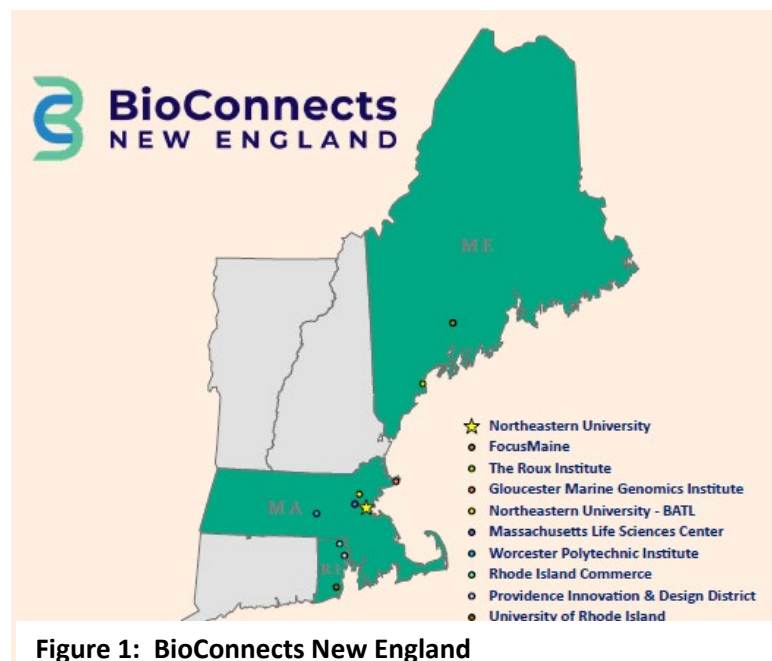


## 1. Overall Narrative

### 1.A. Synopsis

**Regional Impact.** BioConnects New England (BCNE) is a regional growth cluster that will accelerate the economic development of the biopharma industry across economically distressed areas in Maine, Massachusetts, and Rhode Island (**Appendix A**). BCNE’s *vision* is to create high-paying jobs in biomanufacturing that are accessible to communities and individuals previously excluded from one of the fastest-growing industries in New England with national strategic importance. To achieve this vision, we propose the following projects: (1) BCNE governance, (2) build a diverse workforce, (3) scale-up and prototyping capability, (4) entrepreneurship programs, (5) equity support, and dedicated shared lab space in (6) Massachusetts and (7) Rhode Island. Maintaining the United States’ global leadership in the life sciences depends on building the infrastructure to support innovation, entrepreneurship, and manufacturing in the biotechnology sector. The purpose of our coalition is to connect hubs throughout New England to support existing and establish new biomanufacturing infrastructure along with a career pathway (**Appendix C**) to the good jobs of tomorrow for underserved regions, which span short-term, targeted apprenticeships and retraining programs at community colleges through advanced STEM degrees. By aligning biomanufacturing infrastructure with workforce development efforts, our sector-based approach will provide multiple on-ramps into the biotechnology sector for individuals without a four-year college degree to secure a stable, high-quality biomanufacturing job with a starting salary, according to Glassdoor, of \$40k-\$80K (average \$52K). The coalition will also continue to support the learning continuum if they wish to pursue a bachelor’s or advanced degree.



The New England region has experienced greater GDP and employment losses than many parts of the nation during the COVID-19 pandemic due to higher initial caseloads that caused widespread economic disruption. In particular, low- and moderate-income (LMI) communities in Gateway Cities (MA), Opportunity Zones (RI), and rural areas (ME) suffered disproportionate impacts with persistently high unemployment rates (**Appendix B**). BCNE will build back better by making stable, high-paying jobs in biomanufacturing accessible to affected communities.

BioConnects New England also addresses the middle ground between research and development and a successful commercial product. Through small scale process prototyping, BCNE will minimize products lost in the “Valley of Death” between R&D and clinical biomanufacturing. This will allow for a larger

number of drug products to get to the commercial stage more quickly, positively impacting patient outcomes. The recent example of Moderna initially producing its COVID-19 vaccine in Norwood, MA (~24 miles southwest of Cambridge, MA) to ensure its success, highlights the feasibility and importance of locating prototyping and manufacturing activities near research and development (R&D). With Cambridge, MA as one of the largest hubs for biotechnology research and discovery, co-locating biomanufacturing in adjacent areas throughout New England will accelerate innovation and support economic growth in the region.

Finally, by focusing on smaller scale, process development type manufacturing, BCNE can support a distributed manufacturing model for drugs, which is necessary to promote future innovations in the pharmaceutical space. New drugs being developed using cell and gene therapy are either manufactured on a small scale and/or for an individual patient (personalized medicine). This requires tighter supply chains and closer collaboration between R&D and manufacturing personnel than traditional pharmaceuticals where manufacturing can easily be outsourced or offshored. The proposed scale up/prototyping facilities will help accelerate the development of these technologies by allowing manufacturing to take place either adjacent to or even in the hospital. Our cluster-based approach will support the development of this new model for distributed manufacturing that will position the U.S. as a continued world leader in the biopharma industry.

**Regional Assets and Investment.** Northeastern University will lead a multi-state coalition that includes the Biopharmaceutical Analysis and Training Laboratory at Northeastern University (BATL, Burlington, MA), The Roux Institute at Northeastern University (Portland, ME), FocusMaine (Augusta, ME), Massachusetts Life Sciences Center (MLSC), Gloucester Marine Genomics Institute (GMGI, Gloucester, MA), Worcester Polytechnic Institute (WPI, Worcester, MA), Rhode Island Commerce, the I-195 Design & Innovation District in Providence, RI and the University of Rhode Island (URI) (**Figure 1**). These entities bring together years of expertise in workforce development (BATL, Roux, MLSC, GMGI, WPI, URI), entrepreneurship (BATL, Roux, WPI, URI), and prototyping (BATL, WPI, URI) to a diverse set of learners and partners (BATL, Roux, MLSC, GMGI, WPI, URI). Our coalition members are joined by partners such as MassBioEd, BIOME, RIBIO and others as part of a career pathways model (**Appendix C**) with Letters of Support and on our webpage.

**Component Projects.** Because of the complexity and large number of partners in the coalition, to achieve the BCNE vision we developed a separate project focused on ***BCNE Governance (referred to as BCNE Governance throughout component projects)***. This project will address how the entities and partners in the coalition will work together across the three states with regards to decision-making processes, including how to address disagreements that affect budgeting, implementation, and evaluation to promote the success of the overall economic development strategy. ***Workforce Training and Education Pipelines for Demand-driven Industry Needs (referred to as Workforce)*** will address the critical need for training workers from LMI communities to fill high-paying laboratory and manufacturing jobs in the biopharma industry. A continuum of opportunities across the career pathway—from micro-credentials, certificates, apprenticeships and associate degree programs to bachelor’s and other advanced degrees—will be offered using a shared curriculum that we will develop to fill the current gap in developing a trained biomanufacturing workforce. ***Scale-up and Prototyping for Advanced Biopharmaceutical Manufacturing (referred to as Prototyping)*** will serve as a critical enabler for biomanufacturing

of emerging technologies to address an existing shortage in scaling capabilities and to allow companies to prototype prior to full-scale production. ***Biomanufacturing Entrepreneurship Ecosystem (referred to as Entrepreneurship)*** will address the professional service needs of early-stage companies to help facilitate growth by providing mentorship and business services, such as how to develop a business plan. ***Building for Equity (referred to as Building Equity)*** will support the development and training of a diverse workforce for entry-level biomanufacturing jobs as well as identify and develop minority and woman entrepreneurs of early-stage companies. This will include the development of wrap-around services such as financial aid, career coaching, workplace English for Speakers of Other Language (ESOL), transportation, childcare, and food and housing insecurity that are provided across all component projects. ***Construction at Biopharmaceutical Analysis and Training Laboratory (referred to as BATL construction)*** will supplement the biomanufacturing capabilities at the Biopharmaceutical Analysis and Training Laboratory (BATL) to provide additional resources for workforce training and prototyping. Lastly, ***Rhode Island Wet Lab Incubator Operation (referred to as RI lab operation)*** will support the operation of wet lab space for early-stage companies, prototyping and workforce development in the Innovation and Design District in Providence, RI

**CEDS Alignment.** The New England bioeconomy is emerging from the pandemic as an area of economic strength for the region, with 40,000 new jobs projected by 2024 in Massachusetts alone, yet the inability to find skilled workers presents a serious challenge for the industry. By increasing training opportunities and access to stable high-paying jobs in the biopharma industry for workers without a four-year college degree and locating new job opportunities closer to LMI communities, BCNE is well-aligned with the goals and objectives of all three regions. In Massachusetts, both the Metropolitan Area Planning Council (Middlesex County) and the Southern Worcester County CEDS seek to make their regions more equitable, more resilient, and more interconnected with jobs located closer to residents. In Maine the Greater Portland Council of Governments (GPCOG), identifies educational and workforce outcomes and a commitment to reduce poverty and increase equity as a cornerstone of their economic development plan. In Rhode Island, the 2020 Comprehensive Economic Development Strategy (CEDS) has a focus on equity and recognizes the need to provide education and training opportunities that support the skills needed for a 21st-century workforce to access high-paying jobs in sectors targeted for growth and investment including biomedical innovation. BCNE alignment with the regional CEDS will lead to a **sustainable** program through building collaborative partnerships with EDDs in each area.

**Additional, complementary initiatives planned by the coalition.** BCNE will serve as the convener across industry, academia, government, and LMI communities to support efforts across state lines that support the biomanufacturing industry and provide regional economic development in New England. For example, our coalition and extended partners will allow BCNE to support other community lab initiatives throughout New England such as The Beat in Dorchester, MA, Nubian Ascends, in Roxbury, MA—located in two low-income minority neighborhoods in Boston. In addition, we hope to partner with organizations such as the Museum of Science Boston to support their outreach efforts to engage minority high school students in STEM.

**Timelines:** All component projects will begin on the first day of funding and will be complete by the end of year three, Oct. 2025 except for the RI Wet Lab Operation project, which may be complete by the end of year four, Oct. 2026. Governance will begin upon award, and we anticipate

hiring to be complete by Q3 2023. Workforce development, prototyping, entrepreneurship, and equity will begin in year 1 and scale up over the three years of award. The planning phase of the Burlington, MA construction will be complete by Jan. 1, 2023, with construction complete by Nov. 1, 2024, and operation commencing by Jan. 1, 2021. The RI Lab Operation process will be complete and operational by Oct. 2026.

**Metrics of Success.** The primary metric of success will be the creation of new high-quality biotech/biomanufacturing jobs throughout the region that fill employment gaps in economically distressed communities in metro-West Massachusetts, Rhode Island, and Maine (**Appendix D**). We will measure job quality in terms of wages, skill development, and the potential for career laddering and advancement. Progress on creating a career pathway will be assessed by based on the number and geographical dispersion of education and training programs as well as outcomes for participants. Our commitment to equity will be evaluated on the representation of racial minorities and women among students and entrepreneurs during the performance period with the goal of closing the gap in unemployment rates between LMI and more affluent areas within each region. The construction project will be gauged on completion time, number of new square feet of lab space, and the associated economic activity when operational. Finally, governance and sustainability will be monitored by tracking coalition and partner membership over time and how BCNE infrastructure is used to attract new venture capital and/or public funding.

1.B. Description of Location/Region

The component projects will **serve these specific communities** and regions (Appendix A):

<b>FIPS Code</b>	<b>County</b>	<b>Primary Service Provider and City</b>
23005	Cumberland	Roux Institute – Portland, ME
25017	Middlesex	BATL – Burlington, MA
25027	Worcester	WPI and MBI - Worcester, MA
44009	Washington	URI-B3 – Kingston, RI

Within these communities BCNE will specifically **target participants** who have been impacted by COVID19 (e.g., those who have lost their jobs due to the pandemic) to increase access to stable high-paying jobs in biomanufacturing. In addition, BCNE will provide support for low-income students as well as women and underrepresented minority entrepreneurs. The success of our efforts will be built on **engaging stakeholders** across industry (e.g., Abbott, Amgen, Biogen, etc.), academia (e.g., Bates, Brown, UMass, etc.), community colleges (e.g., Middlesex Community College, Southern Maine Community College, Community College of Rhode Island, etc.), community based and workforce development organizations (e.g., ABCD, JVS, YearUp, Boston Private Industry Council) and governments (**see letters of support**). These partners each bring distinct **regional assets**, including a network of regional lab spaces (BATL, WPI, University of Southern Maine, URI) and wraparound services (ABCD, JVS, YearUp) to support all component projects.

**Distress and Economic Opportunity.** The New England region has experienced greater GDP and employment losses than the nation during the COVID-19 pandemic due to higher initial caseloads

causing more widespread disruption of economic activity (**Appendix B**). During 2020, employment declined more sharply in five of the six New England states compared to the nation. This was due to massive job losses in retail, leisure, and hospitality as well as education and healthcare, the region's largest sector accounting for one out of every five jobs. As of December 2021, employment in the education and health sector was still 5 percent below its pre-recession peak in New England compared to a gap of only 2 percent nationally, representing an ongoing loss of 80,000 jobs, including many healthcare workers whose skills are directly transferable to other life sciences sectors such as biotech.

Since the pandemic began, there has been a recognition among regional workforce development leaders in New England to “build back better” with a focus on Gateway Cities (MA), Opportunity Zones (RI), and rural areas (ME) with high share of LMI, Black, Indigenous, and people of color (BIPOC), and immigrant populations (**Communities served**). The unevenness of the economic recovery exacerbated existing economic inequities such that Black and Hispanic workers in Massachusetts and Rhode Island had unemployment rates roughly twice that of whites in 2021. Almost all of the communities within the BCNE region have 24-month unemployment rates that are higher than the nation's with several in Massachusetts and Rhode Island near or topping 10 percent which was 4-5 percentage points above the national average. Compared to the nation, most communities have lower median incomes and higher poverty rates, especially those in Maine. Collectively, the BCNE region contains 73 Qualifying Census tracts and 41 Opportunity Zones with the percent of the population living in a rural area ranging from 3 percent to 36 percent. Although these communities face lingering social and economic challenges yet retain many assets with unrealized potential, many have existing infrastructure, transportation networks, university connections, and a disproportionately young and underutilized workforce that could readily support a regional economic development strategy centered around biopharmaceutical manufacturing

### 1.C. Overview of Private Sector Partnerships

**Industry Leadership.** Our approach to private sector partnership includes identifying the primary challenges the biopharma industry faces and how the coalition will address these challenges. At the foundation of our approach is the concept of co-creation and co-ownership. Education and workforce institutions will co-create training programs with industry input and co-ownership of the content delivered to ensure workers obtain skills that are in high demand. In return, employers will commit to hiring graduates with a focus on increasing access to jobs for workers without a four-year college degree and those in economically distressed communities. Strategically, this model allows for virtuous cycles of sector-based training and job placement where programs and employers work together to adapt content and execution to address the current needs of the industry (evaluate and iterate).

BCNE will engage the private sector through our educational and workforce programs in conjunction with prototyping and implementation of new technologies into the biomanufacturing workflow. In the former, private sector individuals may serve as faculty for content delivery, will provide opportunities for hands-on, on-site, training, and will accompany us to present role models for students and recruit workers from LMI communities. In the latter, the coalition will help

support the private sector through testing of new technologies and inevitably their uptake into the workflows used in industry. This can be through collaboration in the BCNE hub of labs or through a co-location model where companies rent physical locations on a university campus. Both the Northeastern University Innovation Campus in Burlington, MA (BATL) and Gateway Park at WPI already have successfully implemented this model, which we will bring to scale at those sites and replicate at the Roux Institute in Portland, Maine and Rhode Island.

#### 1.D. Sustainability Plan

**Sustainability.** There are a variety of mechanisms that are already in place that will make BCNE a sustainable model for the region. First, we have seen in Massachusetts that investments in the bioscience industry yield returns that create a perpetual cycle of growth and employment increases. In 2008 former Massachusetts Governor Deval Patrick made a bold and historic investment of \$1 billion to build the state's life science industry that was boosted by the Baker administration in 2018. As the steward of these funds, coalition member Massachusetts Life Sciences Center (MLSC) has been responsible for facilitating the industry's growth with employment doubling through an additional 15,000 new jobs, yielding an additional \$4.7B in venture capital investment in Massachusetts. Yet much of the new lab space that is supported by venture capital dollars is earmarked for traditional R&D uses and is located either in or very near to Cambridge, MA leaving little opportunity for diversifying either the workforce or the geographical footprint of the industry. BCNE will use its convening power to focus both public and private sector investment in western Massachusetts, Maine, and Rhode Island to ensure inclusive economic development that is well-aligned with the regional CEDS., braids together private/public/academic/nonprofit resources and empowers individuals through learn and earn opportunities.

BCNE has also put in place an organizational structure led by the **BCNE Governance** component project that will allow for long term sustainability of the coalition. Specifically, the decision-making process has been defined and the coalition will be guided by an external advisory board (**Appendix E**). This sector-based shared governance model promotes sustainability through more seamless braiding of public, private, academic, and non-profit resources such that the whole is greater than the sum of its parts. These efforts will be facilitated by the regional economic competitiveness officer (RECO) who will serve as the conduit between all locations, forging relationships that cross state lines to support sustained growth throughout the region.

BCNE has actively engaged the economic development districts (EDD) throughout the region as partners to ensure alignment with the regional Comprehensive Economic Development Strategy (CEDS). Through close collaboration and continued investment, BCNE will work to meet CED goals in each of the impacted states by working collaboratively across state lines to share best practices for continued support at the state level, including appropriate economic development incentives to help maximize the long-term impacts of establishing national and global leadership in biomanufacturing.

Over time, BCNE will actively seek to braid together funding from private, public, university, and non-profit sources. This braided model has been successfully used by RI's Department of Labor and Training to fund Real Jobs RI Partnerships with employers such as Amgen to expand beyond the training needed to support a few dozen process technologists and instead create a network of educators from public colleges and universities to address the needs of the entire biomanufacturing

sector. This initial government investment in Rhode Island is now being sustained by private and other sources—a model that BCNE will replicate across the region. .

Finally, research shows that “learn and earn” models, such as registered apprenticeships that are primarily paid for and supported by industry, are a highly effective way to sustain training programs for LMI students. These models provide students with hands-on training while earning an income that typically leads to a stable, high-paying job after only a few months. Tuition reimbursement from industry and other funding mechanisms will also enable financial support to students seeking associate degrees through the community colleges as well as bachelor’s and advanced degrees through four-year universities to support training beyond the grant period.

#### 1.E. Community/Labor Union Engagement Plan

BCNE will engage communities and build a culture of trust in partnership. BCNE has formed partnerships with community-based organizations (e.g., ABCD, JVS, YearUp, and the Boston Private Industry Council) to help engage and build this culture of trust. **See letters of support.** The proposed construction project at BATL in Burlington, MA will ensure that strong labor and wage standards are upheld.

**Community Outreach:** The coalition will develop a comprehensive community outreach plan that provides opportunities for exploring biomanufacturing career opportunities through a Biomanufacturing Outreach Academy. Such an academy will provide several opportunities for academic enrichment and exploration for public school students and displaced workers in economically distressed areas such as Lawrence, MA, Lowell, MA, Brockton, MA, Auburn ME, Lewiston, ME, Pawtucket, RI, Providence RI and Woonsocket, RI. Critically, and fundamental to an equity focused approach, the coalition will help increase access to stable, high-paying biopharma jobs in these communities, rather than relocating individuals or job opportunities outside of the community. We will build on proven models for reaching diverse populations to provide training and placement for employment such as Skills for RI’s Future (Skills). Skills works with unemployed and underemployed citizens to help them find and secure new careers. Over the last five years, Skills has placed nearly 5,000 Rhode Islanders into jobs or job training programs with more than 170 employer partners and 15 Real Jobs training collaboratives with more than 50 percent of those placed representing BIPOC community members.

**Community Engagement:** In addition to, and perhaps more importantly than, BCNE’s outreach plan will be its community engagement efforts. Through partnerships with community-based organizations (see **letters of support**) we will actively engage with their constituents to understand individual needs and challenges to build programs that can be tailored to under-represented groups. Programming will be brought to LMI communities to explore biomanufacturing career paths as well as to promote access to entry-level jobs that do not require a four-year college degree in this fast-growing sector. Coalition members are committed to building relationships on the ground to provide information and wrap around services that support local communities and promote regional equity.

**Advisory Board (Appendix E):** BCNE’s community engagement work will be guided by an advisory board of community-based organizations, education and training institutions, industry

partners, and government partners throughout the region. This board will meet quarterly to drive the coalition's efforts to create a more inclusive plan for economic development through the biomanufacturing industry. A key component of the board's work will be to facilitate outreach to the appropriate groups and organizations as well as help us to engage those communities in an authentic, ethical, and meaningful way.

#### 1.F. Equity Plan

**Equity.** BCNE coalition partners such as MLSC, Northeastern, WPI, GMGI, and Rhode Island Commerce have committed to the development of an equity-based approach to workforce development as outlined in the *Building Equity* project. Moving beyond the well-intended but ultimately insufficient notion of equality--an approach that is agnostic to differences in need and ignores historical and systemic barriers and marginalization--the coalition will be guided by principles of *equity*, where everyone is to be provided with what they need to succeed.

**Co-creation:** An important part of supporting a diverse, inclusive, and equitable workforce is to ensure that programming meets participants where they are by providing a host of wraparound and supportive services while also implementing industry-led training that leads to high-quality jobs. Thus, the initiatives developed will be co-created with input from both community-based organizations and industry to focus on the unique needs of learners. BCNE will conduct interviews with (1) industry experts to better understand what skills are needed, (2) workforce development professionals to determine which skills might be transferable from related industries (e.g., healthcare), and (3) community based organizations to assess the need for wraparound services (e.g., career coaching, financial support, childcare, transportation, mental health resources etc.). This information will directly inform best practices for curriculum content and program delivery across the region.

**Mentorship:** In order to increase diversity, individual support staff will work with underrepresented minorities to provide mentorship and support. Modeled after the associates-2-masters (A2M) Biotechnology Navigator positions (NSF S-STEM funded project to Northeastern), individuals will support student success through mentorship as well as tutoring, textbook, and computer access where funding exists. In addition, they will assist students in solving challenges related to childcare and transportation and connecting them to resources to support mental health and well-being. Mentors will be specifically trained to support diverse populations and report directly to the coalition executive team to highlight unexpected challenges students might be facing so that partners across the region can respond with solutions in real-time.

**Cohort Model:** Underrepresentation causes a host of negative psychological, motivational, and physiological outcomes, all of which contribute to attrition. Incorporating a cohort model is an effective way to address a primary trigger of identity "stereotype" threat, which can occur when stereotyped-group members lack critical mass in an unfamiliar setting. Thus, groups of learners from under-represented populations will be recruited to participate in the career pipeline opportunities where the cohort will consist of members from within their given community.

**Pathways to entrepreneurial opportunity, business ownership, and contracting:** It is important to create avenues to startup and ownership opportunities for underrepresented minorities so that hidden barriers to accessing the biotech industry are not perpetuated. Programs such as



Supply RI helps minority-owned enterprises present and position themselves for major procurements from RI-based universities, hospitals, and corporations by intricately walking them through procurement requirements and helping them meet such requirements. *MCE-BioInnovate (ME)*, is an EDA Funded Maine Bioscience Cluster that works with partners to develop and implement a program to educate bioscience researchers and entrepreneurs on best practices related to intellectual property protection, funding, and commercialization. The program also holds connection sessions where minority businesses meet and pitch their company. BCNE will expand Supply RI to work with entrepreneurs of color to foster their careers and help place them on the pathway to starting their own bioscience-related ventures, pursuing executive positions in bioscience, and positioning themselves as successor owners of bioscience businesses -- with the goal of building more diverse leadership within biotechnology companies as well as the industry as a whole.

#### 1.G. Outcomes

**Jobs and Economic Growth.** A comprehensive evaluation, including a data collection and analysis plan, is shared in **Appendix D**.

**Short-Term Goals and Impacts: Measured Annually (over the first 30 months or 2.5 years).**

Regional Leadership: Creating High-Quality Jobs- The primary metric of success will be the creation of new high-quality biotech/biomanufacturing jobs throughout the region that address the employment gaps in LMI communities in metro-West Massachusetts, Rhode Island, and Maine. We will measure job creation annually in terms of both the number of job postings for new positions using data from Burning Glass Technologies (BGT) as well as the number of jobs filled (e.g., employment) as reported by the Bureau of Labor Statistics (BLS). Using the BGT data we will also measure the quality of the new jobs created in terms of wages for entry-level jobs and the basic benefits that are offered (e.g., paid leave, health insurance, retirement/savings plan).

Equity: Increasing Access to Biopharma Jobs for Underserved Populations- We will measure success annually in terms of increasing the number and geographical dispersion of education and training programs throughout the region including total enrollment, the representation of racial minorities and women among students, as well as student outcomes (e.g., completion rates, job placement rates, and wages). We will also measure the number of new women and minority owned start-ups during the performance period. We will also conduct qualitative assessments of the key factors associated with hiring, retention, and promotion practices including coaching and mentoring within the industry to enhance replication over time and across the coalition.

**Long-Term: Measured over the Performance Period (48 months).** Industrial Leadership:

Building the Infrastructure for Inclusive Economic Growth –In terms of economic activity, we will measure the completion of the construction project, including the number of new square feet of lab space, as well as the economic activity associated with this investment including the number of new firms created as well as the expansion of existing firms. To assess economic diversification, we will measure whether the share of biopharma employment with each region (e.g., western Massachusetts, Maine, and Rhode Island) increased over the performance period. To evaluate equity, we will track the share of biopharma jobs that are open to those with sub-baccalaureate degrees and are filled by such individuals as well as those from under-represented groups. Finally,

we will measure whether BCNE played a role in closing the gap in unemployment rates, labor force participation rates, and median incomes across LMI versus more affluent areas in the impacted regions.

Sustainability: Tracking Regional Support –To assess sustainability, we will track coalition and partner membership over time, how the lab space that gets built is used by multiple private and public stakeholders for accelerator development and training, the number of publicly funded programs that BCNE partners with, and how BCNE lab space and activities provide the infrastructure that is used to attract new venture capital and/or public funding.

#### 1.H. Overview of Phase I to Phase II Progress

The work of the BioConnects New England coalition has been underway since the submission of our Phase 1 application. As a first step to support our regional approach we have promoted our work through social media (LinkedIn, Facebook, Twitter) and our website to continue our outreach and engagement efforts.

We have also engaged with all the economic development districts (EDDs) across the region to both understand their CEDS as well as to build direct partnerships. For example, MAPC in Massachusetts, GPCOG in Maine, and Dept. of Commerce in RI (although not an official EDD) are key partners in making connections to the local stakeholders in the life science, real estate, and development sectors in each region. In addition, they have been able to strengthen our approach to economic development by providing data on key metrics of economic distress and aligning our activities with the regional CEDS to better ensure the sustainability of our efforts.

In addition, the coalition has expanded and formalized partnerships across local government, the private sector, non-profit, and other academic partners. BCNE has taken inventory of the programs and infrastructure in the biotechnology and biomanufacturing sectors across the three states to develop a career pathway model that links those opportunities and identifies gaps in the ecosystem.

In our Phase 1 proposal we identified potential barriers to project implementation. One such potential barrier being that large, multi-stakeholder partnerships can be complicated to manage. However, all coalition members have experience managing complex projects and have strong partnerships with industry and regional economic development organizations. To date, all the Phase 1 stakeholders have agreed to take a regional approach to biomanufacturing, inviting in additional partners through this Phase 2 proposal. Our governance component project further addresses how the coalition will promote cross-state collaboration. Another challenge we identified was engaging a set of diverse trainees due to the need to identify, prepare, and support students throughout the program who do not have a strong STEM foundation, financial resources, nor access to industry role models. Thus, to create a pipeline of diverse trainees, the coalition plans to engage people in their own communities through trusted entities. During Phase 1, we have developed strong partnerships with local community groups to help support these efforts and are promoting a co-ownership and co-development model, where the industry and communities work together to develop programs with a lens of diversity and equity.