



## **BROWN AND THE INNOVATION ECONOMY**

Strategic Plan

June 2018

### **Introduction**

In June 2017, Provost Richard Locke launched an initiative to explore how Brown can best contribute to innovation, entrepreneurship, and good job growth in Rhode Island. During the past twelve months, the *Brown and the Innovation Economy* project has engaged in more than 70 interviews, meetings, and events with business, university, nonprofit and government leaders in Rhode Island to identify the challenges facing our region, and the actions the University can take to address them. We have also consulted experts from outside Rhode Island who have played leading roles in economic development in their regions.

Based on this research and the University's 10-year plan, *Building on Distinction*, we have developed a strategy for Brown to increase its contributions to the local economy. In this plan, we introduce five initiatives that align with Brown's mission as a research university and respond to the economic challenges facing Rhode Island. We are committing to undertake these actions in partnership with government, industry, and other universities in Rhode Island and beyond.

### **The Role for Brown**

*Brown and the Innovation Economy* is only the latest in a series of local efforts focused on innovation and economic development in Rhode Island. Our initiative builds on the ideas and momentum of the many initiatives of our state and city government, such as the Brookings Institution's *Rhode Island Innovates* report, and programs like Make It Happen RI and the Knowledge Economy benchmarking project. Our efforts in the life sciences complement the ongoing work of MedMates and the BioHub working group.

In addition, in 2017, Mayor Jorge Elorza formed the Anchor Institution Working Group (AIWG), convening the presidents and CEOs of the city's universities and hospital systems to identify opportunities to work together and with the City more effectively to build and promote an innovation-based economy. Co-chaired by Brown University President Christina Paxson and Rhode Island College President Frank Sanchez, the AIWG has been meeting regularly to review the Mayor's Urban Innovation District Strategy and reach consensus around initiatives to support. The City has retained Venture Cafe to develop multiple concepts into plans with sufficient detail to determine the investment needed to make them succeed, along with a fundraising plan and options for governance.

In our research, we explored with local leaders where the Rhode Island economy is making progress; the obstacles that the state continues to face; and ideas to overcome persistent local challenges. Through this project, the University will focus on five economic challenges where Brown is in a position to make an impact.

**1. Talent development and retention:** One of the best predictors of a region's economic vitality is its human capital. Cities with higher concentrations of college graduates in the workforce typically have higher wages.<sup>1</sup> Growing companies are constantly looking to locate near hubs of talented workers. Talented *individuals* can make a difference. Research has suggested that “star scientists” with many inventions in their field can have a positive impact on nearby startup activity.<sup>2</sup> A skilled workforce fuels a virtuous cycle: highly trained workers attract innovative companies, which recruit still more skilled workers. The challenge is that skilled workers are pooling in some places and not in others.<sup>3</sup>

Interviews with government and community leaders in Rhode Island underscored fears of a “brain drain” from the state. Although the state's colleges and universities attract and train talented students, many leave after graduation. There have been many initiatives to address this, including AICU's bRidge jobs program and the state government's Wavemaker Fellowship, a program to forgive the debt of college graduates who stay in Rhode Island after finishing college. There are opportunities for Brown to build on the these efforts by improving the environment for recent graduates to start business ventures and find fulfilling careers in Rhode Island.

**2. Industry engagement:** Broad partnerships between universities and local industry are rare. However, where they have developed, these partnerships have contributed to extraordinary regional transformations. In what became the Research Triangle of North Carolina, three local universities helped recruit high-technology firms to what had been an agricultural region, leading to meteoric growth in wages and employment as well as clusters of pharmaceutical and electronics firms. In Pittsburgh, Carnegie Mellon University (CMU) has for decades been a leader in software and robotics research, engaging with industry partners across the country. In recent years, CMU's industry partnerships have led to a number of prominent technology giants -- Google, Apple, Amazon, Uber -- establishing Pittsburgh offices to collaborate with and recruit from the university. The development of industry-university partnerships in Pittsburgh has helped speed the city's transition from heavy industry to the knowledge economy.

In Rhode Island, universities and industry have often pursued separate goals without sufficient coordination. In interviews, community and business leaders expressed confusion about how they could partner with Brown. Some said that they would not know how to engage with the University if they did not have a specific contact. One community leader said that while Brown has resources that might be useful to the

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<sup>1</sup> Glaeser, Edward L., and Albert Saiz. 2003. “The Rise of the Skilled City.” National Bureau of Economic Research. <http://www.nber.org/papers/w10191>. Glaeser, Edward L., and Matthew G. Resseger. 2010. “The Complementarity between Cities and Skills.” *Journal of Regional Science* 50 (1):221–244.

<sup>2</sup> Zucker, Lynne G., and Michael R. Darby. 2007. “Star Scientists, Innovation and Regional and National Immigration.” Working Paper 13547. National Bureau of Economic Research. <http://www.nber.org/papers/w13547.pdf>.

<sup>3</sup> Simon, Curtis J., and Clark Nardinelli. 2002. “Human Capital and the Rise of American Cities, 1900–1990.” *Regional Science and Urban Economics* 32 (1): 59–96.

business community, it is unclear how to access them and identify what the University can offer.

Recognizing that the potential gains from university-industry cooperation have not been realized, leaders at Brown and in the Rhode Island business community have begun to explore ways to engage more effectively. The Partnership for Rhode Island is an opportunity for the state's largest businesses to connect with universities in tandem. Brown's Data Science Initiative has participated in recruiting businesses to the state, as well as exploring opportunities to work with businesses already here. And in 2017, Brown established the new Office of Industry Engagement and Commercial Venturing (OIECV) with a focus on unleashing the impact of Brown's research through productive partnerships with industry in Rhode Island and across the country.

**3. Building the capacity for innovation:** A region's ability to generate, share, and absorb new knowledge is central to its ability to support growing companies and create good jobs. Regions with thriving innovation ecosystems such as Silicon Valley, Boston and Seattle have become magnets for growing industries and high-wage jobs. Research has identified an important role for universities in advancing regional innovation. Universities can contribute to innovation directly by developing new technologies in the lab and spinning them out to the market. Investments in university research have also been linked to higher levels of patenting and R&D spending by local companies.<sup>4</sup> The idea is that knowledge can "spill over" from university labs to firms that drive local economic growth.

There are plenty of innovative companies in Rhode Island, but overall levels of patenting and knowledge sharing in the region have been low compared to the rest of New England.<sup>5</sup> Research at Brown has the potential to add to the state's innovation output, but it is rarely commercialized. While there are scholars interested in exploring the commercial potential of their work, they often lack the professional incentives and the business training to pursue commercial opportunities. Faculty at Brown have said that promotion criteria -- particularly for junior scholars -- do not support commercializing their research. And if a scholar decides that they want to try to commercialize their research, some say they would not know where to start. Others in Rhode Island have lamented the lack of management expertise at universities who can help translate research into growing ventures.

Brown has begun to address some of these challenges through its efforts to support "translational development," which takes research discoveries from the lab to market. The goal is to reduce the risk of investing in an idea and identify concrete product opportunities that are attractive to potential industry partners or startup creators.

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<sup>4</sup> Jaffe, Adam B. 1989. "Real Effects of Academic Research." *The American Economic Review*, 957-970.

<sup>5</sup> In 2015, for example, Rhode Island's patents per capita were the lowest in New England except for Maine. Vermont and New Hampshire each had more than double the patents per capita of Rhode Island. Massachusetts had more than triple.

**4. Supporting an environment for entrepreneurship:** Startup firms are important contributors to the regional economy. Young firms are the principal creators of net new job growth in the U.S.<sup>6</sup> Successful entrepreneurial ventures can also attract firms in related industries to locate nearby, contributing to the formation of industry clusters.<sup>7</sup> The economic benefits of successful startups are high, but providing the resources to keep startups local and help them grow is challenging.

Innovative startups tend to locate near clusters of firms in similar industries.<sup>8</sup> The pull of entrepreneurial hubs is a challenge for places like Rhode Island. Promising businesses have launched in the state, then leave as they scale. In our research, we interviewed Brown alumni entrepreneurs who started out in Rhode Island, but moved their companies to regions with more welcoming and inclusive networks for young founders. A major factor cited is that Rhode Island has good individual mentors but lacks a robust community for young entrepreneurs.

The Nelson Center for Entrepreneurship at Brown is working to assemble the resources and develop the environment for entrepreneurs to thrive on campus and in the state. The Center's goals are to teach entrepreneurship as a method of problem-solving, inspire students and others to pursue a solution to problems that they care about, and provide resources that enable aspiring entrepreneurs to act on their solutions.

**5. Regional networks:** Rhode Island's proximity to Boston, New Haven, and New York is an opportunity for the local innovation economy. Regional economics research shows that new innovative activity is likely to cluster where there is a legacy of related firms or research investment.<sup>9</sup> There are spillover benefits for workers and firms that locate near concentrations of innovative companies, research universities, and talented individuals.<sup>10</sup> The concentrations of talent and entrepreneurship in Boston and New York -- and the concentration of research in New Haven -- have the potential to benefit Rhode Island. However, positive regional spillovers are not guaranteed.

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<sup>6</sup> Haltiwanger, John, Ron S. Jarmin, and Javier Miranda. 2013. "Who Creates Jobs? Small versus Large versus Young." *Review of Economics and Statistics* 95 (2):347–361.

<sup>7</sup> Bresnahan, Timothy, Alfonso Gambardella, and Annalee Saxenian. 2001. "'Old Economy' Inputs for 'New Economy' Outcomes: Cluster Formation in the New Silicon Valleys." *Industrial and Corporate Change* 10 (4):835–60.

<sup>8</sup> Delgado, Mercedes, Michael E. Porter, and Scott Stern. 2010. "Clusters and Entrepreneurship." *Journal of Economic Geography* 10 (4):495–518.

<sup>9</sup> Jaffe, Adam, Manuel Trajtenberg, and Rebecca Henderson. 1993. "Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations." *The Quarterly Journal of Economics*: 577–598; David B. Audretsch and Maryann P. Feldman. 1996. "R&D Spillovers and the Geography of Innovation and Production." *The American Economic Review*. Vol 86, No. 3: 630–640.

<sup>10</sup> Greenstone, Michael, Richard Hornbeck, and Enrico Moretti. *Identifying Agglomeration Spillovers: Evidence from Million Dollar Plants* (National Bureau of Economic Research, 2008) <<http://www.nber.org/papers/w13833>>; Moretti, Enrico. *The New Geography of Jobs*. New York: Houghton Mifflin Harcourt, 2012; Moretti, Enrico and Per Thulin. 2013. "Local Multipliers and Human Capital in the United States and Sweden." *Industrial and Corporate Change*. Vol. 22, No. 1: 339-362.

Regional networks among firms, universities and other local institutions are necessary to facilitate knowledge spillovers and support local innovation. Research on Silicon Valley has generated the model of a successful regional network where the boundaries between large firms, startups, and universities are often “porous.” Partnerships between firms and other local institutions succeed with support from “informal communication and collaborative practices.” By contrast, regions with more hierarchical relationships within the firm, more emphasis on secrecy, and sharper distinction between local institutions are less likely to thrive.<sup>11</sup>

Our research suggests the need to strengthen the regional network between universities and firms in Rhode Island, Boston, New Haven, and New York. Although local investors often source deals in neighboring cities and large companies have multiple offices throughout the region, there is room to build deeper ties between researchers, executives, and government leaders throughout the region.

Brown is in a position to convene regional networks through its alumni community throughout the northeast, as well as its research partners at regional universities. Brown researchers and administrators are in a position to engage regional firms as a potential partner -- not a competitor -- and introduce them to the resources available in Rhode Island.

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Addressing these challenges aligns with Brown’s mission: *to serve the community, the nation, and the world by discovering, communicating, and preserving knowledge and understanding in a spirit of free inquiry, and by educating and preparing students to discharge the offices of life with usefulness and reputation.*

This is also consistent with the primary goal of the University’s strategic plan, which is to enhance academic excellence and contribute in meaningful ways to address some of society’s most pressing challenges.

A thriving Rhode Island economy is also good for Brown. Concentrations of talent, innovation and entrepreneurship -- matched with strong industrial partnerships -- will ensure that Brown continues to generate high-impact research and provide a stellar education. It will enable Brown to continue to recruit top students and faculty in a highly competitive environment which is essential for excellence.

We recognize that these steps alone will not be enough to stimulate innovation and good job growth in Rhode Island. In all the action that Brown takes, it will rely on partnerships with local institutions that have complementary strengths. Building entrepreneurial capacity, for example, will require more than research, educational resources, and convening events. It will also require entrepreneurs to start innovative companies and venture capitalists to support them. The University’s advantage is not in managing high-

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<sup>11</sup> Saxenian, AnnaLee. 1996. “Inside-Out: Regional Networks and Industrial Adaptation in Silicon Valley and Route 128.” *Cityscape: A Journal of Policy Development and Research*. Vol. 2, No. 2.



growth businesses or investing in them. Its goal instead is to contribute to the local economy with the resources and skills that it has available.

### **Action Plan**

We plan to take five actions in partnership with other local institutions to address the economic challenges we identified in our research. Each of these programs will establish clear ways to measure their success.

#### **1. *Brown Biomedical Innovations, Inc. (BBII)***

Objective: Translate life sciences research into industry assets.

Brown leadership:

Dr. Jack Elias, Dean of Medicine

Daniel Behr, Executive Director, OIECV

Managing Director, BBII (TBD)

Description: BBII is designed to help biomedical research discoveries bridge the “valley of death.” The valley of death is the gap between when the NIH stops funding a research program and when investors, such as pharmaceutical companies or private investors, are willing to invest in the program. The goal is for BBII to become a regional hub for “translational development,” building a pipeline of commercially-relevant assets from university research discoveries. Some of these assets will be the basis for RI-based biomedical startups, and a robust pipeline of assets and startups can in turn be a magnet for large companies in the field.

First Year implementation roadmap:

**Winter 2018:** BBII’s launch was supported by gifts exceeding \$8 Million.

**Summer 2018:** BBII hires a Managing Director.

**Fall 2018:** BBII begins operations

**Spring 2019:** BBII begins grant-making and incubation for translational research projects.

#### **2. *Brown Venture Founders***

Objective: Encouraging and enabling Brown’s most talented entrepreneurs to base and build their ventures in Rhode Island.

Brown Leadership:

Danny Warshay, Executive Director, Nelson Center for Entrepreneurship

Partners:

Slater Technology Fund

Description:



Brown Venture Founders will receive one-year grants of up to \$50,000 to support their venture's growth in Rhode Island. Founders will also receive office space, mentorship, and ID-based access to Brown University resources.

The Brown Venture Founders program builds upon existing venture support resources of the Nelson Center for Entrepreneurship and the local Rhode Island startup ecosystem. The Brown Venture Prize competition and the Nelson Center's B-Lab accelerator, along with other entrepreneurial activities on campus, are excellent pipelines of potential founders and ventures.

During the first two pilot years (2018-2020), Brown will commit \$25,000 in grant funding -- as well as office space and mentorship resources -- to support Venture Founders each year. Rhode Island's Slater Technology Fund will provide matching grants of \$25,000 for each of the first two years.

Pilot Timeline:

**Summer 2018:** Grant funding and office space awarded to first (2018-2019) Brown Venture Founder: Michelle Peterson, CEO of TextUP (winner of the 2018 RI Business Plan Competition and one of the winners in Brown's 2018 Venture Prize competition).

**Fall 2018:** Select graduating entrepreneurs (e.g. from among B-Lab alumni and previous Brown Venture Prize applicants) as 2019-2020 Venture Founders

**Spring 2019:** Select additional entrepreneurs (e.g. from among B-Lab alumni and previous Brown Venture Prize applicants) as 2019-2020 Venture Founders

### 3. *Industry Engagement*

Objective: Convening University and Industry to deepen networks and identify partnership opportunities.

Brown leadership:

Daniel Behr, Executive Director, OIECV

Tracey Dodenhoff, Business Development, OIECV

Description: Brown is in the process of launching multiple programs to bring university and industry officials together to share knowledge and pursue joint projects. The first is a series of convening events called impact convergence (iCon) programs (workshops, conferences, and showcases) that focus on topics of mutual interest for university researchers and firms. Showcase events will be an opportunity to demystify the work that Brown is doing and for Brown to become more familiar with the interesting work and challenges of regional or global businesses. The events are designed to introduce industry partners to engagement opportunities with Brown: sponsored research, student interaction, executive education programs, and relationships with Brown startups.

Brown will also build a network of industry experts who can help develop the University's research commercialization efforts. The network will include Brown alumni and others with relevant industry leadership experience. The experts will serve as



mentors to individual projects, as well as host office hours where they can interact informally with Brown students and research teams. There are three goals for this initiative: 1) for industry to learn more about the relevant research and ventures coming out of Brown; 2) for Brown students and faculty to seek industry advice and mentorship on their projects; and 3) for industry to explore recruitment / research partnership opportunities with Brown affiliates.

First year implementation roadmap:

**Summer 2018:** Planning underway for first iCon events.

**Fall 2018:** Industry office hours launch with local and regional business leaders.

#### 4. *Rhode Island Innovation Hub*

Objective: Deeper engagement with industry in pursuit of research, recruitment, and mentorship partners.

Brown Leadership:

Daniel Behr, Executive Director, OIECV

Partners:

University of Rhode Island

MassChallenge

IBM AlphaZone

Description: Brown has proposed to partner with IBM, MassChallenge, and the University of Rhode Island to develop an innovation hub and accelerator focused on fostering partnerships between industry and university research teams. The proposed hub is the subject of Brown's Innovation Campus proposal, which also includes First Data, FM Global, Visible Systems, and Ben-Gurion University as collaborators. The 5,000 square-foot center, located in the Jewelry District, would incubate local companies and university-industry collaborations based on the models of the MassChallenge and IBM AlphaZone accelerators.

First year implementation roadmap:

**Spring/Summer 2018:** State of RI announces innovation campus winners

#### 5. *Commercialization-friendly Policies and Trainings*

Objective: Realize the commercial and social impact of Brown research discoveries.

Brown leadership:

Jill Pipher, VP of Research

Daniel Behr, Executive Director, OIECV

Description: To address concerns that the incentives for Brown researchers discourage entrepreneurship and commercialization, the University is revising its policies and





practices in support of partnership and licensing agreements. The goal is for Brown to become a more user-friendly partner to industry, moving away from the transactional approaches that prevail in many university technology transfer offices. OIECV serves as the "business partner" to Brown researchers, helping them validate the commercial relevance and technical feasibility of their discoveries and finding the best path for transitioning their innovations from lab to market - all the while strengthening the researchers' entrepreneurial acumen. There are existing trainings for young faculty and graduate students applying for grants; a similar training for commercial and philanthropic applications of academic research could promote more engaged and interdisciplinary research consistent with Brown's strategic plan.

First year implementation roadmap:

**Spring 2018:** Review of Brown IP policies begins

**Fall 2018:** New Brown IP and Commercialization policies released

**Winter 2018:** Commercialization trainings for Brown faculty begin

### **Looking Forward**

We are enthusiastic about engaging with additional partners throughout the region to ensure the success of these initiatives. If you have suggestions for other ideas, for groups that we should work with, or existing initiatives that are doing complementary work, please share your feedback with Brown University Research Fellow Ben Armstrong at [ben\\_armstrong@brown.edu](mailto:ben_armstrong@brown.edu).