BOSTON UNIVERSITY
Task Force on Convergence

A GUIDING STRATEGY FOR
EMINENCE AND IMPACT OF BOSTON UNIVERSITY

JANUARY 2026

CONTENTS

TASK FORCE MEMBERS

Kenneth Lutchen, Vice President and Associate Provost for Research; Dean of Engineering, Emeritus; Professor of Biomedical Engineering (Co-Chair)

Darrell Kotton, David C. Seldin Professor of Medicine and Professor of Pathology and Laboratory Medicine, Chobanian and Avedesian School of Medicine; Founding Director of the Center for Regenerative Medicine of Boston University and Boston Medical Center (Co-Chair)

David Boas, Professor of Biomedical Engineering, College of Engineering; Director of the Neurophotonics Center

Chris Chen, Professor of Biomedical Engineering and Materials Science Engineering, College of Engineering; Director of the Biological Design Center

Deborah Carr, A&S Distinguished Professor of Sociology, College of Arts and Sciences; Director of the Center of Innovation in Social Science

Kevin Gallagher, Professor of Global Development Policy, Frederick S. Pardee School of Global Studies; Director of the Global Development Policy Center

Lucy Hutyra, Chair of and Distinguished Professor of Earth & Environment, College of Arts and Sciences; Director of the BU Biogeosciences Program.

Jonathan Levy, Chair of the Department of Environmental Health, School of Public Health

Joseph Mizgerd, Jerome S. Brody, MD, Professor of Pulmonary Medicine, Professor of Medicine, of Virology, Immunology & Microbiology, and of Biochemistry & Cell Biology, Chobanian & Avedisian School of Medicine; Director, Pulmonary Center

Yannis Paschalidis, Distinguished Professor of Engineering, College of Engineering; Founding Professor of Computing & Data Sciences; Director, The Hariri Institute for Computing and Computational Science & Engineering

Benjamin Sovacool, Professor, Earth & Environment, College of Arts & Sciences; Director, Institute for Global Sustainability

Michael Sorenson, Associate Dean of the Faculty, Natural Sciences; Professor of Biology, College of Arts & Sciences

Tom Bifano, Professor of Mechanical Engineering; Director, Photonics Center

Sean Mullan, Associate Provost for Graduate Affairs

EXECUTIVE SUMMARY*

Top research universities need to foster a portfolio of approaches for advancing knowledge and innovation. This portfolio consists of single faculty world experts to team science, and the research spans basic science discovery to applied and translational research.

Boston University is well positioned to elevate its national and global standing by embracing **convergent research** as one distinctive institutional strategy to promote research excellence and societal impact. Convergence, which is the intentional integration of methods, perspectives, and expertise across traditionally distinct disciplines, enables new approaches and scalable solutions to complex societal challenges.

The University's breadth of disciplines, collaborative culture, and history of successful interdisciplinary initiatives provide a strong foundation for this effort. The University has substantial experience in interdisciplinary faculty hiring, is home to fourteen University-wide institutes and centers and has a strong record of success in winning interdisciplinary graduate training programs.

This report summarizes the findings and recommendations of the **Task Force on Convergent Research and Education**, convened by the President and Provost of Boston University. The task force was charged to evaluate structural and cultural barriers to convergent research, to propose a structure for strategic investments that could amplify convergent research outcomes, and to create processes that enable convergent research to thrive at a university-wide scale. Through consultation with deans, department chairs, center directors, hospital partners, and more than 200 research-active faculty across both campuses, the task force has identified **eight major convergent research themes** that engage faculty broadly across the institution and where BU already demonstrates strength and clear potential for national leadership. Each theme is

Figure 1: Convergent research themes identified by the task force

articulated through actionable subthemes for which Boston University has a breadth of faculty advancing research to address societal needs, scholarly opportunity, and funding competitiveness. It is worth noting that throughout our process, we also identified exciting convergent themes that cut across disciplines primarily within one of our schools/colleges. This report focuses only on university-wide themes, with foci in two or more schools or colleges that emerged from our data-gathering and deliberate processes. We also recognize that there are numerous potential convergent research themes where BU could excel in the future, and we propose strategies to cultivate additional areas while investing in areas of current strength.

The task force identified four major categories of **barriers limiting convergence**: (1) academic structures related to hiring, appointments, and promotion; (2) resource and infrastructure constraints; (3) lack of mentoring and support for early- and mid-career faculty that would encourage them to embrace collaborative research; and (4) obstacles to convergent education and curriculum development. To address these, the task force recommends coordinated reforms to hiring and promotion processes, standardized approaches to joint appointments, revised evaluation criteria that explicitly value team science, enhanced administrative and grant support, improved access to shared infrastructure, and strengthened faculty development and mentoring programs.

Central to the task force's recommendations is a **portfolio of targeted investments**, to be implemented initially as a two-year pilot and refined through continuous assessment. These include: (1) convergent theme-based cluster faculty hiring initiatives; (2) competitively awarded convergent seed and planning grants; (3) distinguished Ph.D. fellowships aligned with convergent themes; (4) curricular and educational enhancements that support team-science; and (5) the creation of a dedicated administrative structure within the Office of Research to oversee, mentor, and evaluate convergent programs and outcomes.

The task force emphasizes that convergence is not intended to replace disciplinary excellence or basic research focused on a single field, but to **complement and amplify it**, providing pathways for faculty and students whose most impactful work requires synthesis across fields. Success will be measured not by rigid metrics, but by demonstrable outcomes including (1) faculty recruitment competitiveness, (2) collaborative scholarly impact, (3) follow-on external funding, (4) student recruitment and success, and (5) enhanced institutional reputation.

By implementing the recommendations outlined here, BU will emerge as one of the nation's leading universities for convergent research and education—advancing knowledge, addressing society's most pressing challenges, and enhancing the University's long-term eminence and sustainability.

ACKNOWLEDGEMENTS

The task force wants to thank all faculty, deans, associate deans, department chairs, and center directors who provided thoughtful ideas and widespread support for convergence as a potentially amplifying addition to BU's strategy and missions. Our group meetings with various combinations of the above were always collegial, constructive, and often eye-opening in just how much collaboration as a culture has been embedded into our BU communities. Finally, a deep thanks to Sarah Kupersmith who staffed the task force including the complex schedules of its members.

INTRODUCTION

U.S. universities are at a crossroads. They are expected to equip students with foundational skills for impactful lives, advance knowledge for societal benefit, and catalyze innovation that drives economic growth and citizen well-being. Research is central to these goals. Universities cultivate world-class expertise within disciplines—essential for deep knowledge and evidence-based solutions to urgent global challenges—while also building collaborative communities that synthesize insights across fields. This convergent approach, driven by the mission to produce creative, high-impact solutions, requires researchers and students to work across traditional methods and frameworks. Convergence not only fuels continuous innovation at disciplinary interfaces; it also renews and evolves the disciplines themselves.

Many universities, including Boston University, have established interdisciplinary centers in recognition of the value of team science. Yet structural and organizational barriers limit their impact. Centers typically lack authority over faculty lines and hiring, which reside in departments; they rarely house degree programs or curricula; and their directors report to deans or the provost rather than department chairs who control hiring and academic programs. As a result, centers alone cannot coordinate institution-wide strategic growth. New, enabling structures are needed to build, connect, and sustain collaborations across the campus.

The National Academies of Sciences, Engineering, and Medicine define convergence as a distinctive, problem-focused approach that cuts across disciplinary boundaries—integrating knowledge, tools, and mindsets from life and health sciences, physical, mathematical, and computational sciences, engineering, and beyond—to form a comprehensive framework for tackling scientific and societal challenges at the interfaces of multiple fields (NRC, 2014). Convergence should extend further to include the social sciences, humanities, and professional schools such as business and social work.

Convergence goes beyond interdisciplinary collaboration by establishing research communities that generate creative ideas and spawn new subfields. To realize its promise, universities must complement discipline-based investments with strategic initiatives that foster convergence. Two key questions follow: How can the university best facilitate convergent research? And how can departments be incentivized to engage convergent thinking and practice?

BU is uniquely positioned to lead. Across its 17 schools and colleges—from Public Health, Medicine, Dentistry, Education & Human Development, Engineering, Social Work, Law, Business, Rehabilitation Sciences, Fine Arts, Theology, and Computing & Data Science—BU spans a breadth of disciplines unmatched in Boston and many other universities. The university already benefits from a collaborative culture among faculty and leadership. Elevating convergence as a core strategy—by cultivating cross-cutting communities and creating structures that enable faculty and students to traverse boundaries—will attract intellectually bold talent seeking an institutional home that invests in collaboration. These communities can make transformative contributions to knowledge and society, strengthen industry partnerships, and increase competitiveness for external funding. Industry needs deep content expertise and, equally, a versatile workforce comfortable working across disciplines and leading as new fields emerge.

To accelerate convergent research and education, BU established the task force on Convergence with faculty representatives from across the university. This report presents the task force's recommendations for enabling convergence university-wide.

Task force charge: The task force was asked to first identify University-wide convergent themes reflecting areas of high scholarly reputation and substantive external funding in themes requiring extramural funding. Convergence can be pursued within schools/colleges or at the university level. Specifically, the task force addressed:

- Identification of University-wide convergent themes
- Barriers to success and proposed solutions
- Investments in talent, programs, facilities, and administration
- Innovative educational approaches to prepare convergent thinkers
- Metrics to assess progress and impact

At the core is a mindset that prioritizes leveraging the excellence, potential, and impact of the whole university. The task force unanimously concludes that becoming a global leader in convergent research, training, and education will require strategic leadership, intentional budget management, and processes that enhance recruitment and enable faculty to work across disciplinary boundaries.

Importantly, the task force does not recommend that all BU faculty engage in convergence. Leading universities depend on a blend of approaches: some faculty anchor excellence within traditional disciplines to advance new knowledge and pursue basic science; others focus on challenges where engagement across fields can drive powerful solutions. This report proposes a robust scaffold to empower the latter, while sustaining and benefiting the former.

SUMMARY:

BU has already engaged in strategies to advance convergence in select schools, colleges, or research areas (e.g., AI) with substantive success. These efforts provide encouraging evidence that elevating convergence to a university-wide level is achievable. This report describes our task force's findings and identifies convergent research themes and subthemes with particularly significant potential for further development. The findings and recommendations that follow are based on feedback from a wide range of stakeholders as well as from crowd-sourced formalized surveys of the entire university's research faculty. In five sections below, we present our task force report, propose approaches for overcoming barriers to success, and design investment strategies to accelerate success:

1. Recent Systems at BU Designed to Embrace Collaboration and Convergence

2. Identifying Existing Research Convergent Themes

3. Reducing Barriers to and Investing in Convergence Success

4. Investing in Convergence as a Successful Strategy

5. Conclusions and Future Considerations

Relevant Readings:

1. **National Science Foundation: Learn About Convergence Research**:
https://www.nsf.gov/funding/learn/research-types/learn-about-convergence-research

2. **National Academies: Convergence Report**:
https://www.nationalacademies.org/projects/DELS-BLS-11-08/publication/18722

3. **Advancing convergence research: Renewable energy solutions for off-grid communities.** Moran EF, Lopez MC, Mourão R, Brown E, McCright AM, Walgren J, Bortoleto AP, Mayer A, Johansen IC, Ramos KN, Castro-Diaz L, Garcia MA, Lembi RC, Mueller N.Proc Natl Acad Sci U S A. 2022 Dec 6;119(49):e2207754119. doi: 10.1073/pnas.2207754119. Epub 2022 Nov 28.

4. **Convergence research for sustainable regional systems.**Chang H, Roe B, Erkoc M, Heyman J, Foo K, Sanyal D, Banerjee D, Rushforth R, Srinivasan J. iScience. 2025 Jul 22;28(8):113104. doi: 10.1016/j.isci.2025.113104. eCollection 2025 Aug 15. Review.

5. **Fostering the Culture of Convergence in Research: Proceedings of a Workshop.** National Academies of Sciences, Engineering, and Medicine; Division on Earth and Life Studies; Bowman K, Arnold A, editors.Washington (DC): National Academies Press (US); 2019 Jun 26.

1) RECENT SYSTEMS AT BU DESIGNED TO EMBRACE COLLABORATION AND CONVERGENCE

Boston University has launched several successful initiatives that promote convergent research and education, yielding notable intellectual advances and practical impact. These efforts demonstrate that greater university investment in formal, scalable structures is warranted.

1. RE-IMAGINING CROSS-CUTTING COLLEGES

- Faculty of Computing & Data Sciences (FCDS): BU created a novel academic unit focused on computing, data science, and AI methods, intentionally hiring faculty who are housed across 23 departments in 11 schools and colleges—from engineering to theology. A minority hold appointments solely in FCDS (N=18); most have joint appointments with other schools (N=37). This strategy has built a university-wide community advancing computing and data science across diverse fields. FCDS also led a university-wide AI cluster hiring initiative with CAS, Questrom, COM, COE, and the Chobanian & Avedisian School of Medicine, recruiting scholars in foundational, methodological, and use-inspired AI. Primary appointments span computer science, data science, electrical and computer engineering, emerging media studies, information systems, linguistics, and medicine, with nearly all faculty holding one or more secondary appointments. This cross-disciplinary embedding enhances collaboration, mentoring, and innovation.

2. CONVERGENT, MISSION-DRIVEN FACULTY HIRING

- College of Engineering (COE): In 2022, COE adopted a hiring strategy aligned with cross-cutting research foci (e.g., synthetic biology; intelligent and autonomous systems) requiring expertise across departments and schools. Search committees included representatives from multiple departments and research centers; candidates could choose their home department from participating units. This approach led to hires with joint or secondary appointments across the three engineering departments and in CAS departments (biology, chemistry, physics). Approximately 40% of COE's recent hires were made through this model. Foregrounding convergence helped attract exceptional scholars—often with peer-plus competing offers—drawn by BU's collaborative culture and structures that ease cross-disciplinary work.
- AI Hiring Initiative: For the past three years the Faculty of Computing and Data Sciences (FCDS) have coordinated a hiring initiative in which faculty lines from schools and colleges throughout BU are filled by candidates whose research advances innovative use of AI to address important applications in a range of disciplines. The hires have primary academic appointments ranging from Law to Earth and Environmental Science, to Communications, to Computer Science, to Electrical and Computer Engineering and more with secondary or joint appointments in FCDS.
- School of Public Health (SPH): In 2024, SPH launched a climate and health faculty search with a cross-cutting focus. Representatives from all SPH departments served on the committee, and neither the intellectual domain nor home department was predetermined, enabling flexible placement and alignment with convergent themes.

3. UNIVERSITY-WIDE INSTITUTES AND CENTERS

- BU has invested in 13 university-wide centers that catalyze interdisciplinary and convergent research across topics such as sustainability, infectious disease, global development, and social inequalities. Centers report to the Vice President for Research, receive central funding, and often have dedicated space. While centers do not control faculty lines, directors collaborate with deans and department chairs to encourage hiring aligned with center priorities. These centers serve as powerful vehicles for collaboration and innovation that likely would not have emerged without dedicated institutional structures.

4. CROSS-DISCIPLINARY SEED PROGRAMS

- Many centers offer seed grants to spur new directions. While the majority of these provide minimum funding, four programs stand out for their structured mentoring and oversight:
    - Hariri Institute's Focused Research Program (CRC): Catalyzes cross-disciplinary initiatives and provides active guidance to position projects for next-stage external funding.
    - Department of Medicine's Affinity Research Collaboratives (ARCs) (Medical Campus): Funds faculty and trainee communities across disciplines, emphasizing participation across both campuses. ARCs rigorously monitor progress and mentor teams in securing external funding; since 2009, they have fostered collaborations among investigators from 14 schools and 38 departments, with strong subsequent grant success.
    - Clinical and Translational Science Institute (CTSI): NIH-funded, the CTSI has provided substantial internal seed funding and promoted multidisciplinary, multi-institutional health-related collaborations and training across BU's campuses, Boston Medical Center, and Boston's VA hospitals.
    - Center for Innovation in Social Science: This center runs seed and educational programs to help faculty identify and compete for extramural funding.

5. ACADEMIC PROGRAMS

- Degree Programs: BU has longstanding interdisciplinary degrees, such as the graduate programs in Neuroscience and the graduate program in Bioinformatics (founded 1999), now housed in FCDS. Faculty from both campuses and numerous departments—including biology, chemistry, physics, computer science, biomedical and electrical/computer engineering, psychological and brain sciences, medicine, pharmacology, physiology, biophysics, and virology/immunology/microbiology—are integral to these programs.
- Convergent Training Programs: BU hosts multiple interdisciplinary graduate training initiatives supported by NSF NRT and NIH training grants (e.g., T32, TL1). These are not degree-granting programs; trainees from related departments engage in shared convergent experiences and research. Examples include:

- NIH TL1 Regenerative Medicine Training Program (Center for Regenerative Medicine): Funds PhD and postdoctoral trainees from 14 graduate departments across both campuses.
- Neurophotonics Center NIH T32: Grew from an NSF NRT designed to educate students at the interface of photonics and neuroscience.
- Hariri Institute's Center for Computational Science and the Institute for Global Sustainability: Jointly launched an interdisciplinary graduate program to develop the workforce needed for complex industrial-scale energy sustainability challenges.
- BU URBAN (Graduate Program in Biogeoscience and Urban Health): Prepares PhD students across both campuses (Earth & Environment, Biology, Environmental Health, Math & Statistics, Bioinformatics) to address urban environmental issues through interdisciplinary methods and co-production with government, NGOs, and industry.
- NSF NRT in Convergent Biological Control: Supports a diverse cohort of PhD students for tomorrow's workforce in biotech, synthetic biology, manufacturing, robotics, sustainability, and related sectors.

Together, these systems illustrate BU's growing capacity to build convergent communities, align hiring and structures with cross-cutting priorities, and support faculty and trainees through mentoring, seed funding, and interdisciplinary programs. They provide a strong foundation for scaling convergence across the university.

2. IDENTIFYING EXISTING CONVERGENT RESEARCH THEMES

The task force began regular meetings in April 2025 after reviewing an orientation and call-to-action prepared by the co-chairs. Initial meetings centered on open discussion to define "convergence research" and to reflect on its current state at BU.

1. CONSENSUS ON THE CONCEPT OF CONVERGENCE

Task force members reached broad consensus that convergence is a high-potential approach to amplify collaborative research success and impact. While interdisciplinary research brings different areas of expertise to bear, convergence goes a step further: it actively synthesizes and integrates disparate approaches across disciplines to a) develop new methods or frameworks not specific to any single field; and/or b) design solutions from the outset by identifying and integrating all relevant disciplinary facets needed for implementation and scale.

Examples:

- Synthetic biology emerged by combining molecular and cellular biology with engineering systems, creating a new paradigm for designing and controlling cellular function.
- Sustainability and climate change demand early, intentional integration of engineering, environmental science, computational modeling, AI, public policy, public health, social sciences, and business to produce implementable, scalable solutions.

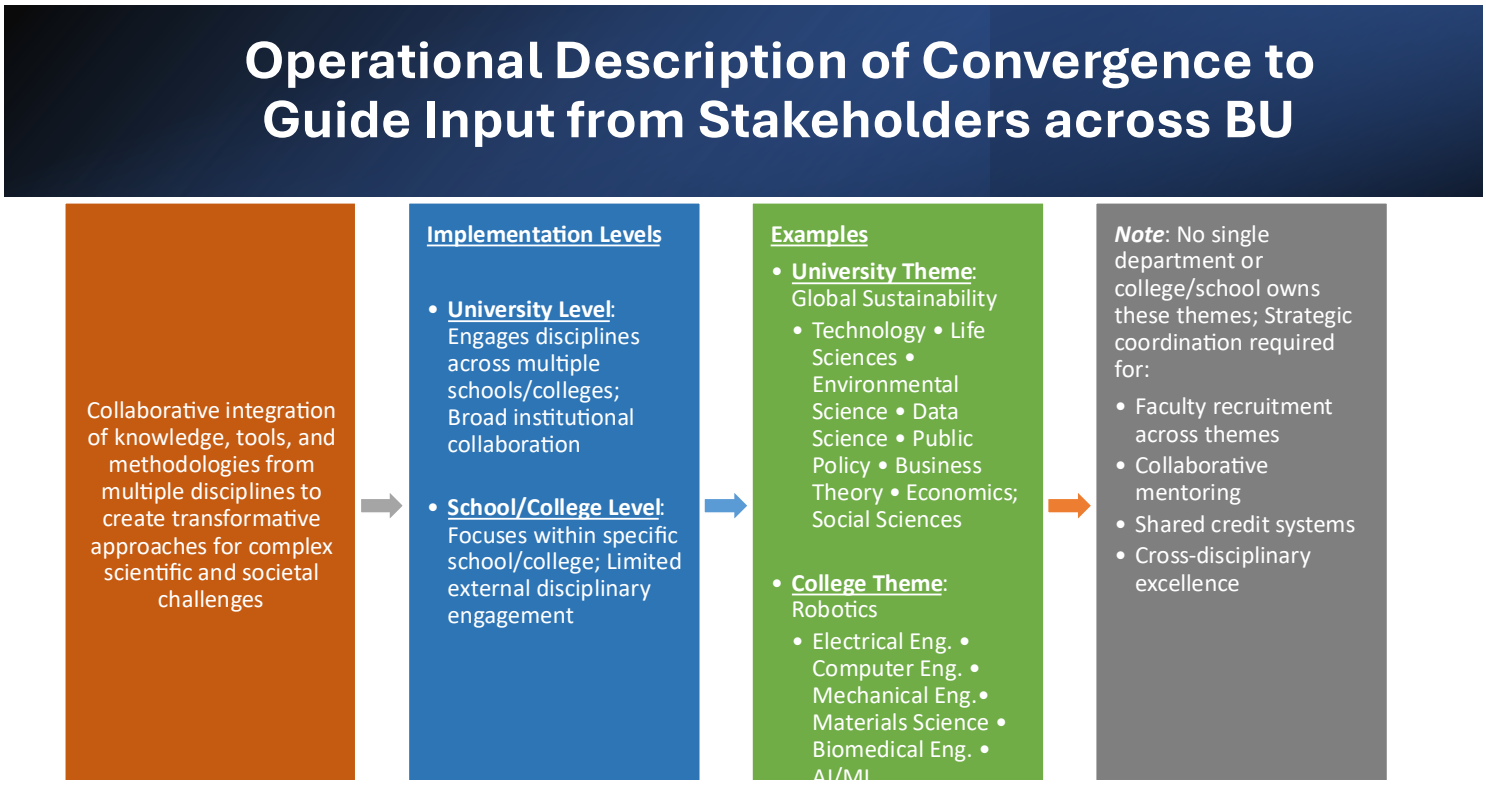

Figure 2: Rubrik to convey concept of university level and college/school level convergent themes

2. CONVERGENT THEME RUBRIC

The task force developed a rubric (Figure 2) to guide what constitutes a convergent theme at university or school/college levels. A core principle is that a convergent theme does not belong to a single department or degree program; there is no single academic degree for a theme. *Advancing the impact of a vibrant convergent theme requires intentional collaboration among multiple departments and schools/colleges, with aligned plans and resources for faculty hiring, PhD fellowships, seed funding, and innovative cross-listed courses or curricula*.

3. PROCESS FOR IDENTIFYING CONVERGENT THEMES

The task force executed a multi-step engagement process with university leaders and faculty to surface areas of strength and challenges relevant to convergence at BU.

- May–June 2025: Task force subcommittees met with campus and teaching hospital leaders to gather priorities, barriers, and recommendations. Stakeholders included:
    1. Directors of all university-wide research centers and institutes
    2. Deans of research-intensive schools/colleges
    3. Leaders overseeing large research enterprises within those schools
    4. Leaders from Humanities and Social Sciences (CAS), the Affinity Research Collaborative (ARC) program (MED), and the Clinical & Translational Science Institute (CTSI)
    5. Leaders from Boston Medical Center

These consultations yielded seven initial, overarching themes aligned with the task force's definition of convergence, each with subthemes.

- Faculty crowdsourcing: On June 30, 2025, the task force distributed a qualitative survey to all full-time, research-active faculty to refine and expand convergent areas of strength. Faculty were asked:
    1. **Are there any current, major, University-wide themes that are missing from this list?** Please share and provide a few bullets of rationale for each.
    2. **Are you aware of emerging, University-level themes that might be considered to add to this list in the coming years?** Please share and provide a few bullets of rationale for each.
    3. **List up to five (5) institutional barriers that need to be addressed to help the University and its faculty apply convergence as a strategy for research excellence and impact.**

More than 200 faculty across the Charles River and Medical campuses responded. The task force compiled responses into spreadsheets and used a generative AI tool to summarize each column. Summaries were discussed in task force meetings from July to September 2025, resulting in refined and extended themes.

4. OUTCOME

This process identified eight major convergent themes (Figure 3). Seven of the eight themes explicitly target societal challenges and opportunities. The eighth—Artificial Intelligence, Data Science, and Computing—serves as a powerful enabler for transformational impact across all other themes and for society broadly. BU's distinctive structure for the Faculty of Computing &

Figure 3: Eight overall convergent themes for BU

Data Sciences provides a strategic advantage for advancing convergent research that leverages these methods.

To make them actionable, the task force derived, from the broad inputs of leaders and faculty, specific BU subthemes under each theme (Figure 4). Each subtheme represents areas where BU demonstrates leading scholarship and/or strong records of extramural funding and which engage faculty from across the university.

BU Convergent Themes & Sub Themes

BOSTON UNIVERSITY

- **Health Across the Lifespan**
  - Neuroscience & Brain and cognitive health
  - Synthetic Biology; Biomolecular, Cell & Tissue Engineering, Regenerative medicine
  - Molecular and Biological mechanisms regulating health and disease
  - Biophotonics, Neurophotonics, and Biomedical optics & Imaging
  - Digital, Predictive, and Personalized Medicine
  - Health disparities: economic, racial, gender, and global
  - Healthcare Innovation Ecosystems, and Healthcare systems & policy
  - Sociocultural, environmental, and behavioral influences on individual and public health
- **Global Sustainability**
  - Mitigating climate change, adaptation & resilience, climate & health
  - Environmental modeling , remote sensing & forecasting
  - Ecosystem health and restoration, biogeochemistry, land conservation
  - Renewable energy, smart grids, energy efficiency, negative emissions, & geoengineering
  - Law, economics, and public policy for sustainability
  - Poverty alleviation, equity, economic development and forced migration
  - Addressing misinformation and disinformation, media literacy and societal impact
  - Climate, Energy, and Environmental Justice
- **Urban Development and Resilience**
  - Civic and cultural engagement and enhancement
  - Infrastructure: housing, transit, energy, smart cities, connected services
  - Urban health and services access and inequities
  - (re)Development and mitigation for climate change (eg., weather, sea-level, etc)
  - Urban Policyand governance
  - Urban accessibility for all (e.g,, aging, disabled, etc.)
- **Arts, Humanities, and Human Condition**
  - Forced Displacement including transnational and local patterns of cultural transformation.
  - Digital approaches for the curation, preservation, dissemination, creation and computational analysis of human culture.
  - Cultural and historical approaches to understanding inclusion and community
- **Infection, Inflammatory, and Immune Disorders**
  - Infectious disease biology
  - Immuno-engineering (vaccines, immunotherapies, etc.)
  - Antimicrobial agents development and resistance prevention
  - Host-directed therapeutics and nano-drug delivery methods
  - Local & Global public health responses for curbing infectious disease
  - Pandemic intelligence, modeling and preparedness
  - Information integrity, media literacy,vaccine hesitancy
- **Artificial Intelligence & Data Science & Computing**
  - AI for
    - health, medicine, and science
    - robotics and intelligent systems
    - education and learning and human augmentation
    - arts and humanities
    - finance, business, law and policy
  - AI information privacy, integrity, security, andAI ethics;
  - Computing infrastructure for AI and cloud computing
  - Evolution of human - AI interactions
  - Quantum Computing & Algorithms
- **Childhood and Adolescent Wellbeing and K-12 Education**
  - Behavioral health & development; Environmental impact on Child development
  - Childhood and adolescent physical and mental health; Impact of social media
  - Educational policy and accessibility
  - Technologies and AI for education pedagogy
  - Community partnerships for family-school systems, research & education, etc.
- **Social and Economic Opportunity**
  - Business and innovation and government interplay
  - Poverty elimination & Economic Development
  - K-16 education systems; Workforce future & lifelong learning
  - Environmental justice
  - Communication for social impact, media literacy,and information integrity
  - Community partnerships and civic engagement

Figure 4: BU convergent themes and subthemes

The task force agreed that not only are the themes and subthemes above competitive for government funding (if the research subthemes require such to perform) but would also align well with the missions of Foundations that fund research and with philanthropists. In short, these themes, in principle, can be supported by a diversified portfolio of funding sources. For each of these subthemes, we further identified example applications of exciting research at BU driven to address an important societal challenge. Below are figures for each of the eight convergent themes in which we list the subthemes on the left and examples of applications to society that BU faculty are already advancing associated with that subtheme.

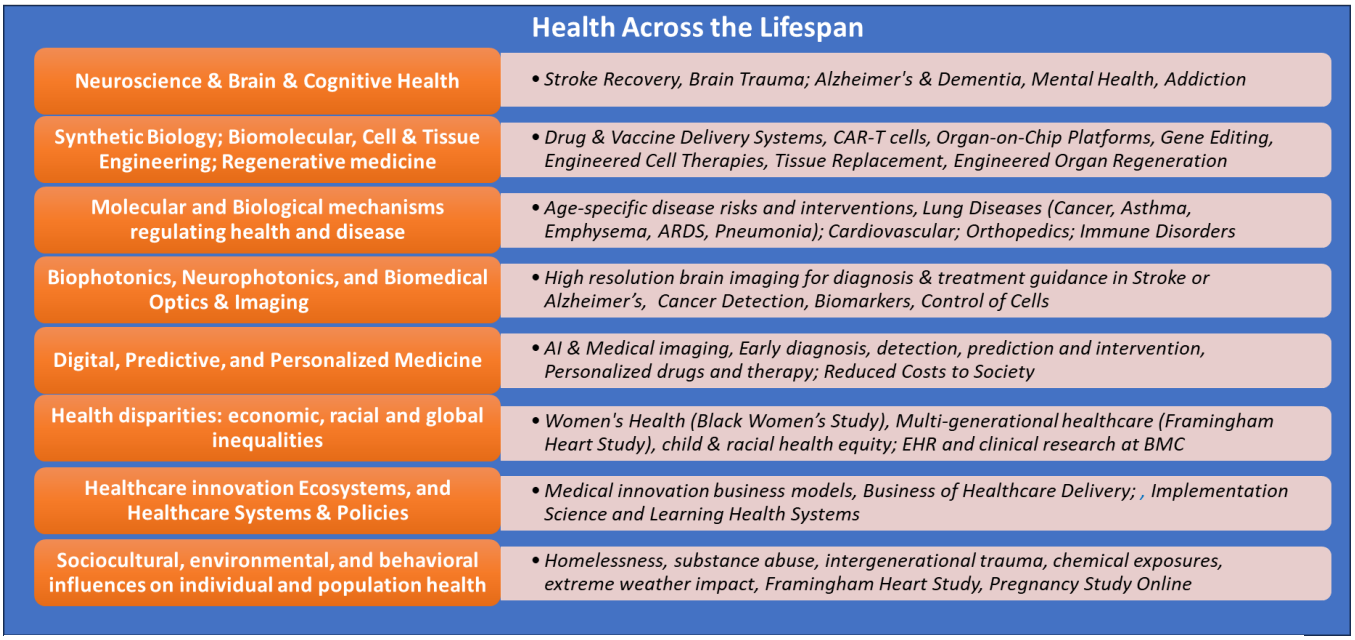

Figure 5: Subthemes for the Health Across the Lifespan convergent research theme

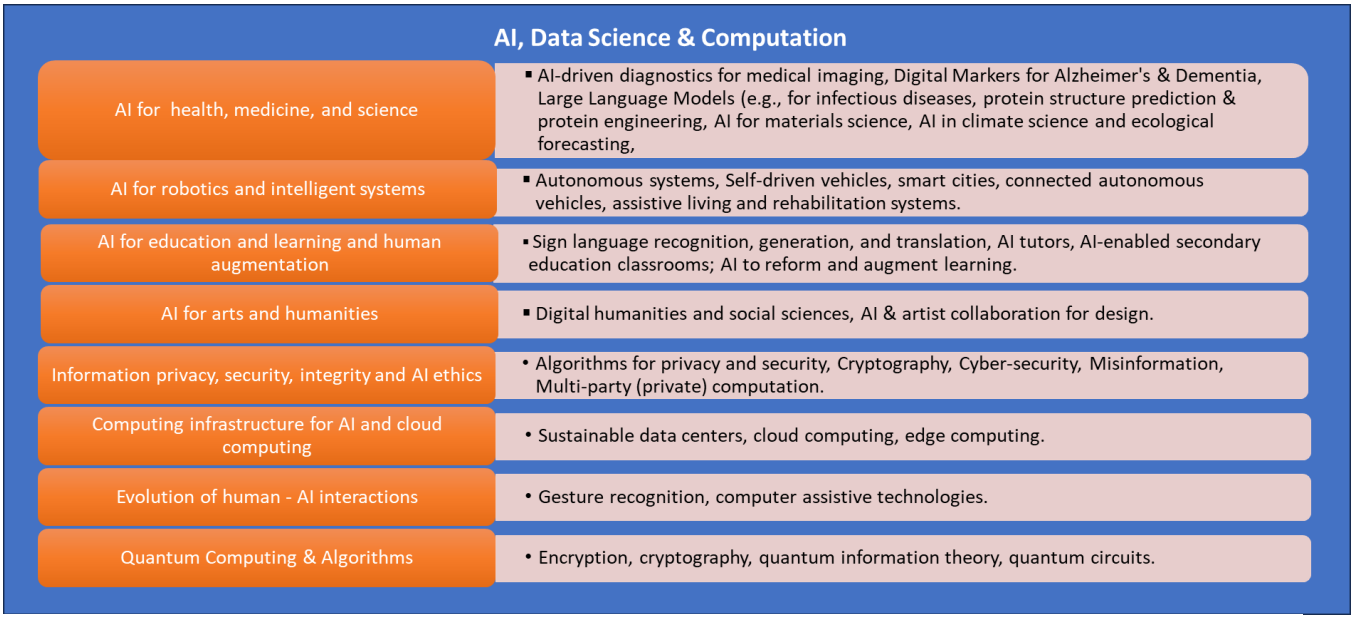

Figure 6: Subthemes for the AI, Data Science, and Computation convergent research theme

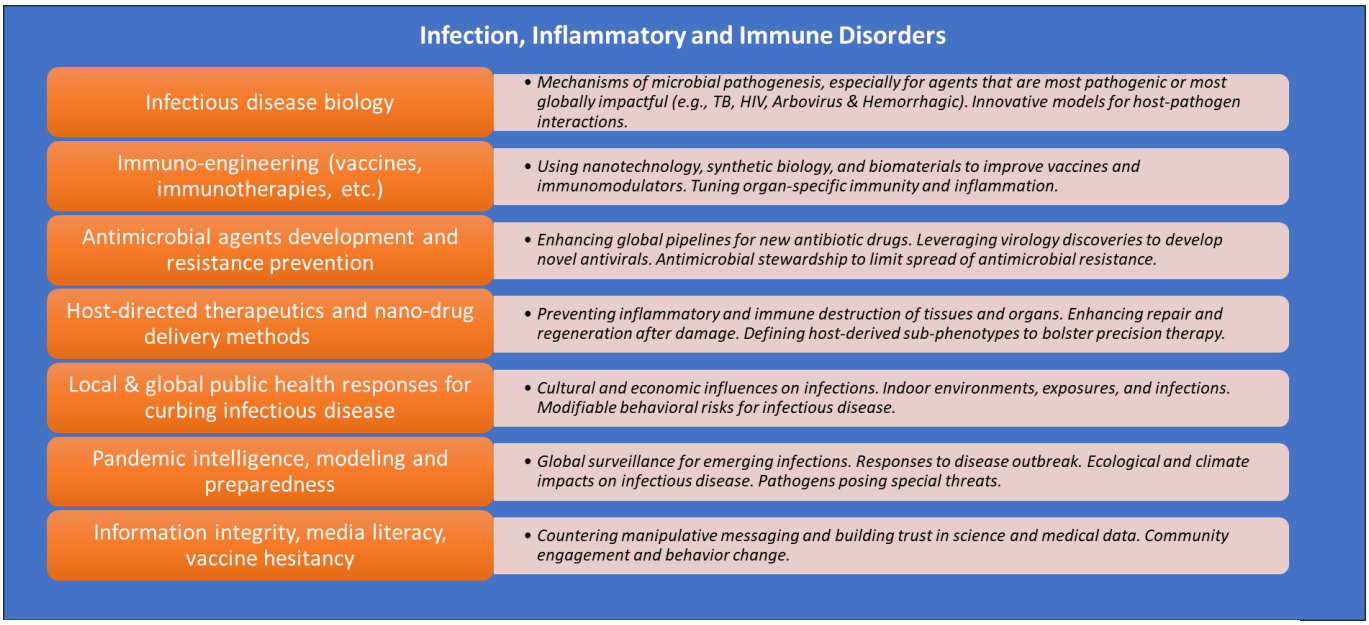

Figure 7: Subthemes for the Infection, Inflammatory, and Immune Disorders convergent research theme

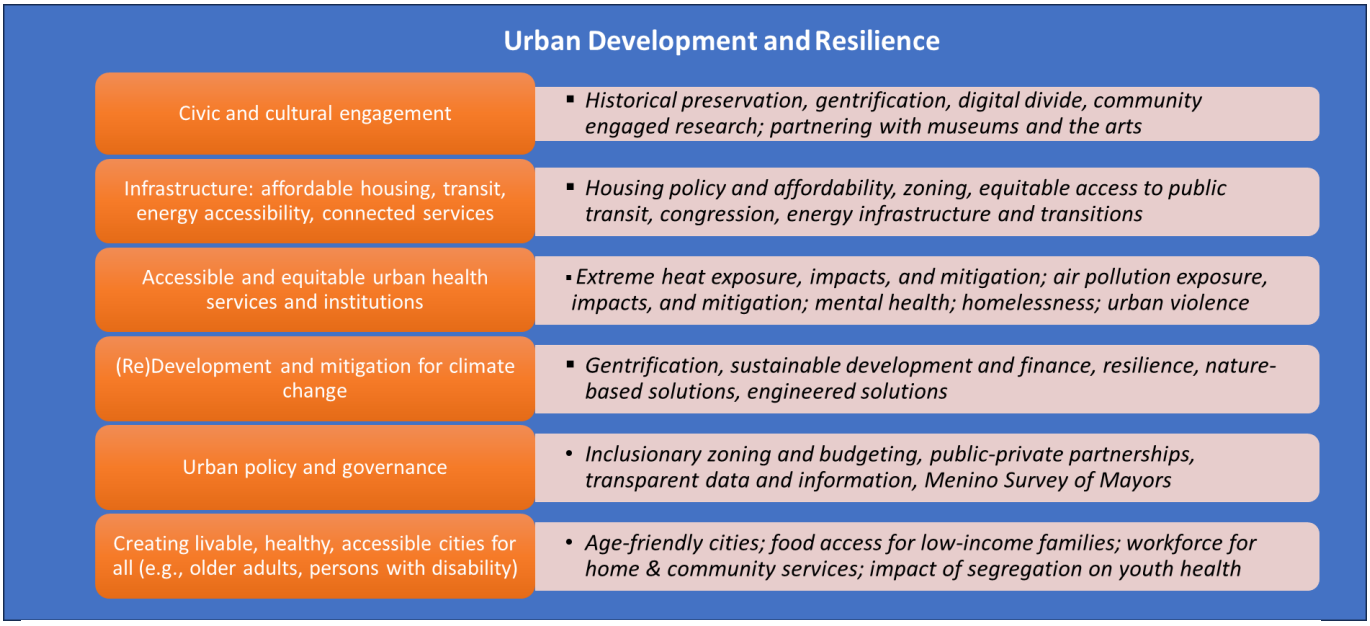

Figure 8: Subthemes for Urban Development and Resilience convergent research theme

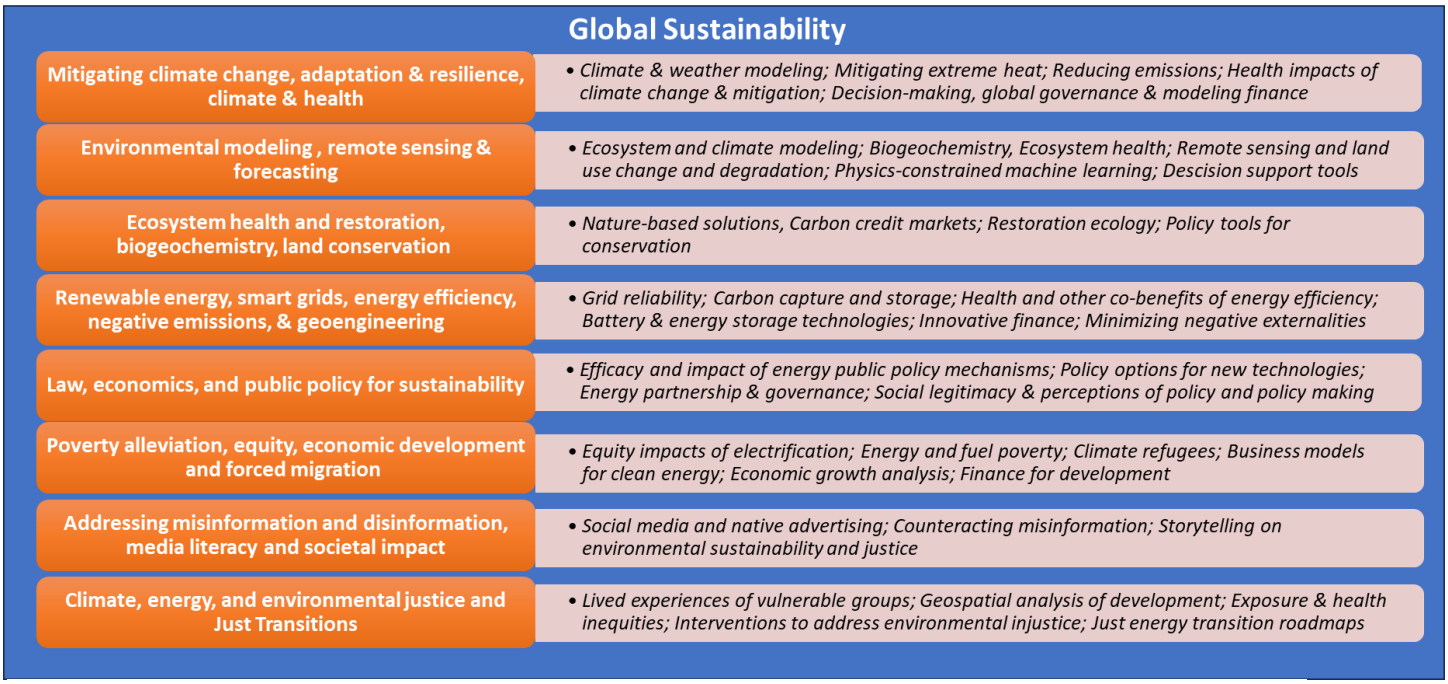

Figure 9: Subthemes for Global Sustainability convergent research theme

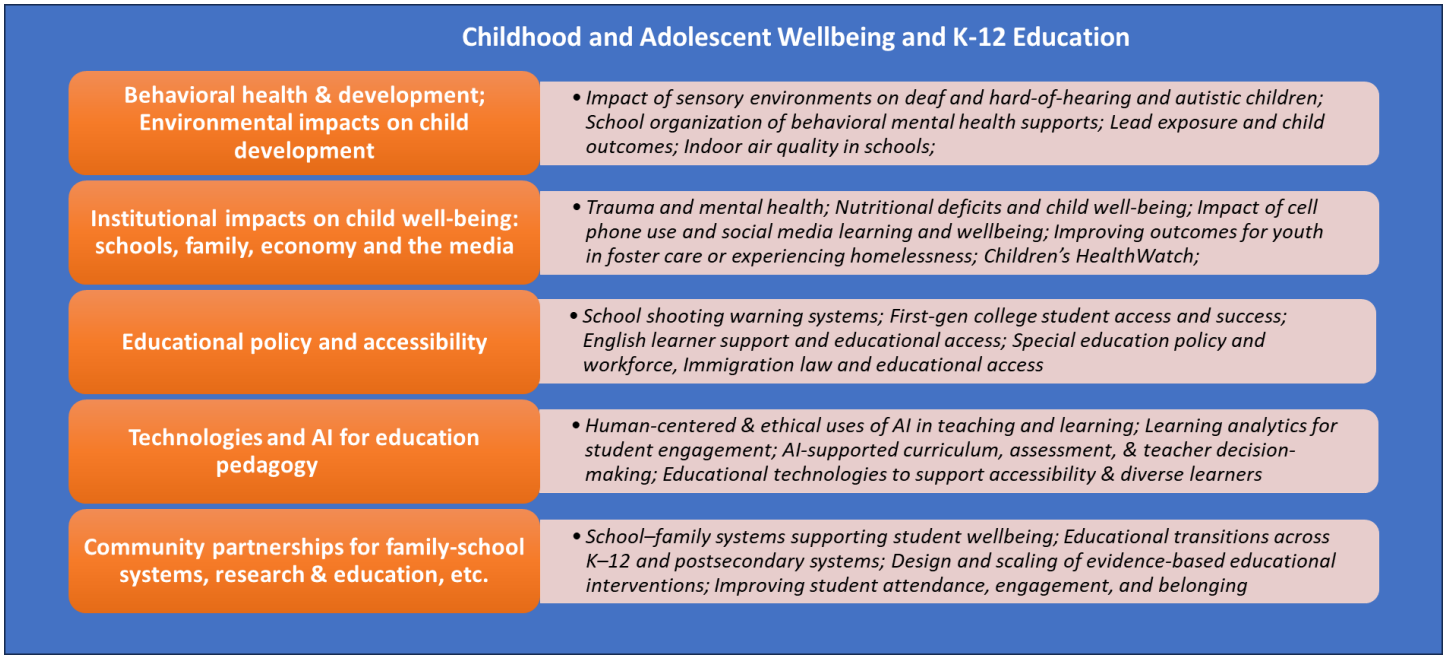

Figure 9: Subthemes for Childhood and Adolescent Wellbeing and K-12 Education convergent research theme

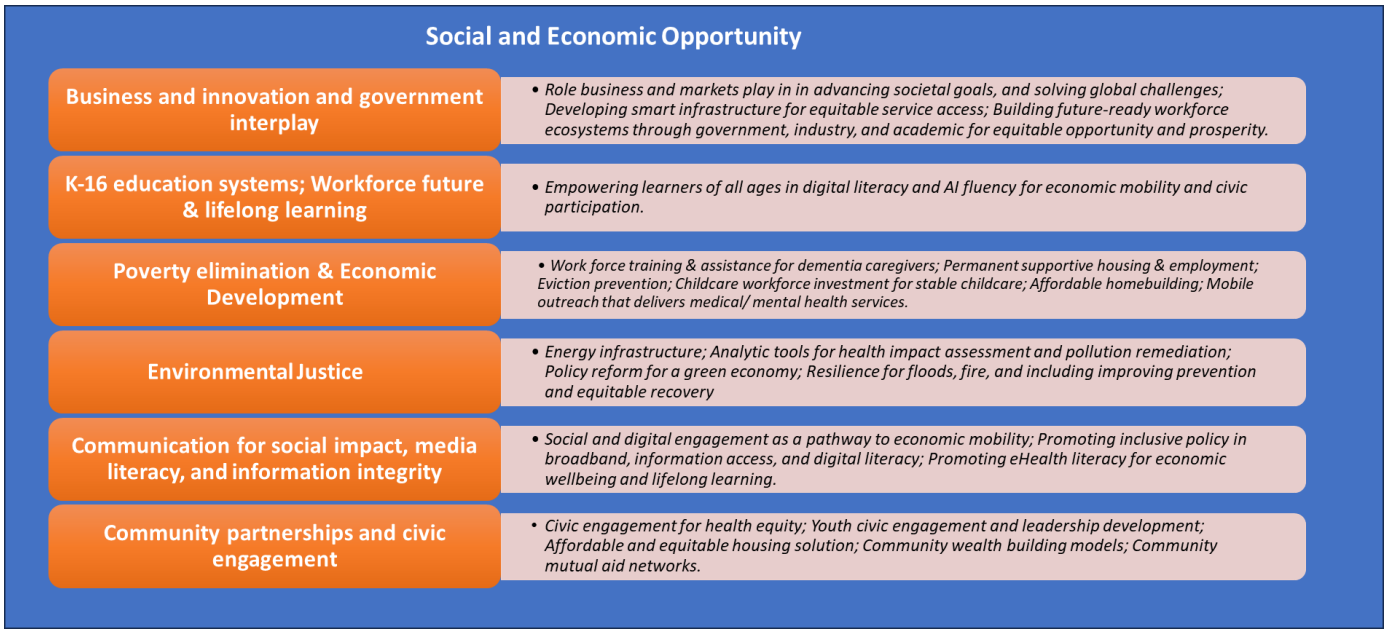

Figure 10: Subthemes for Social Economic Opportunity convergent research theme

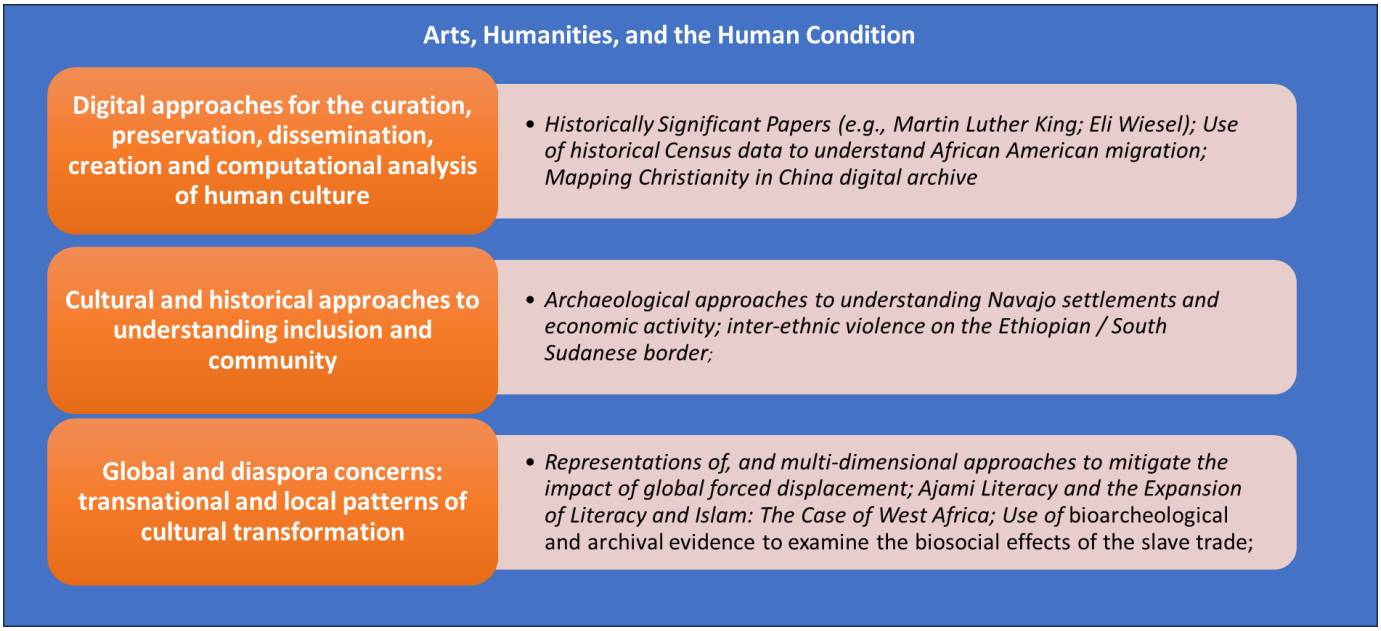

Figure 10: Subthemes for Arts, Humanities, and the Human Condition convergent research theme

5. IMPORTANT NOTE CONCERNING UNIVERSITY VS COLLEGE THEMES: During our process of identifying university-level convergent themes and subthemes, we discovered and learned that each school/college has exciting and high impact convergent themes that are primarily school/college level. These leverage faculty collaborations across departments primarily within these schools and did not rise to the level of a university-wide theme (see Fig. 1). That said, the task force encourages the Deans to consider a strategy of convergence within their school/colleges that leverages some of the concepts and ideas mapped out in Section 3 and Section 4 to help advance research impact and excellence.

3. REDUCING BARRIERS TO AND INVESTING IN CONVERGENCE SUCCESS

Four overall areas of barriers were identified through our crowdsourcing:

1. Reducing or removing institutional barriers to align faculty hiring and promotion processes with convergence

2. Reducing research resource constraints & designing research investments to promote and accelerate convergent research

3. Improving mentoring and support for early-mid-and even senior career faculty at BU, particularly to foster convergent research and collaboration

4. Reducing or removing educational resource constraints to convergent research

Under each broad area, we delineate more concrete and specific barriers. Then in a separate follow-on crowd-sourcing exercise, the task force shared these with all faculty in major leadership positions (deans, associate deans, department chairs and center directors) and requested they each provide about five ideas to address these barriers. These responses were collated, discussed and added to by the task force and then distilled. The following summarizes the results of this exercise in which each specific barrier is followed by ideas on how to alleviate them.

1. REDUCING OR REMOVING INSTITUTIONAL BARRIERS TO ALIGN FACULTY HIRING AND PROMOTION PROCESSES WITH CONVERGENCE:

1.1. Coordinate and Centralize Cross-Department/School Searches

- **Hire with Collaboration in Mind:** Systematize themed/cluster hires aligned with strategic convergent (sub) themes. Adopt hiring practices that actively recruit candidates with experience and interest in collaborative and interdisciplinary research.
- **Learn from Existing Models:** Study and replicate successful interdisciplinary programs within and outside of BU to institutionalize a culture of collaboration.
- **Create a Centralized Framework:** Establish standardized processes for joint and cross-departmental or cross-campus faculty searches to simplify coordination, budgeting, and decision-making between units.
- **Joint Appointments and Secondary Appointments:** Streamline and standardize the processes for secondary or joint appointments with clear policies on evaluation, workload, retention, and governance to reduce administrative friction.
- **Allocate Central Funds:** Allocate a small number of centrally funded competitive faculty lines annually for cross-school hires aligned with strategic themes. Create new lines that *must* be joint/secondary appointments rather than relying solely on departmental lines (see Convergence Investments Programs section).
- **Transparent MOUs:** Create template Memorandums of Understanding (MOUs) for shared hires (e.g., joint and secondary appointments, especially for hiring across

campuses or schools/colleges) to reduce negotiation friction, and clarify teaching loads, service expectations, reporting structures, and space allocation.

- **Involve Centers and Institutes in the Hiring Process:**
    - Consider the Provost providing research centers with faculty lines to support convergent-led searches in partnership with schools/departments. The centers would also be expected to contribute other resources to the search (e.g., space, access to core facilities, etc.). The new hire (and associated faculty line) must be appointed in an appropriate home academic department at the conclusion of the search, based on consultation with the candidate and relevant department chairs.
    - Engage centers and institutes early and consistently in the hiring process (e.g. design and dissemination of job ads, candidate review, interviews and feedback). Include Center directors (or a designated representative) on search committees.
    - When appropriate, connect candidates to centers during recruitment process and consider offering center affiliate appointments as part of the offer when supported by the center.
- **Establishing Candidate Home Department:**
    - As a guiding principle, the primary goal is to successfully recruit outstanding faculty candidates so if two or more departments are supportive of making an offer, the candidate should select their preference and ask for a secondary appointment in the other participating department(s).

1.2. Cultivate an Academic Culture and Incentives That Value, Support and Assign Credit for Interdisciplinary Research (see #3 also)

- **Highlight Success Stories:** Showcase impactful interdisciplinary/convergent projects and faculty at university events, board meetings, alumni functions, and strategic planning sessions. Highlight and celebrate publications that demonstrate institutional priorities and success.
- **Design Institutional Investment:** Provide resources and infrastructure to facilitate interdisciplinary research, including seed funding, grant-writing support tailored for collaborative projects, and platforms for faculty from different disciplines to connect and identify potential collaborations. (see Convergence Investments Programs section)
- **Offer Leadership Support:** Ensure processes and leadership narratives that convey support from the Provost's Office, Deans, and Department Chairs as well as University Appointments, Promotion, and Tenure Committee members for interdisciplinary work.
- **Incentivize Interdisciplinary Collaboration:** Foster a culture that encourages faculty to take risks in interdisciplinary projects.
- **Challenge Disciplinary Silos:** Actively work to break down barriers between departments and schools, including addressing concerns that collaboration will dilute departmental resources or commitment. For example, allow new hires to use PhD stipends in their startup packages to recruit students from other departments or interdisciplinary programs in addition to students from their home department.
- **Consider Hybrid Salary Models:** Develop creative models for hybrid hard/soft salary lines to help reduce barriers related to different faculty funding models across BU's schools/colleges.

- **Selectively Provide a One-Course Release** to faculty that lead to successful major center grant efforts.
- **Prioritize Joint Appointments:** Work to overcome departmental resistance to secondary and/or joint appointments and ensure a clear and consistent message about the university's commitment to interdisciplinary research. Ensure all units are current with this message.
- **Recognize and Reward Acts of Service:** Create a service culture that recognizes faculty members serving on convergent theme hiring committees.
- **Train in Collaboration:** Provide training and resources for faculty to develop skills in interdisciplinary research methods, communication, and collaboration, recognizing that it is not always a natural inclination.
- **Institute IDC Sharing:** Implement standardized, equitable, and transparent policies for sharing Indirect Costs (IDC) that reflect where money and effort is expended across participating departments and schools, rather than solely crediting the lead PI's unit.

1.3. Revising Faculty Evaluation, Promotion, and Tenure Criteria:

- **Recognize and Reward** interdisciplinary, collaborative, and team-based work (including co-authored publications, sustained impact, large-scale projects, and cross-sector partnerships) in promotion, tenure, and merit raises. Move beyond simply "accommodating" collaborative work to actively valuing it. Include guidance for both faculty members and review committees on how to include and evaluate high-risk/high-reward convergent research projects that were innovative but did not lead to immediate or easily measurable results.
- **Develop a Single, Unified Tenure and Promotion Process** for faculty with joint appointments, rather than requiring reviews in multiple academic departments. If encouraging interdisciplinary hires in traditional departments, revamp tenure and promotion requirements to recognize impact of collaborative research.
- **Implement University-Wide Guidelines**: Develop standardized university-wide guidance on promotion that values collaboration while allowing for individual school/campus customization as needed.
- **Showcase Individual Contributions:** Allow/require faculty to clearly articulate their specific contributions to collaborative projects, including their intellectual input, design contributions, and role on grants and publications (e.g., in CVs and promotion dossiers).
- **Train Review Committees:** Provide guidelines and training to promotion committees (at all levels) on how to fairly and appropriately evaluate interdisciplinary work, including considering contributions to team science and convergent research.
- **Refine Letters of Evaluation:** Ensure letters to external evaluators specifically highlight BU's commitment to interdisciplinary research and ask for evaluations that consider these values. Revise standard questions to avoid biases towards single-disciplinary achievements (with caveat that expectation of convergence should be applied only where appropriate to the candidate’s research foci/approach).
- **Ensure Fair Consideration for Different Disciplines:** Consider that some disciplines and types of work (e.g., in the humanities) might not fit the standard STEM-centric view of "convergence," and make sure promotion recognizes diverse definitions of effective collaboration. Moreover, while the goal of this report is to create a scaffold for

convergence to succeed, it is not to convey that all faculty need to participate in convergent research. Junior faculty with excellent and impactful scholarship, highly regarded by senior leaders and clear capacity to attract external research funds if needed, will also be competitive for promotion.

1.4. Improving Information Flow and Networking:

- **Enhanced Faculty Discovery:** Develop and promote a comprehensive, searchable, perhaps AI-enhanced, platform (beyond the current BU Profiles) that allows faculty to easily identify potential collaborators and experts across all schools and colleges, even those in "unexpected" departments.
- **Structured Networking:** Create more opportunities for faculty from different units to meet, discuss research interests, and identify common societal issues or themes for collaboration through targeted networking events, workshops, and retreats. For example, design follow-up steps for the Research on Tap program to help catalyze and sustain new collaborations. Use classes co-taught by faculty from different units as another mechanism to bring individuals and units together.

1.5. Consider New Interdisciplinary Organizational Structures for BU that May Better Support Convergent Research and Education:

- This could include a review of centers within schools and across the university to determine whether alternative structures, including creative mergers, could better foster convergent research related to major themes or subthemes. In the long term, this could also include more radical structural changes such as creating new colleges (e.g., College of Science and Engineering; School of Business and Economics; College of Education, Social Work & Human Development, etc.) to reduce cross-college barriers.

2. REDUCING RESEARCH RESOURCE CONSTRAINTS & DESIGNING RESEARCH INVESTMENTS TO PROMOTE AND ACCELERATE CONVERGENT RESEARCH INCLUDING THE EMERGENCE OF NEW AREAS OVER TIME.

2.1. Enhanced Financial Support for Interdisciplinary Personnel and Projects

- **Dedicated Funding for Ph.D. Students/Postdocs:** Provide institutional funding, fellowships, or harmonized funding models (especially between CRC and BUMC) for PhD students and postdocs engaged in interdisciplinary and convergent research. For example, this could include Deans or the Provost earmarking PhD slots for cross-departmental work. (see Convergence Investment Programs section)
- **Recurring Internal Seed Funding:** Offer more competitive internal seed grants and pilot programs specifically for cross-departmental, cross-school, and cross-campus collaborative projects to help faculty develop ideas to a point where they can seek external funding. (see Convergence Investment Programs Section).
- **Design Programs to Nurture the Emergence of New Themes:** Undoubtedly, new scientific, technical and research breakthroughs will lead to the emergence of new

convergent themes that can transform quality of life and/or accelerate impact on a new or even existing societal challenge.

2.2. Improved and Centralized Administrative/Grant Management Support:

- **Specialized Grant Support:** Establish dedicated teams or central mechanisms (e.g., within OSP or as shared resources) with expertise in managing complex, multi-PI, center-scale, and inter-institutional grants, including pre-award, post-award, and cost-sharing requirements. Note that some larger research centers already have these resources for proposals aligned with their mission. Similar structures should be established for major grant efforts that centers are not able to support on their own. Extending further, BU should keep a record of what support mechanisms for these types of grants are in place and how they best align with each convergent theme to help target grant support appropriately.
- **Streamlined Financial Processes:** Address complexities in financial record access and budget management for interdisciplinary grants across departments and schools, ensuring easier coordination and transparency for PIs and department administrators who manage faculty salaries and effort reporting.

2.3. Development and Access to Shared Research Infrastructure and Facilities:

- **Shared Research Spaces:** Invest in and designate more flexible, open, and shared physical research spaces, labs, and convening areas that facilitate collaboration across departments, schools, and campuses (e.g., between CRC and Medical Campus). This includes logistical support like inter-campus parking or swing spaces. In the longer term, design future research buildings around convergent themes rather than an academic department(s) or a single school or college.
- **Centralized Instrumentation & Core Facilities:** Provide university-level investment and support for shared, cutting-edge research instrumentation, core facilities and equipment, ensuring reasonable access and maintenance for all researchers. This includes identifying and upgrading existing shared cores to align with and enable convergent themed collaborations and impact.
- **Shared Data Resources:** Invest institutionally in key data resources (e.g., de-identified clinical data, national claims data, geospatial exposure and population data) and software (e.g., individual STATA licenses) to make them more broadly accessible to researchers without requiring individual investigator funding for each project.
- **Supported Software Engineering**. Research projects and areas of convergent research increasingly need some software infrastructure and personnel to support access to data resources, curation/customization of data to make them research ready for specific purposes, the building of custom tools to enable research efforts, including software engineering pieces of large grants, etc. A natural way to offer this is through Hariri's SAIL group.
- **Support for Distributed Networks:** Recognize and invest in the administrative and technological infrastructure needed to support large-scale, multi-site, and external partnership-driven research networks.

3. IMPROVING MENTORING AND SUPPORT FOR EARLY- AND MID-CAREER FACULTY AT BU, PARTICULARLY TO FOSTER CONVERGENT RESEARCH AND COLLABORATION

3.1. Formalized and Interdisciplinary Mentoring Programs:

- **Structured Programs:** Establish formal, structured mentoring programs that are not ad-hoc but integrated into the university's support system, with clear expectations for both mentors and mentees.
- **Mentoring Committees:** Move beyond a single mentor to implement mentoring *teams* (as is current practice in Chemistry) that include faculty from outside the mentee's home department/field, providing interdisciplinary perspectives and a broader network. This is critical for junior faculty as they build a balanced portfolio of high impact primary and collaborative research.
- **Offer Training in Mentorship:** Provide training for senior faculty on effective mentoring techniques for collaborative faculty, particularly for navigating interdisciplinary careers and building collaborative teams.
- **Cross-Campus Pairing:** Facilitate matching early-career faculty with mid-career or senior faculty from other departments or campuses to explicitly foster cross-BU collaborations.

3.2. Targeted Support for Building Collaborative and "Rainmaker" Careers:

- **Skill Development:** Offer leadership development programs that teach specific skills needed for convergent research, such as partnership-building, scaling initiatives, global outreach, managing complex projects, and "team science."
- **Seed Funding & Resources:** Provide competitive seed grants, research support, grant preparation and writing support, and administrative assistance for faculty at all levels pursuing cross-cutting convergent projects, with the explicit goal of generating promotion-ready outputs and external funding.
- **Visibility & Networking:** Create opportunities for early- and mid-career faculty to present their interdisciplinary work, connect with potential collaborators, and learn from faculty with established records of convergent collaboration and the receipt/leadership of major multi-investigator external grants.
- **Interdisciplinary Fellowships:** Consider competitive fellowships (e.g., "BU Interdisciplinary Fellows" Program) for mid-career faculty leading interdisciplinary initiatives, providing protected time and resources.

3.3. Aligning Promotion and Tenure Criteria with Interdisciplinary Contributions:

- **Revised Criteria:** Crucially, modify appointment, promotion and tenure (APT) criteria to explicitly value, recognize, and provide pathways for documenting interdisciplinary work, team science, and collaborative achievements. This is seen as the ultimate incentive to the successful pursuit of major grants.

- **Guidance & Templates:** Provide clear guidance, workshops, peer mentoring, and example dossiers (e.g., CV formats, narrative examples) to help early-career and tenure-track faculty effectively frame their collaborative contributions for P&T cases.
- **Center/Secondary/Joint Appointment Input:** Formalize the process for centers and participating departments to contribute to the P&T evaluation of jointly appointed faculty engaged in convergent research (i.e., invite and expect impact from departments/centers in which these faculty have some other form of appointment).
- **Protected Time:** Ensure that early-career faculty, especially those in teaching-emphasis tracks, have protected time for research/scholarship, and that interdisciplinary service does not create an unmanageable "double burden."

3.4. Integrated Support Systems and Cultural Shift:

- **Professional Development Office:** Ensure the faculty development office hosts regular, comprehensive training and mentoring events on both campuses specifically for cross-disciplinary researchers.
- **Integrated Mentorship:** Make mentoring an integrated and expected part of job descriptions, moving away from it being an informal process.
- **Shared Trainees:** Subsidize or facilitate shared PhD students or postdocs between early-career faculty in different units (e.g., SPH and CRC) to foster collaboration from the ground up.
- **Data/Statistical Support:** Provide readily accessible statistical and methodological support for early-career faculty, particularly clinicians, to aid in grant applications and research projects. Statistical support could be offered through the Math & Stats consulting program. Public & Medical health data support through the revamped BEDAC (now part of the SPH Center for Health Data Science), translational designs through the CTSI, and policy impacts through training programs at the Initiative on Cities.

4. REDUCING OR REMOVING EDUCATIONAL RESOURCE CONSTRAINTS TO CONVERGENCE IN EDUCATION AT BU

4.1. Streamlining and Incentivizing Interdisciplinary Curriculum Development:

1. **Promote Cross-Listed & Team-Taught Courses:** Actively encourage and administratively simplify the creation and delivery of courses that span multiple departments or schools, including resolving issues with credit count, faculty of record, and internal "bean-counting" over student seats.
- **Support Interdisciplinary Programs:** Invest in and provide centralized coordination and funding mechanisms for developing and sustaining thematic minors, certificates, and interdisciplinary concentrations, including support for course development and marketing.
- **Foster Experiential Learning:** Formalize pathways for students to engage in "real-world" interdisciplinary learning through partnerships, internships, capstones, and center-based training programs, leveraging external collaborations.
- **Support Development of Interdisciplinary Hub courses**. Recognizing that undergraduates are highly motivated to take courses that “count” towards the Hub, invest

resources in the development of team-taught convergent courses that would be candidates for Hub interdisciplinary course listings. These introductory courses will develop student interests in collaborative work, early in their academic careers.

4.2. Revising Faculty Incentives, Compensation, and Workload Models:

- **Provide Financial & Workload Incentives:** Offer clear financial incentives (e.g., tuition revenue sharing, course release, over base pay) and teaching credit/FTE accounting that accurately recognizes and rewards faculty who develop and/or teach cross-departmentally, team-teach, or contribute to interdisciplinary programs.
- **Formalize Recognition:** Explicitly recognize and reward faculty contributions to interdisciplinary education in merit reviews, promotion processes, and annual reporting, and perhaps even a periodic university-wide "convergent-research" lecture to incentivize participation.
- **Enable Cross-Campus Teaching:** Remove administrative and financial barriers (e.g., adjunct pay structures, salary coverage issues) that make it difficult for faculty from one campus (e.g., Med Campus) to teach on another (e.g., CRC) and vice versa.

4.3. Improving Administrative Processes, Flexibility, and Communication:

- **Streamline Course Approval & Management:** Fast-track the approval process for new interdisciplinary courses (reducing the current 18-month timeline) including Hub courses and simplify administrative procedures related to course cross-listing and scheduling (e.g., harmonizing SPH and CRC schedules).
- **Enhance Communication & Awareness:** Improve internal information sharing about existing interdisciplinary educational opportunities, courses, and resources across all schools and colleges to increase awareness among faculty and students.
- **Provide Centralized Support:** Offer centralized support and training for faculty interested in developing collaborative and interdisciplinary courses, including workshops on collaboration skills and pedagogical approaches for diverse student backgrounds.
- **Support for Students in Interdisciplinary Programs:** Provide resources like interdisciplinary teaching fellows (TAs) to offer "wrap-around" support for students taking courses outside their primary discipline and facilitate cross-registration access.

4.4. Developing Flexible Academic and Curricular Structures:

- **Joint/Dual Degree & Major Programs:** Facilitate the creation and approval of joint PhD programs, dual majors, and convergent minors/certificates that span multiple schools and colleges, addressing challenges in policies, practices, and cultures across units.
- **Team Teaching:** Actively encourage and administratively support team-taught courses across units, including finding ways to account for faculty workload and credit.

4. INVESTING IN CONVERGENCE AS A SUCCESSFUL STRATEGY

The task force recommends five categories of investments to advance the success of convergence at BU, most of which require partnerships between schools/colleges, research centers, and the provost's office. The design of many of the investment initiatives is based on many of the recommended solutions to the barriers in the previous section.

All key stakeholders need to demonstrate a willingness to invest their resources in themes they view as strategic priorities. For example, a dean should be willing to offer an existing faculty line toward a convergent hiring initiative, provided the provost and other deans provide matching support. The categories for university investments are as follows:

1. Convergent Theme Cluster Hiring Initiative

2. Convergent Theme Seed Grant Programs

3. Convergent Theme Ph.D. Fellowships

4. Convergent Theme Educational Enhancements

5. Oversight and Administrative Support for Convergent Programs

In the sections below, the task force provides a description and implementation models for each of the first 4 categories above. We then provide a detailed recommendation for the new administrative structure (category 5) for supporting and monitoring these programs.

1. CONVERGENCE THEME CLUSTER FACULTY HIRING INITIATIVE

The task force recommends that the University periodically run cluster faculty hiring initiatives in partnership with the Provost's Office. We further recommend that the university pilot two convergent themes in Years One and Two and then revisit the process to improve it in subsequent years. These initiatives would work as follows:

1.1. Search Process

For each initiative, the provost's office would solicit hiring proposals from "units" for faculty aligned with any of the subthemes associated with a major convergent theme. The units would include two or more schools/colleges and potentially university or college-based research centers. Because of the size and breadth of CAS, it is possible that a proposal could be from departments only in CAS, but comprising an exciting range of distinctive disciplines/departments aligned with a convergent theme. Regarding research centers, the task force recommends piloting the concept of providing a faculty line to a research center that is already aligned with a subtheme. The center would then need to partner with both a dean and department, as any hire in that line must have a home in an academic department. All participating units would offer resources in addition to the line (e.g., space, access to core facilities, etc.). Finally, the cognate schools/colleges and the provost's office would collaborate in providing startup costs.

Below are proposed details of how these searches can be designed and run. Following the pilot, a debrief should refine the process to improve success.

- Each initiative would search for multiple faculty hires whose research areas are aligned with the convergent theme but whose expertise and home departments would align with a range of academic departments and schools/colleges. The faculty searches can be at assistant, associate, or full professor levels with the latter requiring a greater commitment to space and start-up funds from all units. We anticipate that most recruits will be early career stage.
- The Request for Proposals (RFP) will ask deans/chairs/faculty to self-organize and prepare a proposal aligned with one or more subthemes within a convergent theme.
- The RFP will ask for letters of support from participating department chairs and their deans, as well as from research center directors if they are part of the partnership.
- Each participating department and college/school must identify and commit to the space plan needed for a range of anticipated candidate types (e.g., from experimental to non-experimental). In other words, if the top candidate aligns with a department, that department should already have designated the space they would occupy (which could be in a center as well). Similarly, the sources of all projected start-up costs for all types of candidates need to be agreed (committed) to between the university, school(s)/college(s) and department(s) in advance.
- Deans/chairs must commit to a process in which the departments in which the top candidates will have their primary appointments *is not known in advance*. In other words, we recommend a process embracing an "open" mindset that allows the successful candidate to join a department based on "fit" and their own preferences.
- The goal is to find the best candidates for the convergent theme, but the search committee must work to ensure the candidate would also be an exciting addition to whichever participating department with which they best align. The department can be selected based on best fit after the search has found the best candidate. But (see below), the faculty and chair from the "best-fit" department must also support hiring the candidate. Note that the proposed initiative has the provost adding a faculty position to the cluster search. Hence, it is possible that one of the participating departments will end up recruiting two new faculty while offering only one vacant line.
- If the number of faculty positions is equal to the number of departments participating plus one (provost line), the committee should work towards the goal of each participating department hiring at least one new faculty member. If none of the top candidates align well with a participating department, then the faculty line returns to the department (or respective school/college). This will require real-time assessment as to where the best candidates are matching and whether negotiations are successful or not. The above ensures that every participating department has one of three outcomes: 1) a new faculty member well-aligned with the convergent theme and the department is hired; 2) two new faculty are hired (i.e., the extra provost line); or 3) no new faculty are hired but there is no loss of the faculty line. Hence there is no risk to a participating department. We recognize that the timing of searches varies widely among disciplines, so cooperating departments must develop a clear timeline to ensure that they are competitive in recruiting those candidates from disciplines that typically act very early in the annual hiring process (e.g., in the fall semester of the year prior to the start date).

- Candidates who are acceptable matches to two or more departments will choose which one they prefer to join as their primary and should be offered secondary appointments in one or more other departments (consistent with the convergence concept).
- Deans, center directors, and departments design a search committee in advance, composed of faculty across the university that engage with a convergent theme.
- Search committee members must embrace a commitment to elevate BU's excellence in the convergent theme, equitably spanning participating departments, centers, and colleges. Hence, they must recognize that they are not recruiting for their department alone, though they will need to assess whether a top candidate would be a good fit for their department's teaching, mentoring, or administrative needs as well.
- Participating departments must understand that by choosing to participate, they have decided the search area is one of their highest strategic priorities. The goal is for the search process to produce an excellent convergent theme faculty member to join their department even though the department did not run the search itself. That said, any candidate recommended for hire by the search committee must also be supported by the chair and faculty of the proposed home department. This means that search committee members in that department need to guide the process of the home department faculty engaging with the candidates. For example, it may be useful to have the chairs of the appropriate departments review the application materials of candidates selected for campus visits to calibrate concerns/suggestions in advance of designing each visit. For those candidates invited to campus, the itinerary should ensure that an appropriate set of likely home department faculty meet them. Also, all faculty in all the likely home departments should be invited and encouraged to attend the on-campus seminar.
- Because participating is an opportunity for a department to add one or more new faculty members in a high priority strategic area, department level support should be based primarily on the merits of the candidate without concerns about possible impacts on future hiring in other areas (as they would for a traditional approved search).
- The search committee makes recommendations on who they recommend for hiring based on positive feedback from convergent theme faculty and from home department faculty (and, where appropriate, graduate student feedback in departments where this is the norm). If more than one candidate is recommended for a specific department, the department prioritizes the order in which they will initiate negotiations (in consultation with the search committee).
- Negotiations for an offer letter are run by the home department, not by the search committee, and in consultation with that department's dean (or deans if it is a senior hire with a split appointment) and center directors should their resources (space, equipment etc.) come into play.
- The designated line from the provost may need to be returned to the provost's office if that convergent hire leaves the university.

<u>1.2. Managing Cross-Department Appointments</u>

The task force expects that the typical assistant professor convergent hire should have a single primary departmental home while receiving one or more secondary appointments in disciplines that the convergent theme intersects with. For associate or full professor hires, split tenured lines are acceptable as would be 50:50 split between a tenured position on the CRC and senior status

in a medical campus department. Because of the nature of a convergent search, it is expected that most or all candidates will map into one or more secondary appointments. It is essential that we lower the complexity and barriers for any convergent junior hires receiving secondary appointments.

We further recommend that a small group of faculty members develop an MOU template to help govern the expectations of cluster faculty hires. The MOU would cover items such as the distribution of teaching, service, and salary across multiple departments if any of these are relevant. For example, while an assistant professor may have a home department, it is possible that the home department, secondary department, and the faculty candidate all agree to have the candidate develop and/or teach one of their courses on a topic that would attract students and count toward degrees in the secondary department as well. The MOU should be explicit as to the inputs (roles) from secondary or joint appointment departments needed to support mentoring (in the case of early-career faculty), as well as merit, reappointment, and promotion reviews. The MOU would be particularly important for faculty hired with secondary and/or joint appointments between the Charles River and Medical Campuses. For this situation we recommend the university develop a formal policy that allows for Charles River and Medical Campus faculty to engage in cross-campus instruction, which would include creating a new policy that equitably compensates faculty for teaching efforts independent of the campus the teaching occurs on.

Finally, in rare cases, split primary appointments may make sense and be more desirable for a particular junior hire. When this happens, we recommend developing a tenure/promotion process that creates a single committee (with faculty representation across the relevant departments), followed by a single joint review committee at the college/school level and a single letter jointly signed by the deans summarizing the case.

1.3. Support and Mentoring for Collaborative Portfolios for Tenure-Track and Early Career Faculty

Traditional tenure/promotion assessments focus heavily on scholarships for which the candidate is lead/senior author or sole author (especially in the humanities and social sciences), citations to those articles, and grants for which the candidate is the principal investigator. For convergence to work, this perspective needs to broaden at the department, college/school, and university levels. The messaging to early-career faculty should convey that we value a balanced portfolio of scholarship and funding. This means that the candidate still needs to show evidence of scholarship for which they are the driving lead/senior author and grants on which they are the principal investigator in fields that rely on funding. However, it is also acceptable and encouraged to have these works balanced with scholarly contributions where they are co-authors on a convergent team of faculty and co-investigators on collaborative grants. Creation of such a portfolio will require standing up new mentoring processes. Such successful collaborations should be celebrated. Further, departmental tenure and promotion guidelines should be revised to reflect these criteria.

The most important challenges to address for convergent junior faculty mentoring are to:

- **Develop Mentoring Systems to Help Catalyze and Assess Collaborative Research Partnerships.** One idea is to expand the title of college/school associate deans for research to become associate deans of research and faculty development (which already exists in Engineering and School of Public Health). The latter half of this title connotes that the position is responsible for helping junior faculty engage in collaborative efforts that elevate their research reputation and impact, and that their portfolio of scholarship and grants reflects a balance between research for which the candidate is the primary driver and research for which they are also an essential collaborator.
- **Facilitate Intentional Actions that will Help Communicate the Important Intellectual Contributions the Junior Faculty Member has Made to Collaborative Work** (e.g., external seminars, lead or senior author faculty giving credit to the creative role of the collaborator, etc.). We can envision one or more faculty-wide Research on Tap sessions focused on the convergent topics, led by the early career member(s) to heighten their visibility and as a clear messaging of support for this work.
- **Work with (Mentor) Faculty to Improve our Processes for Valuing Collaborative Efforts in the Dossier of any Faculty Member Coming up for Promotion.** In some cases, this will require modifying processes that have typically relied on a more formulaic approach such as "must have lead authorship in a set number of predetermined top journals." Tenure and promotion evaluation invitation letters should explicitly inform referees that BU highly values and supports collaboration as a means to elevate a candidate's research impact, and the referee should be asked to assess the candidate's effectiveness as a collaborator. Promotion materials should be structured to highlight collaborative contributions, including by the faculty member designating their specific contribution within each peer-reviewed manuscript and by indicating their contributions as co-investigator within each non-PI grant. An anticipated outcome of prioritizing convergence as a heavily weighted component of promotion candidacy would be increased numbers of BU faculty serving in shared, converging leadership roles, such as "multi-PIs" (MPI) on NIH grants or Co-PIs for NSF, DoD, DOE or other grants.

We add that while the goal of a convergent search hire is to elevate scholarly contributions via collaboration, no faculty member should be penalized for *not* collaborating if their portfolio at promotion reflects the success necessary for promotion/tenure. For example, if the candidate has the more traditional portfolio of only lead-author or senior author papers in top-tier journals that are well cited, and high success at funding as principal investigator, then such a candidate would be highly competitive for promotion as usual. Our recommendations should be heeded and implemented in such a way that complement the prevailing practices within particular disciplines and subfields.

2. CONVERGENT THEME SEED GRANT PROGRAMS

Seed funding is a vital mechanism to stimulate novel research that is both convergent and addresses critical societal challenges. These programs aim to foster interdisciplinary collaboration, enabling researchers to generate high-impact scholarship that can attract substantial external funding. The initiative should encourage innovative, high-risk/high-reward projects that integrate disciplines creatively rather than applying them in isolated or siloed ways. Seed grant amounts and length should be designed to promote (and not disincentivize) long term

pursuit of extramural funding opportunities. Ideally seed funding would support initiatives that fall within convergent research theme areas already identified as BU strengths (top down) as well as initiatives in new areas that are organized by faculty (bottom up; see "Catalyzing new research themes" below).

Importantly an administrative structure within the Office of Research will guide investigators and team leaders through various stages of funding (as detailed in the oversight and administrative section of this document below). We recommend the establishment of a formalized Office for Convergence Research Programs at BU. As detailed below, the proposed new office would be led by an individual experienced in research who would guide, mentor, and carry out the recommendations made in this document, including overseeing the awarding and progress of grants. They would work closely with existing units, including Federal and Foundation Relations, to amplify their work and coordinate efforts.

The following recommendations were developed by the task force, designed in part to address some of the barriers identified above in tandem with recommended solutions from our crowdsourcing, and in part based on elements from successful operational models for seed grant programs that have engaged oversight and community building (e.g., the seed grant programs of the Hariri Institute, ARC, and CTSI). As another guiding principle we recommend a portfolio of programs that encourage all convergent themes to build communities and ideas that can lead to high impact research. Specifically, we recommend two forms of investment: 1) larger seed grants; and 2) smaller planning grants. Smaller planning grants are geared towards helping catalyze assembly of new cross-disciplinary and/or cross-themed faculty communities as well as catalyze new themed areas emerging from self-assembly of faculty across disciplines, anticipating that themes will change, emerge, or evolve in the years ahead.

Below we describe both programs:

2.1. Convergent Research (Large) Seed Grants ($150-250K/year for 2-3 years)

These seed grants are designed to support larger-scale projects led by principal investigators from two or more units, as defined above (see "Cluster hiring" where units = schools/colleges/centers). The RFP should be associated with a convergent theme chosen for seed funding that year (top-down support) and may align with any of the subthemes under that theme. Moreover, while the seed grants each year will focus on a subset of convergent themes, faculty should be encouraged to propose projects that can overlap with the main themes of other related convergent themes (e.g., Health Across the Lifespan and Computing, Data Science and AI; or Sustainability and Urban Development, etc.).

Key goals include:

- Catalyzing comprehensive approaches to address critical challenges.
- Combining disciplines in innovative ways to create methods that do not typically emerge from single disciplines.
- Identifying potential sources of sustained sponsored research for the initiative.
- Producing compelling preliminary results for a major external funding opportunity.

If successful, these projects should enhance Boston University's reputation and position the research team as competitive candidates for substantive team-oriented follow-on funding from external sources. Seed grant funding may be used for:

- Support for Ph.D. students or postdoctoral researchers, ideally co-mentored across disciplines.
- Support for research staff working specifically on the seed grant project.
- Instrumentation that will serve to catalyze communities of faculty across disciplines and elevate potential to perform research in a theme.
- Modest research expenses such as travel, data purchase, software, reagents etc.
- Partial base salary (<20%) for Medical Campus faculty who do not have 9-month guaranteed positions.
- Support for organizing a major symposium at BU aligned with the topic of the seed grant that will enhance BU's visibility and strength in competitive and important areas (e.g., potential future reviewers).
- Honoraria for expert reviewers of in-progress major grant proposals, such as training grants or multiple PI grants.

We further feel it is essential for the participating Deans, Center Directors, and the Office or Research to work together to identify dedicated convening space for the faculty, students, and staff participating in a selected Seed Proposal. This is particularly important when the faculty derive from departments that are geographically widespread, especially for MED – CRC collaborative groups.

Two stage review process:

Stage 1 would be preproposals (3 pages or so), which will serve to catalyze self-assembly and crosstalk among many faculty working in any one of the subthemes. Some of these pre-proposals will have fully identified faculty teams from across the university. But another purpose of this stage is to help connect faculty across disciplines. Here the preproposal will identify some potential collaborators, but the review process will proactively connect these to other faculty at BU who are potentially aligned with the project, thereby fostering new convergent teams.

For Stage 2, a subset of those submitting pre-proposals will be invited to submit a full proposal and a subset of these will be chosen for funding. We anticipate significant pre-award coaching as described in the Oversight and Administrative section below.

2.2. Convergent Planning Grants (Smaller; $25-50K, One-Year Duration)

The Planning Grant program would be open to all convergent themes not selected for that fiscal year's Seed Grant round as well as proposals seeking to catalyze new emerging themes. The planning grant serves for brainstorming transformative approaches to address important societal challenges in areas other than the Themes chosen for Seed funding that year. The planning grant program will serve an important role to inform the Office of Research regarding selecting the next year's set of themes for the cluster hiring, seed funding and PhD Fellowship programs. A planning grant would provide resources for faculty to:

Catalyze Cross- or New Convergent Themes

- Self-assemble and pursue projects that cut across multiple themes (e.g., "Global Sustainability and Urban Planning" or "Artificial Intelligence and Infectious Disease").
- Identify and advocate for new convergent themes where Boston University can lead.
- Organize workshops and retreats to explore existing or new convergent research themes.
- Fund short-term student/research assistant projects or pilot studies.
- Review literature, assess patent or research landscapes, and identify opportunities within an existing theme or as part of catalyzing a new theme.
- Develop a comprehensive vision and approach for preparing a major center grant such as an NSF-ERC, NSF-STC, NIH-Center grant (P01/PPG, P30, or P50), or Training Grant (e.g. NIH-T32), etc.
- Develop communications and preliminary frameworks that can support external funding proposals.
- Support modest research expenses such as travel, data purchase, software, reagents, etc.
- Honoraria for expert consultants from other peer- or peer-plus organizations who can provide constructive feedback and vision on in-progress proposals.

The expected outcome from this grant is either a follow-on seed research proposal or direct external funding to execute conceptualized research. The Office of Research will mentor both outcomes for each planning grant submitted and funded.

Each project should demonstrate success toward a set of deliverables along specific timelines, ensuring readiness for external funding opportunities.

Matching Funds from Research Centers:

Many centers have relatively small seed grant programs already. There may be an opportunity to leverage these programs with the larger convergent research program, Hence, the task force recommends developing an approach in which an existing research center has an opportunity to offer partial matching with central funds. These centers would be given the opportunity to review highly rated convergent proposals and identify those for which they would be willing to provide additional funding.

3. CONVERGENT THEME PH.D. FELLOWSHIP PROGRAMS

Pilot funding is recommended for 4-8 fellowships annually. These fellowships would be called a "***Distinguished Ph.D. Fellowship in XXXX (fill in convergent theme name)".*** We also recommend that each year the themes to be supported by these fellowships be aligned with the convergent theme faculty hiring initiatives being selected that year. To facilitate convergent research each nominated fellow should identify co-faculty supervisors from two distinct disciplines. Currently, active BU T32 training programs that include multiple departments tend to emphasize training in convergent research areas and thus can be used as one starting point to help identify areas of strength to build upon.

To align doctoral research with interdisciplinary priorities, the task force proposes piloting two types of fellowships:

3.1. Second-or Third-Year Fellowships

The Office for Research would solicit nominees from (groups of) faculty for Ph.D. students currently in their first or second year and guide the selection process. These Ph.D. students would have begun coursework and research in a convergent theme. Departments or centers should be limited in the number of nominations per year (1-2 students). These fellowships provide stipends funded 50:50 by the Provost's Office and a source of funding (preferably external) from faculty in the student's department or a research center. For themes traditionally supported by external grants, 50% of funding can come from a faculty member's grant or the center. For students receiving 50% from an existing faculty grant the fellowship can be extended for two full years with a 50:50 split each year. This allows for a single provost provided fellowship to contribute to 2 years of partial support so long as the faculty member provides the remainder.

3.2. First-Year Fellowships

To attract extraordinary Ph.D. applicants, these fellowships incentivize enrollment with benefits such as a $5,000 signing bonus (either as salary if permitted or to be placed into a research discretionary account for the student's use). Departments share funding equally with the Provost's Office, with selection driven by recruitment goals aligned with convergent research themes.

Fellowship Community Building
Similar to BU's existing training grant programs, over time, fellows working in convergent themes will form cross-disciplinary communities, enriching academic exchange through journal clubs, seminars, and shared research initiatives. The Office of Research will work with senior faculty in such themes to help develop and fund regularly scheduled if not required activities to create these communities with the goal to eventually drive the development of Ph.D. training grants aligned with key themes.

3.3. Incentivizing Training Grant Proposals Aligned with Convergent Themes

The task force anticipates that over time well-funded communities of faculty with Ph.D. students will evolve along convergent themes and in alignment with established research centers. These faculty should be encouraged to design training programs in the relevant theme and compete for a training grant. To incentivize this, we recommend that the Provost's Office and/or Dean's fund a matching (i.e., additional) training slot for programs with funded training grants aligned with convergent research themes. These need not be "new" slots but a commitment to allocate from the existing pool of PhD slots one to the PI who coordinated a successfully funded training grant.

4. CONVERGENT THEME CURRICULAR ENHANCEMENTS

The task force recommends an RFP process to fund innovative academic offerings that align with convergent themes and when possible, partner with the Institute for Excellence in Teaching and Learning to implement and oversee these initiatives:

4.1. Thematic Courses

Funding can support faculty course development time or buyouts to create team-taught courses (e.g., "Energy Technology Innovation & Public Policy") at undergraduate and graduate levels that attract students from multiple disciplines. We also recommend developing administrative mechanisms to ease cross-listing of convergent courses across different departments and schools so they can meet degree requirements in different programs. Funding levels could include one-time support for initial course development and transitions to more sustainable department-led models. We also encourage undergraduate courses developed under this aegis to receive Hub approval under their interdisciplinary course banner.

4.2. Concentrations or Minors

Proposals for new thematic concentrations (3-course series) or minors (e.g., "Digital Medicine," focusing on AI and machine learning applications) should include commitments from department chairs and deans. Such proposals would have to be approved by the existing required mechanism of review.

4.3. Master's Degree Programs

Funds can support market analysis and pilot development of a new master's degree program aligned with a convergent theme. For a new MS degree, the proposal needs to first perform a market analysis with compelling results that such a degree will attract students at sufficient levels to warrant the investments in the program (working with the central administration, e.g., Associate Provost of Graduate Affairs).

4.4. New Ph.D. Programs

We do not anticipate using convergent funds early on to seed new Ph.D. programs. However, we recognize that such programs could arise over time and should be considered in the future, with the goal of attracting unique students interested in convergent research and education. We can envision convergent "certificate" programs for graduate students, such as the existing interdisciplinary Graduate Certificate program in Women's, Gender, and Sexuality Studies.

5. ADMINISTRATIVE SUPPORT, MENTORING AND MEASURING SUCCESS

This strategic vision for seed funding is designed to transform Boston University's research ecosystem, fostering innovation and collaboration in ways that address society's most pressing challenges. Implementing, sustaining, and ensuring exceptional return on investment will require exceptional logistical support and mentoring of funded programs.

To ensure the success of these initiatives, the task force recommends that they broadly are overseen by the Office of the Provost which will need to coordinate the Office or Research oversight, partnering with the academic Deans, and partnering with the relevant members of the provost cabinet. In that context we recommend the following:

- Creating a dedicated position with responsibility to oversee all **Convergence Research Programs** and funding provided by the Research Development office of the Office of Research.
- The provost will work closely with the Office of Research to review, select and help fund Convergent Cluster Hiring Proposals.
- Creation of an oversight team chaired by the Vice President for Research to oversee the entire portfolio and processes for convergent programs, with an eye towards ensuring that the different categories of investment described above are deployed synergistically to support the development of the most promising convergent themes. This team will oversee the seed programs, mentor seed grant awardees, ensure progress of convergent theme Ph.D. Fellows, and manage a robust system for monitoring progress of funded seed grants (e.g., quarterly reports). The VPR and Research Development team will also ensure projects align with desired metrics (see below), including high-impact scholarship and external funding competitiveness.
- For those programs that require innovations in faculty mentoring and in PhD Fellowship selections the team will need to explicitly connect with the Associate Provost for Faculty Actions and the Associate Provost of Graduate Affairs
- Management of Seed/Planning Grant Programs: Three phases of support would be provided:
    - 1. **Project development and pre-award**: either in response to an RFA or because of spontaneous ("out of cycle") ideas or proposals to the Office, the Director will provide coaching, input, and guidance to faculty who seek to develop proposals. Where appropriate, the Director may approach faculty to encourage or facilitate convergence project development. Project Development will also involve formal campus wide calls for "preproposals" that would then be guided by feedback from the Director and appropriate advisors on feasibility, scope, and likelihood of funding.
    - 2. **Grant Award**: Selected preproposals would move on to proposal stage with Director staff consulted for budget/expense estimates, and review committees or additional stakeholders providing scoring of proposals. Review committee recommendations will be sent to the Vice President for Research and Provost for final funding decisions. Award letters are issued and coordinated with a social media campaign launched to highlight and celebrate awards for the public and for potential donors.
    - 3. **Post-award**: The Director and their office will be actively involved during the entire award period and after the conclusion of the award.
        - Administrative staff support will help Project leads book facilities, plan meetings, and provide additional logistical support as needed.
        - Staff will also prioritize participation of funded teams in campus-wide celebrations of research, such as "Research on Tap" or appropriate on campus research poster sessions or presentations. A campus-wide

celebration of convergence research with talks and posters may be considered once a critical mass of funded researchers has been achieved.
    - Importantly the Director will also hold funded teams accountable by reviewing periodic reports, providing feedback to Project leaders on their productivity or lack thereof, and will emphasize applying for follow-on funding. Seed projects that are achieving success should be mentored in real time to prepare proposals for extramural support. Similarly, seed grants should be terminated if the proposed approach does not produce encouraging results.
    - The Director will also be responsible for tracking all outcome metrics and return-on-investment scores.

6. MEASURING SUCCESS AND KEY METRICS AND PERFORMANCE INDICATORS

Because of the wide diversity of disciplines and areas covered by the eight major themes and their subthemes, the task force did not think it appropriate to define a uniform set of quantitative metrics to evaluate the success and efficacy of the program investments in advance. Rather, we identified a range of markers that gauge impact and quality. These are summarized as follows:

5.1. Faculty Hiring and Development

- Successful recruitment of outstanding faculty, especially in cases where candidates have competitive offers from peer-plus institutions.
- Communication to promising candidates BU's novel commitment to "convergence" as an important benefit of establishing a research and teaching career at BU.
- Evidence of success in collaborative publications, citation, funding, and other indicators of impact among assistant professors in their first three years at BU (e.g., mid-tenure/mid rank review).
- Number of new faculty with joint appointments across multiple departments/schools/colleges.
- Capacity to attract star senior faculty from peer-plus institutions.
- Submission to receipt of major center-like grants related to convergence research themes.

5.2. Seed Grants

- Scholarly impact of multi-author publications supported by seed funding (e.g., articles in high-impact journals, monographs with prominent university presses).
- Numbers and sizes of grants submitted to and funded by federal agencies for major multi-PI projects initially developed with seed grant.
- Numbers and sizes of grants submitted to and funded by foundations or philanthropies for major multi-PI projects initially developed with seed grant.
- Planning Grants
    - Creation of new collaborative groups or significant expansion of existing collaborative groups of faculty generating exciting new potential concepts or approaches for important problems.

- Successful follow-on funding after being awarded either from a larger internal seed grant or from external funding source.

- Ph.D. Fellowships

  - Successful recruitment of outstanding students via funding packages competitive with peer and peer-plus institutions (for 1st year fellows only).
  - Feedback from recruited students of "convergence" approach as an important factor in choosing to come to BU.
  - Evidence of publications as lead or co-author on multi-author convergence papers in high quality journals (or book chapters).
  - Citations to research in "cross-field" applications or journals.
  - Evidence of success at building community of Ph.D. students from multiple degree programs via writing groups, journal clubs, student seminar or work-in-progress events etc.

- Education Innovation
-
  - Evidence of increasing enrollments and a broad spectrum of students from multiple disciplines in newly developed convergent themed elective courses, concentrations, or minors.
  - Add to formal course evaluations a prompt assessing the course's capacity to generate thinking and collaboration across disciplines.
  - Excellent formal evaluations and qualitative student comments regarding the course's capacity to generate thinking and collaboration across disciplines.
  - High and rising enrollments in approved convergent themed master's programs.
  - Successfully adding convergent-themed undergraduate to the HUB's "interdisciplinary course" roster.

SUMMARY OF PROPOSED IMPLEMENTATION

We recommend piloting the *large seed* and smaller *planning grants* and *Ph.D. fellowships* for two years using quarterly assessment of the funded programs (e.g., follow on proposals and funding, etc.) to help shape future programs. We also recommend that each year of the program, funding is prioritized for seed grants and Ph.D. fellowship applicants whose research and teaching foci align with the convergent themes chosen for cluster hiring. We anticipate that after refining these programs and mentoring planning grants into newly convergent successful programs, new sets of convergent themes will be selected for development in subsequent years.

5.CONCLUSION AND RECOMMENDED NEXT STEPS

Boston University has a celebrated history as a world-class, impactful research and teaching institution. Both derive from internal investment and from successfully competing for and attracting substantial external funding. Yet BU – like all major research universities in the US – is at a crossroads, facing new and potentially destabilizing challenges as it strives to maintain and elevate its educational and research missions. Our research universities face potentially less favorable and unconditional support from the government or the public. Competition for funding, talented faculty, and top students continue to rise in an ecosystem where resources, whether from federal, foundation, or industry sources, are tighter and require clearer demonstration of return on investment.

The United States is home to the world's leading research universities and has long stood as an extraordinary model of government-academia partnership that fuels research innovations and drives continuous growth in the economy. *Now, perhaps more than ever, R1 institutions need to be more strategic in how they spend their funds if they are to sustain or grow their research success and impact*. We believe embracing the concept of "convergence" as a guiding philosophy is a critical component for this new strategy; one that will maximize the return on university dollars invested. Moreover, investing in convergent communities of faculty aligned with a theme of existing or emergent strength at BU should position these groups to be more competitive for all forms of funding including philanthropy and/or to produce high impact scholarship in all fields including those that do not typically engage much external funding. A key reason is that groups of convergently collaborative faculty across disciplines will be more intellectually ambitious, fearless and aspirational for addressing societal challenges. If we succeed in this mission, we will attract more than our fair share of superb early-career and advanced faculty, PhD students, Masters students and undergraduates.

The current challenges facing higher education were an important motivating factor as task force members devised, deliberated over, and ultimately designed our proposed framework for success. We recognized from the start the complexity of the challenge for engaging all stakeholders and deriving a collective vision which would resonate with scholars and teachers form diverse disciplines, methods, and career stages. The eight major convergent themes and their respective subthemes resulted from inputs across the entire university and at every level of faculty and leadership. Our processes also noted exciting convergent themes at primarily the school/college level that could be advanced strategically by their deans. In addition to the themes key barriers to overcome for succeeding at convergence as a strategy came forth from this same community. The potential solutions to overcome these barriers and strive to become an institution proud of our convergence approach came from those in all forms of leadership who would need to oversee the implementation of these solutions. Finally, the investment programs and structure were designed specifically to deal with the solutions proposed to reduce barriers and catalyze success.

1. RECOMMENDED NEXT STEPS

- Establish transparent, defensible, and objective processes for reviewing and selecting proposals for seed grants, fellowships, and clustered faculty recruitment.
- Consider creating a standing university level "Committee on Convergence" with a charge to consider best ways and priorities for implementing some of the solutions proposed for

reducing each barrier area (Section 3), focusing on those solutions not explicitly addressed by the investment programs described in Section 4. This group should be a mixture of leadership-level faculty and key Provost cabinet members whose portfolio overlaps with the proposed solutions (e.g., Associate Provost for Faculty Actions, for Graduate Affairs, and for BU Virtual and Excellence in Teaching and Learning).

- Pilot two initial convergent themes with clustered hiring, seed grants, and PhD fellowships; invite proposals from all subthemes within each selected theme.
- Encourage proposals that intersect multiple themes; leverage enabling platforms such as AI, Data Science, and Computing.
- Issue a campus-wide call for planning grants to catalyze bottom-up, self-organized convergence initiatives; simultaneously invite planning grants across all other major themes.
- Commit to expanding investment programs to additional themes via rotation and/or increasing the number of funded themes annually.
- Develop robust methods to monitor process and outcomes, including mentoring and promotion practices that recognize collaborative impact across career stages.
- Track external metrics of success (e.g., winning competitive recruitments in convergent searches versus peer and peer-plus institutions, follow-on funding from seed/planning grants, recognized scholarship and impact).
- Partner with the Shipley Center and the Institute for Excellence in Teaching and Learning to launch an RFP for convergent educational initiatives in year one and beyond.

SUMMARY

BU has the opportunity to build processes and a culture of collaboration at a scale few institutions can match. By investing in and supporting convergent communities across our full disciplinary breadth, we can address major societal challenges and strengthen ties with external partners. Concurrently, innovative curricular enhancements will prepare students to work across disciplines and lead in emerging fields. By embracing convergence, BU will amplify research impact, elevate educational excellence, enhance reputation, and improve financial resilience.

APPENDIX I

SPECIFIC QUESTIONS ADDRESSED BY TASK FORCE IN EACH CATEGORY

Strategy

1. What are the key overall convergent research themes that Boston University is already strong in, based on both scholarly reputation and success in attracting external funding?
2. How should we approach identifying or catalyzing new and emergent areas?

Barriers and Solutions

3. What are the current barriers to convergent research, collaborative research, and convergence-oriented teaching, and how do we address them? What organizational barriers should be removed or modified to make it easier for researchers from different fields and across our two campuses to collaborate effectively?
4. What are the policies, processes, and cultural changes needed to address these barriers so that we can accelerate our progress?

Investments

5. What additions to our research and translational infrastructure would be needed to maximize impact? These might include administrative or organizational resources to better enable collaboration; or physical design of research space that is cross-disciplinary rather than designed and controlled by a department or college.
6. What types of investments would reduce the barriers while catalyzing success? Examples could include thematic cluster faculty hiring initiatives, thematic PhD fellowships, or convergent collaborative seed funding along select themes in ways that incentivize participation of all relevant units. How should these investments be prioritized?
7. How can the University better support existing centers and institutes that pursue convergent research? How can research centers aligned with a theme best work with schools and colleges on cluster hiring initiatives for faculty and recruitment of convergent PhD students?
8. What is the role of external partners (e.g., educational institutions, government, businesses, and philanthropists)?

Talent

9. How can BU best approach recruiting new talent and developing current faculty (e.g., cluster hires, faculty development)? How can we encourage schools and colleges to participate in convergent hires?
10. What changes would be needed to the tenure and promotion system so that candidates get credit for teaching, mentoring, and service outside their home department?
11. What sorts of faculty development programs should be put in place to help faculty develop the ability for convergent work? What types of new metrics would be needed to assess interdisciplinary efforts in promotion and tenure?

Educational Programs

12. What role should convergence play in our undergraduate and graduate educational programs? How can we positively impact and support the educational and research

mission of the schools and colleges with an approach that focuses on convergence? What sorts of programs would distinguish us, in what areas and how?

Metrics and Potential Drawbacks

13. What metrics, short- and long-term, could be used to measure and track success of our efforts over time? What does success look like?

APPENDIX II: CROWD SOURCING REQUEST

TO:	Boston University Faculty
FROM:	Kenneth Lutchen, Professor of Biomedical Engineering and Senior Advisor to the President for Strategy and Innovation, and Darrell Kotton, Professor of Medicine and Director of the Center for Regenerative Medicine, Co-Chairs of the Task Force on Convergent Research and Education
DATE:	June 30, 2025
SUBJECT:	University-Wide Convergent Research Themes_ Request for Faculty Input by July 16

This past April, Boston University convened the Task Force on Convergent Research and Education. One of its charges is to identify strong University-level convergent research themes that are already well-funded, reputable, and well-positioned for advancing high-impact solutions to societal challenges via collaborative and convergent approaches.

To date, we have met with the directors of all University-wide research centers and institutes and the deans of schools and colleges with high research activity, together with several of their leadership faculty who oversee research. We have also met with leaders from the Humanities within the College of Arts & Sciences, the Affinity Research Collaborative program at Chobanian & Avedisian School of Medicine, the BU Clinical & Translational Science Institute, and Boston Medical Center. These meetings have resulted in an evolving list of seven potential overarching convergent themes and sub-themes in which BU has strong research reputation and funding.

We are now seeking broader input from faculty on the proposed themes and sub-themes, suggestions for additions, and any emerging areas we should consider. **If you are a full-time, research-active faculty member, please review the guidelines and theme list and share your feedback by Wednesday, July 16 using this web form.** Feel free to focus on those questions where you feel comfortable to provide specific feedback.

Thank you for taking the time to respond.

APPENDIX III: FEDERAL CENTER SCALE

Agency Grou	Mechanism	Agency/Directorate	Funding Scale	Duration	Structure	BU Fit	Notes
DoD	MURI	AFOSR/ARO/ONR	$1.25–1.5M/yr	3–5 yrs	Multi-PI basic research	★★★★	Flagship DoD basic research; highly competitive
DoD	Collaborative Research Alliances (CRA)	ARL	$3–10M/yr	5–10 yrs	Large multi-institution centers	★★★★	Strong national lab integration required
DoD	AFOSR Centers of Excellence	AFOSR	$1–3M/yr	5 yrs	Multi-PI topical centers	★★★	Focus on hypersonics, AI, cognition
DoD	University Research Centers (URC)	DoD services	$2–5M/yr	5 yrs	Multi-institution, theme-based	★★★★	Similar in structure to MRSEC/MURI hybrids
DoD	DURIP	AFOSR/ARO/ONR	$50K–$3M	1 yr	Equipment	★★★★	Infrastructure foundation for larger centers
DoD	DHA Centers of Excellence	DHA/VA	$2–10M/yr	5 yrs	Clinical + translational centers	★★★★	BU strength in neuro, PTSD, TBI
DoD	Quantum & Photonics Consortia	OUSD/ONR/AFOSR	$2–8M/yr	Multi-year	Multi-institution research center	★★★★	Major BU strength in photonics and quantum
DOE	Energy Frontier Research Centers (EFRC)	DOE SC / BES	$2–4M/yr	4 yrs	Frontier science centers	★★★★	Requires national lab partners; extremely competitive
DOE	Microelectronics Science Research Centers	DOE SC	$2–3M/yr	4 yrs	CHIPS-aligned centers	★★★★	Leverages Photonics + CHIPS ecosystem
DOE	Fusion Innovation Research Engines (FIRE)	FES	$1–4M/yr	4 yrs	Fusion innovation hubs	★★★	Requires strong industry partnerships
DOE	Energy Earthshot Research Foundations	DOE SC	$0.5–2M/yr	3 yrs	Seed / proto-centers	★★★★	On-ramp to EFRC or Earthshot centers
DOE	AI for Science Centers (FASST-aligned)	DOE / NNSA	Center-scale (varied)	4–5 yrs	AI + science centers	★★★★	Leverages MGHPCC and CDS
DOE	Bioenergy Research Centers (BRC)	BER	~$25M/yr	5 yrs + renewal	Very large biology centers	★★★	Large consortia; limited competitions
DOE	Energy Innovation Hubs	DOE	~$60M for 10 years	10 yrs	Large multi-institution centers		
NSF	NSF Engines	TIP	Up to $160M	10 yrs	Regional innovation ecosystems	★★★	Requires full regional coalition
NSF	Engineering Research Centers (ERC)	ENG	~$26M first 5 yrs	10 yrs	Convergence engineering center	★★★★	Among top NSF mechanisms; long runway
NSF	Science & Technology Centers (STC)	Multi-directorate	~$30M first 5 yrs	10 yrs	Frontier science centers	★★★★	Institution-level commitment
NSF	MRSECs	MPS / DMR	$3–4.5M/yr	6 yrs	Materials research centers	★★★★	Multiple IRGs and shared facilities
NSF	Centers for Chemical Innovation (CCI)	CHE	Up to $4M/yr	5 yrs	Chemical discovery centers	★★★★	Strong fit for chemical imaging
NSF	Physics Frontiers Centers (PFC)	PHY	$1–5M/yr	5 yrs	Fundamental physics centers	★★★	Requires top-ranked physics programs
NSF	National AI Research Institutes	Multi-directorate	Up to $20M	5 yrs	National AI hubs	★★★★	Align AI@BU with domain strengths
NSF	Mid-Scale Research Infrastructure (RI-1/RI-2)	NSF	$6–100M	3–7 yrs	Large shared facilities	★★★★	Major shared instrumentation and cyberinfrastructure
NSF	Tech Labs	TIP	$10-50M per year	5 yrs	Derisk emerging technology areas		
NIH	CTSA (UM1)	NCATS	Tens of millions	5 yrs	Institution-wide translational ce	★★★	Requires hospital system anchor
NIH	Cancer Center Support Grants (P30)	NCI	Very large (>$20M/yr typical)	5 yrs	Comprehensive cancer center	★★	Requires integrated cancer center infrastructure
NIH	SPORE (P50)	NCI / NIDCR	~$1.4M/yr	5 yrs	Organ-system translational rese	★★★	Multi-project; strong PI-led efforts
NIH	NIDCD P50 Clinical Research Centers	NIDCD	~$1.5M/yr	5 yrs	Hearing/speech/language center	★★★★	Aligns with Sargent College and neuro strengths
NIH	NIDA Centers of Excellence (P50)	NIDA	~$10M total	5 yrs	Addiction research centers	★★★	Needs population + clinical strength
NIH	Collaborative Program Grants for Multidisciplir	NIGMS	$700K–1.5M/yr	5 yrs	Team-based basic science	★★★★	Replaces P01-style mechanisms
NIH	Biomedical Technology Development & Dissen	NIGMS	Up to ~$850K/yr	5 yrs	Technology platforms	★★★★	Ideal for imaging/omics/computation platforms
NIH	Biomedical Technology Resource Centers (P41	NIBIB	~$1–1.2M/yr	5 yrs (renewable)	National research resources	★★★★	Supports long-lived centers for tools/technologies
NIH	Disease-Focused P30 Centers (e.g., Diabetes, D	NIDDK	$750K–1.25M/yr	5 yrs	Multi-core centers	★★★	Emphasize shared cores and pilot projects
NASA	Space Technology Research Institutes (STRI)	STMD	Tens of millions	5 yrs	University-led institutes	★★★	Robotics, ISRU, materials
NASA	University Leadership Initiative (ULI)	ARMD	$1–2M/yr	4 yrs	Aviation research consortia	★★★	Requires industry and NASA partners
NASA	Explorer / SMEX / MIDEX / New Frontiers	SMD	$20M–$1B	3–10 yrs	PI-led space missions	★★	Needs instrument heritage and major partners
NASA	Earth Venture Missions	Earth Science	$30–166M	3–7 yrs	Earth observation missions/cent	★★★	Connects Earth science with NASA centers
DHS	DHS Centers of Excellence (COE)	DHS S&T	~$4.6M/yr	10 yrs	Large national centers	★★★	Requires homeland security mission partners
NOAA	Cooperative Institutes (CI)	NOAA	Up to $300M	10 yrs	Climate/ocean research hubs	★★	Highly competitive and relationship-driven
NOAA	Climate Adaptation Partnerships (CAP)	NOAA	Mid-scale	Multi-year	Regional climate centers	★★★	Strong fit for IGS and resilience work
USDA	AFRI Sustainable Agricultural Systems (SAS)	USDA NIFA	Up to $10M	5 yrs	Integrated research-education-e	★★★	Needs ag partners and community engagement
ED/IES	IES National R&D Centers	Department of Education / II	$5–10M	5 yrs	Education research centers	★★★	Good for Wheelock + evaluation science
NIST	Manufacturing USA Institutes	NIST	$70–200M + cost share	5+ yrs	Manufacturing hubs	★★★★	Major CHIPS/semiconductor opportunity
EDA	EDA Tech Hubs Implementation Grants	EDA	$40–70M	Multi-year	Regional innovation ecosystems	★★★	Requires state, industry, civic partners