital analytics/ IT training and clearly articulate career pathways to students, parents, and career guidance counselors.
  - Incorporating data analytics into K-12 educational requirements to ensure that the skill sets required for all industries of the future are embedded into Ohio's core educational offerings.

**Action 7: Encompass significant talent development efforts into the NextGen Manufacturing and Materials Innovation Hub.**

- Create a collaborative training facility that aggregates industry demand for advanced skills training and provides hands-on learning.
  - Partner with the career center/vocational training offerings around the state to expand their own next-generation manufacturing training offerings and clearly articulate the high demand for these careers, the level of pay, and the opportunity for career pathways to students, parents, and career guidance counselors.
  - Partner with educational institutions across Ohio to develop new work-school models to serve industry partners—apprenticeships, co-op programs, and working student programs.
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**Action 8: Encourage Ohio graduates to pursue careers within the four innovation opportunity platforms by offering financial incentives.**

- Provide financial incentives for Ohio graduates with skill sets related to the four innovation platforms (including residents attending out-of-state universities) to encourage them to pursue their careers in Ohio.
  - Guarantee diversity and inclusiveness of these efforts to ensure that students across the State of Ohio participate by establishing metric goals for minority and geographic (rural) participation.
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**Action 9: Offer financial incentives for senior and mid-level professionals to relocate to Ohio for careers within the four innovation platforms—create an Ohio Alumni Outreach Program.**

- Attract to Ohio senior and mid-level professionals demanded by industry by offering personal income tax and other incentives. By working to de-risk the perceived costs of relocating to the state, Ohio will catalyze the amount of talent in critical leadership positions in its most innovative firms.
  - Create an Ohio Alumni Outreach Program, utilizing the vast alumni networks of Ohio's higher education institutions and serving as an immediate connection point to the State of Ohio.
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## Sources of Funding

While the funding requirements for these critical statewide initiatives will be significant, they will also be transformative for Ohio's economy—developing an innovation ecosystem structured to leverage disruptive change and adapt to it. It is important to note that, within the State of Ohio, funding streams already exist with significant revenue to provide the vast majority of the resources required for these efforts. It is simply a matter, in some cases, of reprioritizing the focus of these existing revenues on these transformative new activities, and in others, of renewing their original purpose/mission. These existing sources of funding include the following:

- R&D Bond Funding:** The R&D Bond fund has been used to fund the Ohio Third Frontier for over a decade. Utilizing this revenue source, the Ohio Third Frontier has funded a number of innovation-based programs over the years, including efforts to enhance the commercialization of near-market technologies, the advancement of specific industry clusters, and the formation of Wright Centers of Innovation. Since 2008, the bond funding has also provided revenue to support the operations of six ESPs across the state as well as helped capitalize numerous pre-seed and seed funds. The current fund, approved by the voters in 2010, has more than \$225 million of unencumbered funds remaining that could support the regional ESPs and help expand their role to ensure that the innovation opportunities generated by the four statewide Innovation Hubs are scaled in Ohio. In addition, remaining funds could be used to continue to foster the creation of early-stage risk capital funds focused on emerging firms from the four innovation platforms. Further, it is recommended that voters be asked to renew the R&D bond fund at the earliest possible time to provide additional and sustained dollars to fund the other strategic efforts outlined herein.
- Liquor proceeds:** JobsOhio was created in 2011 as a private corporation funded through the purchase of the state's liquor business. JobsOhio paid the state \$1.4 billion to purchase the liquor enterprise and makes supplemental purchase payments to the state every year based on the total net liquor revenues it receives. JobsOhio has significant discretion in the use of its funds to advance economic development efforts in the state. While the entity's primary focus should remain on its core mission of attraction and expansion of corporate entities to and within the State of Ohio, JobsOhio has sufficient resources and should consider dedicating annually a meaningful portion of the liquor proceed revenues to fund the strategic efforts outlined herein.
- Federal workforce dollars:** As a result of the Federal Workforce Innovation and Opportunity Act, the State of Ohio receives more than \$150 million a year in federal funds to apply to workforce efforts. While restrictions exist on how the money can be applied, it is recommended that a portion of these dollars be focused on advancing the NextGen Manufacturing and Data Analytics skill sets of Ohio's workers in partnership with the Innovation Hubs.
- Private capital investments:** It will be critical to engage Ohio's industrial community in these strategic actions to catalyze their own investments in technological development within their own firms that are advanced by the Innovation Hubs, as well as advancing Ohio's innovation economy through investments in later-stage risk capital financing mechanisms.

By targeting existing revenue streams to these focused initiatives, Ohio will be able to accelerate its economy in new and bold ways.

## Conclusion

This following report outlines a blueprint to accelerate Ohio's economy through a focus on driving innovation into the state's industrial base, both existing and emerging, to ensure future global competitiveness. The ability to create the envisioned innovation ecosystem has high stakes for Ohio's future. First movers in creating next-generation environments based around innovation platforms will enjoy disproportionate competitive advantages and economic growth compared with competitors. Failure to advance the four innovation platforms identified have significant long-term ramifications:

- Ohio manufacturing and production industries are especially vulnerable to disruption by new technologies and automation and represent a sizable portion of the state's industry strength. Failure to innovate will leave these companies, and hence a large portion of Ohio's economy, at great economic risk.
- The ability to serve populations with modern, innovative healthcare models has significant stakes in the state's quality-of-life attractiveness versus other states adopting novel integrated healthcare models. Failure to innovate will not only leave Ohio's emerging Future Health industrial base at risk, but will also not advance Ohio's clinical care excellence, a positive quality-of-life factor to which Ohioans currently have access.
- Smart infrastructure leadership will be a key attribute in the branding of future attractiveness of Midwest states. Failure to obtain a leadership position will put at risk Ohio's ability to compete for quality of place.
- Other regions are ahead in realizing the importance of their data analytics talent base to long-term success, and Ohio risks falling further behind without concerted effort in this area.

The stakes are high for Ohio; but, by supporting broad-based **innovation** platforms; further elevating the **entrepreneurial/risk capital ecosystem**; and developing, retaining, and attracting the **talent** that Ohio's industry demands, Ohio can turn innovation into economic growth.