

# Catalyzing Innovation:

Strategies for Missouri to Drive Innovation and Entrepreneurship

Performed For: Missouri Technology Corporation

Performed By: TEconomy Partners, LLC

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*TEconomy Partners, LLC is a global leader in research, analysis, and strategy for innovation-driven economic development. Today, we're helping nations, states, regions, universities, and industries blueprint their future and translate knowledge into prosperity.*

# Foreword

In July of 2019, we began a process to best determine the future of innovation and entrepreneurship in the State of Missouri. At that time, the Missouri Technology Corporation (MTC) launched a national search for a new Executive Director, which I chaired. This search was important because it provided an opportunity for MTC leadership to reflect on the organization's current contributions and the desired future contributions in the cultivation of an entrepreneurial ecosystem in Missouri. That reflection was the beginning of an inflection point—a realization that we should take stock of the successes and lessons learned from our endeavors in spurring entrepreneurial pursuits as background for laying the foundation for the next decade. The next decade will provide tremendous opportunities for investments of time, talent, and treasures in bettering Missouri's entrepreneurial capacity and output. We know that states that recognize the benefits of entrepreneurship and innovation and their role in today's knowledge-based economy are developing policies and programs to establish an inclusive environment that creates, attracts, and retains innovation-based companies and ensures an infrastructure to support them.

In February of 2020, we welcomed the new executive director, Dr. Jack Scatizzi, to MTC and charged ourselves to complete within the next 24-month period a strategic initiative that would lay the foundation for the decade. In January 2021, Governor Parson named me chair of MTC. I accepted the role, having committed much of my career to catalyzing growth and support of innovation and entrepreneurial pursuits. With the support of the Missouri Department of Economic Development and in discussions with the Governor's office, we mapped a 12-month timeline for completing a strategic plan by the Spring of 2022. We established and convened a distinguished steering committee (the Missouri Innovation and Entrepreneurship Strategy Steering Committee) to oversee the design of the Entrepreneurship and Innovation Strategic Plan. The Steering Committee is comprised of a group of 16 talented individuals representing perspectives from entrepreneurs, economic development professionals, academic research and translation, and capital deployment from across the state.

The data show that over the last decade, the MTC has been an essential asset in driving entrepreneurship and economic development throughout Missouri. The organization's successes are a direct result of strategic planning and execution focused on the promotion of entrepreneurship and innovation within emerging high-growth and high-potential markets.

For Missouri to continue to maximize the gains from entrepreneurship, MTC needs a new data-driven strategic plan to support the advancement of entrepreneurship and innovation, create higher-paying jobs, and accelerate economic development on behalf of the State of Missouri. The creation of this strategic plan allows MTC to continue to support and grow Missouri's entrepreneurs and its entrepreneurial-focused ecosystems for the next decade. This plan will help set the direction for policies, programs, and initiatives that foster and support the further growth of entrepreneurs and the advancement of innovation and technology across the State of Missouri.

The desired outcomes for the Missouri Innovation and Entrepreneurship Strategy Steering Committee were:

- A call to action to ensure the State of Missouri prioritizes entrepreneurship and innovation in economic development planning.
- Long-term, statewide entrepreneurship and innovation strategies that leverage Missouri's unique opportunities and help overcome current weaknesses within the state's entrepreneurial ecosystem.
- A detailed, action-oriented roadmap with short- and long-term recommendations for programs, policies, and initiatives aligned with the identified strategic priorities.
- Identification of future processes/performance measures to ensure the strategic plan is responsive to evolving needs.

This report, *Catalyzing Innovation: Strategies for Missouri to Drive Innovation and Entrepreneurship*, represents a milestone in the completion of the strategic plan. A bold set of strategic recommendations and actions have been gathered through the work of our partners TEconomy Partners, LLC under the direction of the steering committee. The background and analysis were data-centered and rooted in objective measures. The engagement across the state was broad and transparent. The outcomes are a bold set of recommendations that will impact the work of MTC and invite other partners across the state to the important mission of advancing innovation and entrepreneurship within the "Show Me" state. While all recommendations may not make it to action in exactly their presented form, the charge was to be bold and unencumbered by current resources. Furthermore, our partners and the committee were tasked to be truly objective and informed by the data in the recommendations for strategic implementation.

I want to thank the members of the steering committee. It was truly a pleasure to convene and chair this body on behalf of the State of Missouri. The dedication and commitment of this group and the many stakeholders from across the state who engaged in this work underscore the energy and enthusiasm for growing the innovation and entrepreneurial ecosystem in Missouri. The engine of innovation seems poised to be aligned, tuned, fueled, and revved. Moreover, the opportunity to reflect on the strong impact of the last decade and the significant potential of the next decade and beyond is inspiring. With this report, we have been charged to Fund, Grow + Scale, Launch + Cultivate, Inspire, and Connect. In the coming months, we look forward to the conversations on key elements of the recommendations for further review and engagement. The final implementation of recommendations will be included in an implementation plan developed by MTC. This report captures an on-time and on-target milestone on our journey to further catalyze innovation in Missouri. We welcome your interest, collaboration, review, and engagement as a partner in this important work. Thank you for your support as we spring forward to a new beginning.

With great hope and optimism for an innovative and entrepreneurial future,

**Dedric A. Carter, PhD MBA**

*Chair, Missouri Innovation & Entrepreneurship Strategy Steering Committee*

*Chairman, Missouri Technology Corporation*



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## Executive Summary

Across the nation, states that recognize the benefits of entrepreneurship and the role it plays in today's knowledge-based economy are developing policies and programs to establish an environment that creates, attracts, and retains entrepreneurs, as well as cultivating an infrastructure to support them. With an emphasis on encouraging economic growth that touches all corners of the state, this strategic action plan seeks to inspire more Missourians to participate in the 21st century economy and to foster a resilient state economy for future generations.

From its inception as a state 200 years ago to its status today as a leader in globally significant industries, innovation and entrepreneurship have always played a critical role in driving economic vitality in Missouri by fostering the formation of novel businesses, scaling their operations, and sustaining their growth as they generate new, high-paying jobs. The positive impacts of supporting innovation-based economic development can be viewed in a variety of ways, such as:

- **Driving productivity growth and new-wealth creation:** Innovation-oriented industries in Missouri pay higher wages and stimulate more investment than other sectors. For example, the average earnings of a worker in the State's tech industry were \$112,100 in 2020, nearly double the average earnings for all jobs across Missouri (\$64,000), according to the recent Technology2030 report produced by the Missouri Chamber of Commerce.<sup>1</sup>
- **Commercializing new products, processes, and services:** Missouri has long been synonymous with industries and technologies that help solve key challenges, such as national defense, health and life sciences, food security, environmental sustainability, and other mission-critical topics.
- **Improving the human condition:** Missouri's academic and industrial advancements across the plant, animal, and human health domains have enhanced living standards and quality of life.

Key to advancing innovation are the people who can turn innovation into successful growth-oriented businesses. It is important to note that while most entrepreneurs start by forming small businesses, not all small businesses are entrepreneurial. The needs of small businesses and growth-oriented entrepreneurs may be similar at first, but they quickly diverge. For economic growth to occur, growth-oriented entrepreneurs

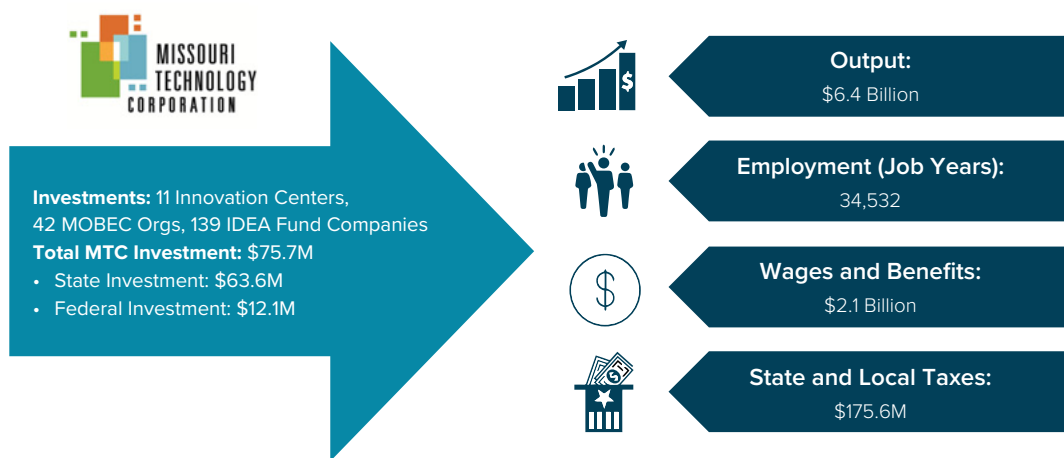
<sup>1</sup> <https://mochamber.com/tech-report/>

must focus on serving customers and markets beyond the residents and businesses in its community—otherwise known as traded-sector activities—in order to drive an increase in a state’s gross domestic product (GDP), which in turn leads to a higher quality of life for its citizens. Business activities that typically focus on meeting the local needs of families and businesses and do not bring new income from outside the region into the region are often referred to as sheltered or locally serving industries. Examples of sheltered industries include restaurants, retail stores, dry cleaners, and state and local government services. While these sheltered industries are critical to Missouri’s quality of life, they rely on purchases from local residents and businesses as their primary market, and so do not generate new income but instead benefit from a growing economy. As noted recently, “Productivity growth in the traded sectors is the primary source of wealth creation and income generation. However, most jobs reside in the non-tradable industries, which are more labor-intensive and less prone to productivity improvements. Productivity growth in the traded sector fuels job growth in the local non-tradable sector through multiplier effects...innovation activities have far higher local multiplier effects than nearly all other sectors, including manufacturing.”<sup>2</sup>

**The Missouri Technology Corporation (MTC) plays a vital role in developing a landscape for innovation-based economic development in the state, which helps support traded-sector entrepreneurs.**

Created by the Missouri General Assembly to promote entrepreneurship and foster the growth of new and emerging high-tech companies, MTC’s mission is to provide leadership and make strategic investments that help entrepreneurs create and grow technology-based businesses in Missouri. MTC supports traded-sector entrepreneurship through high-impact programs such as its support for Innovation Centers, other entrepreneurial support organizations through the Missouri Building Entrepreneurial Capacity (MOBEC) Grant Program, and its investments in Missouri-based, early-stage high-growth technology businesses through the IDEA (Innovation, Development, and Entrepreneurship Advancement) Fund Co-Investment Program. MTC’s portfolio of programs provide strong benefits and positive economic impacts (Figure ES-1).

**Figure ES-1: MTC’s Cumulative Economic Impacts, FY2014-FY2021**



**Source:** Missouri Technology Corporation program data and TEconomy Partners, LLC calculations.

**Note:** Of the 11 Innovation Centers funded over the time period, 9 are still currently operating and providing programmatic services.

2 Emil Malizia, Edward J. Feser, Henry Renski, and Joshua Drucker, *Understanding Local Economic Development: Second Edition*. (Routledge, 2020).



**MTC’s total program portfolio generated an economic activity return of \$100.74 back to the State of Missouri for every \$1 invested—a strong return to the State regardless of the programmatic benefits afforded by the investment.** Furthermore, from a state and local tax revenue return on investment (ROI) basis, MTC’s total program portfolio returned \$2.76 back to the State of Missouri for every \$1 invested. This return indicates that on a direct outlay basis, MTC programs have generated a positive return over the last eight years.

**While Missouri has made significant progress in recent years** (see Appendix A for the complete economic impact analysis of MTC’s investments), **inconsistent funding remains a primary challenge to supporting innovation and entrepreneurship.** Given the importance of innovation and entrepreneurship to economic development in the 21st century, many in the state desire to elevate these themes as policy priorities. Meanwhile, the defunding of MTC in FY18 sent a message throughout the ecosystem that the State of Missouri was not going to expand its entrepreneurial investments that had proven successful, but instead withdraw its support for the ecosystem. This has left founders, programs, and initiatives questioning whether the support and resources they need will be available.

Missouri’s decision to reduce its investments in innovation and entrepreneurship comes at a time when international peers and other competing states are accelerating the pace of new and existing programs, initiatives, and funding streams. At a time when Missouri is not only competing with other nations in the 21st century global economy, but also with many of its peer and neighboring states, its inability to invest in innovation and entrepreneurship could pose future risks to the state’s comparative advantages.

**This strategic plan focuses on developing a systemic entrepreneurial ecosystem with the requisite supports in place to encourage growth in traded-sector industries across the State of Missouri. This study is the culmination of Missouri’s ecosystem stakeholders and partners coming together to form a new, bold strategy for encouraging inclusive, entrepreneurial-led economic growth across the state.** Ultimately, a holistic approach was required to determine how the State of Missouri should promote entrepreneurship, support innovation-based and technology-enabled entrepreneurs, and help drive economic growth through the next decade. As a public-private partnership with leadership covering industry, academia, and economic development, MTC is uniquely situated to help drive this strategy.

Opportunities to encourage innovation and entrepreneurship exist in all corners of the state, and the project team was intentional about soliciting input from throughout the state. At the onset of this strategic initiative, MTC gathered a steering committee of 16 thought leaders from across the state to help guide the effort. Using a multi-pronged, qualitative approach, this effort involved outreach to approximately 500 individuals<sup>3</sup> throughout the state’s innovation and entrepreneurship ecosystem using three distinct components:

- An ecosystem survey to gather input regarding areas such as entrepreneurial culture, risk capital environment, innovation support and physical infrastructure to support entrepreneurs, the business climate, broadband, and other domains. More than 280 individuals participated in this survey, and nearly half (48 percent) of respondents were entrepreneurs.

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3 See Appendix B for a list of stakeholders from across the State of Missouri who informed this effort.

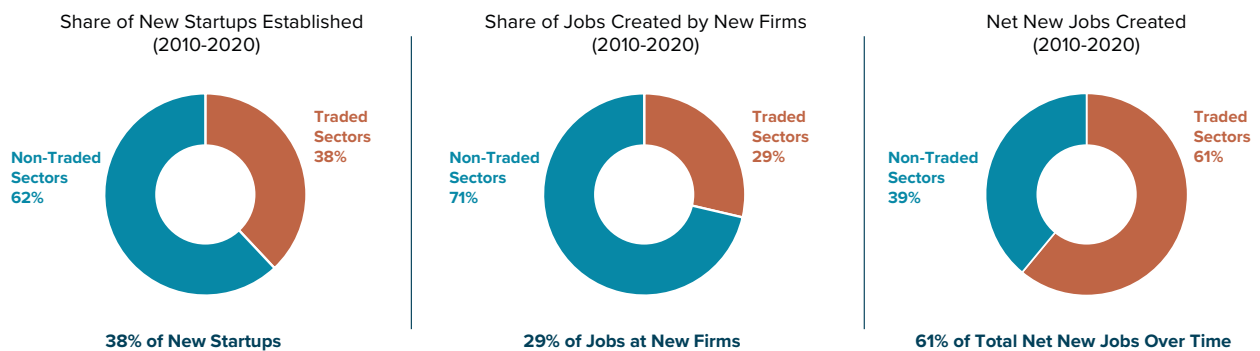
- Targeted interviews with serial entrepreneurs, venture capital providers, leaders of economic development and entrepreneurial support organizations, and other relevant members of the innovation and entrepreneurship ecosystem. In total, there were more than 70 interviews, and many of these discussions included multiple individuals.
- Regional focus groups with more than 120 individuals participating in six, 90-minute discussions to identify how public, private, philanthropic, and educational partners can collaborate in these regions to advance innovation and entrepreneurial development. Beyond these regional conversations, two statewide focus groups were conducted to gain feedback on both the analysis and preliminary recommendations. More than 80 stakeholders from across Missouri participated in these discussions.

## Key Findings That Drive Recommended Actions

Traded-sector firms, those that are serving customers and markets beyond the residents and businesses in their community, play an outsized role in Missouri’s economy. By bringing new dollars into Missouri’s economy, these traded-sector firms exhibit a strong multiplier effect: new jobs are created as exporting firms buy from local suppliers and as workers buy from local businesses. Economists estimate that traded-sector industries carry a multiplier more than twice as high as non-traded-sector firms.<sup>4</sup>

Over the course of the last decade, most net new jobs created in Missouri were due to the success of the state’s traded-sector firms. While the share of new startups established and the share of jobs created by new firms in traded sectors are relatively low—38 percent and 29 percent, respectively—traded-sector firms account for 61 percent of the total net new jobs created over time (Figure ES-2).

**Figure ES-2: Outsized Importance of Traded-Sector Firms to Missouri’s Economy**

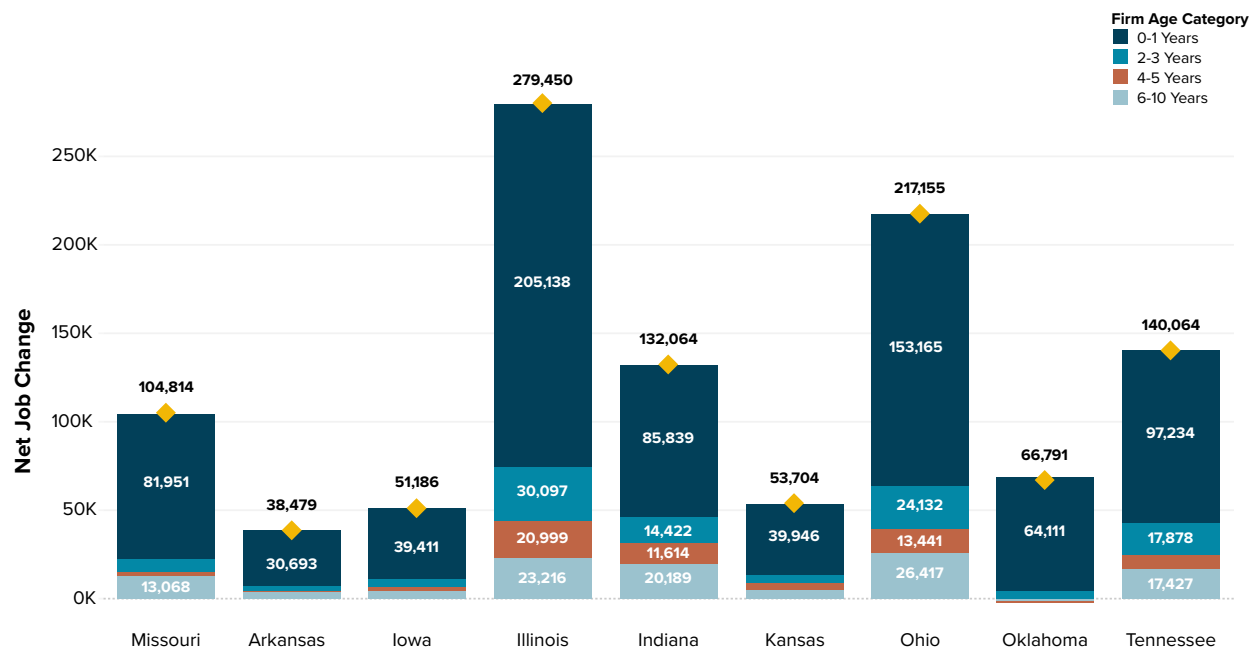


**Source:** TEconomy analysis of BLS Business Employment Dynamics Research and U.S. Census Bureau Quarterly Workforce Indicators Data

4 Timothy J. Bartik and Nathan Sotherland, Local Job Multipliers in the United States: Variation with Local Characteristics and with High-Tech Shocks, (The W.E. Upjohn Institute for Employment Research, March 2019). <https://orcid.org/0000-0002-6238-8181>

However, while traded-sector firms are driving employment in Missouri, relative to all the other benchmark states (with the exception of Oklahoma), the employment contribution from Missouri's young firms is not as robust as they age (Figure ES-3).

**Figure ES-3: Missouri + Benchmark States Traded-Sector Young Firms Total Net-Job Change, 2010-2020**



Source: TEconomy analysis of U.S. Census Bureau Quarterly Workforce Indicators

In many instances, companies are relatively stagnant, not growing in employment once they reach a certain size. Anecdotal evidence suggests that in other instances, companies are growing in employment but are having/choosing to do so in states other than Missouri. This suggests the need for modified or additional resources to encourage economic growth. As a result, **creating opportunities for more traded sector firms to grow and scale in Missouri must be the principal goal of this strategic effort.**

Within Missouri's innovation and entrepreneurship ecosystem, five key challenges were identified as inhibiting entrepreneurial growth. If Missouri is to succeed in creating economic prosperity, it must ensure its competitive position through five means. Each of these approaches directly responds to the primary challenges facing the state's ecosystem (Table ES-1).



**Table ES-1: Recommended Strategic Approaches to Addressing Ecosystem Challenges Facing Missouri**

| Challenge Area   | Recommended Approach  |
|--|---|
| <p>1. While the amount of risk capital dollars invested in Missouri has grown, the number of deals has declined. This suggests a shift toward larger later-stage investments and fewer early-stage deals, making it difficult for many entrepreneurs across Missouri to access risk capital.</p> | <ul style="list-style-type: none"> <li>• <b>Deploy greater levels of early-stage investment capital</b> to meet the demands of Missouri’s growing entrepreneurial base.</li> </ul>  |
| <p>2. Entrepreneurial support services and physical infrastructure remain less accessible, particularly among underrepresented minorities and those living in rural areas.</p>   | <ul style="list-style-type: none"> <li>• <b>Foster the growth and scalability of its high-potential, high-growth startups</b> by increasing access to quality entrepreneurial support services throughout the State of Missouri.</li> </ul> |
| <p>3. There is untapped potential at Missouri’s research institutions that is limiting ideation and entrepreneurship.</p>  | <ul style="list-style-type: none"> <li>• <b>Launch and cultivate innovative startups</b> by taking advantage of Missouri’s research strengths by converting the intellectual assets into market opportunities.</li> </ul>                   |
| <p>4. Not enough Missourians are participating in innovative and entrepreneurial endeavors, thereby making access to talent difficult for many startups and growing firms.</p>   | <ul style="list-style-type: none"> <li>• <b>Inspire and encourage more Missourians to participate</b> in entrepreneurial endeavors.</li> </ul>  |
| <p>5. There is a lack of connectivity among the various components of Missouri’s innovation and entrepreneurial ecosystem, both literally (e.g., broadband) as well as figuratively (e.g., perceived competition and siloed efforts).</p>  | <ul style="list-style-type: none"> <li>• <b>Connect</b> as “One Missouri” by overcoming physical and cultural barriers so that Missouri’s entrepreneurial ecosystems connect with each other and with the world.</li> </ul>                 |

Source: TEconomy Partners, LLC.

## Missouri's Strategic Framework

To overcome these challenges and help catalyze the innovation and entrepreneurial ecosystem statewide, a series of new initiatives that complement existing efforts are needed across the state. It is recommended that the State of Missouri—along with its strategic private sector, philanthropic, academic, and regional economic development partners— advance a set of five strategies and an associated set of 16 actions to drive innovation and entrepreneurship.



### STRATEGY ONE: FUND

Deploy greater levels of investment capital to help meet the demands of the growing entrepreneurial base.

While recognizing that the amount of risk capital dollars invested in Missouri has grown, it is also important to note that the number of deals has declined. This suggests a shift toward larger, later-stage investments and away from early-stage deals, making it difficult for many entrepreneurs across Missouri to access risk capital. Outreach across Missouri's innovation and entrepreneurship ecosystem raised a range of concerns, including:

- Working capital options needed to grow and scale companies are limited. Because not all businesses are suited for traditional venture capital due to unrealistic ROI expectations, alternative financing options are needed to grow and scale companies.
- Both entrepreneurs and potential investors need more training/education regarding accessing and deploying financial capital.
- The lack of angel investment tax credits (compared to Kansas and other states) is a barrier for both potential investors and early-stage entrepreneurs.
- There is a desire to create new funding mechanisms that address Missouri-specific opportunities, such as investment in industry vertical funds not traditionally financed through equity investments, as well as funds targeting diverse founders.

To address these challenges, three actions are recommended:

#### Action 1. Catalyze additional investment capital funds across the capital stack.

- Support the generation of additional indigenous pre-seed, angel, seed, and early-stage venture capital funds in Missouri managed by resident private fund managers.
- Provide additional nondilutive grant funding by supporting a Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) matching grant program, as well as providing matching dollars for nonprofit organizations that provide direct cash grants.
- Pilot innovative financing options that fill gaps in the state's ecosystem, such as revenue-based financing for business models that do not traditionally attract risk capital dollars, and direct investments for founders from underserved populations (demographic or geographic).

#### Action 2. Incentivize angel investments.

- Create an angel investment tax credit that would provide a qualified investor with a transferable income tax credit equal to 25 percent of an eligible investment in an eligible Missouri company.

- Encourage angel networks by providing funding under Action 1 to offset costs of professional fund management, network administration, and due diligence.

### **Action 3. Evaluate the creation of Missouri Rural Vitality Funds to provide collateral for entrepreneurial loans.**

- A private citizen seeking to invest in their rural community could make a commitment of a personal and/or alternative asset to serve as collateral from which banks could provide loan to local entrepreneurs within the rural region.
- Investors would serve on the Board to oversee the implementation of the program.
- Regional/local banks would conduct due diligence on the loan application, service the loan, and benefit from an increased loan portfolio and potential new customers.



### **STRATEGY TWO: GROW AND SCALE**

Increase access to quality entrepreneurial support services throughout Missouri to ensure companies are able to grow and scale.

Over the past decade, Missouri has experienced a significant startup formation rate of traded-sector firms. While Missouri has made many strides in recent years to support these new establishments, there are many concerns that the entrepreneurial support assets and resources are not always equally available. In particular, those Missourians living in rural areas and those who are considered underserved entrepreneurs, including women, veterans, immigrants, rural entrepreneurs, and LGBTQIA+ individuals, face challenges in accessing essential ecosystem services.

To address these challenges, three actions are recommended:

### **Action 4. Develop a statewide Entrepreneurial Pathways Program.**

- Serve as an intake system for entrepreneurs to learn about and access the various resources within Missouri that are dedicated to assisting entrepreneurs. Missouri can build upon the investment it has already made in the creation of MOSourceLink.
- Enhance the website component by further enhancing a robust wayfinder component that can direct entrepreneurial inquiries to the best resources to help meet their current needs.

### **Action 5. Foster regional efforts to provide quality entrepreneurial support services to high-potential, high-growth, traded-sector startups.**

- In order to support Missouri's high-growth, traded-sector startups as they grow and scale, a comprehensive continuum of value-added programs must be available to all growth-oriented entrepreneurs as they progress through the stages necessary to establish a thriving enterprise. Missouri's high-growth, traded-sector startups must be able to access the following entrepreneurial support service programs regardless of where they are located within the state:
  - **Mentorship Network Program:** to overcome the lack of serial entrepreneurs in Missouri, develop networks of seasoned mentors who provide guidance to promising companies, which in turn make them more attractive to the risk capital community.



- **Entrepreneurs-in-Residence Program:** to ensure consistent, significant, value-added assistance to high-growth companies that are fundable but lack C-level talent.
- **Physical Hub Program:** to support the physical places that serve as a region’s entrepreneurial focal point.
- To best assist high-potential and high-growth startups, Missouri should establish two avenues to support the delivery of quality entrepreneurial support services:
  - **Regional Node Funds** are intended to incentivize more of Missouri’s communities to successfully coalesce their assets to best support innovation and entrepreneurship through strategic, coordinated partnerships among entrepreneurial service organizations. Funds for Regional Nodes will need to support traded-sector businesses. However, regions will be able to use the funds to support their entrepreneurs, regardless of sector.
  - **Flexible Support Funds** allow Missouri to respond to other areas of need in the state’s entrepreneurial ecosystem, including sector-focused efforts and piloting innovative approaches to engage entrepreneurs in rural areas and other underserved communities.

**Action 6. Connect Missouri’s corporate partners and anchor institutions with startups, thereby creating a “stickiness” to Missouri for the entrepreneurial endeavor’s ultimate success.**

- Provide corporate partnership grants to regional nodes, their strategic partners, and at the state-wide level to develop first-customer programs that support startup growth and educate entrepreneurs on how to best work with corporations (and vice-versa).
- Other examples of support include networking platforms for startups and industry, accelerator programs that link corporations with promising startups and technologies, and programs that support internal innovation efforts at Missouri companies.



### **STRATEGY THREE: LAUNCH AND CULTIVATE**

Take advantage of Missouri's research strengths by converting the intellectual assets into market opportunities.

Developing a vibrant environment that encourages basic and applied research at colleges, universities, and within industry is essential if Missouri is to catalyze further innovation-led economic growth. It is also critical that Missouri can transfer the intellectual property developed at its colleges and universities into new products, services, and businesses, and ultimately, into new jobs and investment. Currently, there is untapped innovation and entrepreneurial potential within Missouri's research institutions.

To address these challenges, three actions are recommended:

#### **Action 7. Reenergize the Research Alliance of Missouri (RAM) as a mechanism for bringing together the major research institutions of the state to solve common innovation continuum challenges.**

- Reenergize the Alliance to further engage the state's research leaders and break down silos across the state's universities. Activities could include:
  - Streamlining processes that help researchers work with companies across the state and with each other, including partnership agreements, shared-use facility arrangements, and other accommodations.
  - Developing working groups around key sectors related to Missouri's R&D strengths.
  - Encouraging collaborations that help the state's research institutions better compete for federal research funds that require a local match.

#### **Action 8. Leverage the federal I-Corps program and provide startup services statewide to encourage commercialization activity.**

- Continue to coordinate, support, and expand a statewide I-Corps program. In particular, the state should:
  - Work with the newly reenergized RAM to scale the program across a greater number of colleges, universities, and research institutions. Expanding this effort statewide would assist an even greater number of researchers, faculty, and graduate students from across Missouri in launching new startups and in validating a technology's market potential.
  - Partner with Missouri's regional entrepreneurial support efforts to provide I-Corps training where the programs are currently unavailable.
  - Identify ways to provide follow-on support services for promising graduates of the I-Corps program.

#### **Action 9. Provide comprehensive assistance for SBIR/STTR awards to further drive commercialization across the state, especially at Missouri's research institutions.**

- Leverage the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) program to help develop novel technologies into promising young companies. It is recommended that the state develop a comprehensive system to assist potential, current, and past SBIR/STTR awardees. This includes three components:



- Phase 0: Missouri should develop a new program that assists applicants pursuing a Phase I SBIR award.
- Phase I Match: Missouri should support an SBIR matching grant program that provides support for writing applications and serves as a bridge between Phase I and II awards.
- Phase 2 Match: For companies receiving a Phase II SBIR/STTR award, a matching grant could help them further develop commercially viable innovations.



## **STRATEGY FOUR: INSPIRE**

Encourage more Missourians to participate in innovation and entrepreneurship.

Few things are as vital to the long-term prosperity of Missouri’s entrepreneurial ecosystem as having access to the talent needed to grow and scale high-potential, high-growth firms. Interviews with key stakeholders suggest that not enough Missourians are participating in innovative and entrepreneurial endeavors either because they have never been connected to these firms and are unaware that they exist, or because they believe that they are not a fit with an entrepreneurial opportunity. Developing these connections will be critical in the state’s efforts to support the formation and growth of entrepreneurial firms.

To address these challenges, four actions are recommended:

### **Action 10. Improve access to entrepreneurial programming for students in middle/high school and at community colleges and universities.**

- Develop a statewide effort to improve access to programs that encourage student entrepreneurship through training, contests, and entrepreneurial-focused events.

### **Action 11. Fund an internship program that connects startups with talent.**

- Connect students with paid internship opportunities, thereby providing startups and small businesses the opportunity to recruit their future workforce.

### **Action 12. Offer entrepreneurial education across Missouri through regional partnerships.**

- Deliver nationally recognized approaches to lean startup education while also tailoring each program to the unique circumstances of specific regions and providing an entryway into support services.

### **Action 13. Enhance Missouri’s storytelling capacity to encourage more Missourians to be entrepreneurial.**

- Implement a storytelling campaign through aggressive marketing, public relations, and signature events that celebrates successful entrepreneurs who can serve as role models for would-be entrepreneurs currently sitting on the sidelines, unsure how to engage.



## STRATEGY FIVE: CONNECT

Overcome physical and cultural barriers to better connect Missouri's communities with each other and with the world.

Connectivity is missing between the various components of Missouri's innovation and entrepreneurial ecosystem, both literally (e.g., broadband) as well as figuratively (e.g., perceived competition and siloed efforts). Over the last 10 years, while Missouri has made major strides in entrepreneurship/innovation, there is still a sense that the state is not reaching its full potential due to a range of disconnects and other environmental factors that impede further growth.

- **Inter- and intra-regional competitiveness is hindering the ability to realize “One Missouri.”** There is a need for initiatives that encourage greater levels of collaboration across Missouri. Many regions of the state exist in silos, and even within regions, there are further challenges related to coordinating existing resources and working together across silos. The geographic boundaries traditionally used to define some parts of the state may result in a fragmented distribution of resources. For example, within rural Missouri, the large geographic boundaries that define service areas can make it challenging for entrepreneurs to access services as a result of geographic distance. In the state's two largest urban settings, efforts have been taken in recent years to address long-standing inter-regional divisions, but challenges remain.
- **There is a disconnect with internal and external perceptions in the state regarding the importance of innovation and entrepreneurship to Missouri's economy.** There is concern that the defunding of MTC in FY18 sent a message throughout the ecosystem that the State of Missouri does not prioritize investments in innovation and entrepreneurship, but instead has withdrawn its support for the ecosystem. This has left founders, programs, and initiatives questioning whether the support and resources they need will be available.
- **Available and affordable high-speed internet is recognized as the greatest business infrastructure need across Missouri, and the greatest threat to Missouri's innovation climate.** The economic competitiveness of Missouri's communities depends on the widespread availability and accessibility of broadband, for every business and household in the state. To encourage innovation and entrepreneurship, modern technology infrastructure that can handle cloud, data processing, and other capabilities is needed.

To address these challenges, three actions are recommended:

### Action 14. Realize One Missouri: Improve connectivity within and between regions.

- Foster connectivity among and between the various ecosystem partners from across the state via a variety of means, including conferences, technology showcases, pitch competitions, recognition/celebration events, workshops for entrepreneurial-related activities and training, cross-regional mentorship programs, etc.

### Action 15. Link Missouri's innovation and entrepreneurial ecosystem to the world through an external marketing campaign.

- Undertake an external marketing campaign that communicates to key audiences, both domestically and internationally, the depth and breadth of Missouri's unique resources and opportunities that the state provides for advancing the innovation economy.

### Action 16. Deploy broadband infrastructure across Missouri.

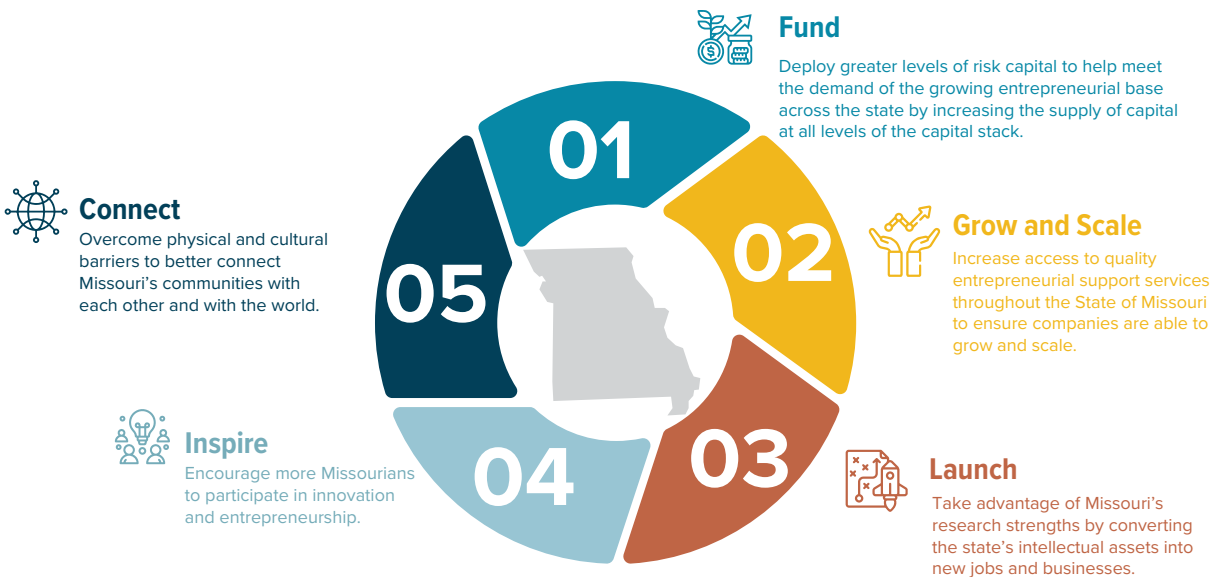
- Leverage federal resources to fund broadband infrastructure in underserved areas of the state. Ultimately, this strategy cannot successfully impact entrepreneurs across the state if Missouri’s lack of broadband infrastructure is not addressed.

## Summary

This strategic action plan for the State of Missouri charts a course for the state to encourage innovation and entrepreneurship over the next decade. For Missouri to see widespread economic growth across all its communities, there is a need to develop a robust innovation and entrepreneurial ecosystem that can foster the formation of novel businesses, help scale their operations, and sustain their growth as they generate new, high-paying jobs. Developing a robust ecosystem to support innovation and entrepreneurship is an essential part of encouraging economic development in Missouri.

Generating these outcomes does not happen on its own, but rather through a series of intentional, strategic, and proactive decisions. The innovation and entrepreneurial strategy is driven by public-private-philanthropic partnerships that capitalize on Missouri’s strengths while ensuring that future innovation and entrepreneurial investments are focused on building the ecosystem that will help ensure the state’s economic vitality for years to come (Figure ES-4).

Figure ES-4: Five Strategies to Support Innovation and Entrepreneurship in Missouri



Source: TEconomy Partners, LLC.

A focus on these five thematic areas will help ensure the state’s future economic vitality for all Missourians. Anticipated economic and societal impacts that will be realized from the successful implementation of this innovation and entrepreneurial strategy include better paying jobs with higher growth potential, the ability to weather future economic challenges, and inspired future generations who will reach their full potential.





## Introduction

### The Role of Innovation and Entrepreneurship in Economic Development

In a complicated, everchanging, and innovation-driven global economy, those places (nations, states, and regions) that cultivate an environment where innovation and entrepreneurship thrive are often among the most competitive. As noted by the U.S. Council on Competitiveness in its recent report:

*Technology and innovation—the combination of imagination, insight, ingenuity, invention, and impact in society—are the main drivers of U.S. economic growth and productivity, the main shapers of the future, and principal determinants of economic opportunities and national security for Americans. With such impact for the Nation, U.S. capacity, capability, and performance in leveraging new technology for economic gain and for innovating should be at the top of the economic and national security agenda, and of major concern to U.S. public and private sector leaders.<sup>5</sup>*

In recent years, however, the strength of the United States, relative to other nations across many categories related to innovation and entrepreneurship, has given cause for concern. Growth and concentration in research and development spending is relatively static compared to competitors like China, South Korea, India, and Germany.<sup>6</sup> The infrastructure necessary to encourage innovation in the United States is inadequate and inflexible, corporate investment in key sectors is declining, and critical skill shortages span many sectors.<sup>7</sup>

Across the globe, many nations have developed robust strategies to support innovation-led economic development. However, due to a lack of coordinated national policies to support innovation and entrepreneurship, state governments have been left with the difficult task of constructing and implementing their own strategies to support technology-based economic development. **As a result, states like Missouri are not only competing with other nations in the 21st century global economy, but also with many of their peer or neighboring states.**

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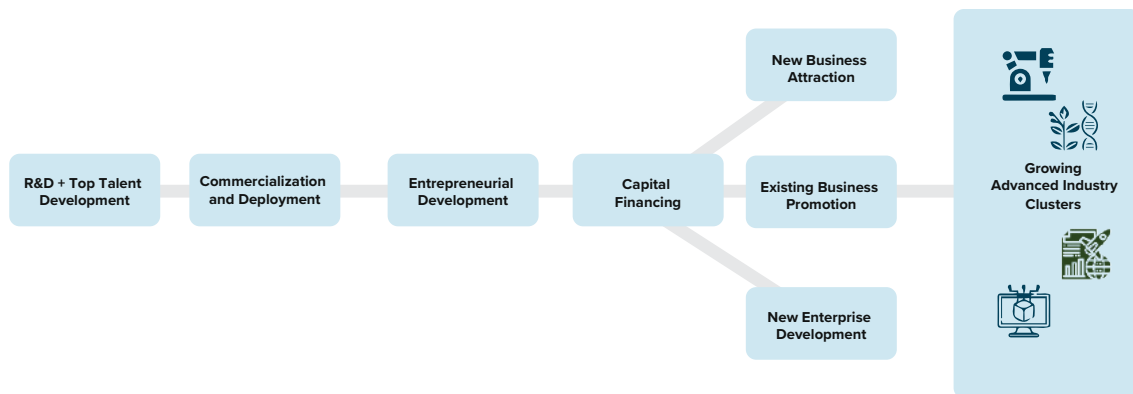
5 The Council on Competitiveness, *Competing in the Next Economy: The New Age of Innovation*, (National Commission on Innovation & Competitiveness Frontiers, 2020.) [https://www.compete.org/storage/documents/documents/CoC\\_Commission\\_NextEcon\\_121620\\_FINAL.pdf](https://www.compete.org/storage/documents/documents/CoC_Commission_NextEcon_121620_FINAL.pdf)

6 National Science Board, *The State of U.S. Science and Engineering*, (National Science Foundation, 2020). <https://ncses.nsf.gov/pubs/nsb20201/global-r-d>

7 Gregory Tassey, "Regional Technology-Based Economic Development: Policies and Impacts in the U.S. and Other Economies," *Annals of Science and Technology Policy*: vol3, No. 1, (May 2019):1–141.

While it is well-understood that the future health of any modern economy rests on its ability to innovate, economic growth is not easy to achieve in general, and innovation-based economic growth is an even greater challenge. The successful development of innovation into value-added products that create economic impact depend on a chain of factors that is particularly complex and challenging to develop and manage. If any link in the chain is missing, the growth potential from innovations can be stunted. The states and regions in the United States that have achieved success in innovation-based economic development (places such as California and Massachusetts) have mature innovation development chains in place. These innovation development chains may form naturally over time (as occurred in Silicon Valley and Boston); or they may result from the dedicated activities of states, regions, and key stakeholders to connect and build links in the chain to assure such development happens (as occurred in the Research Triangle area). Figure 1 illustrates the basic innovation development chain that must be in place to create and bring to market value-added, innovative products and processes with the power to create significant economic impact. Ultimately, those states and regions that have achieved economic prosperity in recent years are those that have addressed gaps and weaknesses in their development chain.

**Figure 1: The Chain of Innovation and Entrepreneurship in Economic Development**



Source: TEconomy Partners, LLC.

For Missouri to see widespread economic growth across all its communities, there is a need to develop a robust innovation and entrepreneurial ecosystem that can foster the formation of novel businesses, help scale their operations, and sustain their growth as they generate new, high-paying jobs. Developing a robust ecosystem to support innovation and entrepreneurship is an essential part of encouraging economic development in Missouri. This ecosystem contains six interrelated stages:

- **Research and Development and Top Talent Development:** a vibrant environment to support basic research, applied research, innovation, and inclusive skill development in universities, in industry, and in informal settings.
- **Commercialization and Deployment:** the translation of market-driven research into products, processes, or other services that create economic value.
- **Entrepreneurial Development:** the quality of direct, available entrepreneurial assistance that , access to mentors or other subject matter experts, and/or the ability to network with other entre-

preneurs or individuals who can help launch and scale a company. This stage also requires physical infrastructure to meet entrepreneurial needs, including needs related to access to physical space, shared services, shared equipment, and support services that are often provided through incubators, innovation hubs, and makerspaces.

- **Capital Financing:** sources of nondilutive capital, equity investments, and debt financing.
- **Economic Development:** A robust innovation ecosystem serves as the base of a “three-legged stool” for economic development, which includes:
  - **New enterprise development:** Encouraging the creation of new businesses in Missouri that can meet both local and global demand.
  - **Existing business promotion:** Supporting established businesses in Missouri with the resources they need to grow, scale, and sustain their operations.
  - **New business attraction:** Encouraging companies from outside of Missouri to locate in the state as a result of the vibrancy of the innovation ecosystem and its clusters.
- **Advanced Industry Clusters:** Missouri’s ability to encourage advanced industries and link startups, small businesses, and potential supply-chain partners with large/anchor companies to help drive innovation, connections, sales, and company growth.

## Entrepreneurial Ecosystem

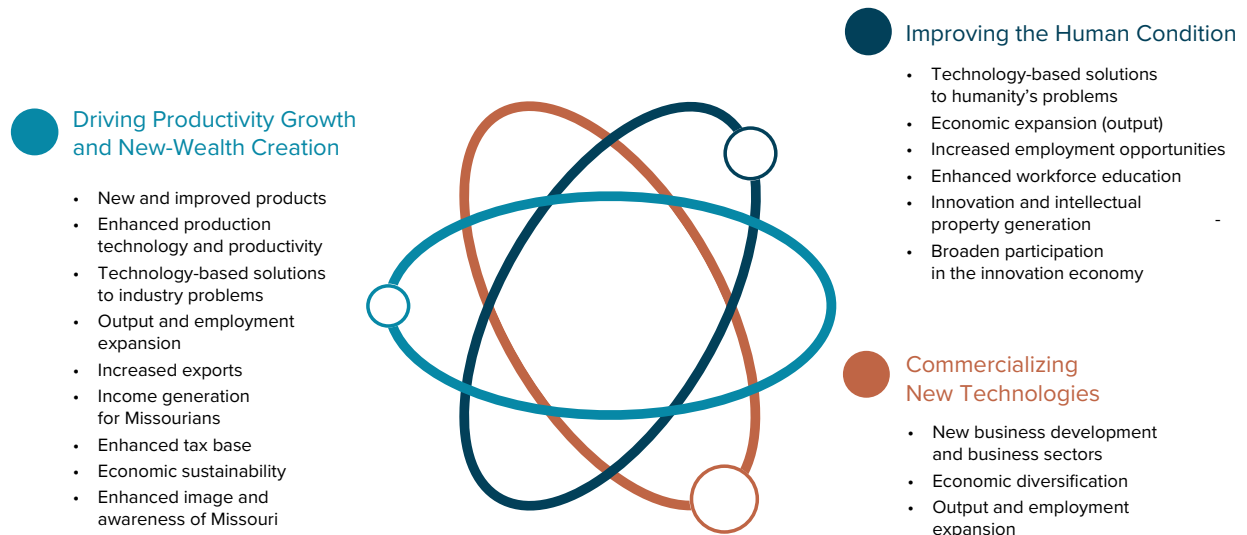
As defined by the Kauffman Foundation, an entrepreneurial ecosystem is “a network of people supporting entrepreneurs, and the culture of trust and collaboration that allows them to interact successfully. The speed at which talent, information, and resources move through the ecosystem can affect entrepreneurs at each stage in their lifecycle.”

**Source:** <https://www.kauffman.org/ecosystem-playbook-draft-3/glossary-and-resources/>

From its inception as a state 200 years ago to its status today as a leader in globally significant industries, innovation and entrepreneurship have always played a critical role in driving economic vitality in Missouri. The positive impacts of supporting innovation-based economic development can be viewed in a variety of ways (Figure 2). Notable examples of positive impacts include:

- **Driving Productivity Growth and New-Wealth Creation:** Supporting economic development in both urban and rural areas alike, including many mutually beneficial supply chains and cross-regional partnerships. Innovation-oriented industries in Missouri are more likely to pay higher wages and offer a higher return on investment (ROI) than locally-serving industries.
- **Commercializing New products, Processes, and Services:** These novel inventions help solve key challenges related to national defense, environmental sustainability, and other mission-critical topics. Missouri has long been synonymous with the defense and aerospace industries and is also a leader in microelectronics –an essential part of a competitive U.S. technology sector.
- **Improving the Human Condition:** Beyond economic benefits, innovation and entrepreneurship also support enhanced living standards and quality of life. Missouri’s academic and industrial advancements across the plant, animal, and human health domains have helped humans live longer, healthier lives.

**Figure 2: Positive Impacts of Innovation-Based Economic Development**



Source: TEconomy Partners, LLC.

## Key Terminology

- **Startups:** A subset of all new establishments that are typically formed by entrepreneurs with the goal of scalable growth. For this analysis, startups are broadly defined as:
  - *New establishments formed in the last 10 years*
  - *Establishments having <50 employees at inception*
  - *Not formed as a subsidiary or branch of a larger firm or enterprise*
- **High-Potential, High-Growth Company:** A company performing better, or expected to perform better, than its specific industry vertical or the market as a whole.
- **Business Dynamism:** The churn in the economy as measured by firm entry, expansion, contraction, and exit.
- **Traded Sector:** Industries that sell their output in competition with businesses in other states or nations, as opposed to local industries that sell their output primarily to the local population.
- **Innovation:** The improvement of existing, or the creation of entirely new, products, processes, services, and businesses.



## Why Focus on Entrepreneurs and Entrepreneurial Companies Within Traded Sectors?

Key to advancing the innovation chain are the people who can turn innovation into successful businesses. Innovation, in and of itself, will not necessarily translate into economic activity. Rather, it is the application of a technology and its introduction into the marketplace that result in economic growth.

The role of entrepreneurs in stimulating economic growth is not a 21st century phenomenon, but instead was understood as an economic reality at the turn of the last century. The development of assembly line production, for example, and its application to the mass production of automobiles reduced the time that entrepreneur Henry Ford took to produce the Model T Ford by 68 percent over six years and reduced its cost by 62 percent, allowing middle-class families to afford what had once been a luxury. During the past century, innovation in mechanics, computing technology, medicine, and business practices has driven economic growth, raised wages, and helped Americans lead longer and healthier lives.

What characterizes an entrepreneurial firm? The National Governors' Association puts forth this definition of entrepreneurship and entrepreneurs:

*Entrepreneurship is the ability to amass the necessary resources to capitalize on new business opportunities; and an entrepreneur is one who combines smart business practices with innovation, without regard for resources under his or her control.<sup>8</sup>*

Innovation and entrepreneurship are inextricably linked. As the Center for American Entrepreneurship, a nationally focused and non-partisan research, policy, and advocacy organization focused on entrepreneurship, notes:<sup>9</sup>

*New ideas are the basic craft and contribution of entrepreneurs. Whether a new product or service, "building a better mousetrap," or new methods of producing, distributing, or delivering products and services, new ideas are the essence of innovation, which drives productivity gains and economic growth, and creates jobs, wealth, and opportunity. New ideas can come from the mind and imagination of entrepreneurs or as the result of scientific inquiry and discovery.*

It is important to note that, while most entrepreneurs start by forming small businesses, not all small businesses are entrepreneurial. The needs of small businesses and growth-oriented entrepreneurs may be similar at first during the startup phase, but they quickly diverge. Small business owners create compa-

### Entrepreneurs

- Commercialize innovative products and services that improve quality of life.
- Create dynamic and flexible new industries and firms to replace those that are no longer viable in a rapidly changing global economy.
- Provide most new employment opportunities, especially in high-paying jobs, ultimately improving quality of life.
- Create wealth that is reinvested in new enterprises and, through demonstrated philanthropic activity, in communities.

<sup>8</sup> National Governors' Association, *A Governor's Guide to Strengthening State Entrepreneurship Policy*, (2004).

<sup>9</sup> Center for American Entrepreneurship, "Innovation," (2020). <https://startupsusa.org/issues/innovation/>

nies to generate wealth and provide employment and income for themselves and others; growth-oriented entrepreneurs are interested in creating new innovative products or services that lead to further investment and growth. It is also important to remember that entrepreneurship includes more than just startups: mature firms must also be entrepreneurial in developing new products and entering new markets.

For economic growth to occur, growth-oriented entrepreneurs must focus on serving customers and markets beyond the residents and businesses in its community—otherwise known as traded-sector activities—in order to drive an increase in a state’s gross domestic product (GDP), which in turn leads to a higher quality of life for its citizens. By bringing new dollars into Missouri’s economy, traded-sector firms exhibit a strong multiplier effect: new jobs are created as exporting firms buy from local suppliers and as its workers buy from local businesses. Traded-sector industries carry a multiplier more than twice as high as non-traded-sector firms, according to an analysis by Tim Bartik of the Upjohn Institute, an expert on economic development policy.<sup>10</sup>

Business activities that typically focus on meeting the local needs of families and businesses and do not bring new income from outside the region into the region are often referred to as sheltered or locally serving industries. Examples of sheltered industries include restaurants, retail stores, dry cleaners, and state and local government services. While these sheltered industries are critical to Missouri’s quality of life, they rely on purchases from local residents and businesses as their primary market, and so do not generate new income, but instead benefit from a growing economy. As noted by economists Emil Malizia, Edward J. Feser, Henry Renski, and Joshua Drucker in their recent book, *Understanding Local Economic Development:*

*Productivity growth in the traded sectors is the primary source of wealth creation and income generation. However, most jobs reside in the non-tradable industries, which are more labor-intensive and less prone to productivity improvements. Productivity growth in the tradable sector fuels job growth in the local non-tradable sector through multiplier effects...innovation activities have far higher local multiplier effects than nearly all other sectors, including manufacturing.<sup>11</sup>*

Some business activities fall between the traded sector and sheltered activities and are termed partially traded industries. One example is healthcare providers, which often serve local residents, but if based at a major medical center offering clinical excellence, can attract patients from outside of a region. Additionally, the availability of quality local healthcare providers is one of the critical quality-of-life factors considered by site location consultants and businesses when locating new business investments. Another partially traded sector is business services that can serve a mix of customers in and outside a region; this sector is critical to providing the professional services needed by new and growing businesses.

Additional research by Upjohn Institute and Bartik finds that targeting economic development initiatives at traded-sector firms with high multiplier effects helps improve their cost-effectiveness and efficiency.<sup>12</sup> Providing customized business services is among the most cost-effective tools for encouraging economic

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10 Bartik, Timothy J., and Nathan Sotherland. “Local Job Multipliers in the United States: Variation with Local Characteristics and with High-Tech Shocks.” Upjohn Institute Working Paper 19-301. W.E. Upjohn Institute for Employment Research. <https://doi.org/10.17848/wp19-301>

11 Malizia, Emil, Edward J. Feser, Henry Renski, and Joshua Drucker, *Understanding Local Economic Development: Second Edition* (Routledge, 2020).

12 Timothy J. Bartik, “What Works to Help Manufacturing-Intensive Local Economies?” Upjohn Institute Technical Report No. 18-035. (W.E. Upjohn Institute for Employment Research, 2018). <https://doi.org/10.17848/tr18-035>

development, according to Bartik. These services can have low costs because they help overcome the market failures holding back entrepreneurs and small- and medium-sized businesses. These businesses face financing and information barriers and may struggle to receive the right assistance or business advice. Offering assistance at modest costs can have a larger effect on a smaller business's competitiveness.

## The Decline of Entrepreneurship—A National Dilemma

Entrepreneurship, the economic force that is widely understood to have made this country the envy of the world, is in a state of decline. Many different studies over the past decade, using various ways to measure the growth and success of startups, all point to the same conclusion—the decline in U.S. entrepreneurship is impeding economic growth. Most recently:

- A study by the Congressional Budget Office completed in December of 2020 shows that startup activity has been slowing down in the United States for the past four decades. New firms (defined as those less than five years old with at least one employee on the payroll) constituted 38 percent of all businesses in 1982; that percentage declined to 29 in 2018. During that period, new firms' share of employment fell by a third, from 14 percent to 9 percent.<sup>13</sup>
- The Kauffman Foundation reported in February of 2021 in its National Report on Early-Stage Entrepreneurship in the United States: 2020 that, while the overall rate of new entrepreneurs experienced an increase throughout 2020, the share of those who created their business out of choice instead of necessity declined during the past year, reflecting the national economic instabilities caused by the COVID-19 pandemic. The decrease in new entrepreneurs who began their business out of choice during 2020, known as the opportunity share, is the largest drop throughout the past 25 years.<sup>14</sup>

The impact of this decline cannot be overstated. A report prepared for the SBA's Office of Advocacy that compares regions with strong and weak entrepreneurial activity found that the most entrepreneurial regions experienced greater economic prosperity compared to the least entrepreneurial regions. "They had 125 percent higher employment growth, 58 percent higher wage growth and 109 percent higher productivity."<sup>15</sup> As a result, states that recognize the benefits of entrepreneurship and the role it plays in today's knowledge-based economy are developing policies and programs to establish an environment that creates, attracts, and retains entrepreneurs, as well as an infrastructure to support them.

MTC plays an integral role in developing a landscape for innovation-based economic development in the state, primarily through its support for Innovation Centers, other entrepreneurial support organizations through the MOBEC Grant Program, and its investments in Missouri-based, early-stage high-growth technology businesses through the IDEA Fund Co-Investment Program. Created by the Missouri General Assembly to promote entrepreneurship and foster the growth of new and emerging high-tech companies, MTC's mission is to provide leadership and make strategic investments that help entrepreneurs create and grow technology-based businesses in Missouri. As noted by Missouri Governor Mike Parson, "Missouri

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<sup>13</sup> See: <https://www.cbo.gov/publication/56906>.

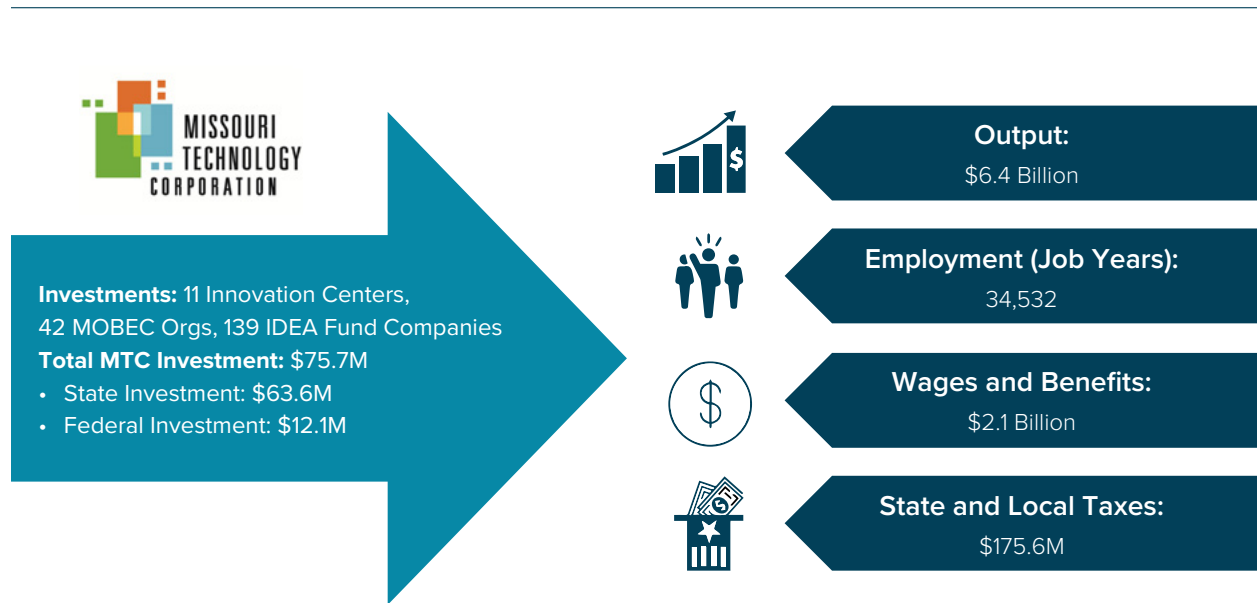
<sup>14</sup> The Ewing Marion Kauffman Foundation, *National Report on Early-Stage Entrepreneurship in the United States: 2020*, (February 2021).

<sup>15</sup> Michael S. Camp, *The Innovation-Entrepreneurship Nexus: A National Assessment of Entrepreneurship and Regional Economic Growth and Development*. (Powell, Ohio: Advanced Research Technologies, LLC, April 2005), p. 5.

Technology Corporation has long been an asset to our state’s entrepreneurs...I applaud MTC for taking steps to build a new strategy for the next generation of new businesses in our state.”

The economic impact that MTC’s portfolio of programs provide strong benefits and positive economic impacts, as illustrated in Figure 3.

**Figure 3: MTC’s Cumulative Economic Impacts, FY2014-FY2021**



*Source: Missouri Technology Corporation program data and TEconomy Partners, LLC calculations.*

*Note: Of the 11 Innovation Centers funded over the time period, 9 are still currently operating and providing programmatic services.*

As further detailed in Appendix A, **the total cumulative economic impacts of MTC’s programs and investments during this timeframe generated:**

- **More than 34,500 job years with wages and benefits totaling more than \$2 billion**
- **More than \$6.4 billion of economic output, and**
- **More than \$175 million in state and local tax revenue for the State of Missouri.**

MTC’s total program portfolio generated an economic activity return of \$100.74 back to the State of Missouri for every \$1 invested—a strong return to the state, regardless of the programmatic benefits afforded by the investment. Furthermore, from a state and local tax revenue ROI basis, MTC’s total program portfolio returned \$2.76 back to the State of Missouri for every \$1 invested. This return indicates that, on a direct outlay basis, MTC programs have generated a positive return over the last eight years.

While the investments of MTC, as well as other federally-funded efforts such as the Small Business Development Center (SBDC) Program and the Missouri Procurement Technical Assistance Centers (PTAC) (both implemented through University of Missouri Extension) are critical in fostering the innovation and entrepreneurial ecosystem of the State of Missouri, there are still unmet needs that, if unfunded or under-resourced,

will not allow Missouri's ecosystem to reach its full economic potential. Understanding how the investments have sought to catalyze the innovation/ entrepreneurial ecosystem in the face of declining national trends is critical to informing future investments in Missouri's innovation/entrepreneurial initiatives.

Furthermore, the defunding of MTC in FY18 sent a message throughout the ecosystem that, rather than expand its entrepreneurial investments that had proven successful, the State of Missouri would instead withdraw its support for the ecosystem. This has left founders, programs, and initiatives questioning whether the support and resources they need will be available.

Missouri's decision to reduce its investments in innovation and entrepreneurship comes at a time when international peers and other competing states are accelerating the pace of new and existing programs, initiatives, and funding streams. At a time when Missouri is not only competing with other nations in the 21st century global economy, but also many of its peer and neighboring states, an inability to invest in innovation and entrepreneurship poses future risks to the state's comparative advantages.

## Study Charge, Methodology, and Outline

This strategic plan focuses on developing a systemic entrepreneurial ecosystem with the requisite supports in place to encourage growth in traded-sector industries across the State of Missouri. **With leadership from MTC, this study is the culmination of Missouri's ecosystem partners coming together to form a new, bold strategy for encouraging inclusive, entrepreneurial-led economic growth across the state.** Ultimately, a holistic approach was required to determine how the State of Missouri should promote entrepreneurship, support innovation-based and technology-enabled entrepreneurs, and help drive economic growth through the next decade. As a public-private partnership with leadership covering industry, academia, and economic development, MTC is uniquely situated to help drive this strategy.

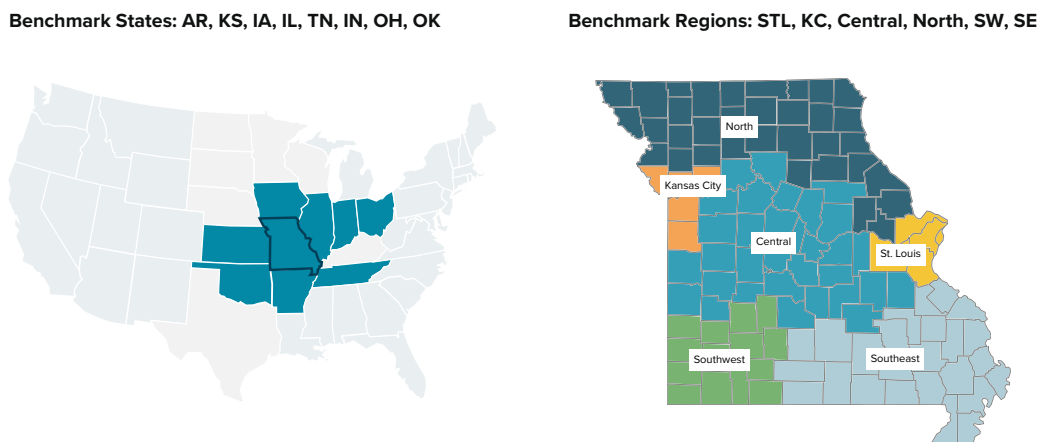
### Project Steering Committee

- Winston Bennett, Entrepreneur, North Region
- Chuck Boughton, Truman State University, North Region
- Shad Burner, Missouri Dept. Economic Dev., Southeast Region
- Stacey Button, Regional Economic Development Inc., Central Region
- Dr. Dedric Carter (Chair), Washington University, St. Louis Region
- Jim Eberlin, Entrepreneur, St. Louis Region
- Sam Fiorello, Cortex Innovation Community, St. Louis Region
- Maria Flynn, Techstars, Kansas City Region
- Craig Frazier, Entrepreneur, Southwest Region
- Rep. Derek Grier, Missouri Legislature, St. Louis Region
- Wendy Guillies, Ewing Marion Kauffman Foundation, Kansas City Region
- Benjamin Johnson, BioSTL, St. Louis Region
- Maria Meyers, UMKC Innovation Center and KCSOURCELINK, Kansas City Region
- Lisa Nichols, Entrepreneur, St. Louis Region
- Dr. Nadia Shakoor, Entrepreneur, St. Louis Region
- Bryan Shannon, Entrepreneur, Kansas City Region

At the onset of this strategic initiative, MTC gathered a steering committee of 16 thought leaders to guide the effort. Representing a cross section of Missouri entrepreneurial, philanthropic, governmental, academic, and industrial communities, this committee played an indispensable role throughout the process. The members of the steering committee can be found in the textbox.

First, the project team developed a mixed-methods quantitative analysis to explore innovation and entrepreneurship activity in Missouri. Importantly, this quantitative analysis looked not only at how Missouri fared against a series of peer and competitor states, but also how the different regions in Missouri were performing. Figure 4 describes the states used for the quantitative analysis, as well as the six regions used throughout the study. These six regions are based on the Missouri Department of Economic Development's Regional Engagement Team.

**Figure 4: Benchmark States and Missouri Regions for Quantitative Analysis**



Source: TEconomy Partners, LLC.

Areas explored through this quantitative portion of the analysis included:

- Dynamics of Traded-Sector Startup Establishments
- Employment Growth at Traded Sector Firms
- Patent Activity and Intellectual Property
- University Technology Transfer
- Investment Capital (such as angel, pre-seed, seed, and venture capital investment)
- Nondilutive Capital (such as SBIR/STTR awards and private grants)

Opportunities to encourage innovation and entrepreneurship exist in all corners of the state, and the project team was intentional about covering all regions of the state with this outreach plan. TEconomy's multi-pronged, qualitative approach involved outreach to approximately 500 individuals throughout the state's innovation and entrepreneurship ecosystem.<sup>16</sup> This included three distinct components:

<sup>16</sup> See Appendix B for a list of stakeholders from across the State of Missouri who informed this effort.

- **Ecosystem survey** to gather input regarding areas such as entrepreneurial culture, risk capital environment, innovation support and physical infrastructure to support entrepreneurs, the business climate, broadband, etc. More than 280 individuals participated in this survey, with representation from across the state’s innovation economy—45 percent of responses were from outside of the St. Louis and Kansas City regions. Notably, 48 percent of individuals who participated in this survey were entrepreneurs themselves. This high share, in conjunction with the substantial number of open-ended response questions in the survey, led to a significant number of comments, suggestions, and other recommendations to inform this study.
- **Targeted interviews** with stakeholders to identify regional and market-specific trends, drive equitable outcomes in areas with lower population density, support entrepreneurial activity from underserved entrepreneurs (including women, veterans, immigrants, rural entrepreneurs, and LGBTQIA+ individuals), and identify opportunities to strengthen commercialization assets. These interviews included conversations with serial entrepreneurs, venture capital providers, leaders of economic development and entrepreneurial support organizations, and other relevant members of the innovation and entrepreneurship ecosystem. In total, there were more than 70 interviews, and many of these discussions included multiple individuals.
- **Regional and statewide focus groups** vetted these findings and helped adjust, refine, modify the situational analysis, and identify ways that businesses, academe, and government can collaborate to advance innovation and entrepreneurial development across all of its regions. Across the six regions, there were more than 120 individuals participating in 90-minute discussions. Beyond these regional conversations, there were two statewide focus groups to gain feedback on both the analysis and the preliminary recommendations. More than 80 stakeholders from across Missouri participated in these discussions.

As noted by MTC Chairman Dr. Dedric Cater, “Our strategic initiative will serve as a lens to bring together many rays of light from across the state. Strategic engagement and subsequent consistent investment are critical to our future growth.” Across surveys, interviews, and focus groups, a wide range of individuals from across the State of Missouri were heard from throughout this process, representing entrepreneurs, risk capital providers, universities and research institutions, entrepreneurial service organizations, corporate innovation leaders, philanthropic foundations, and economic development professionals.

This strategic initiative does not exist in a vacuum. Instead, as part of both the quantitative and qualitative review process, TEconomy frequently referred to the wide range of complementary strategic initiatives developed across Missouri in recent years. The true success of this strategic initiative is to build on these notable examples, such as:

- The Missouri Chamber Foundation’s Technology 2030 Report (2021)<sup>17</sup>
- MOSourceLink Show Me Capital Report (2019)<sup>18</sup>, and

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<sup>17</sup> <http://mochamber.com/wp-content/uploads/2019/03/Technology2030-report.pdf>

<sup>18</sup> <https://www.mosourcelink.com/docs/default-source/sourcelink-documents/show-me-capital-report-2019-final-web-2.pdf>

- Governor’s Innovation Task Force Final Report (2017).<sup>19</sup>

The next section of this report includes a synthesis of both the qualitative and quantitative input. This situational analysis of innovation and entrepreneurship in Missouri suggests that five key challenges limit the state’s ability to develop and sustain a robust, innovational, and entrepreneurial ecosystem.

To address these challenges, recommended strategies and actions can be found in the third section of this report. A vital component of this project was identifying those practices among states that best define the state’s role in promoting entrepreneurship and supporting the advancement of technology and innovation. These best practices are interspersed throughout the report. Strategies and actions are inspired by these best practices and are not intended to imitate them.

This strategic plan is a culmination of the consensus of views of key thought leaders seeking to position Missouri for future economic growth driven by increased innovation and entrepreneurship. In the pages that follow, the Strategic Plan recommends a series of catalytic strategies and concrete actions that, if undertaken, will foster greater levels of economic prosperity for all Missourians in the years to come.

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<sup>19</sup> <https://www.hawthornfoundation.org/gitf>





# Situational Analysis: Innovation and Entrepreneurship in Missouri

**Entrepreneurship is a process involving an interconnected set of resource partners and development stages.** Generating successful new startup businesses helps drive state and regional economic growth. States and regions underperforming in any stage of entrepreneurial development may struggle to realize their full potential in traded-sector industry development (Figure 5).

**Figure 5: Encouraging Entrepreneurship From Ideation Through Company Growth**



Source: TEconomy Partners, LLC.

Entrepreneurial young firms are an important driver of economic growth. In addition to advancing innovation, new companies provide a key source of job creation. It is vital that new and young firms exist in an ecosystem in which they can thrive, providing substantial economic benefits as they grow.

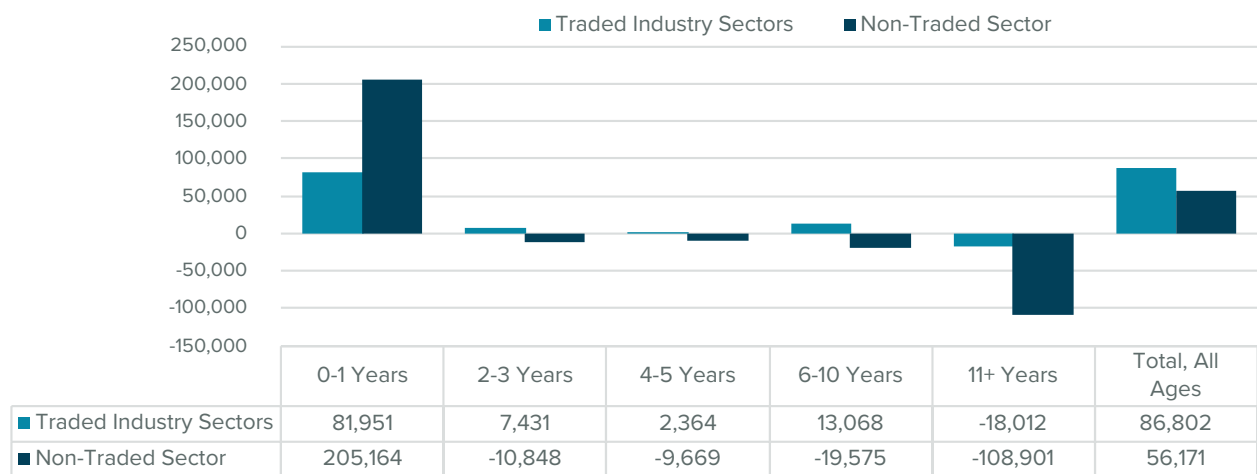
As noted previously, of particular importance are young firms in traded-sector industries. Traded-sector businesses account for a disproportionate share of economic output and employment and offer the primary competitive advantages in driving a state's economy.

Traded-sector industry activities include manufacturing; professional, scientific, and technical services; information technology; transportation and warehousing; agriculture; and food processing – those that typically serve customers and markets beyond their local communities. As a result, traded sectors drive economic growth and are of particular importance to Missouri. The U.S. Cluster Mapping Project describes the critical importance of a strong base of traded-industry sectors:

*[Traded-industry clusters] are free to choose their location of operation (unless the location of natural resources drives where they can be) and are highly concentrated in a few regions, tending to only appear in regions that afford specific competitive advantages....Since traded clusters compete in cross-regional markets, they are exposed to competition from other regions...**Traded clusters are the "engines" of regional economies; without strong traded clusters it is virtually impossible for a region to reach high levels of overall economic performance.***<sup>20</sup>

Traded sector companies are the drivers of economic growth because they bring new income into the state, which in turn gets spent locally and raises overall economic prosperity for communities. In Missouri, young traded-sector firms are the driver of employment growth. While new firms account for most of the net-job gains across both traded and non-traded sector firms in Missouri, traded sector firms generate the majority of net-job gains over time within the total private sector: Traded-sector firms are responsible for roughly 61 percent of total employment growth from 2010-2020, with most coming from new and young firms. Non-traded sector firms experienced net-job declines starting at age 2 and beyond (Figure 6).

**Figure 6: Total Annual Net-Job Change (2010-2020) by Firm Age Category and Sector**

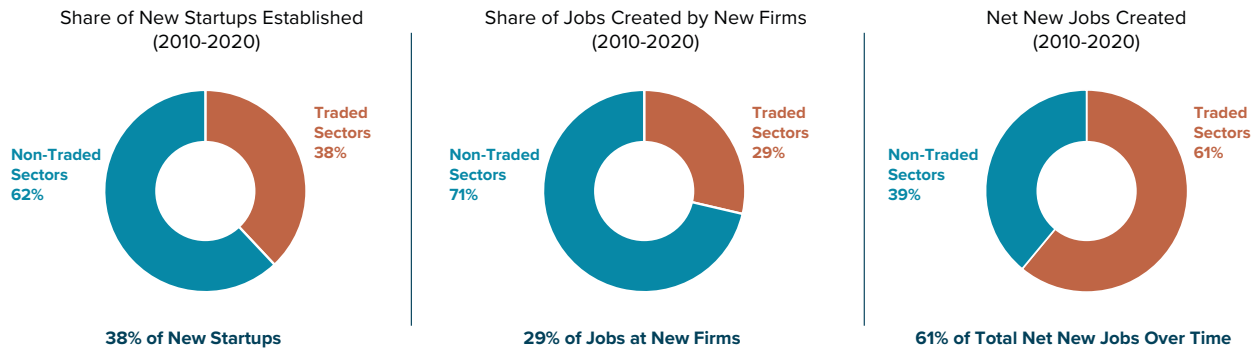


Source: TEconomy analysis of U.S. Census Bureau Quarterly Workforce Indicators

20 <https://clustermapping.us/content/clusters-101>

Importantly, traded-sector firms play an outsized role in Missouri’s overall economy. While the share of new startups established and the share of jobs created by new firms in traded sectors are relatively low—38 percent and 29 percent, respectively—traded-sector firms account for 61 percent of the total net new jobs created over time (Figure 7). **Over the course of the decade, most net new jobs created in Missouri were due to the success of these traded-sector firms.**

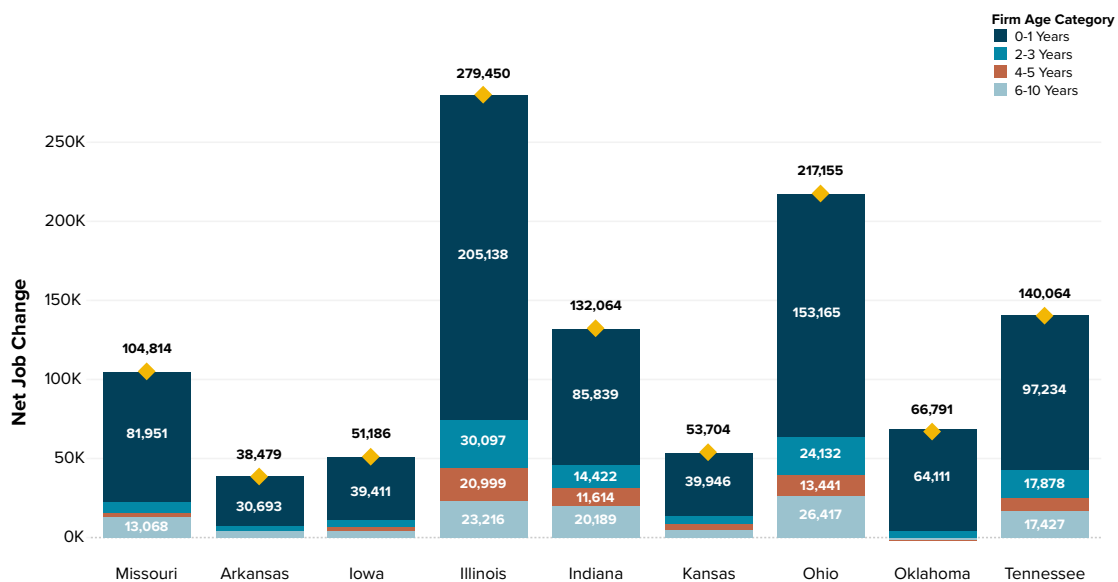
**Figure 7: Outsized Importance of Traded-Sector Firms to Missouri’s Economy**



Source: TEconomy analysis of BLS Business Employment Dynamics Research and U.S. Census Bureau Quarterly Workforce Indicators Data

The significance of young, traded-sector firms in Missouri is especially noticeable when compared to the U.S. average. Missouri’s traded share of 61 percent of total net new jobs compares to an average share across all other states of 55 percent total new jobs over time. **However, while traded-sector firms are driving employment in Missouri, relative to the other benchmark states, the employment contribution from Missouri’s young firms is not as robust as they age (Figure 8).**

**Figure 8: Missouri + Benchmark States Traded-Sector Young Firms Total Net-Job Change, 2010-2020**



Source: TEconomy analysis of U.S. Census Bureau Quarterly Workforce Indicators

In many instances, companies are relatively stagnant, not growing in employment once they reach a certain size. Anecdotal evidence suggests that in other instances, companies are growing in employment but are having/choosing to do so in states other than Missouri. This suggests the need for modified or additional resources to encourage economic growth. As a result, creating opportunities for more traded-sector firms to grow and scale in Missouri must be the principal goal of any strategic effort.

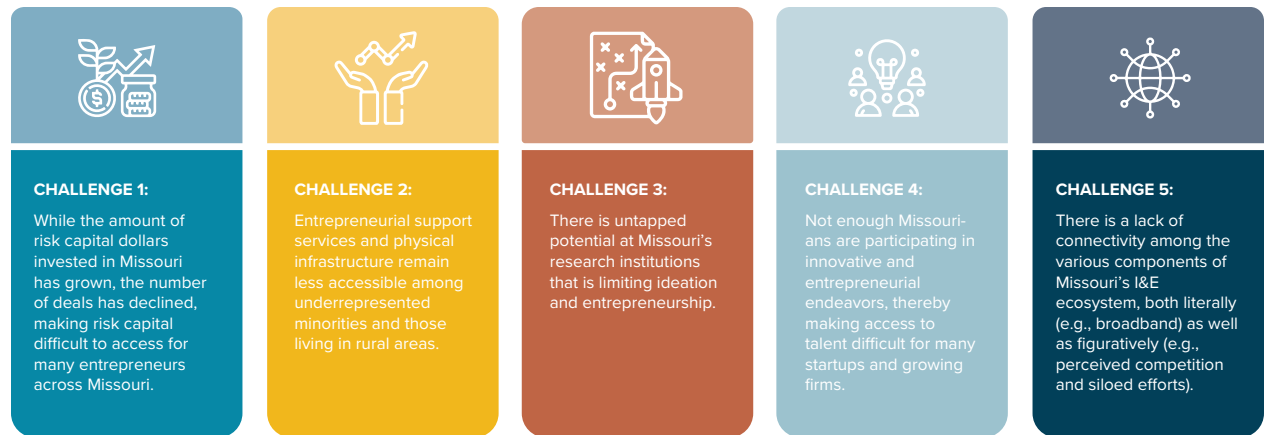
To better understand why Missouri enterprises are not growing and scaling at the same rate as their counterparts, TEconomy's project team examined the state's ecosystem from both quantitative and qualitative approaches that complement one another. The qualitative approach involved targeted outreach to entrepreneurs and other industry leaders, academics, venture capitalists, economic development leaders, and others via a survey, one-on-one interviews, and focus groups. Intelligence gleaned from the two approaches combine to form a more complete picture of the ecosystem and the situation in Missouri, and at the same time, highlight limitations, gaps, and challenges within the ecosystem.

**Within Missouri's innovation and entrepreneurship ecosystem, five key challenges inhibit broader economic growth.** It is necessary to understand the dynamics of these challenges to develop, and ultimately implement, strategies and actions that best support traded sector entrepreneurs in Missouri. These challenges range in their scale and scope, but when combined, significantly hold back the ability of entrepreneurs to start and grow new innovative ventures in the State of Missouri. The five key challenges facing Missouri are visualized in Figure 9 and are:

1. While the amount of risk capital dollars invested in Missouri has grown, the number of deals has declined, making it difficult to access for many entrepreneurs across Missouri.
2. Entrepreneurial support services and physical infrastructure remain less accessible among under-represented minorities and those living in rural areas.
3. There is untapped potential at Missouri's research institutions that is limiting ideation and entrepreneurship.
4. Not enough Missourians are participating in innovative and entrepreneurial endeavors, thereby making access to talent difficult for many startups and growing firms.
5. There is a lack of connectivity among the various components of Missouri's innovation and entrepreneurial ecosystem, both literally (e.g., broadband) as well as figuratively (e.g., perceived competition and siloed efforts).



**Figure 9: Five Key Challenges Facing Missouri**



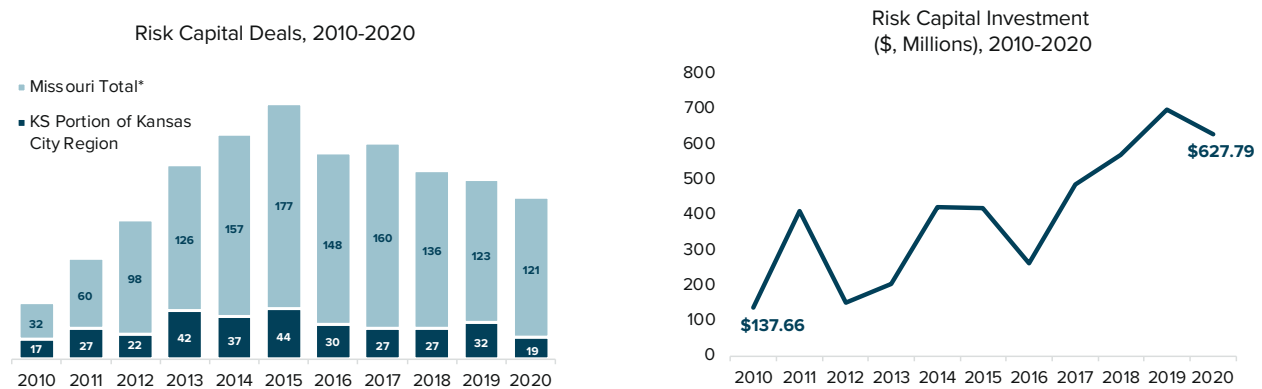
Source: TEconomy Partners, LLC.

The following narrative addresses each challenge in turn, describing and providing evidence for its identification.

**Challenge 1: While the amount of risk capital dollars invested in Missouri has grown, the number of deals has declined, making risk capital difficult to access for many entrepreneurs across Missouri.**

Throughout this planning process, financial capital was frequently viewed as the least accessible element of Missouri’s ecosystem to support innovation and entrepreneurship. Although the number of risk capital dollars invested in Missouri companies (including all companies in the Kansas City Region in both Missouri and Kansas) has grown substantially, from \$83 million in 2010 to \$630 million in 2020, there is concern about the level of deal flow. Since peaking at 221 deals in 2015, there has been a decline in the number of companies receiving venture capital funding (Figure 10).

**Figure 10: Risk Capital Deals and Investment in Missouri\*, 2010-2020**



Source: TEconomy analysis of PitchBook Data

\*Missouri totals do not include deals from the Kansas side of the Kansas City MSA. The total also does not include investments in Arch Oncology, which is headquartered in California..

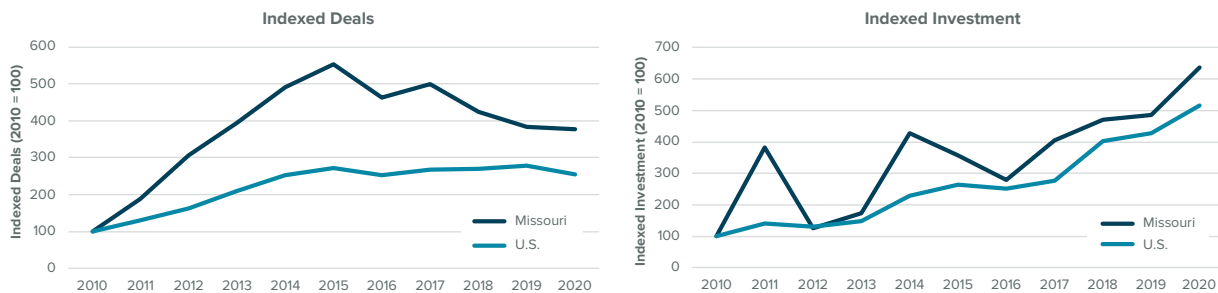
When indexed to national growth rates, similar trends emerge. As Figure 11 illustrates, the level of dollars invested over time has continued to increase (driven primarily by larger, later-stage investments); however, the number of deals, also termed the level of deal flow, has plateaued since 2015.

# The Risk Capital Continuum

While risk capital needs vary by industry, the following graphic illustrates at each company stage of development the likely sources and amounts of funding that are required on average.

|                                  | Ideation  | Commercial Viability  | Market Entry   | Growth & Scalability  |
|----------------------------------|---|---|--|---|
| Activities at Each Stage         | Idea development/invention, possibly involving lean startup approaches, market assessments, and (if applicable) IP creation | Customer discovery, new product development, proof-of-concept testing, prototype development, and validation/market testing | Finalize commercial products, add key team members, execute business plans, marketing plans, manufacturing plans, develop supply-chains, and generate early revenues | Generate operating capital to expand markets, scale manufacturing, re-examine team member mix, generate new employment, and begin new product development |
| Likely Sources of Risk Capital   | Sweat equity; friends and family; non-dilutive grants   | Non-dilutive grants; SBIR; accelerator, pre-seed, angel   | Angel; seed; early-stage; Series A   | Series A, B and C (later-stage VC); private equity; debt  |
| \$ Amounts will vary by industry | On average, up to \$50k   | On average, \$50k-\$250k  | On average, \$250k-\$1million  | \$1 million +   |

**Figure 11. Indexed Risk Capital Activity, 2010-2020**



Source: PitchBook Data, TEconomy Analysis

Note: Missouri totals do not include deals from the Kansas side of the KC MSA nor do they include investments in Arch Oncology, which is headquartered in California.

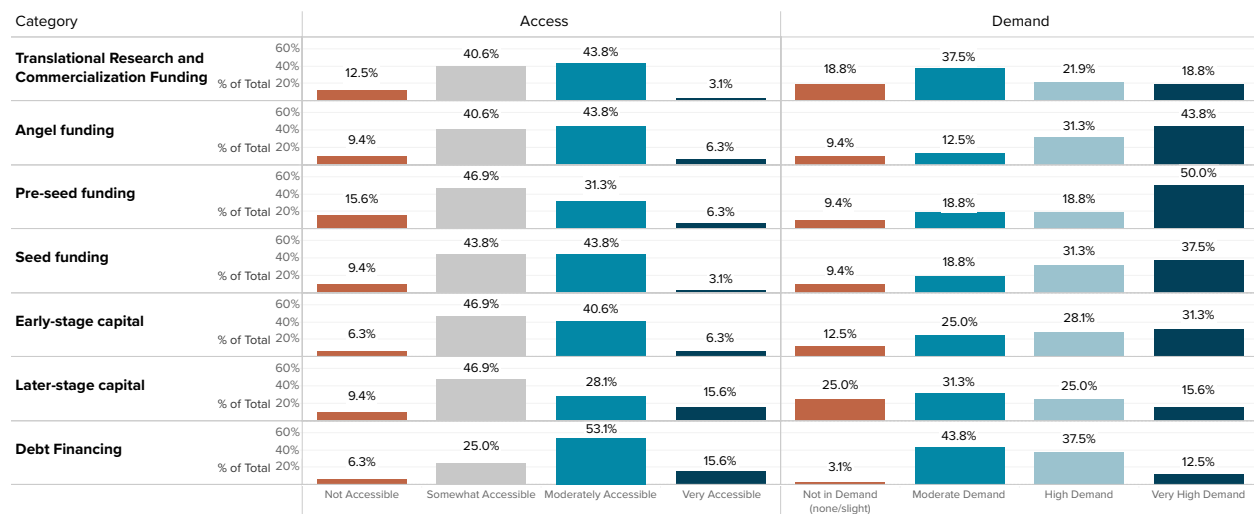
From 2010-2020, the majority of deals stemmed from the St. Louis (853 deals) and Kansas City regions (658 deals), followed by the Southwest (71 deals) and Central regions (63 deals). More than 35 percent of the state’s 1,662 deals were in information technology, while healthcare companies comprised an additional 21 percent of the total deals.

Overall, Missouri is faring better than many of its peer states with regard to raising capital to grow businesses. However, these rates are still lagging the U.S. average, and recent trajectories are cause for concern. For example, while Missouri ranked better than all benchmark states but Illinois in venture

capital dollars invested as a share of Gross State Product, the state still falls significantly behind the nation, which is dominated by California and Massachusetts. Missouri has performed well in relation to comparison states in SBIR/STTR activity, ranking second in both awards and dollars after accounting for levels of state economic output. Again, however, this performance lags the U.S. average.

Although there has been significant growth of the risk capital stack, many believe that supply is not keeping pace with demand (Figure 12). Across Missouri and in nearly every region, financial capital was viewed as among the least accessible element, ranging from 42 percent of responses in the Central Region saying that financial capital was not or slightly accessible, to 27 percent of responses in the Southeast region. While there are gaps across the entire capital stack, pre-seed, angel, and seed funding stand out as areas with a large imbalance in perceptions between high-demand and low-accessibility. There were concerns expressed that Missouri is beginning to lose the deal flow and investment momentum it has built over the last five to seven years. For example, Techstars, an international seed accelerator program with a presence in approximately 50 different cities, made the decision in December of 2021 to discontinue its long-standing presence in Kansas City, citing its desire to focus on larger-growth markets.<sup>21</sup> The loss of the program is a concern to the region, as it had been a vital connector and investor in the region helping to seed a number of high-growth startups. The fact that an international program such as Techstars does not view the region as a larger-growth market with sufficient investor follow-on for its companies is concerning.

**Figure 12: Survey Responses and Evaluation of Capital Access and Demand in Missouri**



**Source:** TEconomy analysis of Missouri Innovation and Entrepreneurship Survey (2021)

Further outreach into Missouri’s innovation and entrepreneurship ecosystem found a range of concerns, including the following:

21 Leslie Collins, “Techstars Pulls the Plug on Kansas City Accelerator Program”, Kansas City Business Journal, (December 23, 2021).



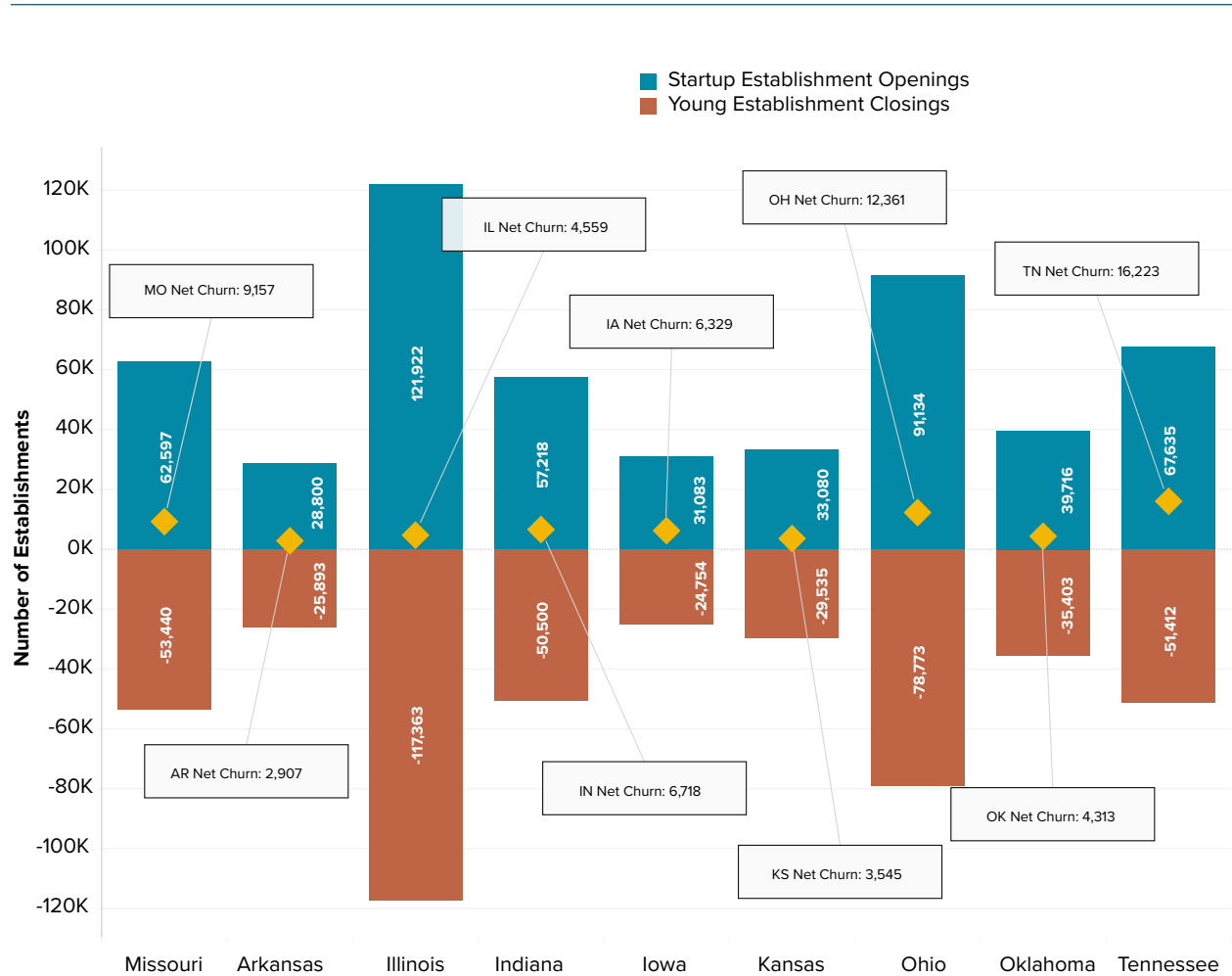


- Working capital options needed to grow and scale companies are limited. Because not all businesses are suited for traditional venture capital due to unrealistic ROI expectations, alternative financing options are needed to grow and scale companies.
- Both entrepreneurs and potential investors need more training/education regarding accessing and deploying financial capital.
- The lack of angel investment tax credits (compared to Kansas and other states) is a barrier for both potential investors and early-stage entrepreneurs.
- There is a desire to create new funding mechanisms that address Missouri-specific opportunities, such as investments in industry vertical funds not traditionally financed through equity investments, as well as funds targeting diverse founders.

**Challenge 2: Entrepreneurial support services and physical infrastructure remain less accessible among underrepresented minorities and those living in rural areas.**

Over the past decade, Missouri has experienced a significant startup formation rate of traded-sector firms. As Figure 13 illustrates, relative to benchmark states, Missouri has had more startup openings relative to young business closings (net churn) than all but two comparison states, Ohio, and Tennessee.

**Figure 13: Churn in Traded Sector Startup Activity: Comparison to Benchmark States From 2010-2020**

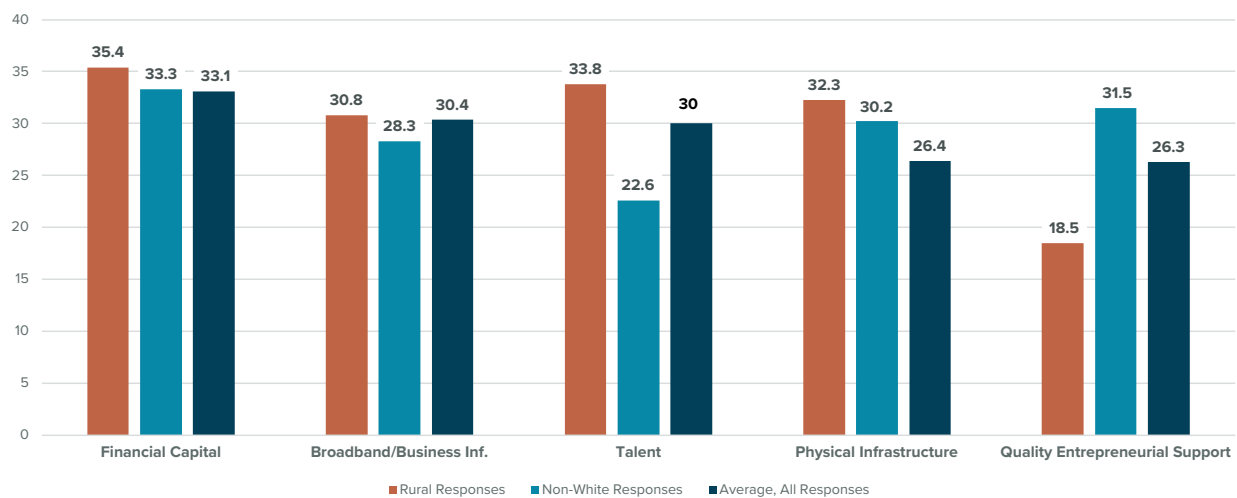


**Source:** TEconomy analysis of BLS Business Employment Dynamics Research Data and Youth Tobacco Survey Establishment data for Missouri

Although Missouri has made many strides in recent years with regards to supporting these new establishments, many are concerned that the entrepreneurial support assets and resources are not always equally available. In particular, those Missourians living in rural areas and those considered underserved entrepreneurs face challenges in accessing essential ecosystem services.

For those living in Missouri’s rural areas, access to financial capital, access to talent, and physical infrastructure were identified as the greatest challenges (Figure 14). While a growing number of physical spaces and services are now available to entrepreneurs, many of these are limited to the state’s urban areas. The lack of a critical mass of population and resulting deal flow prevents some rural communities from developing physical infrastructure. Although survey responses from rural stakeholders expressed fewer challenges in accessing quality entrepreneurial support services, this topic appeared frequently in interviews and in focus groups. There is a need for better coordination of existing resources and better marketing on how to access these resources, as well as a need to consider partnerships and collaborations between urban and rural areas.

**Figure 14: Share of Survey Responses Saying That Ecosystem Element is Not or Slightly Accessible**



**Source:** TEconomy analysis of Missouri Innovation and Entrepreneurship Survey (2021)

Qualitative outreach also suggests that not all populations experience equal access to the innovation and entrepreneurial ecosystem. Survey respondents who were non-white expressed greater challenges with accessing financial capital, quality entrepreneurial support services, and physical infrastructure. Beyond racial and ethnic minorities, Missouri has a wide range of diverse, underserved populations, including women, veterans, immigrants, rural entrepreneurs, and LGBTQIA+ individuals. Targeted outreach is needed to better reach these populations where they live and work. In addition, there is a lack of meaningful mentorship and peer-to-peer networking with individuals from similar backgrounds and experiences. Despite efforts to integrate underserved entrepreneurs into the current ecosystem, there are still feelings of inaccessibility.

### Challenge 3: There is untapped potential at Missouri’s research institutions that is limiting ideation and entrepreneurship.

Missouri’s colleges and universities are a critical source of new ideas that fuel innovation and entrepreneurship. Not only do these institutions of higher education produce skilled workers for Missouri’s economy, but their research and development expenditures drive further economic development throughout their communities and across the state. Over the course of the last decade, a range of promising efforts at Missouri’s colleges and universities have offered reason for excitement (including Missouri S&T’s Kummer Institute for Innovation, Entrepreneurship, and Economic Development; and the University of Missouri’s NextGen Precision Health Institute, among others). However, both the qualitative and quantitative portions of this analysis uncovered areas where the state’s colleges and universities could be performing at an even greater level.

One approach to measure the output of research universities is by leveraging data from the Association of University Technology Managers (AUTM) Licensing Activity Survey, which includes detailed information on research funding, the impact of innovation, patent activity, licensing income, and the number of startups, as reported by AUTM members.<sup>22</sup> In Missouri, two AUTM members participated: the University of Missouri (which reported as a system), and Washington University in St. Louis.

**When compared to peer states and the U.S. average, Missouri’s research universities are underperforming across nearly all measures (Table 1).** The one area where Missouri performs better than the national average and most of its peers is in licensing and options executed. In areas important to ideation and economic development, such as new inventions, patent disclosures, and startups formed, the state is comparatively lacking. In addition, the number of startups formed per \$10 million of R&D is particularly low for Missouri. Identifying ways to encourage new businesses that stem from intellectual property originating from the state’s colleges and universities should be a priority.

**Table 1: Missouri Research Institutions Compared to Peer States and U.S. Average**

| AUTM Metric   | Peer Rank (of 9 States) | Compared to U.S. |
|---|-------------------------|------------------|
| Total Licenses/Options Executed per \$10M in R&D Expenditures (2017-2019) | 2                       | Above            |
| Gross Licensing Income per \$10M in R&D Expenditures (2017-2019)          | 5                       | Below            |
| Invention Disclosures per \$10M in R&D Expenditures (2017-2019)           | 5                       | At               |
| New Patent Applications per \$10M in R&D Expenditures (2017-2019)         | 5                       | Below            |
| Startups Formed per \$10M in R&D Expenditures (2017-2019)                 | 7                       | Below            |

**Source:** TEconomy Analysis of AUTM Survey Data

<sup>22</sup> It is important to note that participation in AUTM’s Licensing Activity Survey is purely voluntary. Other academic institutions in Missouri have chosen not to participate, and data is only available for the University of Missouri System and Washington University.

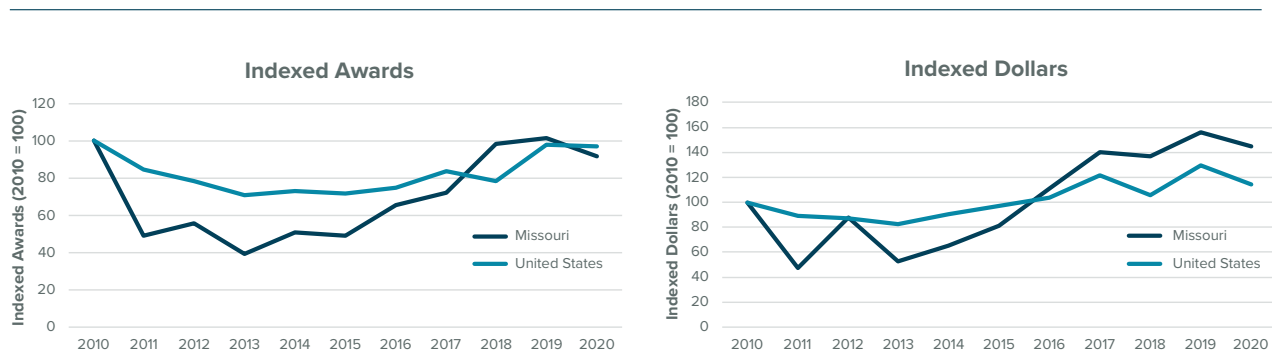
Surveys and interviews with members of Missouri’s innovation and entrepreneurial ecosystems expressed similar concerns related to untapped innovation and entrepreneurial potential within Missouri’s research institutions. Roughly two-thirds of stakeholders from colleges, universities, and other research institutions stated they place a high or very high priority on industry partnerships. However, the same emphasis/importance is not placed on innovation, commercialization, or entrepreneurship. For example,<sup>23</sup>

- 23.1 percent reported that their affiliated institution placed no, or a slight priority, on resources to develop new ideas based on R&D.
- 24.2 percent of respondents said that services to help deploy new and innovative ideas into the marketplace were not or slightly accessible.
- 18.5 percent of respondents said their affiliated research institution placed no or a slight priority on entrepreneurship.

Furthermore, interviews with key stakeholders suggest that faculty are discouraged from engaging in entrepreneurial endeavors. Additionally, university technology transfer offices are often not equipped to work with entrepreneurs, and Missouri’s colleges and universities have historically struggled to collaborate with startups in an effective manner.

**One tool that could be leveraged to increase the number of startup companies emanating from research is the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program.<sup>24</sup>** The SBIR/STTR program provides nondilutive funding to support ideation, commercialization, and new business development. Historically, Missouri’s growth of SBIR/STTR awards lagged the national trend from 2010-2015, but recent state performance has improved with stronger growth rates (Figure 15). Despite these recent gains, Missouri remains behind the nation in awards when normalizing for the size of each state’s economy, falling short in both normalized awards and total dollars.<sup>25</sup> For example, Missouri averaged 1.8 SBIR/STTR Awards per \$10 billion in GRP, 2018-20, compared to 3.1 awards for the U.S. average. The average investment per \$1 million in GRP from 2018-2020 was \$81 for Missouri and \$141 for the U.S. average.

**Figure 15: Indexed SBIR/STTR Activity for Missouri and the U.S. Total (2010-2020)**



Source: TEconomy analysis of SBIR/STTR award data

23 TEconomy analysis of Missouri Innovation and Entrepreneurship Survey (2021)

24 See <https://www.sbir.gov/node/2011103>

25 TEconomy Analysis of SBIR.gov data

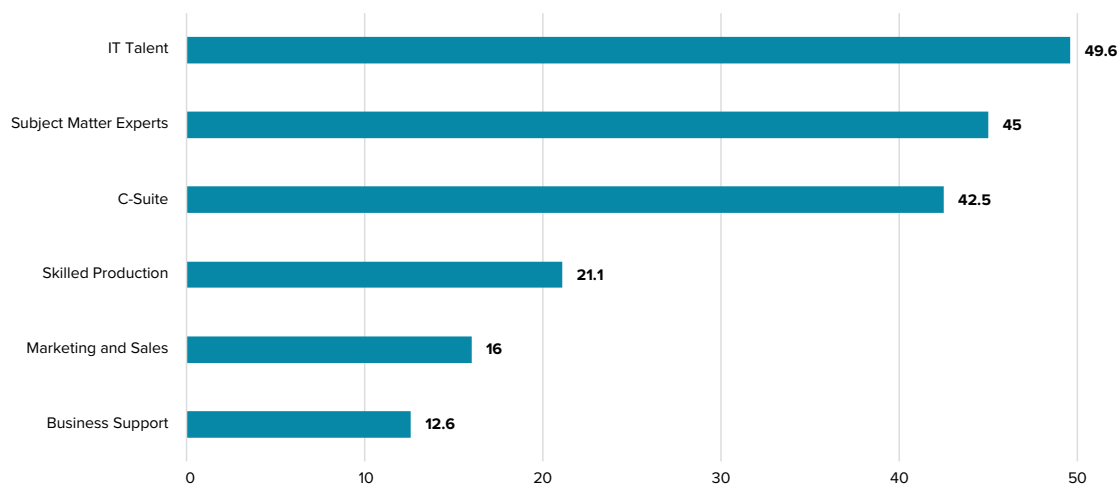
Although Missouri trails the U.S. average, the state compares favorably against its eight peer states:<sup>26</sup> Missouri ranks higher than all benchmark states but Ohio (whose numbers are driven by two national laboratories), despite few statewide resources or formalized support for many of the most technical and cumbersome components of the SBIR/STTR application process. There are opportunities for Missouri to improve its support system for SBIR/STTR awards to help more of its technology-based businesses secure critical, early-stage, nondilutive funding.

### Challenge 4: Not enough Missourians are participating in innovative and entrepreneurial endeavors, thereby making access to talent difficult for many startups and growing firms.

Few things are as vital to the long-term prosperity of Missouri as a well-educated population. As a result, developing workers through schools and training, and then retaining these workers, is of the utmost importance. For a wide range of reasons, the ability to attract and retain talent, especially entrepreneurial talent, remains a struggle for many throughout the state.

When surveyed, stakeholders in Missouri’s innovation and entrepreneurship ecosystem considered C-suite, subject-matter expertise, and IT talent the most difficult roles/groups to attract and retain, with less (but still some) difficulty across business support, marketing and sales, and skilled production roles (Figure 16). Remote work has become an essential part of many companies’ approach to attracting top talent: companies are working in a hybrid mode and hiring from outside of the state for remote positions. Although this solution fills short-term holes in talent needs for entrepreneurial companies, it does not foster economic growth for the State of Missouri and is not a sustainable long-term solution for the companies.

**Figure 16: Share of Survey Responses with Difficulty Attracting and Retaining Key Occupational Groups<sup>27</sup>**



**Source:** TEconomy analysis of Missouri Innovation and Entrepreneurship Survey (2021)

<sup>26</sup> The eight peer states included in this analysis were: Arkansas, Kansas, Nebraska, Iowa, Illinois, Kentucky, Indiana, Ohio

<sup>27</sup> Survey asks: For each occupational group, please describe how difficult it is to attract/retain talent in Missouri. This chart is a sum of the “Cannot attract/retain” and “Difficult to attract/retain” responses.

There is a need to connect undergraduate/graduate students with startups and the entrepreneurial ecosystem. Missouri's research universities remain the state's top tool for attracting and developing top talent. New initiatives at Missouri's colleges and universities, such as Missouri S&T's Kummer Institute for Innovation, Entrepreneurship, and Economic Development, and Mizzou's NextGen Precision Health Institute, are also all worthy of excitement. However, while these colleges and universities excel at basic research and academics, with less emphasis on applied innovation and entrepreneurial development, there are concerns related to talent retention.

**Challenge 5: There is a lack of connectivity among the various components of Missouri's innovation and entrepreneurship ecosystem, both literally (e.g., broadband) as well as figuratively (e.g., perceived competition and siloed efforts).**

Over the last 10 years, while Missouri has made major strides in entrepreneurship/innovation, there is still a sense that the state is still not reaching its full potential due to a range of disconnects and other environmental factors that impede further growth.

**Available and affordable high-speed internet is recognized as the greatest business infrastructure need across Missouri, and its lack is the greatest threat to Missouri's innovation climate.**

The economic competitiveness of Missouri's communities depends on the widespread availability and accessibility of broadband for every business and household in the state. To encourage innovation and entrepreneurship, modern technology infrastructure that can handle cloud, data processing, and other capabilities is needed.

According to the Federal Communications Commission, more than 147,000 households or almost 400,000 Missourians do not have access to high-speed Internet (25mpbs/3mbps). The majority of those citizens reside in rural communities. In August 2021, Governor Mike Parson announced plans to deploy more than \$400 million in American Rescue Plan Act (ARPA) funds to increase broadband internet access, adoption, and assistance statewide. The House Interim Committee on Broadband Development issued its report on January 5, 2022, which included recommendations for how the administration should allocate the ARPA funding.

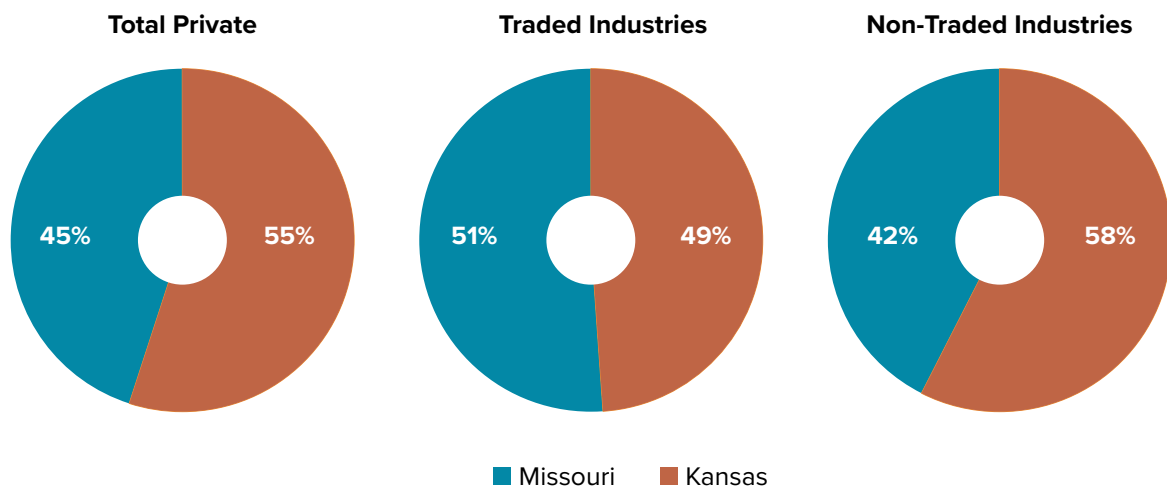
**Given the importance of innovation and entrepreneurship to economic development in the 21st century, there is also a disconnect between internal and external perceptions in the state regarding innovation and entrepreneurship.** There is a desire among many in the state's ecosystem to elevate innovation and entrepreneurship as a priority within policy circles, the Department of Economic Development, and the governor's cabinet. Consistent funding is perceived as a primary challenge for these resources, as the defunding of MTC in FY18 sent a message throughout the ecosystem that the State was not going to prioritize investments in innovation and entrepreneurship. This has left founders, programs, and initiatives questioning whether the support and resources they need will be available. There is also a lack of a robust marketing efforts to better tell the story of innovation and entrepreneurship in Missouri. This disconnect impacts Missouri's ability to communicate the story behind its successes.

**Inter- and intra-regional competitiveness is hindering the ability to realize “One Missouri.”** Initiatives are needed to encourage greater levels of collaboration across Missouri. Many regions of the state exist in silos, and communication is poor between capital sources and service providers in different regions of the state. This has led many companies to look to coastal cities to raise capital and has caused accelerator programs and venture funds to look out of state for their next companies.

Within regions, coordinating existing resources and working together across silos are further challenges. The geographic boundaries used to define some parts of the state for economic development purposes may result in a fragmented distribution of resources. For example, within rural Missouri, the large geographic boundaries that define service areas can make it challenging for entrepreneurs to access services as a result of geographic distance. In the state’s two largest urban settings, while efforts have been taken in recent years to address long-standing inter-regional divisions, challenges remain.

These challenges are most prevalent in the Kansas City metro region, where the entrepreneurial ecosystem continues to be divided as a result of political boundaries. When the ecosystem is analyzed in its entirety, it is discovered that Kansas City metro’s net employment gains from new firm formation is relatively split across the 2010-2020 period, demonstrating the integrated nature of the economic footprint of the region’s ecosystem across state lines (Figure 17). This even divide across state lines of economic entrepreneurial activity within a single metropolitan statistical area (MSA) is unique to the Kansas City Region, with no other MSA in the U.S. facing a similarly geographically divided ecosystem. For an entrepreneur in the Kansas City metro region, accessing risk capital, support services, and talent knows no geographic boundary, and a fully functioning innovation and entrepreneurial ecosystem must be treated as a holistic effort.

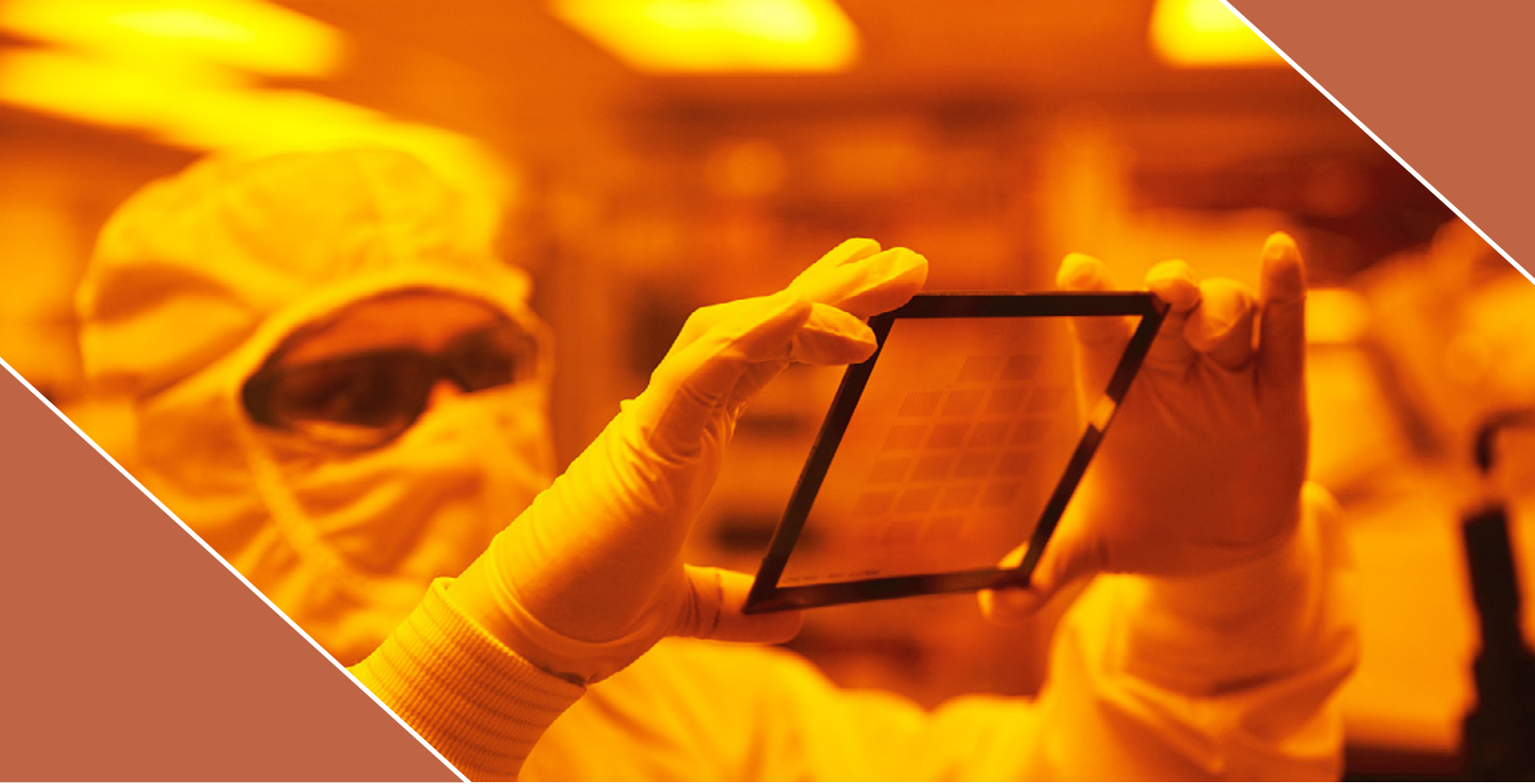
**Figure 17: Net-Job Change from New Firms for Kansas City, MSA, 2010-2020 Cumulative**



**Source:** TEconomy analysis of U.S. Census Bureau Quarterly Workforce Indicators.

Overcoming all these connectivity barriers is essential to achieving “One Missouri” where the sum is greater than its parts.





## Summary

For Missouri to be able to develop a robust and thriving innovation/entrepreneurial ecosystem in which trad-ed sector startups can grow and scale, it must be able to overcome the following five identified challenges:

- **Inability to meet the investment capital demands** of its growing entrepreneurial base.
- **Inaccessibility of entrepreneurial support services** and physical infrastructure among underrepre-sented minorities and those living in rural areas.
- **Untapped potential at Missouri's research institutions** that is limiting ideation and entrepreneur-ship.
- **Not enough Missourians participating in innovative and entrepreneurial endeavors**, thereby making access to talent difficult for many startups and growing firms.
- **Lack of connectivity among Missouri's ecosystem components**, both literally (e.g., broadband) as well as figuratively (e.g., perceived competition and siloed efforts).

The five challenges identified must be addressed through intentional, strategic efforts to realize a more successful and vibrant economy. The strategies and actions that are outlined in the next section attempt to address both the real and perceived barriers to entrepreneurial development and lay-out a roadmap for Missouri that, if pursued, can create opportunities for its most innovative entrepreneurs.





## A Strategic Framework to Support a Robust Innovation and Entrepreneurship Ecosystem in Missouri

If Missouri is to succeed in creating economic prosperity for all by overcoming the current challenges facing its innovation and entrepreneurial ecosystem, it must ensure its competitive position through five means:

- **Deploying greater levels of investment capital** to meet the demands of its growing entrepreneurial base.
- **Fostering the growth and scalability of its startups**, particularly in high-growth industries.
- **Launching and cultivating innovative startups** by taking advantage of Missouri’s research strengths by converting the intellectual assets into market opportunities.
- **Inspiring and encouraging more Missourians to participate** in entrepreneurial endeavors.
- **Promoting itself as “One Missouri”**—a place to grow an innovative company due to the multitude of supportive connection points.

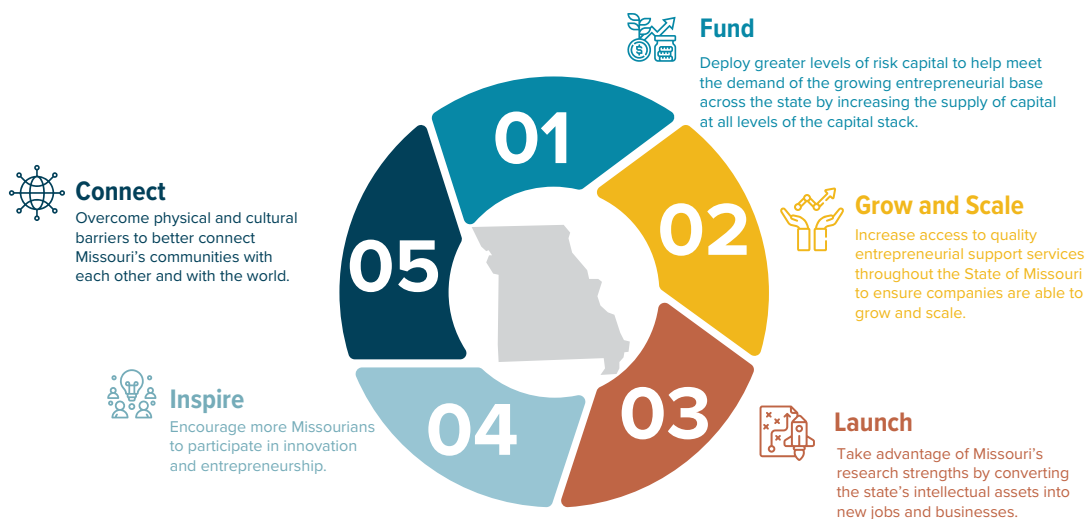
By focusing on these five thematic areas, Missouri will help ensure the state’s future economic vitality. Anticipated economic and societal impacts that will be realized through the successful implementation of this innovation and entrepreneurial strategy include:

- Better-paying jobs with higher growth potential
- Ability to weather future economic challenges, and
- Inspired future generations who reach their full potential.

Generating these outcomes does not happen on its own, but rather through a series of intentional, strategic, and proactive decisions. The innovation and entrepreneurial strategy is driven by public-private-philanthropic partnerships that capitalize on Missouri’s strengths while ensuring that future innovation and entrepreneurial investments are focused on building the ecosystem that will help ensure the state’s economic vitality for years to come (Figure 18).



**Figure 18: Five Strategies to Support Innovation and Entrepreneurship in Missouri**



Source: TEconomy Partners, LLC.

It is proposed that the State of Missouri and its strategic private sector, philanthropic, academic, and regional economic development partners advance a set of five strategies and an associated set of 16 actions to leverage and complement existing efforts, while seeking to overcome remaining challenges and help catalyze the innovation and entrepreneurial ecosystem statewide (Table 2).

**Table 2. Recommended Strategies to Drive Innovation and Entrepreneurship Across Missouri**

| Strategy   | Targeted Actions to Pursue  |
|--|---|
| <b>STRATEGY 1: FUND</b><br>Deploy greater levels of investment capital to help meet the demands of the growing entrepreneurial base.                                   | Action 1. Catalyze additional investment capital funds across the capital stack.  |
|  | Action 2. Incentivize angel investments.  |
|  | Action 3. Evaluate the creation of Missouri Rural Vitality Funds to provide collateral for entrepreneurial loans.   |
| <b>STRATEGY 2: GROW &amp; SCALE</b><br>Increase access to quality entrepreneurial support services throughout Missouri to ensure companies are able to grow and scale. | Action 4. Develop a statewide Entrepreneurial Pathways Program.   |
|  | Action 5. Foster regional efforts to provide quality entrepreneurial support services to high-potential, high-growth traded sector startups.  |
|  | Action 6. Connect Missouri’s corporate partners and anchor institutions with startups, thereby creating a “stickiness” to Missouri for the entrepreneurial endeavor’s ultimate success.         |
| <b>STRATEGY 3: LAUNCH &amp; CULTIVATE</b><br>Take advantage of Missouri’s research strengths by converting the intellectual assets into market opportunities.          | Action 7. Reenergize the Research Alliance of Missouri (RAM) as a mechanism for bringing together the major research institutions of the state to solve common innovation continuum challenges. |
|  | Action 8. Leverage the federal I-Corps program and provide startup services statewide to encourage commercialization activity.  |
|  | Action 9. Provide comprehensive assistance for SBIR/STTR awards to further drive commercialization across the state, especially at Missouri’s research institutions.                            |
| <b>STRATEGY 4: INSPIRE</b><br>Encourage more Missourians to participate in innovation and entrepreneurship.  | Action 10. Improve access to entrepreneurial programming for students in middle/high school and at community colleges and universities.   |
|  | Action 11. Fund an internship program that connects startups with talent.   |
|  | Action 12. Offer entrepreneurial education across Missouri through regional partnerships.   |
|  | Action 13. Enhance Missouri’s storytelling capacity to encourage more Missourians to be entrepreneurial.  |
| <b>STRATEGY 5: CONNECT</b><br>Overcome physical and cultural barriers to better connect Missouri’s entrepreneurial ecosystems with each other and with the world.      | Action 14. Realize One Missouri: Improve connectivity within and between regions.   |
|  | Action 15. Link Missouri’s innovation and entrepreneurial ecosystem to the world through an external marketing campaign.  |
|  | Action 16. Deploy broadband infrastructure across Missouri.   |

Source: TEconomy Partners, LLC.

The details regarding each strategy and subsequent action are outlined in the narrative that follows.



## STRATEGY ONE: FUND

Deploy greater levels of risk capital to help meet the demand of the growing entrepreneurial base across the state.

States and regions with thriving entrepreneurial sectors share one characteristic—they are home to a risk capital community that is both oriented toward early-stage financing and committed to indigenous investment. Entrepreneurs require access to capital at each stage of their development, from early-stage (including proof-of-concept, prototype development, pre-seed, angel, and seed) to Series A and B venture financing. States that have limited risk capital in which to invest end up leaving their entrepreneurial companies on the “runway,” unable to take off and reach their growth potential. States wishing to grow entrepreneurial companies have used a variety of mechanisms to encourage investment in venture capital and to address market gaps, particularly at the commercialization and pre-seed stages. (For an illustration of the risk capital continuum, please see textbox on page 19.)

### MTC’s Impacts: Catalyzing Early-Stage Investment Activity

The Missouri Technology Corporation, as the state’s most active investor of early-stage risk capital, plays an instrumental role in leading early-round investments to help meet the needs of a growing entrepreneurial base. Collaboration among Missouri-based investors in startups has been critical to the growth of the state’s entrepreneurial ecosystem. The accomplishments of Benson Hill serve as a strong example of how a holistic entrepreneurial ecosystem and increased levels of risk capital can nurture growing companies.

In 2013, Benson Hill received an investment through MTC’s IDEA Funds to support its relocation to Missouri. Initially based in North Carolina’s Research Triangle Park, the seed capital investments from MTC, in collaboration with BioGenerator, St. Louis Arch Angels, Cultivation Capital, and others,<sup>1</sup> helped incentivize the fledgling AgTech company to move its headquarters to St. Louis. This relocation strengthened Benson Hill’s research relationship with the Donald Danforth Plant Science Center, which enabled the company to advance its research and product development more quickly. **“We chose to expand our presence in St. Louis because of its leadership in plant science and commitment to innovation,”** said Matthew Crisp, CEO and co-founder of Benson Hill, in an interview with Site Selection magazine.<sup>2</sup>

As a testament to the strength of Missouri’s innovation ecosystem and AgTech cluster, Benson Hill located its new headquarters within 39 North, a 600-acre AgTech innovation district that includes the Danforth Plant Science Center, BRDG Park, Helix Incubator, Yield Lab, and the campus of Bayer Crop Science. Benson Hill’s growth is generating positive exposure for the state’s AgTech Sector. The company’s Series C round saw the first non-coastal investment ever by GV (Google Ventures), the corporate VC arm of the tech-firm Alphabet.<sup>3</sup> Benson Hill’s Initial Public Offering on the New York Stock Exchange in 2021 valued the firm at \$2 billion, delivering a significant return on the state’s initial investment. In the last three quarters of 2021, the company generated \$103.5 million in revenue.<sup>4</sup> Today, the company employs more than 350 individuals.<sup>5</sup> These figures provide proof that Missouri can build and retain “unicorns,” especially in innovative sectors like AgTech.

By providing both seed funding and leadership in the company’s early years, MTC and the other early-stage funders and entrepreneurial service providers influenced the company’s ultimate success. This points to the economic benefits that a robust innovation and entrepreneurial ecosystem, which includes early-stage risk capital providers, provides the State of Missouri.

1 <https://www.bizjournals.com/stlouis/news/2021/05/10/benson-hills-plan-to-go-public-marks-milestone-fo.html>

2 <https://siteselection.com/issues/2019/sep/missouri-local-capital-greenhouses-lure-plant-science-investment.cfm>

3 <https://www.bizjournals.com/stlouis/news/2018/09/19/how-benson-hill-biosystems-became-googles-first-st.html>

4 <https://www.bizjournals.com/stlouis/news/2022/01/03/benson-hill-startup-headquarters-sold-harrison-st.html>

5 <https://www.bizjournals.com/stlouis/inno/stories/news/2021/09/30/benson-hill-going-public-matt-crisp.html>

Emerging trends in innovation capital are making it even more imperative for states and regions to have access to indigenous funds for the growth of innovative firms. These indigenous funds help in identifying promising discoveries and technology advances, providing the initial funding to validate these opportunities, supporting the formation of new ventures, and providing the on-the-ground capacity to support these new ventures and facilitate their connection to outside venture capital.

The earlier analysis clearly indicates that while the amount of risk capital dollars invested in Missouri<sup>28</sup> has grown substantially—from \$138 million in 2010 to \$628 million in 2020—the number of deals has declined. This suggests a shift toward larger, later-stage investments and fewer early-stage deals, making it difficult for many entrepreneurs across Missouri to access risk capital. This was reinforced by the qualitative assessment that highlighted access to risk capital as the area of greatest concern across the state. **Being able to support entrepreneurs' ability to grow and scale requires sufficient pools of investment capital.**

The realignment of national markets since the Great Recession has shifted capital markets downstream, leaving many Missouri companies without access to early-stage investments. This issue is further exacerbated by the perception of a "closed-network" of funders that is difficult for many to gain access to. If this investment climate is not corrected, the state's most promising companies are in danger of leaving the state entirely in pursuit of capital.

In interviews with key stakeholders, there was broad consensus on the need for active efforts in Missouri to continue to increase the level of indigenous risk capital in the state to promote increased deal flow, including:

- Catalyze the growth of both nondilutive sources of capital as well as the earliest stages of risk capital.
- Reinstigate the Angel Investor Tax Credit.
- Ensure increased opportunities for "smart" angel investing through sound due diligence, fund administration, and increased access to deal flow through organized angel networks.
- Create stronger linkages to the later-stage Midwest and national risk capital markets.
- Pilot innovative financing options that fill gaps in the state's risk capital stack for underserved founders, rural entrepreneurs, and business models that do not traditionally attract risk capital dollars.

It is proposed that Missouri pursue three targeted actions to help deploy greater levels of risk capital to help Missouri startups grow and scale.

### **Actions to Pursue:**

1. Catalyze additional investment capital funds across the capital stack.
2. Incentivize angel investments.
3. Evaluate the creation of Missouri Rural Vitality Funds to provide collateral for entrepreneurial loans.

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<sup>28</sup> Missouri totals include deals from the Kansas side of the Kansas City MSA.

### **Action 1. Catalyze additional investment capital funds across the capital stack.**

Nondilutive grants, pre-seed funds, angels, and seed funds provide the early-stage financing so desperately needed by entrepreneurs. Having dedicated, locally managed, resident early-stage sources of funding is absolutely essential for building the “farm team” of firms, which, as they gain experience and need additional funds to expand, become candidates for “major league” funding from larger, more diversified venture funds. The presence of strong indigenous investment funds is needed to attract outside regional and national funds to invest in Missouri’s growing pipeline of deal flow.

MTC, through its direct investments through the IDEA Fund Co-Investment Program has helped to improve the risk capital climate of the state. However, with the influx of State Small Business Credit Initiative (SSBCI) dollars, now is the time to increase the level of capital available. Additional investment capital models must be pursued, focusing on public-private partnerships, by investing in new and diverse fund managers and pilot innovative financing options to fill gaps in the state’s ecosystem (e.g., underserved populations, business models that do not traditionally receive risk capital investments, nondilutive grants, etc.)

Recognizing that building a critical mass of innovative firms is unlikely without seed-stage financing, many states and regions have developed programs to increase the availability of early-stage capital. States and regions have taken various approaches, such as capitalizing funds that make direct investments in companies, investing in privately managed venture funds, investing pension funds in venture capital, and using tax incentives to encourage investment in venture capital. In some cases, universities and foundations are investing a portion of their endowments in seed and pre-seed funding. A number of states have used state dollars to create such investment funds (see textbox).

It is recommended that Missouri undertake the following investment initiatives to catalyze the deployment of investment capital funds across the capital stack:

#### **What Others Do: Ohio Third Frontier Pre-Seed/Seed Plus Fund Capitalization Program**

The state of Ohio, through the Ohio Third Frontier, also has made significant investments to build its indigenous risk-capital base through the Ohio Third Frontier Pre-Seed/Seed Plus Fund Capitalization Program (PCFP). As a result of its program, the Ohio Third Frontier has helped establish Ohio as a leading location for early-stage risk capital investment through the capitalization of multiple Ohio-based Pre-Seed Funds. The goals of the Ohio Third Frontier PCFP are as follows:

- Increase the number of professionally managed Pre-Seed Funds investing throughout Ohio;
- Increase the amount of early-stage capital being invested in Ohio technology-based companies;
- Create a risk capital climate that supports the development, retention, and attraction of investable technology companies in Ohio; and
- Build a pipeline of technology company deal flow that increasingly attracts the resources of venture capital firms both within and outside of Ohio.

The Ohio Third Frontier invested approximately \$65 million in over 44 pre-seed and seed funds across the State of Ohio over an approximate 5-year time period. These funds, in return, have leveraged over \$3 billion in follow-on funding and have created nearly 5,000 jobs.



- Support the generation of additional indigenous pre-seed, angel, seed, and early-stage venture capital funds in Missouri that are managed by resident private fund managers through:
  - Providing grants to pre-seed funds matched 2:1
  - Providing “evergreen” investments to angel networks and seed funds matched 3:1
- Serving as a limited partner in early-stage venture capital funds that are matched at least 4:1
- Provide additional nondilutive grant funding to support proof-of-concept and prototype development activities by:
  - Supporting an SBIR matching grant program that provides support for writing applications and serves as a bridge between Phase I and II awards (as detailed further in Strategy 3, Action 9).
  - Providing matching dollars (2:1) for nonprofit organizations that provide direct cash grants (e.g., Arch Grants, Digital Sandbox KC, etc.). It will be critical that underserved populations that do not have access to “friends and family” funding are identified and considered for investment to ensure that all viable startups have access to the earliest stages of financing.
- Pilot innovative financing options that fill gaps in the state’s ecosystem
  - Consider revenue-based financing for business models that do not traditionally attract risk capital dollars.
  - Continue to provide direct investments for founders from underserved populations (demographic or geographic).

## MTC’s Impacts: Catalyzing Non-Dilutive Funding Support

Digital Sandbox KC provides proof-of-concept resources to support early-stage commercialization in startup companies. Launched in 2013 with funding from MTC and other collaborators, this partnership among private companies, universities, entrepreneurial support organizations and government agencies creates a unique and extensive network of resources for budding startup companies. Notably, the Digital Sandbox program provides expert feedback and project funding of up to \$20,000 to help accelerate innovations toward commercialization.

Since its inception, Digital Sandbox has provided nearly \$3 million in funding for 153 proof-of-concept projects, and participating companies have gone on to raise an additional \$168 million in follow-on investment.<sup>1</sup> These companies have also created more than 1,000 new jobs and generated more than \$136 million in sales. Notably, 60 percent of Digital Sandbox KC’s funds in 2019 and 2020 went to businesses led by people of color. MTC has provided support for the program since it was first established, including the grant funding that played a pivotal role in securing a \$1 million i6 Challenge Grant from the U.S. Department of Commerce Economic Development Agency.

Elsewhere in Kansas City, programs such as LaunchKC have similarly increased the availability of nondilutive funds. As a true public-private-philanthropic partnership, LaunchKC is funded by MTC, the City of Kansas City, Missouri, and numerous local corporate and philanthropic organizations. Since 2015, LaunchKC has invested more than \$2.5 million dollars in cash grants to attract or retain 61 tech startups to Kansas City.<sup>2</sup> In 2021, LaunchKC evolved from a grants-focused competition into a tech accelerator platform that leverages grants and other mechanisms to improve the Kansas City ecosystem.

Many of the Kansas City region’s most successful startups have received funding through early-stage funding programs such as these. **For example, more than 50 percent of the Kansas City region’s venture-backed companies in 2018 and 2019 came from early-stage programs like Digital Sandbox KC and LaunchKC, according to research by Startland News.**<sup>3</sup> This speaks to the importance of not only financial support, but also connections and services, that are needed to help early-stage companies bridge the valley of death.

1 <https://www.digitalsandboxkc.com/about-us/blog/sandbox-updates/2021/10/14/6-early-stage-companies-added-to-digital-sandbox-kc-project-funding-roster>

2 <https://www.launchkc.org/>

3 <https://www.startlandnews.com/2019/04/we-create-kc-2019/>

## What Others Do: Greater Colorado Venture Fund's Revenue Based Investment Model

The Colorado Venture Capital Authority (VCA) supports access to venture capital for Colorado's entrepreneurs and startup businesses funded from the sale of Colorado insurance premium tax credits. The VCA's third fund is the Greater Colorado Venture Fund (GCVF), which invests in early-stage startups in rural Colorado. This state-backed venture capital fund is actively investing in early-stage startups headquartered outside of the Front Range—areas commonly overlooked by traditional venture funds. Unlike many funds, GCVF uses gross revenue as its return variable, which incentivizes simple revenue growth for both parties and is less manipulatable compared to EBITDA, net income, or any metric that is calculated further down on the income statement.

Revenue-based investments help the fund focus on building healthy, sustainable companies in industry verticals often overlooked by traditional venture capital funds. The fund leverages networks around peer-to-peer founders, mentorship, funders, sales and marketing, and recruiting to support portfolio companies. GCVF also provides continuing education and strategic guidance through meetups and portfolio retreats. Currently, there are 24 companies in the GCVF portfolio, ranging from manufacturing to agriculture to data analytics firms, among other sectors.

Because of the match that will be required for each investment of state funds, it is strongly recommended that the State of Missouri work collaboratively with the State of Kansas so that entrepreneurs located within the entire Kansas City metro region be considered, regardless of what side of the state line they are located. It will be critical for the success of the region's ecosystem to be able to access the resources required to grow and flourish that in turn will have positive economic impacts on the entire region.

In addition, it will be critical that a diverse array of founders from different demographic backgrounds and geographic locations are identified and considered for investment to ensure that startups can connect in a culturally competent and meaningful way.

### **Action 2. Incentivize angel investments.**

One characteristic shared by leading entrepreneurial states is that they are home to a network of angel investors willing to invest in very early-stage startup companies. Angel investor funding represents start-up capital provided by high-net-worth individuals, often retired entrepreneurs and executives, to bridge the gap between funding from friends and family and funding from formal venture-capital funds. These angel investors also are an important source of management advice and contacts for entrepreneurs.

Building a base of angel investors able and willing to invest in emerging companies is a challenge for many states. To help overcome this challenge, 31 states offer tax credits to angel investors who invest in technology companies, and 12 states provide tax credits to individuals who invest in early-stage venture funds. Missouri had historically been one of these states, but its tax credit was eliminated approximately 15 years ago.

The elimination of the angel investment tax credit was a significant blow to Missouri's risk capital market. Missouri entrepreneurs are at a disadvantage because, unlike peer states like Kansas, it does not have an angel investment tax credit. The purpose of an angel investment tax credit program is to encourage qualified individual investors to either get off the sidelines or deploy more capital in-state versus out-of-state by incentivizing them to invest in Missouri companies.

## What Others Do:

More than 430 startup businesses have received over \$418 million in investment through **Minnesota's Angel Tax Credit** since the program's inception in 2010. Administered by the Minnesota Department of Employment and Economic Development (DEED), the program offers a 25 percent tax credit for investments in small emerging businesses, with a maximum credit of \$125,000 and a focus on high-tech businesses or those with a proprietary product, process, or service in select industries. Notably, of the \$10 million in credits available in 2019 and 2021, \$5 million is reserved for minority and women-owned and managed businesses, and businesses located outside of the Minneapolis-St. Paul Metropolitan Area.

**Ohio TechAngel Funds (OTAF)** is one of the largest angel networks in the United States. More than 300 high-net-worth, accredited investors have joined one or more of the five funds. The Fund makes initial investments of \$150,000 to \$325,000 in participating preferred stock or convertible notes and makes follow-on investments in the best-performing ventures. Fund members can make sidecar investments in amounts ranging from \$10,000 to \$100,000 per venture. Additionally, OTAF participates in syndications of \$500,000 to more than \$2 million by co-investing with other leading angel investors and angel funds, regional venture capital funds, and family offices. The Ohio Third Frontier provides matching grant funding. Since 2004, OTAF's five funds have invested more than \$16 million. Members of OTAF also made more than \$16 million in sidecar investments in those same companies.

According to recent empirical research on the 31 states with established angel investment tax credits, results have been positively associated with an increase both in the number of angel investors and the amount of angel investment in a state, and this is amplified when these programs impose fewer restrictions and when the supply of alternative capital is more limited.<sup>29</sup> However, this research also suggests that angel investment tax credits on their own are not enough to positively impact entrepreneurial growth. Those investors utilizing angel investment tax credits tend to be younger, more local, and less experienced than the average angel investor. Beyond the need to educate potential angel investors and encourage a more sophisticated local investor pool, these findings underscore the importance of considering angel investment tax credits as one tool among many in a broader toolkit to encourage entrepreneurship.

In line with other states, it is recommended that a tax credit be created that would provide a qualified investor with a transferable income tax credit equal to 25 percent of an eligible investment in an eligible Missouri company.

In addition to the tax credit, the state should encourage more formally organized angel networks to aid with coordination, management, due diligence, and syndication, by allowing angel funds to compete for funding (see Action 1). Missouri should ensure that funding is available to increase the vibrancy and number of resident angel networks by providing funding to offset costs of professional fund management, network administration, and due diligence. Leveraging Action 1, it is recommended that angel networks be encouraged to form by providing 3:1 matching grant dollars where state funds could be used for both operations as well as help de-risk investments.

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29 Matthew Denes, Sabrina T. Howell, Filippo Mezzanotti, Xinxin Wang, and Ting Xu, "Investor Tax Credits and Entrepreneurship: Evidence from U.S. States," (NYU Stern School of Business, August 2020). <http://dx.doi.org/10.2139/ssrn.3596342>

## MTC's Impacts: Incentivizing Angel Investments

Angel investors in Missouri play an important part in the state's risk capital continuum. MTC routinely co-invests with the state's angels to provide capital for the most promising technology and innovation-focused startups. **These funds play a critical role in de-risking these investments for later-stage investors.**

According to an analysis of risk capital data from Pitchbook, MTC and the state's largest organized angel investor groups (St. Louis Arch Angels, Billiken Angel Network, and Centennial Investors) represented three of the state's top six, and four of the top 12, most active (in terms of the number of deals) risk capital investors from 2010-2020.<sup>1</sup> These sources of early-stage capital are an essential component of Missouri's overall capital stack.

Founded in 2005 as an independent network of angel investors in the St. Louis region, Arch Angels has provided more than \$101 million in total investments across 111 different entities.<sup>2</sup> Of these investments, 86 are still active and 12 companies have exited—a display of promising results and sustained support for the regional entrepreneurial ecosystem. Beyond providing financial support, this network of current and former business leaders, engineers, physicians, and scientists offers the guidance and connections necessary to help fuel these new ventures.

A wide range of companies in MTC's portfolio are shared with St. Louis Arch Angels. This includes not only Benson Hill, but also other successfully exited firms like Canopy Biosciences, Confluence Life Sciences, JBARA Software/GainSight, and Newsy.

1 TEconomy Analysis of Pitchbook data

2 <https://www.bizjournals.com/stlouis/news/2021/07/27/st-louis-arch-angels-tops-100m-startup-investment.html>

### Action 3. Evaluate the creation of Missouri Rural Vitality Funds to provide collateral for entrepreneurial loans.

In rural Missouri, there is a significant need for financial capital to support entrepreneurial efforts; however, sources of risk capital are often difficult to access. Furthermore, local banks need traditional collateral to make loans. Often, entrepreneurs do not have the personal collateral to borrow against to support their entrepreneurial endeavors.

It is recommended that the creation of Missouri Rural Vitality Funds be evaluated as a potential innovative approach to supporting economic and community development in Missouri's rural areas. As currently envisioned, the funds would enable private citizens to offer personal and/or alternative assets as collateral for loans to entrepreneurs. This would release dollars into each county or region for which private banks could then make loans against.

The potential program would enable private citizen seeking to invest in their rural community by making a commitment of a personal and/or alternative asset to serve as collateral from which banks could make loans to local entrepreneurs within the rural region. The private citizen would be able to:

- Determine the geographic scale for which their asset could serve as collateral (their local community, their county, or a multi-county region)
- Serve on the local board to help oversee the implementation of the program in their rural region, and
- Have their risk mitigated through incentives, such as a potential tax credit and/or a portion of the interest collected and held in reserve for any future losses.



Regional/local banks would:

- Conduct due diligence on the loan application and service the loan
- Help market/educate local citizens about the program, and
- Benefit from increased loan portfolio and potential new customers.

It is important to highlight the fact that access to risk capital for rural entrepreneurs is a challenge across the nation—one that has not yet been adequately solved elsewhere. For Missouri to tackle this challenge, it must be open to considering an innovative and outside-the-box approach. The creation of Missouri Rural Vitality Funds is a "novel" concept that, to TEconomy's knowledge, has not been implemented anywhere else in United States. It is recommended that additional research be undertaken to understand both state and federal regulations more fully, as well as the level of potential market interest, to assess the feasibility of this concept.



## STRATEGY TWO: GROW AND SCALE

Increase access to quality entrepreneurial support services throughout Missouri to ensure companies are able to grow and scale.

Entrepreneurial activity is critically important to statewide economic development because it drives industrial innovation and new business formation. Almost by definition, the founders of startup companies are innovators—focused on capitalizing on commercial opportunities arising from introducing a new product, enhancing a service, making a delivery system or production process more efficient, more user-friendly, or less expensive. The founders of startup companies often come from established companies, motivated by the identification of an unexploited commercial opportunity and willingness to take the risk that the established company is not. It is, therefore, not surprising that entrepreneurial activity and innovation are strongly correlated.

However, with a few notable exceptions such as Boston and Silicon Valley, the entrepreneurial climate necessary to generate high-potential, high-growth enterprises has not developed fully and sustainably through market forces alone. Building a critical mass of entrepreneurial management talent in a locality depends on providing the resources that must be amassed, and the services needed to successfully build a company.

As a result, catalyzing entrepreneurial activity is a challenge for many states. It is often stated that entrepreneurship is a “contact sport,” and the barriers and obstacles to being able to scale a firm is significant, particularly highly innovative firms. In addition to risk capital that has been previously addressed, the three areas that Missouri’s entrepreneurs indicated are their greatest obstacles are access to experienced managerial talent, networks, and sales. Of these, the most significant obstacle to creating and growing entrepreneurial companies is the lack of experienced management talent. For Missouri, there simply is a lack of experienced, serial entrepreneurs/mentors who know how to turn an idea or a product into a successful venture. Such serial entrepreneurs are needed not only to lead new ventures, but also to serve as mentors to help fledgling entrepreneurs develop their skills and increase their chances of success. Serial entrepreneurs/mentors have contacts in the investor community, can recognize quality deals, and help to generate deal flow that help firms access capital markets.

The second challenge facing entrepreneurs is the lack of a cultural environment that cultivates value-added networking. One of the characteristics that distinguishes regions and states with high levels of entrepreneurial activity is the networking that occurs among companies and between researchers and the venture community. Networking is an extremely important way in which entrepreneurs can learn from others who have encountered similar obstacles. Indeed, research indicates that the extent of social networks is one of the most important factors in encouraging entrepreneurship in any region. Across the stages of the innovation continuum, conversations uncovered various disparities in access to resources. Within rural areas, population density limits connectivity to domain experts and alternative types of technical mentors. Challenges are also magnified for businesses in under-resourced communities, and especially those started by women and Black, Indigenous, and People of Color (BIPOC) entrepreneurs.

The third challenge that entrepreneurs face is the ability to find customers and markets. Entrepreneurial assistance programs usually focus primarily on providing financial, business planning, and physical space

to startup companies to increase their chance of survival. And indeed, startup companies face many obstacles. But just because a startup company remains in existence does not mean that success has been achieved. For many of these companies, the real challenges come when they are ready to grow. Once they have a management team and an organization in place, have obtained financial capital, and are ready to move to the next level, fewer resources are available to assist these companies in finding customers, identifying new markets, and generally increasing sales—all factors that will determine the level of their contribution to the economic health of the communities in which they reside. In addition, firms have difficulty keeping up with the competition, being aware of new discoveries that may affect their markets, and supporting continued product development—obstacles which can be lessened through closer interactions with universities and their researchers.

Overall, the discussions with subject matter experts suggest that there is a need to develop a systemic continuum of quality, value-added services and assistance to support high-potential, high-growth startups throughout the entrepreneurial development process. Currently, Missouri has too many siloed efforts that are not building a critical mass of activity. Furthermore, efforts need to be tailored to each region's unique opportunities, which often dictate the types of services and resources required to help catalyze scale-up. Developing a systemic, regionally-based entrepreneurial service delivery system to help

### **What Others Do: Ohio Third Frontier Entrepreneurial Signature Program**

The Ohio Third Frontier began investing in entrepreneurial services through its Entrepreneurial Signature Program (ESP) in 2008. Ohio divided the state into six regions and awarded the ESP Hub to one technology intermediary organization. The goal of the ESP is to significantly increase the technology-based entrepreneurial commercialization outcomes throughout a defined geographical region, and then to focus the effort on strategic technology-based sectors that offer exceptional economic-development prospects for the region.

Each ESP represents a comprehensive, coordinated network of high-value services and assistance providers that is visible and easily accessible to technology-based entrepreneurs and small tech-based companies throughout its region. Each ESP provides an approach that tightly integrates sources of deal flow, entrepreneurial support, and capital to effectively grow the technology-based entrepreneurial commercialization outcomes throughout its region.

The Regional Hub designation in Northeast Ohio was awarded to a nonprofit entity, JumpStart. JumpStart actually predates the Ohio Third Frontier. In 2003, Cleveland's private, philanthropic and government leaders desired to address its declining economy, loss of jobs, and lack of significant new entrepreneurial growth. JumpStart was formed to bring the concept of "venture development" to Cleveland—a unique mix of capital investment and intensive technical assistance for entrepreneurs.

In 2007, JumpStart was designated as the Ohio Third Frontier ESP for the Northeast Ohio region. As such, JumpStart receives state grant funding that is matched 1:1 by the region to deliver direct business assistance to high-growth innovative entrepreneurs throughout the region. JumpStart has developed a series of business assistance programs and initiatives and maintains both a mentorship network as well as Entrepreneurs-in-Residence on staff to provide value-added services to the most innovative and promising entrepreneurs across Northeast Ohio. Value-added services include providing assistance with forming a business team of managers to assist with market research and identification of potential clients, providing subject matter experts to assist with technical evaluations, regulatory issues, and commercialization assistance, and providing in-depth counseling and advice to prepare the entrepreneur to present investment-grade plans to investors.

JumpStart partners with a series of regional organizations to ensure that these services are provided across the region at the highest quality, and that entrepreneurs also have access to physical space within the various communities JumpStart serves. Since the organization's inception, JumpStart has engaged more than 6,500+ companies. In 2019 alone, JumpStart engaged 1,150 companies, of which 51 percent were led by women and 42 percent were led by people of color. Since its inception, JumpStart has invested more than \$61million into 125 Ohio tech startups (as of October 2020).. Approximately 44 percent of total investment capital has been deployed into companies led by women and people of color.



diversify the state’s economy, take advantage of traded sector opportunities, and encourage broader participation among underrepresented communities must be a cornerstone of Missouri’s efforts to build and sustain its innovation ecosystem.

It is proposed that Missouri pursue three targeted actions to strengthen its support for the entrepreneurial services that will help Missouri startups grow and scale.

#### **Actions to Pursue:**

4. Develop a statewide Entrepreneurial Pathways Program.
5. Foster regional efforts to provide quality entrepreneurial support services to high-potential, high-growth traded sector startups.
6. Connect Missouri’s corporate partners and anchor institutions with startups, thereby creating a “stickiness” to Missouri for the entrepreneurial endeavor’s ultimate success.

#### **Action 4. Develop a statewide Entrepreneurial Pathways Program.**

In order for there to be real momentum in developing a robust entrepreneurial ecosystem, a systemic, statewide Entrepreneurial Pathways program must be developed within Missouri. These pathways help link all entrepreneurs with assistance to identify the resources within the ecosystem that can help them launch their business (Action 4), as well as a comprehensive continuum of value-added programs as they progress through the stages necessary to establish a thriving high-growth enterprise (Action 5).

It is recommended that an Entrepreneurial Pathways program be established for the sole purpose of serving as an “intake system” for entrepreneurs to learn about and access the various resources within Missouri that are dedicated to assisting entrepreneurs. Missouri can build upon the investment it has



already made in the creation of MOSourceLink, which operates not only a website but also works directly with entrepreneurs to link them to the resources that best fits their needs. However, entrepreneurs noted that the information can be static, confusing, and not always responsive to the unique questions or needs that they have. Within the reality of limited resources and numerous actors within the ecosystem, it is a difficult challenge to be responsive to each entrepreneur's unique needs and successfully direct them to the provider that is most appropriate to address them.

It is for that reason that the statewide Pathways Program must have a wayfinder component that can adequately direct entrepreneurial inquiries to the best resources to help meet their current needs. This referral system cannot be done effectively in a passive manner. It is recommended that adequate staffing be created within the host organization to handle the significant number of inquiries that are received, a number that is predicted to increase significantly as the entrepreneurial ecosystem matures. Staff must triage each inquiry to best understand the needs of the entrepreneur, and then provide a seamless hand-off to the appropriate resources of ecosystem partners. It is important to note that as early-stage entrepreneurs receive the assistance they require and begin to grow, it is envisioned that they will be referred back to the Entrepreneurial Pathways Program for additional relevant connections and assistance as new needs arise.

### **Action 5. Foster regional efforts to provide quality entrepreneurial support services to high-potential, high-growth traded sector startups.**

For there to be real momentum in developing a robust innovation/entrepreneurial ecosystem that is capable of supporting Missouri's high-growth traded sector startups as they grow and scale, a comprehensive continuum of value-added programs must be available to all growth-oriented entrepreneurs as they progress through the stages necessary to establish a thriving enterprise. As envisioned, all Missouri high-growth traded sector startups would be able to access the following entrepreneurial support service programs, regardless of where they are located within the state:

#### **What Others Do: LaunchTN Networks**

LaunchTN Networks offer early-stage companies in Life Sciences and Energy access to expert mentors through a systematic program designed to deliver results. The program is modeled after San Diego's successful CONNECT Springboard. Over 20 years, 725 companies have graduated from CONNECT Springboard, and alums have raised \$1.4 billion since 2005. The CONNECT Springboard model came to Tennessee in 2014, when Launch Tennessee and industry association Life Science Tennessee piloted a statewide Mentor Network for early-stage life sciences companies. The effort was so successful that Launch Tennessee expanded the model to the energy vertical.

Participating companies receive expertise from mentors on topics including:

- Business model
- Due Diligence
- Valuation
- Industry feedback
- Marketing plan
- Intellectual property
- Financial model & projection
- Introductions to potential clients or strategic alliances

Companies involved in the network focus on developing a sharp, informative pitch ready to present in front of investors.

- **Mentorship Network Program**—to overcome the lack of serial entrepreneurs who currently exist in Missouri, it will be important to develop networks of seasoned mentors who provide guidance to promising companies that, in turn, make them more attractive to the risk capital community. These mentors also assist innovative companies in accessing key customers and markets.

Key stakeholders noted that Missouri lacks seasoned entrepreneurs with experience in scaling a company. The lack of such talent in the state may result in firms moving elsewhere in search of managerial talent. One innovative solution to the lack of C-level talent is to develop networks of Missouri advisers and mentors with technology, market, and business expertise in specific industry clusters. Some of these business and technology experts are employed within the state's technology clusters and anchor research assets, while others simply call Missouri home and either work outside the state or have recently retired. These specialists can be tapped to bring expert teams of sector-specific entrepreneurial mentors and advisers together to assess and mentor entrepreneurs in the scale-up of new businesses.

It is envisioned that mentor networks would screen and develop relationships with qualified advisers/mentors with subject matter expertise who are interested in supporting high-growth, innovative entrepreneurs. These mentor networks would help inform the commercial assessment of early-stage innovations and guide its commercialization approach, including connecting it with markets, customers, investors, and management teams. The ultimate goal of the mentorship network is for entrepreneurs to seek guidance and expertise to the point that the company is ready for outside investment, in whatever form makes the most sense for the company's life cycle. It will be critical that intentional, proactive outreach is undertaken to ensure that a diverse array of individuals from different demographic backgrounds and professional experiences are identified and secured as mentors to ensure that startups can connect in a culturally competent and meaningful way.

- **Entrepreneurs-in-Residence Program**—to ensure consistent, significant, value-added assistance to high-growth companies that are fundable but lack C-level talent. Entrepreneurs-in-Residence is a concept that many entrepreneurial assistance organizations have adopted over the last decade, including organizations across Missouri. Under a typical arrangement, companies who become part of an organization's portfolio are assigned the services of an Entrepreneur-in-Residence (EIR). The EIR team consists of highly experienced entrepreneurs who have been involved in the successful creation of innovation-based startup companies and early-stage venture deals. EIRs play an operating role in each portfolio company, providing them with a significant level of value-added commercialization assistance and expertise related to accessing new markets and customers. Many EIRs will eventually transition to full-time employee status with one of their portfolio companies. This strategy of recruiting and tapping the expertise of EIRs is one tactic that a number of states use to bolster the executive talent pool within the region.

Interviews with key stakeholders across Missouri suggested a need for more one-on-one, concierge style support services. A central pillar of concierge style support services are EIRs. These serial entrepreneurs would be responsible for supporting high-potential, high-growth traded sector businesses by offering connections throughout the ecosystem and one-on-one support services.

## What Others Do: Pittsburgh Life Sciences Greenhouse (PLSG)

As a dedicated organization focused on growing emerging life-science companies, PLSG combines incubation and early venture financing with a successful effort to advance entrepreneurial talent to lead life science innovations. From 2001 to 2018, PLSG worked with over 490 companies and made approximately \$22 million of direct investments to 84 companies, which have leveraged over \$1.7 billion of additional capital for the region.

One of the keys to PLSG's success—that addressed a significant challenge for the region—is an Executive-in-Residence (EIR) program, which was started to provide emerging life-sciences companies with domain-specific, C-level leadership, providing executive talent to help form companies; subject matter experts to guide companies; executives to run companies; and program managers and directors to help companies grow. In 2005, the PLSG expanded the EIR Program to extend its areas of support and to add specialists for the life sciences community who work more directly with institutional and private investors and the venture capital industry at large—and renamed it the Executive Program.

Since inception, 48 executives have participated in the PLSG EIR program, with more than 60 percent of them still in the region working directly with a life science company. The importance of the Executive Program is that the 30 companies that now employ former PLSG EIRs make up a large share of the more than 80 life sciences companies that PLSG has invested in over its nearly 20-year history.

Similar to the mentorship networks, it will be critical that a diverse array of individuals from different demographic backgrounds and professional experiences are identified and secured as EIRs to ensure that startups can connect in a culturally competent and meaningful way. It is envisioned that EIRs will support high-growth startups by:

- Delivering one-on-one support services to high-potential, high-growth entrepreneurs
  - Assisting with access to capital and helping with fundraising and other grant support
  - Providing technology/venture scouting to identify entrepreneurs who help “feed the funnel” for venture funds and other capital programs
  - Connecting new/existing businesses to the ecosystem
  - Providing sector-specific expertise across multiple geographies
  - Working with regional partners to support additional programs, such as corporate partnerships (Action 6), activities related to entrepreneurship education and workforce development (Strategy 4) and fostering deeper connections across Missouri (Strategy 5).
- **Physical Hub Program** – While many entrepreneurial support services can be delivered in a virtual environment, the value of physical places in promoting and supporting an entrepreneurial ecosystem should not be underestimated. An entrepreneurial hub is the physical place that often serves as a region's entrepreneurial focal point by:
    - Being the center through which entrepreneurial activity and training is promoted, thereby helping to create a critical mass of activity.
    - Becoming broadly recognized as a center for entrepreneurship for the community/region, helping elevate the role of entrepreneurship in the economy.
    - A center of focus for regional investors to help grow companies at an accelerated pace.
    - Offering specialized services, facilities, or other infrastructure (e.g., high-speed internet, wet lab space) that would otherwise be unavailable in an area.

## Examples of MTC's Physical Hub Investments

Current MTC funded Innovation Centers with physical resources:

- Centers for Emerging Technologies, including wet lab space (St. Louis)
- Innovation Stockyard Kit Bond Incubator, including wet lab space (St. Joseph)
- Jordan Valley Innovation Center (Springfield)
- Joseph Newman Innovation Center (Joplin)
- Missouri Innovation Center, including wet lab space (Columbia)
- Missouri Rural Enterprise & Innovation Center (Kirksville)

Additional physical hubs that have been supported by MTC (mostly through MOBEC Grants)

- Donald Danforth Plant Science Center (St. Louis)
- Helix Center Biotech Incubator (St. Louis)
- Independence Regional Innovation Center (Independence)
- Marquette Tech District (Cape Girardeau)
- Technology Entrepreneur Center (T-REX, St. Louis)

- Acting as a center of gravity in which accessing a large network of contacts encourages relationships and synergies between entrepreneurs.

It is important to note that these types of entrepreneurial support services are not new to Missouri. Significant investments have been made throughout the state to develop entrepreneurial support efforts, supported by federal, state, regional, local, academic, private, and philanthropic resources. However, many key stakeholders interviewed feared that Missouri overall has yet been able to “move the needle” in terms of developing a critical mass of high-potential, high-growth entrepreneurial activity.

What is needed in Missouri, at a regional level, is a coordinated delivery model that leverages existing assets and ensures systemic, coordinated, quality services are responsive to localized needs and

linked with commercialization activities at higher education institutions and other research partners. It is perceived that there are varying degrees of quality across the large number of programs, initiatives, and organizations that currently receive dollars to provide entrepreneurial assistance. The perception is that most entrepreneurial services organizations are disconnected from one another, and as a result, most do not have the resources at an individual level to provide sophisticated, value-added business services to high-potential, high-growth entrepreneurial endeavors. These siloed efforts are often competing against one another for scarce resources rather than coordinating efforts to promote broader entrepreneurial growth. This competition and redundancy lead to an “alphabet soup” for the user community. There are also continued challenges for entrepreneurs in rural areas, underserved communities, and in certain industry sectors that have difficulty accessing services. These barriers require new, targeted approaches to filling gaps in the ecosystem.

To best assist high-potential and high-growth startups, it is recommended that Missouri establish two avenues for supporting the delivery of quality entrepreneurial support services:

**Funding Stream One: Regional Node Funds**—intended to incentivize more of Missouri’s communities to successfully coalesce their assets to best support innovation and entrepreneurship through strategic, coordinated partnerships among entrepreneurial service organizations. Funds for regional nodes will need to support traded-sector businesses. However, regions will be able to use the funds to support their entrepreneurs, regardless of sector.

It is recommended that organizations in Missouri's regions collaboratively develop plans that clearly articulate the role of each partnering support organization and envision how the sum of the region's efforts will be greater than its individual parts with increased state funding. Based on these strategies, nodes will be designated to regions that successfully coalesce their assets to best support innovation and entrepreneurship. These regional nodes are intended to help maximize the number of high-potential, high-growth Missouri startups that scale their companies within the state as a result of having access to the quality entrepreneurial support services they need, regardless of their location or their company stage.

Because it is recognized that coalescing a region around a coordinated plan to support a vibrant entrepreneurial ecosystem might prove difficult for some Missouri regions, it is suggested that planning grants be provided to help incentivize regions to coordinate their resources and develop a strategy for service delivery.

Regional node funding will be expected to be matched by regional resources over time. Because of this regional match requirement, it is strongly recommended that the State of Missouri work collaboratively with the State of Kansas so that the entire Kansas City metro region can be considered as one region. It will be critical for the success of the Kansas City Region's entrepreneurial ecosystem to be a single cohesive effort and a quality source of services for all high-potential, high-growth entrepreneurs within the region. This is how the region's assets are already working together, and to artificially divide the ecosystem is counterproductive to the ultimate goal of this effort.

Once a region coalesces around a strategic delivery model, a range of funding options become available to the node and to its partners to support mentorship networks, EIRs, physical hubs, and other entrepreneurial needs identified by the region. It is anticipated that regional node funding will be the primary way that regions receive state funding to support their entrepreneurial service delivery efforts, but not the only mechanism.

**Funding Stream Two: Flexible Support Funds**—enable Missouri to respond to additional identified areas of need in the state's entrepreneurial ecosystem, including, for example, sector-focused efforts, new approaches to engaging entrepreneurs in rural areas and other underserved communities, and piloting new models to better meet the needs of high-potential, high-growth startups.

In addition, in instances where regions are either unable to come together in a collaborative manner or there are identified additional needs beyond what the regional node funding can support, programmatic dollars will be made available by the state through Flexible Support Funds. This will allow for all regions to receive relevant funds for entrepreneurial service and physical infrastructure and can help the state pilot new approaches to addressing challenges facing rural entrepreneurs and those in underserved communities.

**The two funding streams (Regional Node Funds and Flexible Support Funds) are envisioned to work in a coordinated fashion as follows:**

- **Mentorship Network Program:** Across Missouri efforts are underway to create mentoring programs at various accelerators and service organizations, as well as alumni networks at institutions of higher education. Regional Node Funds would seek to support the coordinated efforts within each region as well as create new networks where none currently exist. Flexible Support Funds

## MTC's Impacts: Fostering Regional Efforts to Support Entrepreneurs

Although the creation of a single point of entry for entrepreneurs is not an easy task for a region to undergo, the reduction of barriers and the creation of a seamless access point can be of enormous benefit. In Southwest Missouri, the Springfield region has undergone the difficult process of removing silos and coalescing its most active entrepreneurial support organizations under one roof. This has helped the region create an easily identifiable entryway for all entrepreneurs, whether they participate in traded sector or non-traded sector industries.

Anchored by Missouri State University (MSU), the Jordan Valley Innovation Center is fostering an environment where startups can start, grow, and scale. As an Innovation Center that receives funding from MTC, the eFactory serves as a one-stop-shop hub for entrepreneurial support.<sup>1</sup> The eFactory is centrally located at MSU's IDEA Commons. The region is intentional about locating support services under one roof to better serve entrepreneurs. In an increasingly complicated business environment, this ease of access provides a wide range of benefits. To date, the eFactory has served more than 2,600 companies which have then gone on to create more than 2,300 jobs.<sup>2</sup>

Notable services that exist under one umbrella organization include:

- The MTC-funded initiative Supercharge Southwest Missouri
- A branch of the Small Business Development Center network
- The eFactory Accelerator program
- Rosie, a mentorship program
- The Management Development Institute
- A branch office of Missouri Enterprise
- A branch office of Procurement Technical Assistance
- Additional advocacy and mentorship networks, such as Minorities in Business and SCORE

**The elimination of silos and the creation of a single-entry point for entrepreneurs is a key advantage for Southwest Missouri, and could serve as a roadmap for other regions in the state.** Partnerships are an essential part of the eFactory's success. Working very closely with groups like MTC, MSU, Springfield Area Chamber of Commerce, City of Springfield, major industry partners, and other players in the community, eFactory is part of a holistic commitment to supporting regional economic development.<sup>3</sup>

1 <https://www.mosourcelink.com/blog/post/blog/2019/10/03/an-interview-with-the-entrepreneurship-hub-efactory>

2 <https://efactory.missouristate.edu/impact/>

3 <https://www.mosourcelink.com/blog/post/blog/2019/10/03/an-interview-with-the-entrepreneurship-hub-efactory>

would be used to develop new mentorship networks that support statewide efforts, such as those focused on niche industries or specific populations.

- EIR Program: These individuals, funded through Regional Node Funds, will maintain a physical presence within a specific regional geography. EIRs funded through Flexible Support Funds are envisioned as functioning remotely or in partnership with key industry-led organizations across Missouri within targeted industry verticals. In addition, through Flexible Support Funds, further networks of experts could be developed where a need is identified (e.g., for technical assistance in grant-writing).
- Physical Hub Program: New and existing physical hubs will be funded primarily through Regional Node Funds and will seek to:
  - Fund the development of physical entrepreneurial “front-doors” within regions
  - Encourage downtown development centered around entrepreneurial vitality, and
  - Create additional incubator/co-working space to meet demand.

In instances where regions are either unable to come together in a collaborative manner or there are identified physical space needs beyond what the Regional Node Funds can support, programmatic dollars will be made available by the state through Flexible Support Funds.

If implemented, this comprehensive suite of value-added business assistance services tailored to high-potential, high-growth Missouri companies will help catalyze robust regional entrepreneurial ecosystems across the State of Missouri and will target resources to the most promising entrepreneurs that in turn will drive economic growth in the future.

**Action 6. Connect Missouri’s corporate partners and anchor institutions with startups, thereby creating a “stickiness” to Missouri for the entrepreneurial endeavor’s ultimate success.**

There is limited connectivity between corporate innovation and the startup community across Missouri, which in turn limits the opportunities to develop first customers. As a result, there is an opportunity to strengthen the entrepreneurial ecosystem by fostering relationships between startups and existing businesses to catalyze new product development.

Early customers are critical to a vibrant entrepreneurial ecosystem. However, there has been a historic reluctance across Missouri for large companies to invest in beta-projects or purchase goods and services from local small businesses. These types of relationships are important to economic development for two reasons. First, these agile startups have the potential to help established businesses solve real business problems—first-customer partnerships should not be viewed as a philanthropic effort but instead as a competitive business imperative. Second, an inability to invest in the success of innovative small businesses locally could lead to these startups relocating to be nearer their primary customers. Missouri should ensure that its startups, especially those operating in key industry clusters, are able to grow and scale by connecting them to potential first customers.

Across Missouri, there are examples of corporations working effectively to support startups. However, the survey and interviews suggest a need for greater engagement by corporate partners to help drive innovation. These examples must be modeled in a systemic fashion, however, before true “stickiness” can be achieved.

There are opportunities for regional nodes and their associated partners to do more to encourage partnerships between startups, corporate partners, and anchor institutions (nonprofit institutions that, once established, tend not to move locations, serving as economic engines in their communities—e.g., hospitals, research institutions, and universities). By encouraging partnerships with anchor institutions, there is the potential to create the “stickiness” that has historically been lacking in Missouri’s startup community.

Corporations can support entrepreneurship<sup>30</sup> through:

- Sponsorship of entrepreneur support activities and programs such as networking events or funding support organizations.
- People, product, and place exchanges, offering C-Suite and other mentoring and connections to needed technology and business development networks; making corporate products and services accessible to entrepreneurs; and offering physical space for prototyping and business growth.
- Customer and vendor sourcing, enhancing supply chain, becoming a first or reference customer.
- R&D activities which often include connections between corporations, entrepreneurs and research institutions.
- Investment in funds, mergers, and acquisitions.

**It is recommended that Corporate Partnership Grants be provided to the regional nodes, their strategic partners, and at the statewide level to help:**

- Include corporate resources in mentor networks, especially those that can help connect entrepreneurs to potential industry partners and potential customers.
- Develop “first-customer” and other supply-chain programs that support both startup companies in garnering first customers and growth companies in expansion.
- Educate entrepreneurs on how to work best with corporations (and vice-versa).
- Explore accelerator programs that link corporations with promising startups and/or technologies.

### **What Others Do: Atlanta’s Engage.VC Program (Tech Square Ventures)**

Managed by Tech Square Ventures, **Engage.VC** in Atlanta is designed to promote innovation through a network of connections between startups, corporations, university researchers, and the venture community. Combining elements of corporate innovation and venture capital, Engage.VC is introducing a collaborative venture investment model for corporations: the program’s collaborative sourcing and diligence process utilizes an extensive venture and startup network, proprietary cross-corporate insights, and data-driven market theses to recruit B2B enterprise startups with the potential to reshape the future of industries. Engage.VC acts as a strategic investor, deploying both capital and enterprise expertise to help startups break through corporate barriers through events, programming, and strategic access to leading executives and academics.

Engage.VC searches for entrepreneurs building enterprise startups spanning six strategic themes: Customer Experience, Supply Chain & Manufacturing, Future of Work, Big Data, Analytics, Security, Logistics & Mobility, and Climate Tech & Sustainability. Partners include Georgia Tech, Invest Georgia, Tech Square Ventures, and companies such as Chick-fil-A, The Coca-Cola Company, Cox Enterprises, Delta Air Lines, Georgia-Pacific, Georgia Power Foundation, Goldman Sachs, The Home Depot, Honeywell Connected Enterprise, Intercontinental Exchange (ICE), Inspire Brands, Invesco, UPS, and Wellstar Health System.

To date, 70 percent of Engage.VC startups are Southeast-headquartered, with 40 percent based in Atlanta. Many companies have relocated or opened an Atlanta office since joining the program, and Engage.VC startups now employ more than 200 people in Atlanta.

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30 KCSOURCELINK, *We Create Corporate Engagement*, March 2020, <https://www.kcsourcelink.com/wecreate/entrepreneur-dashboard-corporate-engagement>





- Support collaborations between entrepreneurs, research institutions, and corporations to commercialize new technologies.
- Develop programs that support internal innovation efforts at Missouri companies.
- Encourage corporate investment in Missouri funds.
- Offer value-added networking and platform for industry, academia, and startups to discuss shared challenges and potential opportunities to work together. Networking activities would include:
  - Technology and market intelligence workshops
  - Peer-to-peer networks across CEOs, CTOs
  - Investor forums/pitch competitions
  - Offering skilled technology-workers at larger companies opportunities to connect with the entrepreneurial community, and
  - Identifying potential markets for new products, services, or businesses within the patent portfolios of current companies.

These networks would foster supply-chain linkages/first-customer efforts between the startup community and corporate partners seeking innovative solutions to their most pressing needs. Workshops/networking events would be designed so that corporate stakeholders are engaged in an effort to better understand their most pressing needs, and these needs would then serve as sourced problem statements to the startup community to create linkages and first-customer efforts.



### STRATEGY THREE: LAUNCH AND CULTIVATE

Take advantage of Missouri’s research strengths by converting the intellectual assets into market opportunities.

Developing a vibrant environment that encourages basic and applied research at colleges, universities, and within industry is essential if Missouri is to catalyze further innovation-led economic growth. It is also critical that Missouri can transfer the intellectual property developed at its colleges and universities into new products, services, and businesses, and ultimately, new jobs and investment.

Missouri’s economy has always been carried upon the back of inventiveness and creativity, so the “innovation economy” per se is not a new phenomenon; rather, it is more accurate to say that innovation has increased in importance as the primary impetus of economic growth and competitiveness. Two fundamental forces are driving the preeminent importance of technology and knowledge advancement as the determinant of economic success:

- The first of these is the rapidly accelerating pace of scientific discoveries and the technologies that these discoveries give rise to (advances in genetics, for example, have dramatically accelerated the discovery process in the biosciences). The opportunity to speed the discovery and development processes, in concert with the ability to protect and profit from intellectual property, is leading to an innovation race among competing countries, states, and regions.
- The second fundamental force is the globalization of world markets and the increasing pressure to maintain a high-wage/high-skill employment base through consistently staying ahead in technology and productivity.

With schools like Washington University in St. Louis, the University of Missouri system, and Saint Louis University and nonprofit institutions like the Stowers Institute for medical Research and the Donald Danforth Plant Science Center, the research and development capabilities of the state are a key building block to encourage innovation and entrepreneurship. There are also opportunities to leverage untapped potential across other colleges and universities (such as community colleges and state universities), as well as the state’s Historically Black Colleges and Universities (HBCUs) – Harris Stowe University and Lincoln University. **Bringing together Missouri’s research institutions – including its universities, colleges, and nonprofit research institutions – is an opportunity to leverage the strengths and assets of each partner in a more coordinated, holistic, and intentional matter.**

Research institutions that support ideation are committed to fostering entrepreneurial development and facilitating commercialization of market-relevant findings—emphasizing that faculty roles are not limited to education, research, and public service, but include contributing to economic development. It is important to note that R&D will not “magically” pass over the transom from research to market—from university to business. Initiatives must be put in place to facilitate the commercialization of research discoveries.

Unless domain expertise is available to develop an idea or approach, conduct further applied research, undertake due diligence, or expose the research to people with differing perspectives, ideation will not

occur. In addition, nondilutive sources of capital, such as prototype development and proof-of-concept funds, must be available to the domain experts in order to advance the ideas.

It is recommended that Missouri pursue three actions to better take advantage of Missouri's research strengths and help convert intellectual assets into new businesses and job opportunities.

#### **Actions to Pursue:**

7. Reenergize the Research Alliance of Missouri (RAM) as a mechanism for bringing together the major research institutions of the state to solve common innovation continuum challenges.
8. Leverage the federal I-Corps program and provide startup services statewide to encourage commercialization activity.
9. Provide comprehensive assistance for SBIR/STTR awards to further drive commercialization across the state, especially at Missouri's research institutions.

#### **Action 7. Reenergize the Research Alliance of Missouri (RAM) as a mechanism for bringing together the major research institutions of the state to solve common innovation continuum challenges.**

Across Missouri's colleges, universities, and other research institutions, a wide range of individuals are confronting similar bottlenecks related to R&D and commercialization. Working together to address these common challenges and develop common solutions is a prime opportunity for Missouri to convert more of its research strengths into new businesses and job opportunities.

In 2003, the RAM<sup>31</sup> was developed to coordinate the activities of Missouri's research universities and expand industrial access to their technologies.<sup>32</sup> Featuring leadership from influential academic officials and technology transfer officers, RAM grew to include 17 public and private universities. Leaders from RAM met quarterly to identify and act on common interests. Notable early accomplishments of RAM included developing a model licensing agreement across universities. The Alliance also created a matrix to identify research interests of member schools.

An important component of RAM's activities was its networking and interest groups. Leveraging the social capital and connections of the leading organizations, these interest groups were aligned across key technology areas relevant to the state. Notable examples included:

- The Technology Gateway Alliance (focusing on branding efforts and other initiatives), and the Life Sciences Network, a forum for promoting startups.
- The Information Technologies Network, which organized an annual conference to highlight business opportunities around IT.
- Coalition of Plant and Life Sciences, which featured two full-time staff dedicated to growing the industry.

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31 <https://www.revisor.mo.gov/main/OneSection.aspx?section=348.257&bid=18578&hl=>

32 Description of RAM activities come from Edward L. Bayham, Jerome A. Katz, Robert Calcaterra, & Joseph Zahner, Chapter 14: The St Louis BioBelt—Centre for Plant and Life Sciences: A Triumph of Converging Individual Efforts," in *Handbook of Research on Techno-Entrepreneurship*, ed. Francois Therin (Edward Elgar Publishing, 2007), 265-295.



- Partnering with MOBIO on educational and networking opportunities, including programs that promoted biotechnology's economic development benefits in rural communities.

Overtime, RAM became less active and today no longer exists. Given the importance of innovation and entrepreneurship for Missouri, it is recommended that the Alliance be reenergized to further engage the state's research leaders and break down silos across the state's universities. Once again operating as a program of MTC, activities of a reenergized RAM could include:

- Streamlining processes that help researchers work with companies across the state and with each other, including partnership agreements, shared-use facility arrangements, and other accommodations.
- Developing working groups around key sectors related to Missouri's R&D strengths.
- Encouraging collaborations that help the state's research institutions better compete for federal research funds that require a local match.

**Action 8. Leverage the federal I-Corps program and provide startup services statewide to encourage commercialization activity.**

Central to the strength of Missouri's institutions is the talented faculty and students who conduct research and development. One approach to encouraging entrepreneurship among students and faculties is through the federal I-Corps program. At universities across the nation, Innovation Corps (I-Corps) sites are federally-funded entities that help nurture and support teams of researchers to transition their technology concepts into the marketplace. Launched in 2011, each site provides a range of services, such as infrastructure, advice, resources, networking opportunities, training, and modest funding to enable these teams to transition their scientific work into the marketplace. Participants learn new entrepreneurial skills

## What Others Do: Virginia's Innovation Commercialization Assistance Program (ICAP)

A promising approach to delivering the I-Corps program at a statewide level is the Innovation Commercialization Assistance Program (ICAP), which is provided through the SBDC network in Virginia overseen by George Mason University. The Virginia ICAP leverages George Mason University's expertise through the I-Corps program, offering the evidence-based Lean Startup method for ideation, customer discovery and business planning. Targeting faculty and graduate students, but not limited to these audiences, the Virginia ICAP program helps launch new innovation-led startups based on Virginia's discoveries.

Accelerators and incubators across Virginia leverage the Virginia ICAP program to provide the initial training for entrepreneurs and prepare them for admission into their support programs. As a "pre-accelerator," ICAP helps early-stage technology entrepreneurs develop winning business models and go-to-market (GTM) strategies based on the Lean Startup model. ICAP starts with an intensive two-week bootcamp focused on customer discovery and business value proposition, and then provides more one-on-one mentoring and coaching assistance over the next 6 to 18 months as entrepreneurs build out their business model and products, as well as seek investment.

This ICAP program has a proven track record in helping entrepreneurs successfully launch their businesses and position themselves for federal SBIR awards, state venture investments, and initial early-stage private investments from angel investors and seed funds. Typically, it works with a cohort of up to ten entrepreneurs in each region, with well over 10 cohorts each year. In less than five years, 519 entrepreneurs have been served by ICAP and \$34 million in follow-on financing achieved.

by speaking to potential users, conducting customer discovery, and identifying valuable product insights or potential pivots.

In August 2021, Missouri S&T joined the Great Lakes Hub, a collection of universities across the Midwest operating I-Corps programs, led by the University of Michigan.<sup>33</sup> Through this effort, Missouri S&T works with partners across the state to conduct its programs, including the Missouri Innovation Center at the University of Missouri-Columbia, iWerx in Kansas City, Missouri, Lincoln University in Jefferson City, the University of Missouri-St. Louis, and Washington University in St. Louis. Missouri S&T and its partners have trained nearly 260 teams over the past five years.

One affiliate site of the Missouri S&T I-Corps program, the Skandalaris I-Corps SITE at Washington University, similarly helps scientists learn new methods related to research and customer discovery.<sup>34</sup> In addition, Saint Louis University has also developed an I-Corps program, SLUStart I-Corps.<sup>35</sup> It is designed to help academic researchers, community inventors and innovators, and aspiring entrepreneurs in the St. Louis region extend their focus beyond academia, the laboratory, and the workshop so that they create successful products and services that deliver real value.

It is recommended that Missouri continue to coordinate, support, and expand a statewide I-Corps program. In particular, the state should:

- Work with the newly reenergized Research Alliance of Missouri to scale the program across a greater number of colleges, universities, and research institutions. Expanding this effort statewide

33 <https://news.mst.edu/2021/08/missouri-st-part-of-new-15-million-great-lakes-innovation-corps-hub/>

34 <https://skandalaris.wustl.edu/sc-programs/nsf-i-corps/>

35 <https://www.slu.edu/research/faculty-resources/research-innovation-group/slustart-icorps.php>

would help assist an even greater number of researchers, faculty, and graduate students from across Missouri in launching new startups and in validating a technology's market potential.

- Partner with Missouri's regional entrepreneurial support efforts to provide I-Corps training where the programs are currently unavailable.
- Identify ways to provide follow-on support services for promising graduates of the I-Corps program.

It is envisioned that companies that are formed from the I-Corps program would be prime candidates to receive risk capital funding and entrepreneurial support assistance as described in Strategies 1 and 2 as well as SBIR/STTR grant assistance described in Action 9.

### **Action 9. Provide comprehensive assistance for SBIR/STTR awards to further drive commercialization across the state, especially at Missouri's research institutions.**

Beyond educating Missouri's research faculty and students on how to become entrepreneurs, opportunities abound to leverage the federal SBIR/STTR program to develop novel technologies into promising young companies. Across the nation, states are providing varying degrees of support to applicants of the SBIR/STTR program, including technical assistance with applications, matching funding for awards, and other resources to help encourage these businesses.

The SBIR/STTR award is funded based on each federal agency's extramural R&D budget: agencies exceeding \$1 billion are required to reserve 0.45 percent of their budget for awards, while agencies with R&D funding greater than \$100 million are required to allocate 3.2 percent to small businesses. Through FY2019, over 179,000 awards have been made totaling more than \$54.3 billion. As federal R&D funding continues to grow, this would presumably lead to a commensurate growth in SBIR/STTR funding. **This poses a great opportunity to grow the amount of nondilutive capital and support services available for Missouri's technology-based small businesses.**<sup>36</sup>

As a percentage of total awards, Missouri companies receive proportionately more awards from Health and Human Services (HHS), NASA, and USDA than the national averages.<sup>37</sup> This could suggest that SBIR/STTR awards can play a valuable role in seeding businesses in health and life sciences, agriculture, and aerospace, as well as in other sectors such as national defense and energy.

According to research by SSTI, 33 states offer some form of SBIR/STTR support, and seven states offer three different types of support.<sup>38</sup> These programs generally assist with covering/matching costs over the award cycle, supporting pre-proposal feasibility research and analysis, and assisting with proposal preparation and submittal. However, as it currently stands, there is no formal statewide support mechanism for SBIR/STTR awards in Missouri. There are a few regional efforts that could be leveraged in developing a statewide effort, such as BioSTL's Grants to Business (G2B) Program.

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<sup>36</sup> <https://www.sbir.gov/about>

<sup>37</sup> TEconomy analysis of SBIR.gov data

<sup>38</sup> As of June 2021; [https://www.sbir.gov/sites/default/files/2021\\_State-Funds-for-SBIR-companies\\_0826.pdf](https://www.sbir.gov/sites/default/files/2021_State-Funds-for-SBIR-companies_0826.pdf)

As referenced in Strategy 1, Action 1, it is recommended that the state develop a comprehensive system to assist potential, current, and past SBIR/STTR awardees. This includes three components:

- **Phase 0:** Missouri should develop a new program that assists applicants pursuing a Phase I SBIR award. This program would provide free and/or subsidized technical assistance, as well as direct funding to a business to help prepare their applications.
- **Phase I Match:** As noted in Action 1, Missouri should support an SBIR matching grant program that provides support for writing applications and serves as a bridge between Phase I and II awards. Providing match funds for a Phase I award would allow companies to continue to focus on product development and market-fit, instead of just the application process.
- **Phase 2 Match:** For companies receiving a Phase II SBIR/STTR award, a matching grant can help them further develop commercially viable innovations.

For SBIR/STTR companies that successfully complete each of these programs, the state should consider approaches to further cultivate these technology-based businesses. It is envisioned that SBIR “Phase III” companies (those companies that had successfully completed their Phase II award) would be prime candidates to receive risk capital funding and entrepreneurial support assistance as described in Strategies 1 and 2.

### What Others Do: Montana Technology Innovation Partnership (MTIP) SBIR Grants

The Montana Technology Innovation Partnership (MTIP) was established by the Montana Department of Commerce in 1999 to support technology-based economic development. In August 2018, the management of the MTIP program transitioned to Montana State University's TechLink Center.

The Montana Innovation Partnership (MTIP) offers no-cost services to help Montana innovators and entrepreneurs learn about and compete for funding under the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. The MTIP provides assistance with activities related to successfully participating in these programs such as proposal reviews, intellectual property guidance and referrals, and commercialization planning.

Each year, MTIP awards six FAST microgrants to eligible SBIR/STTR applicants of up to \$2,000. Prospective SBIR/STTR applicants can apply to MTIP to receive microgrants to attend conferences, travel to speak with agencies or commercialization partners, acquire consulting services from an approved service provider for assistance with preparation of Phase I or Phase II proposals, develop supporting project data, and undertake other activities directly related to their SBIR/STTR proposal.

In addition to support for MTIP, the Montana Department of Commerce manages the SBIR/STTR Matching Funds Program. This effort provides technology-based Montana companies with additional funding that can be used for technology development or other uses during the time that the company is working on an SBIR/STTR project with a federal agency. A Phase I matching program is available to help companies conduct feasibility research, and a Phase II matching grant helps companies expand and develop Phase I results and develop commercially viable innovations. Grants of up to \$30,000 per phase are available on a yearly basis.



## STRATEGY FOUR: INSPIRE

Encourage more Missourians to participate in innovation and entrepreneurship.

As noted in a recent report by the Council on Competitiveness, many Americans do not necessarily consider themselves a part of the innovation economy, and do not see their potential as innovators<sup>39</sup>. This is concerning, especially because the Council noted that “a growing community of educators has recognized that experiencing invention, innovation and the fundamentals of entrepreneurship across the K-12 and higher education journey can enhance learning, particularly around STEM, design and adjacent disciplines; open minds and possibilities by fostering student creativity, self-efficacy, and a sense of belonging; and prepare students with the mindsets and skill sets that CEOs are seeking in their future workforce, while further cultivating future inventors and entrepreneurs. Industry partnerships, and the range of resources that they bring, will be key to realizing this goal.”

Ensuring that all Missourians have the pathways to develop the skills needed to pursue entrepreneurship or engage in the innovation economy is a critical dependency of this strategic plan. Respondents and interviewees frequently expressed the importance of improving educational attainment as a central driver of Missouri’s innovation and entrepreneurial ecosystem. While education and workforce development are not the direct focus of this strategic effort, there is a need for more entrepreneurship education that can inspire more Missourians to participate in the innovation economy.

Beyond education on how to become an entrepreneur, respondents and interviewees also expressed a desire to connect Missouri’s talented students with the innovation and entrepreneurship ecosystem. Ultimately, changes in both culture and policy are needed to better support talent development and attraction. There is a need to connect Missouri’s students—whether they are in high school, college, or recently graduated—with startups, technology-based businesses, and the entrepreneurial ecosystem more broadly.

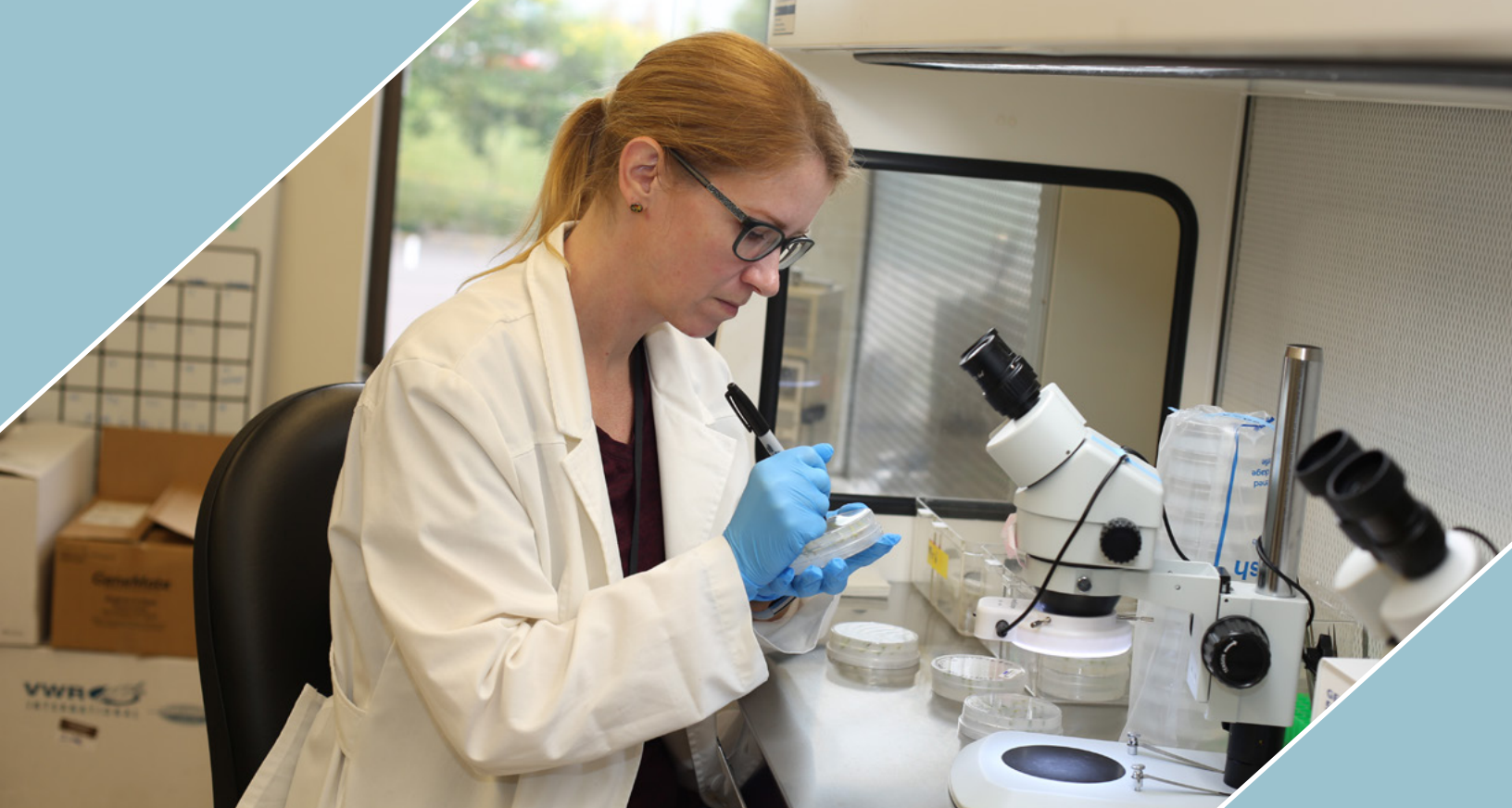
It is important to note that because the regional nodes are anticipated to drive much of the entrepreneurial educational programming, it is anticipated that the State of Missouri will work collaboratively with the State of Kansas so that the Kansas City Region’s entrepreneurial ecosystem can act as a single cohesive source for training, regardless of where a recipient lives within the region. This is how the region’s assets are already working together, and to artificially divide the ecosystem is counterproductive to the ultimate goal of this effort.

It is proposed that Missouri pursue four targeted actions to encourage more Missourians to participate in innovation and entrepreneurship, thereby helping Missouri startups grow and scale.

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39 The Council on Competitiveness (2020), “Competing in the Next Economy: The New Age of Innovation”





#### **Actions to Pursue:**

10. Improve access to entrepreneurial programming for students in middle/high school and at community colleges and universities.
11. Fund an internship program that connects startups with talent.
12. Offer entrepreneurial education across Missouri through regional partnerships.
13. Enhance Missouri's storytelling capacity to encourage more Missourians to be entrepreneurial.

#### **Action 10. Improve access to entrepreneurial programming for students in middle/high school and at community colleges and universities.**

There are many examples of notable initiatives to encourage entrepreneurship among students at the state's largest universities, such as activities within the University of Missouri system (such as the Entrepreneur Quest Accelerator), programs within the Skandalaris Center at Washington University (such as the InSITE Fellowship), programs within UMKC's Innovation Center, and the eFactory at Missouri State University, among others. However, these initiatives remain largely disconnected from one another, and from the other activities occurring within the state's broader innovation and entrepreneurship ecosystem.

Furthermore, programs that encourage entrepreneurship at the state's universities are important, but there is also a need to develop activities that reach the untapped potential of the state's smaller colleges and universities, its community colleges, and even its high schools.

It is recommended that Missouri develop a statewide effort to improve access to programs that encourage student entrepreneurship. This effort should build on ongoing efforts across Missouri and the nation, including Kauffman Foundation's Real World Learning business plan competition, entrepreneurial education programs from Junior Achievement, and Venture for America's fellowship program for recent college graduates pursuing careers in entrepreneurship. Supported by state funding, operated through

academic institutions, and boosted by regional nodes and their partner organizations, it is anticipated that this programming would:

- Offer introductory entrepreneurship training to students by partnering with existing efforts or creating new initiatives in communities where currently programming it not offered modeled after successful programs found elsewhere.
- Deliver statewide student entrepreneurship contests as the middle school, high school, and post-secondary levels, where students are encouraged to develop new products and services that help address key problems facing Missourians.
- Hold events (virtually and in-person) that provide rewards for participation, such as hackathons, pitch competitions, etc.
- Expand statewide national programs that currently have some presence within Missouri, such as the Kauffman Foundation’s Real World Learning business plan competition, the Junior Achievement’s entrepreneurial education programs, the InSITE Fellowship program, and Venture for America.
- Identify avenues to connect the most promising student entrepreneurs with internships (Action 11), or access to additional resources through the Entrepreneurial Pathway and regional nodes.

## What Others Do: Oregon’s InventOR Program

Invent Oregon (InventOR) is the state's only college-level prototyping competition that empowers students to see themselves as innovators and take their ideas for inventions from concept to reality.

In partnership with Portland State University's Center for Entrepreneurship and supported by Business Oregon, the Lemelson Foundation, the Oregon Community Foundation, and the Oregon Lottery, InventOR provides mentorship and development grants up to \$2,500 to competing students. At the InventOR Collegiate Challenge finals, students present their invention and compete for \$30,000 in cash prizes.

**In five short years, Invent Oregon has:**

- Grown to include collaborations with 19 Oregon colleges and universities
- Served over 1,400 college students
- Seen 89 teams participate in the state finals
- Awarded over \$350,000 in prototyping grants and prizes
- Seen alumni file 4 patents and launch 7 businesses

### **Action 11. Fund an internship program that connects startups with talent.**

A recent survey of current college students and recent graduates found that most (36 percent) would look for employment in any city or town where they could find a job, while just 13 percent were interested in looking for employment opportunities limited to the city/town where they attended college.<sup>40</sup> When asked whether the graduate was interested in remaining in the city they attended college after graduation, there

<sup>40</sup> Development Counsellors International (DCI), “Go Fish: How to Reel in Tomorrow’s Talent,” Q2 2018.

was a roughly even split between yes, no, and unsure options. From an economic development perspective, there is a role to play to convince the “unsure” category of Missouri’s career opportunities.

One way to retain talent is to establish personal relationships with students while they are still in school, whether it be high school, two-year programs, undergraduate, or graduate programs. Experience shows that efforts such as internships and co-op programs can be effective in increasing the retention rate of graduates, reducing their out-migration to other states and regions. Within professional degree programs, there is a long tradition of including field experiences as a way to build practitioner skills and facilitate the move from theory to practice. Two of the most common forms of workplace learning are cooperative education (co-op programs) and internships. In co-op programs, students alternate periods of paid work with campus study or split their time between the workplace and the campus. An internship provides students with relevant work experience over a shorter, set period of time.

Both co-op programs and internships are structured and supervised experiential learning opportunities that provide students with practical experience in their chosen fields. Co-op programs and internships illustrate classroom relevance in the professional world. Beneficial for both students and employers, they offer career exploration and skills application for students and provide employers with workers who are creative, enthusiastic, able to assist with projects, and open for mentorship. Transitioning students into full-time employees is also a proven time- and cost-saving recruiting method.

While prevalent among large industrial players, co-op programs and internships are not as prevalent with startup companies. However, experiential education can certainly help students gain the following:

- An appreciation for entrepreneurial endeavors,
- A deeper understanding of subject matter than is possible through classroom study alone,
- The capacity for critical thinking and application of knowledge in complex or ambiguous situations, and
- The ability to engage in lifelong learning, including learning in the workplace.

The hardest part of developing co-op programs and internships is gaining the participation of employers. This is why there are not many formalized programs with early-stage companies. Large corporations with significant in-house human resource departments have the staff time and resources to manage such a program. Early-stage companies typically do not.

In Missouri, survey respondents and interviewees expressed a desire to see more experiential learning opportunities, and support for programs such as internships, co-ops, flexible credentials, apprenticeships, and others. By linking students to innovative startups and other interesting traded-sector companies, these programs can help strengthen and retain Missouri’s locally-rooted talent (particularly those in STEM fields).

In conjunction with the states research and academic institutions (colleges, universities, community colleges), Missouri should fund an entrepreneurial-focused internship program (and other experiential learning opportunities). It is anticipated that the internship program/experiential learning opportunities would:

## What Others Do: Massachusetts Technology and Life Sciences Internship Programs

In Massachusetts, two internship programs focused on science and technology careers are effectively building connections between students and industry: The Massachusetts Technology Collaborative's (MassTech) Intern Partnership and the Massachusetts Life Sciences Center's Internship Challenge.

The MassTech Intern Partnership (MTIP) provides stipends to digital technology companies that are starting and scaling-up across Massachusetts to directly support internships for Massachusetts college and graduate students. Companies are allowed up to two interns and can be reimbursed for up to 50 percent of the intern's hourly wage up to \$8 per hour (for a total of \$3,200/year per individual intern).

Since 2013, the MassTech Intern Partnership has provided over \$2 million to support nearly 950 summer interns at 370 tech firms across Massachusetts. Based upon survey results of participating companies and students, the program has been extremely successful.

Each year, the Massachusetts Life Sciences Center (MLSC) Internship Challenge creates over 500 new internship opportunities for college students and recent graduates by enabling small companies to hire paid interns. The workforce development program connects employers with prospective interns through an online platform and enables eligible companies to pay their interns for up to twelve weeks by subsidizing intern wages. The MLSC reimburses eligible companies for pay rates of up to \$17 per hour for a total reimbursement of up to \$8,160 per intern.

Since the program's inception in 2009, the MLSC has funded more than 4,700 internships with more than 850 companies for students from 240 different academic institutions. Nearly 40 percent of interns who completed college were offered employment directly following their internship.

- Connect students with entrepreneurial employment opportunities through a marketplace mechanism that makes students aware of innovative entrepreneurs and offers startups and small businesses an opportunity to recruit their future workforce.
- Reach students across the post-secondary continuum (from associate degrees through Post-Docs), with an intentional focus on targeting students presently underserved by Missouri's innovation and entrepreneurship ecosystem, such as women, people of color, and those in rural parts of the state.
- Deliver paid internships to students from a range of academic backgrounds to technology-oriented companies or those looking to solve a technology-oriented challenge.
- Offer matching grants that offset costs of internship/co-ops for each student. The amount of the matching grant would vary depending on the age, size, and financial wherewithal of the company employing the intern.

### **Action 12: Offer entrepreneurial education across Missouri through regional partnerships.**

While younger Missourians represent the future of Missouri, it is also critical to inspire a wider range of older or mid-career individuals to see themselves as part of the state's innovation and entrepreneurial ecosystem. Now more than ever, a growing number of individuals are pursuing entrepreneurship as a career path. However, many of these individuals may not know where or how to get started.

It is recommended that Missouri leverage newly established regional nodes to offer introductory courses where "students" learn, practice, and discuss methods and techniques using the lean startup methodology. Students of all ages and backgrounds can gain exposure to this process through guided courses that help define and refine an idea's core problem and solution, and potential customers and potential market opportunities.

Entrepreneurial education programs offered across Missouri should:

- Deliver nationally recognized approaches to lean startup education, while also tailoring each program to the unique circumstances of each region.
- Provide an entryway into deeper support services offered by regional nodes and their partners.
- Offer courses at flexible times and both in-person and virtually, to accommodate the needs of even more individuals.
- Intentionally target individuals from communities presently underserved by Missouri's innovation and entrepreneurship ecosystem.

### **What Others Do: Launch Minnesota's Entrepreneurial Education Program**

As part of its statewide efforts to encourage innovation and entrepreneurship, the Minnesota Department of Employment and Economic Development's Launch Minnesota program offers lean startup classes across the state. In partnership with a wide range of regional hubs located across Minnesota, participants use lean startup tools and receive feedback from experienced instructors, industry experts, and other mentors, who offer insights, advice, and connections.

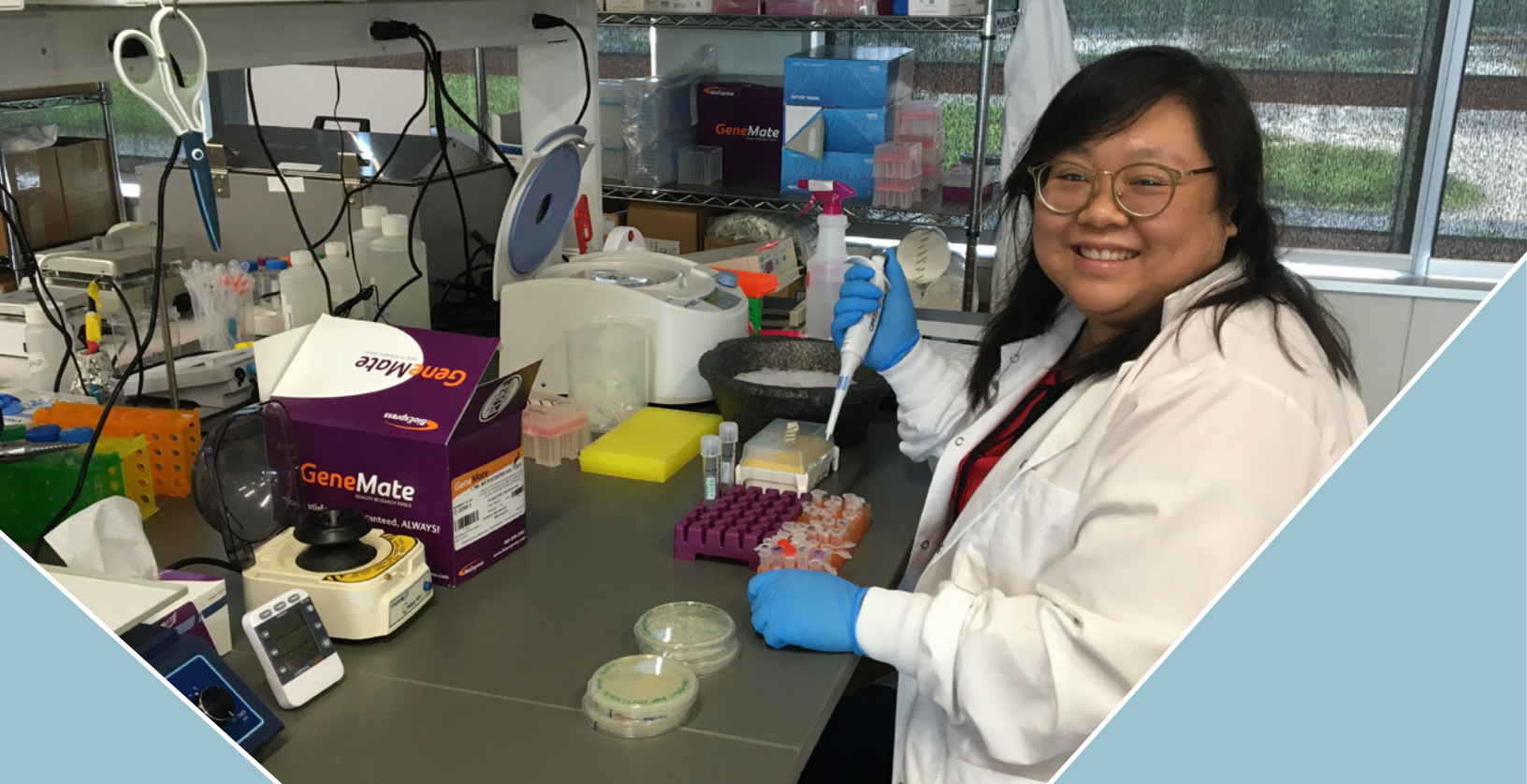
For technology-oriented entrepreneurs, Launch Minnesota works with the University of Minnesota's Holmes Center for Entrepreneurship, which offers hands-on courses to assess and refine business concepts and accelerate progress toward market launch. For other entrepreneurs, the state works with Startup School, a program of Red Wing Ignite and ILT Studios, which focuses on the startup innovation process and finding an idea. Further education is offered through the Minnesota Expert Exchange, a new statewide program initiated by Launch Minnesota in partnership with University of Minnesota to help entrepreneurs find the right support.

In its first year, Launch Minnesota developed lean startup educational opportunities across the state to increase entrepreneurial talent, with over 380 receiving training.

### **Action 13: Enhance Missouri's storytelling capacity to encourage more Missourians to be entrepreneurial.**

Although creating a pipeline of future entrepreneurs and providing value-added education to existing entrepreneurs is critical, what is also needed to inspire more Missourians to be entrepreneurial is the effective communication of innovative startup success stories. For the most part, the citizens of Missouri do not perceive themselves as potential entrepreneurs because the state does not have a well-established entrepreneurial culture. Creating such a culture requires that Missourians understand the opportunities entrepreneurship offers them personally, as well as for growing their community's economy. It will also be important for those that are risk-averse to understand that failure is often the result of such endeavors, but with each failure, knowledge is gained, and future pursuits are enhanced. Finally, the journey of successful entrepreneurs needs to be celebrated within their ecosystem. Through storytelling, these successful entrepreneurs can serve as important role models for would-be entrepreneurs currently sitting on the sidelines unsure how to engage. When more people understand that entrepreneurship is a pathway that is open to them, that they have the ability to recognize a problem and solve it through a business venture, they will be more apt to leave their current careers and take a risk to start their own company.

There is sense that the inability to effectively tell Missouri's entrepreneurial success stories is a missed opportunity. In addition, elevating a diverse set of voices in the innovation ecosystem is critical, and



approaches to amplify a diversity of entrepreneurs in storytelling should be intentionally explored. A storytelling campaign can spotlight success stories that will inspire others—we are more prone to become what we can see.

Missouri needs to implement a storytelling campaign through aggressive marketing, public relations, and signature events. The Governor and other key policymakers will need to be actively engaged in these efforts. The areas that Missouri must address as part of this effort include the following:

- **Leverage the efforts of entities like Startland News and Entrepreneur Quarterly and develop a consistent and active media presence in major Missouri business and innovation publications.** By highlighting company accomplishments and ecosystem efforts, this media helps raise awareness of Missouri’s entrepreneurial activities across the state.
- **Encourage ecosystem partners to highlight success stories as part of their overall marketing efforts.** The success of a shared brand depends on the input going in and the willingness among community partners to “carry the torch” and tell the story.
- **Generate excitement through in-person events that celebrate innovation and entrepreneurship.** In partnership with regional organizations, host in-person events that celebrate entrepreneurship, support networking, and elevate the profile of successful entrepreneurs.



## **STRATEGY FIVE: CONNECT**

Overcome physical and cultural barriers to better connect Missouri's entrepreneurial ecosystems with each other and with the world.

A significant concern often voiced by Missouri entrepreneurs and other stakeholders was the lack of connectivity across the state's innovation and entrepreneurial ecosystem. Stakeholders discussed how regions were not only siloed from one another, but often the competition for scarce resources caused internal silos as well. The lack of connectivity between the two major urban centers of the state, as well as the urban/rural divide, must be overcome if a strong, statewide ecosystem is to thrive.

These challenges are most prevalent in the Kansas City metro region, whose entrepreneurial ecosystem continues to be divided as a result of political boundaries. As previously noted, analysis of the regional ecosystem reveals that Kansas City metro's net employment gains from new firm formation is evenly divided, demonstrating the integrated nature of the economic footprint of the region's ecosystem across state lines. For an entrepreneur in the Kansas City metro region, accessing risk capital, support services, and talent knows no geographic boundary, and a fully functioning innovation and entrepreneurial ecosystem must be treated as a holistic effort not divided by geographic boundaries. Overcoming all these connectivity barriers is essential to achieving "One Missouri" where the sum is greater than its parts.

It is proposed that Missouri pursue three targeted actions to better connect its ecosystem assets to help Missouri startups grow and scale.

### **Actions to Pursue:**

14. Realize One Missouri: Improve connectivity within and between regions.
15. Link Missouri's innovation and entrepreneurial ecosystems to the world through an external marketing campaign.
16. Deploy broadband infrastructure across Missouri.

### **Action 14: Realize One Missouri: Improve connectivity within and between regions.**

One of the characteristics that distinguishes states with high levels of entrepreneurial activity is the networking that occurs among companies and between researchers and the venture community. Networking is an extremely important way that entrepreneurs can learn from others who have encountered similar obstacles. Indeed, research indicates that the extent of social networks is one of the most important factors in encouraging entrepreneurship in any region. For this reason, creating opportunities for value-added networking has become an important component of state and regional efforts to promote entrepreneurship and the growth of entrepreneurial firms.

Networking can occur in a variety of settings, from breakfasts or luncheons where entrepreneurs make presentations or hear from service providers, to recognition events, to the casual interactions that occur among entrepreneurs who share space in an incubator or other physical space.

Mechanisms that facilitate intensive networking within and between ecosystem actors cultivate a proactive environment. The most successful innovative states facilitate extensive and intensive networking

both across the academic/industrial boundary and between companies in allied sectors or in a supply-chain relationship. In a very few leading communities like Silicon Valley, this networking has occurred naturally, with formal organizations like Joint Venture-Silicon Valley coming only later. However, in the vast majority of states attempting to build innovation/entrepreneurial ecosystems, formal networking organizations are built from the ground up; otherwise, the desired degree, scale, and intensity of networking will not occur.

Despite the strong advances of Missouri's entrepreneurial ecosystem, efforts are still siloed. Collaboration among and between various ecosystem stakeholders are limited, and those efforts that do exist have been more singular one-offs in nature rather than systemic. There is not a strong fabric of connectivity.

Mechanisms that facilitate intensive networking within and between ecosystem actors cultivate a proactive environment. The most successful innovative states facilitate extensive and intensive networking. MTC must work to foster connectivity among and between the various ecosystem partners from across the state, including:

- Regional nodes and their partners
- Venture Navigators
- Investment capital community
- Universities/institutions of higher education, and
- Other ecosystem partners/stakeholders.

Connectivity can be fostered in a variety of ways, including:

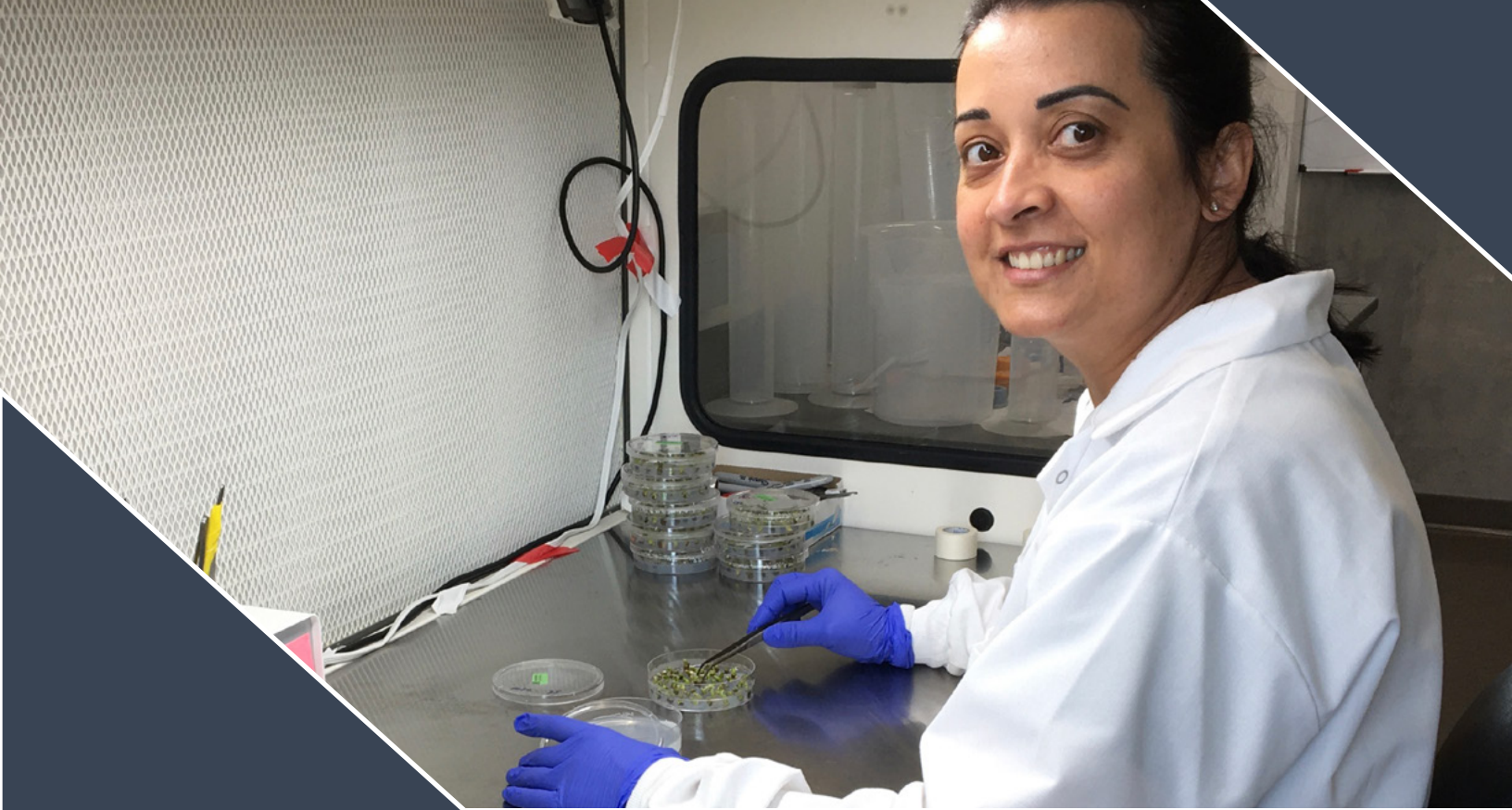
- Conferences
- Technology showcases
- Pitch competitions
- Recognition/celebration events
- Workshops for entrepreneurial-related activities and trainings, and
- Cross-regional mentorship programs.

As with other recommendations, it is strongly recommended that connection points be made across the Kansas City Region's entrepreneurial ecosystem, regardless of where a participant lives or works within the region.

### **Action 15: Link Missouri's innovation and entrepreneurial ecosystem to the world through an external marketing campaign.**

Developing, retaining, and attracting talent, entrepreneurs, capital, and innovation businesses to the state requires that Missouri be perceived as a dynamic entrepreneurial hotbed of activity. To do this, MTC needs to undertake an external marketing campaign that communicates to key audiences, both domestically and internationally, the depth and breadth of Missouri's unique resources and opportunities that the state provides for advancing the innovation economy. This external marketing campaign will serve to enhance Missouri's reputation on a national and global scale.





In establishing an externally focused branding and marketing campaign, a series of coordinated activities must occur:

- Develop a consistent and active media presence in major business and innovation publications involving infomercials, such as special sections and announcements of company accomplishments, to raise the general awareness of Missouri's programmatic efforts to support a vibrant innovation/entrepreneurial ecosystem.
- Undertake an active earned-media campaign directly after release of this strategy. Having articles appear in newspapers and magazines nationwide describing Missouri's plans will play a key role in changing the state's image. However, the placement of such articles will require an active public relations effort to develop news stories and reach key publications.
- Build upon the state's reputation by hosting national and international innovation/entrepreneurship conferences. One way for Missouri to improve its national and international image is to have the state's ecosystem partners join forces to host an annual international conference located in Missouri that would focus on innovation and entrepreneurship topics.

#### **Action 16: Deploy broadband infrastructure across Missouri.**

The proliferation of the internet across every industry and nearly all facets of life has made broadband truly essential infrastructure. While this was becoming increasingly clear through the first two decades of the 21st century, the onset of the COVID-19 pandemic and the expansion of remote work and learning highlights the indispensability of high-speed internet access.

The success of this innovation plan is dependent on pervasive, affordable, and accessible high-quality broadband internet for all households in Missouri. High-speed broadband internet service has transitioned from a luxury good to an increasingly necessary utility. Rural regions are particularly susceptible to poor broadband infrastructure coverage because they pose a costly business case for providers. However, the economic case for rural broadband infrastructure is compelling despite its cost: Broadband access and adoption in rural areas is linked to increased job and population growth, higher rates of new business formation and home values, and lower unemployment rates. Unlike many other types of infrastructure, the long-term benefits of broadband access could grow exponentially, given the potential for innovation and productivity gains it provides.

The success of this strategy is dependent upon the State of Missouri leveraging the federal Transportation Infrastructure Bill and American Rescue Plan Act (ARPA) funds to fund broadband infrastructure in underserved areas of the state. In August 2021, Governor Mike Parson announced plans to deploy more than \$400 million in ARPA funds to increase broadband internet access, adoption, and assistance statewide. The House Interim Committee on Broadband Development issued its report on January 5, 2022, which included recommendations for how the administration should allocate the ARPA funding. Deployment of broadband infrastructure across the State of Missouri will be critical to the success of this strategy.



## A Call to Action

As a result of MTC and other regional investments, Missouri has made positive strides in developing a robust innovation and entrepreneurial ecosystem that can be leveraged. However, to ensure that these investments are positioning the state for robust economic growth, it is critical to successfully implement the recommended strategies and actions as outlined in the previous section. Much of this strategy's success is predicated on building a critical mass of services to significantly increase the level of entrepreneurial deal flow able to grow and scale within the state in order to differentiate Missouri from the ever-increasing number of global competitors for innovation and entrepreneurship. Only through a systemic statewide model that builds critical mass through strong collaborations and partnerships can a robust innovation and entrepreneurial ecosystem be achieved. This will require breaking down the current silos and closed doors that represent the present-day ecosystem.

### Implementation Plan

Based on TEconomy's assessment of the Missouri ecosystem, and its experience implementing innovation and entrepreneurial strategies around the nation, Table 3 identifies for each strategy and subsequent actions:

- The classification of **Priority**: critical for those actions that are essential for the success of the strategy, significant for those actions that can make a major impact in advancing the strategy, and important for those actions that can contribute to the success of the strategy.
- The classification of **Timing** goes from immediate to mid-term. Immediate actions are those that should be undertaken in the first year; short-term actions are those to be undertaken in the one- to three-year period; and mid-term actions are those to be implemented beginning in years three to five. However, a number of actions implemented during the first five years will take a full 10 years or more to begin to see measurable impacts.
- **Implementation lead**, which identifies the organization that is best suited to carry out the action in a collaborative manner with other key stakeholders and partners.

**Table 3: Recommended Implementation Plan**

| Strategy   | Targeted Actions to Pursue  | Priority    | Timing     | Lead Organization/Entity   |
|--|---|-------------|------------|--|
| <b>Strategy 1: Fund</b><br>Deploy greater levels of investment capital to help meet the demands of the growing entrepreneurial base.                                 | Action 1. Catalyze additional investment capital funds across the capital stack.  | Critical    | Immediate  | MTC matched by other sources of funding throughout the state.  |
|  | Action 2. Incentivize angel investments.  | Significant | Short-term | MTC to manage angel investment tax credit in partnership with Missouri Department of Economic Development.   |
|  | Action 3. Evaluate the creation of Missouri Rural Vitality Funds to provide collateral for entrepreneurial loans.   | Significant | Mid-term   | MTC, in partnership with the Missouri Department of Economic Development, to undertake a feasibility study to better assess the opportunity.       |
| <b>Strategy 2: Grow and Scale</b><br>Increase access to quality entrepreneurial support services throughout Missouri to ensure companies are able to grow and scale. | Action 4. Develop a statewide Entrepreneurial Pathways Program.   | Significant | Short-term | MTC  |
|  | Action 5. Foster regional efforts to provide quality entrepreneurial support services to high-potential, high-growth traded sector startups.  | Critical    | Immediate  | MTC in partnership with regional ecosystem partners (including regional service organizations, the philanthropic community, and private industry). |
|  | Action 6. Connect Missouri’s corporate partners and anchor institutions with startups, thereby creating a “stickiness” to Missouri for the entrepreneurial endeavor’s ultimate success. | Significant | Short-term | MTC in partnership with regional ecosystem partners (including regional nodes and other regional service organizations).                           |
| <b>Strategy 3: Launch and Cultivate</b><br>Take advantage of Missouri’s research strengths by converting the intellectual assets into market opportunities.          | Action 7. Reenergize the RAM as a mechanism for bringing together the major research institutions of the state to solve common innovation continuum challenges.                         | Critical    | Immediate  | MTC in partnership with Missouri’s research institutions   |
|  | Action 8. Leverage the federal I-Corps program and provide startup services statewide to encourage commercialization activity.  | Significant | Short-term | MTC in partnership with RAM  |

| Strategy  | Targeted Actions to Pursue   | Priority    | Timing     | Lead Organization/Entity  |
|---|--|-------------|------------|---|
|   | Action 9. Provide comprehensive assistance for SBIR/STTR awards to further drive commercialization across the state, especially at Missouri's research institutions. | Important   | Short-term | MTC in partnership with RAM   |
|   | Action 10. Improve access to entrepreneurial programming for students in middle/high school and at community colleges and universities.                              | Important   | Mid-term   | Regional ecosystem partners (including regional nodes and other regional service organizations) in partnership with regional education providers. |
| <b>Strategy 4: Inspire</b><br>Encourage more Missourians to participate in innovation and entrepreneurship.   | Action 11. Fund an internship program that connects startups with talent.  | Significant | Short-term | MTC in partnership with the private sector and regional ecosystem partners that have developed internship programs.                               |
|   | Action 12: Offer entrepreneurial education across Missouri through regional partnerships.  | Important   | Short-term | MTC in partnership with regional ecosystem partners (including regional nodes and other regional service organizations).                          |
|   | Action 13. Enhance Missouri's storytelling capacity to encourage more Missourians to be entrepreneurial.   | Critical    | Immediate  | MTC through an engagement with an external PR firm in partnership with regional ecosystem partners.   |
| <b>Strategy 5: Connect</b><br>Overcome physical and cultural barriers to better connect Missouri's entrepreneurial ecosystems with each other and with the world. | Action 14: Realize One Missouri: Improve connectivity within and between regions.  | Critical    | Immediate  | MTC in partnership with regional ecosystem partners.  |
|   | Action 15: Link Missouri's innovation and entrepreneurial ecosystem to the world through an external marketing campaign.   | Significant | Short-term | MTC through an engagement with an external PR firm.   |
|   | Action 16: Deploy broadband infrastructure across Missouri.  | Critical    | TBD        | As identified by House Interim Committee on Broadband Development report.   |

## Estimated Resources Required

The resources required to undertake this holistic effort will be significant. However, there is an opportunity to leverage state support to attract federal, private, and philanthropic funding. For each strategic area, a minimum investment level has been recommended. The level indicated is the “floor” (i.e., the minimal level of investment recommended in order to begin to develop a critical mass of activity. The “ceiling,” in which all needs are met, is much higher). Furthermore, as the entrepreneurial ecosystem grows and flourishes in the state, additional resources will be needed to support increasing levels of activity. It is estimated that at a minimum the following level of resources will be required over a 10-year time period to support the implementation of this strategic effort:

- **Fund:** while there is no ceiling on the amount of risk capital that Missouri entrepreneurs may demand over the next decade, it is reasonable to assume that there is a floor which, if unmet, means that companies will be “stranded on the runway” and unable to “take off,” (i.e., grow and scale in Missouri). Therefore, it is recommended that at a minimum:
  - \$100 million be invested in angel, pre-seed, and seed funds over the course of the decade, which if matched 3:1 will generate an additional \$400 million in early-stage risk capital investments in the State of Missouri over the next decade (not including follow-on investment amounts). Currently, approximately 90 percent of Missouri’s total risk capital investment is made at the seed or earlier stage investment rounds, or just over \$40 million a year. This infusion of early-stage investment capital will double the amount of early-stage financing available over the course of the decade. This will allow a significantly larger number of innovative companies to enter the pipeline, thereby significantly increasing the amount of deal flow being generated in the state.
  - \$25 million should be allocated over the next decade to nondilutive risk capital programs (SBIR support, grants, etc.) This allocation will also fund the SBIR/STTR effort targeting university personnel as outlined in Strategy 3, Action 9.
  - \$25 million should be allocated over the next decade to pilot innovation financing options that fill gaps within the state's ecosystem, such as revenue-based financing for business models that do not traditionally attract risk capital dollars, and direct investments for founders from underserved populations (demographic or geographic).
  - Total funding required: \$150 million over the next decade is the recommended minimum investment.
  - In addition, it is recommended that the Angel Investment Tax credit be created to allow for a total of \$100 million in tax credits over the decade, not to exceed more than \$10 million in any given year.
- **Grow and Scale:** To provide the quality entrepreneurial support services needed to scale Missouri’s high-potential, high-growth companies, Missouri will need to invest in entrepreneurial pathways, regional nodes, and other identified entrepreneurial service needs. While funding will vary for each regional node, depending upon existing resources and size of deal flow as an indicator of demand for services, it is anticipated that as Missouri’s entrepreneurial ecosystem further develops across the state, demand for funding will increase. It is estimated that on average:

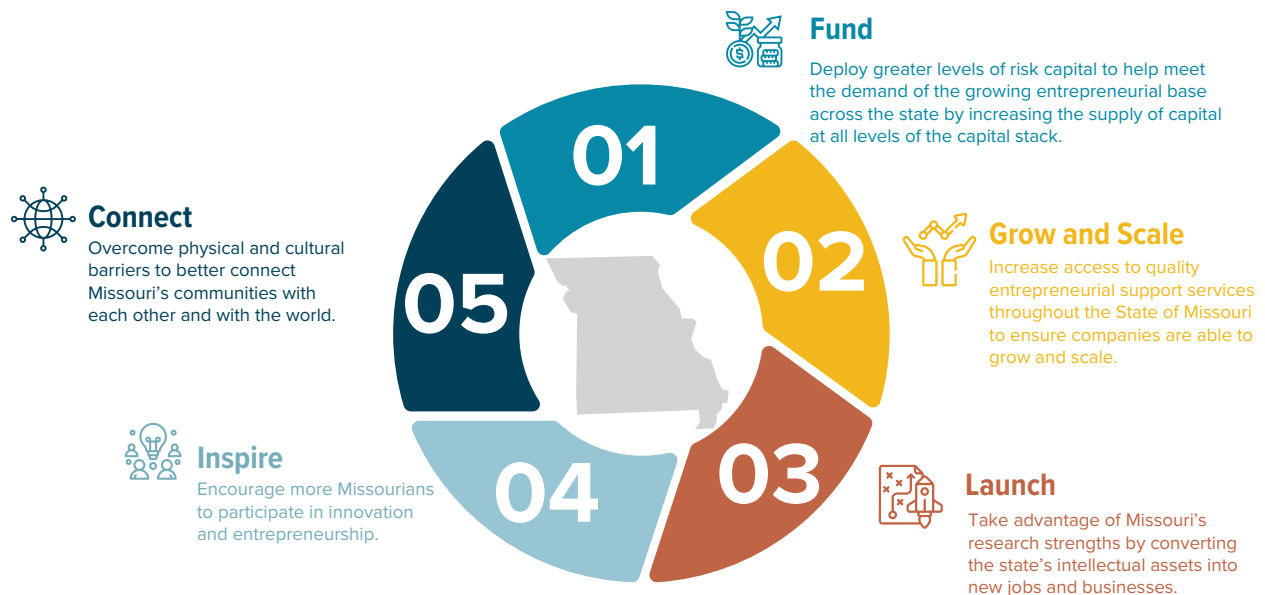
- \$3 million per year in total state funding (both regional node funding and/or flexible support funding) (matched 1:1 by regional/private/philanthropic sources) will be required to sustain operations (including mentorship networks, EIRs, physical hubs, and corporate partnership programs) at a level of critical mass within more densely populated areas (St. Louis, Kansas City).
  - \$1.5 million per year in total state funding (match 1:1 by regional/private/philanthropic sources) will be required for mid-size markets (Springfield, Columbia).
  - \$750,000 per year in total state funding (match 1:1 by regional/private/philanthropic sources) for less-densely-populated areas.
  - The number of regions ultimately funded will depend on their ability to coalesce around a regional plan; however, it is anticipated that up to 12 nodes could be designated over time.
- **Launch and Cultivate:** While both the I-Corps effort and SBIR matching grant program leverage significant federal funding, in order to capitalize upon these funds it will be critical to support:
    - RAM with staffing, estimated to cost \$2.5 million over the course of the decade.
    - A statewide I-Corps effort to be supported with additional state funding of \$5 million over the course of the decade focused on supporting nondilutive grants to successful startup teams.
    - A targeted SBIR/STTR matching program of \$25 million over the decade to support commercialization efforts stemming from Missouri’s research institutions (this is in addition to the Strategy 1 funding).
- **Inspire:** Although many of the proposed educational initiatives are envisioned as part of the entrepreneurial capacity-building grants provided under Strategy 2, it is recommended that:
    - \$30 million over the next decade be dedicated to the internship/co-op program.
    - \$5 million is recommended to support telling Missouri’s entrepreneurial stories over the next decade.
- **Connect:** While much of this work will occur as the regional ecosystems coalesce, it remains important to support networking and connectivity efforts, as well as to market Missouri to the rest of the world. Total funding required to connect Missouri’s ecosystem assets is \$5 million over the next decade (not including the cost of broadband infrastructure).

## Conclusion

This strategic action plan for the State of Missouri charts a course for the state to encourage innovation and entrepreneurship over the next decade. For Missouri to see widespread economic growth across all its communities, there is a need to develop a robust innovation and entrepreneurial ecosystem that can foster the formation of novel businesses, help scale their operations, and sustain their growth as they generate new, high-paying jobs. Developing a robust ecosystem to support innovation and entrepreneurship is an essential part of encouraging economic development in Missouri.

Generating these outcomes does not happen on its own, but rather through a series of intentional, strategic, and proactive decisions. This innovation and entrepreneurial strategy is driven by public-private-philanthropic partnerships that capitalize on Missouri's strengths while ensuring that future innovation and entrepreneurial investments are focused on building the ecosystem that will help ensure the state's economic vitality for years to come (Figure 19).

**Figure 19: Five Strategies to Support Innovation and Entrepreneurship in Missouri**



**Source:** TEconomy Partners, LLC.

By focusing on these five thematic areas, Missouri will help ensure the entire state's future economic vitality for all Missourians. Anticipated economic and societal impacts that will be realized through the successful implementation of this innovation and entrepreneurial strategy include better paying jobs with higher growth potential, the ability to weather future economic challenges, and inspired future generations that reach their full potential.





## Appendix A: MTC’s Economic Impacts

### Study Methodology

Estimating the economic impacts of the Missouri Technology Corporation (MTC) makes use of an input-output model to represent the interrelationships among economic sectors. Input-output (I-O) multipliers are based on the flow of commodities between industries, consumers, and institutions in a regional economy. The premise behind this analysis is that every dollar spent in the economy (the direct impact) is re-spent on the purchase of additional goods or services generating further economic activity and impact (the multiplier—indirect and induced effect).

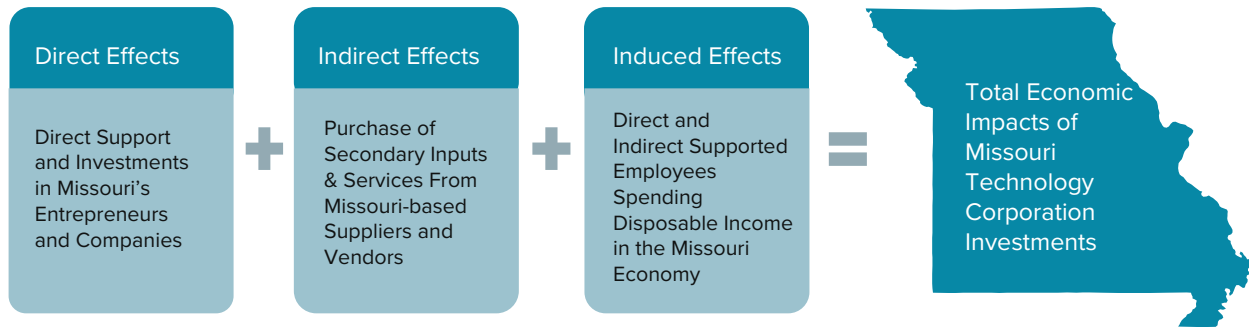
This analysis was performed using a State of Missouri-specific input-output model from IMPLAN. The IMPLAN model is the most widely used economic impact model in the nation and is based on the U.S. Bureau of Economic Analysis national accounts data, supplemented with state-level employment data from the U.S. Bureau of Labor Statistics (BLS) and other economic data from U.S. Bureau of the Census. Sectors within IMPLAN reflect primarily six-digit North American Industry Classification System (NAICS) codes for most manufacturing and technical service industries.

Multi-sectoral aggregations were developed to model the organizations and client portfolios for the MO-BEC Grants and the Innovation Centers. IDEA Fund awardees were mapped to specific IMPLAN sectors.

The trade flows built into the IMPLAN input-output model permit estimating the impacts of one sector on other sectors in Missouri’s economy. These impacts consist of three types (Figure A-1):

- **Direct Effects**—the specific impact of the sector(s) in question
- **Indirect Effects**—the impact on suppliers to the focus industry
- **Induced Effects**—the additional economic impact of the spending of employees in the overall economy
- **Total Impacts**—the aggregated direct, indirect, and induced impacts

**Figure A-1: Measuring the Economic Impacts of MTC**



Source: TEconomy Partners, LLC

In other words, the I-O analysis models the ripple effect that originates from the expenditures made by each company and organization in the MTC portfolio, flows through their suppliers and vendors as additional inputs are purchased, and then through the employees and related supplier workers who spend their wages and compensation in the Missouri economy. The IMPLAN model was used to estimate and capture five types of economic impact:

- **Output**, also known as production, sales, or business volume, is the total value of goods and services produced in the economy; *for public/nonprofit entities, expenditures are often the truest measure of economic activity.*
- **Employment** is the total number of jobs created; it includes the direct jobs paid for through wages, salary, and benefit expenditures and indirect/induced (supported) jobs generated through purchase expenditures.
- **Labor Income** is the total amount of income, including salaries, wages, and benefits, received by employees and other workers in the economy.
- **Value Added** is the difference between an industry's total output and the cost of its intermediate inputs; sometimes referred to as the industry's contribution to GDP.
- **Federal and State/Local Government Tax Revenues** is the estimated revenues to federal and state/local governments from all sources as a result of the impacts estimated. Tax revenues are adjusted for nonprofit and public sector (tax-exempt) direct effects (e.g., nonprofit service provider organizations, university expenditures).

## Economic Impact of MTC’s Investment Portfolio FY 2014-FY 2021

A hallmark of successful innovation and entrepreneurial programs is their ongoing evaluation by the program leadership to ensure that funding is going to high economic impact areas. Each of MTC’s three programs and their economic impact on the State of Missouri from FY 2014 through FY 2021 are presented below.

### IDEA Fund Co-Investment Program

MTC makes investments in early-stage technology companies. Each investment requires a minimum dollar-for-dollar co-investment by the private sector. The goal of this investment is to help portfolio companies achieve critical technical and business milestones. Achieving these milestones can help secure follow-on rounds from private investors, which is termed the leveraged investment. The companies use these investment dollars to hire and procure other services and inputs as they strive to bring their product to market and increase sales. For the IDEA Fund Co-Investment Program (IDEA Fund), TEconomy used the total investment in MTC’s portfolio companies, reported employment, and any reported sales to drive the economic impact model.

Between FY 2014 and FY 2021, MTC’s IDEA Fund allocated a total of \$34.6 million across 167 investments in 139 companies. Of this total investment amount, \$22.5 million was provided by the State of Missouri whose investment was further leveraged by an additional \$12.1 million in federal dollars. The impact of these investments is illustrated in Figure A-2.<sup>41</sup>

**Figure A-2: MTC’s IDEA Fund Cumulative Economic Impacts, FY2014-FY2021**



Source: Missouri Technology Corporation program data and TEconomy Partners, LLC calculations.

<sup>41</sup> These impact analyses capture a cumulative eight years of impacts; hence employment is provided as job years (e.g., one job that was active for all eight years of the analysis would be represented as 8 job years).

As further detailed in Table A-1, MTC’s IDEA Fund investments generated and supported:

- Nearly 13,000 job years with wages and benefits totaling \$743 million
- Almost \$2.5 billion of economic output, and
- \$65.4 million of state and local tax revenue for the State of Missouri.

**Table A-1: Detailed Economic Impacts from IDEA Fund Investments, FY2014-FY2021 (\$M)**

| Impact Type          | Employment (Job Years) | Labor Income (\$M) | Value Added (\$M) | Output (\$M)     | State & Local Tax Revenues (\$M) | Federal Tax Revenues (\$M) |
|----------------------|------------------------|--------------------|-------------------|------------------|----------------------------------|----------------------------|
| Direct Effect        | 6,177.0                | \$376.9            | \$664.2           | \$1,357.3        | \$23.5                           | \$77.8                     |
| Indirect Effect      | 3,254.0                | \$200.2            | \$303.4           | \$581.4          | \$15.8                           | \$38.7                     |
| Induced Effect       | 3,501.8                | \$165.9            | \$294.2           | \$522.8          | \$26.1                           | \$35.0                     |
| <b>Total Impacts</b> | <b>12,932.8</b>        | <b>\$743.0</b>     | <b>\$1,261.8</b>  | <b>\$2,461.5</b> | <b>\$65.4</b>                    | <b>\$151.5</b>             |
| Multiplier           | 2.09                   | 1.97               | 1.90              | 1.81             |                                  |                            |

Source: TEconomy longitudinal analysis of data provided by MTC using IMPLAN I-O model for State of Missouri. Note: column totals based on non-rounded data.

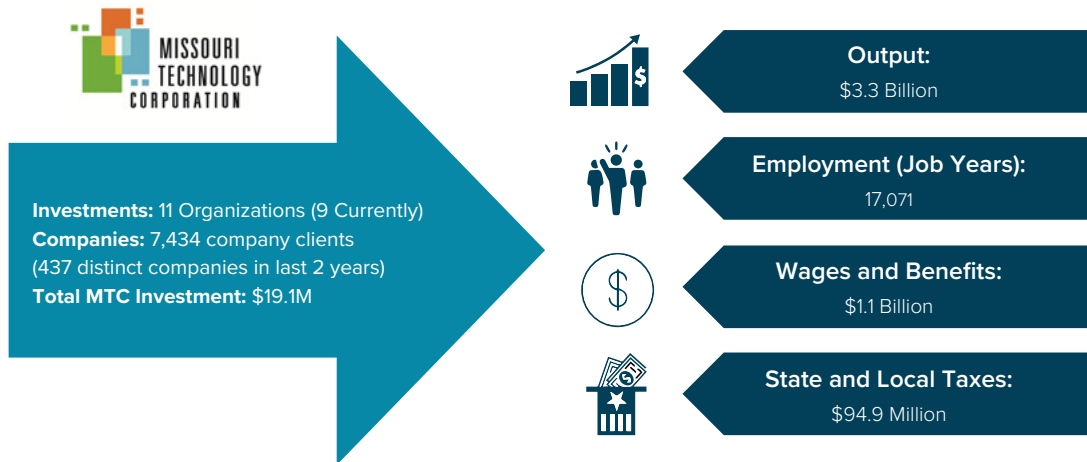
## Innovation Centers

MTC’s Innovation Center program is a major statewide resource to assist Missouri entrepreneurs in creating and growing new high-tech, high-growth businesses. Currently located in nine regions across the state—Cape Girardeau, Columbia, Joplin, Kansas City, Kirksville, Rolla, Springfield, St. Joseph, and St. Louis—the centers work closely with associated universities. The Innovation Centers provide specialized business counseling, hands-on business development, and finance assistance, all resources that are necessary to convert technologies into new businesses that create high-paying jobs. Many of the MTC Innovation Centers also operate physical incubators that provide laboratories and office space at affordable rates.

TEconomy modeled both the total investment in MTC’s Innovation Centers, relationships with company clients, reported employment, and any reported sales. MTC invested \$19.1 million across 11 organizations (nine are still currently active) from FY 2014 to FY 2021. These Innovation Centers worked with 7,434 company clients during this timeline, including 437 distinct companies in the last two years, generating a wide range of economic impacts (Figure A-3).<sup>42</sup>

42 These impact analyses capture a cumulative eight years of impacts; hence employment is provided as job years (e.g., one job that was active for all eight years of the analysis would be represented as 8 job years).

**Figure A-3: MTC's Innovation Centers Cumulative Economic Impacts, FY2014-FY2021**



*Source: Missouri Technology Corporation program data and TEconomy Partners, LLC calculations.*

As further detailed in Table A-2, MTC’s Innovation Centers worked with companies that generated and supported:

- More than 17,000 job years with wages and benefits totaling \$1.08 billion
- Almost \$3.3 billion of economic output, and
- Nearly \$95 million in state and local tax revenue for the State of Missouri.

**Table A-2: Detailed Economic Impacts from Innovation Center Company Clients, FY2014-FY2021 (\$M)**

| Impact Type          | Employment (Job Years) | Labor Income (\$M) | Value Added (\$M) | Output (\$M)     | State & Local Tax Revenues (\$M) | Federal Tax Revenues (\$M) |
|----------------------|------------------------|--------------------|-------------------|------------------|----------------------------------|----------------------------|
| Direct Effect        | 7,581.0                | \$594.1            | \$791.2           | \$1,766.0        | \$35.7                           | \$111.6                    |
| Indirect Effect      | 4,299.3                | \$241.0            | \$372.6           | \$741.8          | \$21.6                           | \$47.3                     |
| Induced Effect       | 5,190.3                | \$243.3            | \$427.0           | \$756.4          | \$37.6                           | \$51.3                     |
| <b>Total Impacts</b> | <b>17,070.7</b>        | <b>\$1,078.4</b>   | <b>\$1,590.7</b>  | <b>\$3,264.2</b> | <b>\$94.9</b>                    | <b>\$210.2</b>             |
| Multiplier           | 2.25                   | 1.82               | 2.01              | 1.85             |                                  |                            |

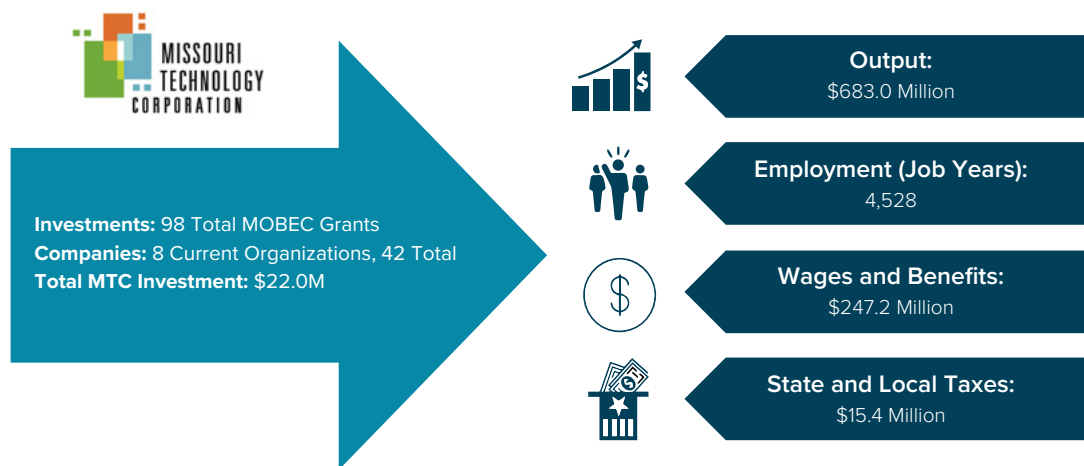
*Source: TEconomy longitudinal analysis of data provided by MTC using IMPLAN I-O model for State of Missouri. Note: column totals based on non-rounded data.*

## Missouri Building Entrepreneurial Capacity (MOBEC) Grants<sup>43</sup>

Through the MOBEC grant program, MTC makes investments to expand Missouri's support system around innovation and entrepreneurship. To help create sustainable, high-paying, private-sector jobs, MOBEC awards are intended to enhance the capacity of nonprofit organizations that support entrepreneurs who are commercializing new technologies around which high-growth companies can be created. Additionally, MOBEC awards help improve the capacity of Missouri research institutions to attract competitive federal and private research funding and centers. The MOBEC awards also seek to strengthen Missouri's targeted high-tech industry clusters of animal health, plant science, biomedical science, applied engineering, and defense and homeland security. Eight organizations received MOBEC Grants in FY 2021: Arch Grants, BioSTL, Joplin Area Chamber of Commerce Foundation, LaunchCode, LeanLab Education, Missouri State University/Springfield Innovation, and WEPOWER.

MTC invested \$22.0 million across 98 grants from FY 2014 to FY 2021, reaching 42 organizations. In addition to laying the groundwork for Missouri's entrepreneurial ecosystem, these investments generate a series of economic impacts for the state (Figure A-4).<sup>44</sup>

**Figure A-4: MTC's MOBEC Grant Organizations Cumulative Economic Impacts, FY2014-FY2021**



**Source:** Missouri Technology Corporation program data and TEconomy Partners, LLC calculations.

As further detailed in Table A-3, organizations receiving MOBEC Grants and other MTC sponsored grants during this timeframe generated and supported:

- More than 4,500 job years with wages and benefits totaling \$247.2 million
- \$683 million of economic output, and
- More than \$15.4 million in state and local tax revenue for the State of Missouri.

<sup>43</sup> Analysis includes all MTC sponsored grants awarded within in the time frame and is not limited to just MOBEC Program Grants.

<sup>44</sup> These impact analyses capture a cumulative eight years of impacts; hence employment is provided as job years (e.g., one job that was active for all eight years of the analysis would be represented as 8 job years).

**Table A-3: Detailed Economic Impacts from MOBEC Grants— Organizations, FY2014-FY2021 (\$M)**

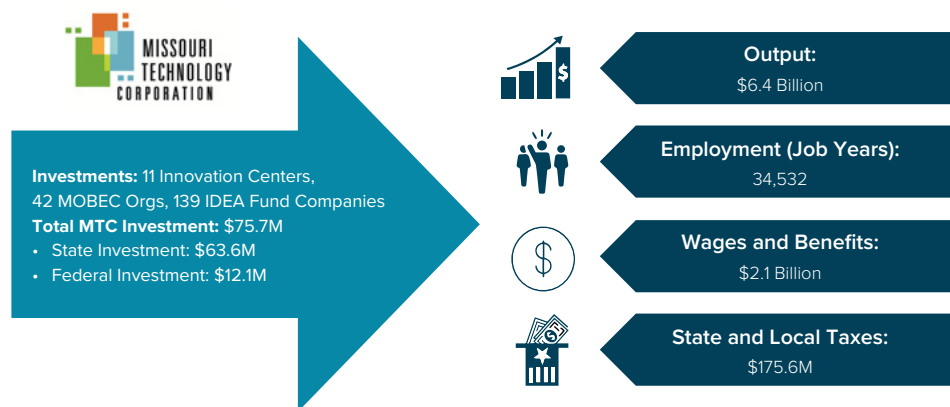
| Impact Type          | Employment (Job Years) | Labor Income (\$M) | Value Added (\$M) | Output (\$M)   | State & Local Tax Revenues (\$M) | Federal Tax Revenues (\$M) |
|----------------------|------------------------|--------------------|-------------------|----------------|----------------------------------|----------------------------|
| Direct Effect        | 2,347.5                | \$133.0            | \$157.9           | \$345.6        | \$3.3                            | \$24.1                     |
| Indirect Effect      | 1006.2                 | \$58.7             | \$85.3            | \$163.3        | \$3.4                            | \$11.1                     |
| Induced Effect       | 1174.7                 | \$55.5             | \$98.1            | \$174.0        | \$8.7                            | \$11.7                     |
| <b>Total Impacts</b> | <b>4,528.3</b>         | <b>\$247.2</b>     | <b>\$341.2</b>    | <b>\$683.0</b> | <b>\$15.4</b>                    | <b>\$46.9</b>              |
| Multiplier           | 1.93                   | 1.86               | 2.16              | 1.98           |                                  |                            |

**Source:** TEconomy longitudinal analysis of data provided by MTC using IMPLAN I-O model for State of Missouri. Note: column totals based on non-rounded data.

### Economic Impact of MTC’s Total Portfolio

From FY2014 to FY2021, the investments of Missouri Technology Corporation have made an important impact on the state. Capacity for innovation and entrepreneurship have been enhanced by the state’s 11 Innovation Centers (nine are still currently active) and 42 organizations receiving MOBEC awards and other sponsored grants. MTC’s direct investments in 139 companies have also made an important impact. The \$63.6 million in state funds for MTC programs have leveraged an additional \$12.1 million in federal funds, for a total investment in innovation and entrepreneurial programs of \$75.7 million. Overall, MTC’s portfolio of programs clearly provides strong benefits and positive economic impacts, as illustrated in Figure A-5.

**Figure A-5: MTC’s Cumulative Economic Impacts, FY2014-FY2021**



**Source:** Missouri Technology Corporation program data and TEconomy Partners, LLC calculations.

As further detailed in Table A-4, the total cumulative economic impacts of MTC’s programs and investments during this timeframe generated and supported:

- More than 34,500 job years with wages and benefits totaling more than \$2 billion
- More than \$6.4 billion of economic output, and
- More than \$175 million in state and local tax revenue for the State of Missouri.

**Table A-4: Detailed Cumulative Economic Impacts of MTC’s Programs and Investments, FY2014-FY2021 (\$M)**

| Impact Type     | Employment (Job Years) | Labor Income (\$M) | Value Added (\$M) | Output (\$M) | State & Local Tax Revenues (\$M) | Federal Tax Revenues (\$M) |
|-----------------|------------------------|--------------------|-------------------|--------------|----------------------------------|----------------------------|
| Direct Effect   | 16,105.5               | \$1,104.0          | \$1,613.2         | \$3,468.8    | \$62.5                           | \$213.6                    |
| Indirect Effect | 8,559.5                | \$499.9            | \$761.2           | \$1,486.6    | \$40.8                           | \$97.0                     |
| Induced Effect  | 9,866.8                | \$464.7            | \$819.3           | \$1,453.3    | \$72.4                           | \$98.0                     |
| Total Impacts   | 34,531.8               | \$2,068.6          | \$3,193.7         | \$6,408.7    | \$175.6                          | \$408.7                    |
| Multiplier      | 2.14                   | 1.87               | 1.98              | 1.85         |                                  |                            |

*Source: TEconomy longitudinal analysis of data provided by MTC using IMPLAN I-O model for State of Missouri. Note: column totals based on non-rounded data.*

### Return on Investment of MTC’s Investment Portfolio FY 2014-FY 2021

A key objective of innovation programs is to stimulate broader regional economic activity, including higher levels of economic output through the growth of new enterprises. The actual economic ROI will vary with program objective, the type of investment mechanism, and the stage of development and sector a company is in. For example, the potential ROI for a program that supports technology commercialization at universities through grants would not be expected to have as high a return as a seed-stage investment in a company that goes on to secure follow-on private sector investment. The investment that is closer to the market is more likely to have the higher economic return.

To calculate the economic ROI, TEconomy used MTC’s program data to estimate the total amount of state taxpayer money used to support each of the programs (see Table A-5). From FY2014-FY2021, a total of \$75.7 million went toward MTC programs, including \$63.6 million in state funding and \$12.1 million in federal dollars. TEconomy calculated economic activity and tax revenue ROI based on funding from the State of Missouri.



**Table A-5: Total Investment in MTC’s Programs: FY2014-FY2021 (\$M)**

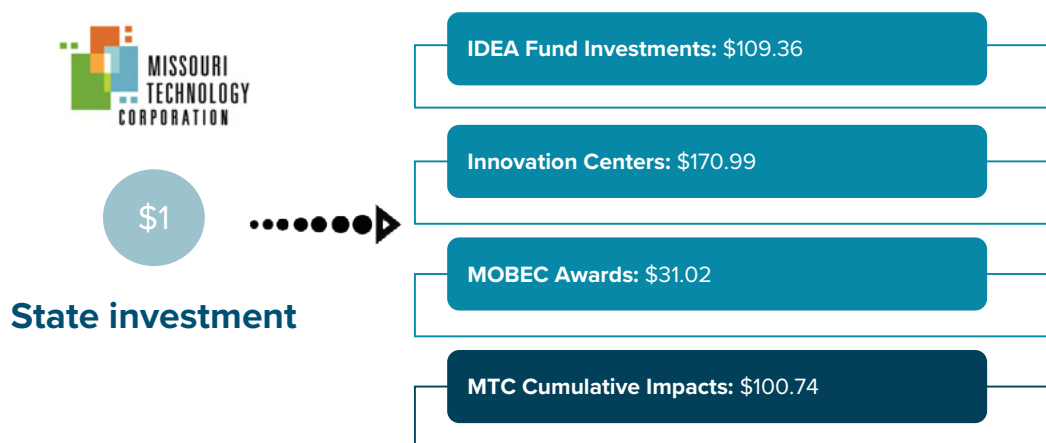
| Program Type and Funding Source         | Investment     |
|---|----------------|
| <b>State Funding</b>                    |                |
| IDEA Fund Co-Investment Program         | \$22.5M        |
| Innovation Centers                      | \$19.1M        |
| MOBEC Awards                            | \$22.0M        |
| <i>Total State Funding</i>              | <b>\$63.6M</b> |
| <b>Federal Funding</b>                  |                |
| IDEA Fund Co-Investment Program (SSBCI) | \$12.1M        |
| Total Federal Funding                   | \$12.1M        |
| <b>Total Investment in MTC Programs</b> | <b>\$75.7M</b> |

Source: MTC’s program data and TEconomy Partners, LLC calculations.

### MTC’s Economic Activity (Output) Return on Investment

TEconomy’s analysis finds that MTC’s programs have had a positive and significant economic activity return on investment. As Figure A-6 illustrates, every Missouri state taxpayer dollar that MTC invests in early-stage Missouri technology companies through the IDEA Fund generates \$109.36 in total statewide economic activity through the direct spending of early-stage companies. State investments in Innovation Centers foster \$170.99 of state economic activity. State investments in the MOBEC Awards Program, which supports tech transfer and innovation ecosystem capacity building, generate \$31.02 of economic activity. Through these programs, MTC is investing across the innovation ecosystem with the goal of increasing the startup and scale-up of Missouri technology companies, strengthening connections among different actors, increasing access to risk capital, and better leveraging the state’s research base.

**Figure A-6: Missouri Technology Corporation’s Economic Activity ROI: FY 2014-2021**



Source: Missouri Technology Corporation program data and TEconomy Partners, LLC calculations.

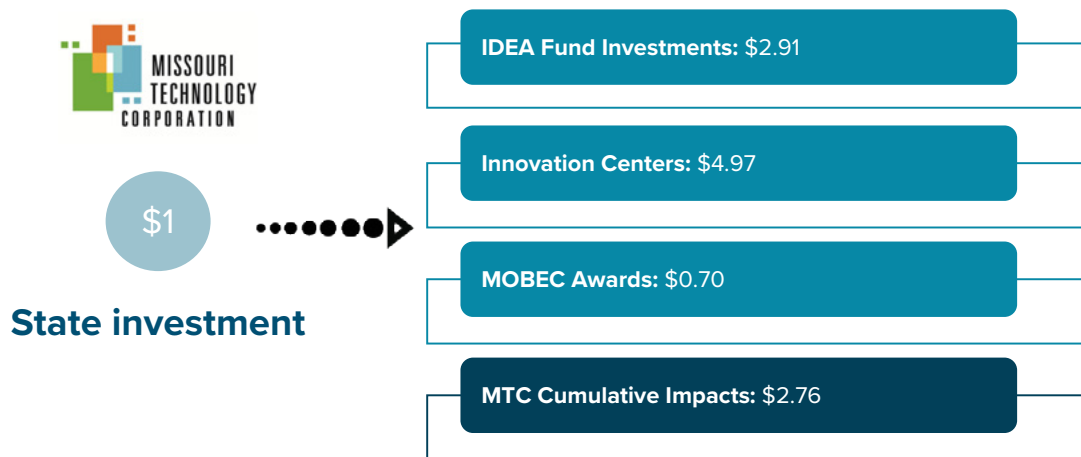
When aggregated, MTC’s total program portfolio generated an economic activity return of **\$100.74** within the State of Missouri for every **\$1** invested by the state—a strong return to the state regardless of the programmatic benefits afforded by the investment.

### MTC’s State Tax Revenue Return on Investment

Tax revenue-basis return on investment analysis for publicly funded, innovation investment programs is a complex undertaking. By its nature, innovation, and the development of companies to push forward this innovation, is a difficult and challenging process. Under the best of circumstances, investments of this nature from both the public and private sector are likely to see both successes and failures. The analysis is further hindered as the early stage of these companies often limit their ability to generate corporate revenue and the corresponding tax revenue, limiting the near-term “payback” on these investments. It is important to remember that the goal of publicly funded innovation investment programs is to assist in the development of new ventures in hopes of sustained economic impacts in future years.

With these caveats, it is still important to assess whether MTC’s programs are generating tax returns to the State of Missouri above and beyond the state investment into MTC’s portfolio. As Figure A-7 illustrates, for every dollar of Missouri taxpayer investment, MTC’s IDEA Fund investments (net of investment proceeds) returns \$2.91 to state and local governments in the form of corporate and personal income tax, sales tax, property tax, and other state and local taxes. MTC’s Innovation Centers return \$4.97 for every dollar of taxpayer investment, and MOBEC Award recipients return \$0.70 for every taxpayer dollar invested.

**Figure A-7: Missouri Technology Corporation’s State & Local Tax Revenue ROI: FY 2014-2021**



Source: Missouri Technology Corporation program data and TEconomy Partners, LLC calculations.

From a state and local tax revenue basis, MTC’s total program portfolio returned **\$2.76** to the State of Missouri for every state **\$1** invested. This return indicates that on a direct outlay basis, these MTC programs have generated a positive return over the last eight years.



## Appendix B: List of Participating Organizations

Chairman Carter and the members of the steering committee (listed on page 9) thank all of the stakeholders from across the State of Missouri who informed this effort to drive innovation and entrepreneurship over the next decade. The broad base of support ensures that no list will be absolutely complete, but many of the contributors of time, talent, and perspectives are listed below. In addition, a host of serial and retired entrepreneurs provided their expertise to this initiative without connection to an organization or company listed below. The steering committee recognizes this work and offers deep gratitude for the investment.

- Abada Health
- Accuronix Therapeutics
- AdSwapper
- Advanced Technology & Consulting
- Advocado
- Aerial Spreader Drone Services
- AgButler
- Agrela Ecosystems
- Apt Crowd
- Arch Grants
- Arch Oncology Inc.
- ATR Thrive
- Babyation, Inc.
- Backstitch, Inc.
- Balto Software
- Benson Hill Biosystems, Inc.
- Better Weekdays, Inc.
- BioGenerator
- BioSTL
- Black & Veatch
- Brewer Science
- Brush Creek Partners
- Bryght Labs, Inc
- Calendar.com
- Callaway Bank
- Canopy Biosciences
- CED Solutions
- Centennial Angels
- Circle Fiber
- City of Grandview
- City of Kansas City
- City of Richmond
- Clara Biotech
- CloudPano
- Codefi
- Community Foundation of the Ozarks
- Compatio
- Confluence Life Sciences
- Core10
- Cortex Innovation Community
- CoverCress Inc.
- CoxHealth
- Crowder College
- CryoCrate

- Cultivation Capital
- Daupler
- DEMIblue
- Donald Danforth Plant Science Center
- Drew Lewis Foundation
- Dynamhex Technologies
- Economic Development Corporation of Kansas City
- Edison Agrosociences, Inc.
- Eemerg Roadside Assistance
- efactory
- Elemental Enzymes
- EmpowerMe Wellness
- EquipmentShare
- Erkios Systems
- Euclises Pharmaceuticals, Inc.
- Feconde LLC
- Finotta
- FlyOver Capital
- Food Haven
- Geneoscopy Inc.
- GeoFutures
- Grant Co
- Greater St. Louis, Inc.
- Greensfelder Law Firm
- Healthy Hip Hop
- Hearo
- Holton Capital
- Immunophotonics
- Innovation Economy Partners
- Innovation Stockyard
- Intergrated Roadways
- Interplay
- Invent Yourself, LLC
- iShare Medical
- ITEN
- Jefferson City Regional Economic Partnership
- Joplin Chamber of Commerce
- Joseph Newman Innovation Center
- Jordan Valley Innovation Center
- Katalyst
- Kauffman Foundation
- KCSOURCELINK
- KCRise Fund
- Kiosite, LLC
- Kirksville Regional Economic Development Inc.
- KNIMO
- Küat Racks
- LabelInsight
- LaunchCode
- LaunchKC
- LEANLAB Education
- LeanLabKC
- Lewis & Clark Ventures
- Lewis & Associates
- MatchRite Care
- MathBRIX, LLC
- McCrate Consulting
- MedZero
- Mercy Health
- Mid America Angels
- Missouri Department of Economic Development
- Missouri Enterprise
- Missouri House of Representatives
- Missouri Quilt Co.
- Missouri Rural Enterprise and Innovation Center (MREIC)
- Missouri Small Business Development Center
- Missouri Sourcelink
- Missouri State University
- Missouri University of Science and Technology
- Missouri Western State University
- Mostly Serious
- Habitat Communication & Culture
- Mycroft AI
- NORDEF
- North Central Missouri Development Alliance
- Northeast Missouri Economic Development Council
- Northeast Missouri Electric Power Cooperative
- Orange EV
- PANDA Technology
- Patients Voices

- Paylt
- Pipeline Entrepreneurs
- Plastomics
- Readout Health/Biosense
- Regional Economic Development Inc. (REDI)
- Relay Trade Solutions
- Rezilient Health
- Right to Start
- RiverVest Ventures
- Rolla Regional Economic Commission
- Ronawk
- Royal Street VC
- Saint Louis University
- Sixty-West
- Small Business Empowerment Center
- Southeast Missouri State University
- SpenDebt
- Splitsy
- St. Louis Arch Angels
- Healium
- Swipesum
- TAVR Solutions
- Technology Partners
- Techstars
- TechSTL
- The BALSAs Foundation
- The Porter House KC
- The Teledentists
- ThermAvant
- Tiger Hawk Technologies
- T-Mobile
- TopOPPS
- Traxsson, LLC
- TreviPay
- Truman State University
- TS Conard
- University of Missouri-Columbia
- University of Missouri-Kansas City
- University of Missouri-Kansas City Innovation Center
- University of Missouri-St. Louis
- Veeper
- VenBOo
- Venku
- Veterans United
- Vision Group Development Co.
- Washington University in St. Louis
- WATT
- Well Principled
- WEPower
- World Wide Technology, Inc.
- Yield Lab
- zPods

## Photo Images

In addition, Chairman Carter and the members of the steering committee thank all the organizations who submitted photos to make sure this report reflects the diversity of innovation ecosystems found across Missouri. The images used in this report are attributed to the following entities:

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**Page vi:** BioSTL

**Page ix:** Codefi

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**Page 17:** Orange EV

**Page 21:** efactory

**Page 29:** efactory

**Page 31:** BioSTL

**Page 32:** Benson Hill Biosystems, Inc.

**Page 41:** University of Missouri –  
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**Page 71:** Kirksville Regional  
Economic Development Inc.

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