Report of Task Force 2021 and Beyond: Appendix

October 2021

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INTRODUCTION

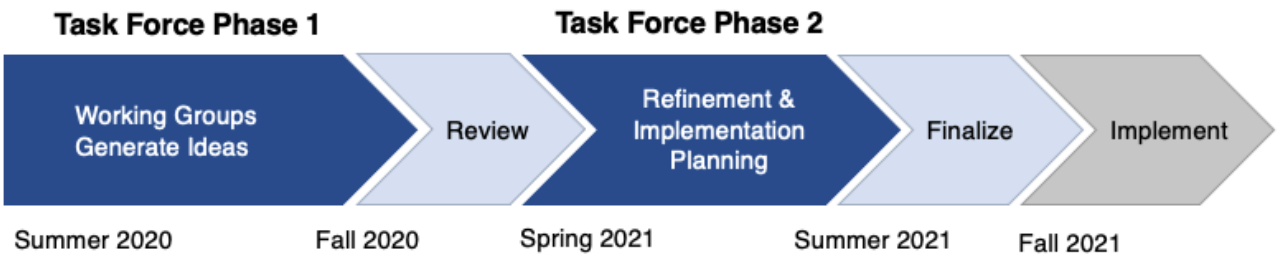
Charge of the Task Force 2021 and Beyond

President L. Rafael Reif provided the following charge to Task Force 2021 and Beyond on May 4, 2020. He appointed Rick Danheiser, Chair of the MIT Faculty and Arthur C. Cope Professor of Chemistry, and Sanjay Sarma, Vice President for Open Learning and Fred Fort Flowers and Daniel Fort Flowers Professor of Mechanical Engineering, to co-chair this effort.

> *The Covid-19 virus required us, individually and together, to suddenly redefine the way we live and work, the way we learn and teach, the way we conduct research. It required a radical withdrawal from the campus and imposed a serious financial threat, for the Institute and for many in our community. There may be no full return to our familiar "normal."*
>
> *While MIT continues to manage through this emergency, Task Force 2021 will seek to use the lessons of this extraordinary time to explore how MIT might invent a thriving new future. What have we learned about what we treasure most in the MIT experience? What aspects caused the most frustration? What worked better than we hoped? And what might be open to constructive change?*
>
> *Task Force 2021 will distill and apply the knowledge we have gained together to help us imagine an MIT that is better, safer, more flexible, more effective, more efficient, more sustainable, more inclusive, more equitable, more affordable and more financially resilient in the long term, while sustaining the Institute's distinctive values and culture and its dynamic approach to education, research and innovation.*
>
> *In short—by drawing on expertise and experience from across the community—Task Force 2021 is charged with developing the blueprints for building a better MIT.*

Process and Timeline

Task Force 2021 and Beyond carried out its work in two major phases over the course of efforts spanning 16 months. In the first phase, nearly 200 MIT faculty, staff, and students participated in 11 Working Groups that generated more than 50 discrete ideas that were posted for comment by the MIT Community in December 2020. In the second phase of the Task Force, 16 new groups—known as Refinement and Implementation Committees (RICs)—worked on distilling the ideas and proposals put forth during the previous phase and designing and recommending plans for their implementation. More details about each phase can be found under Task Force 2021 and Beyond Phase One and Task Force 2021 and Beyond Phase Two of this Appendix.


Task Force Phase 1
Task Force Phase 2
Working Groups Generate Ideas
Review
Refinement & Implementation Planning
Finalize
Implement
Summer 2020
Fall 2020
Spring 2021
Summer 2021
Fall 2021

TASK FORCE OVERSIGHT AND ADVISORY GROUPS

Membership of the Task Force Coordinating Committee

Rick Danheiser, Co-Chair, *Chair of the Faculty; Arthur C. Cope Professor of Chemistry*

Sanjay Sarma, Co-Chair, *Vice President for Open Learning; Fred Fort Flowers (1941) and Daniel Fort Flowers (1941) Professor of Mechanical Engineering*

Steve Bradt, *Executive Director, MIT News Office*

Anantha Chandrakasan, *Dean, School of Engineering; Vannevar Bush Professor of Electrical Engineering and Computer Science*

Glen Comiso, *Senior Director for Institute Affairs, Office of the President*

Mark DiVincenzo, *Vice President and General Counsel*

John Dozier, *Institute Community and Equity Officer*

Glenn Ellison, *Gregory K. Palm (1970) Professor of Economics*

Joe Higgins, *Vice President for Campus Services and Stewardship*

Timothy F. Jamison, *Associate Provost; Robert R. Taylor Professor of Chemistry*

Danielle Khoury, *Controller*

Melissa Nobles, *Kenan Sahin Dean of the School of Humanities, Arts, and Social Sciences; Professor of Political Science*

Lisa Schwallie, *Executive Director, Business and Operations, Office of the Vice President for Open Learning*

Krystyn Van Vliet, *Associate Provost; Michael (1949) and Sonja Koerner Professor of Materials Science and Engineering*

Membership of Advisory Groups and Resource Team Leads

Alumni Advisory Group

Noubar Afeyan PhD ’87

Haejin Baek ’86

Hala Fadel MBA ’01

Anne Hou ’83

Brian Hughes ’77

Tamra Johnson ’01

Priyamvada Natarajan ’90, ’91, SM ’11

Diane Peters-Hoskins ’79

John Seo ’88

Jeffrey Wilke SM ’93

Ronald Williams SM ’84

Elaine Wong ’97

Student Advisory Group

Baptiste Bouvier, *Undergraduate Student, Class of 2022, Computer Science and Engineering*

Yu Jing Chen, *Undergraduate Student, Class of 2022, Urban Studies and Planning with Computer Science*

Nabeel Gillani, *Graduate Student, MIT Media Lab*

Albert Gerovitch, *Undergraduate Student, Class of 2021, Electrical Engineering & Computer Science and Brain & Cognitive Sciences*

Peter Godart, *Graduate Student, Mechanical Engineering*

Kelvin Green II, *Undergraduate Student, Class of 2021, Physics*

Jordan Harrod, *Graduate Student, Medical Engineering and Medical Physics, Harvard-MIT Health Sciences and Technology Program*

Alexis Jones, *Undergraduate Student Class of 2022, Chemical and Biological Engineering*

Shuli Jones, *Undergraduate Student Class of 2021, Computer Science and Engineering*

Aiyah Josiah-Faeduwor, *Graduate Student, Department of Urban Studies and Planning and MIT Sloan School of Management*

Mohit Karnani, *Graduate Student, Department of Economics*

Rijul Kochhar, *Graduate Student, Program in History, Anthropology, Science, Technology and Society*

Sandra Li, *Undergraduate Student, Class of 2021, Mechanical Engineering*

Nathan Miller, *Graduate Student, MIT-Harvard Health Sciences and Technology Program*

Obiageli Nwodoh, *Undergraduate Student, Class of 2021, Physics*

Denise Tellbach, *Graduate Student, Mechanical Engineering*

Kevin Wang, *Graduate Student, Aeronautics and Astronautics*

Legal and Ethics Resource Team Lead

Mark DiVincenzo, *Vice President and General Counsel*

Communications Resource Team Lead

Steve Bradt, *Executive Director, MIT News Office*

Recommended Responsibilities for Oversight

This list proposes who will be the key individuals with responsibility for the oversight of the recommendations of Task Force 2021 and Beyond. These are the individuals who the Community can turn to for updates on the status and disposition of these recommendations. Note that in some cases reports of ad hoc groups will be delivered to additional members of the administration and committees of Faculty Governance as described in reports of the Task Force Refinement and Implementation Committees.

- **President L. Rafael Reif**
    - Institutional responsibility for MIT's response to the recommendations of Task Force 2021 and Beyond
    - Institutional responsibility, with the Provost and Chancellor, for recommendations of the MIT DEI Strategic Action Plan (RIC 13)
- **Provost Martin Schmidt**
    - General oversight with regard to ad hoc committees overseen by Associate Provost Krystyn Van Vliet
    - Recommendation on the MIT DEI Strategic Action Plan (RIC 13) with the President and Chancellor
    - Recommendation on the One Agile Team and the Planning Group to create the One Agile Team (RIC 14) with the Chancellor and Executive Vice President
    - Recommendations on graduate student funding of the Student Funding Committee (RIC 15)
- **Chancellor Melissa Nobles**
    - General oversight with regard to ad hoc committees overseen by the Vice Chancellor
    - Recommendations on the fundraising plan for experiential equity and civic responsibility internships (RIC 2) with VP Resource Development
    - Oversees the Task Force on the Undergraduate Program (2022, RIC 1) with the Vice Chancellor and Faculty Chair
    - Oversees the Ad Hoc Committee on Career Advancement for Instructional Staff (RIC 7)
    - Recommendations on the MIT DEI Strategic Action Plan (RIC 13) with the President and Provost
    - Recommendations on the One Agile Team and the Planning Group to create the One Agile Team (RIC 14) with the Provost and Executive Vice President
    - Recommendation on educational sabbaticals (RIC 16)
- **Chair of the Faculty and Chair of Faculty Policy Committee Lily Tsai**
    - General oversight with regard to recommendations assigned to committees of Faculty Governance
    - Oversees the Task Force on the Undergraduate Program (2022, RIC 1) with the Chancellor and Vice Chancellor
    - Oversees the Working Group on the SME Requirements (RIC 1) with the Vice Chancellor and Chair of CUP

- Oversees Ad Hoc Committee on Social Equity and Civic Responsibility in Undergraduate Education (RIC 2) with the Vice Chancellor
- Oversees Ad Hoc Working Group on Community and Nonprofit Liaison Program (RIC 2) with Associate VPR
- Oversees Ad Hoc Committee on Graduate Student Professional and Personal Development (RIC 3) with the Vice Chancellor and CGP
- Oversees Ad Hoc Committee on Graduate Advising and Mentoring (RIC 4) with the Vice Chancellor and CGP
- Oversees the Ad Hoc Committee on Leveraging Best Practices from Remote Teaching for On-Campus Education (RIC 16) with the Vice President for Open Learning

- **Vice President for Research Maria Zuber**
  - General oversight with regard to recommendations in the area of research assigned to the Associate Vice President for Research
  - Recommendation on the Underrecovery Solutions Commission (RIC 6)
  - Recommendations for career support of postdocs and instructional staff (RIC 7)
- **Associate Provost and Associate Vice President for Research and Co-Chair of CRSP Krystyn Van Vliet**
  - Oversees Ad Hoc Working Group on Community and Nonprofit Liaison Program (RIC 2) with Chair of the Faculty
  - Oversees Ad Hoc Working Group on Meeting Spaces (RIC 8) with the VP Campus Services
  - Oversees Ad Hoc Working Group on Flex Spaces for Hybrid Work Schedules (RIC 8) with the VP Campus Services
  - Oversees Ad Hoc Working Group on Shared Research Spaces (RIC 8) with the VP Campus Services
  - Oversees Ad Hoc Working Group on Repurposing the Campus Footprint (RIC 8) with the VP Campus Services
  - Recommendations on industrial collaboration (RIC 12) and international collaboration (RIC 12) with the Associate Provost for International Activities
  - Oversees Standing Advisory Board on Strategic Planning of Classroom Spaces (RIC 16) with the Vice Chancellor
  - Recommendations on common community spaces and green outdoor spaces (RIC 16) with Campus Planning Committee
- **Associate Provost for International Activities Richard Lester**
  - Recommendations on international collaboration (RIC 12) with the Associate Vice President for Research
- **Vice Chancellor for Undergraduate and Graduate Education Ian Waitz**
  - Oversees the Working Group on the SME Requirements (RIC 1) with the Faculty Chair and Chair of CUP
  - Oversees the Task Force on the Undergraduate Program (2022, RIC 1) with the Vice Chancellor and Faculty Chair

- Oversees Ad Hoc Committee on Social Equity and Civic Responsibility in Undergraduate Education (RIC 2) with the Chair of the Faculty
- Oversees Ad Hoc Committee on Graduate Student Professional and Personal Development (RIC 3) with the Chair of the Faculty and CGP
- Oversees Ad Hoc Committee on Graduate Advising and Mentoring (RIC 4) with the Chair of the Faculty and CGP
- Recommendations on a stronger undergraduate advising structure (RIC 5) with the Chair of CUP
- Oversees Standing Advisory Board on Strategic Planning of Classroom Spaces (RIC 16) with the Associate Provost and Associate VPR
- Recommendations on off-campus educational experiences for undergraduates (RIC 16)

- **Vice President for Campus Services and Co-Chair of CRSP Joe Higgins**
  - Oversees Ad Hoc Working Group on Meeting Spaces (RIC 8) with the Associate Vice President for Research
  - Oversees Ad Hoc Working Group on Flex Spaces for Hybrid Work Schedules (RIC 8) with the Associate Vice President for Research
  - Oversees Ad Hoc Working Group on Shared Research Spaces (RIC 8) with the Associate Vice President for Research
  - Oversees Ad Hoc Working Group on Repurposing the Campus Footprint (RIC 8) with the Associate Vice President for Research
- **Executive Vice President and Treasurer Glen Shor**
  - General oversight with regard to ad hoc committees overseen by the Vice Presidents for Human Resources and the Vice President for Campus Services
  - Oversees Ad Hoc Working Group on Employee Development (RIC 10) with the Vice President for Human Resources
  - Oversees the One Agile Team and the Planning Group to create the One Agile Team (RIC 14) with the Chancellor and Provost
- **Vice President for Human Resources Ramona Allen**
  - Recommendations of Work Succeeding (RIC 9)
  - Oversees Ad Hoc Working Group on Employee Development (RIC 10) with the Executive Vice President
- **Vice President for Open Learning Sanjay Sarma**
  - Oversees the Ad Hoc Committee on Online Credentials (RIC 11)
  - Oversees initiatives in online and onsite continuing education (RIC 11) with Deans' Council
  - Oversees the Ad Hoc Committee on Leveraging Best Practices from Remote Teaching for On-Campus Education (RIC 16) with the Chair of the Faculty
- **Vice President for Resource Development Julie Lucas**
  - Recommendations on a fundraising plan for experiential equity and civic responsibility internships (RIC 2) with the Chancellor
- **Deans' Council**

- Oversees initiatives in online and onsite continuing education (RIC 11) with the Vice President for Open Learning

- **Committee on the Undergraduate Program**
  - Oversees the Working Group on the SME Requirements (RIC 1) with the Vice Chancellor and Faculty Chair
- **Committee on Graduate Programs**
  - Oversees Ad Hoc Committee on Graduate Student Professional and Personal Development (RIC 3) with the Chair of the Faculty and Vice Chancellor
  - Oversees Ad Hoc Committee on Graduate Advising and Mentoring (RIC 4) with the Chair of the Faculty and the Vice Chancellor
- **Committee on Campus Planning**
  - Recommendations on off-campus educational experiences for undergraduates (RIC 16) with the Associate Provost and Associate VPR

TASK FORCE 2021 AND BEYOND PHASE ONE

Overview of Phase One

In Phase One, 11 Working Groups in four "Workstreams" were appointed to generate ideas and proposals based on President Reif's charge to the Task Force. During this phase, dozens of working group meetings took place in addition to several general Task Force–wide plenary sessions, a community forum, meetings with the Alumni and with the Student Advisory Groups, and the collection of suggestions via a community-wide idea bank. Well over 50 ideas were developed by the Working Groups in Phase One, and these were announced and posted for community comment in mid-December. The ideas were next reviewed by the Task Force leadership and Coordinating Committee, after which a new set of committees were appointed for "Phase Two" of the Task Force to refine and plan the implementation of the "raw" ideas developed during Phase One.

Summary Descriptions of Phase One Workstreams and Working Groups

Academic Workstream

This workstream focused on academic opportunities and implications as MIT plans for the "new normal," with the potential changes in our economic, technological, and cultural realities. Primarily includes education and research activities that impact undergraduate and graduate students, postdocs, faculty, research staff, and student life staff. The Academic Workstream comprised five Wokring Groups with the following purviews:

Education Group

All MIT degree-granting education programs.

Student Journey Group

All activities for degree-seeking students, including internships and other career-related activities; clubs, affiliate groups, residential groups, Greek life, and other communities; athletics; dining services; student support services; and other student activities.

Research Group

All research activity done by faculty, other primary investigators/research staff, postdocs, and graduate students; the appropriate number of laboratories and centers; research subsidies, pre- and post-award support; research infrastructure; supporting new faculty research agendas; etc.

Academic Learning and Residential Spaces Group

All academic space (classrooms, teaching labs, informal learning spaces, and libraries) and residential space.

Beyond MIT Group

All non-degree-granting education, including mentoring; executive and professional education courses; programs or courses offering credentials or certificates; and programs offered by the Industrial Liaison Program, MIT SOLVE, MIT Technology Review, the MIT Press, etc.

Administrative Workstream

This workstream focused on administrative opportunities and implications as MIT plans for the "new normal." Administrative functions include information technology infrastructure; non-classroom, non-residential space (including research lab space), office space, commercial space, and other real estate; and administrative systems, processes, and policies, including finance, procurement, facilities, security, planning, human resources, and other areas. The Administrative Workstream comprised three Working Groups:

Campus Operations Group

Information technology infrastructure; non-classroom and non-residential space, including research lab space, office space, and commercial space; how to fund space; space management policies; utilities; and emergency preparedness and management.

Administrative Processes Group

Systems, processes, and policies, including those within the Vice President for Finance, Research Administration Services, Office of the Recording Secretary, and Technology Licensing Office areas, and other financial areas; human resource systems, etc; and procurement and sourcing strategies.

Workforce Operations Group

Human resources practices, policies, and benefits, including working remotely, hoteling, remuneration, and rewards and recognition.

Finance and Data Workstream

Primary role of this workstream was to review certain key financial and funding models for ongoing Institute activities. This workstream will also aid the other working groups by providing financial perspectives, data, and research support, as well as support for financial modeling/financial feasibility analyses.

Financial Modeling Group

Building financial model(s) to inform scenarios and recommendations; considerations/recommendations for alternate financial models/overheads/etc. to align with current and developing strategies.

Data and Research Group

Building operational models to inform scenarios and recommendations; considerations/recommendations for what data we should be collecting to align with current and developing strategies.

Community and Culture Workstream

This workstream focused on culture, diversity, equity, inclusion, community, and values at MIT, particularly how these themes will be included strategically and implemented tactically in the context of the task force's work. To help this process, three sub-groups were formed in the areas of Pulse Surveys, DEI Framework and DEI Liaisons.

In addition to these workstreams and groups, two resource teams and two advisory groups were established to provide input and guidance during the course of the work of the entire task force:

Legal and Ethics Resource Team

Provided legal and ethics perspective to the work of the task force. Identified and supported working groups with legal and compliance resources. Potential legal areas may include policies related to international, domestic, and local issues; faculty, student, and human resources–related policies; government funding; etc.

Communications Resource Team

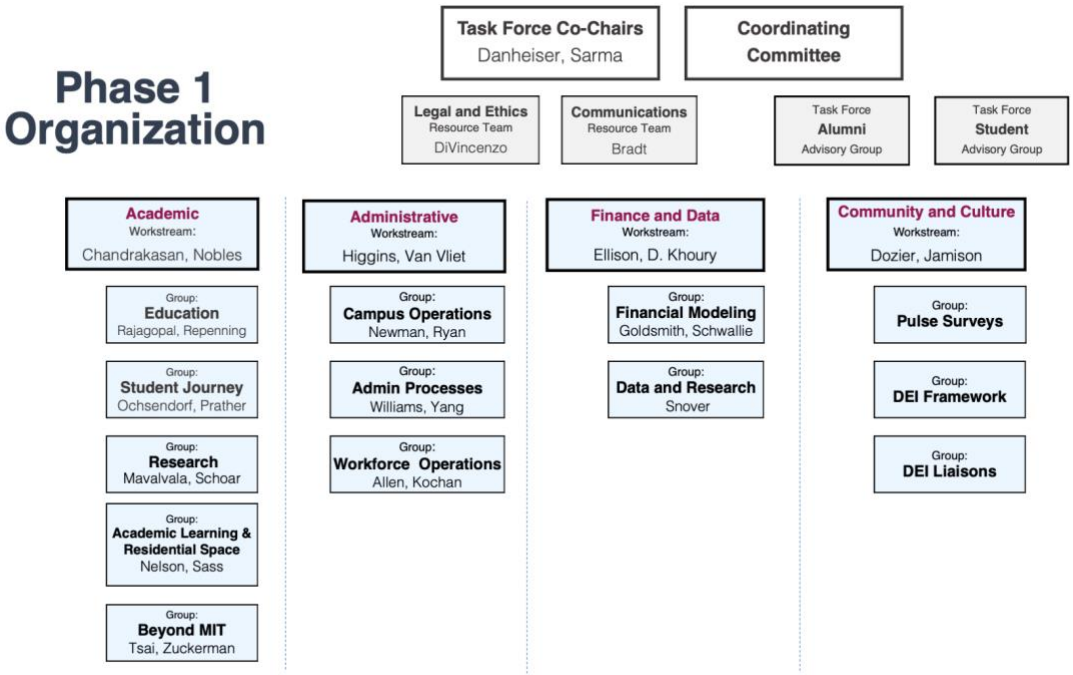
Supported communications the communications needs of the task force and its working groups, including soliciting ideas and feedback from the MIT community and communicating opportunities for engagement. Supported communications of interim and final task force findings. Helped develop communications infrastructures needed for the work of this activity. Developed communications strategy for the findings and actions derived from the task force activity.

Alumni Advisory Group

This group comprised 12 MIT alumni who met with the task force co-chairs during the course of the effort to provide advice and the alumni perspective.

Student Advisory Group

This group comprised 17 undergraduate and graduate MIT students, most of whom participated in other aspects of the task force, who met with the task force co-chairs during the course of the effort to provide advice and the student perspective.


Phase 1 Organization
Task Force Co-Chairs
Danheiser, Sarma
Coordinating Committee
Legal and Ethics
Resource Team
DiVincenzo
Communications
Resource Team
Bradt
Task Force
Alumni
Advisory Group
Task Force
Student
Advisory Group
Academic
Workstream:
Chandrakasan, Nobles
Group:
Education
Rajagopal, Repenning
Group:
Student Journey
Ochsendorf, Prather
Group:
Research
Mavalvala, Schoar
Group:
Academic Learning & Residential Space
Nelson, Sass
Group:
Beyond MIT
Tsai, Zuckerman
Administrative
Workstream:
Higgins, Van Vliet
Group:
Campus Operations
Newman, Ryan
Group:
Admin Processes
Williams, Yang
Group:
Workforce Operations
Allen, Kochan
Finance and Data
Workstream:
Ellison, D. Khoury
Group:
Financial Modeling
Goldsmith, Schwallie
Group:
Data and Research
Snover
Community and Culture
Workstream:
Dozier, Jamison
Group:
Pulse Surveys
Group:
DEI Framework
Group:
DEI Liaisons

Membership of Task Force 2021 and Beyond Phase One

Academic Workstream

Anantha Chandrakasan, Co-Chair, *Dean, School of Engineering; Vannevar Bush Professor of Electrical Engineering and Computer Science*

Melissa Nobles, Co-Chair, *Kenan Sahin Dean of the School of Humanities, Arts, and Social Sciences; Professor of Political Science*

Tia Giurleo, Staff, *Strategic Engagements Officer, School of Engineering*

Education Group

Krishna Rajagopal, Co-Lead, *Dean for Digital Learning; William A. M. Burden Professor of Physics*

Nelson Repenning, Co-Lead, *School of Management Distinguished Professor of System Dynamics and Organization Studies, MIT Sloan School of Management*

Tami Kaplan, Staff, *Faculty Governance Administrator, Office of the President*

Welina Farah, Staff, *Administrative Assistant, Open Learning*

Arthur Bahr, *Associate Professor, Literature Section*

Duane Boning, *Clarence J. LeBel Professor in Electrical Engineering, Department of Electrical Engineering and Computer Science*

Christopher Capozzola, *Professor, History Section*

Yu Jing Chen, *Undergraduate Student, Class of 2022, Urban Studies and Planning with Computer Science*

David Darmofal, *Jerome C. Hunsaker Professor, Department of Aeronautics and Astronautics*

Michale Fee, *Glen V. and Phyllis F. Dorflinger Professor, Department of Brain and Cognitive Sciences*

Nabeel Gillani, *Graduate Student, MIT Media Lab*

Jeffrey Grossman, *Morton and Claire Goulder and Family Professor in Environmental Systems, Department of Materials Science and Engineering*

Adam Martin, *Associate Professor, Department of Biology*

Youssef Marzouk, *Professor, Department of Aeronautics and Astronautics*

Michael Short, *Class of '42 Associate Professor of Nuclear Science and Engineering*

Gigliola Staffilani, *Abby Rockefeller Mauzé Professor, Department of Mathematics*

Emma Teng, *T.T. and Wei Fong Chao Professor of Asian Civilizations, Global Languages and History Section*

Lawrence Vale, *Ford Professor of Urban Design and Planning, Department of Urban Studies and Planning*

Student Journey Group

John Ochsendorf, Co-Lead, *Professor of Architecture and Civil and Environmental Engineering, Departments of Architecture and Civil and Environmental Engineering*

Kristala Prather, Co-Lead, *Arthur D. Little Professor of Chemical Engineering*

Kimberly Benard, Staff, *Assistant Dean of Distinguished Fellowships and Academic Excellence, Career Services & Professional Development*

Larry Anderson, *David H. Koch '62 Head Coach, MIT Men's Basketball*

Hamsa Balakrishnan, *Professor, Department of Aeronautics and Astronautics*

Baptiste Bouvier, *Undergraduate Student, Class of 2022, Computer Science and Engineering*

Pablo Jarillo-Herrero, *Cecil and Ida Green Professor of Physics*

Aiyah Josiah-Faeduwor, *Graduate Student, Department of Urban Studies and Planning and MIT Sloan School of Management*

Anne McCants, *Professor, History Section*

Eden Medina, *Associate Professor, Program in Science, Technology, and Society*

Rosalind Picard, *Professor, Media Arts and Sciences Program*

Emily Pollock, *Associate Professor of Music, Music and Theater Arts Section*

David Randall, *Senior Associate Dean for Student Support and Wellbeing, Division of Student Life*

Katharina Ribbeck, *Mark Hyman, Jr. Career Development Professor, Department of Biological Engineering*

Stu Schmill, *Dean of Admissions and Student Financial Services*

Blanche Staton, *Senior Associate Dean for Graduate Education; Director of the Office of Graduate Education*

Kate Trimble, *Senior Associate Dean; Director, Office of Experiential Learning*

Research Group

Nergis Mavalvala, Co-Lead, *Curtis (1963) and Kathleen Marble Professor of Astrophysics*

Antoinette Schoar, Co-Lead, *Stewart C. Myers-Horn Family Professor of Finance and Entrepreneurship, MIT Sloan School of Management*

Cathy Borgesen, Staff, *Financial Operations Manager, Materials Research Laboratory*

Robert Atkins, Head, *Advanced Technology Division, MIT Lincoln Laboratory*

Angela Belcher, *James Mason Crafts Professor of Biological Engineering and Materials Science and Engineering, Department of Biological Engineering*

Timothy Cronin, *Kerr-Mcgee Career Development Assistant Professor, Department of Earth, Atmospheric, and Planetary Sciences*

Robert Desimone, *Doris and Don Berkey Professor, Department of Brain and Cognitive Sciences*

David Goldston, *Director, MIT Washington Office*

Jonathan Gruber, *Ford Professor of Economics*

Maha Haji, *Postdoctoral Associate, Department of Aeronautics and Astronautics*

Yasheng Huang, *Epoch Foundation Professor of International Management; Professor, Global Economics and Management, MIT Sloan School of Management*

Laura Kiessling, *Novartis Professor of Chemistry*

Paulo Lozano, *M. Alemán-Velasco Professor of Aeronautics and Astronautics*

Nathan Miller, *Graduate Student, MIT-Harvard Health Sciences and Technology Program*

Aude Oliva, *Senior Research Scientist, MIT CSAIL; MIT Director, MIT-IBM Watson AI Lab; Co-Director, MIT Quest for Intelligence*

Joseph Paradiso, *Alexander W. Dreyfoos (1954) Professor in Media Arts and Sciences*

Katie Rae, *CEO and Managing Partner, The Engine*

Charles Stewart, *Kenan Sahin (1963) Distinguished Professor of Political Science*

Vivienne Sze, *Associate Professor of Electrical Engineering and Computer Science*

Danielle Wood, *Assistant Professor, Media Arts and Sciences Program*

Academic Learning and Residential Space Group

Suzy Nelson, Co-Lead, *Vice President and Dean for Student Life*

Lawrence Sass, Co-Lead, *Associate Professor of Computation and Design, Department of Architecture*

Meagen Cutler, Staff, *Assistant Director for Assessment, Office of the Dean for Student Life*

Peter Bedrosian, *Assistant Registrar, Office of the Registrar*

Chris Bourg, *Director of Libraries*

John Fernández, *Professor, Department of Architecture*

Albert Gerovitch, *Undergraduate Student, Class of 2021, Electrical Engineering & Computer Science and Brain & Cognitive Science*s

Kelvin Green II, *Undergraduate Student, Class of 2021, Physics*

Jordan Harrod, *Graduate Student, Medical Engineering and Medical Physics, Harvard-MIT Health Sciences and Technology Program*

Caroline Jones, *Professor of the History of Art, Department of Architecture*

Michael Laub, *Professor of Biology*

Sandra Li, *Undergraduate Student, Class of 2021, Mechanical Engineering*

Robert Miller, *Distinguished Professor of Computer Science and Engineering, Department of Electrical Engineering and Computer Science*

Jay Scheib, *Class of 1949 Professor, Music and Theater Arts Section*

Beyond MIT Group

Lily Tsai, Co-Lead, *Ford Professor of Political Science*

Ezra Zuckerman, Co-Lead, *Alvin J. Siteman (1948) Professor of Entrepreneurship and Strategy, MIT Sloan School of Management*

Julia Reynolds-Cuellar, Staff, *Associate Director, J-WEL Higher Education, Open Learning*

Alex Amouyel, *Executive Director, MIT Solve*

Bill Aulet, *Professor of the Practice of Technological Innovation, Entrepreneurship, and Strategic Management, MIT Sloan School of Management*

Elizabeth Bramson-Boudreau, *CEO and Publisher, MIT Technology Review*

Amy Brand, *Director, MIT Press*

Bruce Cameron, *Director, System Architecture Group*

Glen Comiso, *Senior Director for Institute Affairs, Office of the President*

Peter Hirst, *Senior Associate Dean for Executive Education, MIT Sloan School of Management*

Mohit Karnani, *Graduate Student, Department of Economics*

Eric Klopfer, *Professor, Comparative Media Studies Program*

Karl Koster, *Executive Director, Corporate Relations, and Director of Alliance Management, Office of Strategic Alliances and Technology Transfer*

Clapperton Chakanetsa Mavhunga, *Associate Professor, Program in Science, Technology, and Society*

Bhaskar Pant, *Executive Director, MIT Professional Education*

Philipp Schmidt, *Director of Digital Learning and Collaboration, MIT Media Lab*

Yossi Sheffi, *Elisha Gray II Professor, Department of Civil and Environmental Engineering*

Lawrence Susskind, *Ford Professor of Urban and Environmental Planning, Department of Urban Studies and Planning*

Administrative Workstream

Joe Higgins, Co-Chair, *Vice President for Campus Services and Stewardship*

Krystyn Van Vliet, Co-Chair, *Associate Provost; Michael (1949) and Sonja Koerner Professor of Materials Science and Engineering*

Frances Neville, Staff, *Executive Assistant, Office of the Provost*

Campus Operations Group

Julie Newman, Co-Lead, *Director, MIT Office of Sustainability*

Brent Ryan, Co-Lead, *Associate Professor of Urban Design and Planning, Department of Urban Studies and Planning*

Jennine Talbot, Staff, *Senior Planner for Capital Renewal, Campus Construction*

David Barnes, *Assistant Department Head of Facilities Services Department, MIT Lincoln Laboratory*

Suzanne Blake, *Director, MIT Emergency Management*

Peter Cummings, *Executive Director for Administration, Division of Student Life*

Elazer Edelman, *Edward J. Poitras Professor in Medical Engineering and Science, Harvard-MIT Program in Health Sciences and Technology*

Peter Godart, *Graduate Student, Mechanical Engineering*

Marco Gomes, *Director, Infrastructure Operations, Information Systems & Technology*

Jason Jay, *Senior Lecturer, Sustainability Initiative Director, MIT Sloan*

Michael Labosky, *Associate Director, MIT EHS Office*

Miho Mazereeuw, *Associate Professor and Director Urban Risk Lab, School of Architecture + Planning*

Eileen Ng, *Assistant Dean for Administration, MIT Schwarzman College of Computing*

Michael Owu, *Managing Director, MIT Investment Management Company*

Greg Raposa, *Space Administrator, Office of the Provost*

Bill Witts, *Manager, Facility Information Systems, Campus Planning*

Administrative Processes Group

Heather Williams, Co-Lead, *Assistant Dean, School of Science*

Maria Yang, Co-Lead, *Professor of Mechanical Engineering*

Mary Roderick, Staff, *Human Resources Administrator, McGovern Institute for Brain Research*

Marine Brown, *Director of Finance, MIT Open Learning*

Robin Elices, *Executive Director, Office of the Executive Vice President*

Curt Heintz, *Assistant Department Head/Deputy CIO, MIT Lincoln Laboratory*

Eamon Kearns, *Senior Director, Emerging Solutions, IS&T*

Elizabeth Lennox, *Assistant Dean for Finance and Administration, School of Engineering*

Pierre Lermusiaux, *Professor of Mechanical Engineering and Ocean Science and Engineering, Department of Mechanical Engineering*

Christina Lo, *Director of Strategic Sourcing and Contacts, Office of the Vice President for Finance*

Kathleen McGrath, *Director of Financial Operations, Office of the Vice President for Finance*

Karen Shirer, *Chief of Staff, Office of the Vice President for Research*

Mary Ellen Sinkus, *Administrative Officer and Strategic Initiatives Liaison, School of Engineering*

Workforce Operations Group

Ramona Allen, Co-Lead, *Vice President for Human Resources*

Thomas Kochan, Co-Lead, *George Maverick Bunker Professor of Management, MIT Sloan School of Management*

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Task Force 2021 and Beyond Phase One Ideas

This section includes the report of ideas submitted by the following Task Force Workstreams and Working Groups at the conclusion of Phase One.

- **Academic Workstream Ideas**
    - Education Group
    - Student Journey Group
    - Research Group
    - Academic Learning and Residential Spaces Group
    - Beyond MIT Group
- **Administrative Workstream Ideas**
    - Workstream Big Ideas
    - Campus Operations Group
    - Administrative Processes Group
    - Workforce Development Group
- **Finance and Data Workstream Ideas**
    - Financial Modeling Group
    - Data and Research Group
- **Community and Culture Workstream Ideas**

Academic Workstream Ideas

Education Group Ideas

Education Group Submission for Task Force 2021 and Beyond Report

November 3, 2020

Idea 0. Educating The Whole Student

A frequent theme in the TF2021 Education Group has been the need for MIT to “educate the whole student.” Since its founding, MIT has focused its education on enabling a person to participate effectively in "the humane culture of the community." [Quote taken from William Barton Rogers’ statements on the vision for MIT upon its founding.] The 1949 Lewis Report stated that "education is preparation for life" and led to the creation of a School of Humanities and Social Sciences (Arts being added later). Since that time, MIT has maintained a strong commitment to combining a deep liberal arts experience for its undergraduates with its central focus on science, engineering, and technology excellence—the Institute’s ability to embed liberal arts education within a research institution is not sufficiently recognized outside MIT. That said, we believe that MIT’s education does not adequately develop the whole student. An MIT education should include the intra- and inter-personal skills

necessary to leverage disciplinary abilities in a world comprised of wildly different and overlapping cultures and increasingly complex and often painfully inequitable social structures. Such an education should help students to both take ownership of their lives and beliefs and listen carefully to new ideas and different perspectives that reaffirm, or help them to reimagine, what they believe is true and right and just. A focus on the whole student also recognizes that well-being, satisfaction, and engagement are entwined throughout college and life.

What are the stated student-focused objectives of an MIT education, in particular with respect to the whole student? Beginning with the MIT mission statement:

> *The mission of MIT is to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century.*
>
> *The Institute is committed to generating, disseminating, and preserving knowledge, and to working with others to bring this knowledge to bear on the world's great challenges. MIT is dedicated to providing its students with an education that combines rigorous academic study and the excitement of discovery with the support and intellectual stimulation of a diverse campus community. We seek to develop in each member of the MIT community the ability and passion to work wisely, creatively, and effectively for the betterment of humankind.*
>
> *—MIT Mission Statement (2020)*

Aspects of the whole student are certainly reflected in the "ability and passion to work wisely, creatively, and effectively." The stated objective of combining rigorous academics and the excitement of discovery in a supportive, intellectual, and diverse campus community could be favorably read to include education of the whole student. However, these statements in our mission do not explicitly recognize the growing necessity of meaning-making, consideration of different perspectives, challenging (their own/others) assumptions, understanding the history and consequence of hierarchies and inequities, and engaging in lifelong practice driven by scholarship and reflection. If MIT students are to work for the betterment of humankind and to make a better world, they need to identify problems to work and seek solutions in ways that reflect the complexities of human, organizational, and societal contexts. Although our mission statement hints at these goals, they don't ring out like a clarion call, as is needed. It is telling that the statement begins with a reference to "science, technology, and other areas…". While the mission statement offers little as to the nature or priority of these "other areas," they are likely the components of an MIT education that need strengthening if we are to educate the whole student.

MIT should prominently state the goal of educating the whole student. This could be done through modification of the MIT mission statement, which was first developed in the late 1990's and could be revisited. We suggest that a broadly constructed group of faculty, students, and staff consult widely across the community and reconsider MIT's goals in educating the whole student, first by expanding the mission statement in ways that reflect them fully, and, second, by re-distilling the statement into one

with brevity and power. We understand that the Provost and Chancellor are planning an Institute-wide effort to develop a statement of MIT's shared values; the group that takes on this challenge could at the same time reconsider the mission statement. Regardless of the specific form, stating a desire to educate the whole student sends a message to the MIT community as well other academic institutions of the importance of doing so. We also believe that the act of reconsidering our mission statement is important itself and is likely to lead to valuable recognition within MIT of the desired impact and value of its education. Finally, such a statement is consistent with MIT's founding desire for its students to participate effectively in the "humane culture of community."

Five further ideas+proposals follow. The first and second are direct examples of how MIT can better educate the whole student; the third may become an example in the future; and the fourth expands our vision to educating the whole student over a lifetime. The fifth idea+proposal enables progress toward any improvements to, and innovations in, MIT education, including educating the whole student.

Idea 1. Incorporating Education about Structural, Systemic, and Institutional Hierarchies

We propose that every MIT undergraduate student, as well as students in many, or potentially all, graduate programs should learn to recognize and engage critically with the **Structural, Systemic and Institutional Hierarchies (SSIH)** that shape our professional, civic, and personal lives; and, further, that every Department and Section should contribute to this education in appropriately discipline-specific ways. **Shared responsibility** would enhance the quality, impact, and perceived value of an SSIH-oriented education. Furthermore, the **challenge** of devising paths toward such discipline-specific curricula would increase self-awareness within departments, and across MIT, in ways consonant with other recent initiatives toward Diversity, Equity, and Inclusion (DEI). In other words, we see value in both process and product, and therefore urge that an ad hoc committee of faculty, students and staff be charged with facilitating and incentivizing the development of such curricula, supported by Institute leadership and collaborating wherever possible with existing structures of **faculty governance**.

Educating the Whole Student, our overarching "Idea 0," should entail teaching students to perceive and analyze SSIH in contexts relevant to their disciplines and future careers. Although we can envision many implementation models (see below), we see particular value in a case studies-based approach, by which a recent scientific or "technical" challenge (e.g., AI's persistent difficulties with Black faces,1 the ambivalence of many Black Americans towards a potential COVID-19 vaccine2) is studied both from a technical perspective and through the lens of the histories that helped produce that challenge (e.g., the brutally racialized dimension of early biomedical research which makes Black mistrust of American healthcare tragically comprehensible). Grounding this education in discipline-specific contexts would give students the vocabulary and context needed to see and engage with the SSIH in their institutions and professions (and the world at large) and influence what problems they decide to work on and how, and the drive needed to remediate inequities within their chosen profession. **Shared, five-School responsibility** in developing SSIH curricula that commands the respect of professionals in the field will

[1] https://www.wired.com/story/best-algorithms-struggle-recognize-black-faces-equally/
[2] https://theundefeated.com/features/half-of-black-adults-say-they-wont-take-a-coronavirus-vaccine/

ensure that students and faculty take this enterprise seriously. Furthermore, we can imagine working with alumni in building case studies for this curriculum; they might also serve as guest speakers.

SSIH education relates to both DEI and ethics, albeit in different ways. SSIH, in particular those with negative consequences, are the deep-rooted impediments to the as yet unattained goals of DEI. And, as a part of learning how to engage critically with SSIH, students will need to learn how to confront ethical questions and employ moral reasoning in the SSIH context. Furthermore, understanding the hierarchies that shape us, professionally and personally, enhances our capacity for ethical action.

A central **challenge** will be that most faculty don't know how to teach about SSIH, although every one of us lives within structural, systemic, and institutional hierarchies—every one of us feels their effects when we are lower down and, whether we realize it or not, every one of us contributes to their effects when we are higher up. And yet, somewhat comparable objections were initially raised about the CI-M requirement which is now regarded as successful precisely because it is anchored in contexts appropriate to a student's major and discipline. It took time and collaboration with those who did have expertise to learn how to provide our students with CI-M experiences. The same will be needed here also, likely even more so. **Faculty Governance** processes are the best way to work through such challenges. The lesson from the history of the Communications Requirement is that we need to move forward with a vision, with creativity, since the best implementation pathways will not be clear to any of us as we begin this conversation, and with a measured pace and broad and repeated consultation.

The relative advantages of different possible modes of implementation will need to be analyzed in depth by the purpose-built committee that we recommend. We do not have a favored mode. That said, a number of examples have come up during our discussions. A single-subject SSIH-M requirement patterned on the CI-M requirement is a possibility at the undergraduate level. To build the expertise and curricula needed to offer SSIH-M subjects suitable for majors across MIT, collaboration and co-development of curricula will be key and co-teaching may be helpful. Both could be enabled by the Education Sabbaticals discussed below. A completely different way of implementing SSIH education goals could be to offer hands-on subjects that get at issues of SSIH by investigating them in more practice-based settings, perhaps including linking students to a consequential community project. Pursuing this direction to the fullest would include developing and offering experiential learning opportunities that incorporate a focus on SSIH and develop "reflective practitioner" skills. These modes of implementation may be applicable in many graduate programs as well, and would also align with our second idea+proposal below. Subject matter for such practica could be tailored to many disciplines: e.g., socially responsible finance; bioethics; algorithmic justice; etc. A third option, which could also be applicable in graduate or undergraduate programs, is to achieve SSIH education goals within the curriculum via nuggets embedded within multiple required subjects. A purpose-built committee could prompt and assess experimentation in these and other directions and share the resulting experience and expertise. It could certainly be that different departments and programs choose different implementation paths.

Our group was not unanimous about the ideal form and remit of SSIH curricula, and we anticipate that views in the broader MIT community would be even more wide-ranging. We therefore present this

proposal with a spirit of real humility about the range of possible outcomes that may emerge as we embark upon this conversation and begin experimenting—but with equal confidence that to do nothing would be a grave error.

Idea 2. Experiential Empathy: Deepening Relationships Between MIT Students, Boston, and The World

Although MIT's mission statement encourages all of us to "serve the nation and the world in the 21st century," many students struggle to incorporate meaningful and impactful social engagement into their MIT education. Students are often reluctant to leave the "MIT bubble," and connecting students to structured public service opportunities isn't easy, requiring significant capacity, planning, and resources. Still, as a part of Educating the Whole Student, the MIT education should be enhanced in ways that: (1) empower and incentivize students to participate in projects that serve the public interest; (2) healthily "joggle" students by getting them out of the MIT bubble through immersive experiences that reframe their perspectives, whether in the greater Boston community or around the world; (3) engage students in self-reflection, relationship-building, and holistic growth while breaking down barriers between MIT and the world, both local and global.

To address these goals, we propose expanding support and capacity for the Office of Experiential Learning to play a convening, catalyzing, connecting role, driving a concerted and substantial expansion of public interest-focused experiential learning opportunities for MIT students that immerse them in contexts that feel far from MIT, whether they are located nearby or at a distance. Through these experiences, students can meaningfully collaborate with, learn from, and contribute to local nonprofits, public agencies, and/or global NGOs. For example, a Course 6 student might work with Boston Public Schools (BPS) to develop new educational technologies serving students and teachers. Groups like MISTI, PKG Public Service Center, D-Lab, and the MIT Leadership Center, and individual faculty members currently make these types of experiences available to students, but at a very limited scale. Equipping the Office of Experiential Learning with additional support will enable greater coordination among these groups and a thoughtful but ambitious expansion of the pool of readily available opportunities for students—while still enabling them to identify and pursue experiences about which they are passionate.

To both help prepare students for these internships and amplify their learning as they participate in them, we propose identifying and developing a series of "curricular wrappers": "reusable" for-credit subjects or modules. These modules would: prompt reflection, introspection, peer-to-peer learning among students; enhance awareness of different cultures, languages and structural, systemic and institutional hierarchies (see previous idea+proposal, above); and enable them to explore first-hand the potential ethical implications of their work. For example, Course 6 students building educational technologies in BPS might engage in curricular wrappers on racial and socioeconomic inequalities in US public education; language learning (a large fraction of BPS families speak Spanish); community-based participatory design; and the potential ethical pitfalls of emerging technology. In some cases (e.g., MISTI), short subjects or trainings on language and cultural learning already exist to prepare students for their engagements abroad. To ensure that they remain rigorous, curricular wrappers should be initiated and sustained by academic departments, and approved through existing channels of faculty governance.

To preserve flexibility, they may be instructor-led on-campus subjects with discussions led by graduate students, faculty-led subjects offered in the field, or remote MITx modules. They may augment existing D-Lab/PKG/other subjects, and could potentially also be eligible for HASS credit.

MIT students often feel a tension between using their education to serve the public interest, and "optimizing" their futures through prestigious and lucrative industry experiences. To eliminate (or at least weaken) this trade-off and increase participation in public interest-focused experiential learning, we recommend the creation of competitive, prestigious fellowships offered in partnership with major industry or other players. To be eligible for these fellowships, students should have previously participated in public interest internships and relevant curricular wrappers. Fellowships would include a summer and/or IAP internship placement with the industry partner that immerses students in teams and projects probing pressing issues at the intersection of research and society (e.g., a Google-sponsored "Computing and Society Fellowship" offered in partnership with Google, which would include a summer internship at Google exploring the social implications of computing; or, a Unilever-sponsored "Ethical Global Business Fellowship" which would include an international internship placement to help design fair and equitable global supply chains; etc.).

While we envision the Office of Experiential Learning taking the lead in identifying, curating, and developing the meaningful new experiential programs and rigorous and innovative curricular models outlined above, it should also convene and collaborate with the many individuals and offices across the Institute who possess relevant expertise, relationships, and administrative know-how. To aid with this, we recommend the creation of a Faculty Advisory Board that would work closely with the Office of Experiential Learning, providing strategic vision and a breadth of perspective as MIT cultivates the aforementioned internships and curricular wrappers. Faculty Advisory Board members can also serve as ambassadors to departments across the Institute as these opportunities grow. We recommend that this group explore how these experiences might differ for undergraduate and graduate students, and how students might access them throughout their life cycles at MIT: from the months leading up to matriculation through the months, or even years, after graduation.

Idea 3. How Can We Enhance the Unscripted In-Person Engagement, Where the Magic of MIT Is To Be Found, by Integrating Digital Delivery Modes of Education? How Will Doing So Impact Campus?

So much of the magic of MIT lies in the unscripted engagement that happens among our community members, whether it be students working together on projects and problems or students and instructors engaging in seminars, labs, UROPs, … When we all return to campus, the digital delivery modes with which we now have become familiar can be deployed to deliver some of the scripted parts of our teaching; how do we take advantage of this experience to create more time and space for the interactive, engaging, components from which the magic originates? In each disciplinary context, how do we save more in-person time for the kind of intense engagement that yields moments of understanding or discovery or creation? What precursors to those experiences can be learned well when taught online? Can we fulfill our institutional mission even more effectively if we take digital delivery

models increasingly seriously? What lessons can we learn from our collective experience this semester that will help us find ways to do so? How will doing so impact campus?

These are big questions that many of us will be thinking through, in different ways, in different contexts, across MIT. It is too soon to answer these questions definitively. We all need time to reflect upon our Fall experiences and look ahead. Many faculty have noted an intensified interest in, focus on, and discussion of teaching and learning. The creativity and ingenuity brought out by necessity, the focus on finding ways to engage with students and support group interactions, the thinking anew about what works and why since we cannot just teach the way we always have, are sure to bear fruit in the long term. Surely we will be able to use what we have learned to create more engagement, more magic, when we are all bumping into each other again. That said, the best answers for how to do this are unlikely to emerge before we start doing it. The early answers emerging in our discussions include: (1) using what we have learned about asynchronous digital delivery options to reduce dependence on large in-person lectures; (2) finding ways to recreate the role of the Zoom "Chat" in enabling students to be comfortable asking questions that improve the learning experience for all, even in large lectures; (3) continuing to use Zoom to make it easier to bring in outside speakers, including alumni, allowing our students to engage with experts from anywhere; (4) and, as we build and renovate buildings, adding more flexible teaching and learning spaces with a focus on the (many) kinds of engagement that only happen in-person.

We are in the midst of an intense period of experimentation and learning, with a collective focus on education, but, what is the big picture? It is too soon to know. The big ideas and opportunities (or maybe many small and medium-sized ones) will emerge only as we enter the post-COVID era and begin to weave what we have learned into a new normal. It is too early to identify big opportunities or make big recommendations. What we need is the conversation. We recommend that the Office of Open Learning play a convening, catalyzing, and connecting role as people across MIT develop—and experiment with—answers to these questions as we return to teaching and learning together.

Idea 4. Lifelong Learning

The cadence and rhythms of university education have changed little in the last hundred years in the United States. Undergraduates attend for four years, typically starting at age 18 or 19, and professional master's students attend for one to three years in their early to mid 20s. Engineering and management schools often supplement their degree offerings with shorter, non-degree granting courses, usually taken later in life. This scheme was born in a world in which a highly engaged teaching mode required students and faculty to be in the same room and combining that requirement with expensive travel dictated lengthy, intense periods of co-location punctuated by a few lengthy opportunities to practice the skills learned in the classroom (e.g., internships). While the question of whether the "semester separated by lengthy breaks" constituted an optimal format in the pre-digital world is a question for historians, there it is little reason to believe that it remains well matched to the educational requirements of a rapidly changing world increasingly connected by digital technology. As one example, it's hard to believe that the best way to educate managers and leaders in the 21st century is to give them an intense dose of training and networking at age 27 and then sporadically supplement that with a combination of books purchased in airport newsstands offering "The New Science of…." and short in-

person training courses built on the folk-wisdom of case-based discussions that sample heavily on the dependent variable of success.

Digital technology radically alters the economics of education delivery and it is high time that we revisit both the frequency and dosage of our offerings. Our core recommendation is that MIT charge a new committee with tackling this question in depth and proposing a set of experiments in lifelong learning. Note that our industry is very much entrained to the existing cadence and it is unlikely that it will be entirely overturned any time soon. Thus, borrowing a term from our friends in the Entrepreneurship Center, the committee should think carefully about the most fruitful "beachhead market": what area of education might most benefit from a new higher frequency, lower dosage model? In the last few years there have been ongoing discussions about using digital learning modes *prior* to a student's arrival to MIT's campus. MicroMasters programs, for example, can serve both as a standalone educational offer and an extended screening for applicants who wish to later join a degree program.

As we already have MicroMasters programs underway, our initial discussions suggest a focus on lifelong learning *after* professional master's degrees. Offering our alumni opportunities to return to campus for additional education might have several desirable properties, including further enhancing their ties (and hopefully their subsequent generosity) to the Institute. Note that many schools including MIT offer extensive post-degree education whether it be in engineering (through Professional Education) or management (through Sloan Executive Education). However, these offerings are generally fragmented and the prospective student is left to choose their path through them. Our notion is that we offer a set of such paths that have been carefully designed, thus having our students return to MIT on a regular basis, rather than reconsidering the educational menu anew each time they require additional training. These are speculative ideas and the newly constituted committee should tackle these questions in depth and, in addition consider how MIT can best enable its undergraduate alumni to achieve their lifelong learning needs and goals.

Idea 5. Realigning Institutional Education Incentives: Institute-Wide, Instructor and Senior Faculty Education Sabbaticals

In our discussions it quickly emerged that the largest obstacle to education advances and innovation is the lack of dedicated time available to both faculty and instructors (academic teaching staff including Instructors and Lecturers) to update and improve MIT's subject offerings, to totally reimagine and revamp a subject, and to work collaboratively with a colleague from a different department toward an education goal. The root cause appears to be fewer institutional incentives to innovate in the education space compared to research. We see making it easier for faculty and instructors to invest time and creative energy in these directions as a necessity if MIT is to rise to the challenges of educating the whole student.

To unleash the full educational prowess of MIT's faculty and instructors, we propose to create an Education Sabbatical, separate from senior faculty sabbaticals, to provide equal opportunities for both senior faculty and instructors to delve deeply into initiatives to substantially improve their education offerings. Rather than focusing on specific educational methods, education goals, or new technologies

and pedagogies, this proposal seeks to address the root causes preventing or slowing the uptake of any and all such advances: insufficient time, resources, and institutional incentives for utilizing one's time to improve education. More details and potential obstacles are described below.

Consistency is valued more in teaching than in research, but in too many cases we often settle into an overly stable equilibrium. Our fields evolve, our students learn in new ways, education technology changes quickly, and maintaining MIT-quality educational offerings requires an ability to adapt to this change. The current MIT system does not incentivize excellence in education nearly as much as in research, despite it being in our primary Mission Statement. With the exceptions of Alumni Class Funds, d'Arbeloff Funds, and to some degree MITx, *formal* mechanisms do not exist to enable faculty to dedicate substantial time to significantly improve the quality, modernity, and efficacy of education at MIT.

In addition, there are serious inequities between our faculty and instructors. Instructors are often at the core of our education efforts and typically dedicate a larger fraction of their time to teaching, and yet are not afforded the same freedoms with their time as faculty. This Education Sabbatical proposal will be a major step in increasing equity among MIT's teaching staff, as Instructors and Lecturers of all ranks would be equally eligible to apply for an Education Sabbatical as senior faculty.

The Education Sabbatical is designed to be:

- **Substantial:** Complete relief from one semester-course worth of teaching. It would not release anyone from other duties related to research, service or advising. That said, there should be flexibility to propose and award different kinds of Education Sabbaticals. Perhaps in some context a half-semester would suffice to achieve a focused goal. Perhaps in other cases, where the goals are larger or broader, a semester plus a summer (possibly including summer salary) would be needed.
- **Competitive, yet unrestricted:** These are not automatically earned, but rather applied for with a short proposal. The number should have no fixed limit, but each proposal should require support from Department leadership, subject to the Department having balanced the associated short-term loss of teaching with the subsequent gains to result from the work done during the sabbatical.
- **Accountable, pre-sabbatical:** Departments may require faculty and instructors who propose an Education Sabbatical to help plan for their absence from teaching in advance—in some cases it may help to pre-record their class in the semester before they are on Education Sabbatical.
- **Accountable, post-sabbatical:** Faculty and instructors will write a brief report detailing what they accomplished during their Education Sabbatical, which will affect chances of success in future applications for an Education Sabbatical.
- **Not guaranteed:** Applicants must demonstrate support from Department leadership, and depending on the proposal, perhaps School- or Institute-level support with an additional letter.
- **Open only to Instructors and Senior Faculty:** Pre-tenure faculty would not be eligible as (1) they already have a semester of junior faculty research leave with more benefits and fewer responsibilities, and (2) one of the criteria for tenure is sustained demonstration of teaching excellence, which for most pre-tenure faculty benefits from teaching a subject with a stable curriculum several times.

Examples for good uses of an Education Sabbatical could include, but are certainly not limited to:

- Substantially updating a subject to include new knowledge in a rapidly evolving field, for example creating machine learning and computational modules and problem sets in nuclear engineering.
- Writing a book for a subject, or a complete revamp of course notes to include substantial new material, new explanations, and/or new assessments and assessment methods.
- Complete soup-to-nuts redesign of a subject that takes it in a new and innovative direction. Proposals of this nature should be welcomed, but it is important that Education Sabbaticals can equally well be used to make what we already teach better.
- Co-designing a jointly taught subject across departments, schools, and/or centers. (We note that making it easier for faculty across departments/schools to co-design education opportunities is needed to enable other proposals.)
- Learn how to co-teach with a colleague from another department in the service of an important educational goal and to gain new perspective. Examples could include building subjects that make up the "Common Ground" envisioned as a contribution of the Schwarzman College of Computing or developing curricula that teach our students to recognize and engage critically with Structural, Systemic and Institutional Hierarchies, as we have described above.
- Some Education Sabbaticals may be sabbaticals spent in a different MIT department than one's own; such sabbaticals may yield other benefits in addition to the primary education goals. One can imagine proposals made jointly by two faculty, in which A gets an Education Sabbatical in B's department followed the next semester by B getting an Education Sabbatical in A's, with the goal of building education modules that are of value to both departments.
- Launching a major new education initiative, such as a NEET thread, or developing "curricular wrappers" for public-interest focused experiential learning opportunities, described above.

Importantly, these are *not* designed to be periods of relaxation or simple reflection. Faculty can use their regular every-seven-year sabbatical for that purpose if they so choose.

Why now? COVID has forced us to teach in new ways, and at the same time it has prompted us to think anew about teaching and learning, about what works and what doesn't. We think that the availability of competitively awarded Education Sabbaticals will most rapidly improve how MIT achieves its education mission at any time, but there is a particular opportunity to channel the new ideas and energies that can flow in this direction as we come out of the COVID pandemic.

Task Force 2021 and Beyond—Education Group

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Student Journey Group Ideas

Finding Your People

Current State

Advising is broken and is in need of a radical re-imagining. Surveys conducted by Institutional Research consistently demonstrate challenges around advising for MIT students (https://ir.mit.edu/surveys). At the graduate level, inherent conflicts of interest often inhibit advising directed toward the personal growth for the student—one-third of graduate students report lack of sufficient support in exploring non-academic career options. At the undergraduate level, lack of strong connections between assigned advisors and students limits the potential efficacy of advising. Nearly 30% of students in the most recent senior survey report being dissatisfied with the quality of advising.

Envisioned State

Graduate students

Advising is done through the department and, in the case of most PhD students, directly by their primary thesis research supervisor/PI. Some departments have experimented with academic advisors in addition to research advisors and other advising models, but MIT is not currently evaluating best practices in advising. A PI may wish to grant graduate students flexibility to explore activities of interest with little to no connection to the thesis topic, but they are also guided (at best) or constrained (likely) by their funding resources and requirements to meet deliverables for sponsored research. Moreover, excellence in graduate student advising is not incentivized, as it is not usually a job responsibility that is evaluated regularly or explicitly considered in tenure and promotion cases. To create an exceptional graduate advising experience, we propose the following:

- Fund alternative methods to support graduate research and/or education that are not directly tied to specific projects.
- Implement 360-degree advising reviews of faculty principal investigators in all departments, as Brain and Cognitive Sciences has done in recent years.
- Explicitly consider feedback from these reviews in promotion cases, and on a semi-regular basis for full professors.
- Build stronger orientation cohorts outside disciplines for beginning graduate students, as is done for undergraduates.
- Create and provide access to mentoring networks that extend beyond departmental boundaries to include, for example, graduate alumni.

Undergraduate students

Advising has traditionally been framed as a one-to-one connection between a student and their academic mentor (first through a largely randomized first-year experience pairing and then through randomly designated departmental pairing). It is largely left to chance whether or not these connections are a good fit. The traditional mode of advising ignores both the diverse backgrounds and starting points of the students who enter the Institute (see Finding Your Path), and the myriad of sometimes changing

interests of students as they navigate their undergraduate years (see Finding Your Purpose). In short, we must expand the network of advising to improve guidance that each undergraduate seeks and needs.

To provide exceptional undergraduate advising, we propose to re-envision advising as a network of advisors to better serve students, as follows:

- Include the diverse talents of the entire MIT community, including alumni, staff, peers, partners, etc., to populate these networks.
- Provide training for all students on developing successful advising interactions, so that they are empowered to identify and cultivate strong relationships.
- Incentivize graduate students and staff to advise/mentor undergraduates as members of these networks.
- Create robust training for mentors, which can include the populations identified above.

Pros

These methods will improve advising, resulting in direct benefits to the quality of the student experience at MIT. Undergraduates will be able to gain a suite or web of advisors who will support the whole student. Graduate students will gain a greater ability to explore skills outside of academic research, and to better prepare for their futures.

Cons

This will disrupt the traditional framework and mechanisms for advising and disruption is hard. But MIT should not be afraid of acting simply because of that. We will upend the dominant model of graduate education, and put the student at the center. We must also ensure that processes to build advising networks do not minimize the importance of relationships with existing academic and research advisors, as students rely on these relationships not only for personal growth but also for recommendation letters and job references. We will need to break with tradition and revolutionize. Undergraduates will learn to weigh the opinions of multiple people and choose the right path for them from the advice from the web or suite.

Finding Your Purpose

Current State

Students, at least at the undergraduate level, leave MIT less invested in serving the world than when they entered (according to a comparison of surveys of newly matriculated students (https://ir.mit.edu/survey-of-new-students) versus graduating seniors (https://ir.mit.edu/graduating-student-survey). Graduate students are tied more to their research by financial constraints, and have traditionally had less space to explore. Undergraduate students have access to a plethora of opportunities outside of the formal curriculum but sometimes struggle to access and navigate their myriad options.

Envisioned State

To maximize the benefit of extracurricular exploration:

- How do we help students explore with a sense of purpose? How can we encourage greater integration of ethical thinking, public policy, and service?
- How can we increase graduate student mobility to enable greater exploration?

To address these key questions, we propose the following:

- Fund alternative methods to support graduate education that are not directly tied to specific research projects.
- Embed ethics education within the curriculum and popular co-curricular programs in a fully integrated and holistic manner
- Cultivate and fund a critical mass of immersive nonprofit, public sector, and for-profit social responsibility internship opportunities
- Provide opportunities for graduate students to pursue internships, including for exploration of non-research careers.
- Create Research Exchanges that enable graduate students to explore collaborative work at other institutions.
- Review and possibly streamline the transfer credit system to facilitate a student's ability to make progress towards the degree during a term away from MIT.

Pros

Creating more flexible and more meaningful opportunities for exploration will enable students to pursue career and life choices with more confidence and clarity. Exploration outside of MIT will create ambassadors who can also share their learnings upon their return to campus, helping MIT to gain the diverse perspectives needed to remain a world leader in teaching and research.

Cons

As noted, undergraduate students have many opportunities to explore, but they are sometimes challenged with making the most thoughtful choices and with reflecting upon and contextualizing the experience. Effective embedding of ethical and broader sociological considerations is not easily done; simply creating an additional class is a solution that is easy to envision but largely ineffective.

Finding Your Path

Current State

While the end goal of student entry to MIT is the same for every student—the successful completion of the requirements for a diploma—the starting points for individual students vary widely, as does the eventual shape of the journey through MIT, which may include some byways and even failures. The diverse backgrounds (e.g., socioeconomic, racial, educational, personal, sexual orientation) of both undergraduate and graduate students lead to many different journeys through the Institute. Students arrive with varying previous experiences and levels of knowledge about how to fully access MIT's considerable resources. What is sometimes called "the hidden curriculum" of success needs to be available to every student regardless of their starting point. Students should also leave MIT with the tools to live healthy and purposeful lives.

Envisioned State

We dismantle the Hidden Curriculum by teaching its core tenets (e.g., self-advocacy, building networks, accessing resources) to all students, without presuming prior knowledge of upon entry.

We need to make learning about well-being as important as their intellectual pursuits. This includes teaching students to deal with the complexities and uncertainty of life, and how to take care of their mind, body, and relationships.

We need to re-examine MIT's core mission to put people at its center, irrespective of their origins or the nature of the path that brought them to us.

Pros

We are in a particular moment in time where MIT can take the lead in creating more opportunities to combat institutional racism. We have the chance to examine how our systems presuppose "privileged" knowledge as common sense. If we are successful, we will not only have taught students how to engineer a better world, but also how to be better people.

Cons

Leveling the ground for all students is a hard problem with no easy solutions. It will also be difficult for some in the community to understand how systems of oppression disproportionately disadvantage certain students. It calls us to look at our own mythos of MIT as a meritocracy, and recognize that it does not realize the full potential of every student equally.

Research Group Ideas

Summary Report of the Working Group on the Future of Research at MIT

Group leads: Nergis Mavalvala and Antoinette Schoar

Three major themes emerged from the deliberations of the research working group: (1) the importance of cross-disciplinary research to MIT's ability to impact some of the greatest technical and societal challenges; (2) the need to keep up with the shifting trends in funding for research; and (3) the importance of shaping career opportunities and experiences for young researchers at MIT. The lack of diversity and an inclusive climate for researchers from minority groups cuts across all aspects of the research enterprise at MIT, including the three themes identified here.

We identify some key recommendations, motivated by deliberation of the major themes, and list them at the end of report.

Multidisciplinary Collaborations

Some of the most pressing and difficult problems that society faces at this point in time require large scale interdisciplinary research efforts, from climate change to the use of data in society. MIT has historically been very successful in setting up and facilitating large scale multidisciplinary research efforts, and prides itself as exemplifying a research culture with few disciplinary boundaries but driven by solving important problems. MIT is especially poised to solve such interdisciplinary problems because of its ability to recruit and support interdisciplinary people. Researchers that span multiple fields are more effective at communicating across fields and have great potential for making major breakthroughs. The convergence of engineering with the life sciences has been highly successful at MIT and could serve as a model for future interdisciplinary collaborations. We believe that MIT should build on its unusual strength in this area. Examples where MIT could strengthen its leadership and have greater impact through broad collaborative initiatives could be data sciences with behavioral and social sciences, climate change and sustainability, and life sciences and engineering connecting to health care innovation.

Facilitating and supporting collaborations

MIT has issued several very successful grand challenges that provide top down incentives for work on specific topic areas of interest. It would be similarly important to build structures that allow for organic (bottom up) development of faculty collaborations. Encouraging multidisciplinary "grass roots" collaborations needs to be supported by structures that help faculty and researchers from different disciplines meet and explore research ideas:

- **Foster collaboration:** When grand challenges are initiated or where the institute sees large collaboration possibilities, MIT could convene internal working groups or mini conferences to "introduce" researchers to each other. These events should be "curated" to achieve maximum impact and reach the right faculty members. Maybe the Deans of relevant schools would select leading senior researchers in a field to select and invite the relevant senior and junior researchers

within a field to present research ideas that could be relevant to the subject matter. These would allow (junior) faculty from different areas to meet, learn about each other's work, and get inspired to develop new ideas together.

- **Fund collaboration:** Better support faculty to apply for funding for these multidisciplinary efforts by providing resources for grant writing, dialogue with Resource Development, etc.
- **Reward collaboration:** Incentives and rewards for researchers, especially junior faculty, need to be tailored in a way to support such initiatives. The promotion and tenure process should allow people to advance who are part of large successful collaborations. This means giving credit to junior faculty for leading modules of a larger research effort. This may also be achieved by structuring large scale projects in a way that allows junior researchers to receive independent credit. It also requires the promotion committees for such cases to be carefully composed of faculty across fields to evaluate both the depth and innovativeness of these tenure cases. There are currently no universal authorship guidelines at the Institute, these should be developed.
- **Encourage externships:** PhD students and postdocs, can often be very siloed early in the academic process. If interdisciplinarity is to be embraced, avenues that enable researchers to spend time working in different fields should be encouraged, and when appropriate, mandated. For programs where it would be beneficial to the students and/or postdocs, we propose establishing an 'Externship' at the Institute, where an RA could be required to spend time in a team outside their own area. We envision this process to be "demand or pull driven" so labs that would benefit from having interdisciplinary students would invite someone from outside into their lab. When the externship students return to their home group, they will be encouraged to present a proposal that would suggest new work that leverages the perspective that they gained from working in a different field, and present it in a joint meeting between both their externship (host group) and their home group. We recognize that this model may not be appropriate for all fields, and there will be some students who won't want the 'distraction', while some group leaders also may resist losing their students for some weeks or taking on a student who doesn't know the ropes in their own field, etc. There may also be IP boundaries that need to be negotiated or coordinated in advance by policies that contain any conflict (this kind of thing already happens, so there is precedent). How to fund these exchanges will also need to be worked out. Despite these potential challenges, we see sufficient benefit to many students and postdocs that we propose it here for further consideration.
- **Involvement of policy perspective:** To ensure such interdisciplinary work is relevant to policy makers, it would be beneficial, from the outset of a project, to consider the audience/user of the research. This could include the MIT research community engaging with the MIT DC office to identify connections between researchers and the questions that matter to policy makers. There are already some existing programs at MIT to reward policy engagement of faculty such as the Bose Fellows research grants the MIT Policy Lab at the Center for International Studies and the Research to Policy Engagement Initiative of the Technology Policy Program. These efforts should be better integrated, funded, and rewarded. One might even consider setting up a prize for the best policy effort on campus, similar to an Edgerton award.
- **Innovation:** Multidisciplinary projects can result in opportunities for significant innovations, beyond influencing policy proposals. Many departments and labs at MIT have been very successful in translating academic insights into real world impact, especially via entrepreneurship, the creation of

nonprofit organizations and private sector engagement. But the pathway to moving innovations into the real world varies between areas. We would like MIT to think about how to support different efforts, for example, by supporting multiple paths for entrepreneurship and new firm creation, but also nonprofits or government institutions.

- **Caveat:** We want to be careful that interdisciplinarity is not seen as a goal in itself. There are many worries about lack of depth—interdisciplinary research should be careful to strengthen a discipline and not weaken it by creating work that does not bring meaningful contributions. Researchers at MIT should be firmly grounded in their subject areas and only tenured through the department or academic program that they consider their intellectual home. We must also strike a balance between big science versus small science. In promoting large-scale collaborations to tackle large problems, MIT will need to ensure that smaller projects led by individual PIs do not become marginalized or under-resourced.

Industry collaborations

Large corporations (but also some governmental agencies and private institutions, including hospitals) have access to big data and computing facilities that are out of reach for most academics. We need new engagement models between academia and industry (academic and government) to manage and leverage these collaborations where parties bring different strengths. MIT has always had a strong relationship with industry, including training many of our undergraduate and graduate students for careers in industry.

a. The computing resources needed for tackling large problems in AI and machine learning are increasingly in the hands of industry, not academia. MIT will likely not be able to reproduce those resources, so it must facilitate industry collaborations to gain access. This access would, in turn, stimulate academic research that would help the tech industry and also help us train the next generation of students who will work for the tech industry.
b. Beyond computing resources, the tech industry increasingly possesses the large datasets that are needed in the field. Our students and faculty need access to those datasets, including large clinical datasets, under terms of mutual benefit.
c. As students and faculty increasingly work in tech areas of social impact, they may need to be protected from attacks on social media.

But at the same time, we also need to put in place guardrails and safeguards to prevent industrial funding from overly shaping the research agenda on campus, for example by only helping certain fields, or coming with problematic strings attached.

Foreign collaborations

The past several years has seen an erosion of the US relationship with many foreign countries, particularly China. These international strains may increasingly challenge MIT's ability to recruit foreign talent at all levels, from undergraduate and graduate students, to postdoctoral fellows to faculty members. These conflicts have also impacted our ability to forge foreign collaborations necessary to solve global problems as well as our ability to raise funding from foreign donors. At the same time, national security concerns should be respected, and MIT has an obligation to ensure that laws regarding any possible foreign espionage or hacking of data systems are enforced.

MIT should retain its strong voice in welcoming individuals from foreign countries to our community and encouraging healthy international engagements by our students and faculty. Part of this approach includes continuing to ensure that the main campus of MIT participates primarily in openly shared, non-classified research that can include students from any nation.

MIT should continue to self-regulate its foreign involvements and to use these regulations to protect our own community from targeting by political or legal entities. The Senior Risk Group, and the committees for overseeing international relationships serve these functions, and could serve as a model for other institutions.

The Committee on Outside Engagements at MIT has recently released a report in which it proposes that engagements with foreign individuals and entities should be evaluated on the basis of MIT's values. However, it has proposed that these individuals and entities be judged on their own merits, and not on the basis of judgments about foreign governments. In the same way, we expect foreign individuals and entities to judge MIT on its own behavior, and not on the basis of judgements of our own national government. These principles could be more widely adopted to guide MIT's foreign relationships of all types. Of course, we need to be mindful of the fact that in many countries the involvement of government even in private institutions is very prevalent, either through direct ties or implicit pressures. Therefore, it is important to base these decisions on a nuanced understanding of whether an institution in a foreign country can be seen as itself responsible for the violation of MIT values, or whether it is run by individuals who violate our values.

Emerging Trends and New Paradigms for Funding Research

Research at the frontier of science and technology is becoming progressively more expensive, especially in areas such as the life sciences. At the same time many funders, especially private foundations, are increasingly unwilling to pay the full federally negotiated Facilities and Administrative (F&A) cost generated by these research activities. This "Underrecovery" needs to be funded as these indirect costs are real costs associated with research, but the current process by which such Underrecovery money is allocated is opaque, cumbersome, and creates frustration among research units. Finding an efficient, fair, and transparent process is important for the future competitiveness of the institute and the ability to attract and retain the best talent across all fields.

Fair and transparent distribution of resources across MIT

Underrecovery is a persistent concern for both researchers and administrators at MIT, especially as it relates to funding from foundations that do not pay the federally negotiated F&A rate. Individual researchers are required to request funds from DLCs, Schools, and the VPR to cover this difference creating delays in proposal preparation and administrative burdens. The current process of Underrecovery affects different schools and types of research endeavors across MIT very differently. First, research activities across fields and units vary in how much true resource costs they generate. For example, life science needs expensive lab equipment, real estate, and large amounts of research staff. Mathematics or economic theory often just needs an office. Second, the ability to attract government funding that covers the full overheard cost stipulated by MIT (~52%) varies across areas. For example,

NSF and NIH funding in the life sciences is much more abundantly available than in behavioral or social sciences.

By not tracking the true resource costs that are generated by different research activities, MIT implicitly charges different units and research areas very different prices for doing research. In the long run this can make research areas with lower resource costs less competitive at MIT and the best scholars might leave. It also hurts the institute overall since funding with a positive net present value is turned down because of the requirement for faculty to identify the Underrecovery sources.

Not having a clear process by which Underrecovery is allocated and accessed creates burden, especially so for junior faculty. Young scholars often find it more difficult to attract government funding early in their careers, so may be more likely to rely on foundation funding. However, many do not know that there is under recovery money to help them with foundation grants or how to access that support. Similarly, the current process actively discourages PIs from applying for prestigious career development grants for doctoral students (like NSF), since it creates a burden on the PI's budget. Unfortunately, this hurts the career progression of the students.

This working group recommends that, as a first step, this process be made more transparent so that researchers can better understand the mechanics, the intended, and unintended effects of the process. The goal is to create more planning certainty for researchers, and reduce administrative burden across the institute. Given the complexity of trading off support for different research endeavors across the institute, the process should draw on the expertise of Deans and Department heads and delineate clearly where budgetary decisions lie. We would like MIT to consider a distributed decision-making process with clear guidelines and metrics for approval processes. A clearer process could positively increase collaborations, provide early stage investigators increased opportunities to secure funding, and improve diversity of research groups.

This process should be accompanied by an internal accounting effort to better understand what are the true costs of different types of research to the institute. And what levels of support are needed sustain this research in the long run. It would also allow the institute to better understand if it is discouraging researchers in some areas not to get grants through MIT or to leave MIT altogether. We are currently not proposing that this exercise should immediately result in charging different overheads for different research activities. Indeed, government policies restrict the institute from charging very different overheads for different types of research. Fairness considerations will require careful review of any findings from such an exercise. In addition, it would have to be very carefully calibrated to ensure that it does not discourage researchers from applying for high overhead funding and that it cannot be gamed.

Adapting to the changing nature of funding

We are very encouraged that MIT is positioning itself well in a changing funding landscape. There is universal agreement that more government R&D funding is needed for fundamental science and for different types of R&D funding. As the ratios of government, corporate, and foundation funding shift, the balance between short-term and long-term research, basic and applied research is also shifting.

Large scale initiatives, like the MIT climate initiative, would benefit from developing a multifaceted model of funding from government, private, corporate, philanthropy.

Another opportunity for improving MIT's research enterprise may lie in evaluating the efficiency with which research is carried out. Are research funds being spent efficiently? We recommend identifying possible wasteful and/or unnecessarily expensive practices that make MIT less competitive. Whether true or not, there is the perception that well-funded labs are wasting money while others are barely making ends meet. This bears further study, if possible.

Opportunities for improved sharing of data, equipment and resource efficiency

Many research endeavors increasingly require expensive lab equipment, computing resources or large-scale datasets. But this equipment often is only intermittently used and could be more efficiently utilized. Where the use of such resources are "non-trivial," i.e., they can safely and easily be made available to other researchers, we encourage improved sharing of such resources in the spirit of "One MIT."

Currently multiple platforms are used to manage research funds. We recommend maintaining more centralized data on research resources that could be accessed to encourage more resource sharing. We also envision a centralized system or app where researchers list their equipment and even the modality of accessing it. It could be conceptually similar to the example of the Mobius app, which connects most makerspaces/machine shops on campus right now: https://project-manus.mit.edu/mobius. But this app currently does not include more specialized equipment that someone might have in their lab, so individuals are required to know someone in a different lab or serendipitously learn about it.

To incentivize labs to be part of such a system we propose (1) making the registration process as easy as possible, e.g., building in "default registration" at procurement that automatically lists equipment unless someone explicitly opts out of it; (2) providing rewards to those participating in the centralized app by possibly providing more support in the upkeep or procurement of equipment; and of course(3) allowing PI's to opt out of sharing resources that are either too difficult to share safely with researchers outside their lab, or that are a key part of their research process.

Research Careers

MIT must build a more diverse and inclusive body of young researchers going forward. A general concern is how to improve the career experiences and transitions of young researchers at each stage of their careers by broadening their experiences while at MIT, but also providing them with options beyond MIT. Creating a more positive experience for young researchers is also of paramount importance. We believe that these issues are especially important for underrepresented groups. In specifically addressing the lack of diversity and endemic cultural challenges at MIT, we want to propose ideas for strengthening accountability and ensuring follow through on these issues.

We identify a few areas where attention is needed.

Strengthen the UROP program

MIT has a unique UROP program which allows undergraduate students to learn about research and get involved right from the start of their campus experience. It is often considered a key attraction for both faculty and students at MIT. But some students and faculty have noted that it is difficult to learn about and access different research opportunities. We encourage the Institute to (further) strengthen the program by improving the UROP system: better communicate to both incoming faculty and students how to access UROPs, e.g., how to post positions, how to apply for UROPs; and ensure that the UROP program is equitably serving students of all backgrounds, including those without existing research experience. During the COVID crisis, the University substantially increased UROP support. They should consider keeping a higher level of UROP support so that every student who wants a UROP can be funded by University funds. Some departments have piloted "matching" programs, where PI groups advertised available projects on a website, and interested students were matched to those projects by a "coordinator." We recommend expanding these matching programs to make the process easier to navigate. Mechanisms for gathering feedback on UROP experience, similar to course evaluations could also strengthen the UROP program. Another mechanism to incentivize improved UROP supervision could be to make UROP supervision part of the faculty performance evaluation.

Provide feedback and multiple advancement paths to research scientists

Research scientists are critical to managing research activities at MIT. But their career advancement opportunities are often limited. Some ultimately achieve a status of Principal Research Scientist (PRS), but many can languish in that position with limited prospects for promotion to PRS for the better part of their career. At the same time, many research scientists might not be well served becoming a PRS. We believe that it is important to have a better structured promotion system that will review career opportunities for research scientists more effectively and help to align expectations for career advancement. We recommend that MIT build a more professional review system that could include a more granular career ladder for research staff to be able to learn about their prospects at MIT and advance their careers at MIT, or to find a position beyond MIT. This could be in the form of adding some intermediate levels for promotion, and would require PIs to regularly review their research staff, and to provide guidance for promotions and/or career transitions. It would impose accountability on PIs to manage their research staff more effectively and humanely. Regular reviews of all research staff should be required. A model for that already exists for postdocs, where their renewal is approved only after an annual review is completed by both the postdoc and their supervisor.

Facilitate career transitions for postdocs and research scientists

The Institute should provide training options for postdocs and research staff to transition to other positions in industry or government agencies. This could be in the form of sponsoring interview trainings and career fairs for research staff. Another very helpful tool could be to allow post docs and research scientists to take up to short (paid or unpaid) internships in the private sector or government agencies to help with job finding. We also noted in the section Research Group Ideas, "Facilitation and Supporting Collaborations," that for postdocs and doctoral students we would like to encourage externships and internships in other labs in order to expand the scope of their training while at MIT.

Connect postdocs with alternative financial advancement opportunities

Postdocs often are at a stage of life where financial demands become more pressing. One possible path to providing opportunities for postdocs to supplement their income could be through outside consulting or industry internships. This would have the added advantage of expanding the postdocs' networks, giving them exposure to industries where they may become future employees. However, this process would have to be carefully designed since many grants do not allow staff to do consulting. Similarly, students who are not US citizens face visa constraints when working outside of their sponsoring organization (MIT).

Collect data to support hiring the most talented and diverse postdocs

MIT should take a leadership role in creating a diverse and inclusive environment for postdocs not only because this will benefit our community and research, but also because the MIT postdoc community serves as a significant source for top faculty candidates and research leaders. In this way, lack of diversity in postdocs creates a bottleneck for the advancement of women and URMs into faculty positions and other high-level research positions. The best way to understand problems within postdoc hiring is to collect and analyze data on the postdoc recruitment process. MIT currently has no infrastructure for understanding or evaluating the postdoc hiring process, which makes it challenging to understand current problems as well as difficult to propose and benchmark solutions. A first step towards improvements must therefore be to collect information on this continuously as postdocs are hired, and via surveys of both PI's and postdocs. MIT also does not currently have any explicit recommendations to PIs for how to hire postdocs, either with the intention of improving inclusivity in the hiring process or simply to help PI's recruit the best postdocs. MIT should become a leader in defining and following postdoc hiring best practices, including PI training, wide advertisement, implementation of proven practices established for faculty hiring and student applications, and clear statements about a commitment to diversity and inclusion. MIT must also imagine new and improved ways to recruit a diverse group of postdocs, such as by leveraging visiting graduate student positions as explicit pathways to a postdoc position, and simplifying the process of finding a PI, for example by centralizing applications within departments and facilitating matches.

Provide more training and feedback to junior faculty

MIT should provide a stronger on-boarding process (and continued support) for new faculty as they take on new responsibilities such as setting up labs, hiring, and effectively managing staff, for which they may not have much experience. Junior faculty are under enormous pressure to produce output in order to achieve tenure while learning the ropes and facing increasing budget constraints. MIT should provide more training and mentoring, conduct lab reviews to help junior faculty to adopt best practices, and manage operations effectively. Further, hiring and promotion committees should actively seek student and postdoc input. We recommend that all promotion applications consult lab members and staff of a faculty member coming up for promotion. This is especially important early on in a faculty career to be able to give the person guidance and help improve the way they manage their operations. While we believe this process is very important, we understand it is also very delicate. Junior faculty typically have a relatively small set of lab members and thus evaluations are subject to idiosyncratic perceptions.

Additionally, students and postdocs often feel uncomfortable officially expressing criticism given the power relationship with respect to the faculty.

Prevent mistreatment and abuse

Another critical issue is for MIT leadership is to provide more guidance, oversight, and accountability for how people are treated within labs. The dynamics of power are known to adversely affect the careers and personal well-being of young researchers, be they students, postdocs, research scientists or junior faculty. This must be urgently addressed to attract and retain the brightest minds and most exceptional researchers at MIT. As an example, the RISE 4 MIT petition includes a series of evidence-based policies to support victims, prevent retaliation, increase transparency, and ultimately break the "culture of silence."

Emphasize diversity, equity and inclusion throughout

Unsurprisingly, lack of DEI also pervades MIT's research enterprise and adversely affects the experience of researchers who are members of minority groups that include women, non-cisgender men, and especially people of color. Many factors contribute to this, including the prevalence of conscious and unconscious bias, structural barriers to success, structures of power created by tenure, hierarchy and control of resources, funding, and career advancement. Every aspect of MIT, including the research enterprise, must implement significant and urgent reforms to address this, including our recommendations below.

Increase MIT's accountability to community recommendations

There have been numerous studies at MIT and elsewhere (the National Academies, e.g.) that have made actionable recommendations to address these pernicious systemic issues. Indeed, recommendations generated via a variety of strategies, from focus groups to community organization and institutional data/surveys have been widely publicized and have strong support from the MIT community. Yet, the majority of these recommendations have seen little progress. This shortfall in implementation and accountability must be addressed. We recommend that MIT develop mechanisms for responding to recommendations in a proactive and timely fashion, and implement benchmarking strategies that allow for transparent assessment of progress. Furthermore, implementing a system of incentives and accountability will be crucial to ensuring progress.

Include student voices

Students have been a tremendous force pushing MIT to pursue institutional reforms that will make the Institute more proactive and accountable in addressing racism, sexism, harassment, and abuses of power in our community. MIT should tap their energy, commitment, and ideas through collaboration and representation on Institute committees that will both make (new) recommendations, and also spearhead their implementation.

Executive Summary

These discussions led to a few key recommendations in the form of specific actions that should be taken to address some of the issues identified, and more importantly, to take advantage of the opportunities presented by the TF2021 process:

1. MIT should provide more structured support for multidisciplinary research within MIT. We recommend exploring specific mechanisms, such as:
    - Curated internal workshops to allow researchers from different departments to meet and learn about each other's research.
    - Temporary "visiting faculty" appointments for faculty at MIT to engage in collaborative research with another department or lab at MIT.
    - Externship programs for doctoral students or postdocs between labs.
    - Explicit changes to how promotion committees evaluate cross-disciplinary research that may be carried out in larger collaborations.
    - Researchers, including PhD students and postdocs, should be afforded some flexibility, e.g., a few hours a week of discretionary time, to pursue intellectual activities that are not narrowly tied to the grants that they are supported on. This is already the case for Principal and Senior Research Scientists, and should be extended to more junior researchers, whose openness to new ideas and exploration could be a real catalyst for sparking innovative and multidisciplinary new research directions.
2. MIT should provide better opportunities for junior researchers to advance their careers, both within MIT and beyond their time at MIT. Specific mechanisms could include the following:
    - More graduated career ladders for Research Scientists with multiple tracks tailored to different research staff positions. These career steps should be linked to explicit career reviews with the staff member's supervisor to ensure clear communication and alignment of expectations about deliverables and career progression.
    - Enhanced career development opportunities for junior researchers (graduate students, postdocs, and early-career research scientists), such as consulting, externships within and outside of MIT, and rotations in labs other than their primary group.
    - MIT should invest in building a stronger pipeline of young researchers from under-represented groups such as women, researchers of color, and other marginalized groups.
3. MIT should pay close attention to recent trends in how research is funded. In particular:
    - As private funding increases, the recommendations of the recent reports of the committees led by Profs. Tavneet Suri and Peter Fisher must become an integral part of how MIT engages with private funding sources.
    - Underrecovery is a growing problem at MIT. We recommend a separate commission be charged with studying this, comparing MIT's methods for dealing with Underrecovery to peers, and recommending a solution that leads to a more transparent process and equitable allocation of resources.

- Current models for funding of graduate students give a lot of power and control to PIs and group leaders. These are likely to be examined by the NASEM committee, and we strongly support any recommendations aimed at mitigating these hierarchical inequities.

Subappendix

Some examples of areas for multidisciplinary collaborations

Data sciences with behavioral and social sciences

One of the promises of the new Schwartzman College of Computing is to engage every part of MIT in the new computing era, and the next few years should see the realization of that promise. The recent advances in computing and data sciences, including AI and machine learning, provide tremendous opportunities for solving societal problems and transforming many areas of human interaction, for example in the provision of health care, communication systems, financial services, etc. In order to fully unlock its long-run potential, this data analysis should be guided by rigorous models of human behavior and social interaction. The data generation process itself is shaped by a complex system of human interactions, personal or corporate incentives, and government regulations among others. These can create systemic biases or inequities in how data is generated and interpreted. At the same time, human behavior dynamically reacts to and evolves with the data generation itself. In turn, the social sciences could be transformed by the massive advances in computational power that allows for the aggregation of individual decisions to market wide or even countrywide forecasts. Therefore, a truly interdisciplinary approach would harness the power of computational methods, with rigorous models of human behavior and social interactions. Beyond the social sciences, cognitive and neurosciences could better inform AI, providing models of human learning and intelligence that could better inform and guide AI approaches. Finally, many other areas of science and engineering would benefit from a closer relationship with the College of Computing, and the College would benefit from these interactions as well.

Climate change and sustainability

This is another example of a large-scale problem of great urgency that requires not only the collaboration of natural scientists and engineers, but also behavioral and social scientists who can work together to communicate about climate change and help change public perceptions. Within the portfolio of Climate Change topics, there is work to be done on reducing the current and future stock greenhouse gases in the atmosphere, mitigating the current harmful impacts of climate change related to sea level rise, temperature changes, and extreme weather, and adapting to long term environmental shifts such as land degradation and coastal erosion. The topic of Sustainability asks a broader question: What are the underlying causes of Climate Change and will human society succeed in changing course to rectify them? Thus, research on Sustainability considers human creation of uncontrolled waste streams in the atmosphere, land, and ocean while examining the economic and social systems that allow for unsustainable consumption of natural resources and extreme wealth inequality across the human population. Research is needed that integrates economics, social equity, and environmental health into connected frameworks at local, national, and global scales. Going further, as humans expand economic operations beyond earth in orbit, on the moon and Mars, there is research needed to ask how human society can avoid repeating mistakes made on Earth and pursue more circular economies in the future.

Finally, Sustainability research notes that global progress requires that people and the environment are able to achieve basic needs, as outlined by the United Nations Sustainable Development Goals. MIT can continue to play a role to prototype, analyze, and evaluate models for sociotechnical systems that aspire to sustainable and equitable outcomes.

Health care innovation

Health care is the largest single sector of the economy and a natural focus for collaboration at MIT. Innovating in health care requires coordinating efforts between biologists, engineers, data scientists, and economists. In addition, we have and can continue to draw on the strength of Boston area health care providers and researchers through external collaboration as well. COVID-19 has highlighted the variety of areas where such collaboration is necessary, such as coordinating the economic incentives for the development of vaccines with the biology and with the logistics of delivery, and with developing both new biological treatments and engineering new solutions for delivering those treatments.

Academic Learning and Residential Space Group Ideas

Community Spaces and Relationships

Current State

- Common spaces are not prioritized when designing a new structure on campus
- Spaces for community building become deprioritized because they do not fulfill a purely academic or residential purpose
- Students lack adequate space to learn and work together
- There is also a lack of "phone booth" spaces for individual work
- Few spaces are student managed

Envisioned State

- All future building projects will include a consideration for opportunities for community spaces within the construction/design
- Every campus planning process will include consideration and collaboration with stakeholders to identify opportunities for community building, with consideration for communities that should be prioritized as "critical communities"
- Focus on creating "third spaces," neither fully academic nor residential, that would allow for wider community use
- Move away from centralized idea of student spaces towards a dispersed model of community spaces which would accommodate a wider range of "ownership" and management (including student-run spaces), and produce more interaction between user groups, such as graduates and undergraduates
- Create wider range of communal spaces, including those that allow for individual work (e.g., phone booth, co-working, or private spaces), taking into consideration the need for well-ventilated and outdoor options that would provide greater flexibility in responding to pandemic circumstances
- Enhance belonging through welcoming communities where relationships flourish
- Foregrounded in this idea is that building relationships with others, regardless of their background, is a core value at MIT; community space will help foster those interactions—whether serendipitous or intentional

Pros

- Community spaces become part of the process instead of an afterthought or potentially value-engineered out
- Provide access for a wider range of groups

Cons

- Engaging stakeholders may lengthen planning

- Constantly balancing points of views and agendas of potential users
- Community space is a precious resource, and often this is devalued when there are other academic priorities

Embrace Remote Work

Current State

- Pre-COVID, nearly all staff worked primarily on campus; now nearly all are working from home, during an emergency situation without adequate, intentional planning
- The emergency shift has created inequities between working environments and shifted resource management to staff (i.e., ability to obtain necessary resources while working remotely)
- Unstated expectation is that staff will return to campus when it is safe to do so
- Working on campus is the norm; working remotely is the exception

Envisioned State

- A more flexible on-campus schedule, reducing stress and time for community, and freeing up space on campus that is currently dedicated to administrative functions
- For those that can effectively work remotely, on-campus work becomes the exception rather than the rule
- System in place for people to obtain necessary resources for an effective remote working environment
- Intentional DLC-based shift towards virtual meetings and clear system for joining meetings remotely
- Emphasis on staff engagement (e.g., DSL's SEABoard Program) to keep staff connected with one another and the MIT community and identity
- Repurpose administrative space for active learning, touch-down spaces for multiple groups of administrators when they come to campus, and community space

Pros

- Administrative staff spaces could be used for core academic or student life needs
- Remote work would be framed as a benefit, rather than consequence of the environment, and allow a wider range of people to be a part of MIT
- Allows for less time lost in transit
- Virtual environments offer quick, "face-to-face" collaboration, without travel

Cons

- Staff might feel disconnected or siloed
- Reduction in casual connections (e.g., seeing someone in the Infinite)

Outdoor Spaces

Current State

- Climate change initiatives are dispersed throughout campus; the campus lacks a coherent, visible climate change strategy for producing highly desirable and useful outdoor spaces
- Much of the spaces between buildings lack shade and therefore are not accessible for outdoor use during extreme temperatures
- The number of hardscape surfaces that do not have any canopy greatly contribute to the heat production of the campus
- Pandemic has highlighted the fragility of our current system that relies substantially on indoor spaces to gather

Envisioned State

- Tree canopy will increase shaded outdoor spaces, increasing the capacity for community members to gather outside safely and comfortably.
- Enhancing tree canopy will help moderate the ambient temperature, contribute to reducing the urban heat island effect, and increase campus resilience to climate change
- Increasing useable outdoor space allows for greater flexibility in response to crisis situations
- First step in a larger network of "greening effort" tied to community building
- Incorporation of elements of resiliency and preparing for climate change
- Outdoor spaces enhance community (linked to Idea #2 above)

Pros

- Highly visible, low effort indicator of MIT's commitment to sustainability and a resilient campus
- Creates greater opportunity for community building

Cons

- Require rethinking interstitial spaces on campus
- Potential for a reduction in sunlight at ground level
- Increased maintenance

Academic Classrooms

Current State

- Future of MIT Education report (2014) included a suggestion for a working group focused on the design of academic teaching spaces
- Classroom renovations overseen by Registrar's Office and DLCs with faculty input, missing the student perspective
- Registrar assigned classrooms are designed following MIT Classroom Standards

Envisioned State

- A working group composed of faculty, staff, and students to spearhead the redesign of classroom spaces to integrate more interactive teaching spaces (e.g., TEAL classrooms, seminar spaces that promote interaction with movable furniture)
- Group would work with range of stakeholders to help set a strategic, intentional plan for academic spaces
- By focusing specifically on learning spaces, group could be more responsible to change (e.g., new models of learning post-COVID)
- The "Magic of MIT" is real engagement, building together, learning together
- Adapt classrooms to future needs of learning through a strategic, high-level lens

Pros

- Centralized group would ensure a more consistent approach to classroom design across departments and allow for a broader implementation of new concepts
- Group could foreground the goal of interactive teaching spaces which will allow for more hands-on learning experiences and enhanced education experience

Cons

- Time commitment for faculty, staff, and students

Reach and Educate More Students

Current State

- Online and on-campus education experiences are largely separate; Few online; programs integrate an on-campus experience for learners
- Pre-COVID educational environment highly valued on-campus, residential experiences
- Students come onto campus and spend the entire semester doing a variety of activities, utilizing campus space resources over the entire time period
- Student groups, including academic, residential, and community, are closely tied to and build identity around a physical, spatial resource

Envisioned State

- Swing students on/off-campus; students would come on to campus for period of intense use and then leave, making room for a different cohort to experience campus. These periods of intense use would also be used to create strong connections between members.
- The campus will act like a bridge between online and fully residential education, where the MIT campus is a hub linking modes of learning

- Group identity is decoupled from physical resource, allowing resource to be shared with other groups when not in active use; relying on strong community bonds and support networks, making them more resilient to potential catastrophic changes
- This could be accomplished in a variety of ways, including use of a Co-Op experience to increase residential capacity

Pros

- Students who wouldn't otherwise be able to have an on-campus MIT experience would
- Utilize space differently to support a wider range of audiences
- Bridge online, in-person, and practical experience learning through co-op; certificate program

Cons

- Redesigning the learning structure if moving to a Co-Op or internship model
- Logistics of having cohorts move on- and off-campus
- Resources (e.g., faculty, staff, financial) needed to support more students.
- Space constraints when swinging students on- and off-campus (e.g., housing, classroom)

Beyond MIT Group Ideas

MIT Postgraduate Education of the Future Initiative

Current State

While the MIT Work of the Future Taskforce has invested research and reflection into how technological innovations and the digital economy transform the nature of human work, MIT as a leading global institution of higher education has only begun to think about how we ourselves can play a part in the Taskforce's vision of "ensuring that the gains from these emerging innovations contribute to equality of opportunity, social inclusion, and shared prosperity."

We currently lack a coherent vision and plan for an MIT "Postgraduate Education of the Future" that makes MIT a pioneer in preparing people to work at "good jobs" of the future—jobs that are satisfying and meaningful. How can MIT re-envision postgraduate education in a way that enables lifelong learning and growth mindsets so that people can, as Joshua Cohen notes in his Work of the Future brief, "exercise our powers of perception, imagination, and judgment; collaborate socially; and make constructive social contributions." How can MIT empower and educate people to work in the digital economy and use technology so that they amplify their own potential and take pleasure in their work?

Units at MIT have developed professional online programs, but our reach is small relative to the size of the workforce and relative to our collective breadth at MIT. Our current reach in residential MIT Professional Education is around 2,500 students per year and around 10,000 students per year for blended online; in Sloan, 5,000 students residential plus 15,000 online; through the Office of Digital Learning, around 15,000 online—relative to a total US workforce of 124 million in the 2020s.

There are also populations of potential learners we rarely see at MIT. They get their initial undergraduate degree, put down roots in a job and with a family, and see residential-only programs as out of reach to financial constraints, family logistics, and/or ongoing job responsibilities. With a coming economic recession, rates of career change for many are likely to increase, and many will be looking for opportunities to grow. Leaders in both the public and private sectors are trying to adapt to rapid social, economic, and technological changes in their jobs and environment. Managers as well as executives increasingly recognize that they need to update their understanding of data, science, and technology and understand how new developments in these areas affect their job descriptions and responsibilities.

Demand for professional and executive STEM education (including for non-degree programs) creates a significant revenue opportunity. Spending in just the US on executive education was over $1 billion in 2019 and $83 billion on workplace training. During the COVID pandemic, increased Work From Home (WFH) has increased the draw of more prestigious brands. Consumers will be looking to prestigious brands like MIT, given they have less organic exposure (conferences, etc.) and are seeing a narrowing of learning opportunities. Our EdX courses have been very well received, but do not target a professional audience. Our MicroMasters programs have been a big success, and we may want explore their role in contributing to flexible, recombinant postgraduate courses of study.

In sum, MIT needs to be thinking about how it can lead in the Work of the Future by developing a thoughtful, creative, and coherent Postgraduate Education of the Future and pioneering a higher-education strategy for "good jobs" that can complement firm-level and public policy strategies.

References

OpenCourseWare (OCW) has had 210 million site visits and is the largest .edu channel on YouTube but was designed to make content from existing courses widely available rather than built specifically for online educational programs.
https://www.statista.com/statistics/788521/training-expenditures-united-states/
https://upcea.edu/wp-content/uploads/2017/09/The-Changing-Landscape-for-Professional-and-Continuing-Education-in-the-U.S.whitepaper.feb17.v2.pdf

Envisioned State

We propose an MIT Postgraduate Education of the Future Initiative. This initiative would establish a new college or university-wide unit at MIT dedicated to online postgraduate education with a range of postgraduate subjects and coherent, intentional programs. Offerings and the structure of programs would not solely be driven by available content or the traditional sequence of master's and doctoral degrees, but also by the needs of learners that are leaders and innovators in the public and private sectors, professionals, and other members of the workforce. The structure and sequence of degree programs in the United States has changed very little over the last century. Yet, as the report by the Education Group notes, "it's hard to believe that the best way to educate managers and leaders in the 21st century is to give them an intense dose of training and networking at age 27 and then sporadically supplement that with a combination of books purchased in airport newsstands offering "The New Science of…." and short in-person training courses built on the folk-wisdom of case-based discussions that sample heavily on the dependent variable of success."

Within the new college/unit established by this Initiative, faculty from the Schools/College would serve as faculty leads for online postgraduate subjects and programs that are carefully and intentionally designed to empower learners for "good jobs" and "good work." Faculty leads would direct teaching teams of lecturers, instructors, visiting faculty, and digital learning experts. Lecturers and instructors could be appointed to the college/unit or have joint appointments between the new college/unit and existing departments. Graduate students and postdocs who want to explore non-academic careers—something that the Student Journey Group as highlighted as an important consideration—could serve as instructors and TAs.

Like the Education Group, we acknowledge that the existing cadence of postgraduate education is unlikely to change anytime soon. But it is important to step back and assess the specific purposes for which existing master's and doctoral degrees are best suited, and to identify the needs that they fail to serve for which we need to create new forms of postgraduate education. These new forms might involve recombination of existing subjects and pedagogies, as well as the creation of new ones. There could also be bridges between the new college/unit and on-campus education that are facilitated by the Academic Learning and Residential Spaces Group's idea to reach and educate more students.

This Initiative could also enable MIT to connect more effectively to under-resourced and marginalized communities and groups by providing a reduced or free tuition program and integrating with the Social Equity Committee and Community and Nonprofit Liaison Program (CLP) that is also being proposed by the Beyond MIT Group. And like the Education Group, we envision that this Initiative could also support lifelong and continuing engagement with MIT alumni who could return to programs and paths specifically designed for them.

We suggest an initial five-year plan for authorization and discussion of partnerships across campus. These would not be framed as efforts to consolidate or amalgamate initiatives. Instead, the new college/unit could provide "air support" and appointments for new and existing initiatives distributed across the Schools/College.

To implement this five-year plan, we recommend a purpose-built committee that will examine this initiative with respect to MITx, OCW, existing professional and executive education efforts, as well as how existing models (Harvard Kennedy School of Government's Executive Education, Harvard Extension, Boston University Evergreen) to understand our comparative advantages as well as how we are best placed to contribute to the public good. This committee should also look carefully at how MIT can complement existing initiatives by professional schools and local colleges and universities to avoid replacing or crowding out initiatives that are already having positive social impacts.

Pros

- Directly derived from our mission to "educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century"
- Responds directly to the challenges and opportunities created by the COVID pandemic
- Builds on MIT's strengths for large and growing science and engineering industries that will represent career change opportunities for many
- Revenue from this new college/unit can subsidize the MIT budget for research operations and new faculty recruitment
- Increases STEM and the integration of social sciences, humanities and ethics, and design with STEM across the world
- Increases STEM knowledge and skills among government leaders and officials who need to make policies and decisions about the regulation of data, science, and technology. The supply of STEM education and training for government leaders and officials is currently very limited, and MIT has a unique draw for this group of potential learners.
- Increases MIT engagement and profile globally without the costs of developing physical satellite locations
- Readily paired with on-campus professional education and the Industrial Liaison Program (ILP) as complements
- Could include pro bono / not-for-profit stream that integrates with our subgroup's other idea, the Community and Nonprofit Liaison Program (CLP)–Social Equity Fund

- There is a potential for synergy with graduate education. Much like we have made GIRs available on edX, production budgets for these courses could augment existing applied courses for graduate students
- Inaction by MIT on online education for a broader range of learners may also have reputational risks

Cons

- Risk of diluting MIT's brand and reputation across a wider base of student learners
- Risk of taking bandwidth and priority away from research and undergraduate and graduate teaching
- Creating incentives to reward existing faculty for online teaching, in recognition for moving their field forward with a global audience, may lead to new or perceived inequities among existing faculty, DLCs, and Schools/College
- College/unit would be a structural change at MIT

Fulfilling MIT's Public and Social Responsibilities

Current State

MIT and other elite universities are experiencing a crisis of public trust and legitimacy. We need to do a better job of convincing the public that universities are beneficial for society. MIT's mission is to "educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century." But in 2019 about four in 10 Americans believed that "colleges have a negative effect on the United States" (source: Pew Research Center: https://www.pewsocialtrends.org/essay/the-growing-partisan-divide-in-views-of-higher-education/).

Even though we want the public to view the research and education we traditionally produce as valuable for society, the fact is that much of the public does not always see what we do as immediately useful or beneficial. We need to engage with a broader range of communities, and we need to engage in ways that do not place us above others as the "experts." In the US, this means localities and groups that have been systematically disadvantaged by the operations or outcomes of the economy, regardless of partisanship. Internationally, this means a diverse range of societies and countries.

We need to welcome collaborations where communities and their representatives are equal partners in co-constructing all aspects of the work—from problem setting, to data gathering and analysis, to the drawing of implications for action. In short, we need to move away from a "push" approach whereby research and innovation happen at MIT and then we tell others what the solutions are—to a "pull" approach whereby communities actively recruit us to work with them on the problems they want to solve.

MIT cannot teach our students to work and lead in a diverse range of communities if we as an organization do not do so ourselves. Our students are less likely to think that public leadership and community service are important after spending four years at MIT. As the Student Journey Group also notes, MIT students graduating in 2018 were 10 percentage points more likely to say that being a leader in their community, working for social or political change, and participating in politics or community

affairs were “not important at all”—and around 15 percentage points more likely to agree that volunteering was not important at all (source: MIT Office of Institutional Research’s Survey of New Students https://ir.mit.edu/survey-of-new-students) and Graduating Student Survey https://ir.mit.edu/graduating-student-survey, specifically the 2014 new students survey - http://bit.ly/2014_newstudents and 2018 graduating student survey: http://bit.ly/2018_newstudents.

We need to set an example for our students by working directly in and with under-resourced and marginalized communities on an equal footing to identify the problems that they care about the most. We need to give our students more opportunities to do substantive, sustained, and meaningful work in communities that are different from their own so that they can understand different points of view and different ways of defining problems. And we need our students to see and understand for themselves that the final decisions about what should result from MIT’s interventions should rest with the people and the communities whose lives are at stake.

This work needs the support and explicit endorsement of MIT as an entire organization, rather than taking place through an ad hoc collection of individual and decentralized efforts.

Enormous, unrealized potential for community engagement, applied research, and collaborative innovation exists among faculty, staff, and students. Not everyone is motivated to do this work—but there are many at MIT who are. The problem is that among those who are, many do not feel they have the financial, moral, and organizational support of MIT to do so. As a result, we do this work on the side, as an “extracurricular” activity,” often in part or entirely outside the Institute. As a result, the potential gains from collaborating with others at the Institute and from integrating this work with basic research, undergraduate education, and graduate mentoring remain unrealized.

MIT has never made an explicit commitment to spend any of its discretionary resources and to invest the voluntary efforts of its faculty, students, and staff to helping groups that are marginalized and disadvantaged nationally and internationally. At present, the Institute does not, in a university-wide effort, support innovation, applied research, or direct community engagement in partnership with communities that need technical assistance of the sort we can readily supply.

Currently, technical assistance and applied research with communities is treated just like all other research done by labs across MIT. As such, it is subject to the same overhead and Underrecovery requirements—even when funds are spent on programming and activities within these communities to benefit them directly. Efforts to meet the Institute’s organizational or “corporate” social responsibilities will fail unless MIT communicates and commits to devoting a share of its discretionary resources to meeting the needs of marginalized and disadvantaged communities.

Envisioned State

MIT should articulate our public responsibilities globally and locally. These commitments should newly imbue our research and education and guide us to prioritize certain activities for investment of our time, money, and expertise, such as an analogue to the Industrial Liaison Program (ILP)–a Community and

Nonprofit Liaison Program (CLP) that provides pro bono opportunities to nonprofits and communities for collaboration with MIT who cannot normally afford access to our partnership opportunities.

Explicitly state our "corporate" social responsibility (CSR) commitments and rethink how academia understands social impact. While CSR usually refers to profit-making companies and what they propose to do to qualify as "good citizens of the world," and MIT is not a profit-making corporation, we still feel that as a business-like entity MIT ought to make explicit a statement of its social responsibilities. It should do this even though it is not legally required to do so. CSR responsibilities are usually framed in terms that are consistent with the mission of the organization (that is, they are not a way to absolve the organization of other less-than-fully-ethical things it continues to do). We think the same should be true of MIT. It should make an explicit statement about how it sees its public responsibilities both globally and locally. For example, will MIT make a commitment to direct a portion of its discretionary resources (i.e., faculty and staff time, money, prestige, etc.) to help meet specific (and measurable) social, environmental, economic, and justice needs in the neediest communities around the world? This statement should be a strong and living statement of strategic intent and commitment to implementation measures, such as the flagship element we propose below.

Establish a "Community and Nonprofit Liaison Program" (CLP), analogous to the Industrial Liaison Program (ILP), overseen by a Social Equity Committee. MIT's Industrial Liaison Program (ILP) provides, in its own words, a portal to MIT that enables companies to harness MIT resources to address current challenges and anticipate future needs. Yet no such program or portal exists for underserved and disadvantaged communities or nonprofit organizations who cannot normally "buy" MIT's technical or capacity-building assistance. Faculty, students, and staff currently volunteer their skills and time to advising and collaborating with these communities and organizations, but only through scattered, ad hoc efforts, which are not systematically supported by MIT despite the fact that these efforts boost MIT's impact and reputation. Moreover, grants and funds that are raised for these activities are subject to MIT's overhead rules and Underrecovery processes, despite the fact that they are philanthropic and designed to address social inequities, take place off campus, and require minimal infrastructural support from MIT. As a result, many of these funds are not currently run through MIT.

How might MIT organize itself so that it can draw on voluntary offers of skill and interest from all quarters of the Institute to "swarm" certain problem-solving needs identified by faculty, students, staff, alumni, and other members of MIT that interact with communities and nonprofits? How can MIT build on this energy and interest—much of which already exists—to expand what our undergraduate and graduate students learn and encourage, in the words of the Student Journey subgroup, "the integration of ethical thinking, public policy, and service"?

We imagine a new "Community and Nonprofit Liaison Program" (CLP) overseen by a Social Equity Committee composed of a campus-wide mix of faculty, students, staff and senior administrators. This committee should be empowered by the MIT Corporation and the MIT faculty to "invest" a percentage of the income MIT takes in every year (i.e., from all sources) to meet the Institute's social responsibilities. Companies often commit to philanthropic efforts as part of their corporate social responsibilities and enable their (workforce's) voluntary efforts and a portion of their staff time to

community-based activities. MIT has substantial discretionary resources. Will it commit to use a portion of these funds to help meet global and local social, economic, environmental, and justice needs?

Alumni, philanthropic foundations, and other donors have expressed interest in making gifts to MIT specifically for the purpose of supporting an Impact Fund, similar to the MIT Impact Lab proposed in 2019. In the past, gifts and grants for technical assistance to communities and nonprofits have been difficult for MIT to process, but it is important for the MIT central administration to encourage rather than discourage gifts of this kind. The Social Equity Committee could be charged with administering this Social Impact Fund.

The Committee should be appointed by the President and the Corporation with the approval of the faculty. It would include key "office holders" with related job responsibilities (like the Associate Dean of International Oversight, representatives of each of the five School Deans, heads of the campus workers organizations, the head of ILP, and others.). It could also overlap with the Faculty Advisory Board to the Office of Experiential Learning that the Education Group of the Academic Workstream is proposing in order to encourage students to participate in projects that serve the public interest and break down barriers between MIT and the world in both local and global ways.

Social investments (or allocations) made by the Committee could be triggered by requests from CLP partners or proposals from anywhere within MIT. That is, investments or allocations would be made in response to proposals from members of the MIT community (including alumni). To be selected, proposals would need to meet specific criteria such as serving under-resourced or disadvantaged communities which would not normally be able to “buy” MIT’s technical or capacity-building assistance. Such communities, their local governments, and nonprofit organizations would become partners in MIT’s CLP.

Once such partners and activities are identified, the Committee and CLP office should seek to identify volunteers from across the campus, particularly faculty, who might help “swarm” the particular problem, offering their time to assist in multiple ways. Faculty could offer to take on “consulting-like roles” or organize relevant classes to assist client communities. Student associations or organizations could make particular projects their priority for a period of time. One could further imagine a civic and community-oriented version of the MIT Startup Exchange as well. Right now, there is no coordinating mechanism to ensure that MIT mobilizes all of its embedded expertise to help undertake projects on behalf of (non-corporate) under-resourced or disadvantaged communities.

The CLP would be a way to achieve the recommendation of the Student Journey Group to “cultivate and fund a critical mass of immersive nonprofit, public sector, and for-profit social responsibility internships.” Such experiences are essential to educating “the whole student” in our undergraduate program and can also enable graduate students to explore non-research careers, priorities that the Education and Student Journey Groups have highlighted. The CLP could also contribute to and animate the “third spaces” that are neither fully academic or residential and allow for wider community use envisioned by the Academic Learning and Residential Spaces Group’s proposal to promote community spaces and relationships.

The CLP could also coordinate with the Office of Experiential Learning and the Structural, Systemic, and Institutional Hierarchies (SSIH) curriculum being proposed by the Education Group. CLP projects and activities could provide experiential learning, hands-on subjects, and a diversity of case studies, which are proposed as potential pedagogical approaches for the SSIH curriculum.

The Committee should be empowered to "compensate" departments or research units for faculty or staff time that is volunteered as part of a swarm. This could be through release from committee or regular responsibilities, or for projects for which there is philanthropic funding, through discretionary funds and a point system similar to ILP. The Committee could also advocate during promotions, tenure or hiring decisions on behalf of those who originate such initiatives or commit their time to help implement them. We hope this will remove some of the barriers that presently impede the involvement of MIT junior faculty in the work of improving social equity in the world. When MIT says it is already committed to solving the most pressing problems in the world—and that is how it fulfills its social responsibilities—that overlooks the many ways in which incentives and dis-incentives of all kinds currently constrain what MIT does and who it helps. We need to (1) create new incentives for faculty, students, and staff to work with client communities on problems defined by marginalized groups in society, and (2) remove some of the obstacles or disincentives generated by the normal rules of MIT operations.

If structured properly, the Social Equity Committee will be empowered to suspend some of MIT's general rules and procedures (i.e., including overhead rates for qualified projects, thus doing away with the problem of Underrecovery of overhead for social responsibility-inspired projects). Following Committee designation, selected projects would be allowed to seek donations, matching gifts, or voluntary support from anywhere inside or outside of MIT. None of these gifts would be assessed overhead charges.

It will take some time to outline the precise mandate of this new committee and to formulate the guidelines or criteria by which it will operate in line with MIT's core purposes. We think the process of formulating these criteria and appointing the members of the Committee should be entirely transparent, and open to input from the whole MIT community. The Committee will need full time staff support immediately. The criteria for project selection used by the Committee might change over time, although all proposed changes should be open to close MIT-wide scrutiny before they are made.

Establish metrics for social responsibility and impact. Companies usually promise to take responsibility for the externalities of their operations as part of their corporate social responsibilities. MIT already does this, in part, by taking campus sustainability seriously and trying to reduce its carbon footprint. Can we also establish metrics to determine whether we have done an adequate job of reducing our GHG emissions, eliminating food waste, and cutting our overall carbon footprint? What more should the Institute be volunteering to do?

Finally, companies talk about the ways in which they intend to modify their hiring, labor, and work-place practices to make life better for those who are not well served by their normal operations. MIT could

commit to increase the extent to which all the goods and services it purchases provide disproportionate benefits to those who have been hurt in the past. MIT is an anchor institution in the Boston area and even in the country. It could do more as an anchor institution to direct its discretionary spending in ways that enhance social equity. The only way a statement of social responsibility will mean anything is if it is framed, monitored, and revised in measurable and transparent ways.

Pros

- Commits the MIT community to working with communities, their local governments, and nonprofit organizations in the US and around the world who otherwise could not afford to pay for technical or capacity-building assistance from the Institute.
- Shows through action that the institute values civic leadership and community service in line with its primary mission
- Creates impact that is more bidirectional, efficient, and effective than the work of traditional university labs and centers.
- Organizes and links what MIT is already doing in developing countries and in communities across the US
- Systematically mobilizes all of MIT's embedded but scattered expertise to help undertake projects on behalf of (non-corporate) under-resourced and disadvantaged communities.
- Provides additional support (i.e., elimination of overhead) for what parts of our community are already doing to help under-served and marginalized groups and communities.

Cons

- There is sure to be tension surrounding the identification of only some activities as "socially responsible," especially if there are resources attached. There needs to be MIT-wide endorsement of the criteria for project selection and the process by which the Social Equity Committee works needs to be totally transparent.
- Clearly there are funding and resource issues to address. While some projects might require only one-time MIT involvement, others would probably benefit from a more extended partnership. The Committee would have to decide on the "life" of each project or engagement.
- It will not be easy to build new incentives into the reward structures at MIT to encourage faculty and staff to participate in helping to meet MIT's social responsibilities. Can we learn from pro bono work at law firms? Can we create "volunteer time off" (VTO) for staff to allocate time to CLP projects (e.g., Cisco's Leadership Fellows Program—https://www.slideserve.com/luka/cisco-leadership-fellows-program-criteria-for-nonprofit-or-non-government-organization-projects as discussed in HBR—https://hbr.org/2009/09/helping-others-helps-yourself)?
- It is not clear what percentage of the Institute's workload should be committed to the fulfillment of our global and local social and civic responsibilities.
- There is a danger that the CLP could become a silo and have a "green-washing effect" whereby most of MIT decides that they don't need to embed the values and principles of MIT's public and social responsibilities into what they do because these are "outsourced" to CLP. In order to ensure that CLP and the Social Equity Committee tilt the whole organization and culture into a more socially

responsible mindset in all that we do, we must involve the regular and consistent participation from the senior leadership, and faculty, staff, and students from the College and all the Schools.

Administrative Workstream Ideas

Task Force 2021 and Beyond: Administrative Workstream Summary Report and 12 Supporting Ideas

Workstream Chairs: Krystyn J. Van Vliet and Joe Higgins
Workstream Support: Frances Neville, Jennine Talbot, Chase Bronstein, Greg Raposa

MIT's research and education missions and campus residential community include diverse administrative functions. While we all rely on such services to live, learn, and work together as the MIT community, the needs met by the Institute's daily operations seem either so elemental as to be invisible or so inflexible as to be circumvented. These functions include a host of campus operations, administrative processes crossing the academic, research student life, and business operations, and workforce operations for MIT employees, students, and contracted service providers. These are the Where, How, and Who of MIT's operations that can help MIT maximize its positive impact on the world, and can also help each of us bring our best selves to that mission as a faculty, staff, or student member of the MIT community.

The COVID-19 pandemic created a forced experiment in MIT's operations. In March 2020, the concept of the campus shifted dramatically. But the campus never really closed, and the Institute's mission continued in a new way. Critical campus operations remained intact and some research projects continued throughout the spring and summer, while many of us worked from home for the first time and the residential population was much smaller but just as important to support well. This workstream never met in person, and yet we developed a sense of teamwork via telepresence, focused around clear needs. Without time for measured discussion and debate, we all adapted where we worked and studied, how we communicated information and decisions, and exactly who comprised our workforce that supported the constant operations of the campus in Cambridge as well as our off-campus research facilities and MIT Lincoln Laboratory. By the fall semester of 2020, we started to grasp some of what we missed about old campus rhythms, and also some of what we did not miss fondly. While none of these adaptations were easy, and not all were preferable or better, we now had an existence proof that they were at least possible if we committed to them together.

The Administrative Workstream included three substreams to tackle this opportunity, with a lens on the Where, How, and Who. All teams considered the campus community to include: MIT's 168-acre campus in Cambridge, MA 02139, as well as nearby properties that MIT leases for use by multiple departments, labs, and centers (DLCs); MIT's off-campus research facilities including Bates Engineering R&D Center and Haystack and Wallace Observatories in Massachusetts; MIT Lincoln Laboratory in Massachusetts; and MIT's Office in Washington, D.C.

- **Team Where** focused on campus operations, led by Brent Ryan and Julie Newman. This team focused on considerations of physical space including use of buildings and grounds, supporting infrastructure including utilities, and sustainable campus operations including climate resilience. Time horizons of changes in this sphere can span short-term to long-term, spanning many decades that reflect the level of investment and longevity of campus buildings and support infrastructure.

- **Team How** focused on administrative processes, led by Maria Yang and Heather Williams. This team focused on data and decisions, including the systems, tools, and people who support faculty and students in research, education, and residential life. These administrative processes can include employee onboarding and training, DLC and faculty management of research groups and projects, learning systems, and the associated information systems and technology (IS&T) infrastructure. Time horizons of change in this sphere are short-term to medium term, given the historic siloing of data and pace of system changes that depend in large part on internal MIT practices.
- **Team Who** focused on workforce operations, led by Ramona Allen and Tom Kochan with significant leadership support from Dyan Madrey. This team focused on MIT's recruitment and retention of a talented workforce of faculty, staff spanning research, technical, and administrative roles, and contracted service providers. That holistic definition of those who work at MIT focused more on faculty and staff than on students, since this vital component of student learners and researchers in the MIT community was considered by other TF2021+ workstreams.

Our premise was to image MIT operations with a clean slate. With the charge provided by the TF2021+ co-chairs, we aimed to *fix the features that never worked well for us; adapt successes of others to fit MIT needs; glean from the ongoing experience of disrupted work practices the surprising where, how, and who of MIT's best work; and identify and retain the features that make us proud to live, work, and learn at One MIT.*

The themes that emerged early in the Administrative Workstream were retained through the final synthesis stage of three big ideas. These themes appeared to resonate with other workstreams, and we summarize these as key features that we recommend to be criteria for TF2021+ recommendations that are advanced to implementation:

1. **Community-minded spaces and systems:** Maintain and promote MIT community through sharing of space and data, and through cross-training and development of people at MIT.
2. **One Agile MIT:** Create an agile project team staff that enables us to builds a new "train tracks and trains" of tools and systems—while the current staff keep the cars on the existing train of MIT innovative research and education, and then moves on to the next prioritized project.
3. **Flexible work at and for MIT is a key part of MIT's future, and is not default work from home (WFH):** MIT must pilot and practice how this improves work of the individual, team, and Institute; the present circumstance does not extend to future excellence without the individual and Institute investment in a few design cycles.

The Administrative Processes Workstream elected to synthesize the ideas of each substream to reflect **Three Big Ideas** outlined elsewhere on the TF2021+ site. These Big Ideas are:

1. **New Ways of Working: Integrating flexible and sustainable work practices and places at MIT**—Promoting and piloting collaborative work that balances tradeoffs of remote work, community interaction, and shared stewardship of campus resources to achieve MIT's mission—with new practices and tools for the Institute's research, education and administrative teams

2. **MIT Career Networks: Employee development, strategy and career pathways**—Skills development connected to clear career pathways at MIT for staff and faculty, including integrated training on new tools to recruit and retain top and diverse talent
3. **One Agile MIT:** Enabled by new digitized data sharing practices across DLCs, and a new cross-functional team, implement transformational MIT-internal projects that support clear and easier decisions by MIT's world-class research, teaching, and administrative support teams

Big Idea 1. New Ways of Working: Integrating Flexible and Sustainable Work Practices and Places at MIT

Summary

Promoting and piloting collaborative work that balances tradeoffs of remote work, community interaction, and shared stewardship of campus resources to achieve MIT's mission—with new practices and tools for the Institute's research, education and administrative teams

Context

The COVID-19 pandemic created a forced experiment in MIT's operations. In March 2020, the concept of the campus—and what it meant to work and study @mit.edu—shifted dramatically. In the context of a public health emergency, rapid changes were executed and critical campus operations for life and safety continued. For most of the MIT community, however, work and study were dislocated from the campus buildings and MIT off-campus research facilities we thought of as our "MIT home." Most of us were also dislocated from in-person interactions with our colleagues, supervisors, mentors, mentees, and friends that comprised our "MIT family." While none of these adaptations were easy, our early assessments were that parts of our MIT lives were improved and some were worsened. In the hazy context of the continued global pandemic, it is too early to accurately perceive the new baseline of work life, home life, and Institute operations. However, two features of that new baseline appear clear: (1) the future MIT includes flexible work places and work practices, which are not a default work-from-home or a retreat to familiar yet inflexible ruts; (2) MIT's mission requires that we plan and practice adaptations of the campus now. This transition requires that our commitments to both community and sustainability are integrated with our commitment to research and education excellence.

MIT will not realize the benefits of flexible work places and practices by happenstance or by copying other universities or companies. MIT's world-class research and education means that some teams, roles, and individuals cannot work remotely on most days, and that some may do their best work that way. MIT's campus footprint in Cambridge, Massachusetts reflects the constraints of an urban riverbank location and the continuous reinvention of research needs and teaching approaches and student life priorities. MIT's embrace of the campus as a living laboratory—including demonstrations of sustainable operations for climate resilience developed by faculty, staff, and student teams—signals that we are ready to approach this opportunity as a design cycle that requires not just planning but also prototyping, evaluation, and redesign as we learn together. New Ways of Working seeks to leverage the best of what we learned in a crisis, confront the risks and benefits of sharing the campus differently, and retaining the community strength that we call One MIT. While we often think of MIT from the individual vantage

point—the campus perceived as our lab, our office, our desk, our favorite lunch spot outdoors or library nook or shop bench or workout facility or lecture hall indoors—the essence of @mit.edu is collaboration among people in groups of many different sizes and skillsets, and different working styles and hours. New Ways of Working challenges us to also consider the collective MIT, and the tradeoffs that flexible work places and practices include for us to thrive individually and together in the next year and next decade. We owe this thoughtful action to the next century of MIT that will inherit our choices.

Recommendation

MIT should immediately advance planning and piloting of flexible work practices and places. This should include options for hybrid working schedules (remote and on-campus) for diverse MIT teams, and include implementation pilots to evaluate physical spaces and best practices for more flexible work of research, education, and administration teams. Internal and external experts should be consulted to plan such pilots.

Current State

MIT's primary "campus" presence is concentrated in Cambridge, MA. This includes all buildings with MIT building numbers in the Kendall Square area, whether owned or leased by MIT for use by departments, labs, and centers (DLCs). MIT-affiliated facilities beyond Cambridge are comparatively few in number and limited in campus audience. These include specialized MIT Off-Campus research facilities in Massachusetts (MIT Bates Research and Engineering Center, MIT Haystack Observatory; MIT Wallace Astrophysical Observatory), as well as MIT Lincoln Laboratory (LL, a federally funded R&D Center), international research facilities such as in Singapore (SMART) that provides access to participating MIT research project teams, and the MIT Washington Office. MIT shuttle service is limited currently to LL.

Campus building space assignments are administered formally by the Provost's Office. Space footprints assigned to units (e.g., a school or academic department) can then be adapted to meet changing needs, such as a new faculty hire or research program or student life activity. Spaces are assigned to DLCs, including Departments that report through academic School and College Deans, the Vice President for Research (most Labs and Centers), the Registrar (most classrooms) or Offices (e.g., Chancellor or Executive Vice President and Treasurer or Open Learning). In practice, this has mixed success: it does not accommodate rapid change or program growth (or shrinkage) efficiently for this scarce campus resource, but provides DLC leadership the capacity to make local choices and changes within a specific footprint. Project Manus and Makerworks exist as models for shared workshops, and some DLCs have shared laboratories for multi-faculty research groups or hands-on teaching, but these models are limited in scope and audience. Outdoor spaces at MIT are shared, and are mostly traditional campus lawns and plazas with some exceptions (e.g., the Hive); athletic fields are understandably more circumscribed in their use by the wider MIT community, with limited permeability of MIT communities that live on or use the West Campus. With notable recent improvements in availability of outdoor furniture and lighting, activities using most outdoor spaces are generally limited to a few special events.

Allocation of administrative space on campus (i.e., space used by those with roles vital to enabling research and education, if not directly participating in research or teaching activities) is grounded in the

assumption that employees are assigned to a stationary space for a five-day, 40-hour work week. In this construct, one goes to the same quadrant of campus and interacts with the same neighbors and maintains the same daily routines. Although the consistent workplace provides a sense of stability, routine, and consistent connectivity, there is little to no adaptability and systemic function built into the current system. Moreover, x% of MIT staff are in meetings x% of the time and thus a desk sits available for use x% of the week. Within this framework, staff rely on access to resources (e.g., office supplies, coffee) that each department is responsible for acquiring. Few campus-wide spaces exist for temporary or intermittent use (e.g., 'hoteling' by the day or week) for faculty and staff, except for building W92 and an internal model in Sloan. MIT individuals and MIT teams frequently seek and request such space on campus and off-campus—whether for special projects or preferred work practices/locations. MIT lacks a campus-wide policy or reservation system that would facilitate that beyond a DLC or use of a limited number of Registrar-managed classrooms. A pilot program to add just 14 existing campus meeting rooms to a campus-wide reservation system was successful, but took two years to implement and identified challenges to scaling based on both technology and current preferred practices within DLCs.

Operationally, procurement processes at MIT are dispersed and thus redundant. This can negatively affect speed and cost of procured materials, and limit interoperability of procured services across DLCs. Campus waste management is also redundant, e.g., split between Grounds and Housing Services.

MIT has a flexible work policy (Policy 3.1 in the Employment Policy Manual) that has allowed employees to request different work schedules and/or work locations to meet their individual needs and the needs of the Institute. COVID-19 forced much of the Institute to work remotely overnight. Most respondents to MIT's 2020 Quality of Life survey already had experience working remotely (69%), though for many roles (e.g., MIT Police, MIT Custodial Services staff, and many researcher using specialized equipment or certain campus-based artefacts) working remotely is not possible. Departments in which a larger percentage of staff were already fully remote prior to COVID-19 were able to quickly adjust to the new remote requirement. Adaptation was more challenging for DLCs with less experience in this area.

Envisioned State

- Working and learning at MIT includes coming to campus, but with a much easier way for any MIT community member or MIT team to access more working space in an as-needed basis. By design, a move towards a more flexible work environment could lead to a three-fold benefit for MIT: valuable workspace could be opened up for highest-value activities (among widely varying research, teaching, student life, administrative, and external uses). While not focused on campus footprint reduction for its own sake, such shared and flexible approaches could facilitate expansion of research and education programs while also limiting space creep to alleviate pressure on affordable housing, mobility, resource use and environmental footprint in Cambridge. Human flexibility and resilience that we build in doing this will have spillovers for organizational vitality. But achieving this vision will require dedicated attention to both space utilization and personnel development.
- Additional resource cores dedicated either to research or non-research activities, with opportunities for shared space and equipment to support similar work, reduce redundancy, and enable sustainable procurement and waste management among multiple DLCs.

- Diversified sites in Cambridge and beyond (MIT+) could provide flex space to support working, living, learning, and research on or around the MIT campus. Using existing available Cambridge space as a pilot could provide short-term learning for several DLCs in the academic and administrative spheres. Developing a purposed-designed shared flex site (e.g., workstream discussions with Stanford Redwood City and RAND) for MIT+ locations will require additional planning and considerations.
- Open access (for the MIT community), real-time platform for scheduling interior or exterior space. In parallel, an expanded, accessible (universal design / DEI) platform of facilities data to support transparent space management processes. Exterior program spaces, such as designated outdoor 'patios' with the necessary supports to enable mission-driven (traditionally indoor) activities, could be achieved under this model.
- Particularly for administrative staff roles within DLCs and Offices, wherever possible, successful job completion should be independent of physical location and time, depending on the specific job requirements and nature. Managers and employees have conversations about what work is best done in the office, what work can easily be done remotely, and/or a combination of the two. Equipment needs, impacts on team culture and collaboration, and employee feelings of respect, inclusion, and engagement should all be considered. Options for flexibility are key.
- Programs to leverage community/crowd-source data (a la Waze) are developed to accelerate and diversify the data collection on campus space, broadly defined. And participation in data collection is incentivized by partner programs that provide enhanced, data-supported, user experience of campus (e.g., where is the closest available parking spot to my meeting? what other talks are scheduled near my class? how busy is the nearest study lounge? who in my department is working on campus today?). The data-driven user experience of campus also extends to an understanding of how data they provide feeds into metrics on larger MIT initiatives, like reduction energy use intensity (EUI) and greenhouse gas (GHG) production.

Implementation notes

1. Preparation for phased implementation should include rapid assessment of the capabilities of potential consultants with expertise in work practices, architecture and design of collaborative research facilities and work spaces, technology supporting space sharing and distributed work locations, and organizational change.
2. Consider short-, mid-, and long-term future states, because implications of hybrid work locations include many tradeoffs for the DLC and the individual to consider, pilot, and adapt. Some units can adapt more quickly and for a greater percentage of their team members; most units and individuals will continue to want some easy, predictable and flexible access to campus-based resources even if most work activities can be conducted off-campus; all units will continue to seek personal interactions that feels like genuine community.
3. Evaluation of pilot success for DLCs would be measured against MIT shared values for New Ways of Working. A draft set of such principles was developed by the Campus Operations substream, including headings such as: Teaching and Learning Excellence; Flexible / Adaptable; Support / Allow for Future Models of Work, Learning, and Discovery; Campus as Living Lab; Positive Regional / Global Change Agent; Improve Business Continuity; Reduce Traffic / Congestion.

Pros

A commitment to a flexible, resilient, and collaborative work environment that overtly seeks to reduce our environmental impact and develop a culture of shared resource use can lead to increase in innovation and job satisfaction at MIT.

- MIT+ locations: Expands definition of MIT campus to include MIT+, as sites currently considered off-campus locations outside Cambridge. Added flexibility for commuters, frees space on campus for sustainable renovation and research/teaching needs that require proximity to existing campus-only resources.
- Dynamic hybrid space at existing MIT campus: Better meets org/group needs for use of existing spaces. Creates more research-accessible space; fosters DLC flexibility in space priorities.
- Improved space efficiencies supporting better utilization and renovation of teaching and research spaces
- Resource cores added efficiency, synergy and diversity on projects, cost savings
- Increased transparency and increased buy-in in space management processes
- Shared understanding of space use and value propositions associated with university goals (sustainability, safety, resiliency, flexibility)
- More efficient use of space (office space, parking, meeting/conference rooms) for each team
- Environmental impact reduction (reduced carbon footprint, reduced commuting costs/time)
- Allows for flexibility in how and where work at MIT gets done
- Enhanced image of MIT as an employer and a place to work
- Increased employee health (reduced stress, reduced cost of commuting, family/personal time/needs, healthier food, personal hygiene/comfort)
- Expanded productivity (focused work time, impromptu meetings, more efficient scheduling of appointments, reduced tardiness/absenteeism)
- Improved talent recruiting (more candidate interest, access to a larger pool of talent)
- Expanded resilience of organizational capability
- Enhanced innovation, the building of a culture of strength via maintenance of individual motivation

Cons

- MIT+ locations: Not convenient for everybody (equity issues). Reduced visibility of employees in supporting roles may be perceived as inactivity by supervisors or faculty. Without careful piloting, could further silo administrative staff from academic and research staff, or a sense of identity loss as One MIT. Potential additional costs for space and services.
- Shared resource cores can prompt perceived loss of control over when/how equipment accessed, in both research and administrative units.
- DLCs may feel any space sharing is relinquishing a gatekeeper role for “gathering space” availability (visibility and scheduling) and sufficient autonomy in unit planning and growth.
- Increase engagement in planning and policy dialog could slow development and disenfranchise participants without clear deadlines and feedback loops.

- Unintended cultural consequences of flexible space usage (e.g., lack of informal support possible when you don't easily know where to find people)
- Reduced face-to-face communication, lack of 'community' feeling, moderated social connection, feelings of isolation
- Risk of workload and professional development inequities arising from some employees having more in-person interaction with supervisors depending on work location
- More tailored practices required to ensure consistent performance management and additional actions necessary to ensure accountability/expectation alignment
- Missed opportunities for collaboration between colleagues not working in the same spaces, though we note the oft-mentioned anecdote that MIT collaborations often spark off-campus because we leave our cocoons of familiar campus places and paths.

Big Idea 2. MIT Career Networks: Employee Development, Strategy and Career Pathways

Summary

Skills development connected to clear career pathways at MIT for staff and faculty, including integrated training on new tools to recruit and retain top and diverse talent

Context

MIT currently employs individuals in a broad range of employment categories both in its academic and administrative/staff operations. These include people with full-time tenure and non-tenure track teaching and research faculty, postdocs, adjuncts, lecturers, research scientist roles on the academic side, as well as full-time staff and administrator roles. The effective workforce at MIT also includes over 2,000 people across various employee categories such as temporary, contract, and part-time roles. In particular, the MIT career networks of non-tenure track staff present important opportunities for improvement that also benefit the broader Institute of tenure-track faculty and student communities.

For the past several years, exit interviews and survey data of MIT employees (who terminate through Central Human Resources) consistently show that the leading reasons employees leave MIT are that they don't feel MIT is committed to their professional development, and that there are not enough opportunities for career advancement. As a result, MIT is losing talented employees to other organizations and institutions where they can find more secure employment and more robust development resources and opportunities. This turnover is costing the Institute in several ways:

- We are investing time and resources in repeatedly training and onboarding the same positions, sometimes multiple times within the same year. We are not retaining these employees long enough to enable them to build strong institutional knowledge of MIT's history and practices. Many DLCs rely heavily on the institutional knowledge of employees who have worked at MIT for extended periods. With many of those individuals nearing retirement, there is a looming problem in those

DLCs if we do not ensure a pipeline for reliably replacing the individuals who retire along with other long-term MIT employees.

- Many contingent workers possess diverse skill-sets and are capable of contributing more to MIT than their current positions require. When these workers feel that MIT is not committed to them as employees, they seek opportunities elsewhere instead of taking the initiative to expand themselves professionally within MIT.
- Feelings of precarity prevent our employees from developing trust between themselves and their managers, and between employees and MIT as an organization. These feelings also erode a sense of solidarity among members within our community and impede a shared commitment to MIT's mission.
- Employee development and mentorship is not a deeply embedded cultural norm in all DLCs. This affects faculty-staff relationships as well as student-staff and faculty-student relationships, because we all observe and replicate what we think it means to build and maintain great teams at MIT.

Recommendation

Establish integrated opportunities and expectations to develop skills for mentorship, management of teams, and career advancement through tools, training, and support of career pathways and networks at MIT—as a natural part of working at, contributing to, and being part of One MIT.

Current State

The top two reasons that people leave MIT is for career advancement and professional development. Onboarding and orientation is left to the local units, where the quality of the training varies considerably.

The current state of our systems used in many staff roles has resulted in customized solutions that may lead to single points of failures, poorly documented systems, and mixed levels of training with few, if any, commercial training options. This is true on both the central and local DLCs at MIT. There is online training available for some of these systems, but staff are too busy to access the training and the training is often not easily accessible. In addition, training during rollouts of systems, processes, and programs is conducted, but is inadequate for new members of the community. While online training is a good resource, it does not allow trainees to ask questions, develop relationships with colleagues, or learn about the systems and initiatives in place in other units.

This can be considered in the context of support, systems, training offerings, and visibility to opportunities for career progression, including:

- Management Support
    - Managers do not always realize that their role is to help develop their employees beyond classroom training nor do they always have training in this area.
- Systems
    - Technical platforms not aligned and training offerings are limited to none.
    - Current systems make it impossible to target employees by levels or roles.

    - Current system emphasizes formal training programs; modernized system needs to shift to a learning platform accessible to all employees.
- Career Progression
    - Career progression involves moving up, moving laterally, and/or growing within a job.
    - Currently, we lack transparent, formal career paths, and other kinds of formal development opportunities such as job rotations, job enhancements, etc., which could assist in retaining and engaging employees and succession planning.
    - Training programs not linked to career progression, performance management, or compensation.
- Course/Training Offerings
    - There is a moderate array of employee development courses that focus on specific roles (emphasis on management) with limited offerings for the average employee.
    - Course offerings are not timely/infrequent
    - Development programs are not suited to all job types
    - MIT employees are often unaware of the internal training resources available such as: EdX, LinkedIn Learning, Sloan Exec. Ed, HR resources, and tuition reimbursement

Envisioned State

A workplace culture in which employees and MIT make shared commitments to one another to better both entities and meet the "One MIT" principle. That workforce members are considered indispensable and distinct contributors. And the Institute recognizes that modern work comprises intangibles such as emotional, psychological, and extemporaneous behaviors that draw upon exceptional interpersonal skills and practices. Employee development is deeply imbedded into the culture. There is accountability associated with it for all MIT employees, including functional level development, accessible organizational maps of MIT DLCs, and career progression road map for select job families (prioritize with input from broader MIT community).

MIT has a robust onboarding program that will provide a clear sense of how to access resources, develop their skills, and meet their long-term career aspirations and bring their best to MIT as their skills develop. All offices own a system or procedure would provide training and documentation related to the activities that they oversee.

All staff have tools, systems, and resources for personal and professional development through a robust and innovative development and career progression plan. Managers and employees are aware and work together on employee development and/or career mapping activities. Traditional career paths and ladders, and/or other kinds of development opportunities, including job redesign, job rotation, job enhancement, lateral moves, etc., are transparent to employees. MIT has dedicated resources (and funding) whose priority it is to proactively establish and implement employee development/career progression strategies—growing talent from within the Institute, with the goal of increased retention and engagement. These principles will manifest themselves in practices such as: Following an initial trial period (6 months?), the Institute provides minimum longer-term contracts (3 years?) for MIT employees

in positions that are currently at-will employment, short fixed-term contracts, or subcontracted; Job descriptions offering full-time employment will encourage cross-training and foster individuals' opportunities to develop, broaden, and exercise and develop diverse skill sets.

Pros

- Employees usually feel more engaged when they believe that their organization is concerned about their development. MIT will experience a more stable workforce where more employees stay at MIT long enough to accrue valuable institutional knowledge.
- Developing and implementing employee development ideas/strategies may improve recruitment, morale, job satisfaction, motivation, productivity, and retention. Examples:
    - Having formal career progression in place provides employees with an ongoing mechanism to enhance their skills and knowledge that can lead to mastery of their current jobs, promotions, and transfers to new or different positions.
    - Employees will have a cadre of resources to assist them with training and development; career progression, etc.
- Managers are fully trained and engaged in the development of their employees.
- Catch up with state-of-the-art learning systems in place in leading private sector companies
- Increased retention of talented employees will reduce resources spent on training and onboarding for positions that experience high turnover rates.
- More robust training programs would allow staff to move more easily between units at MIT, more fully utilize the systems that we have in place, and spend more of their time on strategic activities.
- A more unified community without some employees feeling like second-class citizens.
- Reduced potential for disparate impact, disparate treatment, and other discriminatory practices that may disproportionately affect contingent workers.
- MIT would be known as an employer with fantastic training opportunities and career paths for all members of the community.

Cons

- Employee development is a significant responsibility for managers, who can be overwhelmed with their day-to-day responsibilities.
- Managers may not be prepared to have development and career conversations
- Managers may be apprehensive about career progression, as it could lead to employees leaving their DLCs.
- Significant expenditure and design costs to create a learning system for staff
- There may not always be a career progression strategy for every role or person.
- Longer-term contracts bring the risk of committing to employees that end up not being good fits for their positions. Performance review and management practices may need to be strengthened in order to offset this risk.
- Flexibility will be reduced to deal with upward and downward fluctuations in demand or budget resources for the work contractors perform.

- Would require that each office would take responsibility for training within their domains. Most departments do provide some level of training and some have robust training programs (EHS, HR, RAS, VPF for entry-level tasks), but there are many other administrative activities that do not provide training for new staff or ongoing development for those who are in the process.

Big Idea 3. One Agile MIT

Summary

Enabled by new digitized data sharing practices across DLCs, and a new cross-functional team, implement transformational MIT-internal projects that support clear and easier decisions by MIT's world-class research, teaching, and administrative support teams

Context

MIT prides itself on running lean teams that can accomplish amazing things: our research creates first-in-world discoveries and technologies, our education teams prepare students to ponder and address challenges on Earth and outer space, and our campus operational teams maintain safe, vibrant, 24/7 research and residential communities. In response to the COVID-19 public health emergency, these lean teams stretched even further to respond, create, pivot, and adapt many MIT systems so that we could continue our research and education mission. In rapid succession, new campus tools and systems were developed and deployed for accessing all MIT buildings, offering campus-wide learning systems for remote instruction, enabling viral testing at MIT Medical for those whose work and studies required use of the campus, and many more feats of necessity. Teams were formed to respond with both haste and care, communicate as broadly and quickly and accurately as possible with stakeholders, and make thoughtful decisions in the interest of the broader community and many constraints. Notably, those teams that implemented new systems and tools were not extra capacity at MIT; most diverted their efforts from existing responsibilities at MIT and felt a sense of responsibility to the MIT community. While no such process is without errors, the context of the shared and global crisis also afforded some empathy *for* those who made the best decisions they could in the interest of quickly and steadily improving on the current situation *by* those who understandably found some changes flawed, confusing, or counter to their needs.

Outside the context of such emergencies and community, of course, no organization including MIT would aspire to such marathons of change for administrative projects that support MIT-wide operations. Building the new train tracks while also keeping the important trains (of research, education, and residential life communities on an urban campus) running is ideally not done by the same people at the same time. But in reflecting on why some MIT changes were both easier and better in such a crucible, while others were more fraught, it appeared that MIT had the capacity for agility. What made it harder in normal times? Legacy silos and practices inhibited our shared use of data, tools, and decisions, but this was not about just dated systems or data warehouses in departments, labs, and centers (DLCs). Sustained change that would maintain world-class information and workflow to support world-class research and teaching also required shared values, tools and teams that together improve administrative practices across MIT.

Recommendation

One Agile MIT is a concept that includes both a dedicated (yet dynamic) team for prioritized projects to modernize MIT's administrative processes and systems, and the development and adoption of new practices for sharing of digitized data across DLCs. This benefits the work efficiencies of faculty and administrative staff in DLCs and Offices across MIT, enabling increased strategic focus and time for mission-critical activities of research, teaching, and mentorship of students and research staff.

Current State

Despite years of believing otherwise, we have learned that we can be nimble and make huge decisions at a rapid pace when in a crisis. Many at MIT believed this was intractable in part because we have seen committees formed to advance overdue administrative process changes, only to have their work seemingly forgotten or overruled/bypassed due to the lack of decision/implementation capability.

Administrative Project Management teams are re-invented from one major project to the next. Different implementation teams are formed, staffed by MIT community stakeholders, who are already managing daily operations, and then once the work is complete or the work hits an impasse the team is dissolved. Despite a culture of continuous improvement and adaptation, MIT lacks a professional project management resource charged with implementing new administrative systems and processes. Such a team can learn, build, document, and lead an effective and agile implementation methodology that consistently works with the MIT culture.

The current range of tools for data management, reporting, forecasting impedes easy collaboration among DLCs on internal administrative workflows as simple as this: supporting a faculty member with research projects administered in a few DLCs with personnel (students, research staff, or administrative staff) affiliated with a few other DLCs. At MIT, such interdisciplinary research and education is a strength but the administrative process flows supporting them expose a weakness and an opportunity. To be clear, the required administrative work to support seemingly every-day decisions is done well and carefully by staff, but the nature of the information flow and tools means it is also done inefficiently. Addressing these issues would enable MIT staff to spend less time on tedious tasks and focus on work that makes better use of their abilities, and pave the way for better access to data by all users.

Our current data systems contain a multitude of data hierarchies, resulting in delays for new staff receiving all the authorizations needed for them to function in their roles. Globally, historical information and changes have not been tracked effectively and, in many cases, any documentation is outdated and incomplete. This can leave administrative users unable to determine where to send internal questions.

- Administrative tasks require knowledge of how a particular employee relates to the rest of MIT (who the supervisor is, what departments are they affiliated with), but this information is often incorrect or incomplete in systems accessible to some administrative staff. Data access and data management limitations incur repercussions across all units.
- While data issues are most frequently noted in the context of financial systems, this issue pervades all aspects of MIT, notably hinders our Diversity Equity and Inclusion (DEI) efforts, and touches on

managing opportunities for students, access to campus, and space planning and utilization within DLCs, among other areas.

- Larger DLCs with available internal resources create robust work-around systems, which they prefer to maintain (and sometimes silo) rather than use less customized solutions. This leads to inequities in the abilities of staff to work effectively and provide the necessary support to their stakeholders. These local systems result in staff developing skills to manage tasks that are inconsistent across the Institute, and make staff movement among units challenging.
- Greater access to all types of data (HR, finance, space, research) information to all stakeholders in appropriate form, more dynamic reporting, and less repetitive/tedious work enables increased focus on planning and analysis, increased accuracy.
- Several other US universities besides MIT already have project teams dedicated to improvement of general administrative and business operations (as distinct research administration, specifically).

Envisioned State

A new, permanently staffed, agile project management team that supports the implementation of MIT priority projects for administrative workflows, with the following characteristics:

- The team or team lead has the authority to make decisions that will result in "good enough" advances and implementation. Some standardization will come at the cost of some customization to some MIT stakeholders. But moving in this direction will increase the opportunities for staff to utilize external training resources, and increase our available external applicant pool of those experienced in less customized software solutions.
- Cloud computing and rapid software innovations outside MIT dictate that we move to this model. We want to preserve the spirit of rapid Covid decision-making in support of operations in a sustainable way.
- Avoid having teams work on topics without clearly defined roles in decision reviews and approvals, so that resourced projects do not stall.

To mitigate the concerns regarding the work of the project team, we recommend the following features for further development and pilot implementation:

- The Project Management Team should form an implementation committee that includes key stakeholders for each project. There should be a clear decision tree built into every committee/project detailing the decision-maker at each stage in the process, a timeline for decision-making, the stakeholder buy-in process, and the deliberative process.
- Establish overarching principles for decision-making: e.g.: (1) push decision-making as far down in the org chart as possible, but high enough to carry sufficient authority and ability to allocate necessary resources; (2) maintain maximum transparency; (3) involve major stakeholders; and (4) consult minor stakeholders.
- Provide opportunities for the team members to have hands-on experiences and allow other staff the opportunity to join these teams. This model would also allow less experienced colleagues to take on growth opportunities for short periods. If the Institute implemented and administrative fellowship program, these opportunities could be for longer (and more meaningful) periods. Some EVPT-reporting units also include such a rotation model as part of the first year(s) of employment to build

broader awareness of systems, challenges, and working teams in a few DLCs who work closely together (e.g., Office of Sustainability, Office of Campus Planning, and Department of Facilities Construction Services).

- Gather input and people from the community and act as a clearinghouse for administrative system support, which would include communicating on ongoing projects, soliciting stakeholder feedback, and maintaining local solutions to common administrative tasks across all subject domains (HR, student management, finance, research, gift management, etc.).
- Maintain and oversee system support, which may also include serving as a clearinghouse for training opportunities and up-to-date documentation across all domains of work. The agile team would be different but connected to training teams.
- An annual call for innovation proposals (3-5) to DLCs with submissions from the community that would include the creation of a selection process with adequate decision-making, including the authority to share all of the information that was collected within the community.

Implementation Notes

While administrative project prioritization would include multistakeholder input in the steady-state, the Administrative Workstream offers the following list of example projects that benefit from the collective and broad experience of the members comprising the Administrative Processes (Team How) substream:

- PI Dashboard—Financial/administrative tools to support proposal submission and accounts management are not modern. Faculty may wait weeks for a busy financial officer to compile projections, in part because of data access, tagging, and management system inefficiencies across DLCs.
- Universal Ticket System—If someone at MIT has any type of problem (locked out of office? heater broken?), they can fill out a single ticket which will then be routed to the right office to be addressed.
- Create a single system of record for all of MIT's agreements. MIT needs better coordination between offices for revenue classification and support (OGC, RSO, RAS, OSATT, TLO, RD, VPF). It is confusing for faculty and their DLC support teams to deal with agreements that follow different internal processes, different systems, different time frames.
- Implement a new enterprise resource planning (ERP) system: MIT's system is highly customized and configured on an implementation plan that is decades old. Replace or overhaul MIT's system to maximize the potential to gain efficiency. Consolidate student and administrative systems. Having separate databases cause unnecessary complexities with administrative processes.
- Implement Institute-wide faculty search software: Some MIT schools uses a now-dated MIT-developed system. Evaluate current best-in-class tools that integrate with ERPs.
- Create a single system of record for all of MIT's agreements. MIT needs better coordination between offices for revenue classification and support (OGC, RSO, RAS, OSATT, TLO, RD, VPF). It is confusing for faculty and their DLC support teams to deal with agreements that follow different internal processes, different systems, different time frames.

- Improve the MIT-internal research proposal submission process: The current five day in advance proposal submission process is frustrating for all involved: faculty, department administrators, and RAS staff for cyclic deadline proposals such as federal agency grants and contracts.
- Implement an enterprise-wide faculty and researcher information system: MIT needs a system that allows faculty and researchers to view and update their profiles, export data for academic review, and create custom CVs and biosketches. This could build on work done previously in the School of Engineering and maintained by Institutional Research.
- Develop a new centralized process for identifying and managing underrecovery expenses: The current ICR process is decentralized and labor intensive, with variations in process among schools and DLCs.

Pros

Engages the MIT community in strategic discussions on administrative workflow and planning. The new cross-functional team would ensure broader input on processes, and the annual process for selection of ideas will increase the engagement of the community by surfacing ideas and concerns. In addition, a project team would formalize a group of staff who can commit their efforts to helping plan and lead these types of activities, which are now occurring in an ad hoc fashion as time and other activities allow.

- Data access and management is a major upstream issue that, if resolved, will build a strong foundation for the creation of numerous other applications and initiatives.
- Some of the workarounds that have been developed because of data access and management issues outlined above are possible in part because people can communicate informally in person. Addressing data access and management will enable longer term WFH or remote work (e.g., potential MIT+ locations) for administrative staff, as appropriate to flexible work practices and places.
- Logical, seamless data access and management will enable numerous admin staff (and by extension the rest of the MIT community) to spend less time on tedious tasks and more time on innovative, value-added tasks.

Cons

- Significant recurring costs associated with an endeavor such as this one, which will include staffing, space, and funds for purchasing software and enabling ongoing user training. It is possible that these costs are offset by staff retention at MIT, and indirectly by efficiency gains for faculty and staff teams who can redirect time to student and staff mentorship.
- Concept may also present challenges and/or conflicts with current MIT governance structures, such as the Information Technology Governance Committee (ITGC) and its subcommittees, and for senior leadership charged with the responsibility and authority to make systems and process decisions across key areas of Institute operations.

The remainder of the Administrative Workstream section includes the 12 Good Ideas that formed the initial fodder for Administrative Workstream synthesis of Big Ideas. These good ideas were developed within each substream. Components of these drafts were later refined through the TF2021+ workshops, discusses with many invited speakers from other universities and research organizations, and our

workstream meetings. Below we list the names of the 12 Good Ideas, followed by idea outlines for each. Our intention is that this more granular information can inform recommendations and actions following this task force.

- **Where? Campus Operations Substream**

1. Exploring spatial nodes: Expansion, local flexibility, decentralization, and links to enhanced function
2. Enabling space efficiencies through streamlined and centralized financial operations
3. Data-driven intelligent, resilient, and safe campus operations
4. Optimization of campus space and resources via development of a flexible, resilient workforce and shared economy

- **How? Administrative Processes Substream**

5. One Agile MIT: To be supported by a new cross-functional project management implementation team
6. Develop better tools and procedures for data management, reporting, forecasting
7. Improving staff training and development
8. PI dashboard / Modern ERP
9. Universal ticketing and help desk

- **Who? Workforce Operations Substream**

10. Charting a long-term staffing strategy for MIT
11. Employee development
12. Flexible work including at remote locations

Campus operations (Team Where) substream ideas

- **Where 1.** Exploring spatial nodes: Expansion, local flexibility, decentralization, and links to enhanced function
- **Where 2.** Enabling space efficiencies through streamlined and centralized financial operations
- **Where 3.** Data-driven intelligent, resilient, and safe campus operations
- **Where 4.** Optimization of campus space and resources via development of a flexible, resilient workforce and shared economy

Where 1. Exploring spatial nodes: Expansion, local flexibility, decentralization, and links to enhanced function

Current state

- At the current time (Fall 2021), MIT's primary "campus" presence is concentrated in Cambridge, MA, on the traditional campus or immediately adjacent. Satellite facilities are comparatively few in number and limited in campus audience.
- Outdoor spaces at MIT are rarely available for diverse campus activities except for special events. They are mostly traditional campus lawns and plazas with some exceptions (e.g., the Hive).
- With respect to leasing, MIT only leases space near campus, mostly in the Kendall Square area, as an adjunct to central campus activities.

- Space assignments for academic departments are administered by dean's offices and then distributed to DLC (depts, labs, centers).
- There are few campus-wide 'hoteling' (temporary use by the day or week) sites on campus for faculty and staff except for W92 on campus and an internal model in Sloan.
- Project Manus and Makerworks exist as models for shared workshops, but these models are limited in scope and audience.
- MIT does not have dispersed campuses or mini-campuses except in partnership with other universities/countries, e.g., Singapore and Moscow Skoltech.
- Procurement processes at MIT are dispersed and as a result redundant.
- Waste management is also redundant, for example split between grounds and housing.

Envisioned state

- Exterior program spaces, such as designated outdoor 'rooms' with the necessary supports to enable mission-driven (traditionally indoor) activities, could be achieved in the form of temporary 'sheds' or tents in the near term.
- Satellite administrative operations could consolidate personnel who have indirect student interactions to the campus periphery and or remote locations to decrease their footprint on campus. The leasing arrangements for these operations could happen in the near to medium term but the complexity of these arrangements would depend on the location of satellite operations.
- Diversified hoteling sites could provide hoteling space to support temp working, living, learning, and research on or around the MIT campus. Using existing excess space as a pilot, such as 730 Main Street, could happen in the near term and would not be overly complex. Developing a 'signature space' analogous to that developed by RAND would take longer and involve additional logistical considerations.
- Additional resource cores dedicated either to research or non-research activities could provide opportunities for shared space and equipment to support similar work, reduce redundancy, and enable sustainable procurement and waste management. Such research cores could be developed in a medium-term timeframe and would require substantial coordination between units affected.
- Dispersed campus-type spaces, potentially 'mini MITs', could provide opportunities for regional innovation nodes to leverage local resources and tech. Such dispersion would also provide redundancy in case of central campus restrictions analogous to current situation. Generation of such campuses is likely to be lengthy and complex due to needs for program development, physical space planning, and allocation of existing campus personnel to such spaces.

Pros

- **Satellite admin ops:** Added flexibility for commuters, frees space on campus for core and research
- **Dynamic hoteling:** Frees up space, efficiency of space usage. Better meet org/group needs. Create more research space by moving admin off-campus. Give dept. more autonomy.
- **Resource cores:** Added efficiency, synergy, and diversity on projects, cost savings (sharing equipment, e.g., centralized print farm)

- **Exterior program spaces:** flexibility in COVID-type scenarios, constructability is easy / low cost, swing space, promote sustainability culture (esp. green spaces), easy to fundraise for (e.g., space outside physics building)
- **Mini-MITs:** makes MIT resources available to broader communities, could leverage additional personnel, promote hiring

Cons

- **Satellite admin ops:** Additional costs for procurements and leasing. Loss of independence (sacrificing existing space to collective). Not convenient for everybody (equity issues). Works counter to "One MIT."
- **Hoteling:** Reduces visibility of employees, expected resistance from faculty (reduced independence from PIs)
- **Resource cores:** competition for resources, (perceived) loss of control over when/how equipment accessed,
- **Exterior program spaces:** limited to or affected by New England seasonal variations
- **Mini-MITs:** Requires significant resources and a major culture shift, as well as evaluation of value add, waters down experience on campus

This idea seeks to advance seven of the shared values sought and articulated by the Campus Operations Substream. These include Teaching / Learning Excellence, Flexible / Adaptable, Support / Allow for Future Models of Work, Learning, and Discovery, Campus Test-bed / Living Lab, Positive Regional / Global Change Agent, Improve Business Continuity, Traffic / Congestion.

Where 2. Enabling space efficiencies through streamlined and centralized financial operations

Current state

- Each DLC manages financial processes discretely/ internally. This individualized operational model has fostered a culture of dedicated financial functions, personnel, and in some cases systems and software specific to DLCs, that enable highly customized financial processes and reporting.
- In some cases the necessity for dedicated financial staff and practices in each unit have propagated space inefficiencies, and perpetuated a conflation of stature with departmental space allocation (e.g., inefficiencies associated with redundant functions and/or PT staff needs). This proclivity to cache departmental space to project "growth" is further pressurized by the 8-yr tenure window.
- DLC control has allowed greater budget autonomy, but resulted in inefficient and complex financial practices associated with procurement and overhead recovery.
- Added complexity associated with customized financial and or administrative structures in individual divisions and units has disincentivized resource sharing. This has subverted the existing sharing-culture to be perpetuated/enacted at the most granular level (interpersonal connections and barter agreements).

Envisioned state

Early state

Building on previous EVPT/VFP analysis of financial systems and structures, perform additional investigation (see 'work in the fall' section above), standardize processes associated with common business practices, and unify systems, including the elimination of "bolt on" applications for individual divisions or DLCs. This simplification and standardization will enable financial personnel cross-training and cross-support between units, reducing the space required to support redundant and/or multiple part-time staff between units. Units can reuse recaptured space for other key personnel, including lecturers, PhD candidates, and/or shared grad student space, etc.

As part of early work steps will also be taken to operationalize existing resource (space and equipment) sharing culture. This will include investment in and development of, technical/applications support (e.g., a "share market"). DLC leadership will be engaged in the supporting administrative processes, to elevate and structure the sharing discussion and decision-making. This will enable cooperation and expand the existing sharing culture, allowing for space use reduction associated with redundant equipment and resource management (e.g., supply storage) between units. This can build on the success of the current 'COVID Store' model and/or expand other unified resource management / share-economy models that exist on campus; e.g., lab cores, MIT Fx, and the VPF Surplus/Exchange program. And this may also enable an expansion of the expansion of the (lab) resource cores concept (see other CampusOps Substream proposals on space).

Building efficiencies of scale through shared resource management, and possibly moving toward shared resource cores will allow the Institute to identify and address disparities in universal design relative to any proposed "sharing" enhancements. For example, assuring access equity through technical/applications support, access requirements for shared spaces.

Mid-term state

Ongoing development of streamlined and standardized financial structures will provide additional opportunities to address equity and inclusion through "sharing" adaptations of space policy. Identify and acknowledge where systemic constraints that conflate equality with equity relative may have resulted in unjust resource allocation (e.g., space allocation based on funding, doesn't acknowledge societal bias in funding access). As space policy is adapted to incentivize sharing, equity and inclusion can be enhanced in parallel.

Centralization of common financial practices around procurement and materials management can also enable progress on Institute initiative for sustainable procurement, and facilitate a shift to a model of on-demand supply and just-in-time delivery that is centrally managed. This will further reduce the space needed for distributed and unit-dedicated (redundant) storage for common items like paper, gloves, lab consumables, device dongles, etc. Again, this recaptured space can be reused for other uses; project team rooms, study lounges, lab space, seminar space, etc.

Long-term state

The envisioned future state would demonstrate the centralization of financial administrative supports, reducing the distributed space use associated with dedicated and/or multiple PT staff. Additionally, redundant space for dedicated unit storage of common resources will have been supplanted by a central store system with on-demand supply and just-in-time delivery of products and services that are sustainably sourced, and foster better equity and inclusion in both their design and procurement. A fully operationalized sharing culture supported by centralized technology/applications, and a streamlined leadership-engaged administrative process. Space recapture by these adaptations will be available for repurposing. Some of it may be used to support a culture shift to other Institute-supported (centralized/efficient) shared resources management. Some examples might include shared shell space to support renovation swing space, building-level lab cores, admin resource cores, etc.

The simplified and centralized financial support framework will also support a shift to space charge-back. This would allow for additional traction on incentivizing Institutional goals (space sharing, resource efficiency/reduced carbon footprint, equity, etc.), and enable a more streamlined, transparent, system for centralized overhead recovery. Of course, any system of space charge-back would need to be adapted to MIT's culture, and implementation would need to include a program of change management. But it, and the efficiencies it enables, are not possible without first establishing the underlying financial systems framework, and shifting the campus culture toward enhanced sharing and unified resource management.

Pros

- Improved space efficiencies supporting better utilization of teaching and research spaces
- Easier cross-training and cross-support for financial personnel
- Enable sustainable procurement and improved efficiencies for waste stream management
- Enable traction on Institute goals on increased WBE vendor
- Strengthen training, supports, and support networks for financial staff

Cons

- Lots of work required to get DLC buy-in
- Paradigm associating stature and space is PERVASIVE in academic culture
- Legacy financial systems and highly customized processes are integrated with DLC operations
- Further silo administrative staff from academic and research staff

This idea seeks to advance 7 of the shared values sought and articulated by the Campus Operations Substream. These include: Sustainability, Teaching and Learning Excellence, Resource Conservation, Perceived Equity, Efficient / Effective Space Use Improve Business Continuity, Nimble / Scaleable (operations and policy).

Where 3. Data-driven intelligent, resilient, and safe campus operations

Current state

- Over the past 10 years Facilities has dramatically expanded the collection of data on space utilization and performance. However, operational metrics like building system performance and utility consumption are not yet universally or uniformly metered or monitored on campus. Metrics on use and utilization (e.g., documented occupancy, capture of ad-hoc use) are also not universally or uniformly collected, and/or made available for cross-reference to operational metrics. This data is sometimes collected via survey or focus data-logging to inform specific inquiries, but is not available in larger aggregation to develop more comparative or longitudinal understanding. Appetite for significant investment in comprehensive data collection infrastructure is often superseded by the need for efficient/cost-effective investment in mission-driven space renovation.
- Currently management and policy setting relative to campus safety is consolidated to a few key departments (EHS, EM, MIT Police, etc.) most closely responsible for mitigating recognized safety risks. Decisions are made to establish compliance, or maintain/return to typical operations under ostensibly known circumstances.
- The prioritization of efficiency and risk-mitigation, typical in higher education institutions, results in a culture that is more typically reactive, and relies on demonstrated, substantive impacts for investment rational. The lack of comprehensive, widely accessible, and/or comparative data limits the ability to calculate investment risk-reward in a more predictive fashion or model more fluid/ dynamic scenarios. So, data is not consistently used to inform decision making.

Envisioned state

Early state

In keeping with the oft-quoted axiom of economists, if you don't measure it, you can't manage it. So an effort to better manage our space utilization and utility resources should begin with standardizing baseline data collection across all facilities, space typologies, space assignments. This data should be made widely available to begin to inform decision making and develop comparative understanding.

To begin to more effectively leverage these data resources, and understanding that the future circumstances of campus operations will be increasingly fluid and/or dynamically "abnormal," MIT should move toward developing a culture of regular scenario planning and workshopping to test policies and procedures for space management and campus safety that had previously been dictated by compliance or seeking only to re-establish operational "norms" under an assumption of ostensibly known circumstances. Initiating this new culture of scenario planning should leverage groups established for COVID response, and utilize the associated workshop model where all available data is made readily available to inform the review, testing, and augment campus safety and space management policies. Also understanding that dynamically "abnormal" crises unravel typical dependencies and induce unforeseen impacts, these the workshopping process engage additional participation over time, to collect wider perspectives and understanding of impacts associated with more dynamic scenarios. Broader engagement will also help the larger campus community see the value of data being collected, and how it can be used to improve outcomes for MIT and them.

Mid-term state

As the culture of data-driven scenario planning evolves, operationalize an outcomes-based approach to expanding facilities data collection. Queries identified in workshops and/or initiatives by leadership will inform component data-sets collected (e.g., The Ofc. of Community Engagements wants to explore affordable off-hours leasing for community small groups > collect/create datasets on omnibus scheduling, confirmed occupancy/attendance, and energy use intensity (eui) during use, to determine a pro-rated cost).

As more data becomes available, establish a real-time operations and space-use data platform (building on existing data warehouse model), with an integrated ability to leverage legacy data snapshots. This will create a more shared (unfiltered) basis of understanding to inform nimble decision-making, and support more vibrant and informed workshopping on campus safety and space management. Additionally, leverage more widely available data to rebalance policies and procedures to target greater traction on GHG goals, increased space utilization, and healthier/ safer environments.

In parallel with robust measurement and monitoring capabilities, expand “living-lab” methodology from facilities technology (equipment and systems components) to facilities use (policy and management practices). Develop capability for field testing of different space operations and space management policies by budgeting for risk taking, temporary inefficiencies, proof of concept trials. Then analysis collected metrics relative to current operations/performance.

Long-term state

The envisioned future state will have transitioned to an open access (for the MIT community), real-time platform for space (interior and exterior) scheduling. In parallel, an expanded, accessible (universal design / DEI) platform of facilities data is available to support fully transparent space management processes.

Programs to leverage community/crowd-source data (a la Waze) are developed to accelerate and diversify the data collection on campus space. And participation in data collection is incentivized by partner programs that provide enhanced, data-supported, user experience of campus (e.g., where is the closest available parking spot to my meeting? what other talks are scheduled near my class? how busy is the nearest study lounge? who in my department is working on campus today?). The data-driven user experience of campus also extends to an understanding of how data they provide feeds into metrics on larger MIT initiatives, like reduction EUI and GHG production.

Pros

- Increased transparency and increased buy-in in space management processes
- Shared understanding of space use and value propositions associated with university goals (sustainability, safety, resiliency, flexibility)
- Increase dynamic understanding of facilities use (occupancy, energy use, system performance, learning retention, productivity, and job satisfaction, etc.) will inform innovation in space use and management

Cons

- Resistance to individual DLCs relinquishing a gatekeeper role for gathering space availability (visibility and scheduling)
- Concerns relative to data privacy for individual community members (i.e., big-brother monitoring)
- Concerns relative to community security with increase facilities data accessibility
- Increase engagement in planning and policy dialog could slow development and disenfranchise participants without clear deadlines and feedback loops.

This idea seeks to advance 7 of the shared values sought and articulated by the Campus Operations Substream. These include: Sustainability, Teaching and Learning Excellence, Resource Conservation, Perceived Equity, Efficient / Effective Space Use, Improve Business Continuity, Nimble / Scaleable (operations and policy).

Where 4. Optimization of campus space and resources via development of a flexible, resilient workforce and shared economy

Current state

Part 1: Space and resource allocation

The allocation of administrative space on campus is grounded in the assumption that employees are assigned to a stationary space for a five-day, 40-hour work week. In this construct, one goes to the same quadrant of campus and interacts with the same neighbors and maintains the same daily routines. Although the consistent workplace provides a sense of stability, routine and consistent connectivity, there is little to no adaptability and systemic function built into the current system. Moreover, x% of MIT staff are in meetings x% of the time and thus a desk sits available for use x% of the week. Within this framework, staff rely on access to resources (e.g., office supplies, coffee) that each department is responsible for acquiring.

Part 2: Workplace expectations and skill sets

The pandemic has forced a rapid change toward virtual and flexible work, which requires additional coordination both within and between groups. These new expectations have highlighted **variability** in the workforce in terms of habits and skills of personal flexibility and resilience.

Envisioned state

By design, a move towards a more flexible work environment could lead to a three-fold benefit for MIT: (1) valuable workspace could be opened up for highest-value activities (administrative, research, teaching, external uses); (2) footprint reduction could help alleviate pressure on affordable housing, mobility, resource use, and environmental footprint in Cambridge; (3) the human flexibility and resilience that we build in doing this will have spillovers for organizational vitality. But achieving this vision will require dedicated attention to both space utilization and personnel development.

Pros

- Increase in work satisfaction and flexibility
- Measurable resource use reduction

- Environmental impact reduction
- Increase in space availability
- More dynamic use of technology
- Aid recruitment and retention efforts by making MIT a more desirable and contemporary employer.

Cons

- Unintended cultural consequences of flexible space usage (e.g., lack of informal support possible when you don't easily know where to find people)
- Need to outline performance standards and supervision when working offsite
- Need to understand, accommodate and manage issues of equity across workplace responsibilities.

Implementation note

This is a multi-phase process that warrants short and long-term planning.

The initial phase of this process following space optimization analytics may call for infrastructure and training that supports a Hybrid and Dynamic Workforce:

- **Immediate term:** An analysis to understand who, where and how to pilot this proposal
- **Medium term:** Execute the pilot phase and collect data
- **Long term:** Develop a plan for the physical infrastructure in offices and data infrastructure to support a flexible dynamic work environment

Once a plan is developed MIT may need to invest in Workforce development: This will lead to an expansion in cross-training and soft-skills development in systems-thinking and problem-solving to build resiliency and adaptability.

- **Immediate term:** Create situations and systems that calls for people to work together and incentivizes collaboration and collaborative outputs.
- **Medium term:** Provide required coaching and training that teach people the skills to work dynamically.
- **Longer term:** Measure productivity over time, impact on people and org

The final phase will be measured by the **space optimization and resource use** framework. This will call for an understanding of current use conditions and an infrastructure to build a shared economy.

A commitment to a flexible, resilient, and collaborative work environment that overtly seeks to reduce our environmental impact and develop a culture of shared resource use we believe will lead to increase in innovation and job satisfaction at MIT.

There could be unintended cultural consequences of flexible space usage (e.g., lack of informal support possible when you do not easily know where to find people).

This idea seeks to advance 5 of the shared values sought and articulated by the Campus Operations Substream. These include a desire to advance Sustainability, Work/Life Integration, Research Vibrancy,

and Social Equity (gender, racial, socioeconomic), and Perceived Equity (on/off campus, faculty/staff, student/professional).

Administrative processes (Team How) substream ideas

- **How 1.** PI Dashboard / modern ERP system
- **How 2.** Develop better tools and procedures for data management, reporting, forecasting
- **How 3**. Universal ticketing and help desk
- **How 4.** Improving staff training and development
- **How 5**. One Agile MIT (developed further to draw from other inputs as Big Idea)

How 1. PI dashboard / modern ERP system

Current state

- PI Dashboard does not exist. PIs generate funds for their own labs and for the Institute through proposals, but the financial and administrative tools to support the proposal submission process, as well as the accounts management process, have not kept up with modern standards. A person on the street can check their balances with an app on their phone, but a PI may have to wait weeks for their overworked financial officer to complete the slow process (see above) of compiling projections of their accounts. Addressing this problem will allow PIs to make better budgetary decisions, allow financial officers to focus their time on other tasks, and alleviate the risk of over-expenditures for departments and schools. Addressing this problem will almost certainly mean that other data issues (see above) will also have to be addressed.
- SAP is the core system for many of our administrative processes across MIT, but not for all processes. ERP stands for enterprise resource planning, but this means more than databases and software. At MIT in SAP, authorizations are controlled by the Roles database, the core system for grants management is Kuali Coues, and student management is MITSIS. All three are custom-built solutions with significant deferred maintenance. SAP has also been highly customized and built around old processes and procedures. In order for us to take advantage of the advancements in SAP and utilize all its capabilities we need to upgrade to the most current SAP version and also make changes to our business processes to reduce customizations and workarounds.
- In addition, there are opportunities to migrate Roles, Student management and Grants Management to the SAP platform, and some of the core modules that can be used. This will enable us to improve all our administrative processes and gain efficiencies. This implementation would require significant business process change that ultimately will provide large rewards but would require a strong change management component. To gain a full understanding of the functionality and benefits of the most current version of SAP we would need to engage external help.

Envisioned state

PIs would have access to their research-related financial information regardless of the location and source of the funds within MIT's administrative units. PIs and their DLC support teams would also have access to other research-related information in the same dashboard (e.g., research personnel,

intellectual property disclosures, current material transfer agreements or data use agreements, approved laboratory safety protocols or human subjects research protocols, etc.).

Pros

- Dashboard access to account and other information will help PIs make faster, more accurate decisions about spending and writing proposals.
- PI Dashboard will reduce time spent by staff providing basic information, allowing staff to work on other more value-added or urgent tasks, which may have the effect of increasing satisfaction with work.
- Enables PI-RAS interactions to focus on tasks that are more challenging.
- Reduce risk of overspending for departments and schools.
- PIs would have access to real-time data.
- If the dashboard could be created to provide administrators with access to the data based on authorizations provided by the PI rather than by unit, we would resolve a long-standing issue related to data being in silos.

Cons

- Our current systems and the regulatory/audit environment have led units to create shadow systems that can be difficult to integrate into new systems. These local systems are frequent viewed as critical for historical reporting reasons.

How 2. Develop better tools and procedures for data management, reporting, forecasting

Current state

- Data management: MIT uses a myriad of tools for financial and information management. We should develop better tools and procedures for data management, reporting, forecasting. Addressing these issues would enable staff to spend less time on tedious tasks and focus on work that makes better use of their abilities, and pave the way for better access to data by all users.
- With respect to data access, our current systems contain accidental integration and architecture with a multitude of data hierarchies which are inconsistent and/or unmanaged, resulting in delays for new staff receiving all the authorizations needed for them to function.
- Globally, historical information and changes have not been tracked effectively and, in many cases, any documentation is outdated and incomplete. Determining data lineage or impact analysis impossible for most systems, which leaves users unable to even determine where to send questions.
- Administrative tasks require knowledge of how a particular employee relates to the rest of MIT (who the supervisor is, what departments are they affiliated with), but this information is often incorrect or nonexistent. This has repercussions across all units.
- There is presently decentralized oversight of revenue streams and the processes and systems that support them: General Institute Budget (Tuition/Investments), Research (grants/contracts), Gifts/Donations, and Fees/Memberships. The result is the lack of a well-integrated and easily usable system to track resources, from the revenue source to expenditures to balances available.

- While data issues are most frequently noted in the context of financial systems, this issue pervades all aspects of MIT, notably hinders our Diversity Equity and Inclusion (DEI) efforts, and touches on managing students, access to campus, space planning, and utilization, among other areas.
- Wealthy, large units create robust work-around systems, which they are loath to give up in the interest of less customized solutions, but leads to inequities in the abilities of staff to work effectively and provide the necessary support to their stakeholders. These local systems result in staff developing skills to manage tasks that are inconsistent across the Institute and make movement among units challenging.
- Greater access to all types of data (HR, finance, space, research) information to all stakeholders, more dynamic reporting, less repetitive/tedious work --> increased focus on planning and analysis, increased accuracy.

Envisioned state

A clear and consistent process of acquiring, validating, storing, protecting, and using data in an accessible, reliable, and meaningful way. Access to data and systems will be easy to obtain. The structures in place for a variety of data visualization and reporting options will be available to users in a format with enough flexibility to connect with local data and allow downloading and printing. Ideally, shareable data would be stored in a format standardized for key items (unit names, definitions of categories, etc.) under a single schema. Units would be confident that they can rely on the central data resources and that those repositories will provide them with the flexibility to customize for their own reporting, in order to allow transitions from local systems to centrally managed and maintained systems.

Pros

- Data access and management is a major upstream issue that, if resolved, will build a strong foundation for the creation of numerous other applications and initiatives.
- Some of the workarounds that have been developed because of data access and management issues outlined above are possible in part because people can communicate informally in person. Addressing data access and management will enable longer term WFH for administrative staff.
- Logical, seamless data access and management will enable numerous admin staff (and by extension the rest of the MIT community) to spend less time on tedious tasks and more time on innovative, value-added tasks.

Cons

- Systems at MIT are interconnected and untangling the labyrinth will probably be a long and tedious project.
- There are likely to be obstacles in streamlining and cleaning up the data that will require staff—who will have to balance tedious, but necessary work—against other more interesting projects.
- In addition, changes that are made will affect existing reports and systems, which could be disruptive if the communications to the community are poorly handled.

How 3. Universal ticketing and help desk

Current state

Google has a universal ticket system. If you are working at Google and you need pretty much anything—payment, request for a repair, questions about a policy—you submit a query to a single unified address. There is no need to determine which office to contact because the ticket system does this automatically. In Boston, there is a 311 system allowing you to access city services. You do not need to know where the help comes from you; you simply send the issue into the system. More recently, the Division of Student Life rolled out a new system called Ask.MIT with the overarching goal of allowing students to make generalized inquiries: "Ask MIT. Get Answers. You shouldn't have to think about where to turn for help. Just ask. A Student Support and Wellbeing team member will get back to you within 1 business day. Or scroll down for more. https://ask.mit.edu/."

DSL hopes that Ask.MIT will function in much the same way as Google's universal tracking and Boston's 311 function. Our team recommends a similar system to address and manage administrative and operational activities.

Envisioned state

An MIT where who you know does not define how quickly you can access information.

Pros

- Members of the MIT community spend a lot of time trying to find answers. In many cases, they are bounced from office to office while trying to gather information. If they are lucky, they know someone who can answer many questions and they call on "that person" when they feel lost. It would be better if everyone had access to "that person."
- In addition, such a system would allow the Institute to gain a better understanding of policies, procedures, and resources that are poorly understood by the community, which could lead to improvements in training and communication efforts.
- There is no reason to delay this task, which could be accomplished by asking key offices to assign staff to field questions that fall within their domain, by utilizing staff in the Atlas Service Center, or by putting this in the Project Management Office if that idea moves to fruition.

Cons

The risk is that there could be over-utilization of the system by users who find the system easier to use than tracking down the information. That might not be a bad thing, but it may need to be addressed if it becomes a problem. For the project to be successful, the staff who are in appointed to answer the queries will likely be existing MIT employees whose units may be unhappy to see them moved.

How 4. Improving staff training and development

Current state

- The top two reasons that people leave MIT is for career advancement and professional development. Onboarding and orientation is left to the local units where the quality of the training varies considerably.
- The current state of our systems has resulted in customized solutions that may lead to single points of failures, poorly documented systems, and mixed levels of training with few, if any, commercial training options. This is true on both the central and local side of MIT. There is online training available for some of these systems, but staff are too busy to access the training and the training is often not easily accessible. In addition, training during rollouts of systems, processes, and programs is conducted, but is inadequate for new members of the community.
- Finally, we note that, while online training is a good resource, it does not allow trainees to ask questions, develop relationships with colleagues, or learn about the systems and initiatives in place in other units.

Envisioned state

- MIT would be known as an employer with fantastic training opportunities and career paths for all members of the community.
- All offices that own a system or procedure would provide training and documentation related to the activities that they oversee. (This information would also be leveraged by the universal ticketing system.) This would likely require ongoing support from HR to create templates and to provide assistance for business process owners who are developing local training.
- One notable area ripe for improvement is data-manipulations skills for staff, for example, excel advanced skills, tableau.
- In addition, many staff report that they do not attend training because they are too busy or do not have access to funds to cover the costs of external offerings.
- A robust training program would also provide clear career paths for staff and provide a roadmap for developing the skills necessary to meet their career aspirations.
- Finally, MIT would create and implement a robust onboarding program that will provide a clear sense of how to access resources, develop their skills, and meet their long term career aspirations.

Pros

Based on exit interviews conducted by HR, we understand that many staff leave MIT due to a lack of career advancement. In addition, those who come to MIT find our business processes to be so complicated and outdated that some leave MIT and others spend excessive time onboarding and familiarizing themselves with administrative systems and processes.

In addition, more robust training programs would allow staff to move more easily between units at MIT, more fully utilize the systems that we have in place, and spend more of their time on strategic activities.

Cons

Executing this proposal would require that each office would take responsibility for training within their domains. Most departments do provide some level of training and some have robust training programs (EHS, HR, RAS, VPF for entry-level tasks), but there are many other administrative activities that do not provide training for new staff or ongoing development for those who are in the process.

How 5. One Agile MIT to be supported by a new cross-functional project management implementation team (Skunk Works for administration)

Current state

- MIT has a culture that requires a lot of buy-in from many stakeholders. Despite years of believing otherwise, we have learned that we can be nimble and make huge decisions at a rapid pace when in a crisis. We believed this in part because we have seen many committees formed, only to have their work forgotten or overruled/bypassed due to the lack of decision/implementation capability.
- Administrative Project Management teams are re-invented from one major project to the next. Different implementation teams are formed, staffed by MIT community stakeholders, who are already managing daily operations, and then once the work is complete or the work hits an impasse the team is dissolved.
- Despite a culture of continuous improvement and adaptation, MIT lacks a professional project management resource charged with implementing new administrative systems and processes. Such a team can learn, build, document, and lead an effective and agile implementation methodology that consistently works with the MIT culture.

Envisioned state

- A new, permanently staffed, agile project management team that supports the implementation of MIT priority projects with the following characteristics:
    - The team or team lead has the authority to make decisions that will result in "good enough" advances and implementation. To get productivity, we need standardization, which will come at the cost of customization to MIT. Moving in this direction will increase the opportunities for staff to utilize external training resources and increase our available external applicant pool of those experienced in less customized software solutions.
    - Cloud computing and rapid software innovations outside MIT dictate that we move to this model. We want to preserve the spirit of rapid Covid decision-making in support of operations in a sustainable way.
    - We should avoid having teams work on topics without any decision capability or without a clearly defined role.

To mitigate the concerns regarding the work of the project team, we recommend the following

- The Project Management Team should form an implementation committee that includes key stakeholders for each project. There should be a clear decision tree built into every committee/project detailing the decision-maker at each stage in the process, a timeline for decision-making, the stakeholder buy-in process, and the deliberative process.

- Establish overarching principles for decision-making: e.g.: (1) push decision-making as far down in the org chart as possible, but high enough to carry sufficient authority and ability to allocate necessary resources; (2) maintain maximum transparency; (3) involve major stakeholders; and (4) consult minor stakeholders.
- Provide opportunities for the team members to have hands-on experiences and allow other staff the opportunity to join these teams. This model would also allow less experienced colleagues to take on growth opportunities for short periods. If the Institute implemented and administrative fellowship program, these opportunities could be for longer (and more meaningful) periods.
- Gather input and people from the community and act as a clearinghouse for administrative system support, which would include communicating on ongoing projects, soliciting stakeholder feedback, and maintaining local solutions to common administrative tasks across all subject domains (HR, student management, finance, research, gift management, etc.).
- Maintain and oversee system support, which may also include serving as a clearinghouse for training opportunities and up-to-date documentation across all domains of work. The agile team would be different but connected to training teams.
- An annual call for innovation proposals (3-5) to DLCs with submissions from the community that would include the creation of a selection process with adequate decision-making, including the authority to share all of the information that was collected within the community.
- Locally created systems would be considered for broader implementation or modified to allow access to the broader community. See: BUSINESS TRANSFORMATION OFFICE @ UCLA https://www.bto.ucla.edu/news/mission-ucla-business-transformation-office-bto (10 staff members) as an example. Several other universities already have similar project teams.

Pros

The proposal would allow MIT to engage the community in strategic discussions on administrative workflow and planning. The new cross-functional team would ensure broader input on processes, and the annual process for selection of ideas will increase the engagement of the community by surfacing ideas and concerns. In addition, a project team would formalize a group of staff who can commit their efforts to helping plan and lead these types of activities, which are now occurring in an ad hoc fashion as time and other activities allow.

Cons

There are significant ongoing costs associated with an endeavor such as this one, which will include staffing, space, and funds for purchasing software as well as identifying funds for ongoing training. This concept may also present challenges and/or conflicts with current governance structures, such as the Information Technology Governance Committee (ITGC) and its subcommittees, and for senior leadership charged with the responsibility and authority to make systems and process decisions across key areas of Institute operations.

Workforce operations (Team Who) substream ideas

- **Who 1.** Employee Development
- **Who 2.** Flexible Work including at Remote Locations

- **Who 3.** Charting a Long-Term Staffing Strategy for MIT: First step, develop a pilot program for reducing contingent employment at MIT

Who 1: Employee development

Current State

For the past several years, Exit Survey (sent to all non-faculty employees who terminate by Central HR) results highlighted the top two reasons why employees leave MIT: Opportunities for Career Advancement and Opportunities for Professional Development.

- **Management Support**
    - Managers do not always realize that their role is to help develop their employees beyond classroom training nor do they always have training in this area.
- **Systems**
    - Technical platforms not aligned and training offerings are limited to none.
    - Current systems make it impossible to target employees by levels or roles.
    - Current system emphasizes formal training programs; modernized system needs to shift to a learning platform accessible to all employees.
- **Career Progression**
    - Career progression involves moving up, moving laterally, and/or growing within a job.
    - Currently, we lack transparent, formal career paths, and other kinds of formal development opportunities such as job rotations, job enhancements, etc., which could assist in retaining and engaging employees and succession planning.
    - Training programs not linked to career progression, performance management, or compensation.
- **Course/Training Offerings**
    - There is a moderate array of employee development courses that focus on specific roles (emphasis on management) with limited offerings for the average employee.
    - Course offerings are not timely/infrequent
    - Development programs are not suited to all job types
    - Often communication about programs does not filter down to employees
    - MIT employees are often unaware of the internal training resources available such as: EdX, LinkedIn Learning, Sloan Exe. Ed, HR resources, and tuition reimbursement

Envisioned state

- Employee Development is deeply imbedded into the culture. There is accountability associated with it.
- All staff have tools, systems, and resources for personal and professional development through a robust and innovative development and career progression plan.
- Managers and employees are aware and work together on employee development and/or career mapping activities. Traditional career paths and ladders, and/or other kinds of development

opportunities, including job redesign, job rotation, job enhancement, lateral moves, etc., are transparent to employees.

- MIT has dedicated resources (and funding) whose priority it is to proactively establish and implement employee development/career progression strategies—growing talent from within the Institute, with the goal of increased retention and engagement.
- Employee development will be inclusive and available to all MIT employees.
- Area one: Develop a functional level development and career progression road map for select job families (prioritize with input from broader MIT community)
- Area two: Create foundational employee curriculum tracks to support onboarding (example, general MIT knowledge: What is a Provost? information on the different schools and focus, relevant departments, etc.),
- Area three: Invest in developing a state-of-art learning system—a large menu of courses from multiple internal/external sources that employees can take guided by an AI system that guides learners through courses that serve as pathways to promotion and job readiness for available opportunities.

Pros

- Employees usually feel more engaged when they believe that their organization is concerned about their development.
- Developing and implementing employee development ideas/strategies may improve recruitment, morale, job satisfaction, motivation, productivity, and retention. Examples:
    - Having formal career progression in place provides employees with an ongoing mechanism to enhance their skills and knowledge that can lead to mastery of their current jobs, promotions, and transfers to new or different positions.
    - Employees will have a cadre of resources to assist them with training and development; career progression, etc.
- Managers are fully trained and engaged in the development of their employees.
- Catch up with state-of-the-art learning systems in place in leading private sector companies
- Resource to support performance expectations; pay expectations

Cons

- Employee development is a significant responsibility for managers, who are often times overwhelmed with their day-to-day responsibilities.
- Managers may not be prepared to have development and career conversations
- There may not always be a career progression strategy for every role or person which may have a negative consequences.
- Managers may be apprehensive about career progression, as it could lead to employees leaving their DLCs.
- Significant expenditure and design costs to create a learning system—can be mitigated by working with leading companies that already have AI supported learning systems in place

Who 2. Flexible work, including at remote locations

Current State

Starting in March, COVID-19 forced much of the Institute to work remotely overnight. MIT has in place a flexible work policy (Policy 3.1 in the Employment Policy Manual) that has allowed employees to request different work schedules and/or work locations to meet their individual needs and the needs of the Institute. A review of the 2020 Quality of Life survey revealed most respondents already had experience working remotely (69%), though for many jobs (e.g., MIT police, many researchers, custodial staff) working remotely is not possible. Departments in which a larger percentage of staff were already fully remote prior to COVID-19 were able to quickly adjust to the new remote requirement. For departments with less experience in this area the adjustment was more challenging.

Envisioned State

Wherever possible, successful job completion should be independent of physical location and time, depending on the specific job requirements and nature. Managers and employees have conversations about what work is best done in the office, what work can easily be done remotely, and/or a combination of the two. Equipment needs, impacts on team culture and collaboration, and employee feelings of respect, inclusion, and engagement should all be taken into account. Options for flexibility are key.

Pros

- Allows for flexibility in how and where work at MIT gets done
- Improved employee retention
- Enhanced image of MIT as an employer and a place to work
- Increased employee health (reduced stress, reduced cost of commuting, family/personal time/needs, healthier food, personal hygiene/comfort
- Expanded productivity (focused work time, impromptu meetings, more efficient scheduling of appointments, reduced tardiness/absenteeism)
- More efficient use of space (office space, parking, meeting/conference rooms)
- Reduced carbon footprint, reduced commuting costs/time
- Improved talent recruiting (more candidate interest, access to a larger pool of talent)
- Expanded resilience of organizational capability
- Enhanced innovation, the building of a culture of strength via maintenance of individual motivation

Cons

- Culture shock
- Reduced face-to-face communication, lack of 'community' feeling, moderated social connection, feelings of isolation
- Risk of workload and professional development inequities arising from some employees having more in-person interaction with supervisors depending on work location
- Missed opportunities for collaboration between colleagues not working in the same spaces

- More tailored practices required to ensure consistent performance management and additional actions necessary to ensure accountability/expectation alignment
- Challenges providing effective time management skills,
- Added responsibility to contain distractions
- Increased concern about arbitrary actions
- Potential of staffing change

Who 3. Charting a long-term staffing strategy for MIT: First step, develop a pilot program for reducing contingent employment at MIT

Current State

MIT currently employs individuals in a broad range of employment categories both in its academic and administrative/staff operations. These include full-time tenure and non-tenure track teaching and research faculty, postdocs, adjuncts, lecturers, research scientists on the academic side, and full time staff and administrators as well as over 2,000 contingent workers across various employee categories such as temporary, contract, and part-time roles (often in jobs that were previously full-time positions) Our group proposes to generate an inventory of these different categories and to develop a long term vision and strategy for both managing the proportions in different categories and actions needed to reduce or eliminate the inequities, risks, insecurities, and sense among the contingent workforce that they are second-class citizens in the MIT community. Our preliminary review of this issue is that many in the contingent categories feel there is a feeling of a "one-way honor system" at work and a violation of the “One MIT” ethos. Their loyalty and dedication to MIT is assumed while MIT is not reciprocating.

As a first step in this broader examination, we propose to focus on the current and desired future state of contingent work at MIT. We will then examine the broader range of employment categories based on lessons learned in this first phase.

Exit interviews and survey data consistently show that the leading reasons employees leave MIT are that they don't feel MIT is committed to their professional development, and that there are not enough opportunities for career advancement. As a result, MIT is losing talented employees to other organizations and institutions where they can find more secure employment and more robust development resources and opportunities. This turnover is costing the Institute in several ways:

- We are investing time and resources in repeatedly training and onboarding the same positions, sometimes multiple times within the same year. We are not retaining these employees long enough to enable them to build strong institutional knowledge of MIT's history and practices. Many DLC's rely heavily on the institutional knowledge of employees who have worked at MIT for extended periods. With many of those individuals nearing retirement, there is a looming problem in those DLCs if we do not ensure a pipeline for reliably replacing the individuals who retire along with other long-term MIT employees.
- Many contingent workers possess diverse skill-sets and are capable of contributing more to MIT than their current positions require. When these workers don't feel that MIT is committed to them

as employees, they seek opportunities elsewhere instead of taking the initiative to expand themselves professionally within MIT.

- Feelings of precarity prevent our employees from developing trust between themselves and their managers, and between employees and MIT as an organization. These feelings also erode a sense of solidarity among members within our community and impede a shared commitment to MIT's mission.

Envisioned state

A workplace culture in which employees and MIT make shared commitments to one another to better both entities and meet the “One MIT” principle. That workforce members are considered indispensable and distinct contributors. And the Institute recognizes that modern work comprises intangibles such as emotional, psychological, and extemporaneous behaviors that draw upon exceptional interpersonal skills and practices.

These principles will manifest themselves in practices such as:

- Following an initial trial period (6 months?), the Institute provides minimum longer-term contracts (3 years?) for MIT employees in positions that are currently at-will employment, short fixed-term contracts, or subcontracted.
- Job descriptions offering full-time employment will encourage cross-training and foster individuals' opportunities to develop, broaden, and exercise and develop diverse skill sets.

Pros

- MIT will experience a more stable workforce where more employees stay at MIT long enough to accrue valuable institutional knowledge.
- An employer-employee relationship will be built on shared commitment and trust in one another to work towards mutual betterment.
- Increased retention of talented employees will reduce resources spent on training and onboarding for positions that experience high turnover rates.
- A more unified community without some employees feeling like second-class citizens.
- Reduced potential for disparate impact, disparate treatment, and other discriminatory practices that may disproportionately affect contingent workers.

Cons

- Longer-term contracts bring the risk of committing to employees that end up not being good fits for their positions.
- Performance review and management practices may need to be strengthened in order to offset this risk.
- Flexibility will be reduced to deal with upward and downward fluctuations in demand or budget resources for the work contractors perform.
- The longer-term contracts may not be appealing to younger workers or those looking to explore a new role or field. Positions specifically tied to training and early career development (e.g., predoctoral and postdoctoral researchers) may not be appropriate for such a program.

Finance and Data Workstream Ideas

Financial Modeling Group Ideas

Overhead Underrecovery: Funding and Process

Current State

The $ volume of oh/ur generated each year ($18.4M in FY19) has been growing at a significant annual rate. This poses great challenges to MIT's ability to financially support it—both in current and future years. Furthermore, the internal administrative process of identification of resources needed to support oh/ur is time-consuming, friction-laden, and inefficient wrt the number of people involved and amount of time required to perform. (Underrecovery funding is most often sourced from DLCs, PIs, Dean's Offices and VPR. Each of these entities has at least one person involved in addressing for each proposal requiring support, though the SoS proposal has reduced this to some degree [only proposals that are awarded by some of the largest foundations require the above steps, vs each proposal requiring them.])

Envisioned State

More central funding—or funding available to DLCs; less administrative time and effort required to support at the proposal and award stages.

Pros

Develop a sustainable funding model. Allow great degrees of freedom for PIs to pursue foundation funding. Reduce administrative pain point.

Cons

May require $Ms annually to address, some of which may be offset by administrative efficiencies gained by redesigning administrative processes.

Increase Unrestricted Support to MIT

Current State

MIT currently demonstrates some measure of success raising unrestricted funds but faces internal and external cultural and operational challenges to increasing funds. In FY20 40% of alumni donors gave unrestricted. Of the 10,755 alumni 86% of them gave less than $1K for $1.6 million. During FY20, 22 gifts at $25K+ and 71 at $10K-$24,999 were raised for unrestricted.

Envisioned State

More unrestricted funds over time.

Pros

More flexible funding.

Cons

MIT has a long history of "your gift your choice" consistent with the independent thinking that characterizes much of the student experience.

While more focus on unrestricted giving (and potentially a couple of other key General Institute Budget needs like financial aid) may increase dollars in this "bucket," it may limit other giving to niche areas across the Institute. This potential shift is worth a closer look to understand impact (including MIT culture of units "going rogue" with their own fundraising).

The Leadership Giving group ("Major Gifts," with a focus on $100K+) currently focuses on restricted giving options which are typical in a campaign and easier to steward; a new playbook would need to be developed to include a focus on unrestricted giving to enhance these valuable dollars.

Finally, it will require significant change management to develop a more centralized-decentralized model.

Grow and Coordinate Professional Education

Current State

MIT currently has several professional education programs that are operated by the following schools and DLCs: MIT Professional Education, Sloan Executive Education, Open Learning xPRO, School of Architecture, CTL, IDSS, etc. As of now, there is minimal sharing of marketing plans, coordination with vendors, and no sharing of the product pipelines or assets. There is also minimal alignment with respect to faculty compensation in teaching these courses.

Envisioned State

Consolidate the programs and create a centralized, unified entity that would not only house these programs, but also prepare joint marketing plans, and share an entire suite of resources such as online assets, programming, and faculty. The entity would be empowered to be more proactive in terms of identifying market needs that MIT could fill and procuring faculty to fill them, with the support of Deans if need be. The envisioned state would increase revenue to MIT, as well as improving the efficiency and scale of the Institute's professional education programs, while allowing for more intentional use of faculty time.

- All online assets shared and leveraged
- Coordinated programmatic course planning
- Leverage scale in operations, vendors
- Align practices, e.g., certification and CEUs
- Consider university partnerships, e.g., Harvard

Pros

- Increases revenue to MIT

- Increases efficiency and scale of MIT's professional education landscape
- Allow for more intentional use of faculty time
- Advance admissions pipeline

Cons

- Reduced faculty control of courses
- Need to figure out how to split revenues
- Some schools may lose ability to control their Prof Ed arms

Online Master's Programs

Current State

Currently, MIT does not have a full suite of professional master's nor full-fledged online degree programs geared towards certain professional competencies. Online professional master's in STEM have been launched by our peers, including Stanford Harvard, Columbia, Johns Hopkins, and other peer institutions. Upside revenue potential is substantial. For instance, Georgia Tech currently has 10,000 students enrolled in its $7,000 Master's in Computer Science.

These higher-tuition programs have the potential to bring in substantial additional Institute dollars, while enabling MIT to step into the realm of practical degree programs using existing virtual platforms.

Envisioned State

Develop and launch a full-range of admission-only online professional master's programs. The programs would serve as a new revenue source for MIT, possibly to support terminal degree graduate students. The coursework would be centered on emerging areas of interest in the workforce such data analytics, artificial intelligence, coding, etc.

Pros

- New revenue source for Institute, possibly used to further support grad student population
- Helps MIT remain competitive in shifting graduate education market
- Capitalizing on current technologies
- Attracting a new student population of adult learners and professionals

Cons

- High cost in developing content
- Strain on faculty who are already stretched thin with current course load and other responsibilities

Graduate Student Funding

Current State

Graduate student funding at MIT is an area which has maintained a pattern of unfunded mandates: there is a level of uncertainty around graduate student support that has become culturally expected at MIT, with the assumption that other awards/sponsored research/grants/gifts/outside funding will be able to cover any gaps in financial aid for a doctoral candidate's future years of study. Currently, graduate financial aid is largely appointment based (RA, TA, fellow), institute-funded, and covers up to full tuition, fees, and student health insurance. Many schools also contend with only being able to offer a 9 month stipend for a TAship, therefore the student is responsible for securing his/her own sources of funding/income for the remaining 3 months of the year while still pursuing his/her degree.

Envisioned State

Our envisioned state is a financial model that can sustainably provide financial support to MIT's graduate student population and reduces/eliminates the ambiguity around graduate student funding and financial hardship in later years.

Our group has come up with several ideas to support this model (ideas will be expanded on in other proposal templates):

- Raising and enhancing endowment for fellowships and other graduate student funding—guaranteeing tuition at current rates, supporting summer stipends (expanding 9 month term to 12 months), childcare, and housing
- Increase tuition subsidy for RAships
- Allowing for ABD (all but dissertation) status for out-year graduate students—tuition paid for the first two years and reduces with ABD status to alleviate financial strain on students (would vary by school)

Pros

Significantly reducing stress and ambiguity among the graduate student population with respect to financial aid; allowing students to complete their coursework in a defined window without having to worry about financial support; enabling MIT to gain in terms of graduate competitiveness and increasing the diversity of graduate student body.

Cons

Potential losses in tuition revenue and restructuring tuition may not be supported at MIT

Undergraduate Financial Aid and Student Debt

Current State

MIT cost of attendance is $73K. MIT is one of 6 US colleges that are need-blind, financial aid awarded solely on need, and will meet the full financial need of each students. Students with family income of

<$90K can come on full scholarship. 76% of undergrads have no student loans. The average student loan debt for those who borrowed is $23K.

MIT had stood apart on Raj Chetty's mobility index, but peers are increasing their commitments dramatically, so despite our own increases in commitment, our relative advantage is slipping. Last academic year, our award averages were the smallest of our HYPS competitors.

Philosophy is that paying is responsibility of student and family.

Envisioned State

Several possibilities to explore:

- More aid for the neediest: Raise full-scholarship family income level to, say, bottom 90% of US households, e.g., $185K
- Lower top-line tuition: Reduce cost of attendance by 10%. Alternately, declare a 10-year moratorium on tuition increases.
- Something bold and different: Perhaps make it easier for undergrads to pay 3 years full cost of attendance only (though, do they want this?) through curated gap years coupled with internships and online courses or X-Terms; partner with Bunker Hill Community College and/or UMass and/or online program delivered broadly at community colleges to do transfer program after Sophomore year; Income-share agreements; Other?
- Review philosophy? MIT shares responsibility?

Pros

- Increase accessibility -> greater diversity?
- Less loans = more career freedom upon graduation
- Good PR in hostile environment
- Perhaps undergrad competitive advantage

Cons

- Changes current financial model—need to fund gap

Data and Research Group Ideas

Data Governance

Current State

There are three areas of data governance that need to be updated: commonly understood data definitions, access controls, and centralizing MIT's official data for external reporting. MIT already has a framework for data governance in place. The Data Warehouse has long collected and published Meta Data. The Roles Database is used for granting access. Definitions of official data are overseen by the VPF,

Institutional Research, the Registrar, Human Resources, Facilities, and other individual groups. Nonetheless, MIT still lacks a centralized source of information.

- Common understandings of data definitions and data lineage (maintain a shared understanding of the meaning of underlying data and where it comes from to ensure continuity and reliability)
- A process for maintaining the correct access roles as individuals move around the Institute (How do we "shut off" access to individuals who leave one role for another within MIT?)
- Which data should be used in public venues (MIT aspires to transparency with data, which makes the questions of "Who decides the "official" data that are made public and how is this communicated?" particularly important).

A common theme of data governance is collaboration and coordination, and communication.

Envisioned State

Ideally there would be a central data governance resource that would maintain meta data including the data linage, maintain the roles database and publish the official sources of data with directions on how to access them. This resource must be centrally managed. Responsibility for data governance should not rest with any of the individual data providers such as VP Finance or Human Resources, but rather should be overseen at the Institute level. This could be a person with familiarity with all the different data sources or uses in the office of the Provost or the EVPT. Without having an office tasked with responsibility for data governance the process is likely to stall.

Additionally, this central resource should be tasked with identifying missing data and unmet needs. One example of an unmet need is information on faculty and graduate student affiliations with research laboratories and centers. Many faculty and principal investigators do not conduct their research in their academic department but instead conduct their research in a Laboratory, Center or Institute. For example, Physics faculty conduct their research within RLE, Kavli, LNS, Plasma Fusion, and other smaller units. EECS faculty have laboratories in CSAIL, RLE, LIDS and other smaller units. Another example of missing data is detailed demographic information such as gender identity, socioeconomic indicators, and country of origin for students or staff.

Pros

Reliable analysis depends upon reliable data with commonly understood definitions. A centralized data governance function would help DLCs to create accurate reporting and aid in analysis and decision-making. It would reduce inconsistent internal and public reporting.

Cons

The biggest danger to successful data governance is scope creep. Keeping the process focused on the data that is most central to accurate reporting will be the challenge. The second problem is too many cooks in the kitchen. There are other universities have created data governance processes that include multiple committees. While it is important to have input from the community, too many committees can paralyze this type of initiative.

Community and Culture Workstream Ideas

Integrate Aspects of Social Responsibility across the Institute

Current State

Overall at MIT, it is not clear that social responsibility is integrated or ingrained deeply into our core activities, especially given the way we work in a highly decentralized manner. The level of understanding and skills in areas supporting social responsibility may be extremely uneven, lessening our ability to have the impact we desire both within our own community and more broadly. For the purpose of this work, we are defining social responsibility as the responsibility of individuals to take action that benefits the greater whole and supports our North Star.

Envisioned State

Societal benefit from shared social responsibility grows from knowledge and practice of diversity, equity and inclusion, ethics, and communication skills. These aspects of social responsibility should be integrated deeply across MIT. Institute-wide support of this integration, and the development of shared definitions for core competencies in ethics, DEI, and communication will yield long term success.

Degree programs, including those in STEM, should tightly incorporate these aspects of social responsibility in order to ensure that MIT students leave with a deep understanding of these issues and the tools to conduct their profession and communicate their research and ideas in a socially conscious way. Incentive structures for faculty, staff, postdocs, and other members of the research community should also integrate social responsibility considerations into their criteria.

This envisioned state can include many possible implementations, such as:

- Work release for time spent in the community
- Dedicated time for professional development and learning for staff and postdocs
- Making DEI service work or training a criterion for promotion
- Clarify that social responsibility is a component of time spent at MIT during orientation
- Creation of supports/incentives for the creation of K-12 outreach programs
- Deeper acknowledgement of alternative outcomes to STEM programs and normalization of these outcomes. For example, science communication careers and policy positions.
- Integration of these concepts to core coursework in both graduate and undergraduate curricula (not just an additional orientation lecture). As an example, adding safety and inclusivity sections to design projects.
- Capitalizing on existing efforts to integrate ethics into the curriculum and other aspects of the Institute.

Pros

- Potential to be transformative due to its integrative approach institute-wide at all levels.

- Enhanced engagement with local communities through widespread and individual improvements as opposed to specific programs and events
- Alumni, trainees, and all staff bring these values and an ability to communicate them to other institutions

Cons

- Generally, a deeper integration of social responsibility should not produce negative outcomes
- Improper integration to course structures can detract time, while not significantly adding benefit. If not done correctly, it may reduce the willingness to take part in future implementations.
- The misperception of loss, like less time for other classwork. Proper implementation would enhance current offerings versus reduce them.
- Time-consuming to implement for curriculum, but other components can be done sooner
- Defining the aspects of DEI, communication, and ethics that should be incorporated will be a challenge, but can be guided by the strategic action plan and values statement
- Decentralized approach to administrative practices create a challenge for a consistent set of expectations and accountability

Belonging Begins at Onboarding

Current State

The way we welcome new people to MIT and help them acculturate varies widely. There are distinct orientation/onboarding approaches for undergraduates, graduate students, postdocs, faculty, and staff; beyond that, every department, lab, office, residence hall, etc. may have its own process for bringing people on board. The current standardized processes provided by HR and individual offices, typically cover nuts-and-bolts questions well (e.g., 401(k)s, add-drop dates) and vary in the degree to which they take on bigger questions around culture and community and common values at MIT. ("Process over people" is a common approach to onboarding.) DEI (and Belonging) tends to be "extra," an "add-on," a "soft skill," at the periphery.

Envisioned State

We believe MIT has the opportunity to use the moment when people are just joining our community to share a clear, affirmative vision of our culture and the kind of community we aspire to be. Local onboarding approaches and activities in DLCs, RLGs, administrative units, et al., would be preserved, and under this proposal, everyone who joins MIT participates in a rich common pool of learning about our culture and values, in order to promote a broader awareness and sense of belonging. ("People over process" would thus be our envisioned state.) DEI (and Belonging) are critical to and a core of our mission, both a strategy and a goal.

Pros

- Certain aspects can be universal and part of all onboarding, independent of the timing

- Institute-wide onboarding could be distributed throughout the year and framed as a celebration of our community in addition to an opportunity to learn about our community and shared values. There are already times and events that could be leveraged:
    i. Fall (coincide with orientation)
    ii. Winter (coincide with IAP)
    iii. Spring (coincide with CPW)
    iv. Summer (post-commencement)
- Several central structures, offices, and roles at MIT are well-situated to provide expertise:
    i. Human Resources
    ii. Institute Events

Cons

- Temporal coordination Different groups of people start at different times: At what time(s) after joining MIT is it most effective to be intentional about cultural orientation?
- Maintaining the uniqueness of the individual offices/departments at MIT while also promoting the shared values of the Institute
- Logistics and effort involved with all-Institute events and activities
- Resources Human, Financial, Spatial
- Sustainability How would engagement be maintained? Are incentives necessary?
- Robustness How to communicate and organize across a large decentralized community
- Management Who are liaisons between central and local communities?
    i. DLCs Are there HR officers for each department?
    ii. RLGs Heads of House?
    iii. Administrative and business units HR officers?
    iv. Students UA and GSC?
- Clarity of Purpose and Expectations MIT has a clear mission statement, yet how this translates into cultural norms have yet to be defined. Examples of missions statements with corresponding expectations:
    i. https://sc.edu/about/offices_and_divisions/student_affairs/our_initiatives/involvement_and_leadership/carolinian_creed/index.php
    ii. http://emotion.caltech.edu/lab-info/our-fundamental-scientific-principles/

Centering Equity to Advance Achievement

Current State

Over decades, MIT has commissioned many reports and developed many separate approaches to dealing with aspects of inequality and racial injustice, e.g., support programs for students from underrepresented minority groups, workshops and seminars on diversity, equity, and inclusion, Day of Dialogues, diversity forums, various fellowships, scholarships, prizes, and awards, the Bias Response

Team, the Hammond Report, community surveys, etc. However, often these good efforts occur in isolation, with limited resources, and/or with the ability to affect only small corners of the MIT community—not sustaining the equity we need. Recently, MIT launched a process to develop a Diversity, Equity and Inclusion (DEI) strategic action plan. To live up to the promise of such a plan, we need to intentionally connect and strengthen our existing efforts to remove the sharply uneven negative effects on the MIT community that result from inequities

Envisioned State

To accomplish this, we propose developing a new Racial Justice and Equity Initiative at MIT which would contribute to the DEI strategic action plan by coordinating our ongoing work around racial justice and equity, assessing community concerns and needs, and using this information to develop recommendations and strategies to mitigate inequities and injustices based on race and other marginalized and/or intersectional identities. The initiative would provide ongoing monitoring of our challenges and progress through the lens of each of our marginalized communities, and the broader Institute as well. It would also be charged with reporting back to the community on a regular basis to promote accountability.

This is an area where there is risk, opportunity, vision, passion, decentralized stakeholders, a need to overcome cultural traditions and behaviors that do not serve us, and a lot at stake. While this would be a new initiative, MIT has past experience at addressing similar systemic issues, such as sexual misconduct, assault, and prevention. Using lessons learned from that work, we propose the following elements for the new initiative:

1. **Needs assessment:** conduct a needs assessment that is specifically targeted at learning where racial inequities are affecting aspects of MIT community and culture (e.g., in admissions, recruitment, outreach, financial aid, hiring, retention, promotion, campus and classroom environment, quality of life, overall MIT experience, etc.), which attempts to remedy these inequities are already demonstrating success, and where there are unaddressed gaps. The ultimate goal would be to determine our most pressing needs, and longer-term goals and objectives, to serve as an input for the ongoing work of the initiative.
2. **Dedicated advisory committee:** Designate a committee or task force, drawn from a broad cross-section of the MIT community, to help monitor and guide the overall work of this new initiative, and to ensure accountability. For inspiration we have looked to the Committee on Sexual Misconduct Prevention and Response, which works with the Institute Discrimination and Harassment Response Office and Violence Prevention and Response to oversee an Institute-wide approach to prevention of sexual misconduct and other forms of gender-based discrimination. The Committee on Race and Diversity could potentially adapt to fill this role, or a new committee could be formed.
3. **Dedicated staffing and oversight office:** This new initiative would fall under the purview of the ICEO. As such, the ICEO's office should be charged and resourced (with appropriate staffing, infrastructure, and budget) in order to support the ongoing work of the initiative and to provide staff support to the committee. The ICEO's office would be responsible for hiring staff for this initiative, providing monitoring and oversight of the initiative and its recommendations, and ensuring accountability together with the advisory committee. We envisage that the ICEO's office

would also serve as a central Institute-wide point-of-contact for racial justice and equity work—aggregating and coordinating racial justice and equity resources, best practices, faculty expertise, etc.

This general structure, of an advisory committee attached to an office charged with implementation, has been employed successfully in a range of contexts across MIT (for example with regard to undergraduate admissions and financial aid). Depending on the content of the DEI strategic action plan, this initiative could be incorporated into a broader landscape of Institute-level action to advance DEI in our community: in any case, we believe it is important that there is an initiative with a specific focus on racial justice and equity.

Pros

- Provides a path to support a future envisioned state where all members of the MIT community feel a sense of belonging, with the potential for significant quality-of-life improvements for many members of our community.
- Provides a clear conduit for all community members to engage with issues of equity and racial justice, with the potential to customize outreach and engagement for those from historically marginalized groups.
- Fosters transparency and accountability with respect to progress on racial justice and equity, which can be incorporated into MIT's DEI strategic plan.
- A successful initiative of this type at MIT would provide a model for other institutions around the world.
- Such an initiative could help support the recruitment and retention of excellent students, postdocs, staff, and faculty across all racial and ethnic groups.
- Members of the MIT community attempting to work on these issues would benefit from a coordinated effort to aggregate data and best-practices, and monitor what is working and what is not, minimizing time spent on "reinventing the wheel."
- It would be a significant educational benefit if as part of being at MIT, everyone would gain access to a set of best practices to support equity and racial justice, which they could use to help address related issues in their own communities at MIT and beyond.

Cons

- Could these resources have a higher impact if invested elsewhere?
- Developing appropriate metrics, for measuring the current state of our community and progress over time, may itself be a difficult problem that could hamper the effectiveness of the initiative if not solved.

Reestablish and Create New Rituals of Connection

Current State

When the MIT community is together on campus, a range of rituals and rhythms reinforce our values and connect us a community, e.g., Commencement, the Great Glass Pumpkin Patch, Winterfest, the Excellence Awards, anytime there's a prominent hack. But when we're remote from one another, those rituals are fundamentally changed. Often, they feel less potent. Sometimes they are wiped out altogether. What's more, even before the pandemic, some rituals or events that had bound us together in the past (MIT Open Houses, Dance Parties, cultural festivals, MIT150, the Pageant and parade, etc.) had fallen away for various reasons, such as effort, expense, the passing of anniversary moments, etc. The result is that—especially in our new mostly remote world, but even in "normal" times—we have relatively few rituals that everyone at MIT can feel a part of or enjoy, regardless of age, role or background.

Envisioned State

Even if the pandemic vanished tomorrow, we believe MIT should prioritize and actively invest in cultivating the energy, creativity, diversity, cohesion, and playful spirit of our community by restoring some well-loved rituals and/or creating some new ones. Specifically, this could include ideas like:

- Reviving the original spirit of IAP, in which everyone at MIT was encouraged to take time in January to explore something new
- Committing to holding an MIT Open House every four years; staff used to report enormous pride in being able to bring their families to MIT
- Establishing "Pi Day" as a special day at MIT—not only the day when we admit new students and when some people recite a whole lot of digits after 3.14159, but as a day that includes something a lot more accessible (e.g., Pie! baking lessons, contests, eating, etc.)
- Holding an MIT-wide dance party every year or two, both to give everyone some end-of-term relief and to get everyone dancing together -staff, students, and faculty!
- Holding a multicultural festival every year or two, that allow different groups to share music, dance, food that matters to them.

Some of these ideas have resonance during our response to the pandemic and can be implemented as virtual events.

One idea that could work well online, and therefore is suitable for more immediate implementation, could be a multicultural festival. We imagine it with elements similar to the Get Out The Vote Fest which was organized by the UA and many student cultural groups—presentations and performances from diverse groups of all kinds, open to the whole MIT community. This festival would not just be a party for the sake of partying. It would be a party that helps to further and elevate some of our key values: educating members of our community about other members' cultures and showing everyone that their culture is welcome, and celebrated, at MIT

Pros

- A use of institute money that has broad impact
- A good use of resources in a time where our community is fractured by our response to the pandemic
- Investment in cultivating the energy, creativity, diversity, cohesion and playful spirit of our community
- Events are intended by the schedule and the content for the whole community

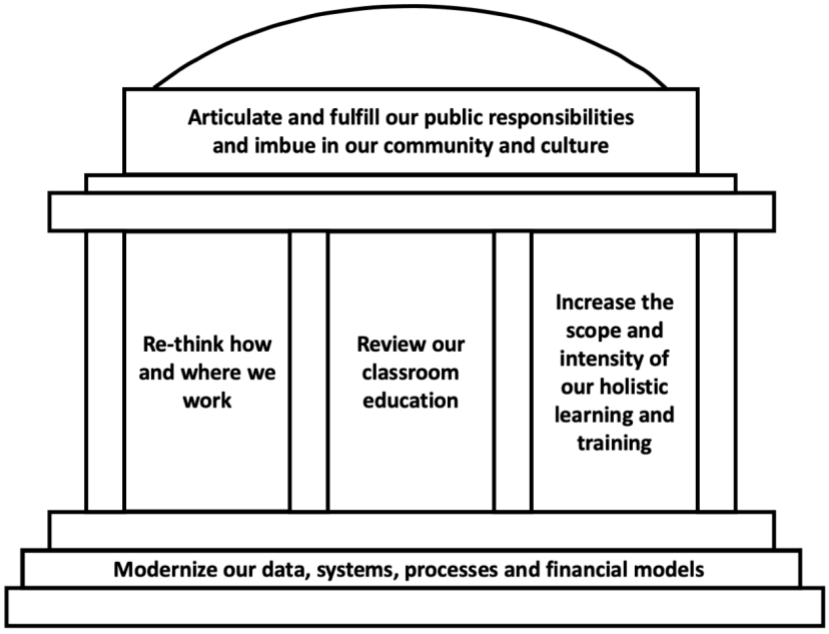
Cons

- Costs money
- Most members of our community are already stretched—implementation may be seen/felt as a burden
- During a financial exigency, some may not view this as a necessary expense

Thematic Overview of Phase One Ideas

Summary Themes of Ideas

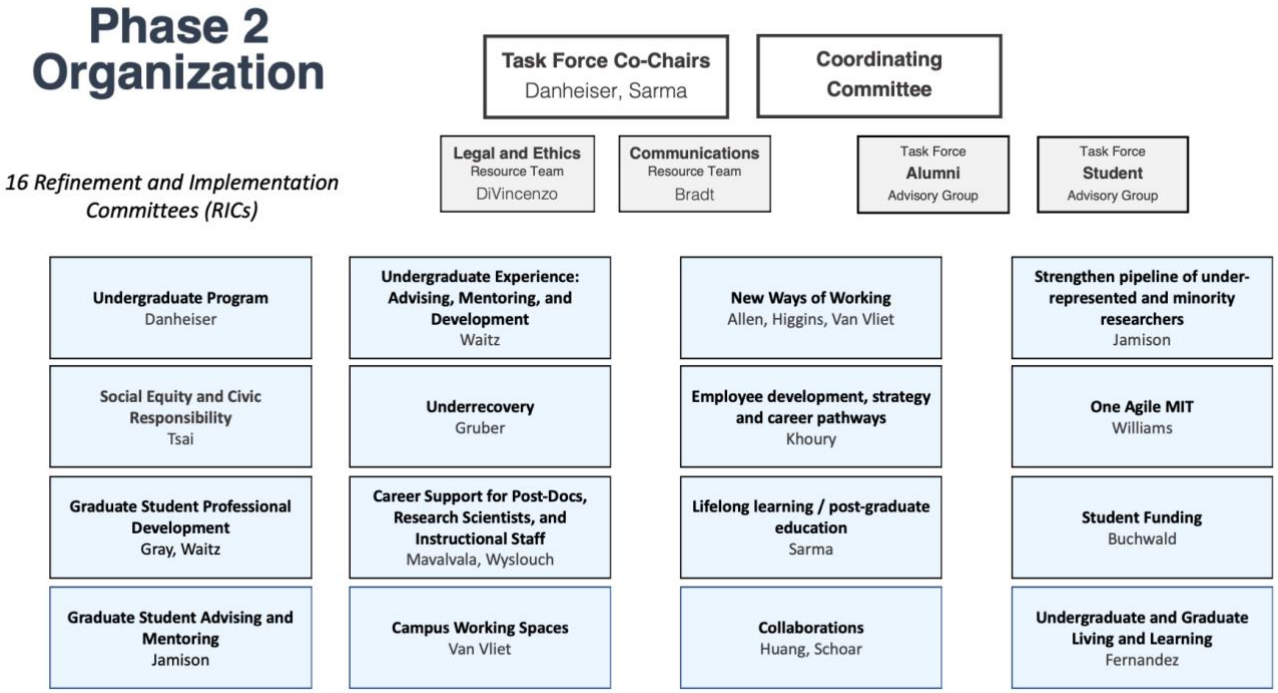
The ideas were organized into five themes, shown in the “dome” graphic below. At the base, the recommendation that we need to upgrade our systems. The pillars correspond to the overhauling we need to take on in response to the lessons of 2020. The dome describes a key outcome that has become even more important for the years ahead.



TASK FORCE 2021 AND BEYOND PHASE TWO

Overview of Phase Two

Phase Two of the work of the Task Force, launched in March 2021, focused on refinement and implementation planning for the Phase One ideas. The primary vehicle for advancing this work were sixteen "Refinement and Implementation Committees" (RICs) charged to develop specific and concrete proposals, and define implementation plans for those proposals.



Summary Descriptions of Refinement and Implementation Committees (RICs)

Undergraduate Program

The Undergraduate Program RIC resumes the process begun by the Chair of the Faculty and the Vice Chancellor for Undergraduate and Graduate Education prior to the pandemic on the possibility of standing up a task force to review the undergraduate academic program, including in particular the General Institute Requirements. This committee is not directly associated with any specific ideas from Phase One but is connected to many of the themes that emerged.

Social Equity and Civic Responsibility

This RIC is charged to advance ideas related to articulating MIT's social responsibilities and consider how the Institute can support students, faculty, and staff in fulfilling these responsibilities via vehicles such as curricular and co-curricular efforts, a potential community and nonprofit liaison program, a social impact fund, and the creation and use of "third spaces" (neither fully academic nor residential) for social responsibility. The Community and Culture Workstream stressed that key aspects of social responsibility be integrated deeply across MIT. Furthermore, a major thrust of the recommendations from no less than three of the Academic Workstream groups focus on providing our students with experience and education in the area of social responsibility, broadly defined.

Graduate Student Professional Development

Several groups in the Academic Workstream proposed ideas aimed at implementing "holistic graduate education." On this RIC's agenda for consideration are the introduction of professional development opportunities for graduate students, including perhaps even a "professional perspective requirement," which might be satisfied through internships (both corporate and social good); research exchanges, and research collaborations with companies; or the exploration of non-research careers through teaching experiences and other activities.

Graduate Student Advising and Mentoring

The Student Journey Group recommended that MIT enhance the scope and effectiveness of graduate advising and faculty mentoring. This recommendation connects directly to discussions that have already been taking place by faculty governance leadership and administration since fall 2020. As a result, an Ad Hoc Committee on a Strategic Plan for Graduate Advising and Mentoring has been convened to focus on this issue. This new ad hoc committee is charged with implementing this idea based on the work of both the task force and the Committee on the Graduate Program.

Undergraduate Experience: Advising, Mentoring, and Development

The Student Journey Group declared in their report that "Advising is broken and is in need of a radical re-imagining." The charge to this RIC will be to propose an implementation plan to address the recommendations of the Student Journey Group for enhancing undergraduate advising, including strengthening the UROP program, teaching the MIT "hidden curriculum," and expanding advising networks.

Underrecovery

Both the Research and Financial Modeling Groups highlighted Underrecovery as an area requiring urgent attention. The Research Group pointed out that "Underrecovery is a persistent concern for both researchers and administrators at MIT, especially as it relates to funding from foundations that do not pay the federally negotiated F&A [facilities and administrative] rate." This RIC will be charged with studying current Underrecovery funding levels and processes, and making concrete proposals to the Provost to enhance the transparency and efficiency of identifying sources of Underrecovery funds.

Career Support for Postdocs, Research Scientists, and Instructional Staff

Career support for postdocs and research scientists emerged as a major concern in the deliberations of the Research Group. This working group noted that while "research scientists are critical to managing research activities at MIT . . . their career advancement opportunities are often limited." The Research Group offered several recommendations for career support of postdocs and research scientists, including providing multiple paths for advancement as well as training options to facilitate career transitions. Also suggested were systems to foster diversity, equity, and inclusion (DEI) and prevent mistreatment. The Career Support RIC will be charged with developing concrete proposals to realize the recommendations of the Research Group in this area.

Campus Working Spaces

This RIC will further develop the recommendations of the Campus Operations Group on spatial needs and decentralization, considering how new technology and changing work practices have affected our requirements for space. The work of this RIC will be coupled to the discussions of the Work Succeeding RIC.

Work Succeeding

Recognizing that "flexible work at and for MIT is a key part of MIT's future, and is not default work from home," the Administrative Workstream proposed several "new ways of working." Specifically, the workstream recommends that "MIT should immediately advance the planning and piloting of flexible work practices and places. This should include options for hybrid working schedules (remote and on campus) for diverse MIT teams, and include implementation pilots to evaluate physical spaces and best practices for more flexible work of research, education, and administration teams. Internal and external experts should be consulted to plan such pilots." As mentioned above, the work of this RIC will be coupled to that of the Campus Working Spaces RIC.

Employee Development, Strategy, and Career Pathways

In their report, the Administrative Workstream noted that "For the past several years, exit interviews and survey data of MIT employees . . . consistently show that the leading reasons employees leave MIT are that they don't feel MIT is committed to their professional development, and that there are not enough opportunities for career advancement." The Administrative Workstream recommends that MIT "establish integrated opportunities and expectations to develop skills for mentorship, management of teams, and career advancement through tools, training, and support of career pathways and networks at MIT—as a natural part of working at, contributing to, and being part of One MIT." This RIC will develop concrete action plans to address these recommendations

Lifelong Learning / Postgraduate Education

"Lifelong learning" and other aspects of postgraduate education are central to the ideas posed by several groups of the Academic and Administrative Workstreams. The Education Group argued in their

report that “Digital technology radically alters the economics of education delivery and it is high time that we revisit both the frequency and dosage of our offerings.” The Education Group discussed several approaches to lifelong learning and concluded that “Our core recommendation is that MIT charge a new committee with tackling this question in depth and proposing a set of experiments in lifelong learning.” In their report, the Beyond MIT Group noted that at the Institute “we currently lack a coherent vision and plan for an MIT ‘Postgraduate Education of the Future’ that makes MIT a pioneer in preparing people to work at ‘good jobs’ of the future,” and proposed ‘an MIT Postgraduate Education of the Future Initiative’.” This initiative “would establish a new college or university-wide unit at MIT dedicated to online postgraduate education with a range of postgraduate subjects and coherent, intentional programs.” These recommendations will be the subject of the Lifelong Learning RIC, whose charge will be to evaluate these ideas and propose a plan forward.

Collaborations

The report of the Research Group of the Academic Workstream pointed out that multidisciplinary research is a historical strength at MIT and noted that interdisciplinary research is a key to the solution of some of the most difficult and pressing problems that face society today. This RIC will consider the recommendations of this working group for fostering collaborations within the Institute, for promoting new engagement models with industry and government, and to encourage appropriate international collaborations.

Strengthen Pipeline of Underrepresented and Minority Researchers

The Research Working Group wrote that the “lack of DEI . . . pervades MIT’s research enterprise and adversely affects the experience of researchers who are members of minority groups that include women, non-cisgender men, and especially people of color. Many factors contribute to this, including the prevalence of conscious and unconscious bias; structural barriers to success; and structures of power created by tenure, hierarchy, and control of resources, funding, and career advancement. Every aspect of MIT, including the research enterprise, must implement significant and urgent reforms to address this . . . . This shortfall in implementation and accountability must be addressed.” In their report, the Research Group went on to urge that “MIT develop mechanisms for responding to recommendations in a proactive and timely fashion, and implement benchmarking strategies that allow for transparent assessment of progress. Furthermore, implementing a system of incentives and accountability will be crucial to ensuring progress.” In conjunction with other ongoing efforts at the Institute, this RIC will be charged with developing concrete plans to build a stronger pipeline of young researchers from underrepresented groups, considering both hiring and providing a more supportive, attractive environment once at MIT for members of such groups

One Agile MIT

“One Agile MIT” is a concept developed by the Administrative Workstream that involves the creation of a new, permanently staffed project management team for prioritized projects to modernize MIT’s administrative processes and systems, along with the development and adoption of new practices for the sharing of digitized data across departments, labs, and centers. The Administrative Workstream

suggests that this will benefit the work efficiencies of faculty and administrative staff across the Institute, “enabling increased strategic focus and time for mission-critical activities of research, teaching, and mentorship of students and research staff.”

Student Funding

Both the Research and Financial Modeling Groups highlighted the high cost of graduate students at MIT as an important priority for attention and this RIC will work with the Provost in developing a plan to address this longstanding issue of “research deferred maintenance.”

Undergraduate and Graduate Living and Learning

This RIC will address several ideas posed by the Education and Academic Learning and Residential Spaces Groups, including how best to leverage digital technologies in pedagogy as well as proposals of the Spaces Group on community and outdoor spaces and on the design and planning of classrooms and other academic spaces.

Membership of Task Force 2021 and Beyond Phase Two

Refinement and Implementation Committees

Undergraduate Program

Rick Danheiser, Chair, *Chair of the Faculty; Arthur C. Cope Professor of Chemistry*

Arthur Bahr, *Associate Professor of Literature*

Duane Boning, *Clarence J. LeBel Professor in Electrical Engineering*

Anne McCants, *Professor of History*

Krishna Rajagopal, *Dean for Digital Learning; William A. M. Burden Professor of Physics*

Lily Tsai, *Chair-Elect of the Faculty; Ford Professor of Political Science*

Ian Waitz, *Vice Chancellor for Undergraduate and Graduate Education; Jerome C. Hunsaker Professor of Aeronautics and Astronautics*

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Krishna Rajagopal, *Dean for Digital Learning; William A. M. Burden Professor of Physics*

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Martha Gray, *J. W. Kieckhefer Professor of Health Sciences and Technology; Professor of Electrical Engineering and Computer Science*

Paula Hammond, *David H. Koch (1962) Professor in Engineering, Department of Chemical Engineering*

Ian Waitz, *Vice Chancellor for Undergraduate and Graduate Education; Jerome C. Hunsaker Professor of Aeronautics and Astronautics*

Undergraduate Experience: Advising, Mentoring, And Development

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Baptiste Bouvier, *Undergraduate Student, Class of 2022, Computer Science and Engineering*

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Anne McCants, *Professor of History*

Kristala Prather, *Arthur D. Little Professor of Chemical Engineering*

David Randall, *Senior Associate Dean for Student Support and Wellbeing, Division of Student Life*

Janet Rankin, *Director, Teaching and Learning Laboratory*

Michael Short, *Class of '42 Associate Professor of Nuclear Science and Engineering*

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John Donnelly, *Associate Controller*

Ronald Hasseltine, *Assistant Provost for Research Administration*

Danielle Khoury, *Controller*

Laura Kiessling, *Novartis Professor of Chemistry*

Lisa Schwallie, *Executive Director, Business and Operations, Office of the Vice President for Open Learning*

Charles Stewart, *Kenan Sahin (1963) Distinguished Professor of Political Science*

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Paulo Lozano, *M. Alemán-Velasco Professor of Aeronautics and Astronautics*

Maha Haji, *Postdoctoral Associate, Department of Aeronautics and Astronautics*

Joseph Paradiso, *Alexander W. Dreyfoos (1954) Professor in Media Arts and Sciences*

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Martin Culpepper, *Professor of Mechanical Engineering*

Caroline Jones, *Professor of the History of Art, Department of Architecture*

Julie Newman, *Director, MIT Office of Sustainability*

Allison Parisi, *Principle Financial Analyst, Treasury and Planning, Office of the Vice President for Finance*

Greg Raposa, *Space Administrator, Office of the Provost*

Brent Ryan, *Associate Professor of Urban Design and Planning*

Work Succeeding

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Joe Higgins, Co-Chair, *Vice President for Campus Services and Stewardship*

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Robin Elices, *Executive Director, Office of the Executive Vice President*

Shirley Entzminger, *Faculty Support Staff, Department of Mathematics*

Amy Glasmeier, *Professor of Economic Geography and Regional Planning, Department of Urban Studies and Planning*

Timothy F. Jamison, *Associate Provost; Robert R. Taylor Professor of Chemistry*

Erin Kelly, *Sloan Distinguished Professor of Work and Organization Studies*

Thomas Kochan, *George Maverick Bunker Professor of Management*

Christina Lo, *Director of Strategic Sourcing and Contracts*

Todd Robinson, *Senior Campus Planner*

Employee Development, Strategy, and Career Pathways

Danielle Khoury, Chair, *Controller*

Long Tran, Staff, *Assistant Controller*

Glen Comiso, *Senior Director for Institute Affairs, Office of the President*

Ronnie Haas, *Director of Strategic Talent Management, Human Resources Department*

Thomas Kochan, *George Maverick Bunker Professor of Management*

Heather Williams, *Assistant Dean, School of Science*

Lifelong Learning / Postgraduate Education

Sanjay Sarma, Chair, *Vice President for Open Learning; Fred Fort Flowers (1941) and Daniel Fort Flowers (1941) Professor of Mechanical Engineering*

Susan Young, Staff, *Assistant Director, J-WEL Workforce Learning, Open Learning*

Bruce Cameron, *Director, System Architecture Group*

Chris Caplice, *Senior Research Scientist and Executive Director, Center for Transportation & Logistics*

W. Eric Grimson, *Chancellor for Academic Advancement; Professor of Computer Science and Bernard M. Gordon Professor of Medical Engineering*

Nelson Repenning, *School of Management Distinguished Professor of System Dynamics and Organization Studies*

Pawan Sinha, *Professor of Vision and Computational Neuroscience, Department of Brain and Cognitive Sciences*

Lisa Schwallie, *Executive Director, Business and Operations, Office of the Vice President for Open Learning*

Lily Tsai, *Chair-Elect of the Faculty; Ford Professor of Political Science*

Lawrence Vale, *Ford Professor of Urban Design and Planning*

Collaborations

Yasheng Huang, Co-Chair, *Epoch Foundation Professor of International Management; Professor, Global Economics and Management*

Antoinette Schoar, Co-Chair, *Stewart C. Myers-Horn Family Professor of Finance and Entrepreneurship*

Kate Stoll, Staff, *Senior Policy Advisor, MIT Washington Office*

Angela Belcher, *James Mason Crafts Professor of Biological Engineering and Materials Science and Engineering*

Robert Desimone, *Doris and Don Berkey Professor, Department of Brain and Cognitive Sciences*

Richard Lester, *Associate Provost for International Activities; Japan Steel Industry Professor, Department of Nuclear Science and Engineering*

Meghan McCollum Fenno, *Counsel in the Office of the General Counsel; OSATT Director of Strategic Transactions*

Aude Oliva, *Senior Research Scientist, MIT CSAIL; MIT Director, MIT-IBM Watson AI Lab; Co-Director, MIT Quest for Intelligence*

Charles Stewart, *Kenan Sahin (1963) Distinguished Professor of Political Science*

Strengthen Pipeline of Underrepresented and Minority Researchers

Timothy F. Jamison, Chair, *Associate Provost; Robert R. Taylor Professor of Chemistry*

Trinidad Carney, Staff, *Assistant Director of Admissions, Admissions Office*

Emery Brown, *Edward Hood Taplin Professor of Medical Engineering and of Computational Neuroscience; Professor of Health Sciences and Technology*

John Dozier, *Institute Community and Equity Officer*

Maryanne Kirkbride, *Deputy Institute Community and Equity Officer and Executive Administrator, MindHandHeart*

Eric Klopfer, *Professor and Head, Comparative Media Studies/Writing Program*

Asegun Henry, *Robert N. Noyce Career Development Professor of Mechanical Engineering*

Ray Reagans, *Alfred P. Sloan Professor of Management; Professor of Organization Studies*

One Agile MIT

Heather Williams, Chair, *Assistant Dean, School of Science*

Mary Roderick, Staff, *Human Resources Administrator, McGovern Institute for Brain Research*

Connie Winner, Staff, *Assistant to the Dean, School of Science*

Olu Brown, *Director, Platform Engagement, Information Systems and Technology*

Brian Canavan, *Registrar*

Glen Comiso, *Senior Director for Institute Affairs, Office of the President*

Mark DiVincenzo, *Vice President and General Counsel*

Elizabeth McManus, *Project Manager, Office of the Executive Vice President and Treasurer*

Nelson Repenning, *School of Management Distinguished Professor of System Dynamics and Organization Studies*

Lisa Schwallie, *Executive Director, Business and Operations, Office of the Vice President for Open Learning*

Mary Ellen Sinkus, *Administrative Officer and Strategic Initiatives Liaison, School of Engineering*

Lydia Snover, *Director of Institutional Research, Office of the Provost*

Student Funding

Stephen Buchwald, Chair, *Camille Dreyfus Professor of Chemistry*

Naziat Adnan, Staff, *Senior Tax Analyst, Office of the Vice President for Finance*

Stephen Bell, *Uncas and Helen Whitaker Professor of Biology*

Glenn Ellison, *Gregory K. Palm (1970) Professor of Economics*

Ken Goldsmith, *Assistant Dean for Finance and Administration, School of Architecture and Planning*

Nergis Mavalvala, *Dean, School of Science; Curtis (1963) and Kathleen Marble Professor of Astrophysics*

Donca Steriade, *Professor of Linguistics*

William Tisdale, *ARCO Career Development Professor of Chemical Engineering*

Undergraduate and Graduate Living and Learning

John Fernández, Chair, *Professor, Department of Architecture*

Jennine Talbot, Staff, *Senior Planner for Capital Renewal, Campus Construction*

Brian Canavan, *Registrar*

Albert Gerovitch, *Undergraduate Student, Class of 2021, Electrical Engineering and Computer Science and Brain and Cognitive Sciences*

Jeffrey Grossman, *Morton and Claire Goulder and Family Professor in Environmental Systems, Department of Materials Science and Engineering*

Jordan Harrod, *Graduate Student, Medical Engineering and Medical Physics, Harvard-MIT Health Sciences and Technology Program*

Amy Kaiser, *Senior Planner, Office of Campus Planning*

Suzy Nelson, *Vice President and Dean for Student Life*

Krishna Rajagopal, *Dean for Digital Learning; William A. M. Burden Professor of Physics*

Brent Ryan, *Associate Professor of Urban Design and Planning*

Phase Two Charges for the Refinement and Implementation Committees

Charge for Refinement and Implementation Committee (RIC) 1 Undergraduate Program

Committee Members

Rick Danheiser (Chair) (TF-Lead), Arthur Bahr (E), Duane Boning (E), Anne McCants (SJ), Krishna Rajagopal (E-Lead), Lily Tsai (B-Lead), and Ian Waitz

Charge of the Committee

The Undergraduate Program Refinement and Implementation Committee will consider whether the Institute should convene a **Task Force on the Undergraduate Academic Program**, or alternatively, to suggest other mechanisms for advancing undergraduate education at MIT.

Prior to the Covid-19 pandemic, the Chair of the Faculty and the Senior Leadership of the Institute had agreed that it would be desirable to stand up such a Task Force to begin work in Spring 2020. The charge and membership for this Task Force was to be developed jointly by Faculty Chair Rick Danheiser and Vice Chancellor Ian Waitz. The charge of the Task Force would include review of the undergraduate curriculum including, in particular, the General Institute Requirements. Both the SME (science-math-engineering) and HASS (humanities-art-social sciences) components of the GIRs would be reviewed. Proposals by the Task Force for changes in the undergraduate requirements would be submitted to the appropriate committees of Faculty Governance for their consideration.

The Undergraduate Program Refinement and Implementation Committee will consider the appointment of the postponed Task Force with a timetable calling for its work to begin during Academic Year 2021-2022. If a decision is made to stand up such a Task Force, then the RIC will define the scope of the review, propose a charge for the Task Force, and recommend potential members. These recommendations will be submitted to the Faculty Chair and the Vice Chancellor for implementation.

In considering the need for this Task Force, and in defining its charge (should a Task Force be deemed appropriate), the Refinement and Implementation Committee will take into consideration developments since 2019, including ideas with regard to the undergraduate curriculum developed by the Education, Student Journey, and Beyond MIT Working Groups during Phase One of Task Force 2021 and Beyond. In this connection the members will maintain frequent consultation with RICs 2 (Social Responsibility, Lily Tsai, Chair), 5 (Undergraduate Experience: Advising, Mentoring, and Development, Ian Waitz, Chair), and 16 (Undergraduate Living and Learning, John Fernandez, Chair). This will be facilitated by the common membership of members of RIC 1 with these committees.

In addition to considering the ideas of the Task Force in Phase One, the Committee will also consider suggestions about the incorporation in the undergraduate academic program of education on climate change and sustainability as well as computational thinking.

Phase One Ideas

No specific Phase One ideas are specifically associated with the charge for this committee that are not covered by another RIC. However, the members should carefully review the ideas proposed by the Education, Student Journey, and Beyond MIT Working Groups in Phase One.

Related Sources

The Committee will wish to review a number of prior reports on the undergraduate academic program, including, but not limited to, the Report of the Committee on Educational Survey (Lewis, 1949), the Report of the Committee on Curriculum Content Planning (Zacharias, 1964), the Report of the Committee on the Science Requirement (Greytak, 1989), the Report of the Educational Design Project (Hodges/Benton 1998), the Report of the Task Force on Student Life and Learning (1998), the Report of the Task Force on the Undergraduate Educational Commons (R. Silbey 2006), the Report of the CUP Subcommittee on the Educational Commons (Redwine/Stewart 2008), the Report of the Institute-wide Task Force on the Future of MIT Education (Ruiz/Sarma/Wilcox 2014), and the Report of the Working Group on Computational Thinking (Grimson 2017). The Committee should also consider recommendations from across the Institute with regard to the incorporation of education on climate change and sustainability in the undergraduate curriculum, including the recent recommendations of the Student Sustainability Coalition.

Consultation

The Committee may wish to consult with undergraduate students either via meetings with representatives arranged by the Undergraduate Association, or by an open forum meeting.

Timeline and Output

The RIC will provide a report to the Faculty Officers and the Faculty Policy Committee, the Committee on the Undergraduate Program, the Chancellor, and the Co-Chairs of the Task Force by mid-June 2021.

Charge for Refinement and Implementation Committee (RIC) 2 Social Equity and Civic Responsibility

Committee Members

Lily Tsai (B-Lead) (Chair), Adam Albright, Yu Jing Chen (E), Christine Ortiz, Kris Prather (SJ-Lead), Krishna Rajagopal (E-Lead), Larry Susskind (B), Emma Teng (E),and Kate Trimble (SJ)

Charge of the Committee

To review the ideas on incorporating research and education experiences involving social responsibility, public service, and appreciation of structural, systemic, and institutional hierarchies developed by the Task Force Phase One Working Groups on **Education** (SSIH and Experiential Empathy), **Student Journey** ("Finding Your Purpose"), and **Beyond MIT** (Fulfilling MIT's Public and Social Responsibilities), as well as ideas proposed by other members of the community, and to refine and merge these Phase One and other ideas as appropriate to arrive at concrete and specific proposals for implementation. The report of the RIC will recommend an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation as well as a recommended timetable for implementation. If appropriate, the committee may define milestones to be met in the course of implementation. If any significant financial resources would be required for implementation of the recommendations, then these should be described.

The implementation plan may include a recommendation for establishing one or more pilot studies, in which case the RIC should propose (a) the nature of the pilot study, (b) who will oversee the pilot study (e.g., the Vice Chancellor, the Chair of the Faculty, a Faculty Governance Committee such as CUP, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the study will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., the Vice Chancellor, the Chair of the Faculty, a Faculty Governance Committee such as CUP, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One reports of the Education, Student Journey, and Beyond MIT Working Groups.

Related Sources

Over the past year there has been considerable discussion at the Institute concerning the incorporation of DEI and ethics in the undergraduate curriculum and the RIC may wish to review some of this material. Examples include the article by Jared Berezin in the Faculty Newsletter ("Does MIT Support DEI

Education in STEM? If So, Creation of DEI-M Subjects Could Help," Nov-Dec 2020, pp 19-20) and the Opinion Guest Column by six students and Professor Ed Bertschinger in The Tech ("MIT Should Implement a Society and Ethics Two-Subject Requirement," January 7, 2021). Copies of each are attached.

Consultation

The Committee may wish to consult with undergraduate students either via meetings with representatives arranged by the Undergraduate Association, or by one or more open forum meetings.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June 2021.

Charge for Refinement and Implementation Committee (RIC) 3 Graduate Student Professional Development

Committee Members

Ian Waitz and Martha Gray (Co-Chairs), Duane Boning (E), Anna Frebel, Nathan Miller (R), TL Taylor, Larry Vale (E), and Lauren Pouchak (Staff)

Charge of the Committee

To review the ideas on holistic graduate education developed by the Task Force Phase One Working Groups on **Education**, **Student Journey** (on "Finding Your Purpose"), and **Research**, as well as ideas under development by the Committee on the Graduate Program and by the Office of the Vice Chancellor, and to refine and merge these Phase One and other ideas as appropriate to arrive at concrete and specific proposals for implementation. The report of the RIC will also recommend an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation as well as a recommended timetable for implementation. If appropriate, the committee may define milestones to be met in the course of implementation. If any significant financial resources would be required for implementation of the recommendations, then these should be described.

The implementation plan may include a recommendation for establishing one or more pilot studies, in which case the RIC should propose (a) the nature of the pilot study, (b) who will oversee the pilot study (e.g., the Vice Chancellor, the Chair of the Faculty, a Faculty Governance Committee such as CGP, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the study will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., the Vice Chancellor, the Chair of the Faculty, a Faculty Governance Committee such as CGP, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One reports of the Student Journey, Education, and Research Working Groups, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review a number of external reports on graduate student professional development such as the recommendations of the MIT Working Group on Graduate Professional Development and the recommendations of the MIT Career Exploration Committee (these can be

provided by Vice Chancellor Waitz) and any other reports they deem relevant. The Committee may wish to review minutes from relevant meetings of the CGP.

Consultation

The Committee may wish to consult with graduate students either via meetings with representatives arranged by the GSC, or by an open forum meeting. The Committee may wish to meet with representatives of EECS with regard to the department's "Professional Perspective" requirement.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June 2021.

Charge for Refinement and Implementation Committee (RIC) 4 Graduate Student Advising and Mentoring

Committee Members

Tim Jamison (CC) (Chair), Paula Hammond, Rick Danheiser (TF Co-Chair), Martha Gray, and Ian Waitz

Charge of the Committee

To appoint an **Ad Hoc Committee on a Strategic Plan for Graduate Advising and Mentoring**, developing the charge for this committee, and appointing the membership.

The RIC will review the ideas on graduate advising and mentoring developed by the Task Force Phase One Working Group on **Student Journey** (in "Finding Your People"), as well as ideas discussed by the Committee on the Graduate Program and by the Office of the Vice Chancellor, and will refine and merge these Phase One and other ideas as appropriate in preparing a charge for the Ad Hoc Committee. The RIC will recruit the membership of the Ad Hoc Committee, which will be chaired by Paula Hammond and Tim Jamison.

The report of the Ad Hoc Committee will be submitted to the Faculty Policy Committee, the Committee on the Graduate Program, and the offices of the Vice Chancellor and the Associate Provost for Faculty Development and Diversity. The Co-Chairs of Task Force 2021 and Beyond will also be copied on the final report as well as any progress reports and updates.

Phase One Ideas

Members of the RIC are urged to read the entire Phase One reports of the Student Journey Working Group.

Related Sources

The Refinement and Implementation Committee should suggest in the charge to the Ad Hoc Committee other sources that should be consulted by the Ad Hoc Committee, which may include:

- The NASEM report on the Science of Effective Mentoring
- Response to the Report of the National Academies Committee on Women in Science, Engineering, and Medicine
- The Center for the Improvement of Mentored Experiences in Research (CIMER) educational offerings and assessments, including the Mentoring Competency Assessment (MCA)
- MIT Graduate Advising Playbook & Graduate Advising and Mentoring Survey, sponsored by the Office of the Vice Chancellor in collaboration with the Teaching and Learning Lab, MindHandHeart, Office of Graduate Education, Graduate Student Council, School of Engineering Student Advisory Group (GradSAGE)

Consultation

While there is no need for further consultation by the RIC, the Committee may wish to suggest groups and individuals that should be consulted by the Ad Hoc Committee.

Timeline and Output

The Refinement and Implementation Committee will complete the development of the charge for the Ad Hoc Committee on a Strategic Plan for Graduate Advising and Mentoring and appoint its membership by no later than May 1, 2021. The charge and list of members will be reported to the co-chairs of Task Force 2021 at that time.

The RIC will define a timetable for the work of the Ad Hoc Committee that will include target dates for updates and progress reports as well as a target date for the completion of its report.

Charge for Refinement and Implementation Committee (RIC) 5 Undergraduate Experience: Advising, Mentoring, and Development

Committee Members

Ian Waitz (Chair), Michael Bergren, Rick Binzel, Baptiste Bouvier (SJ), DiOnetta Jones Crayton (CC), Anne McCants (SJ), Kris Prather (SJ-Lead), David Randall (SJ), Janet Rankin, and Mike Short

Charge of the Committee

To review the ideas on the advising and mentoring of undergraduate students developed by the Task Force Phase One Working Groups on **Student Journey** ("Finding Your People" and "Finding Your Path") and **Research** (on UROP), as well as ideas proposed by other members of the community, and to refine and merge these Phase One and other ideas as appropriate to arrive at concrete and specific proposals for implementation. The report of the RIC will also recommend an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation as well as a recommended timetable for implementation. If appropriate, the committee may define milestones to be met in the course of implementation. If any significant financial resources would be required for implementation of the recommendations, then these should be described.

The implementation plan may include a recommendation for establishing one or more pilot studies, in which case the RIC should propose (a) the nature of the pilot study, (b) who will oversee the pilot study (e.g., the Vice Chancellor, the Chair of the Faculty, a Faculty Governance Committee such as CUP (Committee on the Undergraduate Program) and CSL (Committee on Student Life), or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the study will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., the Vice Chancellor, the Chair of the Faculty, a Faculty Governance Committee such as CSL and CUP, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One reports of the Student Journey Working Group, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Refinement and Implementation Committee should review prior reports and material on undergraduate advising which will be provided by the Vice Chancellor and his office.

Consultation

The Committee may wish to consult with undergraduate students either via meetings with representatives arranged by the Undergraduate Association, or by one or more open forum meetings.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June 2021.

Charge for Refinement and Implementation Committee (RIC) 6 Underrecovery

Committee Members

Jon Gruber (Chair), Angie Belcher, John Donnelley, Ron Hasseltine, Danielle Khoury, Laura Kiessling, Lisa Schwallie, and Charles Stewart

Charge of the Committee

To review the ideas on current Underrecovery funding levels and the process for awarding Underrecovery developed by the Task Force Phase One Working Groups on **Research** and **Financial Modeling**, as well as ideas under development by the Office of the Provost and the Office of the Vice President for Research, and to refine and merge these Phase One and other ideas as appropriate to arrive at concrete and specific proposals for implementation. The report of the RIC will also recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Provost, the Vice President for Research, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., Provost, the Vice President for Research, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

As an initial step in their deliberations, the Refinement and Implementation Committee should meet with Provost Marty Schmidt who will update the members on the progress that his office and that of Executive Vice President and Treasurer Glen Shor have made in addressing these issues. The Provost will provide suggestions and guidance to the Refinement and Implementation Committee, which will consult with him during the course of its deliberations.

Note that the related issue of graduate student funding is the subject assigned to RIC 15 (Steve Buchwald, Chair) and the work of RIC 6 and RIC 15 will need to be coordinated by frequent communication between the Chairs.

Phase One Ideas

Members of the RIC are urged to read the entire Phase One reports of the Financial Modelling and Research Working Groups, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review practices at peer institutions, current practices within MIT (e.g., in the School of Science), and past studies of the Underrecovery and more broadly the financial model of funding central expenses at MIT. The Committee may also wish to develop financial models to understand the likely implications of various levels of resource funding towards Underrecovery.

Consultation

The Committee may wish to consult with faculty and administrators in departments that request or incur substantial Underrecovery, as well as with members of the office of the Vice President for Research and Vice President of Finance who are knowledgeable about the Institute's Underrecovery practices.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 7 Career Support for Postdocs, Research Scientists, and Instructional Staff

Committee Members

Nergis Mavalvala and Bolek Wyslouch (Co-Chairs), Fikile Brushett, Maha Haji, Paulo Lozano, Joe Paradiso, and Ann Skoczenski

Charge of the Committee

To review the size and structure of Research Scientists, Postdocs, and non-tenure-track instructional staff at MIT, and review relevant ideas on career support, including hiring (and associated data), onboarding, providing multiple advance paths to research scientists, career transitions, connecting with alternative financial advancement opportunities, and systems to foster DEI and prevent mistreatment which were developed by the Task Force Phase One Working Group on **Research**. The report of the RIC will recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Provost, the Vice President for Research, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., Provost, the Vice President for Research, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One report of the Research Working Groups, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review practices at peer institutions, current practices within MIT, and past reports including the Quality of Life Survey 2020 as it pertains to relevant populations, and Advancing a Respectful and Caring Community: Report of the Institute Community and Equity Officer.

Consultation

The Committee may wish to consult with postdocs, research scientists, and Instructional staff via meetings by school or department, or by an open forum meeting.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 8 Campus Working Spaces

Committee Members

Krystyn Van Vliet (Chair), Allison Parisi, Brent Ryan, Caroline Jones, Greg Raposa, Jon Alvarez, Julie Newman, and Marty Culpepper

Charge of the Committee

To review ideas related to the impact of changing technology and work practices on space at the Institute which were developed by the Task Force Phase One **Campus Operations Working Group**, **Academic Learning and Residential Space Working Group**, and the **Administrative Workstream**. The focus is on the non-academic use of space at MIT and includes an expanded definition of campus to locations outside of Cambridge. Ideas related to academic use of space are within the purview of other RICs, in particular the RIC focused on undergraduate and graduate living and learning. **Furthermore, the work of this RIC will be tightly coupled to the discussions of the New Ways of Working RIC**. The report of the RIC will recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Provost, the Executive Vice President and Treasurer, the Associate Provost, etc., or some combination), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., Provost, the Executive Vice President and Treasurer, the Associate Provost, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Note that most of the ideas from the Phase One Academic Learning and Residential Space (ALRS) Group will be covered by the Undergraduate Living and Learning committee (RIC 16); however, the charge for the Campus Working Spaces committee (this RIC, RIC 8) does include the idea from the Phase One ALRS

Group related to remote work. Members of the RIC are urged to read the public comments on the relevant ideas, which can be found on the Task Force website.

Consultation

This Committee will work closely with the New Ways of Working RIC. That group also is closely tied with the MIT Work Succeeding Initiative which includes a steering committee and ambassadors who represent functions and entities across MIT. Other RICs also involve campus space and may be consulted including ideas related to One Agile MIT (RIC 14) and Undergraduate and Graduate Living and Learning (RIC 16). The Committee may wish to consult with various functions and levels of MIT staff via meetings, surveys, or by an open forum meeting. Also, the Committee may want to consult staff and experts involved in employee development and career pathways at the Institute and in relevant external entities. Various entities at MIT focus on campus space including campus planning, committee for renovation and space planning, DSL housing and residential services, etc.

Related Sources

The Committee may wish to review practices at peer institutions and current practices within MIT—as well as practices outside of higher-ed in the industry, government and nonprofit sectors.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 9 Work Succeeding

Committee Members

Joe Higgins, Ramona Allen and Krystyn Van Vliet (Co-Chairs), Amy Glasmeier, Christina Lo, Robin Elices, Shirley Entzminger, Tim Jamison, Tom Kochan, and Todd Robinson

Charge of the Committee

This RIC is being launched under the name MIT Work Succeeding and has established related committees and ambassadors.

The charge of the MIT Work Succeeding initiative is to enable flexible work options through guidance, tools, and policies that will:

- Empower teams to work collaboratively and effectively to further the MIT mission;
- Support our employees' varied needs and emphasize job satisfaction and personal well-being; and
- Position the Institute to retain and attract the very best talent.

This RIC will review ideas on advance planning and piloting of flexible work practices and policies, platforms, data, and systems that support such practices which were developed by the Task Force Phase One **Campus Operations Working Group**, **Workforce Operations Working Group**, **Academic Residential and Learning Spaces Working Group**, and the **Administrative Workstream**. This includes short-, mid- and long-term future states, and considers flexibility, sustainability, and desired community. **The work of this RIC will be tightly coupled to the discussions of the Campus Working Spaces RIC.**

Work Succeeding shall create *guidance and tools* for how we will work together in the future and policies to support teams so they know how they should operate in our new world. Through an iterative process, we will learn together—leveraging lessons learned from the past year to design a strategy for the future.

The report of the RIC will recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Executive Vice President and Treasurer, the Vice President for Human Resources, the Provost, the Vice President for Research, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., The Executive Vice President and Treasurer, the Vice President for Human Resources, the Provost, the Vice President for Research, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the public comments on the relevant ideas, which can be found on the Task Force website.

Consultation

As mentioned above, this RIC is being launched under the name MIT Work Succeeding and charged to enable flexible work options through guidance, tools, and policies that will:

- Empower teams to work collaboratively and effectively to further the MIT mission;
- Support our employees' varied needs and emphasize job satisfaction and personal well-being; and
- Position the Institute to retain and attract the very best talent.

Two key groups have been established for this effort: a steering committee—all of whom are included in the membership of this RIC; and ambassadors who represent a broad range of staff at MIT. This Committee will also work closely with the Campus Working Spaces RIC. The Committee may wish to consult with various functions and levels of MIT staff via meetings, surveys, or by an open forum meeting. Also, the Committee may want to consult staff and experts involved in employee development and career pathways at the Institute and in relevant external entities.

Related Sources

A website and FAQ for Work Succeeding is being launched. The Committee may wish to review practices at peer institutions and current practices within MIT—as well as practices outside of higher-ed in the industry, government and nonprofit sectors.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 10 Employee Development, Strategy, and Career Pathways

Committee Members

Danielle Khoury (Chair), Glen Comiso, Heather Williams, Ronnie Haas, and Tom Kochan

Charge of the Committee

To review the ideas on establishing integrated opportunities and expectations to develop skills for mentorship, management of teams, and career advancement through onboarding, tools, training, and support of career pathways and networks at MIT which were developed by the Task Force Phase One **Administrative Processes Working Group**, **Workforce Operations Working Group**, **Community and Culture Workstream**, and the **Administrative Workstream**. The report of the RIC will also recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Executive Vice President and Treasurer, the Vice President for Human Resources, the Provost, the Vice President for Research, etc. or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., the Executive Vice President and Treasurer, the Vice President for Human Resources, Provost, the Vice President for Research, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review practices at peer institutions and current practices within MIT—as well as practices outside of higher-ed in the industry, government, and nonprofit sectors. The following

documents from Professor Tom Kochan may also help inform the discussions: Shifting the Paradigm: From Training to Learning Systems: A Case of IBM; and Working Paper on the Learning System at IBM: A Case Study. It may be helpful to take stock of the strengths and challenges of relevant programs and processes and determine if a shift such as that described in the documents would fit in a future vision.

Consultation

The Committee may wish to consult with various functions and levels of MIT staff via meetings, surveys, and/or by an open forum meeting. Also, the Committee may want to consult staff and experts involved in employee development and career pathways at the Institute and in relevant external entities.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 11 Lifelong Learning / Post-Graduate Education

Committee Members

Sanjay Sarma (Chair), Bruce Cameron, Chris Caplice, Eric Grimson, Nelson Repenning, Lisa Schwallie, Lily Tsai, Pawan Sinha, and Larry Vale

Charge of the Committee

To consider options for a more cohesive MIT-wide approach to aspects of lifelong education including online professional education and online master's degrees (recognizing that fully online degrees are not permitted under MIT's rules at the moment). A key idea is to create an institute-wide unit at MIT dedicated to post-graduate education, which offers a range of subjects and coherent, intentional programming, possibly including degree programs. The ideas for this RIC stem from the work of three groups in Phase One of the Task Force: **Education**, **Beyond MIT** and **Financial Modeling**. The report of the RIC must recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Provost, the Vice President for Research, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., Provost, the Vice President for Open Learning, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One report of the Research Working Groups, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review practices at peer institutions, current practices within MIT, and past reports including the Report of the Institute-wide Task Force on the Future of MIT Education.

Consultation

The Committee may wish to consult with leaders of MIT Professional Education, Executive Education, and xPRO, as well as professional-facing MIT units such as the Corporate Relations/Industrial Liaisons Program and MIT Technology Review.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 12 Collaborations

Committee Members

Yasheng Huang and Antoinette Schoar (Co-Chairs), Angie Belcher, Bob Desimone, Meghan Fenno, Richard Lester, Aude Oliva, and Charles Stewart

Charge of the Committee

To provide recommendations to support research collaborations, including organic (bottom up) faculty collaborations, particularly across schools, as well as collaborations with corporations and international entities. The charge stems from the work of the Task Force Phase One Working Groups on **Research** and **Campus Operations**. The report of the RIC will recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Provost, the Vice President for Research, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the pilot program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., Provost, the Vice President for Open Learning, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One report of the Research Working Groups, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review practices at peer institutions, current practices within MIT, and past reports including the Report of International Relationships of MIT in a Technologically Competitive World, and A Global Strategy for MIT.

Consultation

The Committee may wish to consult with members of the International Advisory Committee, International Coordinating Committee, and Senior Risk Group, as well as with faculty and administrators who are or have been involved in MIT collaborations, both across disciplines within MIT and externally with companies, governments, and non-government organizations.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 13 Strengthen the Pipeline of Underrepresented and Minority Researchers

Committee Members

Tim Jamison (Chair), Emery Brown, John Dozier, Ase Henry, Maryanne Kirkbride, Eric Klopfer, Ray Reagans, and Justin Steil

Charge of the Committee

To provide concrete plans to build a stronger pipeline of researchers from underrepresented groups considering both hiring and providing a more supportive, attractive environment once at MIT. The ideas were developed by the Task Force Phase One Working Group on **Research** in coordination with the Workstream on Community and Culture. The report of the RIC will recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Provost, the Vice President for Research, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., Provost, the Vice President for Open Learning, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One report of the Research Working Group, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review practices at peer institutions, current practices within MIT, and past reports including Advancing a Respectful and Caring Community: Report of the Institute Community and Equity Officer, the 2020 Faculty and Staff Quality of Life Survey, the Report on the Initiative for Faculty

Race and Diversity, the Faculty Policy Committee Statement on Representative of Minorities on the Faculty and in the Graduate Student Body, 2015 recommendations from the Black Graduate Students Association and the associated 2020 BGSA Recommendations Check-up, and the focus groups commissioned by MIT Human Resources.

Consultation

The Committee may wish to coordinate broadly with those who are developing the ICEO Strategic Action Plan for Diversity, Equity, and Inclusion, as well as with underrepresented and minority researchers across the Institute.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 14 One Agile MIT

Committee Members

Heather Williams (Chair), Olu Brown, Brian Canavan, Glen Comiso, Mark DiVincenzo, Elizabeth McManus, Nelson Repenning, Lisa Schwallie, Mary Ellen Sinkus, and Lydia Snover

Charge of the Committee

To provide concrete plans to build a new cross-functional team that, enabled by new digitized data sharing practices across DLCs, will implement transformational MIT-internal projects that support clear and easier decisions by MIT's world-class research, teaching, administrative support teams, forwarding ideas which were developed by the Task Force Phase One Working Groups on the **Administrative Workstream**, **Administrative Processes**, **Data and Research**, and **Campus Operations**. The report of the RIC will also recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Provost, the Vice President for Research, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., Provost, the Vice President for Open Learning, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One report of the Research Working Group, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review practices at peer institutions and current practices within MIT.

Consultation

The Committee may wish to coordinate with those who have developed Institute-wide transformational systems and processes within MIT.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Charge for Refinement and Implementation Committee (RIC) 15 Student Funding

Committee Members

Stephen Buchwald (Chair), Stephen Bell, Glenn Ellison (FD-Chair), Ken Goldsmith (FM-Lead), Nergis Mavalvala (R-Lead), Donca Steriade, and Will Tisdale

Charge of the Committee

To review the ideas on student funding developed by the Task Force Phase One Working Groups on **Financial Modeling** and **Research**, as well as the report of the Working Group on Graduate Student Tuition Models, and to refine and merge these Phase One and other ideas as appropriate to arrive at concrete and specific proposals for implementation. The report of the RIC will include a recommended timetable for implementation and, if appropriate, milestones to be met in the course of implementation.

The main focus of this Refinement and Implementation Committee will be graduate student funding and the issues raised in the 2018 Bell Committee Report and elsewhere concerning the high rate of graduate tuition at MIT, the tuition shortfall on certain external fellowships, and the need for a "dissertation writing status" for advanced graduate students. Note that the related issue of Underrecovery is the subject assigned to RIC 6 (Jon Gruber, Chair) and the work of RIC 15 and RIC 6 will need to be coordinated by frequent communication between the Chairs.

As an initial step in their deliberations, the Refinement and Implementation Committee should meet with Provost Marty Schmidt who will update the members on the progress that his office and that of Executive Vice President and Treasurer Glen Shor have made in addressing these issues. The Provost will provide suggestions and guidance to the Refinement and Implementation Committee, which will consult with him during the course of its deliberations.

The principal focus of this Refinement and Implementation Committee is graduate student funding. If time permits, it is possible that the RIC may also consider the ideas of the Financial Modeling Working Group on undergraduate financial aid and student debt.

Phase One Ideas

Members of the RIC are urged to read the entire Phase One reports of the Research and Financial Modeling Working Groups, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Refinement and Implementation Committee will review the 2018 report of the Working Group on Graduate Student Tuition Models chaired by Steve Bell as well as the extensive data gathered by the Bell

Committee. The Committee may need to update some of this data including data concerning funding arrangements at peer schools. Additional historical information on graduate tuition at MIT and supporting documents will be supplied by Rick Danheiser.

Consultation

The Committee will consult with the Provost as outlined above.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force and to the Provost by mid-June 2021.

Charge for Refinement and Implementation Committee (RIC) 16 Undergraduate and Graduate Living and Learning

Committee Members

John Fernandez (Chair), Brian Canavan, Albert Gerovitch (Spaces), Jeff Grossman (Edn), Jordan Harrod (Spaces), Amy Kaiser, Suzy Nelson (Spaces), Krishna Rajagopal (Edn), and Brent Ryan (Lead-Campus Ops)

Charge of the Committee

To review and recommend how best to leverage digital technologies in pedagogy (including existing best practice and lessons from remote education during the pandemic), and how best to use in-person classes, and to articulate a future view for academic classrooms, outdoors spaces, and community spaces. These ideas stem from the work of the Task Force Phase One Working Groups on **Education**, **Academic and Residential Learning Spaces**, and **Community and Culture**. The report of the RIC will also recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.

The implementation plan may include a recommendation for establishing one or more pilot programs, in which case the RIC should propose (a) the nature of the pilot, (b) who will oversee the pilot (e.g., the Provost, the Vice President for Research, or some combination of the above), (c) a proposed timetable for the completion of the study, and (d) how the results of the program will be evaluated.

The implementation plan may include a recommendation for convening one or more follow-on ad hoc committees. In this case the RIC may propose (a) a charge for the ad hoc committee(s), (b) a suggested list of potential members, (c) who the ad hoc committee(s) will report to (e.g., Provost, the Vice President for Open Learning, etc.), and (d) a proposed timetable for the completion of the work of the ad hoc committee(s).

Phase One Ideas

Members of the RIC are urged to read the entire Phase One report of the Research Working Group, as well as the public comments on the relevant ideas, which can be found on the Task Force website.

Related Sources

The Committee may wish to review practices at peer institutions and current practices within MIT, and past reports including the Report of the Institute-wide Task Force on the Future of MIT Education and Task Force on Student Life and Learning. The RIC should also study the May 2014 report of the MITx

Subcommittee of FPC that was appointed to consider the role of online delivery of educational materials in MIT subjects.

Consultation

The Committee may wish to consult with those who have developed Institute-wide transformational systems and processes within MIT. The Committee should also coordinate its discussions on online delivery of educational material with the Committees of Faculty Governance (FPC, CoC, CUP, and CGP) that are also discussing these questions this spring.

Timeline and Output

The RIC will provide a report to the Co-Chairs of the Task Force by mid-June.

Refinement and Implementation Committee (RIC) Supplemental Materials

Supplemental Materials for RIC 1: Undergraduate Program

- For the charge to the **Ad Hoc Committee on Social Equity and Civic Responsibility**, see report of RIC 2.
- For the charge to the **Ad Hoc Committee on Digital Learning in On-campus Education**, see report of RIC 16.
- Proposed charge for the new **Ad Hoc Working Group on the SME Requirements**

The Chair of the Faculty, in consultation with the Chair of CUP and the Vice Chancellor, will appoint a new Ad Hoc Working Group on the SME Requirements which will continue the work of the 2019 working group of the same name. The new group will begin work in Fall 2021 and issue a report by Fall 2022 to the new Task Force on the Undergraduate Academic Program. The general aim of this Working Group is to provide a foundation for the further review of the requirements by the Task Force and to facilitate their subsequent deliberations. Members of this Ad Hoc Working Group may be included in the membership of the Task Force when it is convened in AY 2022-23.

The work of the Ad Hoc Working Group will include the following steps and aims.

- The Working Group will begin by reviewing key prior reports on the General Institute Requirements with the aim of understanding the rationale for the current GIRs, how they have evolved over time, and changes that have been. A list of these prior committees and reports is included below.
- The Working Group will review the findings of the 2019 Ad Hoc Working Group which that spring and summer met with representatives of each department responsible for a science core GIR subject and then critically analyzed the current subjects.
- The Working Group will schedule meetings with representatives of the Departments of Biology, Chemistry, Material Science and Engineering, Math, and Physics. The purpose of these meetings, analogous to the meetings held in 2019, is to review in depth the aims and current content of the science core GIR subjects and to critically analyze the extent to which they effectively achieve the aims of the GIRs as expressed in the RIC 1 Report.
- It should be suggested to these departments that these meetings can also be used as an opportunity to describe innovations and changes under consideration with regard to these subjects. Via these meetings, and subsequently, the Ad Hoc Working Group can serve as a sounding board to provide feedback on innovations and changes underway or under consideration by these departments.
- Subsequent or concurrent with the above, the Ad Hoc Working Group will canvass Faculty, Students, and the Administration for input concerning the effectiveness and appropriateness of the current SME requirements and potential directions for change. Note that the SME Requirements comprise

the science core, the REST requirement, and the laboratory requirement, and all should receive attention.

- Details with regard to the vehicles used to collect this input is left to the Ad Hoc Working Group, but may include meetings with Deans and Senior Leadership, Town Hall meetings with Faculty and Students, online channels for providing suggestions, meetings with Faculty Committees concerned with the undergraduate academic program, consultation with faculty with key roles in departmental programs (e.g., Undergraduate Officers), and discussions with faculty with prior key roles with regard to the undergraduate academic program.

The findings of the Ad Hoc Working Group will be submitted in the Fall of 2022 to the Chair of the Faculty, the Vice Chancellor, the Chair of CUP, and the Chair and members of the new Task Force on the Undergraduate Academic Program.

The membership of the Ad Hoc Working Group will be appointed by the Chair of the Faculty after consultation with the Vice Chancellor and the Chair of CUP and will comprise ten faculty. The members will include at least one faculty member from the Departments of Biology, Chemistry, Material Science and Engineering, Math, and Physics, as well as additional faculty from the other Schools including two each from the Schools of Engineering and SHASS.

Charge of the 2019 Ad Hoc Working Group on the SME Requirements

The Faculty Officers will be collaborating with Chancellor Cindy Barnhart and Vice Chancellor Ian Waitz to appoint a **Task Force on the Undergraduate Academic Program** which will undertake a comprehensive review of the General Institute Requirements, with work tentatively planned to begin no later than January 2020. Prior to the work of the Task Force, the Faculty Officers will appoint an Ad Hoc Working Group on the SME (Science, Math, Engineering) Requirements to meet during the current spring semester.

- The Working Group will comprise a total of 7 faculty, with representatives from the departments of Biology, Chemistry, Materials Science and Engineering, Math, and Physics, and including two additional faculty, one from the School of Engineering and one from the School of Humanities, Arts, and Social Sciences. The Working Group will be chaired by Rick Danheiser who will also represent Chemistry.
- The Working Group will begin work in March 2019, meet during the spring semester, and complete a report by September 2019. The report will initially be provided to the Department Heads of the departments currently responsible for SME GIR subjects, the Committee on the Undergraduate Program (including the Vice Chancellor), and the Chancellor. Recommendations, if any (e.g., for experiments), will be submitted to the Committee on the Undergraduate Program.
- The aims of the Working Group will be limited, and will principally be to define issues, and most importantly, to critically evaluate the current SME GIR subjects. See the charge of the Working Group below for details.
- Based on this evaluation, and as time permits, the Working Group may propose directions for change. These might take the form of experiments to be undertaken with the authorization of CUP,

or even immediate changes in current subjects. The latter would require amendment of Rules and Regulations through a vote of the MIT Faculty.

- Dr. Tami Kaplan will attend the meetings of the Working Group and provide some administrative advice and support.
- The faculty serving on the Ad Hoc Working Group may provide the nucleus for the membership of the future Task Force, although there is no obligation on the part of the Working Group members to join the Task Force should they be invited.
- The Ad Hoc Working Group will serve in part as an "experiment" that could facilitate the creation of a permanent subcommittee of CUP, analogous to the CUP Subcommittee on the HASS Requirement. In the fall, CUP and FPC may wish to consider proposing such a subcommittee of CUP to continue the work of the Working Group. Creating such a committee would require a Faculty vote.

Charge of the Ad Hoc Working Group on the SME Requirements

The primary goal of the Working Group will be to critically evaluate the content and scope of the current SME GIR subjects from the perspective of the aims of the GIRs. Following this analysis, the Working Group will consider how the current SME GIRs might be improved.

The Working Group will address the following questions:

1. **What are the aims of the SME General Institute Requirements?** The Working Group will review the aims of the SME GIRs as previously defined by various committees and task forces and discuss whether any changes/additions deserve consideration. This discussion will begin with a presentation on the history and aims of the SME GIRs, similar to that presented by Rick Danheiser to Science Council in June 2018 and to Associate Heads of School of Science Departments in October 2018.
2. **How well do the specific subjects currently offered fulfill the purpose of the SME GIRs?** Addressing this question will involve a technical review of the syllabus of the existing subjects that includes meetings of the Working Group with current GIR instructors. The Working Group will consider the following questions.
    - Which of the aims of the SME GIRs defined above are addressed with each subject and how well does the subject fulfill that aim?
    - Are there alternatives to the current syllabus in that subject that might better fulfill the aims of the SME General Institute Requirements?
    - Is it essential that each subject should be part of the education of every MIT student? This last question will be considered further under (3) below.
3. **How well does the overall scope and structure of the current SME General Institute Requirements (i.e., the number and choice of subjects) fulfill the aims of the General Institute Requirements?** Although this is a question that will be a focus of the subsequent Task Force on the Undergraduate Academic Program, the Working Group will discuss whether the current general areas of science, math, and engineering included in the SME GIRs and the number of subjects in each area are appropriate.

4. **What alternatives to the current scope, structure, and content of the SME GIRs are worth considering?** Based on the conclusions from the reviews outlined above, what alternatives should be considered to improve the general institute requirements in science, math, and engineering?

Considerations Guiding the Discussion of Alternatives

In considering changes to improve the SME GIRs, the Working Group will keep in mind the recommendations of the Task Force on the Future of MIT Education, some of which were echoed in the recommendations of the First Year Design Class in Spring 2018.

- Should all MIT students be required to take nine SME GIRs?
- Should there be greater flexibility in the SME requirements? For example, should students have options that include substitutions within the SME GIRs? Should students have choices between alternative "flavors" of some GIR subjects?
- Can the SME requirements be improved by the introduction of modular subjects?
- Can online and blended learning models be used to improve the SME GIRs?

Membership of the 2019 Ad Hoc Working Group

Rick L. Danheiser, Chair, *Arthur C. Cope Professor of Chemistry; MacVicar Faculty Fellow; Associate Chair and Chair-Elect of the MIT Faculty; Member CUP 1998–2001, 2017–2019*

Arthur Bahr, *Associate Professor of Literature; MacVicar Faculty Fellow; Chair-Elect of the Committee on the Undergraduate Program*

Stephen P. Bell, *Uncas and Helen Whitaker Professor of Biology*

W. Craig Carter, *POSCO Professor of Materials Science and Engineering; MacVicar Faculty Fellow; Secretary of the MIT Faculty; Chair, Committee on Curricula, 2015–2017*

Nuh Gedik, *Professor of Physics*

Steven B. Leeb, *Professor of Electrical Engineering; Professor Mechanical Engineering; Associate Director, Research Laboratory of Electronics; MacVicar Faculty Fellow*

William P. Minicozzi, *Singer Professor of Mathematics; Associate Head, Department of Mathematics*

Charge of the 2017 Working Group on Computational Thinking

For many years, at least since the 2004–2006 Taskforce on the Undergraduate Educational Commons chaired by Prof. Robert Silbey, various MIT faculty members have asked whether, and if so how, MIT should ensure that all its undergraduates learn algorithmic reasoning and computational thinking. To answer this question, we are charging a small group of faculty to conduct an in-depth study of what the phrases "algorithmic reasoning" and "computational thinking" mean in the context of the education of MIT's undergraduates across all five schools. In conversation, many colleagues who have thought about this issue are clear in saying that these phrases should mean more than an introduction to programming languages. As a place to begin this study, we believe that computational thinking should encompass an intellectual framework, not just a skill. Phrases that were used in the Silbey report include "computational modes of analysis," "algorithmic reasoning," "data abstraction," "designing computational solutions to theoretical and practical problems," and "providing a computational

paradigm for reasoning and problem solving." We are asking you to do a careful, deliberative assessment of what these and other phrases ("abstraction and complexity," "modularity and interfaces," "complexity of algorithmic solutions," "algorithmic paradigms") mean across MIT.

Questions that we would ask you to examine include:

1. How do faculty, students, and alumni in different fields of endeavor, across the full breadth represented by MIT's five schools, use computational thinking? Is it an important mode of thinking in (for example) economics, policy formation, management, architecture, biology and biological engineering, chemistry and chemical engineering, and other disciplines?
2. What, if any, is the common intellectual framework that people across MIT employ when they speak of computational thinking and algorithmic reasoning? In what ways is diversity among the meanings of such phrases in different disciplinary contexts important?
3. To what extent are algorithmic reasoning and computational thinking already being taught? What fraction of our graduates, across all five schools, learn them in the course of meeting the explicit requirements of their majors? What fraction take a course that covers computational thinking even if not an explicit requirement of their majors? To what extent and in what ways do we already implicitly expect that a broad spectrum of MIT undergraduates across many majors understand algorithmic and computational thinking by the time they graduate from MIT? When in their career at MIT do we expect students to learn computational thinking?
4. Should we acknowledge algorithmic and computational thinking as an explicit expectation of all our graduates? If yes, what is the rationale/case for this?
5. If yes, what are the key elements of algorithmic and computational thinking and what are the associated learning objectives and measurable outcomes for knowledge, skills, and attitudes? How are they common across the broad spectrum of MIT undergraduates, and how do they differ? Across MIT, how are they relevant to solving problems and mastering endeavors?
6. If yes, does it matter when during their careers at MIT our students are exposed to computational thinking and algorithmic reasoning? What benefits would accrue from a uniform approach to teaching them and what might the downsides be? What benefits would accrue from discipline-specific approaches and what might the downsides be?
7. What are our peer institutions doing? Are there possible models outside MIT that merit our consideration?

As you start to formulate your answers to the questions above, we would ask that you develop a list of possible options for accomplishing the goals for the computational education of MIT undergraduates that you articulate, if these goals are not already being met. Please describe each such option as concretely as you can, including pros and cons, including which goals among those you articulate each option addresses, and including actionable next steps.

Examples of options that you might consider include:

i. Modules, with or without online components, that could be incorporated within MIT's existing GIR subjects.

ii. New subjects or modules with no prerequisites, ranging in duration from one month to one semester, whose development and teaching may involve collaboration among departments and other academic units.
iii. A model for teaching computational thinking along the lines of how CI-M subjects teach communication, where each major can make discipline specific choices for how to achieve overarching MIT-wide goals that you have articulated, via more advanced subjects or modules designed for students in the specific major.

The first two are examples of options where next steps would include curriculum development. For such options, we hope that you will provide preliminary examples of partial syllabi, with explanations of your rationales for the elements in these syllabi, and a sense of the (groups of) colleagues who might be asked to develop the curricula. That is, these are examples of options that we would hope you develop to 24 the point that the next step could be Dean Freeman pulling together people and resources for implementation. The third is an example of an option where your study might prompt some departments to initiate next steps, perhaps with support from Dean Freeman. All are examples of options where the next steps would include consideration by a broader group of faculty, including relevant faculty committees. We are convinced that a deep study as described above is a key step toward evaluating whether or not changes to MIT's undergraduate curriculum and pedagogy are merited. Depending on your findings, your study may provide the foundation for subsequent advances in how we educate our students. We are asking you to focus on questions as above and on options with near-term actionable next steps. We hope that the answers that your study provides, together with any subsequent curriculum development that it prompts, will serve as valuable input to any future discussion of our GIRs.

We would ask that you set as your goal that by June 30, 2016 you have completed the majority of your work and reported your progress and your emerging conclusions to us, so that by that date we have a full understanding of what remains for you to do, and a firm late-summer or early September deadline for your report.

Sincerely,
Prof. Dennis Freeman
Dean for Undergraduate Education
Prof. Krishna Rajagopal
Chair of the MIT Faculty

————————————

Membership:
Eric Grimson, Chair, EECS
Deepto Chakrabarty, Physics
Michael Cuthbert, Music and Theater Arts
Peko Hosoi, Mechanical Engineering
Caitlin Mueller, Architecture
Jim Orlin, Sloan
Troy van Voorhis, Chemistry

Charge of the CUP Subcommittee on the HASS Requirement

It is the responsibility of the CUP Subcommittee on the HASS Requirement (SHR) to govern the Requirement as laid out in the motion approved by the Faculty on May 20, 2009. This includes two high-level goals in the CUP charge:

- Support, encourage, and monitor the development of new innovative subjects and changes to the HASS Requirement; and
- Ensure regular review of new and existing subjects to ascertain that the educational goals of the HASS Requirement are met while maintaining MIT's high educational standards.

To that end, subject to final approval by the CUP, the SHR shall act with power to:

- Monitor and revise policies associated with the HASS Requirement as necessary.
- Establish criteria and guidelines for the designation of subjects that will satisfy the HASS Requirement and adjust them as appropriate; evaluate subject proposals from all Schools for HASS designation and assign to appropriate categories in accordance with criteria.
- Establish criteria and guidelines for HASS Concentrations and adjust them as appropriate; review existing and approve new and modified Concentrations as needed.
- Maintain the official lists of HASS subjects and HASS Concentrations.
- Oversee individual student requests for exceptions or substitutions to the HASS Requirement, in collaboration with the CoC.
- Periodically collect and analyze data on patterns of student fulfillment of the Requirement, assess the student experience with the Requirement, and monitor the administration of the Requirement. Propose changes as needed based on such review.
- Interact and engage with departments and units in the development of innovative HASS curricula. Propose to the CUP limited educational experiments that SHR deems appropriate for assessing changes to the curriculum and educational policies and practices.

Supplemental Materials for RIC 3: Graduate Student Professional Development

Ad Hoc Committee on Graduate Student Professional and Personal Development

The charge for the Ad Hoc Committee on Graduate Student Professional and Personal Development rests on an overarching **goal** that all graduate students shall have space and agency to explore their interests with a sense of purpose and understanding of impact, integrate ethical thinking with their technical training, and participate in greater exploration of their chosen career path. Notably, each student shall explore their own impact on the world, either through their research or through means such as policy work, community action, among others. This exploration should bring together the student's talents, personal passions, and experience. Regardless of the specific form, requiring students to explore what an impactful career and life means for them sends a message to the world that MIT believes students should understand the impact of their work on society and believes in the importance of educating the whole student.

Guiding Principles

Every student, regardless of their degree program should leave MIT with a set of essential non-technical, interpersonal and intrapersonal skills beyond their disciplinary expertise, a deep understanding of the impact their decision making has on local communities and larger societal issues, and understanding of different pathways and agency to chart their path to impactful careers.

Graduate Professional and Personal Development Requirements

The Committee should work to identify specific learning objectives and a set of requirements, or framework of components that all MIT graduate students are required to participate in before graduation that could be fulfilled by department/school/college level and/or trans-Institutional programs and experiences. In addition, an integral piece of this framework should be to allow every student to have an engagement beyond MIT and outside of their unit or school/college. This is not meant to imply that every student needs to participate in an internship, but that students should have exposure beyond their immediate discipline.

Regardless of the specific form, requiring students to explore what an impactful career and life means for them sends a message to the world that MIT believes students should understand the impact of their work on society and believes in the importance of educating the whole student.

We have identified the following high level objectives that should be the guideposts for a set of common professional and personal development requirements for all graduate students:

- **Student agency:** Ability to explore impactful career pathways, and make choices about opportunities to engage in beyond MIT and outside of unit or school/college;

- **Internal exploration:** Introspection and understanding one's self, and the different pathways to impactful careers to thrive in today's increasingly diverse society; opportunities for exploration, reflection;
- **External exploration:** A deep and broad understanding of the impact decision making has on immediate situations, local communities and larger societal issues; and
- **Skill building:** Developing a set of essential non-technical personal and interpersonal skills building and expanding upon the foundational technical skills and disciplinary expertise central to an MIT graduate education.

During the development of these requirements, it will be necessary to gain feedback from graduate students, departments, schools, and other stakeholders. The Committee should also consider how to integrate existing courses/classes/programs into this new framework. Quarterly progress updates should be given to the Committee on Graduate Programs (CGP).

An implementation plan for the components should include the following:

- A Graduate Professional and Personal Development Requirement framework that all graduate students are required to complete
- Consideration of an oversight committee similar to the undergraduate communications requirement or other mechanism for both sustainability and for continued evolution of identified requirements.
- Prioritized list of resources required to implement the framework components including distributed and central administrative needs (i.e., programming support and documentation of student participation, resources for departments to embed appropriate expanded and new experiences).
- Detailed timeline for Institutional approval through proper governance structures and mechanisms for oversight, accountability, and sustainability.
- Timeline for launch for departments and academic units that includes a phased approach with a detailed implementation plan including the impact on current and future students.

Timeline

The Ad Hoc Committee's report should be submitted to the relevant Standing Committees of the MIT Faculty including the Committee on Graduate Programs (CGP), as well as the Vice Chancellor as appropriate. The strategic plan should be developed by March, 2022 so that key components could be considered for the 2023 Academic Year.

Guiding Boundaries

We recommend the Committee use Wiggins and McTighe's Backward Design model to develop an intentional framework for a graduate common core. Starting with the overarching goal above, the committee should work backwards to identify specific ways to complete the common core requirement using the following steps:

- Identify desired results
    - What should students hear, read, explore or otherwise encounter?

    - What knowledge, and skills should students master?
    - What are the big ideas and important understandings students should retain?
- Determine acceptable evidence
    - How will we know students are making progress towards the goal?
    - What will we accept as evidence of student understanding?
- Plan components
    - What enabling knowledge (facts, concepts, principles) and skills (processes, procedures, strategies) will students need in order to achieve desired results?
    - What activities will equip students with the needed knowledge and skills?
    - What will need to be taught and coached, and how should it best be taught, in light of performance goals?
    - What materials and resources are best suited to accomplish these goals?

Membership

The Committee membership shall include a range of MIT community members including faculty and professional staff with expertise in this area, and graduate students who will act as connectors to the graduate student community to ensure the work considers and incorporates the views of the student population.

- Faculty: 2 SHASS + 2 SoE + 2 SoS + 1 SA+P + 1 Sloan + 1 SCC;
- Admin & Staff: 6; including staff support
- Graduate students: 5

Additional Resources for the Committee to Consider

- Reports
    - Task Force 2021 Education Subcommittee report
    - NASEM report on Reshaping Graduate Education for the 21st Century
    - Professional Development Hub (pd|hub) report, Enhancing Dissemination of Evidence-Based Models for STEM PhD Career Development, findings from pd|hub's NSF-funded convening of interdisciplinary and cross-sector stakeholders at the Janelia Research Campus of the Howard Hughes Medical Institute
    - Committee on Graduate Schools (CGS) data briefs on Understanding PhD Career Pathways
    - The MIT Response to the Report of the National Academies Committee on Women in Science, Engineering and Medicine
    - Final Report of the MIT Career Exploration and Services Committee
- Competencies
    - The Human Skills Matrix, developed by J-WEL
    - MIT Career Advising and Professional Development's (CAPD) professional development competencies

    - Program Goals and Learning Assessments developed in 2019 as part of the New England Commission of Higher Education (NECHE) reaccreditation
- Data and Programs
    - Institutional Research survey data including the Student Quality of Life survey, the Doctoral Exit survey, and the Academic Climate survey
    - Career Advising and Professional Development (CAPD) 2018 scan of programs
    - CAPD graduate professional development scan from 2018
    - Gordon Engineering Leadership graduate program certificate
    - MIT Department level initiatives including EECS's Professional Perspectives, CEE's second year Professional Development Seminar and the MIT LEAPS Spring Classes (8.S396/8.S397)
    - The CDIO Syllabus, used to define expected outcomes in terms of learning objectives of the personal, interpersonal, and system building skills
    - University of Virginia Graduate Professional and Career Development for Graduate Students—PhD Plus
- NIH BEST programs—Broadening Experiences in Scientific Training

Supplemental Materials for RIC 4: Graduate Student Advising and Mentoring

RIC 4 Subappendix 1

The RIC 4 committee included the charge for RIC 4 in this Subappendix 1. Rather than duplicating the text here, the full charge can be found previously in this document in the section Phase Two RIC Charges.

The committee also included additional relevant content from Phase 1 Student Journey Working Group "Finding Your People" Idea found below. See also the Task Force Phase One Working Group on Student Journey (in "Finding Your People").

Envisioned State

Graduate students

Advising is done through the department and, in the case of most PhD students, directly by their primary thesis research supervisor/PI. Some departments have experimented with academic advisors in addition to research advisors and other advising models, but MIT is not currently evaluating best practices in advising. A PI may wish to grant graduate students flexibility to explore activities of interest with little to no connection to the thesis topic, but they are also guided (at best) or constrained (likely) by their funding resources and requirements to meet deliverables for sponsored research. Moreover, excellence in graduate student advising is not incentivized, as it is not usually a job responsibility that is evaluated regularly or explicitly considered in tenure and promotion cases. To create an exceptional graduate advising experience, we propose the following:

- Fund alternative methods to support graduate research and/or education that are not directly tied to specific projects.
- Implement 360-degree advising reviews of faculty principal investigators in all departments, as Brain and Cognitive Sciences has done in recent years.
- Explicitly consider feedback from these reviews in promotion cases, and on a semi-regular basis for full professors.
- Build stronger orientation cohorts outside disciplines for beginning graduate students, as is done for undergraduates.
- Create and provide access to mentoring networks that extend beyond departmental boundaries to include, for example, graduate alumni.

Pros

These methods will improve advising, resulting in direct benefits to the quality of the student experience at MIT. Undergraduates will be able to gain a suite or web of advisors who will support the whole student. Graduate students will gain a greater ability to explore skills outside of academic research, and to better prepare for their futures.

Cons

This will disrupt the traditional framework and mechanisms for advising and disruption is hard. But MIT should not be afraid of acting simply because of that. We will upend the dominant model of graduate education, and put the student at the center. We must also ensure that processes to build advising networks do not minimize the importance of relationships with existing academic and research advisors, as students rely on these relationships not only for personal growth but also for recommendation letters and job references. We will need to break with tradition and revolutionize. Undergraduates will learn to weigh the opinions of multiple people and choose the right path for them from the advice from the web or suite.

RIC 4 Subappendix 2

Ad Hoc Committee on Graduate Advising and Mentoring

Membership (as of June 17, 2021)

Paula Hammond (Co-Chair), *Professor and Department Head, Chemical Engineering*

Tim Jamison (Co-Chair), *Professor of Chemistry and Associate Provost*

Rachel Beingessner (Staff to the Committee), *Director of Special Projects, Office of the Associate Provost*

Lauren Pouchak (Staff to the Committee), *Director of Special Projects, Office of the Vice Chancellor*

Noam Buckman, *MechE, SoE, GSC Nominee*

Paula do Vale Pereira, *AeroAstro, SoE, GSC Nominee*

Alvin Harvey, *AeroAstro, SoE*

Laurel Kinman, *Biology, SoS*

Levi Knippel, *Chemistry, SoS*

Luis Kumanduri, *Mathematics, SoS*

Devora Najjar, *Media Arts and Sciences, SA+P*

Cynthia Ni, *Chemical Engineering, SoE*

Gabrielle Robbins, *History, Anthropology, Science, Technology and Society, SHASS*

(1 additional Graduate Student to be appointed)

Lourdes Aleman, *Associate Director for Teaching and Learning, Teaching and Learning Lab*

Suraiya Baluch, *Associate Dean for Graduate Student Advising, Office of Graduate Education*

Amy Keating, *Professor of Biology and Biological Engineering, Associate Department Head, Biology*

Leslie Kolodziejski, *Professor, Electrical Engineering and Computer Science*

Joe Paradiso, *Professor and Associate Academic Head, Media Arts and Sciences*

Ray Reagans, *Professor of Management and Work and Organization Studies, Associate Dean for Diversity, Equity, and Inclusion, Sloan School of Management*

Brad Skow, *Professor of Philosophy, Linguistics and Philosophy*

Committee Charge

Graduate students are essential to the MIT Community and the leaders of tomorrow in their disciplines. One of the important faculty roles is to provide an environment in which graduate students can learn experientially during their research, which may be conducted in collaboration with or with advising by a faculty member serving as their thesis supervisor. Survey results and anecdotal information indicate that the advising and mentoring relationship is the primary indicator of how graduate students feel about their entire MIT experience. Advising and mentoring also figure prominently in conversations regarding supervising, power imbalances, and collegiality. Nevertheless, upon arriving at MIT our faculty often do not have any formal training in or exposure to the principles of mentorship and advising, and they generally are not provided consistent modes of constructive feedback on their mentoring and advising over the course of their career. Further, our distributed model of graduate education can present challenges for Departments, Labs, and Centers (DLCs) to utilize central Institute resources and internal and external best practices.

As such, the Ad Hoc Committee on Graduate Advising and Mentoring is charged with developing a strategic plan for graduate advising and mentoring, to include creation of a platform for faculty skill development and lifelong learning in mentorship, mechanisms for graduate student feedback, and normalized, equitable metrics of assessment of mentoring that can be readily adopted into faculty development and performance and promotion reviews. Graduate students, staff, and faculty shall comprise this ad hoc committee, and the plan is to be submitted to the Chair of the Faculty, Provost, Chancellor, Vice Chancellor, Faculty Policy Committee (FPC), Committee on Graduate Programs (CGP), and other appropriate offices and committees. So that implementation may begin in the spring semester of the 2021-22 academic year, the plan should be submitted by **December 31, 2021**, and should include the following:

- Strategic objectives
- The essential and measurable elements, competencies, expectations, and best practices of effective mentorship at various stages of career development
- A framework for assessment that includes the types of information and data that will support ongoing professional development and mitigate negative mentorship experiences
- Structured feedback systems to improve mentorship at all levels and all career stages
- Evidence-based educational programs for students and faculty, including guidance on how programs may be adapted across the Institute and by academic discipline
- Consideration of the impact of advising and mentoring as it relates to identity, particularly gender and race/ethnicity, and to first-generation graduate students
- Alignment with and support of MIT's Statement of Shared Values (under development)
- Policies and programs that support multiple mentorship structures and models
- Recommendations on rewards and/or incentives for excellence in mentorship

- An implementation plan that considers all affected stakeholders, Institutional approval timelines, and ongoing Institutional oversight, and that includes a prioritized list of necessary resources
- Guidance on how the plan would be adapted for postdocs and research staff

The Committee shall consider best practices internal and external to MIT, including:

- NASEM report on The Science of Effective Mentoring
- Responses to the Report of the National Academies Committee on Women in Science, Engineering and Medicine
- The Center for the Improvement of Mentored Experiences in Research (CIMER) educational offerings and assessments, including the Mentoring Competency Assessment (MCA)
- MIT Graduate Advising Playbook & Graduate Advising and Mentoring Survey
- Existing programs and initiatives at MIT that represent opportunities for synergy, including existing mentoring programs (such as UCEM) and the RICs of Task Force 2021 (such as RIC 13)
- Consultations with experts in central MIT administrative offices, such as Institutional Research (IR), Human Resources (HR), the Office of Graduate Education (OGE), and the Institute Community Equity Office (ICEO)

RIC 4 Subappendix 3

Ad Hoc Committee on Graduate Advising and Mentoring

Agenda for the Meeting on Wednesday, June 2nd, from 3:30–5:00 p.m.

Resources to review

1. Please begin familiarizing yourself with the 2019 NASEM Report on the Science of Effective Mentorship in STEMM. A copy of the report is also attached.
2. For those interested, a high-level summary of the report in the form of a video can be found here. Key points of the report are also nicely summarized here.

Agenda

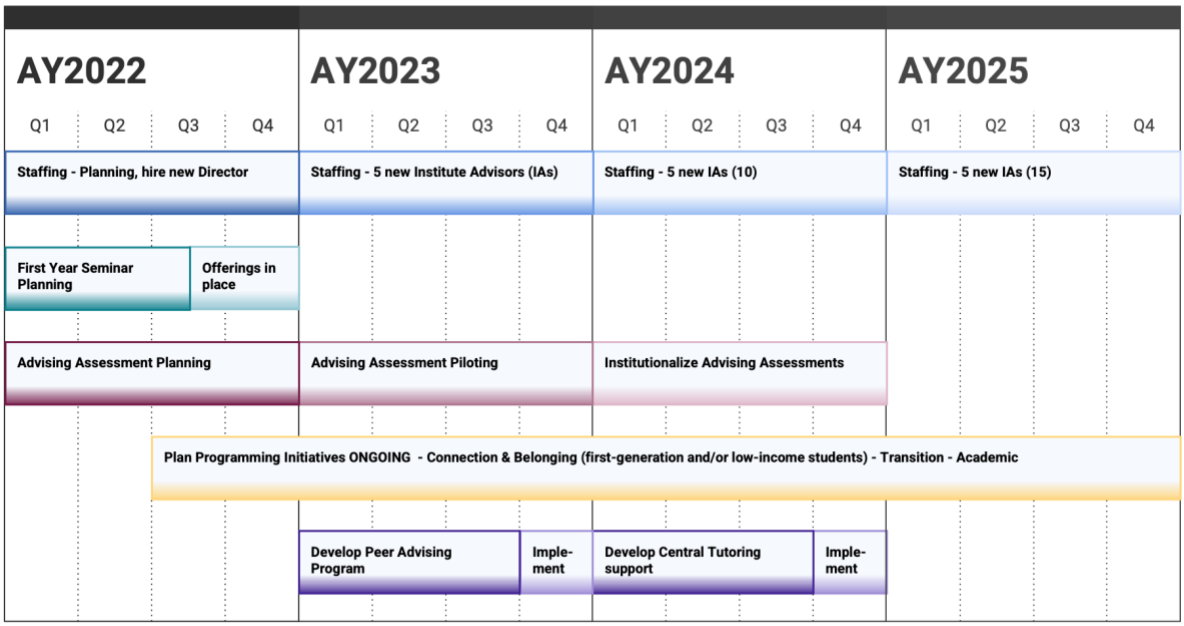
1. Welcome and introductions
2. Summary of the 2021 MIT Graduate Research Advising Survey (*Noam Buckman and Paula do Vale Pereira*)
3. Review of the Committee charge (*Paula Hammond and Tim Jamison*)
4. What is mentorship? (*Rachel Beingessner*)
5. Summary of graduate advising and mentoring initiatives at MIT (*Lauren Pouchak*)
6. Before the next meeting (July, TBD)
   i. Please review the resources listed above, if you haven't already.

ii. Please review the following video—Sherilynn Black, Ph.D., and Angela Byars-Winston, Ph.D., describe the value of cultural awareness in mentorship. They also review highlights from the NASEM report on effective mentorship and discuss resources on culturally aware mentorship for mentors and mentees.

Supplemental Materials for RIC 5: Undergraduate Experience: Advising, Mentoring, and Development

Four-Year Advising Implementation Plan

The following recommended implementation plan focuses on five main components: staffing, academic offerings, peer support, assessment, and programming. The phased approach begins with a planning year and each subsequent year adds staff, peer support, programs, and advising assessments that can be adapted and shifted as needed.



Planning Year—AY2021–2022

A long-term commitment and multi-year implementation plan are necessary to create an advising system that works for all undergraduates. The proposed four-year implementation plan is intended to provide a framework which is not overly prescriptive, such that it can evolve as it develops based on continuous assessment. The committee discussed the pros and cons of a speedy launch of this new initiative. We believe getting it right through a deliberate and iterative process is more important than doing it fast. A new director of a centralized advising system that augments and supports department advising will need to understand the complex MIT landscape that includes a varied set of services. A new director will also need to onboard a nucleus of advisors. It is hoped that these advisors will bring their own creative ideas to the planning process and will, in turn, be able to acclimate and train future cohorts of advisors.

A strong, strategically-minded leader is needed to 'conduct the advising orchestra' of academic advising resources and coordinate the efforts of a new advising center that includes the Office of the First Year (OFY) with campus partners that include but are not limited to the Office of Minority Education (OME),

Student Support Services (S3), Office of Experiential Learning (OEL) including UROP, Academic Administrators, Undergraduate Officers, the Teaching + Learning Lab (TLL), Residential Education, the First Year Learning Communities (FLCs), Career Advising and Professional Development (CAPD, including the Distinguished Fellowships Office) and faculty champions.

The Advising Center, along with its campus partners will initially need to work to socialize and create community buy-in for the Center. As the process unfolds, continued updates to the Committee on Undergraduate Programs (CUP), the Committee on Curricula (COC), and the Committee on Academic Performance (CAP) are imperative.

The 4-year implementation plan, as proposed, does not specifically address the needs of all students immediately. We therefore encourage the new director to identify mechanisms to support upper-level students, particularly those who need it most, by opening up some services to a broader cohort of students if possible and consistent with staffing.. These services and supports could include, but are not limited to, mentoring meetings, upper-level seminars, and peer programs to supplement advising in departments.

We recommend the following actions during the planning year of the four year implementation plan:

- **Develop First Year Seminars (FYS) for AY2023**
    - Consider restructuring/evolving First Year Advising Seminars (FAS) and Discovery/Exploratory subjects to provide First Year Seminars (FYS)—small, structured, group-based, positive interactions with faculty for every first year student, and work through faculty governance to accomplish this
    - Work with departments and others to significantly expand the number of FYSs with a goal to provide this opportunity to every undergraduate student who is not enrolled in a First Year Learning Community (FLC)
    - With help from Schools/College, incentivize and identify faculty to teach FYSs for AY2023
- **Develop Institute Advisor (IA) role, plan for hiring new staff, update current OFY staffing roles**
    - Hire new Advising Center Director
    - Hire 5 new IAs each year for 3 years beginning in AY2023
    - Goal of 16 new staff, 4 current advising staff in OFY for 19 AIs by AY2025
    - Each cohort of new IAs focuses on and follows a class through graduation, with programming and other job responsibilities
    - Provide an option to ‘opt-in’ for upperclass students who would like this type of developmental advising
- **Develop/enhance programming**
    - Boost connection and belonging initiatives—including First Generation Low Income (FLI) programming
- **Develop assessment plan**
    - Gather stakeholders and assessment experts to create assessment plan for advising to pilot in AY2023

Phase One Implementation—AY2022–2023

The first year of implementation includes offering First Year Seminars for all students except those participating in First Year Learning Communities (FLCs), and the assignment of five new Institute Advisors (IAs) and current OFY staff to first year students (the **class of 2027**). The new FYS initiative that will afford all first year students the opportunity to participate in a small group based experience will need to be appropriately supported and incentivized by the Schools/College to ensure sufficient levels of faculty participation. At least two new Institute Advisors could be designated for upper-class students looking for developmental advising to augment the advising they are receiving from their faculty advisors, and/or their departments.

Planning for AY2024 should include the hiring of five additional Institute Advisors (IAs). Program planning efforts should focus on transition Initiatives including the sophomore transition and the creation of deeper connections to departments as students decide on their majors.

We know peer connections at MIT are some of the strongest. Phase One should also include the development of a robust Peer Advising Program wherein a group of trained and paid upperclass students help their peers navigate the 'hidden curriculum' of MIT.

- **Develop Peer Advising Program**
    - Map out pilot for enhanced peer-advising program to create strong connection to departments
    - Consider the roles of Orientation Leaders, Associate Advisors and Resident Peer Mentors in developing a robust peer advising program in collaboration with departments and other existing peer groups
    - Hire and train Peer Advisors for AY2024

The lack of central support for providing best practices in Institute-wide tutoring efforts is problematic. This phase of planning should include the mapping-out of centralized tutoring support to facilitate: the sharing of best practices, institute-wide tutor training, and a centralized and streamlined platform for students to access tutoring.

At this phase of the implementation, a pilot advising assessment should be under way.

Phase 2 Implementation—AY2023–2024

Phase 2 includes assigning five new IAs focused on supporting the incoming **class of 2028**. Central tutoring support should be available for departments providing training, best practices, and a central platform as mentioned above.

A review of pilot assessments should be undertaken at this point to make adjustments before institutionalizing advising assessment.

Planning for AY2025 should include hiring of an additional five new IAs for the class of 2029, while programming efforts should focus on academic initiatives to boost tutoring offerings and ongoing best

practice training for IAs and those advising students in departments. A plan for institutionalized assessments should be completed by this time.

Phase 3 Implementation—AY2024–2025

The last phase of the implementation plan includes assigning five new IAs for the **class of 2029**. Throughout the year continued assessments of: the Peer Advising Program; central tutoring support; and overall advising. The team of advisors will work with campus partners to modify programming based on assessment data and the desire to address student needs and concerns.
Planning for shifting a group of advisors to the next incoming class. The class of 2030 should be the last part of the implementation plan. An assessment of this advising structure should provide a feedback loop to adjust advisor loads and advising practices as needed.

Financial Resources

Hiring a new group of Institute Advisors and a Director for a new Advising Center requires a large, ongoing investment. These new staff members will have the important task of working with faculty advisors to guide, empower, engage, and support students from matriculation to graduation. By investing in this group of advising professionals to augment our current system, we can create better all around efficacies and outcomes for faculty, students, and staff. In addition to yearly staffing costs, the following budget also estimates costs to resource student programming. We expect additional one-time start-up costs to be modest (~$70K).

Yearly cost estimate:

$174,213	Advising Center Director ($125,000-$150,000, avg = $174,213 with 26.7% eb)
$929,349	Institute Advisor: 9 at Assistant Dean level ($78,000-$85,000, avg = $103,261 with 26.7% eb)
$513,138	Institute Advisor: 6 at Staff Associate level ($60,000-$75,000, avg = $85,523 with 26.7% eb)
$105,350	Increase in base budget including professional development for staff
$75,000	Increase in student programming budget

$1,866,050 Total phased in over four years

RIC 5 Subappendix A

MIT has a wide variety of groups, offices, and programs that support students—they each serve distinct but connected roles. The newly proposed Institute Advisor would be the only advising role that provides continuity throughout a student's four years at MIT and acts as a connector to the wide range of student advising and support areas.

Categories	Individual/group (examples)	Roles, context in relation to advising	Relationships and dependencies
Governance/policy	Committee on Undergraduate Programs (CUP)	Overseas UG programs Advising updates, curricular changes—First Year Seminars	Approve curricular and programmatic changes for undergraduate education, review of academic performance—escalate issues
	Committee on Curricula (COC)	Acts on proposals to create, revise, or remove undergraduate subjects and undergraduate curricula Curricular changes—First Year Seminars	
	Committee on Academic Performance (CAP)/Faculty Advisor	Faculty advisor makes case to academic performance review board, if student is at risk academically	
Support, Wellbeing and Student Life	Student Support Services (S^3)	Promotes the academic success and holistic experience of students, especially undergraduates. S^3 reinforces the core values of MIT by providing support in an accessible and respectful environment. Provide advice and advocacy for students and act as a hub of resources, referrals, and information across the MIT community	Provide ongoing student support
	CARE Team	Student-focused resource that empowers students to be in control of their own personal information, treatment plans, and future, works with families of students to support them in supporting their loved ones	
	Residential House Teams	Faculty, professional staff, graduate students, and house government collaborate to enhance the sense of community and help students make the most of their MIT experience	
Experiential opportunities	Undergraduate Research Opportunities Program (UROP)	Cultivates and supports research partnerships between MIT undergraduates and faculty	Offer Curricular and co-curricular and global opportunities

	Priscilla King Gray Public Service Center (PKG)	Springboards student learning beyond the classroom and into communities around the world through internships, fellowships, and public service projects	
	MIT International Science and Technology Initiatives (MISTI)	Matches MIT students with tailored internship, research, and teaching opportunities abroad.	
Academic departments and programs	Departments and units that provide advising-related programs and services	Support transition from first year to major specific advising from faculty and peer mentor programs (see Peer Advising and Mentoring, below),varied levels of support	Provide Academic support of varying degrees
First year initiatives	Office of the First Year (OFY)	Provide services and programs to catalyze student exploration and access to opportunity, and promote the academic success and personal development of undergraduates, enrich and support undergraduate education at the Institute	Acclimate students to MIT, provide community building opportunities, academic support
	Office of Minority Education (OME)	Promote academic excellence, builds strong communities, and develop professional mindsets among students of underrepresented minority groups	
	First Year Learning Communities (FLCs)	Provide students the opportunity to participate in small, interactive classes, have access to their own physical lounges on campus, and participate in a variety of programs and events	
Advising	Institute Advisor (new)	Provide ongoing advising support over 4 years working with faculty advisors to guide, empower, engage, and support students from matriculation to graduation	Make students aware of institutional programs, services, resources Offer disciplinary and academic advice Provide career advising and professional development opportunities
	Faculty Advisor	Currently in the first year, then re-assigned once student picks major	
	Career Advising and Professional Development (CAPD)	Empower students to explore their life and career goals by helping them to develop core competencies and build professional networks, engage students and alumni in self-discovery to craft lives that are intellectually challenging, personally enriching, and of service to the world	

	Distinguished Fellowships Office	Guide students to a deeper understanding of their intellectual and professional preferences while introducing them to new research or career options through reflection and introspection	
Peer advising and mentoring	Orientation Leaders (OLs)	Support the incoming class transition to MIT	Provide transitional and ongoing connections along with formal and informal support
	Associate (Peer) Advisors (AAs)	Upper-level students provide academic support and resources to first-year students. Matched with a faculty advisor of a traditional or seminar-based advising group. Associate advisors compliment the advisor's efforts by providing the student perspective on MIT academics and student life. In addition, associate advisors informally support the first-year students living in their dorms.	
	Resident Peer Mentors (RPMs)	Help first-year students adjust to life at MIT academically and in their residence hall. RPMs are upper-class students who work with 4-10 new students and one or more academic advisors to provide support together.	
	Department-specific peer advisors	In some departments (e.g., Physics, Mech E), upper-class students in the department provide academic advise and mentoring to students new to the major.	

RIC 5 Subappendix B

Advising Center Director Job Description DRAFT

Position Description

The Director of the Advising Center at MIT will support the Institute's commitment to provide a coherent and unified academic advising student experience through exemplary advising leadership, process management, assessment and evaluation, equity and inclusion, and continuous improvement. The Director of Academic Advising provides leadership in a holistic, developmental advising process based on a dynamic student-advisor relationship that enables students to integrate their interests and abilities with MIT's academic programs. The director provides administration of day-to-day operations associated with the management of MIT's comprehensive academic and career advising program that allows students to achieve their educational, professional, and creative goals through the full range of institutional and community resources available to them. The position reports to the Vice Chancellor of Undergraduate and Graduate Education, and works closely with faculty and department administrators and other campus advisors who engage students in an inquiry process that challenges them to do their best work, become self-directed, and complete their educational goals on the way to realizing their personal and professional goals. This position provides a centralized resource within the academic advising community, not only to uphold and implement strategic guidance from the Office of the Vice Chancellor, but to also provide advocacy and leadership in the ongoing review of best practices in academic advising.

Duties

- Oversees strategic planning, operational management, administrative direction and assessment of an institutional advising strategy focused on proactive, holistic, and data-informed practice using new and existing technology and training.
- Directs, coordinates, and manages all daily operations of Advising Center by designing, implementing, and updating administrative policies and procedures for advising, and staying informed on Institute policies and procedures as they relate to advising and student support.
- Leads a team of Institute Advisors, advocates for campus-wide advising career advancement opportunities and takes responsibility to hire, supervise, train, and develop staff. Responsible for maintaining academic advising proficiency by advising an appropriate caseload for each Institute Advisor which involves assessing students' advising and programmatic needs.
- Directs, manages, and organizes advising for new students by coordinating Office of the First Year staff and support for orientation advising; developing orientation programs and advising activities; assisting students with the advising and enrollment/registration process.
- Recruits faculty to teach First Year Seminars, provides guidance on course parameters and goals.
- Represents Advising Center on standing campus committees, providing information and professional expertise related to advising; represents the Institute to a variety of professional organizations by attending meetings and actively participating in professional activities;

- Collaborates with campus partners including departments, offices, and programs that offer student support, curricular and, co-curricular activities. Enhances the undergraduate campus life experience by developing and monitoring programs that are focused on academic progress, belonging, and success.
- Administers an operating budget consistent with Institute policy and collaborates with the development officer to secure external resources in order to access additional advising resources.
- Performs other related duties as assigned.

Required Qualifications

MS/MA/MEd or professional degree. Five years of academic advising or student services, and/or career counseling with demonstrated progression of experience. Evidence of commitment to equity and inclusion. Experience leading initiatives. Excellent verbal and written communication skills. Strong problem solving and time management skills. Ability to work effectively with diverse groups of stakeholders and to build strong rapport with students and campus partners. Budget management and experience supervising and evaluating professional staff.

Preferred Qualifications

Ph.D. in Education, Counseling, Guidance, Social Work, or related field with a focus on academic advising, student personnel services and/or career counseling from an accredited college or university. Five years of administrative experience in academic support, tutoring. Excellent interpersonal skills and demonstrated ability to work effectively in a highly collaborative environment. Excellent oral, written communication skills, and organizational skills. Working knowledge of Banner, EAB Navigate, and Degree Works or other student information systems.

Supplemental Materials for RIC 6: Underrecovery

RIC 6: Underrecovery—Detailed Report

John Donnelly, Jonathan Gruber (chair), Ron Hasseltine, Danielle Khoury, Laura Kiessling, Lisa Schwallie, Charles Stewart[3]

Research is the lifeblood of MIT, and research carried out at MIT has made the world a better place for more than a century. But the funding of research has changed dramatically over the past several decades, with a dramatic shift from government grants to other sources. This shift poses a fundamental challenge: government and industry grants have traditionally provided funding to cover the accurate indirect costs of research, many foundations and other not-for-profit sources do not. The result is increasing Underrecovery of these indirect costs, a portion of which MIT asks DLCs and Principal Investigators to fund from their discretionary resources. Many DLCs and PIs lack sufficient discretionary funds to under-write these indirect costs.

This changing mix of funding and the challenges it brings have created a rising burden of financing at MIT. This burden has been met in various ways over the years. The current system relies on a negotiated mix of departmental, school and central MIT funding. That mix varies by department and by school. Moreover, many faculty members feel that MIT constructs high "hassle costs" for them in obtaining funding for these indirect costs on foundation and non-for-profit organization grants. They therefore do not pursue valuable research opportunities.

In practice, almost all of the requests made by departments and schools for assistance with funding of Underrecovery costs are ultimately approved and are paid for through a combination of central funds (VPR and Provost funds) and departmental or school discretionary funds. But the path to this funding is winding, burdensome, and leaves no one satisfied. This stands in stark contrast to perceptions of our peers and competitors, who are thought to be much more supportive of funding the shortfalls in indirect costs, not requiring funding of it, but, rather absorbing it within available central resources.

The goal of this report is to set up a process by which MIT can address the problem of decentralized Underrecovery funding going forward. We begin by laying out how research funding works at MIT today and then layout a process that includes gathering information from peer institutions.

Background: Research Funding at MIT

Direct and Indirect Costs

When a researcher at MIT carries out a research project, they incur both direct and indirect costs. The direct costs include:

[3] We are grateful to James Nutter for assistance, and to Marty Schmidt and Maria Zuber for helpful conversations.

- Salary costs: faculty and staff salary and benefits. Generally, summer salary for the faculty (Academic year salary is generally paid by the General Institute Budget or by Professorships)
- Equipment, materials and supplies and services costs.
- Research assistant costs: the stipend paid to research assistants on the project and 50% of their academic year tuition (the other 50% plus medical insurance being funded by the central General Institute Budget)

It should be noted that as outlined above MIT voluntarily funds from Institute resources costs such as faculty academic year salaries and some of the graduate student tuition and medical insurance costs that would be allowable as direct cost on sponsored research projects. This represents institutional cost sharing for sponsored research projects that involve faculty and graduate student effort.

But this research also comes with some indirect costs as well:

- Cost of current space/facilities—most research happens in shared office/lab space—building and equipment depreciation, interest; utilities, rent and repairs, and maintenance expenses
- Cost of administrative support – central administration and services such as procurement, general financial services, Human Resources; IS&T support; research administration services (formerly known as the Office of Sponsored Programs); and departmental administration
- Libraries

The government has traditionally prescribed a methodology that provides an average rate for all sponsored research. That is, MIT would add the total indirect costs associated with research, divide by a subset of the direct amount of expected activity/funding (known as modified total direct costs4), and then create indirect cost rates that are then charged to the government. In this way, MIT could ensure the total costs of research were funded. The government negotiates this rate with the institution and is generally required to pay this rate. However, other funders may negotiate or unilaterally decide what rate they are willing to pay.

The Challenge: A Changing Funding Environment

That approach has become more challenging over time for two reasons. First, government grants no longer cover all of the indirect costs associated with research for a number of reasons including:

- A 26-point cap on the “A” side of the F&A rate
- A 3.6-point cap on the salaries and benefits of Faculty performing administrative work
- Cost Sharing (mandatory) on both the individual award level and the Institutional level—this includes an adjustment for faculty academic year salaries/benefits related to research funded by the Institute. This adjustment is $13M for FY22.
- Gutting of the Utility Cost Adjustment (acknowledging that Lab space uses more energy than other types of space)
- The “Fixed for the life of the award provision” which fixes all Federal awards at MIT’s F&A rate when received
- A cap on the allowable salary of highly compensated individuals (such as NIH salary cap)

[4] Includes all direct expenses except major equipment, subawards over $25,000, tuition, and other smaller items.

- Elimination of research allocability of Student Services costs such as Bursar, Registrar, Admissions

Second, the nature of funding is changing at MIT:

- In FY13, MIT's share of campus5 research direct expenses from federal sponsors was 70%. At the end of FY20, it was 62%. Over that time period, federal support of direct costs at MIT actually decreased $4.5 million, while non-federal support of direct costs increased $86.7 million (average annual growth of 5.5%)
- In FY13, MIT's share of campus direct research expenses funded from Foundations in particular (the sponsor base that most often caps allowable indirect cost rates) was 4.4%. It had grown to 9.0% at the end of FY20 (average annual growth of 13.3%).
- From FY13 to FY20, funded Underrecovery has grown from $5.5 million in FY13 to $16.5 million in FY20 (average annual growth of 16.9%)
- The F&A rate is expected to increase in FY23 (the FY20 F&A rate was 50.6%). MIT's on-campus F&A billing rate has been artificially low for a number of years, driven down by incorporation of past over-recoveries and finalization of nine years of delayed Federal audits. Unfortunately, just as the rate began to rise again, to its natural level, pandemic related stagnation and decline of the MTDC base and increased Covid-19 related costs (testing, PPE, retrofits, etc.) have combined to cause underrecoveries which must now be incorporated into future billing rates increasing them from current levels to possibly as high as the mid-60's in FY23 and beyond.

The increased contribution from non-federal sponsors presents a challenge, because foundation and non-for-profit organization grants pay a lower rate for indirect costs. On average, across all grants at MIT, the indirect cost rate charged on FY20 activity was 58.7%. The amount provided by foundation and nonprofit sponsors is generally substantially less. For example, the Simons Foundation provides 20%; Chan Zuckerberg (CZI) and Sloan Foundation provide 15%; the Moore foundation provide 12.5% and the American Cancer Society and Gates Foundation provides 10%;, while others like the Beckman Foundation, Brain Research Foundation, Burroughs Wellcome, and Dreyfus Foundation often pay no indirect costs at all.

Unfortunately, the indirect costs of research typically do not vary in a corresponding way with the funder. We face a mounting problem: as funding for research shifts to those funders that pay lower indirect rates, the shortfall in indirect costs grows.

The Evolution of MIT's Approach to Underrecovery

Traditionally at MIT, resolving this issue was the purview of departments and schools. To address shortfalls, MIT created a small Underrecovery fund in the mid-1990s to help support critical projects for which departments and schools could not cover the full costs.

The existing system was developed in 2001, particularly in response to the growing needs of the life sciences. Each school was given a small budget of funds from a central pool to fund Underrecovery incurred on their own projects. Any requests beyond that had to be funded either from specific

[5] Excludes Lincoln Lab and SMART (the Singapore MIT Alliance for Research and Technology)

individual requests made to central administration or from the school or departments discretionary funds.

In 2013, the system was revised to significantly expand the amount of central funding devoted to Underrecovery. From 2013 through 2019, the amount of Underrecovery expense rose from $5.5 million to $18.4 million, before declining in 2020 to $16.5 million. This Underrecovery expense was funded from two buckets, described in more detail below: a year-over-year budgetary allocation, which was $7M in FY20, with the balance funded from DLC, School, and central discretionary funds.

A Simplified Overview of Underrecovery

The Underrecovery process at MIT is very complicated and only a small number of individuals truly understand all its inner workings (fortunately some of them were on our committee). The goal of this report is not to present a comprehensive lens into the nuts and bolts of the Underrecovery process at MIT. Rather, we will provide a simplified overview that captures the key elements of Underrecovery. We will divide this overview into the three essential elements.

Funding of Underrecovery by Schools, DLCs and VPR

As noted above, the total amount of Underrecovery to be funded in in FY20 was $16.5 million. The funding for this Underrecovery was obtained through multiple sources. The first is departmental cost-sharing. Depending on the school, departments are asked to fund between 0% (SHASS DLCs) and 50% (School of Science DLCs) of Underrecovery requests. The second are the schools and the VPR Area (labs/centers that are not part of any school), who are asked to fund between 0% (SHASS) and 50% (untenured faculty in School of Engineering). The third is the Vice President for Research (VPR), who pays the remaining costs. This is a staged process where the request goes to the DLC, then the School or VPR Area, then to VPR, funding at each stage is required before it goes to the next level.

Source of Funding Received from Schools, DLCs and VPR

The $16.5 million in funding comes from a variety of sources. The first is departmental and school "normal" budget allocations and discretionary/expendable funds of the schools/DLCs. The second is funds that are specifically allocated each year to each of the schools by the VPR/Provost to fund Underrecovery. The third is funds that are retained from the VPR/Provost allocation that is provided by the VPR on a project-by-project basis.

Critically, some of this funding is "baked into" the budget, in that it is a recurring expense that is funded regularly every year, while some of the funding comes solely from a limited pool of discretionary funds. In 2020, the split was:

- $7M in the recurring base budget
- $7.64 million from a wide variety of discretionary sources, including general budgets and carryforward reserves, expendable gifts and income from endowed funds, revenues from departmental shares of patents and licensing and industry memberships fees, and faculty start up funds.

- $1.88 million from a one-time $3 million allocation from Provost discretionary funds (the remainder being carried over to 2021).

This is a somewhat artificial distinction except that ongoing funding of the stream that is recurring base budget is easier to fund on a year-over-year basis since the starting point for each year's budget is the previous year's budget, a point we return to below.

Further, the availability of resources varies greatly by DLC and even by School. Some DLCs have limited discretionary funds to pay this cost. At the same time, the need for Underrecovery funding varies based on the nature of the DLC's research portfolio and can fall disproportionally hard on some DLCs. This mismatch between resources and need creates a pain point for some DLCs and their faculty even if the particular DLC's funding is augmented by additional one-time allocations from their Dean's Office. In these units, the faculty are either directly or indirectly discouraged from requesting support especially if they are already receiving some support as they know any funding they get takes away from what their colleagues can get.

Process

The process of receiving Underrecovery funding can be expressed as some combination of three approaches. The first is default approval, where any Underrecovery is automatically covered. The second is standardized application, where investigators must apply for Underrecovery funding, but they do so through a formalized and well-understood process. The third is "hat in hand," where each time investigators need funding for Underrecovery they must approach various sources to raise this funding.

MIT used to rely almost exclusively on a "hat in hand" process, but since 2013 the process has incorporated elements of centralization. There are formal and transparent cost-sharing responsibilities across departments, schools, and the VPR. Schools are allocated money from the budget each year that provides certainty about the minimum that they will have. Yet in a large number of cases, especially when the new requests are large, investigators/departments/schools still need to approach the VPR for incremental funding. As a result, investigators, leaders, and administrators devote substantial time and effort to seeking support and resolving indirect cost funding issues.

Key Differences from Other Schools

There are two fundamental differences between MIT and other universities.

MIT is one of a very small group of universities which have historically negotiated annual "Fixed with Carryforward Provision F&A rates" with the Federal government. The primary advantage of "Fixed" rates is the carryforward process which was designed to ensure that both parties, the university and the Federal Government, are left whole, there are no gains or losses on either side, and no money is left on the table. Disadvantages include carryforward driven budget and rate instability and heightened Federal audit scrutiny.

The majority of universities negotiate multi-year Predetermine F&A rates. Doing so means forgoing future recovery of underrecovered amounts but lessens administrative burden (for both the Institution

and the Federal Government), provides long-term rate and budget stability, and dramatically lowers Federal audit oversight and its associated risks.

Second, other universities include all Underrecovery as part of their general budgets and overall funding, viewing it as an institutional cost allowing flexible funding arrangements and a natural means for handling rising Underrecovery costs. As described above, more than half of Underrecovery funding at MIT comes from discretionary funds, which are limited. Many investigators and some DLCs lack access to sufficient discretionary funds to cover shortfalls in indirect costs.

There are of course a wide variety of other differences that are missed by this overly simplified presentation. We return to this issue in our recommendations section.

Problems with the Existing System

This system has a number of problems.

Time and Stress Costs to Faculty

The primary cost of the system is the time and stress to faculty that arises from the work to gather funding for Underrecovery. A recent survey of Chemistry department faculty indicated that 75% of the respondents had encountered problems with Underrecovery. The solutions ranged from not applying for grants that would have advanced their research because of the barrier of raising sufficient indirect costs to cover the shortfall to moving their grant applications to other MIT partners (e.g., the Broad Institute or the Ragon Institute). What was most discouraging was that many of the assistant professors were already worried about discretionary funds and indirect cost recovery, even before they had encountered problems?

Time and Burden for Administrators

There is a lot of behind the scenes administrative burden under the current Underrecovery system associated with: budgeting and requesting at the time of the proposal, and for the tracking and accounting for the funding entries required to be made on a project by project basis.
Lack of Transparency
Most MIT faculty do not understand how the Underrecovery process works. They likely just have a vague sense that grants from foundation and non-for-profit organization funders are discouraged. And if they have received such grants in the past, they have dealt with the various hassle costs described above. These perceptions can have a chilling effect on applying for grants—even though in the end most of these costs are covered in practice. Such concerns are especially distressing if they erroneously prevent new faculty members from seeking funding opportunities that will help them launch their careers.

Inequities across Departments

As noted above, there are distinct cost sharing agreements across the schools. The exact rationale for these relative cost sharing systems is not necessarily related to either department resources or sources of funding. Moreover, there may be significant heterogeneity across departments within a school in the

resources that they have to finance Underrecovery of indirect costs. As previously noted the lack of resources in some departments, even if mitigated by the School or VPR, can still create perceived barriers to faculty in requesting funding for Underrecovery.

Limitations on Discretionary Central, School and DLC Funding

More than half of the funding for Underrecovery comes from the discretionary funds from the Provost, VPR, Schools, and DLCs. This is not a regularly budgeted item and as such must compete every year with other needs for a limited pool of discretionary funds. As Marty Schmidt told our committee, if there were unlimited discretionary funds, he would be happy to pay all Underrecovery—so the key constraint here is the availability of these funds.

Next Steps: The Underrecovery Solutions Commission (URSC)

We view the goal of our committee as two-fold. The first is to describe in simple terms how the existing UR system works, and the problems it creates. The second is to lay out the mandate for a follow-on committee to answer the hard questions critical to creating a robust and transparent approach to Underrecovery.

In this section, we lay out the broad scope that we envision for such a follow-on committee, which we call the Underrecovery Solutions Commission (URSC). We begin by proposing a structure of such a committee and its mandates. In the next section, we dive into questions and opportunities that the URSC should address.

Membership of the URSC

The natural chair of the URSC would be Marty Schmidt or Maria Zuber, but this proposal seems infeasible given their other obligations. Still, the chair should be someone from central administration with a direct line to decision-makers who control the budget such as Marty Schmidt. The committee should have one representative from each school, since the Underrecovery needs, as well as current sharing rules, vary by school. Care should be used in selecting a representative who understands the needs of both well-funded and under-funded departments. Experience in departmental administration would also be valuable as such individuals will have encountered first-hand the barriers put in place by the current system. At least one member should be an Assistant Dean.

Including someone who really knows all the nuts and bolts of the current system is also critical; Ron Hasseltine has played that role on our Committee, and he would be a natural person to play such a role on the URSC. The group should also include someone from the Vice President for Finance (VPF) area, who has experience with financial analysis; Danielle Khoury has been an important voice on this topic on our committee and would be a natural choice for the USRC.

The USRC would require a substantial level of staffing for project and analytical support. The long list of questions to be asked and answered, and the significant amount of information to be collected from other institutions, will require dedicated staffing. We suggest one full time staffer who has minimal other obligations.

Charges to the URSC

The URSC would be given three charges.

Charge 1: Asking and answering the hard questions. As noted earlier, once the Underrecovery process is made more transparent, it raises multiple challenging questions. In the next section, we pose some of these questions and offer initial thoughts about how they should be addressed.

The first charge of the URSC should be to review this list, add any other questions that are relevant, and fully explore the issues involved in answering them. This will be the basis for the solutions recommended under Charge 3.

Charge 2: Learning from other institutions. MIT is relatively unique in how it approaches the Underrecovery process. As such, there are tremendous opportunities for learning from our peer institutions. But given the complicated and overwhelming nature of this problem, and its inherent correlation with how peer institute budgets work, open-ended surveys and interviews alone will not bring us closer to understanding the pros and cons of these alternative approaches.

The second charge would then be to pose a set of specific information from other institutions that are required to guide the URSC—and to then compare the resulting information clearly across this range of institutions. Below, under "Charge 2: What to Learn from Other Institutions," we suggest the key questions that this Committee suggests be answered by other institutions, but the URSC should feel free to augment this list.

In terms of peer institutions, we should start with the commonly included "HYPS" (Harvard, Yale, Princeton, and Stanford) as they are the 4 schools with endowments larger than MIT (excluding university "systems" like U of Texas). To include the next largest endowments (still excluding "systems") that would bring in UPenn, University of Michigan, and Northwestern. The Committee should also consider research volume when selecting peer comparisons—selecting peers that have similar research volumes to MIT in addition to similar endowment sizes.

Charge 3: Recommendations. Finally, based on the learnings from charges 1 and 2, the URSC should be in a position to make recommendations on how the Institute should adjust (if at all) its Underrecovery processes and underlying rules.

Charge 1: Asking—and answering—the hard questions

If the problem of Underrecovery were easy to solve, it would have been solved already. The complicated nature of this issue, and the way it intersects with so many other aspects of life at MIT, has led to our current convoluted and non-transparent system. To comprehensively address the topic of Underrecovery requires asking and answering a set of very hard questions.

In this section, we pose these questions. This list may not be comprehensive, and the URSC should feel free to augment it. We also discuss the insights from our committee on these questions, based on our own experiences as well as a helpful interview with the Provost.

Question 1: What limitations, if any, should there be on submissions of foundation and nonprofit grants?

Perhaps the most fundamental question for the URSC is whether MIT should have any limitations on grants from foundation and nonprofit sources. As noted above, the limitations in place today deter researchers from pursing a variety of promising funding opportunities that lead to lost opportunities for the researchers, MIT, and society. Removing such limitations would allow MIT and its faculty to take advantage of these opportunities. As government funding has declined in multiple areas (and can be subject to political forces), many foundations have stepped in with research opportunities. Moreover, many foundation funds provide seed money that can lead to findings allowing researchers to capture larger federal grants.

At the same time, funding Underrecovery is costly for the Institute—in particular given a structure that places more than half the burden on a limited set of unrestricted funds. The use of unrestricted funds for indirect costs has an important opportunity costs, as it could be used by the Provost, VPR, Schools, and DLCs to fund other priorities, such as student costs, faculty retention or research infrastructure.

Moreover, all else equal, obtaining funding from a government grant with a higher indirect cost rate would be less financially burdensome on the Institute than would be obtaining funding from a foundation or nonprofit grant with a lower indirect cost rate. Of course, all else is often not equal, as government funding may not be available in sufficient amounts for some types of research (e.g., research on specific diseases that have enormous social costs).

The URSC should endeavor to undertake a fundamental cost-benefit analysis of grants that do not pay full indirect costs. This endeavor would recognize the enormous value of such grants to MIT, its researchers, and the world at large. But it would also recognize the costs laid out above. Based on these considerations, the URSC should first address the key question: should there be any limits at all on grants that do not pay full indirect costs?

Question 2: What disincentives/incentives are appropriate to encourage higher indirect cost grants?

Given the second issue raised in Question 1, MIT may want to consider either disincentives or incentives to encourage the use of higher indirect cost funding sources. Proper disincentives or incentives could allow researchers to target foundation and non-for-profit organization funds when necessary, but to focus on government or industry sources when available. Currently, we have strong disincentives for foundation and non-for-profit organization grants of the form described above.

There are three separate issues here. The first is the proper role of encouragement for MIT researchers to bring their government grants through MIT. A number of our faculty have affiliations with other institutions through which they may run their grants. Should—and can—MIT collect data on faculty

funding from other sources? And what should MIT do to discourage such behaviors, while respecting the benefits that researchers derive from other affiliations?

The second is the substitution of government and industry sources for foundation and non-for-profit organization sources where possible. Some examples that could be considered:

- Cost sharing on Underrecovery, as today
- Dedicated resources at MIT to assist researchers in finding government sources
- Financial incentives, including bonuses, to researchers that use government funding (which the committee notes raise some slippery slope issues).

The third is the variation in indirect cost rates paid by different funders—and whether those different rates should cause differential preferences towards some funders or not. Moreover, in a few instances, the benefactors of certain foundations have also been generous benefactors to MIT. We have endeavored in recognition of their tremendous support of MIT to use institutional discretionary resources to minimize the barrier to faculty for receiving awards from their foundations.

Question 3: What more can MIT do to increase indirect cost rates from funders?

While foundation and non-for-profit organization funders are eager to minimize their costs, they generally recognize that research is expensive and has some fixed costs. The question is whether MIT could do better in getting these institutions to recognize these fixed costs and absorb more of the costs of covering them.

To answer this question, the URSC should undertake a survey of school and department leaders to uncover any lessons for encouraging higher indirect cost rates on foundation and non-for-profit organization funds. In addition, this is yet another area where learning from other institutions can be very informative.

Question 4: What more, if anything, should MIT do to increase fundraising for Underrecovery?

The limitation on the discretionary funds that the Provost has available to fund Underrecovery arises partly because of the difficulty of fundraising for this category of costs. As Provost Schmidt emphasized to our committee, donor giving to categories such as undergraduate scholarships or faculty chairs generates a strong “warm glow” from being identified with accomplishments such as graduation or faculty recognition. Fundraisers have traditionally faced a challenge in creating such a warm glow associated with general giving for fixed research costs.

Could MIT do more to increase the warm glow of such giving? For example, could MIT emphasize the high leverage that arises from such giving, in that it makes it more feasible for researchers to use foundation and non-for-profit organization funding sources? Tying particular gifts to particular foundation and non-for-profit organization grants—and the research funded by them—may encourage more giving. We can also consider framing the fundraising as contributing to “cost-sharing” of a partially funded research project rather than attaching it to specifically paying for indirect costs.

Further, perhaps there are ways to strategically fundraise for items that are attractive for donors and use the funding to support DLC costs in a way that relieves the unrestricted general budget allowing funds to be reallocated for Underrecovery or other hard to fundraise priorities.

Question 5: How, if at all, should MIT try to shift the line between direct costs and indirect costs?

While what is a direct and indirect cost is fairly clearly defined, there are specific direct as well as indirect costs that could be characterized as project related that are paid by MIT. These include faculty academic year salaries, graduate student tuition, and some project level administrative and support costs. As such, there may be changes that MIT could make to shift costs from MIT paid to sponsor paid—and in some circumstances some typically indirect costs could be direct charged to help reduce the Underrecovery problem.

The first rule in such a discussion should be to "do no harm" by clearly understanding and respecting government rules and regulations—as Provost Schmidt emphasized to the committee, any change in this direction that put our indirect cost recovery from the government at risk would be very dangerous.

Within that constraint, however, it is worth at least asking if there are changes that can be made in this area. One example is the direct funding of faculty salaries. Currently, faculty salaries are fully funded during the academic year and are generally ineligible to be put on grants as a direct cost.6 We could instead permit faculty to choose to put some number of academic year months on grants, using the balance to offset Underrecovery funding. For example, if a faculty member wanted to put 4 months of their salary totaling $50K on a 2-year grant, during those 2 years $50K of the faculty's salary would be distributed to the grant, and the $50K of Institute funding that previously had been directed to support the faculty member's salary would instead be directed towards Underrecovery on the grant. At the conclusion of the grant, the $50K of Institute funding would revert to supporting the faculty's salary.

It is important to note that because the faculty member would need to approve any of their time being put on the grant, they are in control of if / when such mechanisms are used. Faculty who are not comfortable with such a mechanism can choose not to employ it. Additionally, the Institute is paying the same regardless, it is just a question as to whether the funding is directed to the faculty salary or towards Underrecovery.

Another example is direct charges for dedicated laboratory and other space. A few grants that require dedicated space might allow for some of the cost of renovating the space as a direct cost. Further, some limited grants might allow for a space charge in lieu of F&A. In these cases, we should have a model available to be able to quickly determine the cost of the space allocated to the project. The VPR Office of Cost Analysis has developed a tool called the Facilities Operations and Services Charge (FOSC) Calculator that can calculate the allocable space cost for a particular project. The funds received from this sponsor funded cost can be used to offset Underrecovery.

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[6] The SOE is the only school that currently allows direct charging. (It is special case by case everywhere else and is permitted only by an exception approved by the dean.) It permits up to 10% of the AY faculty salary to be charged to grants. The Department and the faculty member share the funds released from the general budget for this.

Another example is direct charging the full cost of tuition. MIT provides from institutional resources 50% of the academic year tuition for graduate research assistants. The tuition for graduate students working on sponsored research projects is an allocable cost to the project. If that cost were charged to the project, the institutional funds allocated for this subsidy could be used to offset the Underrecovery on the project.

It is worth noting that MIT has tried many of these ideas over the years and they have not been well received or accepted by the foundations. The limited cases where they worked were based on the foundation desperately wanting to work with a particular faculty member. Further, the administrative effort in managing these alternative arrangements are significant for the very modest return. Lastly, these direct cost arrangements were not popular with the faculty since they reduce the available funding for the direct project costs. That said, the issue of indirect cost funding has become much more significant over time so it may be worth at least revisiting these options.

Question 6: Where should the preponderance of Underrecovery lie? Should Underrecovery be fully centralized, rest entirely in the departments, or remain diffuse as it Is now?

Provost Schmidt informed our committee that at one point the Administration proposed a centralized fund for Underrecovery to which faculty could apply, but that this suggestion was met with a negative response from the schools for two reasons. First, the schools felt that they and their departments had an important informational advantage in determining which grants are most "deserving" of support. Second, there are significant differences in need by school, department, and researcher, and the schools were concerned that this would not be appropriately reflected in a centralized system.

This debate should be revisited. In particular, to the extent that researchers are unwilling to apply for Underrecovery because they don't want to overburden their departments, then moving to centralized funding could remove this barrier. The URSC should document the costs and benefits of moving to a centralized system, gather views of key stakeholders, and consider what is done at other institutions.

Question 7: How should Underrecovery be tracked and funded? On a project-by-project basis as it is now? In aggregate, as many of our peers do? Or somewhere in between?

Right now, DLC's have to get every project that does not bear the full F&A rate approved and must establish funding for the shortfall before the projects gets underway. Then, when the project begins, each DLC has to make monthly funding entries in SAP to fund the Underrecovery. These entries need to be monitored and corrected by Deans' Offices and the VPR. This process eats up an enormous amount of time for administrators across MIT.

To be clear the issue is not the tracking of Underrecovery. SAP tracks the Underrecovery and automatically clears the difference between the sponsor approved indirect costs and the cost based on MIT's negotiated indirect costs to a DLC cost center. The real issue is the funding via JVs and tracking the funded costs on a project by project basis. If we could eliminate this manual process more than half the work in the system would disappear for administrators at every level. Given that Underrecovery is

generally funded by a DLC, School, and VPR formula from standard sources, this does not seem like a value-added activity. Is there a simpler way to do it?

Question 8: Should the allocation of Underrecovery resources vary based the demands the research places on Institute resources?

Currently, the Underrecovery rate is the same regardless of the use of resources by a particular grant. Yet different grants use very different levels of MIT indirect cost resources. For example, a grant to faculty for work that they do just with their own computer has very low indirect costs other than perhaps some incremental administrative assistance. A grant which requires lots of facility space, advanced instrumentation or lab infrastructure and graduate students requires more expense that increases the level of indirect cost base.

To some extent, this disparity is reflected in Underrecovery cost-sharing rules, which require no cost-sharing from SHASS (where grants have relatively low indirect cost) and higher cost sharing from lab-based disciplines. But these lines are getting blurrier; for example, some of the most important low indirect cost funding to SHASS has been for J-PAL, a lab-based research enterprise.

Moreover, some projects have a mix of campus-based and non-campus-based resource use—yet they typically face the same demand for Underrecovery as other projects.

Question 9: How should the allocation of Underrecovery funding reflect ability to pay?

Related to the previous question is the question of whether recovery should depend at all on the ability to pay of the school, department or even researcher. There is substantial variation around the Institute in ability to pay Underrecovery charges due to both internal and external funding sources. At one level, it seems natural that both should be incorporated. Similar to government tax and spending systems, it seems sensible that there be a redistribution towards those with the most need, and away from those with the most resources.

There are some countervailing considerations, however. First, penalizing researchers for having substantial resources available acts as a potential “tax” on those researchers that can dissuade aggressive pursuit of funding opportunities. Second, a “flatter” structure for Underrecovery leads to maximum opportunities for cross-unit collaboration. As the Provost emphasized, MIT has very few barriers to working across interdisciplinary boundaries because guidelines and rules are relatively uniform. If this was no longer true, it could provide a disincentive for collaboration. For example, the “point” system at the Sloan School is a natural method for assessing departmental contributions—but makes it hard to reward Sloan faculty for work outside of that school.

Charge 2: What to learn from other institutions

The goals for reaching out to our peer institutions should be to provide insights that can guide the URSC in designing a better Underrecovery process. Gathering all of the relevant information will be challenging as some of it may be considered privileged. Efforts should be made at the highest levels of MIT to encourage other schools to participate in this effort.

We present here a series of questions that can guide the URSC as they meet with other schools:

Size of research budgets and funding sources

The URSC should endeavor to get as complete as possible data on the relevant research spending and funding sources. This would include at least:

- Sponsored research by funding source
    - Government
    - Foundation
    - Industry
    - Other
- For each category, total direct cost and indirect cost payments
- Distribution of negotiated indirect cost rates
    - Would be ideal to get these rates by funder if at all possible, but seems unlikely
- Ideally, gather this data over past decade to see how sources have evolved

Underrecovery process

The key here would be to do a careful overview with the relevant stakeholders at each university to develop a rich understanding of their Underrecovery process. This understanding should be sufficient to answer questions such as:

- Does your Institution require you to fund Underrecovery when the sponsor will not pay the billed F&A rate?
- To what extent is Underrecovery support baked into the base budget, the indirect cost revenue plan or discretionary funding?
- If your school does require you to fund Underrecovery, to what extent does the it rely on the three models outlined above (default approval, formalized application, hat-in-hand) to fund it?
- To the extent that there is a formalized application process
    - How is the cost shared across departments, schools, and centralized funds?
    - When centralized, what role do departments and schools play in determining approval?
    - What is required in the application?
    - What share of funding that is applied for is paid?
    - How well has the university stuck with ex-ante allocations versus discretionary “top ups”?
- How does cost sharing, if any, vary by investigators/departments/schools?
- Are there different rules for different categories of funders—or particular funders?
    - Does this vary by funder indirect cost rates?

Charge 3: Recommendations

The final charge for the URSC is to make recommendations for a new system for addressing Underrecovery. These recommendations should be informed by the data collected through the first two charges.

In order to provide some guidance to the URSC, our committee has developed a short set of recommendations that we think should be implemented—and could be implemented even as the URSC does its detailed work.

Recommendation 1: A no-hassle pilot managed centrally through the VPR Office

As noted earlier, for projects funded by some sponsors, MIT has imposed a "no hassles" policy funding all the full Underrecovery. MIT should engage in a broader no-hassles pilot program to see how this will impact the use of non-government funding sources. Running the pilot centrally will eliminate some of frustration faculty feel now, having to do so much work to get their Underrecovery approved and funded, sometimes speaking with their department head, their school Dean, the Provost, and the VPR Office. Under the new "No-hassle" pilot, the faculty would have one-stop shopping, provided their research falls into a "priority area," as mentioned below. VPR would execute as well as monitor, and when making decisions that require it, would consult with schools and departments.

There are important questions to answer when we think about the implications of moving to a broader no-hassles policy. Would such a policy lead to a flood of applications? Would it lead to researchers turning from government to non-government funders? Would it lead to better relations with these funders?

MIT leadership should designate three areas as "priority areas" for which there will be a no hassles policy. A priority area could be for a specified foundation; it could be for a certain type of faculty (e.g., Assistant Professors in SHASS); and/or it could be for a purpose (e.g., Diversity, Equity and Inclusion or Climate Change).

To keep the pilot manageable and simple, there should be a limited amount of the total Underrecovery funding that is devoted to this pilot—we suggest 10-20%—for 3 years or the duration of the URSC, whichever is longer. Each fiscal year, these funds would be set aside in a pool, and a website, behind Kerberos passwords would be available to display how much of this pool is committed during the year. While sufficient funding remains, faculty can apply for grants that fall under these priority areas confident that the Underrecovery will be fully funded by the pool. We also propose that a simple process be set up such that anyone who is engaging with a funder and planning use of the pool must engage with the Vice President for Research's Office so that VPR is apprised of anticipated demand, and additionally that the Provost and Vice President for Research monitor use of the pool each year. If the pool is at risk of early depletion or of being significantly stilted towards one of several priorities, the Provost and VPR can decide whether to amend the rules (e.g., reserve the remainder for the less-funded priority areas), top up the fund, or allow it to deplete for the year.

Recommendation 2: Regularize budgeting for underrecovery

A significant disadvantage for Underrecovery funding at MIT, and a source of constant difficulty for central administration, is the tension over allocating discretionary funds to Underrecovery. MIT should follow the practice of Stanford and other institutions and build Underrecovery directly into the base budget to remove this disadvantage. Of course, such a transition will take time. But MIT should start down this path.

We recommend a five-year transition towards centralized budget funding of Underrecovery. We have computed the cost of this transition as follows:

- We assume total Underrecovery will rise by 11.2%/year, the compound average growth rate over FY 2016-2019 (ignoring the decline in the unusual year of 2020). In this case, total Underrecovery will be $34.6 million by 2027
- We assume that the amount baked into the budget, $7 million, would stay constant absent any initiative of this type
- This implies that discretionary funding would have to rise from its current level of $8.5 million to $27.6 million by 2027

Under these assumptions, a five-year glide path towards full budgetary financing of Underrecovery that begins with the FY 2023 budget would require adding an incremental $4.9 million to the institute budget each year over five years, and with an expected increment of $2 million per year thereafter.

This is a rough calculation that makes two critical assumptions that go in opposite directions. On the one hand, we assume that the budgeted amount for overhead would remain flat absent this initiative. If, in fact, the budgeted amount was already going to increase at 11.2% per year to keep the budgeted allocation constant relative to amount of research, then the increment relative to that updated baseline would be only $4.5 million/year. Second, we have ignored the issue raised above of the expected rise in Underrecovery in coming years due to both to paying back past "over-recovery" and higher research costs post-COVID.

Recommendation 3: Develop a transparent explanation of underrecovery and educate faculty and students

Perhaps the most important thing that the we learned as a Committee is that the Underrecovery process is very difficult to understand—and explain. Many on our Committee had no idea, for example, that there were varying cost-sharing rules across schools. The Institute as a whole would benefit from a much more transparent process from allocating Underrecovery—and a much clearer understanding among faculty and students of how this works.

In particular, we hypothesize that there is an unnecessary reluctance of many faculty to apply for potentially high-impact funding because they don't understand that almost all applications for Underrecovery are ultimately funded. A better understanding that, behind the veil, most of those who need Underrecovery support receive may open doors for faculty to exciting new funding opportunities.

We recommend that the Provost's or VPR Office create a very simplified explanation of the Underrecovery process that makes a few essential points but does not get into unnecessary detail. This should then be presented at a public forum allowing for questions and answers for interested faculty and students. This could also be incorporated into new faculty orientation or other faculty programs meetings as needed to educate the faculty across the Institute.

Recommendation 4: Start a mini-campaign targeted to loosening the demands on unrestricted funds

As the capital campaign comes to a close, MIT should look to a new mini-campaign aimed at loosening the demand on unrestricted funds by working to really show donors the types of things that unrestricted giving funds. Essentially, providing the "warm glow" discussed earlier, using stories and communications aimed at highlighting how unrestricted giving supports high impact areas (such as research cost sharing) and Institute priorities. Looking at recent data, we noted that 21% of Stanford's endowment funds general/unrestricted purposes vs. only 15% for MIT. This is a key reason that MIT struggles to fully centrally fund Institute-wide priorities like student aid and Underrecovery. Moreover, we can clearly see that Stanford's percent of endowment supporting general purposes has grown to 21% in FY20 from only 14% in FY10, after they made significant efforts to show donors the strategic priorities that unrestricted giving supports.

Recommendation 5: A thorough review of opportunities to maximize direct costs under existing rules

Try to find opportunities to charge MIT project related costs as direct cost on sponsored programs. This includes charging lab renovations and/or space, direct charging academic year faculty salaries , other related project support cots and full tuition to sponsored programs funded by non-federal sponsors where allowable or accepted by the sponsor. Are we missing opportunities, such as foundations might pay faculty salaries, full tuition, pay to renovate space? We do some of this now on an opportunistic basis—we need to consider doing it more consistently.

Timing

We propose that the recommendations be implemented by the following timeline:

- **By December 31, 2021**
    - USRC charge is finalized, members are identified and committed, and committee is announced to the community, to begin work at latest in January 2022.
    - Planning for a mini-campaign to loosen demands on Underrecovery is underway
- **By July 1, 2022, i.e., FY2023**
    - No-hassle pilot is identified and implemented for FY23
    - Funds are secured and the 5-year transition towards building a central fund for Underrecovery has begun
    - Plans are made and materials are developed to education new faculty, who are joining in AY22-23, about our Underrecovery process
- **By August 31, 2022**
    - The URSC has completed a review of how peer schools conduct Underrecovery and has shared this with the faculty and administration
    - The mini-campaign to loosen demands for Underrecovery is publicly launched
- **By December 31, 2022**
    - The URSC has a preliminary report that includes draft responses to each of the Hard Questions and has shared this with the community for comment

    - A thorough review of opportunities to maximize direct costs under existing rules has been completed and policy updates have been drafted
- **By June 30, 2023**
    - The URSC has completed its work
    - A review of the no-hassle pilot has concluded, with recommendations of how, if at all, to adjust for FY24
    - The full faculty has had an opportunity to partake in the training on Underrecovery

The committee views this as a relative generous timeline, and with dedicated staffing the schedule could be perhaps expedited.

Supplemental Materials for RIC 8: Campus Working Spaces

RIC 8 Subappendix 1: P-CRSP Working Group Charges

P-CRSP Topic 1. Increasing Meeting Spaces on Campus: How to Share and Reserve

Charge

As the MIT community returns to campus, it is likely to see renewed—and perhaps increased—demand for meeting spaces. Today, many meeting spaces at MIT are "owned," scheduled, and maintained by a single DLC. Awareness of a given meeting space, and the ability to reserve it, is typically limited to members of that DLC. In consequence, many meeting spaces may be under- or over-utilized; those looking to reserve meeting spaces may be limited to rooms that aren't well-suited to their needs in terms of size, location, and configuration; and members of the MIT community looking to collaborate with those beyond their DLC may find it challenging to meet in "mutually inconvenient" locations.

This P-CRSP working group will explore how MIT might make more efficient use of existing meeting spaces by investigating the following:

The current inventory of meeting spaces

- Locations
- Accessibility to which segments of the campus community
- Capacity
- Amenities
- User perceptions regarding the utility, availability, suitability, and other aspects of meeting spaces in their DLC

Following completion of meeting room inventories and surveys of users, guesstimate the ideal mix of meeting room capacities, technologies and campus geographic distribution

- Low-barrier opportunities to create more (or better) meeting spaces in high-demand or under-served parts of campus
- Opportunities to better serve certain constituencies (e.g., students, DLCs with limited on-campus footprints)
- Identify constituents in the MIT community who would benefit from a system that enabled people to more easily reserve and share meeting spaces across DLCs

The kind of meeting space reservation system that would best serve the MIT community

- Role of meeting space reservations
- Evaluation and possible improvement of reservation systems
- Best and worst examples of meeting space reservation systems on campus

- Review of recent reservation system pilots
- Specs for the ideal reservation system (e.g., Open Table, spaces@mit.edu, at the door of the room)
- Establishment, management and enforcing of the reservation system
- Prioritization policies
- Types of meeting spaces to be included in the reservation system
- The effects of in-person attendee numbers and tech-needs in a hybrid world on space reservations

The policies that would make sharing meeting spaces sustainable over time

Administration of meeting spaces is currently a mix of decentralized (DLC) and centralized (School or Institute-level). Considerations:

- Financial responsibility for the maintenance when equipment or furniture is damaged or goes missing
- Responsibility for room set-up and take-down
- Policies for different types of meeting spaces (e.g., event spaces vs. smaller meeting spaces)
- Designating types of meeting spaces reservable by the full MIT community
- Barriers to increased sharing of meeting spaces across DLC and reducing these barriers

Timeline

Fall semester, 2021 for data gathering, and Spring 2022 for policy formulating and report writing. There is possibility of synergy with RIC 16 community space research and survey efforts proposed for 2021-22 academic year, so investigating this possibility will be worthwhile.

P-CRSP Working Group Roster (draft; will seek input from unit leadership before invitation):

Brian Shannon, *Project Manager, Associate Provost's Office*

Ted Johnson, *Institute Events*

SHASS faculty and staff representatives (2, including 1 from CCP)

SA+P faculty and staff representatives (2, including 1 from CCP)

SoE or SoS faculty and/or staff representative (2, including 1 from CCP)

Sloan faculty and staff representative (2, including 1 from CCP)

SCC staff representative (1)

Peter Cummings or Gus Burkett, *DSL*

Frances Neville, *Associate Provost's Office*

Alumni Events representative

Additional student and postdoc input via association consultation and RIC 16 coordination

Staff Support: OCP, TBD

Will incorporate work from prior studies and reports on specific topics, as well as in-progress initiatives, including:

- Task Force 2021
- Recommendations of RICs 8, 9 and 16
- Concurrent work of P-CRSP Charge 2
- In-progress pilots
- Other relevant studies and reports

P-CRSP Topic 2. Flex Space for Hybrid Work Schedules in Cambridge

Charge

As more members of the MIT community return to campus this fall, a great many will be operating on hybrid work schedules, and may not require a dedicated, traditional on-campus workspace five days of the week. This P-CRSP Working Group will explore the role of flex spaces in supporting the on-campus workspace needs of MIT employees, including campus populations and roles that are or could be well served by flex spaces; range of office/workspace requirements for those under EVPT, Chancellor, Provost and VPR leadership; different work styles and schedules our flex spaces would need to accommodate, understanding that the need to be on campus may vary over the course of a day, a week, a month, or the lifecycle of a project.

The working group will curate data about how in-person workspace needs / work activities have evolved:

- The level of need to participate in synchronous video meetings while on campus
- Audiovisual (AV) solutions that best support hybrid meetings
- Qualities of a meeting room layout that supports hybrid meetings
- Lessons learned from early AV pilots (e.g., in NW23)

The working group will identify qualities that would make flex spaces great on-campus places to get work done, including:

- Feedback from research on best practices, and from past experience at MIT
- Creating a sense of "neighborhood and home with flex spaces that goes beyond "hot-desking or "hoteling"
- Lessons learned from…
    - On-campus spaces that already support flex space
    - "Third spaces" like independently operated cafes near campus or employee residences
    - Co-working spaces operated by third-party organizations
- Qualities and characteristics that will be key to the success of flex spaces at MIT
- Other factors to be considered (e.g., optimal office layouts; optimal locations for flex spaces; proximity to meeting spaces; sustainable practices—[e.g., sourcing and waste disposal]; other)

The working group will draft recommended attributes of policies that would help make flex spaces a sustainable and cost-effective strategy for meeting certain on-campus workspace needs, which may include:

- Sharing of flex spaces within and/or among DLCs
- Management and maintenance of flex spaces
- Accessibility
- Reserving work stations
- Responsibility for replacement of damaged equipment or furniture
- Principles for guiding the establishment and operation of flex spaces at MIT

Timeline

Fall semester, 2021 for data gathering, and Spring 2022 for policy formulating and report writing. There is possibility of synergy with RIC 16 community space research and survey efforts proposed for 2021-22 academic year, so investigating this possibility will be worthwhile.

P-CRSP Working Group Roster (draft; will seek input from unit leadership before invitation)

Kim Sutherland, *AP Office*

TBD, staff within EVPT teams including Facilities, HR, VPF (3)

TBD, staff within Chancellor teams including DSL and OVC (2)

TBD, staff under VPR office (1)

Mark Hayes, *Director of Campus Dining* or Peter Cummings, *DSL, Executive Director for Administration*

TBD Faculty, AO, and AA representatives among five schools and college (5)

Michael Owu, *MITIMCo*

Staff Support: OCP, TBD

Will incorporate work from prior studies and reports on specific topics, as well as in-progress initiatives, including:

- Task Force 2021
- Recommendations of RIC 8, 9 and 16
- Concurrent work of P-CRSP Charge #1
- In-progress pilots
- Other relevant studies and reports

P-CRSP Topic 3. Shared Space of PI-led Research

Charge

At MIT, space for principal investigator-led research is often assigned to the PI and specialized for the type of research that the PI plans to lead. The finite volume and distributed locations of such spaces on

campus creates several operational and cost inefficiencies for the PI and the Institute, and can also be in conflict with shared values of both sustainability and broad latitude for academic inquiry. This working group is charged with understanding cost/benefit/drivers for space sharing, considering examples and determining best practices of how campus spaces for PI-led research could improve flexible responses to changes in research program needs and research group sizes, while also consistent with resource stewardship (both financial and material). The group will need to address issues regarding the understanding needs/drivers for sharing, policy/culture, finances and sustainability, including:

Key characteristics of people, spaces and equipment

- DLCs and PI phenotypes already do this; meet with and visit these groups and spaces
- Different types of research equipment, research facilities and support areas (e.g., conference rooms, offices, etc.…) where sharing can provide benefits
- Characteristics (people, usage, oversight, cost, specialty, etc.…) of space/equipment that is always shareable, always not shareable, or shareable under certain conditions
- Key features of Labs, labs, Centers, centers, programs, and initiatives that facilitate **sharing of space**
- Quantifiable costs/benefits that can be communicated to PIs/DLCs and the cost/benefit manifest opportunities to leverage sharing within the MIT research community\
- Incentives that could be offered to encourage faculty and departments to share research space via quantifiable costs/benefits to PIs/DLCs

Policies and culture

- The different processes (management arrangements) and technology that are needed to enable sharing for research-focused spaces
- Methods for individual PIs, especially new faculty hires, to maintain a sense of prioritized access to equipment
- Policies and culture changes needed to enable reservation of shared spaces (perhaps over years) with ease and trust
- Policies and culture changes would be needed for group size to flex with ease and trust

Financial

- Responsibility for payment of renovation shared spaces, equipment, support (e.g., staff, overhead, supplies, etc.…) and maintenance of shared equipment, especially the expedited repair in emergent situations
- Processes, content and technology are necessary to enable the financial support and transactions that would occur within shared spaces, for example to enable passing on variable costs to users of equipment

Stewardship/Sustainability

- The fostering of stewardship of MIT's resources and furthering of progress towards meeting our sustainability goals.

Timeline

The group's work would commence and end in the Spring of 2022, though the complexities of some issues may require the extension of work into early Fall 2022. In their work, the working group is encouraged to seek input from DLCs, post docs, financial officers, technical staff and graduate/undergraduate students (and wider community). The work may include recommendations for early experiments and/or instructive pilot programs.

P-CRSP Working Group Roster (draft; will seek input from unit leadership before invitation)

John Sterman, *Sloan School of Management*

Steve Buchwald, *Department of Chemistry*

Greg Raposa, *Space Planning, AP Office*

Gareth McKinley, *Department of Mechanical Engineering*

Caroline Jones, *Department of Architecture*

Bruce Tidor, *MIT Schwarzman College of Computing, EECS*

Anthony Zolnik, *Department of Aeronautics and Astronautics*

Dennis Grimard, *MIT.nano*

Elizabeth Lennox, *School of Engineering*

Julie Newman, *Office of the Executive Vice President & Treasurer*

Rafi Segal, *Department of Architecture*

Charles Stewart, *Political Science*

Staff Support: OCP, TBD

Will incorporate from prior studies and reports on specific topics

- MIT.nano equipment support plan
- Fast Forward: MIT updated climate action plan
- Capital renewal plan 2030
- Floor plans for:
    - Exemplar lab for new PI
    - Exemplar shared-PI lab
    - Core research facility
- Met Warehouse and Schwarzman College of Computing plans

P-CRSP Topic 4. Repurposing Our Campus Footprint with the Advent of Increased Lab Space

Charge

MIT is now committed to achieving net zero campus emissions by 2026 and eliminating direct emissions by 2050. MIT is now poised to address issues of growth, energy production, energy use and a transition to a new energy era looking forward. This P-CRSP Working Group will take on the discussion of growth and expansion of mission in a manner that rethinks space allocation. Members will be challenged to re-envision how space is used, repurposed, shared, allocated in a manner that enables MIT to grow in mission while reducing our rate of growth in square footage and energy use intensity.

Note

This topic may become an extension of or inform

- Flex space for hybrid working schedules in Cambridge (P-CRSP topic 2)
- Shared research space of PI-led research (P-CRSP topic 3)
- Space for collaboration and meeting—formally and informally (P-CRSP topic 1 and RIC 16):

Considerations of the problem boundaries include:

- Role of the use of cloud resources, including when not working on campus
- Balance and use of leased space in 02139 and MIT-owned space on campus
- Affinity groups of all types as users of space rather than owners of space, including student affinity groups
- Buildings that are most appropriate to support research laboratories, given their building infrastructure and bones
- Buildings that are most appropriate to support office and other types of low-intensive space uses
- The possible opportunity to set policy building by building or by DLC
- Growing and declining areas of resource-intensive research in which Cambridge proximity is desirable
- Expectations and standards for future labs in the context of a net zero commitment

Timeline

This working group will require Spring 2022/Fall 2022 engagement due to the complexity of understanding the growth trajectory of MIT and how that aligns with mission expansion.

P-CRSP Working Group Roster (draft; will seek input from unit leadership before invitation)

Greg Raposa, *AP Office*

Julie Newman, *MITOS*

Jon Schwarz, *IR*

Ron Hasseltine, *VPR Office*

Faculty and staff representatives from CEE, EAPS, MechE, Biology, Chemistry, ChemE, MSE, Political Science, Economics, Media Arts and Sciences, Architecture, DUSP, MTA, Math, KI, and/or MITei (12)

Staff Support: OCP, TBD

Will incorporate work from prior studies and reports on specific topics, as well as in-progress initiatives, including:

- Task Force 2021
- Future of Education
- Fast Forward MIT

RIC 8 Subappendix 2

RIC 8 Subappendix 2 describes the intersection of RIC 16: Student Living and Learning, RIC 8: Campus Working Spaces, and RIC 9: Work Succeeding.

Intersection of RICs 8, 9, and 16

There are clear and important intersections related to Campus Spaces among RICs 8, 9, and 16. These intersections are apparent in the charges detailed below:

- **RIC 8: Campus Working Spaces**
    - Increasing meeting spaces on campus: how to share and reserve
    - Flex space for hybrid work schedules in Cambridge
    - Shared research space of PI-led research
    - Repurposing our campus footprint with the advent of increased lab space
- **RIC 16: Undergraduate and Graduate Living and Learning**
    - Community “third” spaces
    - Green outdoor spaces
- **RIC 9: New Ways of Working**
    - Flexible, hybrid and remote work arrangements

RIC 8: Working & Meeting spaces

RIC 16: Community "third" spaces

RIC 16: Green spaces

RICs 8 & 9: Flex spaces for hybrid work

Note that increasing meeting spaces on campus is a focus of R
IC 8's P-CRSP topic 1, and overlaps in part with RIC 16 "community spaces" that can be different from meeting spaces; integrating "meeting" spaces with the community needs to be coordinated.

Shared principles and values

We recommend coordinating the efforts of the following to streamline the data collection, pilot studies and analysis of Campus Spaces. This coordinated effort will use the following shared values and principles (detailed in RIC 8 Subappendix 3) to guide proposed projects:

Values

- Social Equity (gender, racial, socioeconomic)
- Sustainability
- Teaching / Learning Excellence
- Community Safety / Security
- Research Vibrancy
- Data-driven / Transparency
- Strong MIT Community (affinity / Culture)
- Positive Regional / Global Change Agent
- Resiliency
- Work / Life Integration
- Campus Test-bed / Living Lab
- Intentional Serendipity / Interactions
- Nimble / Scaleable (operations and policy)

- Wellness / Mental and Physical Health
- Perceived Equity (on/off campus, faculty/staff, student/professional)
- Built Environment Stewardship (building and landscape)

Principles

- Respecting the hierarchies of existing spaces
- Providing a good mix of spaces (lab, classroom, offices and support spaces) that encourage interdisciplinary interactions
- Respecting the original structural organization of the buildings' architecture

RIC 8 Subappendix 3: Shared Principles and Values Relevant to RIC 8 Recommendations

Principles and Value statements arising from prior P-CRSP analysis of renovations for existing campus buildings, particularly academic and research buildings of mixed uses

- Respecting the Hierarchies of Existing Spaces
    - More public zones on lower floors, more proprietary as you ascend to higher floors
    - Clear and direct passageways that provide ease of wayfinding
    - Locating classrooms near vertical circulation and public toilet rooms
- Providing a good mix of spaces (lab, classroom, offices and support spaces) that encourage interdisciplinary interactions
- Respecting the original structural organization of the buildings' architecture
    - Adding transparency and natural light into the corridors (clerestory windows and views to the outside)
    - Locating technical spaces in basement and highest floors for ease of mechanical support
    - Stacking similar space types to accommodate most efficient air distribution (wet labs and toilet rooms)
    - Locating vertical air distribution along column grids
    - Utilizing high floor to ceiling heights for spaces that are appropriate (not offices)

Value Statements and Performance Criteria from TF2021 Campus Operations Working Group

Values

- Social equity (gender, racial, socioeconomic)
- Sustainability
- Teaching/learning excellence
- Community safety/security
- Research vibrancy
- Data-driven/transparency
- Strong MIT Community (affinity/culture)
- Positive regional/global change agent
- Resiliency
- Work-life integration
- Campus test-bed/living lab
- Intentional serendipity/interactions
- Nimble/scaleable (operations and policy)
- Wellness/mental and physical health
- Perceived equity (on/off campus, faculty/staff, student/professional)
- Built environment stewardship (building and landscape)

Performance Criteria

- Preparedness
- Maintain data security operational compliance
- Carbon/greenhouse gas footprint neutral or negative
- Flexibility/adaptability
- Efficient/effective space use
- Universal design/practical accessibility
- Financially sustainable/endowment stewardship
- Predictable budget/cash flow
- Improve business continuity
- Traffic/congestion neutral or negative
- Maintain/encourage inter-DLC collaboration
- Resource conservation (water, energy, carbon)
- Maintain public trust/standing
- Out-compete peers for top people and funding
- Support/allow for future models of work, learning, discovery

Supplemental Materials for RIC 10

RIC 10: Employee Development, Strategy, and Career Pathways—Detailed Report and Recommendations

Committee Members

Danielle Khoury (Chair), Glen Comiso, Ronnie Haas, Tom Kochan, Heather Williams, and Long Tran (staff)

Charge and Summary Problem Statement

The Committee of RIC 10 "Employee Development, Strategy, and Career Pathways" was charged to review the ideas on establishing integrated opportunities and expectations to develop skills for mentorship, management of teams, and career advancement through onboarding, tools, training, and support of career pathways and networks at MIT which were developed by the Task Force Phase One Administrative Processes Working Group, Workforce Operations Working Group, Community and Culture Workstream, and the Administrative Workstream.

As summarized in the charge for RIC 10, the Institute faces a particular challenge in retaining top experienced and diverse talent. Recent exit interviews and survey data indicate that the leading reasons staff leave MIT are for better career advancement and professional development opportunities. Many leaving employees feel that MIT is not committed enough to their professional development and that opportunities for career advancement at MIT are too limited, as employee development and mentorship are not deeply embedded cultural norms at MIT. This feeling is especially common among departing administrative and support staff. As a result, MIT is losing talented employees to other organizations and institutions where they can find more secure employment and more robust employee development resources. When an experienced employee leaves the Institute, it is a loss of vital institutional knowledge of MIT's history and practices and of the time and resources invested over the years to train the particular employee. Additionally, for roles that are highly specialized, are in high demand areas, or are in areas where retirements are looming, these losses have an even stronger impact.

While not noted in the charge to our RIC, we would stress that the rapid changes in technologies and work processes occurring in workplaces today and that are expected to accelerate in the future increase the importance of continuous ("lifelong") learning and skill upgrading. This makes it all the more imperative for MIT to transform its policies and practices to encourage and support workforce learning and upskilling.

In fulfilling our RIC 10 charge, we investigated the numerous ideas identified by the Task Force Phase One and crafted the recommendations below. If successfully implemented, we believe these measures will greatly strengthen MIT's employee development, learning, and career advancement opportunities for administrative and support staff, the two categories of staff included in the scope of this report.

Vision for New Career Development and Learning Approach

RIC 10 strongly recommends that MIT undertake a strategic transformation of its current employee development and training policies, practices, and programs and integrate them into a comprehensive and focused state-of-the art career development and learning program. The new approach should empower administrative and support staff to identify and pursue learning opportunities that enhance job-related skills and also provide the skills necessary for advancement, whether within or outside of their current units. Achieving this innovative and ambitious vision will require robust leadership commitment, of both time and resources, and broad collaboration across the Institute in order to effect the necessary change to our existing norms.

Recognizing our current state and with an eye toward realizing this exciting transformation, we have identified two key "next step" recommendations, which will support the advancement of our more detailed recommendations and goals. In addition, we have included a base assessment of effort and resourcing needs required to achieve each goal.

Leadership Support for Employee Development

Foremost, we acknowledge that the key factor to achieving success over the detailed recommendations included in this report is an Institute-wide commitment to strengthening MIT's employee development programs.

Recommended Next Step

- Confirm that MIT senior leadership supports this new vision and can make critical resources available for this endeavor; create a Senior Leadership Advisory Committee. Key members would be Glen Shor, Ramona Allen, and Marty Schmidt or Provost Designee. This Committee should meet at least quarterly to oversee progress towards our goals.

Timeline

This Committee should begin meeting in the Fall of 2021 to become familiar with the detailed recommendations included in this report.

Proposals for Core Concepts and Goals

This section details RIC 10's additional proposals organized into six core concepts: (1) Employ a strategic talent management approach; (2) Create an integrated learning platform; (3) Promote existing resources and structures; (4) Develop career development opportunities and pathways; (5) Enhance learning resources and opportunities; and (6) Expand mentoring programs.

Recommended Next Step

- Convene and charge a new staff development working group reporting to the newly established Senior Leadership Advisory Committee that is empowered to help drive the changes necessary to achieve our goals. This group will plan, coordinate, drive, and help implement the recommendations outlined below, including an evaluation and refinement of the resourcing requests.

- Working Group members should include Central HR (Ronnie Haas); VPF (Danielle Khoury; Long Tran); VPR (Jeannette Gerzon); Academic and other central units (Magdalena Rieb; a member of Open Learning; add other representative such as a volunteer from AAC-II and a nominee from the Support Staff Working Group)
- The working group should meet monthly and establish sub-groups as necessary to facilitate progress towards specific recommendations/goals as necessary to achieve goals.

Timeline

This group will first meet with the Senior Leadership Advisory Committee in the Fall of 2021 to walk them through the recommendations and get input on resourcing requests.

1. **Employ a Strategic Talent Management Approach.** To effect change in MIT's norms and practices and build the foundation for an Institute-wide strategic talent management approach, the Institute should:
    a. Strengthen performance development by better communicating and leveraging MIT's existing program (see https://hr.mit.edu/performance) which promotes active partnership between *managers, employees, and the Institute, to* help staff be fully engaged and reach their full potential. Performance development includes individual and team goal-setting focused on both performance and development/growth opportunities. Currently there is a wide-variety of practices related to performance development across the Institute and many units do not necessarily know of or leverage Institute provided tools. There is also a wide range in the level of focus on performance development across different units.
    b. Continue to educate managers on and hold managers accountable for their critical responsibilities around staff development; set an expectation that all managers participate in MIT's management development programs on essential topics including their role and responsibilities, performance development, goal setting, ways to have career conversations, and giving effective and timely feedback.
2. **Create an Integrated Learning Platform.** Provide the IT resources to create a learning platform that employees can access to assess their current skill profiles and that identifies courses and other online resources available to enhance their skills for their current positions and that provide pathways to other job opportunities available in their unit and across the Institute.
3. **Promote Existing Resources and Structures.** MIT currently has many employee development resources including career guidance tools, training materials, and talent management structures to establish employee development programs. These resources are not always widely known and readily available for leaders, managers, and staff to utilize. The Institute should:
    a. Curate, organize, and promote MIT policies, practices, information, and resources related to talent management and development, career advancement, internal career mobility, job-related skills development, and performance and development goals and feedback.
    b. Continue to train managers and staff on how to have productive conversations about career development planning and promote career development consultation resources.
    c. Increase visibility and guidance for hiring managers and employees in support of internal mobility on using https://hr.mit.edu/careers/current-employees.

d. Promote and expand existing career networking resources and structures for MIT staff.

4. **Develop Career Development Opportunities and Pathways.** MIT should also develop skills-based programs and guidance to help staff understand core competencies relevant to their current position and those required to pursue career development opportunities that are available across the Institute. Information related to career development opportunities and pathways should be made widely-accessible in any easy to use format in order to empower staff. Information should be simple, understandable and supplemented with recommended trainings to bolster roles and paths. The Institute should:
    a. Increase visibility of existing career pathways leveraging MIT's Job Description Catalog and curate and promote career development opportunities to all staff in order to:
        i. Empower administrative and support staff to help chart and navigate their own career paths;
        ii. Give managers and local HR representatives tools, including easy access to job guides and pathways, to aid in development discussions with their direct reports.
    b. Create a framework and visual model that can be used to show career steps, skill and competency expectations, and recommendations for learning opportunities (formal and informal) that can be applied as a template to any job function; VPF has volunteered to partner with academic DLCs and HR to develop a pilot for this model using the "Finance" job family as a test case.
    c. Enhance MIT's career development services for staff website to include more tools for individuals including editable tools and templates for individual development plans leading to advancement in current and/or future roles.
    d. **Resourcing:** Additional staffing in central HR is recommended to achieve these goals. We recommend adding up to two new permanent full-time employees (FTE) in order to model and map career pathways and to increase the capacity of MIT's career development services for staff across the Institute.
        i. Up to one new full-time staff member, with instructional design expertise who would: (1) collaborate with local subject matter experts and HR teams to create and implement the framework and a visual model across the Institute; (2) inventory, maintain, update, and continuously improve our career pathways; (3) help update and maintain training content that goes along with the career pathways and work with subject matter experts (including the recommended new project manager of learning and development, see section 6(e) below) on this content. [Alternatively, this could potentially be a two-year term position.]
        ii. Up to one new full-time staff member to: (1) shore up and increase our ability to provide individual career consultations, conduct workshops, career panels, and programs for staff and managers to build interest in and expand the knowledge of career paths at the Institute; (2) manage an ongoing networking community for peer to peer mentoring of staff across functions and roles. Additionally, we propose considering increasing the existing 80% FTE working in this space up to a 100% FTE.

5. **Enhance Learning Resources and Opportunities.** MIT should transform its existing training content and programs to a new state of the art, development-focused learning approach. In order to achieve this, the Institute should update and innovate learning expectations, offerings, and delivery, to provide staff with clearer and more focused training guidance. This will allow staff to more easily improve skills that are necessary for career advancement. A recent MIT Learning Center System quick stats summary showed that > 75% of training taken by MIT staff via the Learning Center platform was related to mandatory and compliance topics (such as Environmental Health and Safety, and Responsible and Civil Conduct), with < 25% of training related to skills-based, career development, and other courses. To bring this imbalance to a greater equilibrium and to foster a stronger career development training approach, the Institute should:
    a. Partner with an external professional service provider to perform a complete assessment of currently available training resources, categorize currently available training resources by area, function, and role, and provide actionable recommendations for MIT to implement a best in class training and development program, including the tools, technology, and/or systems to best deliver learning content.
        i. The external partner should interview and work with existing learning and training content owners across the Institute to perform the assessment.
        ii. The assessment should include an organized inventory and health evaluation (i.e., new, recently updated, needs content updating, obsolete, etc.) of existing trainings currently being delivered by business owners across the Institute, such as EHS, IS&T, VPF, IDHR, HR, etc.; the inventory should include materials on central training websites, as well as professional education courses, open learning courses, etc. The assessment should also identify gaps in current training and additional external learning and training resources that can be made available to Institute employees.
        Categories of learning include: compliance-based training related to specific roles and responsibilities (ex. EHS training); job-specific training (ex. finance training); professional development training (ex. MIT management development, L2L); career development training (ex. career skills assessment); and other learning opportunities (such as conferences, committees, professional organizations, etc.).
        iii. The recommendation for a best in class training and development tool should be a product that encompasses all aspects of profession development (training, performance development, etc.) and can be scaled up to meet all current and future uses; another valuable aspect of a tool would be the ability for individuals to add accomplishments, outside certificates, degrees, awards, etc., to their training record.
        iv. A sub-group formed by the new staff development working group should be responsible for conducting a request for proposal (RFP) to further detail the scope of work and interview and select a professional service provider for this project.

b. Encourage MIT staff to create a development plan with the support of their managers based on their professional and career development goals leveraging MIT learning resources and opportunities.
c. Promote existing templates for individuals to develop an Individual Development Plan, with the support of their managers that identifies a learning plan that could potentially lead to increased responsibilities as well as promotion and advancement opportunities.
d. Continue to promote learning and training opportunities (across many platforms and in many formats) offered by the Institute or learning and training opportunities available from outside sources, online or otherwise.
e. Enhance messaging for manager and staff of the importance of providing time for staff to participate in learning as well as the importance of applying the learning once they return from training.
f. Implement a recommended number of hours per year for staff to engage in professional and career development activities (including training, committee work, attending Institute events and programs, etc.); for example, a recommended 20 and 10 learning hours per year for managers and non-managers, respectively.
g. Emphasize in management training programs and hold managers accountable for providing experiential learning opportunities through stretch assignments, committee-work, project-based work, and other work-related options to employees as part of their development plan.
h. Set an expectation that managers take time to understand their direct reports' professional and career development needs or help them to find the resources or mentoring relationships that would help them succeed in their goals.
i. Resourcing:
    i. Funding for the consultants discussed in point a) above for the initial phase of the project.
    ii. Recommendation for up to one new full-time FTE, for a highly experienced project manager of learning and development to convene, facilitate, and oversee the development and continued growth of the Institute's new centralized learning approach. This project manager would have extensive experience in state of that art learning and approaches and would work closely with the new instructional design staff member identified above.

6. **Expand Mentoring Programs.** While there are some naturally occurring and/or facilitated mentoring relationships at MIT, there are many unmet needs and means for MIT employees to find mentors. Mentoring programs can be implemented locally, as well as centrally, in order to support a range of important needs, including those of new employees, new managers, emerging leaders, and staff invested in career exploration. The Institute should:
    a. Develop and document a scalable model of the School of Science Staff Mentoring Program with assistance from MIT HR for: (1) new hires and transfers with a peer mentor who could serve as a source of information about job responsibilities, MIT policies and procedures, and Institute organization and culture; (2) help both coaches and new staff increase their confidence and

expand their skill sets; and (3) promote a cooperative and connected working environment for all participants.

   i. We recommend implementation of a pilot at one School and one administrative unit, focusing on new employees, and under the direction of local leadership.

b. Continue to support a circle-mentoring program similar to the program that was developed in the Research Administrative Services by Jeanette Gerzon.

   i. This formal program would run annually with an annual open call for interested mentors and mentees with mentor cohorts launched. This program would focus on career development that is aligned to the business needs of the Institute with cohort groups formed based on sub-topics (human resources, resource development, finance, etc.).

c. Expand central HR's capacity to implement a mentoring pilot program for new managers and emerging leaders, leveraging the Leader-to-Leader alumni community as mentors. Goals for this program include:

   i. Build MIT leadership bench strength;

   ii. Set newer managers up for success by strengthening their performance, skill, and knowledge;

   iii. Provide managers with knowledge and experience beyond book-knowledge and 'classroom' for dealing with complex managerial issues;

   iv. Influence managers' behavior and their sphere of influence over MIT's employees in ways that lead to increased morale, productivity, performance, and problem solving from their role models;

   v. Leader-to-Leader alumni providing advice and guidance to new managers and/or emerging leaders; and

   vi. Providing MIT colleagues an opportunity to get to know more about MIT's leadership program and ideally expand and diversify a pipeline of future leaders at MIT.

d. Continue to support career development, peer mentoring, and networking programs sponsored by central HR for MIT staff who want to expand their professional network for career exploration and informational interviewing purposes.

e. Communicate the value of mentoring programs for their ability to provide advancement opportunities to diversify the community.

f. Resourcing: We recommend increasing the capacity of MIT's talent management team in order for them to take a lead in curating, creating, and supporting mentoring programs for staff that meet the needs of new employees, new managers, emerging leaders, and staff invested in career exploration. We estimate this would require 50% of an FTE. The goal would be to build and pilot scalable and sustainable programs with the goal of reviewing the capacity needed to maintain these in the long term.

What Will Make a Difference

- Leaders and managers demonstrating the importance and value of employee development through practicing, resourcing, modeling, and recognizing accomplishments in this space.

- Committed and skilled managers with the capacity for focusing on employee development.
- Managers implementing clear talent management plans that acknowledge professional development opportunities for staff while also meeting current/ future needs of MIT.
- Empowering staff by listening and supporting their career goals and aspirations.

Challenges

- Finding initial and sustainable funding for additional resources to bolster employee development efforts for the long term.
- Freeing up staff time and expertise to accomplish recommendations.
- Achieving staff buy-in regarding changes in norms and expectations for learning/training; ensuring the new approach will meet their needs and be highly utilized.
- Greater transparency requires greater communication—managers and local HR reps would need to be trained on how to have discussions with staff regarding things like core skill sets, how to help them get the experience they need for the next level role, etc.

Other Important Considerations

We aspire for a time when MIT is able to invest and support a comprehensive Talent Management System with integrated components that track progress through the employee lifecycle.

We recognize that some of MIT's current polices, processes and practices such as compensation, promotions, rewards and recognition, and annual salary review, while not directly pertinent to employee development and career advancement, also need to be examined as they also impact employee recruitment and retention.

Supplemental Materials for RIC 13: Strengthen Pipeline of Underrepresented and Minority Researchers

A Draft Proposal for an International Conference

Science and Racial Justice: Blacks and Indigenous Peoples in Science and Engineering

The Program in Science, Technology, and Society (STS), together with the Schools of Science and the School of Engineering, is in the process of planning an international conference entitled "**Blacks and Indigenous Peoples in Science and Engineering**." The topic is compelling and timely. MIT is uniquely qualified to shape and sponsor such a conference. Sponsorship would be an opportunity for the Institute to exert leadership in addressing and solving a major global problem. This proposal is presented in full support of the Institute's goals to address issues of racial injustice near and far.

The conference would feature several keynote addresses by distinguished scientists, science educators, engineers, administrators, historians of science, and philosophers. There would also be conference sessions with panelists from all ranks, including graduate students and postdocs.

Possible session topics would include: "**The Role of Blacks in Science**." This session might explore general views of past roles that blacks have played in science, and future roles that they seek to play.

Another topic would cover "**Scientific Careers in Non-academic Settings**. " This session would examine the environment for Blacks in scientific laboratories, industry, and independent research institutes outside academe.

A counterpart to this would be a session on "**Barriers to Entering the World of Science**." What are the roadblocks, from childhood on, that impede interest and accomplishment in science and engineering?

A session involving senior scientists would focus on "**Mentorship in Developing Scientific Careers**." It would identify and discuss best practices as exemplified in the careers of Black scientists who have received noteworthy mentorship, in narratives told by scientists of both races. One topic particularly worth exploring is mentorship across racial lines, and the unique challenges that it poses.

One session might focus on "**Historically Black Colleges As Feeder Institutions for Black Scientists**" This would highlight some of the work of past mentors such as St. Elmo Brady and Henry C. McBay. It would recognize these colleges and universities for their past contributions and give them incentive for future action and influence. Majority universities and colleges could study the work of HBCU's as models of best practices.

"**Black Women in Science**." This session could bring in Black women alumnae such as Shirley Jackson and Paula Hammond to speak on their experiences at MIT and elsewhere.

A session on "**Honors and Awards in Science and Engineering**" would showcase and celebrate individuals who have achieved at the highest levels of science and engineering. At the same time, it would open up discussion of the criteria used in making these evaluations and judgments, and how they affect careers and opportunities for Blacks in science and engineering.

A session on "**Blacks in the Professional Organizations, National Academies, and Learned Societies**" would address the need for greater diversity in scientific associations. The officers and Black members of these groups could explore problems of inclusion with respect to current membership and projected goals for membership recruitment.

A session on "**Funding for Black Scientists**" would bring in Foundation officers, governmental agencies, and private donors to speak about funding prospects, as well as on the centrality of funding in promotion and tenure review at colleges and universities.

Another topic covered might be "**Intervention Programs to Promote Interest in STEM Subjects in Early Education**." This session would examine current efforts to promote interest in STEM subjects starting in elementary and high schools. Science teachers and educators could be invited to present efforts and to share problems.

One topic might be "**Undergraduate Research Opportunities for Black and Indigenous Students**." This session would involve undergraduates and faculty in a discussion about the importance of early exposure to research in career advancement. Issues of race and diversity in the earliest stages of career development could emerge from such a session.

Other sessions might include "**Exemplary graduate programs in Science and Engineering**," "**Black Scientists and the Promotion and Tenure Process at Major Research Institutions**," and "**Careers for Blacks in Science and Engineering**."

While STS is projected to play a major role in the planning and production of the conference, a major role is visualized for other MIT schools, departments, and the ICEO in sponsorship, leadership, and organization. Such a collaboration offers an effective way for the administration and the faculty to come together on a project targeted to meet a vital goal of the Institute. Key people in planning this conference would be senior faculty in the School of Science and the School of Engineering, such as Paula Hammond, Emery Brown, Dale Morgan, Wesley Harris, Daniel Hastings, among others. Key people from the Schools would be Deborah Fitzgerald, Fox Harrell, David Kaiser, and Robin Scheffler, among others. An organizing committee might consist of Sylvester James Gates, Paula Hammond, and others.

Given the Institute's current support for Black Lives Matter, as expressed explicitly in President Reif's most recent letter to the MIT community, funding for events like this has been set aside and made available from the upper administration. The subject matter of this proposed conference represents a perfect fit.

Supplemental Materials for RIC 14: One Agile MIT

RIC 14 Subappendix A. Detailed Recommendations

The Project Delivery Framework has various phases—Initiation, Discovery, Execution, and Support—and normally the prior phase directly impacts the success or failure of each subsequent phase (i.e., a quality discovery leads to quality execution). At MIT the overall framework is understood and followed, however, there are opportunities to improve on this process and provide structure, guardrails, insight, and assistance that will lead to better quality projects. This need is a unique value-add that the One Agile team can provide to ensure that projects can be completed in a timely manner while meeting the requirements defined at the start of the project. Specifically, the 'One Agile Team' will focus on helping project teams succeed by providing **knowledge/education, transparency, guidance, approval, and artifacts throughout each phase of the project delivery framework**.

Modeled on the 2030 space plan and the Committee for Renovation and Space Planning (CRSP) process, the initial activities of the One Agile Team will be to undertake a process similar to the one undertaken by the Space Plan 2030 Team, which was described as generating "a framework that is flexible and responsive, providing structure without limiting the possibilities in what has always been—and most likely always will be—a complex and challenging process. Our goal is to ensure that the inevitable evolution of MIT is a guided but communal endeavor: iterative, inclusive, and intelligent." In that case, the evolution was our physical infrastructure, but we now turn to evolving our administrative infrastructure.

During the initial start-up phase of the team, we expect the following activities to be undertaken:

1. Review the catalog of existing projects that could be reasonably handled by this team; projects under consideration will be limited to those that were in the charge associated with the Task Force 2021 Administrative Workstream, Administrative Processes, Data and Research, and Campus (see **Ric 14 Subappendix B** for the list of these projects and a figure of the potential project portfolio design). We note that there are multitudes of other projects that should be undertaken, but we are mindful of the fact that MIT's resources are limited and any work undertaken should be aligned with the strategic goals of the Institute. In addition, we note that One Agile MIT should focus on projects that cross unit boundaries.
2. The Team would also be tasked with mapping the business processes to the annual cycle and align the projects against the timeline to help individuals understand MIT's administrative infrastructure at a high-level. This would be a long-term goal of the team with the goal of trying to help newcomers understand our annual cycle and business processes and systems in a single location. This will also help guide the timing of implementation of work as well as planning for stakeholder engagement with the goal of timing projects and meetings when staff are not engaged in other activities.
3. Next, the team will create a Project Plan Form for each of the projects using the form in **RIC 14 Subappendix C**, which, as an example, has been completed using some of the work of this team. A critical component of the work will be clear and precise problem statements to avoid scope creep

and to ensure that the project requirements are understood by the senior leaders who will prioritize the projects that will be approved to move forward and determine those that will be delayed or removed from consideration.

4. The projects that do not lend themselves to the project plan form, but that are viewed as strategic goals, should be broken down into their sub-parts using the scope down form, also in **RIC 14 Subappendix C**, until it is possible to state clearly what the work will address.

In addition, we recommend that the office develop a clear intake form that provides IST and others with enough information that they can accurately scope the project, develop an accurate budget based on the actual cost of similar projects with a contingency of 10-15%, an accurate description of the time that IS&T will need to devote to the project in a format that is designed in partnership with IS&T, and create a memo of understanding (MOU) similar to the CRSP model. This intake form will be reviewed and signed by the business owner, key stakeholders, and service providers, including IS&T, to ensure that there is uniform agreement on how to move forward.

Critical components of these project plans will include generating good problem statements that describe the high-level process(es) and denote result metrics: quality, cost, and time. In addition, the problem statement will likely lead to scaled-down projects that can be addressed quickly on a 30-60 day timeline. The information collected via these forms could seed future work plans, which would include further scoping problems down to the level necessary to make progress on delivering the minimum viable project. For example, the PI dashboard may be scoped down to creating a report based on the account supervisor to bypass issues related to authorizations held by administrators.

Our Committee believes that transparency in the decision-making and prioritization of projects is critical to the success of these activities. To this end, similar to the Space Plan 2030, the scatterplot of projects should be made available to the community, with regular updates regarding each project's status: idea on the scatter plot, or in one of the process steps: feasibility, development, launch, or production. Information on institute-wide needs should be collected on an annual basis to identify the major administrative needs. Once this is generated, ITGC, senior leaders, and other key stakeholders should prioritize the projects that they would like to move forward. This list should be limited to the top four to six projects that are aligned with the Institute’s priorities and strategic goals as defined by the Academic Council. Once the projects are selected, the decision should be broadly communicated in such a way that makes it clear to the community that other projects will not be undertaken until these projects have moved forward. The One Agile MIT team should carefully assess this feedback in consideration of project prioritization.

We also note that our current project management process lacks a central repository for completed projects that provides owners and users with the materials and resources necessary to utilize and maintain the systems. While the hand-off between developers and authors occurs for all projects, given the distributed nature of our systems and processes, it is not always clear where these materials reside or that they are updated and maintained as MIT continues to evolve. For example, a newcomer to MIT probably would not realize that they need to go to the web page for the Vice President for Research to

invite a visiting student to MIT. To address this issue, we recommend that thought be put into how projects move out of production and into the hands of an owner who will maintain and update the systems, as well as provide training resources and information on updates to the MIT community. As outlined in **RIC 14 Subappendix B**, we believe that this item should be included on future projects and that a web page should be created that documents past projects with key information similar to the capital projects site here.

We further recommend that the ITGC be provided with an increase in their budget allocation to account for the work and recommendations of the One Agile Team. We further recommend that ITGC allocate some of their funds to the EVPT, Chancellor, VPR, and the Schools, to allow them to participate in directing the work of One Agile. We expect that doing so would open up the possibility that Schools and DLCs would consider allocating their own resources to support projects in the One Agile Team's queue. We note that, similar to the model in place with the Department of Facilities budget that is dedicated to maintaining common spaces, these funds should not be taken from IS&T funds that are used to support existing computational infrastructure.

We recommend that One Agile include dedicated office space including a conference room on the main campus that can be used for meetings and to track projects. Based on work by Professor Nelson Reppening and his colleagues at Sloan, we recommend that this office use visual management, which benefits from physically tracking progress. More specifically, we believe that the Team should maintain a catalog of all projects, but that the group limited their initial work to a subset of narrowly scoped projects agreed upon by Academic Council. These projects should be prioritized by key stakeholders and moved through the system as the Teams capacity will allow them to successfully engage with the projects. As such, there will be a list of agreed and prioritized projects that will move through the stages outlined below. Given the importance of the projects, we recommend that Professor Repenning and/or someone familiar with visual management be engaged in the Team's early work.

One of the most appealing aspects of the One Agile MIT project is the opportunity that it will provide to the MIT administrative community to contribute to updating our administrative infrastructure. There are many ways that this could be accomplished, including the following:

1. Encouraging managers to allow their staff to serve on these committees and working groups and allow junior staff members to take on some of the duties of the members of the team. We believe that doing so will provide career development opportunities to learn and grow.
2. Although we acknowledge that the opportunity to learn new skills has intrinsic value, it may be worthwhile to consider providing a modest salary increase to the staff members who are covering for One Agile Team members as part of the cost of the project.
3. Ask part-time or retired staff members to cover for staff members on One Agile project teams, which would have the added benefit of utilizing the part-time pool, which frequently includes new parents who need to ramp down, as well as retirees.

Short-term Goals, Due by September 30, 2021

1. Define the oversight structure in consultation with the Provost, EVPT, and ITGC and establish the process for the initial prioritization process and subsequent quarterly re-prioritization and updates.
2. Obtain resources to:
    a. Create universal project intake form
    b. Collect and create the project portfolio and the annual timeline for when processes occur.
    c. Identify staff who can allocate an appropriate amount of time to standing up the team, many of the RIC 14 team members have expressed a willingness to engage in this process, but we ask that at least one staff member be allocated from the EVPT or the academic side of the house to support this work.
    d. Identify dedicated space for meetings, mapping the work, and maintaining information on projects, co-located near Atlas may be appropriate.
3. Hire a director and a project manager with experience in project management and software development, ideally with MIT experience from the EVPT and the academic side. (A draft job description appears in **RIC 14 Subappendix F**.)
4. Create a project prioritization process (i.e., determine what quantifiable information can be used to prioritize projects) and present data in an easy-to-understand graphic (e.g., most important to least important) to senior leaders. A partial list follows:
    a. Alignment to the MIT's mission
    b. Total annual cost of the current process
    c. Number of users impacted
    d. Number of steps in the process (key strokes, systems, emails, and users to complete a task)
    e. Error rate in processing
    f. Extent of previous work on the process or system
5. Collect and collate project artifacts that can be used in toolkits, including developing and documenting the project management process and supporting materials similar to the CRSP process: intake form, MOU, timeline, stakeholder confirmation.

Long-Term Goals, Due by September 30, 2022

1. Document guiding principles and obtain buy-in (perhaps post as part of project portfolio site/app)
2. Establish a cadence for senior leadership's quarterly review and input on priorities utilizing existing structures, including ITGC and other standing committees.
3. Determine the process for identifying the top 4-6 projects that will move forward under the new process.
4. Define the project management principles that will be followed. A partial list follows:
    a. Ensure systems provide flexibility, convenience, and agility for quick and iterative implementations
    b. Empower team leads to make key decisions and to say no when necessary
    c. Leverage industry trends and best practices when assessing new technologies
    d. Encourage an iterative project mindset so that projects can get implemented sooner (i.e., deliver Minimal Viable Product (MVP) and then iterate)
    e. Scope down projects and establish a dynamic work design system to ensure that the system can respond to changing circumstances.

5. Through engagement with academic, chancellor, and EVPT or their designees to identify stakeholders and form teams, and create timelines.
6. Create 'Agile Project Management' and dynamic work design class to be available for IAP.
7. Hire a second project manager with sufficient experience in data management to support our ability to correctly scope the projects, and an administrative assistant role to provide administrative and logistical support to the teams.
8. Create infrastructure, including a website, to allow One Agile MIT to serve as a clearinghouse for projects and business processes at MIT.

Operating Budget

1. Material, services, equipment, training, and meeting costs: $150K/year
2. Staffing: Short-term: director and project manager with software development skills: $310K SWEB/year, Long Term: director with MIT experience, two project managers with project portfolio management expertise (see draft job description in **RIC 14 Subappendix F**), and an administrative assistant: $480K SWEB/year. This is a rough estimate that assumes dedicated resources from IST and other offices who partner on projects.
3. Space and equipment: $200K/one time

As noted above, the projects are funded through a CRSP model with funds that are in addition to the budget below. Meaning, that each project that is approved to move forward will be submitted for review and approval with a budget for the work to be performed. In some cases, there will be a budget to determine the scope and feasibility of the project followed by a budget to fund the work to be performed.

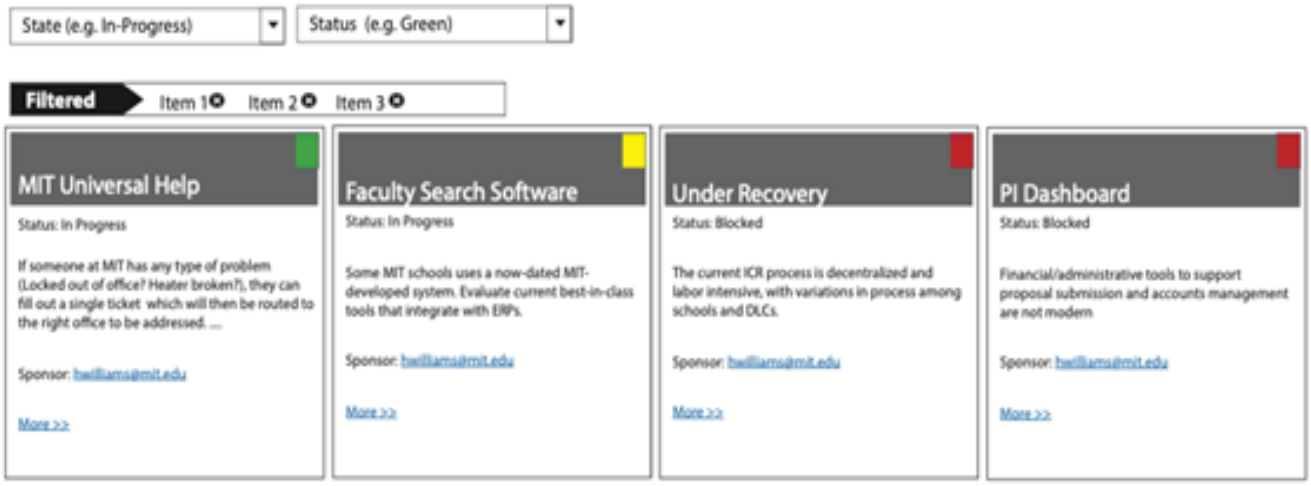
RIC 14 Subappendix B. Potential Projects

1. PI dashboard: Financial/administrative tools to support proposal submission and accounts management are not modern. Faculty may wait weeks for a busy financial officer to compile projections, in part because of data access, tagging, and management system inefficiencies across DLCs.
2. Universal ticket system: If someone at MIT has any type of problem (Locked out of office? Heater broken?), they can fill out a single ticket which will then be routed to the right office to be addressed.
3. Create a single system of record for all of MIT's agreements. MIT needs better coordination between offices for revenue classification and support (OGC, RSO, RAS, OSATT, TLO, RD, and VPF). It is confusing for faculty and their DLC support teams to deal with agreements that follow different internal processes, different systems, and different time frames.
4. Implement a new enterprise resource planning (ERP) system: MIT's system is highly customized and configured on an implementation plan that is decades old. Replace or overhaul MIT's system to

maximize the potential to gain efficiency. Consolidate student and administrative systems. Having separate databases causes unnecessary complexities with administrative processes.

5. Implement Institute-wide faculty search software: Some MIT schools use a now-dated MIT-developed system. Evaluate current best-in-class tools that integrate with ERPs.
6. Improve the MIT-internal research proposal submission process: The current five day in advance proposal submission process is frustrating for all involved: faculty, department administrators, and RAS staff for cyclic deadline proposals such as federal agency grants and contracts.
7. Implement an enterprise-wide faculty and researcher information system: MIT needs a system that allows faculty and researchers to view and update their profiles, export data for academic review, and create custom CVs and bio sketches. This could build on work done previously in the School of Engineering and maintained by Institutional Research
8. Develop a new centralized process for identifying and managing Underrecovery expenses: The current ICR process is decentralized and labor intensive, with variations in process among schools and DLCs.

Example of the possible project portfolio design



RIC 14 Subappendix C. Potential One Agile Projects, Issues to Mitigate and Opportunities for Improvement

Name and description	Issues to mitigate	Opportunities for improvement
PI Dashboard Financial/administrative tools to support proposal submission and accounts management are not modern.	Lack of prioritization, unclear requirements and business owner	One Agile team will provide *holistic project management support,* including *defining requirements, creating project artifacts*, and will help *shepherd through appropriate approval channels*
Universal Help System If someone at MIT has any type of problem (Locked out of office? Heater broken?), they can fill out a single ticket, which will then be routed to the right office to be addressed.		
Faculty Search Software Some MIT schools use a now-dated MIT-developed system. Evaluate current best-in-class tools that integrate with ERPs.		
Underrecovery The current ICR process is decentralized and labor intensive, with variations in process among schools and DLCs.		
Faculty Summer Session EB Summer EB calculation needs to be changed.		
Modern ERP MIT's system is highly customized and configured on an implementation plan that is decades old. Replace or overhaul MIT's system.	Awareness that initial assessment is underway	One Agile team will *provide transparency* regarding key Institute projects as well as status/progress
Modern Data Retrieval and Reporting Accessing and reporting on key data to run business areas is cumbersome and time consuming.		

RIC 14 Subappendix D. Project Plan Form

<table>
<tr>
<td>Problem Statement:
MIT has no overarching home or a holistic view of our administrative infrastructure. Our system for business process improvements is plagued by issues related to project prioritization, project management, implementation, transparency related to decision making, implementation issues resulting in local work-arounds, and training at roll-out that becomes out-of-date as modifications occur.</td>
<td>Target Design: The One Agile Team will:
Develop scatterplots for senior leadership consideration.
Produce roadmaps and identify resources, partner with key stakeholders.
Liaise with governance structures on project developments
Develop highly effective communication for new developments in order to keep the administrative community well versed.
Leadership Guidelines: Projects will be prioritized and the administrative community will have input on prioritization. Projects may require customization at local level. The Team will handle a manageable amount of projects at one time.</td>
</tr>
<tr>
<td>Current Design:
The current design consists of projects with poorly-defined requirements, distributive decision-making processes, limited resources, complex bureaucracy, limited dedicated staffing, and a competitive resource allocation process.
Root Cause:
Lack of project completion, consistent project ownership, adequate staffing for project management, and updates to the administrative community.</td>
<td>Execution Plan:
The One Agile Team will focus on providing knowledge/education, transparency, guidance, approval, and artifacts throughout each phase of the project delivery framework.
What did we learn and What's Next? We need to establish effective administrative process/systems management oversight that carries through process and system improvements from inception implementation.</td>
</tr>
</table>

RIC 14 Subappendix E. One Agile MIT Steady State Responsibilities and Deliverables

Phase	Category/type	Artifacts/deliverable
Initiation	Artifact	**Universal Project Intake Form:** Capture goals/objectives, audience, description, funding (including offset and ongoing costs), sponsor, etc.
	Transparency	**Project Portfolio:** A single location that provides insight into key MIT projects (includes status, priority, sponsor, etc.)
	Guidance	**Facilitate connecting people** who have similar project needs (or connecting people to an existing solution)
	Education	**Project Principles Document:** Provide information regarding how teams can help make projects successful (e.g., agility, MVP, quick decision making, etc.)
	Approval	**MOU:** Collaborate with others to create and approve MOU
	Artifact	**Executive Summary:** High level overview to be circulated to key stakeholders
Discovery	Artifact	**Discovery Toolkit:** Facilitate the use of project management tools by the project team such as requirements doc, Risks, Actions, Issues and Decisions (RAID) log, status reports, communications templates, resource allocation /budget templates, discovery findings, gap analysis template, etc.
	Guidance	**Monthly Check-Ins:** Facilitate meetings to ensure project is on track. Make recommendations if the project is off-track.
Execution	Artifact	**Execution Toolkit:** Scorecards, testing plans, budget templates, etc.
	Guidance	**Monthly Check-Ins:** Facilitate meetings to ensure project is on track. Make recommendations if the project is off-track.
Support	Artifact	**Go Live/Support Toolkit:** Support plan, go live checklist, transition plan, sponsor sign off, close out report, etc.
	Guidance	**Facilitate go-live plan** and post go-live **retrospectives**.
Steady State	Artifact	**Maintaining the project intake form** and ensuring that it is completed accurately (or provide assistance to ensure it is completed properly) **Maintain the project toolkits** for each phase of a project **Own the overall project portfolio and the catalog of potential future projects.**
	Guidance	Initiating and **scheduling recurring project check-ins** and guide projects that are struggling or are off-track Initiating and **scheduling project retrospectives** and disseminating findings to all project teams in the spirit of continuous improvement

		Being a resource when projects need help or provide assistance completing necessary project artifacts (e.g., helping to identify budget or capture goals in an Executive Summary) **Helping to remove blockers** that cause projects to become zombie projects (e.g., lack of sponsor, unclear business requirements, no budget, important, but tedious projects)
	Approval	**Prioritizing key projects** and coordinate/manage the approval process from other governance committees **Liaising with other governance structures** to speak on the project's behalf to gain support and approval
	Education	**Educating the community** on MIT project guiding principles, including the goals of agile project management and the need to make quick decisions. Provide training and level set teams.

RIC 14 Subappendix F. Project Manager Job Description

Position Overview

Reporting to the Director of the One Agile MIT (1AM), the Project Manager will provide project management expertise to support key advancements of particular importance to the Institute. Working collaboratively across all areas of the Institute (Administrative, Academic, Student, Research, etc.), he/she will oversee a portfolio of new initiatives, as well as future system and process modernization projects. He/she will also be responsible for tracking and assessing the overall progress of systems projects more broadly across the Institute to keep the Director apprised of progress and leverage cross-functional opportunities. The Project Manager will develop and maintain a reporting system across all areas to enhance long term planning and communication. He/she will act as liaison to the MIT community to gather input related to ongoing projects, programs, events and meetings as needed.

Primary Responsibilities and Activities

- Create and execute complex project work plans.
- Participate as a subject matter expert and represent/capture customer's business requirements.
- Help guide conversations with individual business units and identify opportunities to simplify legacy processes
- Manage all aspects of requirement gathering and documentation.
- Manage teams in the identification of business requirements, functional design, process design (including scenario design, flow mapping), prototyping, testing, training, and defining support procedures.
- Escalation point-of-contact for all project-related issues.
- Lead or assist resolution of critical project issues.
- Manage day-to-day activities of all team members.

- Maintain project schedules, budgets, resources, risk management, and status reports.
- Present executive level information to Steering Committees.
- In this role, you may also manage other Project Managers, Coordinators, or Specialists.
- Create quality team deliverables such as existing business processes (and identify pain points with these processes), use cases, evaluation of vendors/solutions, future-state diagrams, timeline/schedule/budgets
- Facilitate and own smooth transition from one phase to the next
- Strong background successfully managing complex IT projects, especially cloud-based systems
- Strong understanding of modern technical infrastructures and integrations
- Predict risk factors and eliminate them for the successful completion of the project.
- Frequently reporting about the project to the clients on exactly about the progress of project

Reporting

The Project Manager will report to the 1AM Director.

Requirements

Bachelor's degree required. Project management certification or successful completion of a recognized project management curriculum desired. Extensive project management experience needed, with a minimum of five years relevant project management experience, and experience in a technology environment desired. Proven ability to plan, manage, and execute system and process improvement projects with an eye to improving user experience. Ability to thrive in a fast-paced environment, to build relationships, to work both independently and as part of a team. Experience in or understanding of the academic setting desired. Excellent communication and presentation skills, and ability to foster collaboration and build consensus across diverse constituencies essential. Ability to craft and execute strategy to achieve organizational goals.

Supplemental Materials for RIC 15: Student Funding

Graduate Tuition

Graduate students are critical to fulfilling MIT's mission of advancing knowledge and educating students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century.

- PhD students play a critical role in advancing knowledge.
- Having a steady stream of graduate students from different backgrounds is key to increasing the diversity of new faculty candidates at MIT.
- Training students who will take on substantial roles in firms to address the challenges of our time increasingly requires training people with graduate degrees.
- Graduating PhD students play a critical role in disseminating the knowledge developed in our research enterprise.
- The best faculty want to work at universities with top graduate students.

MIT's top-ranked PhD programs are a tremendous asset. Many, however, are facing significant challenges coping with financial shortfalls that have gradually built up in MIT's unique funding model. It is accurate to regard this as a form of deferred maintenance that is critical to address.

Causes of Funding Challenges

A number of trends have contributed to MIT's graduate tuition difficulties. Some are under our control and could potentially be reduced/eliminated. A one-time fix may offer a permanent solution for some, while other trends are beyond our control and will require continuing efforts.

- **Growth in non-teaching/research costs.** MIT has very tightly controlled faculty lines and undergraduate enrollment, while administrative/support/service employment is not as tightly controlled. While undergraduate enrollment numbers remain fixed and tuition-paying PhD students are at most growing slowly, costs continue to increase on a per tuition-paying student basis.
- **Cost of living trends and awareness of graduate student needs.** Housing prices in the Boston area have increased. In addition, the social norm that PhD students should not have to rely on parental contributions/loans has become more established, and MIT has become more attuned to making sure that PhD students earn a living wage.
- **Decrease in federal funding. Federal support for PhD students and for research in general has not been keeping pace with tuition and enrollment increases.** The "shortfall" between what the NSF Graduate Fellowships, NIH, and several other grants pay and MIT's full (or even 50%) tuition has increased dramatically.
- **Competition with other schools for faculty and graduate students.** A rising tide lifts all boats, but strong endowment returns increase the dollar gap in per-student endowment between universities with varying levels of endowment. This can be advantageous to MIT in some engineering disciplines, but in fields such as math, chemistry, physics, biology, economics, and political science—areas in which Harvard, Stanford, and Princeton are top competitors—this is a problem. Research accomplishment is resource dependent, and departments struggle with recruiting/accomplishment

if MIT cannot provide faculty with comparable support. Attracting top graduate students also requires treating students as well as do our competitors.

- **Labor market for new PhD students.** Growth in the number of schools offering top-notch PhD training, and in the number of PhD students per faculty member has made the academic labor market for PhD students more challenging. To be competitive for scarce positions at top schools, students in many fields (especially those in the social sciences where students go straight to faculty positions and are not working on their advisors' projects) have felt the need to increase the number of years they work on their PhD, and to devote a larger share of their PhD time to their own research. The true costs to MIT of this increased time-to-completion are moderate, but MIT's tuition policies demand large transfers from departments to the GIB when students take longer to complete. This trend is forcing departments to admit smaller classes, and has made it difficult to provide students with a living wage.

The first trend leads MIT to consider increasing tuition for PhD programs. The third is important to understanding why moderate tuition increases will not solve the problem. The second trend, the graduate student part of the fourth, and the fifth lead MIT to want to also increase graduate student support. The faculty part of the fourth trend is one of the reasons why we cannot offset the per-student increases by admitting fewer PhD students. The fifth trend and the faculty part of the fourth also highlight inefficiencies that are created by MIT's current policies—charging fictitious prices well above true incremental costs has adverse real consequences such as making grant applications by MIT faculty less competitive, and punishing departments that allow students to take the time they need to reach the top of their profession.

One can hope that the first two trends will level off. MIT could decide to limit or reverse growth in non-faculty costs. The percentage of graduate students who must be provided with a living wage is naturally capped at 100%, and Boston-specific cost of living increases need not grow beyond the rate of inflation. Hence, one can think of them as deferred maintenance that can be permanently addressed with a one-time cash infusion.

The other trends will continue to some extent. NSF Graduate Fellowship tuition payments and NIH compensation limits will increase more slowly (in absolute terms) than MIT tuition. Gaps in comparison to our wealthier peers, who make larger subsidies to ameliorate these situations, will continue to grow in absolute terms. The desired size of PhD programs may continue to slowly increase. Long-term plans should recognize the need to address these trends continually so as not to create additional deferred maintenance in the future.

Goals for Tuition Reform

A positive aspect of the graduate tuition problem is that there seems to be fairly broad agreement on what MIT would like to accomplish in respect of tuition reform:

- Increase stipend levels in programs/student subgroups where stipends are currently low to minimize the number of students with income below what MIT's Living Wage calculator suggests is necessary.

- Help make grant applications from MIT scientists and engineers competitive with applications from peer institutions.
- Exploit available funding sources to the fullest extent possible. This includes charging full tuition to fellowship sponsors willing to pay full tuition and taking some smaller payments when the alternative is getting zero.
- Avoid situations in which distorted prices provide faculty/departments with an incentive to take actions that are not in the best interests of MIT and its students.

One topic on which there is less than complete agreement is on the size of PhD programs.

- Some in the administration, influenced by MIT's internal accounting, believe that increased PhD enrollment is very expensive and should be tightly limited. We disagree. We feel strongly that PhD students are tremendously important to many goals, and that the costs of running top-notch programs are largely fixed costs. We feel that much of the alleged "savings" from reducing enrollment will prove illusory. We recognize that the Institute will want to retain levers that allow it to manage the growth of PhD programs, and that growth that does not bring in revenues in line with incremental costs is a concern.

There may be some scope for free improvements if distortions can be reduced by better aligning the prices charged to departments with the costs/benefits to MIT, and eliminating wasteful transfers to outside parties, e.g., unnecessary income tax on supplements to NSF Graduate Fellowships that current policies sometimes require.

Most improvements will require an increase in GIB funding. Here, we must consider the importance of each goal, and the relative cost-efficiency of potential policies as means to reach the goal.

The salience of each goal differs across departments. Hence, optimal policies may differ across departments. Designing finely tailored policies would be unwieldy and subject MIT to scrutiny from funding agencies, but one may want to recognize the differences between departments in which PhD students are primarily supported through sponsored research, and those in which PhD students are primarily supported by internal funds and GIB.

Policy Levers

The set of policy levers available to MIT is similar across most departments. The levers could, however, be used differently in different parts of the Institute.

- **Provost-funded supplements to student stipends.** Partial stipends are a flexible tool allowing funding to be directed to particular departments, students in particular situations, etc. For example, where it would be inappropriate to base wages on employees' marital and family status, stipends can be used to help provide a living wage. Another application in which we see this tool to be particularly useful is as a means to provide summer support to students in non-lab disciplines.
- **Increases in the RA subsidy.** MIT provides a 50% tuition subsidy to students employed as RAs on grant supported projects. Adjustments to the percentage would allow MIT to address the competitiveness of faculty grant applications without impacting tuition revenues from external

fellowships. Percentages could be increased across the board, or differentially across departments, or for students in different years (although this could raise concerns).

- **Changes in treatment of fellowships providing limited tuition payments.** MIT is unusual in requiring that the partial tuition provided by NSF fellowships must be supplemented with additional funding to pay MIT's full tuition. This creates multiple inefficiencies including individual income tax payments on imputed income used to pay tuition, difficulty in attracting NSF winners (who are less sought after here than elsewhere), and departments hesitating to admit too many NSF winners despite the funding they bring. MIT could follow other schools' lead in accepting the payment in lieu of tuition or increase the central tuition subsidy. Similar comments apply to a number of other government and private fellowships, e.g. NASA, Soros, and Hertz fellowships pay partial tuition. An even more severe concern applies to underrepresented minority students supported by Ford Foundation Fellowships, which only provide a stipend. We will also recommend applying a similar tuition subsidy for students supported by NIH and other government-sponsored training grants. These vehicles provide additional means of outside support to fund graduate students and are key both for increasing interdepartmental interaction and in the recruitment of underrepresented minority students.
- **Changes in ABD tuition.** MIT is also unusual in not having a reduced ABD tuition for students in later years. For example, Harvard's tuition drops to roughly 25% of MIT's tuition in years 3 and 4 and to 6% in years 5 and beyond. MIT's tuition structure departs substantially from its true incremental costs from having late-stage students in residence. Having more third year or later-year PhD students does not create pressure to offer more PhD-level classes. Later-year students are less likely to live in graduate dorms, and they provide many positive externalities including mentoring younger students. MIT's full-tuition policy has created substantial hardships in non-lab programs where departments must make the difficult choice of refusing to allow students who have already sunk five years into their PhD to remain in the programs long enough to pursue an academic career, or failing to pay living wages.
- **Subsidize tuition for non-supported students.** MIT could potentially alter the structure of tuition so that the rates differed for students who are not supported by their adviser or provide partial scholarships on this basis, provided that this could be done in a way that was consistent with rules of funding agencies.
- **Changes to fundraising policies.** MIT's insistence that fellowship funds must pay full tuition (and payout rate policies) make the full cost of endowing a graduate fellowship very high. In a sense, this is an enormous tax on funds raised to support graduate student stipends that can make it difficult to raise future fellowship funds. Named fellowships are best thought of as naming rights. As such, MIT and individual departments have a great deal of latitude in setting prices for naming an endowed fellowship—the main constraint is stewardship. MIT could directly subsidize fundraising costs, offer matching funds to departments, or prioritize fellowships in ongoing campaigns.

Design Considerations for PhD Programs Primarily Supported by Fellowships and MIT Sources

The primary concerns voiced by departments differ greatly between departments in which students are primarily supported by research grants versus those in which students are primarily supported by fellowships and internal MIT sources. The levers that seem most appropriate also differ.

In departments in which PhD students are primarily supported by fellowships and MIT funds (which include GIB, departmental endowed funds, and teaching assistantships) the primary concerns are:

- Some students receive only 9 months of support, resulting in annual incomes below MIT's stated cost of living.
- Trends toward lengthening PhDs have left departments without sufficient financial resources to support their students. Departments have been forced to choose between undesirable options. Some late-stage students are pushed to leave before they are ready under the threat of funding cutoffs. Some have reduced the size of their incoming classes to offset the lengthening, which hurts the programs academically and saves MIT much less than the departmental internal accounting suggests because the majority of the "savings" is departments not paying tuition to the Provost. Some are only able to provide 9-month stipends or leave students to declare non-resident status and live off far below the MIT-recommended income levels.
- The increasing gap between MIT tuition and what NSF Graduate and other fellowships are willing to pay has also substantially contributed to funding shortfalls in some departments, particularly in Mathematics and Economics.
- Teaching loads are higher than at competing universities, making it challenging to attract top students and limiting student success.

Addressing the problems in the fellowship/MIT supported departments is relatively inexpensive. These departments have a fairly small share of PhD enrollment (289 in SHASS, 116 in Math, 193 in SA+P, and some in other places). Simple changes that would address most of the concerns are:

- **Instituting reduced ABD tuition rates.** Instituting a reduced ABD tuition rate of at most 10% to apply to students from year 5 on is the most pressing need for many non-lab departments. Very few students in these departments receive external support, so lowering tuition is just shrinking the circular economy in which MIT provides departments with funding that they pay back in tuition. Hence, such a tuition policy would have almost no true cost to MIT. A substantial benefit of this trivial cost is that departments would have more flexibility to allow students to extend their studies where it seems mutually beneficial, using a cost criterion (the stipend) closer to the true cost. Students would also be more able to seek outside fellowships or teaching jobs to support themselves—currently it is not worth applying to most fellowships because the limited tuition they provide is too far from what MIT demands. Departments are also better insulated against shocks in time-to-completion, reducing special requests to the Provost.

  It would also be beneficial to institute a more expansive ABD policy that reduced tuition to at most 50% starting in year 3 (or perhaps when students have fulfilled a set of ABD requirements). Last year, we believe that no SHASS students received more than half of MIT's tuition from an external source, and only 6 received even half tuition, so cutting tuition by 50% would cost zero

and cutting by 75% (to roughly match what Harvard charges) might cost about $100K per year. Again, this change would make it more feasible for students to seek outside funding. Another benefit to MIT is that teaching assistantships will be dramatically cheaper for departments, enabling them to increase TA employment where they think the benefits to undergraduate education warrant the true expense. Whether ABD tuition applies could vary by department and/or depend on whether students are supported by their advisers.

OR

Providing additional tuition scholarships to these departments. An alternative to creating reduced ABD tuition rates would be to allow departments to accommodate increased time to completion by increasing the size of the circular economy, giving departments more scholarships that provide full tuition. Departments would again only need to fundraise for stipend costs to allow longer time to completion. This solution will lead to more administrative hassles and requests for renegotiations of scholarship counts as time to completion evolves and seems less preferable.

- **Centrally funding excess tuition on NSF and other graduate fellowships.** About 60 students in these departments are supported by NSF fellowships. Centrally supporting the tuition shortfalls on these fellowships would cost about $2.5 million. It would also provide departments with a greater incentive to take NSF winners over students without NSF Graduate Fellowship support and to encourage upper-year students to apply for NSF fellowships, which could lead to some offsetting stipend savings/tuition revenues. Similar subsidies would encourage departments and students to take advantage of private foundation fellowships such as the P.D. Soros Fellowships for New Americans and Wenner Gren fellowships in anthropology. The incremental cost to MIT of extending support to such fellowships as well would be very small.
- **Summer support funding.** Many non-lab departments offer 9-month fellowships and/or teaching assistantships that do not cover a student's full cost of living. A program that provided summer stipends to students would address this problem at a moderate cost. The Provost could fund summer research assistantships for early-year students, and summer fellowships for late-year students pushing to finish their theses. The former would have spillover benefits to junior faculty, and the latter might help reduce time to completion. Even offering moderate subsidies to departments, e.g. providing 50% of the standard monthly stipend, would improve departments' competitive positions and substantially reduce living wage shortfalls. The program might help attract top students with outside fellowships, potentially offsetting a portion of the cost. These programs need not be opened to science and engineering departments, limiting their cost. Even funding full summer support to all students in the summers after their first four years would only cost about $5M per year.

In total, addressing the funding crises in these departments is not expensive, and it seems that MIT could adopt all three reforms to some degree, e.g. centrally funding tuition shortfalls on NSF and other fellowships paying partial tuition, adopting a low ABD tuition rate for students in Year 5 and above in these departments, and providing funding to departments to offer $5K RAships/fellowships to students in their first four summers.

Design Considerations for PhD Programs Primarily Supported by Grants

The primary concerns voiced by lab-based departments are different. The primary concerns are:

- MIT tuition policies make including graduate students on grant applications very expensive. The reduced competitiveness of grant applications sometimes leads faculty to lose in competition to faculty elsewhere. It reduces the size of their research groups, which reduces faculty members' accomplishment and stature. It also distorts the composition of research groups, increasing the number of postdocs at the expense of graduate students. Postdocs who come with their own fellowship support contribute no funds directly to MIT, and reliance on such (usually foreign) funding limits opportunities to bring in US citizens from underrepresented backgrounds.
- The increasing gap between MIT tuition and what NSF and others pay for fellowship support makes graduate students with NSF Graduate Fellowships (and other fellowships) less desirable for MIT faculty than for faculty at our peer institutions. As mentioned before, MIT is unique in not accepting the NSF Graduate payment in lieu of tuition and stipend among our peer institutions. Recipients of NSF Graduate Fellowships tend to be the "best of the best," and are made to jump through additional hoops (compared to other graduate students) by grossing up their salaries to include tuition and then requiring them to pay taxes on this amount. This makes MIT less attractive compared to other schools. The increased cost for NSF Graduate Fellowships, makes MIT faculty less able to support research groups of a size that makes them competitive with faculty at our peer schools. This also disproportionately affects younger faculty who are able to attract the best students, but are less competitive in attracting postdoctoral coworkers with stipend-paying fellowships.
- MIT tuition policies also discourage departments from applying for NIH and other training grants. NIT training grants cap tuition at $21K per year. This creates a $34K per year shortfall that must be covered from departmental funds. This is particularly unfortunate because NIH training grants require an extensive plan to recruit underrepresented students and often play a part in departmental efforts to improve the diversity of their graduate student body.
- The high cost of tuition, combined with the stipend levels required, is problematic in other respects. An example is graduate students supported on NIH grants. For fiscal year 2022, each graduate student costs (50% tuition plus stipend) $16,035 more than is allowed on an NIH grant. While MIT has negotiated with the NIH to allow re-budgeting, this uses nearly all of the consumables and services (M&S) budget (typically, $20-22K/student/year) and thus leaves almost no funds for these necessary expenses. Again, this puts MIT faculty at a significant disadvantage relative to their peers in grant applications, and is one reason why MIT faculty support only a very limited number of graduate students with NIH grants (approximately 30 per year).

Addressing these issues is most naturally done with the levers mentioned above:

- A larger central tuition subsidy for RAs.
- Central funding of tuition shortfalls for NSF Graduate Fellowships and other fellowships.
- Central funding of tuition shortfalls for students supported by NIH and other training grants.

The current 50% RA subsidy is entirely arbitrary, and could easily be adjusted to 60%, 75% or some other percentage to make it cheaper for faculty to include graduate student support on their grant

applications. The key is to allow faculty members at MIT to support groups of the same composition of graduate students and postdoctoral coworkers for the same costs as at our peer private institutions. One aspect of this is to make MIT grant applications competitive with grant applications from those at peer schools—we want reviewers to think of our proposals as charging comparable amounts for the amount of work that is proposed, and want applicants to be able to ask for funding for as many graduate students as their peers can ask for on a grant of a comparable size.

Different structures at different schools (e.g., having or not having ABD tuition) and different rules of different grant-making agencies make MIT's current disadvantage heterogeneous. There does not seem to be a strong argument for employing an ABD structure starting in Year 5 in lab departments. It does not align with the costs of educating students, and it can provide faculty with an incentive to keep students around for extra years, slowing their progress in fields where multi-year postdocs are the norm. Instead, it seems preferable to implement a uniform increase in the RA subsidy that applies to students in (almost) all years.

- We believe that an increase in the RA subsidy to about 75% would make our applications roughly comparable.

A 75% subsidy would raise equity concerns relative to non-lab disciplines, which may be upset that their fellowship accounts are being drained by paying four times the tuition that lab disciplines are asked to pay. Such criticism could be blunted by implementing earlier ABD rates in non-lab departments or by providing discounts to tuition payments made from internal fellowship accounts.

An additional concern is that departments will have even more incentive to game the system and classify even first-year students who are primarily spending time on coursework as "research assistants" to take advantage of tuition discounts. For this reason, the Institute could choose to only make the RA rate available to PhD students in the second-year or later.

The cost of a 75% subsidy is hard to predict. With no offsetting effects a subsidy to students beyond the first year, would cost roughly $34M per year (2400 students x $14K per student). But there should be at least three or four partially offsetting effects: (1) faculty will have an incentive to shift the composition of proposed research teams, including more tuition-paying grad students in place of non-tuition paying postdocs; (2) faculty may increase the total number of students + postdocs they propose to employ, as they would if they kept the dollar value of proposals constant; and (3) faculty may receive more funding because fewer proposals are declined; and (4) some grants such as those from the NIH are already refusing to pay MIT's tuition charges and require cuts elsewhere in grants to offset the stated charges.

Another potential concern about an increased RA subsidy is that it could become more expensive over time if the graduate student population grows. To allay this fear, the provost's office could institute limits on the number of students in each department who could receive the 75% subsidy. The initial limits could be set based on recent graduate student populations and grow at some rate, such as the historical rate of increase in the graduate student population. If departments knew that additional

growth in the graduate student population would leave them with only 50% support for the extra students, this would provide an incentive to increase the graduate student population only when it is considered important to do so.

- Central funding of NSF and other fellowship tuition shortfalls

The NSF Graduate Fellowship issues are somewhat different in the lab licenses compared to the social sciences. Two factors make the case even stronger in lab disciplines: these disciplines are incurring wasteful tax liabilities in the current system, and an additional factor that may make MIT lose NSF students to competitors is that NSF students elsewhere feel sought-after by faculty and enjoy the freedom this gives them to choose labs. Two factors that go in the opposite direction are that individual NSF fellowships pay less tuition than other grants that faculty might otherwise get to support students (whereas in non-lab scientists NSF grants are essentially the best one can hope for), and that an Institute-wide policy of waiving federal tuition would again provide most of its benefits to lab-based departments, further skewing the allocation of resources in the reform. The incremental cost to the Institute of centrally funding the shortfall between NSF payments and MIT tuition is again small. A rough forecast might be that ~80 NSF holders in lab disciplines will be first-year students who need full tuition and ~240 NSF holders will be upper-year students who are already receiving 50% tuition through the RA subsidy. The incremental cost of providing accepting NSF payments as payments in lieu of tuition would then be about 80 x 41.5K + 240 x 15K = $6.9M. If the 75% RA subsidy proposal is adopted, then some of these costs are already being covered and the increment is just 80 x 41.5K + 240 x 2K = $3.4M.

- Central funding of training grant tuition shortfalls

The NSF Centrally funding tuition shortfalls on NIH and other training grants would encourage departments to seek more such funding. Such grants are one of the few ways in which departments can seek funding for early-year students who are not yet attached to lab groups. They also facilitate interdepartmental interaction, e.g., the Computational and Systems Biology training grant, which involves faculty across multiple science and engineering departments. And they help in the recruitment of underrepresented students. PhD students supported by NIH training grants require a subsidy of about $34K per year. If 75 students are supported on such grants annually, the cost to MIT of the tuition shortfalls would be about $2.5M per year.

Summary

Over the last two decades, MIT has not directly confronted trends that challenge graduate student funding. Policies designed for an earlier era have had unintended and undesirable consequences, draining money from departments, hampering research productivity, and putting vulnerable students in difficult positions. There is a strong case for devoting real resources to address concerns as part of TF 2021.

Concerns and the impacts of different policy levers differ across departments. It seems prudent to approach problems in different ways in lab-based and non-lab disciplines, although as outlined below,

there is some overlap. Prioritized lists of the primary ways in which it seems sensible to address problems are:

- Non-lab disciplines:
    - Institute a very low ABD tuition rate of about 10% starting in Year 5, so that departments are not disproportionately taxed when they accommodate legitimate student desires to spend sufficient time preparing for academic careers and can encourage such students to seek outside funding which is more available for stipends than for tuition.
    - Centrally fund tuition shortfalls on NSF Graduate Fellowships and other foundation fellowships commonly received by students in these departments, so that departments can more actively encourage their graduate students to seek this funding source.
    - Provide resources to allow departments to provide summer RAships/Fellowships to help guarantee that student support will meet the projected 12-month cost of living.
    - Consider an even earlier step down in tuition that would reduce tuition to at most 50% for students in years 3 and above. Such cuts would eliminate some distortions and have essentially no revenue impact (if the policy is limited to non-lab disciplines.)
- Lab disciplines:
    - Increase the RA tuition subsidy to 75% for students beyond the first year. This could be phased in to examine the effects on the size and composition of grant applications and awards, which will affect the total cost. A lesser increase could also be considered if the demands on MIT's resources of achieving parity with other schools is thought to be prohibitively expensive.
    - Centrally fund tuition shortfalls on NSF Graduate Fellowships and other individual-based fellowships.
    - Extending a tuition subsidy to NIH and other government-sponsored training grants.

The policies recommended by our RIC will entail substantial costs. These costs, however, also bring with them an opportunity to appeal to donors to help address the challenges inherent in pursuing its educational mission that MIT will be recognizing. We recommend that MIT also

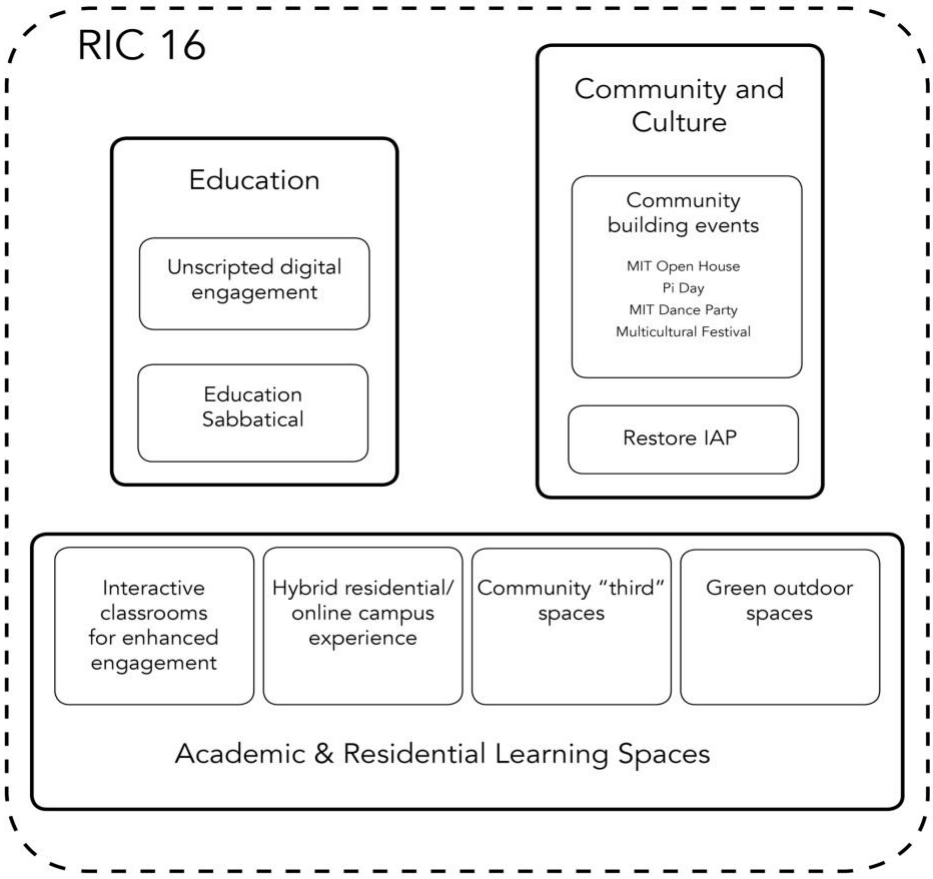
- Significantly increase the number of centrally administered graduate fellowships. This will entail a major and focused fundraising campaign.
- Seek a major donor, similar to the Moore Foundation that matched contributions to endowing fellowships at Caltech, as a means to leverage fundraising for endowed fellowships by departments. Decreasing the amount of tuition charged to such fellowships to 25% (75% subsidy) would greatly enhance the attractiveness of endowing fellowships at MIT and make us more competitive with our peer institutions.

Supplemental Materials for RIC 16: Undergraduate and Graduate Living and Learning

Detailed Report of the Refinement and Implementation Committee

Charge of the Committee

To review and recommend how best to leverage digital technologies in pedagogy (including existing best practice and lessons from remote education during the pandemic), and how best to use in-person classes, and to articulate a future view for academic classrooms, outdoors spaces, and community spaces. These ideas stem from the work of the Task Force Phase One Working Groups on **Education**, **Academic and Residential Learning Spaces**, and **Community and Culture**. The report of the RIC will also recommend (a) an implementation plan that will include the identification of who (individual or committee) will oversee and be assigned responsibility for implementation; (b) a recommended timetable for implementation which includes (but is not limited to) implementation milestones to be achieved by September 2022 and September 2023, and (c) how the results of the implementation will be evaluated. If any significant financial resources will be required for implementation of the recommendations, then these should be described. If the resources are considerable, the RIC may propose a spectrum of implementation options ranging from negligible to significant required resources.



Education

Enhance unscripted in-person engagement by integrating digital learning into MIT education

Description

So much of the magic of MIT lies in the unscripted engagement that happens among our community members, whether it be students working together on projects and problems or students and instructors engaging in seminars, labs, UROPs, … When we all return to campus, the digital delivery modes with which we now have become familiar can be deployed to deliver some of the scripted parts of our teaching; how do we take advantage of this experience to create more time and space for the interactive, engaging, components from which the magic originates? In each disciplinary context, how do we save more in-person time for the kind of intense engagement (between student and instructor, and among students) that yields moments of understanding or discovery or creation? What precursors to those experiences can be learned well when taught online? Can we fulfill our institutional mission even more effectively if we take digital delivery models increasingly seriously? What lessons can we learn from our collective experience this semester that will help us find ways to do so? How will doing so impact campus?

These are big questions that many of us will be thinking through, in different ways, in different contexts, across MIT. It is too soon to answer these questions definitively. We all need time to reflect upon our Fall experiences and look ahead. Many faculty have noted an intensified interest in, focus on, and discussion of teaching and learning. The creativity and ingenuity brought out by necessity, the focus on finding ways to engage with students and support group interactions, the thinking anew about what works and why since we cannot just teach the way we always have, are sure to bear fruit in the long term. Surely, we will be able to use what we have learned to create more engagement, more magic, when we are all bumping into each other again. That said, the best answers for how to do this are unlikely to emerge before we start doing it. The early answers emerging in our discussions include: (1) using what we have learned about asynchronous digital delivery options to reduce dependence on large in-person lectures; (2) finding ways to recreate the role of the Zoom “Chat” in enabling students to be comfortable asking questions that improve the learning experience for all, even in large lectures; (3) continuing to use Zoom to make it easier to bring in outside speakers, including alumni, allowing our students to engage with experts from anywhere; (4) continuing some Zoom office hours, as their convenience and low-barrier-to-entry nature have made them well attended (5) and, as we build and renovate buildings, adding more flexible teaching and learning spaces with a focus on the (many) kinds of engagement that only happen in-person.

We are in the midst of an intense period of experimentation and learning, with a collective focus on education, but what is the big picture? It is too soon to know. The big ideas and opportunities (or maybe many small and medium-sized ones) will emerge only as we enter the post-COVID era and begin to weave what we have learned into a new normal. We recommend that the Office of Open Learning play a

convening, catalyzing and connecting role as people across MIT develop—and experiment with—answers to these questions as we return to teaching and learning together.

Implementation plan: September 2022 and 2023

Oversight and administrative responsibility

RIC 16 proposes the creation of a one-year ad hoc committee co-chaired by the Dean for Digital Learning and the Director of the Teaching and Learning Lab. This group should play the convening, catalyzing and connecting role envisioned above. Its membership should strongly overlap with the membership of the Classroom Advisory Board described in the Academic Learning and Residential Spaces section A because one of the outputs of this group should be inputs to their work on developing guiding principles around classroom design. Other outputs could include ideas and recommendations for Department (Associate) Heads for redesign of subjects, or for the LMS Advisory Committee or/and IS&T if a case emerges for integration and deployment of some new MIT-wide software. Membership of this group should include students, faculty from all schools and the college with experience in different modes of teaching, and representatives from the Registrar's Office, the Digital Learning in Residential Education group, Sloan Technology Services, and IS&T. Ideally, many of these representatives as well as some of the Faculty would overlap with membership on the Classroom Advisory Board.

The charge of the committee would generally include:

- Gather input from Department (Associate) Heads, Undergrad and grad officers, individual instructors, and students about how instructors from different departments using different teaching modalities are employing digital delivery, particularly those used in remote teaching during the pandemic, as we begin teaching in the new normal; begin to enumerate good practices and recommendations for how digital delivery could/should be deployed.
- Focus on ways in which MIT instructors can take advantage of what we have learned from our remote teaching experience about how to deliver some of the scripted parts of our teaching to create more time and space for the interactive, engaging, in-person components where "MIT magic" originates.
- And, focus on (new?) ways in which in-person time can be utilized for intense and active engagement among classroom participants (faculty, lecturers, TAs, students) that yield moments of understanding or discovery or creation.
- Recommend best practices for utilizing digital delivery methods and for creating the engaging in-person learning experiences in a blended fashion to Departments and instructors.
- Work closely with the Classroom Advisory Board described below so as to develop a strategic assessment grounded in pedagogical motivations, needs and goals for how MIT should best augment and improve its capabilities for auto-lecture capture and streaming capability in classrooms in light of what this committee learns about how teaching in the new normal is evolving.
- May include recommending future pilots for teaching classes in new ways, for new software tools, or for digital infrastructure in classrooms.

Recommended timetable

Identify and recruit committee members in early Fall 2021. Convene and charge the group with reporting out by the end of Spring 2022.

Required resources

Administrative support will be required for the group. Faculty, administrative and student time will be necessary.

Assessment methodology

This committee will be successful if deliverables are completed by the end of AY21-22.

Proposal for a pilot project

No need for a pilot before creating the ad hoc committee above. But, recommendations of this ad hoc committee may include future pilots for teaching classes in new ways and/or pilots for the infusion of digital infrastructure into classrooms.

Education sabbatical

Description

The largest obstacle to the education advances and innovation needed (this refers to ideas in this RIC and in RIC 2 and in RIC 11 and many more) is the lack of dedicated time available to both faculty and instructors (academic teaching staff including Instructors and Lecturers) to update and improve MIT's subject offerings, to totally reimagine and revamp a subject, and to work collaboratively with a colleague from a different department toward an education goal. We see making it easier for faculty and instructors to invest time and creative energy in these directions as a necessity if MIT is to rise to the challenges of today and tomorrow.

To unleash the full educational prowess of MIT's faculty and instructors, we propose to create an Education Sabbatical, separate from senior faculty sabbaticals, to provide equal opportunities for both senior faculty and instructors to delve deeply into initiatives to substantially improve their education offerings. Rather than focusing on specific educational methods, education goals, or new technologies and pedagogies, this proposal seeks to address the root causes preventing or slowing the uptake of any and all such advances: insufficient time, resources, and institutional incentives for utilizing one's time to improve education. More details and potential obstacles are described below.

In too many cases, we often settle into an overly stable equilibrium in how we teach. Our fields evolve, our students learn in new ways, education technology changes quickly, and maintaining MIT-quality educational offerings requires an ability to adapt to this change. The current MIT system does not incentivize advances and innovation in education nearly as much as in research.

In addition, there are serious inequities between our faculty and instructors. Instructors are often at the core of our education efforts and typically dedicate a larger fraction of their time to teaching, and yet are not afforded the same freedoms with their time as faculty. This Education Sabbatical proposal will

be a major step in increasing equity among MIT's teaching staff, as Instructors and Lecturers of all ranks would be equally eligible to apply for an Education Sabbatical as senior faculty.

The Education Sabbatical is designed to be:

- **Substantial:** Complete relief from one semester-course worth of teaching. It would not release anyone from other duties related to research, service or advising. That said, there should be flexibility to propose and award different kinds of Education Sabbaticals. Perhaps in some context a half-semester would suffice to achieve a focused goal. Perhaps in other cases, where the goals are larger or broader, a semester plus a summer (possibly including summer salary) would be needed.
- **Competitive:** These are not automatically earned, but rather applied for with a short proposal. The number should have no fixed limit, but each proposal should require support from leadership of one or more departments.
- **Accountable:** Faculty and instructors will write a brief report detailing what they accomplished during their Education Sabbatical, referring back to what they proposed. In any future applications for an Education Sabbatical, proposals+reports from all previous Education Sabbaticals should be included.
- **Not guaranteed:** Applicants must demonstrate support from Department leadership, and depending on the proposal, perhaps School- or Institute-level support with an additional letter.
- **Open only to Instructors and Senior Faculty:** Pre-tenure faculty would not be eligible as (1) they already have a semester of junior faculty research leave with more benefits and fewer responsibilities, and (2) there are benefits for pre-tenure faculty to teaching a subject with a stable curriculum several times.

We can provide many examples for good uses of an Education Sabbatical. Some may involve substantial updates to a core subject that bring in new knowledge from a rapidly evolving field while others may involve design and development of a completely new subject or educational initiative. Many of the most interesting examples we have thought of involve co-developing a subject jointly taught across departments, schools, and/or centers. Hence, some Education Sabbaticals could involve spending a semester in a department other than one's own for the purpose of designing such a subject. Learning how to co-teach with a colleague from another department in the service of an important educational goal could be the outcome of some Educational Sabbaticals.

We think that the availability of competitively awarded Education Sabbaticals will most rapidly improve how MIT achieves its education mission at any time, but there is a particular opportunity to channel the new ideas and energies that can flow in this direction as we come out of the COVID pandemic.

Implementation plan: September 2022 and 2023

Oversight and administrative responsibility

Oversight should be Provost and Deans. Administrative responsibility within the Provost's Office, or could sit with the Vice Chancellor. There will need to be an annual call for proposals, and then a

committee of faculty charged with prioritizing the proposals received. Perhaps then Deans' Council reviews, before Provost decides.

Recommended timetable

Start immediately; Pilot this by issuing a call for proposals in late Fall 2021, seeking proposals for Education Sabbaticals for Fall 2022 or Spring 2023.

Required resources

Some larger departments already do Educational Sabbaticals although not by name—they give a colleague a semester of teaching relief for purposes along the lines we are describing. For these departments, this proposal formalizes something they already do, and makes it possible for their faculty to make educational impacts with a larger footprint than just their own department. Should be no resources needed in these cases. Resources would be needed if summer salary is involved; key question is whether requests for summer salary are or are not allowed as part of an ES proposal. And, resources are needed in smaller departments where replacement teaching must be hired.

Assessment methodology

Requiring faculty/instructor to write a report after the ES, including reporting on what they have accomplished with reference to their proposal, is important. All these reports should be read by the faculty committee prioritizing next year's proposals; they should also be available to the Provost, the relevant Deans, and the relevant Department Heads. This should allow experience as to which kinds of ES proposals yield good outcomes to accumulate.

Proposal for a pilot project

1. Oversight and administrative responsibility: See above
2. Recommended timetable: See above
3. Required resources: See above
4. Assessment methodology: See above

Academic Learning and Residential Spaces

Interactive Classrooms for Enhanced Engagement

Description

Develop a working group composed of faculty, staff, and students to spearhead the design of classroom spaces to integrate more interactive teaching spaces (e.g., more modern and much more flexible descendants of the TEAL classrooms for active learning modalities; seminar spaces that promote interaction with movable furniture) and/or set a strategic, intentional plan for academic spaces. Adapt classrooms to future needs of learning through a strategic, high-level lens.

- A working group composed of faculty, staff, and students to spearhead the redesign of classroom spaces to integrate more interactive teaching spaces (e.g., active learning classrooms, seminar spaces that promote interaction with movable furniture)

- Group would work with range of stakeholders to help set a strategic, intentional plan for academic spaces
- By focusing specifically on learning spaces, group could be more responsible to change (e.g., new models of learning post-COVID)
- The "Magic of MIT" is real engagement, building together, learning together
- Adapt classrooms to future needs of learning through a strategic, high-level lens

Implementation plan: September 2022 and 2023

RIC 16 proposes a standing Classroom Advisory Board, jointly charged by and reporting to the Chair of the Faculty, the Vice Chancellor, and the Chair of P-CRSP. The board would be co-chaired by a Faculty member and the Registrar. General membership should include students; Faculty selected such that there is at least one member from all five schools and the College, and so that the Faculty membership of this Advisory Board has at least one overlap with the membership of the Committee on the Undergraduate Program (CUP) and of the Committee on Graduate Programs (CGP); and representatives from the Registrar's Office, Provost's Office (i.e., staff campus planner from P-CRSP?), the Digital Learning in Residential Education group in Open Learning, the Teaching and Learning Lab, MIT AV, MVP, and Facilities.

Charges for the Advisory Board may include:

- Developing guiding principles around classroom design
- Drafting short- and long-term strategic plans that include budget impacts/requests
- Coordinating key stakeholders such as AV, MVP, Facilities, ODL, CRSP, and the Registrar's Office
- During its first year, review the landscape of auto-lecture capture and streaming capability in classrooms. Working closely with the ad hoc committee described in Education A, develop a strategic assessment grounded in pedagogical motivations, needs and goals for how MIT should best augment and improve these capabilities. Develop and deliver long term recommendations that include specific hardware, software, infrastructure, ownership and investment options. This work should form a part of the short- and long-term strategic plans referred to two bullets above, and will require and motivate the coordination referred to one bullet above.
- Advocating for resources with P-CRSP and R-CRSP for space builds/renovations and with the Provost for technology infrastructure. We anticipate and recommend that R-CRSP and P-CRSP will each invite the co-chairs of the Advisory Board to attend some of their meetings as agenda items related to classrooms and classroom design arise.

Recommended timetable

- Codify advisory board charge with sponsors, identify administrative support, and identify/recruit chair(s) and members: Fall 2021
- Convene and charge board by November 2021.
- First deliverables (guiding principles, strategic priorities, methodology, timeline(s), multi-year strategic plans) in Spring 2022.

Required resources

- A combination of project management and general administrative skills are needed to support the work of the committee. An administrative headcount (or portion thereof) would have to be identified and resourced to support the board
- Faculty, administrator and student time

Assessment methodology

- Some deliverables such as guiding principles and strategic plans will be obvious.
- Strategic plans will be assessed and adjusted on a yearly basis

Proposal for a pilot project

A short-term pilot is not necessary if a standing committee is appointed.

Hybrid Residential/Online Campus Experience

Description

The undergraduate residential education experience is a fundamental element of MIT's mission. Students, faculty, and staff greatly value the vast array of interactions on campus—in classrooms, labs and workshops, in residential dormitories and across the campus. While there is strong interest from undergraduates to maximize time on campus, there is significant value in considering the various ways that certain students may expand their perspectives and enrich their learning from other contexts away from campus. There is also important value in considering how MIT undergraduates could enrich their knowledge of and empathy of others—disadvantaged and under-resourced individuals, marginalized groups and sectors of society—both domestically and internationally through experiences beyond the "MIT bubble." The first part of this recommendation aims to diversify the MIT undergraduate experience with an array of high quality educational opportunities that strategically augment residential education.

However, there are significant challenges to implementing an educational experience for large numbers of undergraduate students away from campus. The primary challenge is the lack of broad interest of undergraduates to spend time away from the MIT residential educational experience. The world class education offered by MIT professors coupled to the particularly strong traditions and unique residential culture of the MIT campus make our institution what it is. These extraordinary assets are important factors that result in only small numbers of undergraduates interested in spending time away from the campus. The great majority of undergraduates do not consider time away from campus as contributing a net benefit to their education and overall university experience.

The second part of this recommendation aims to provide an enriching, short-term, residential experience to non-MIT undergraduates by providing the mechanism and resources to spend some short period of time on campus during the regular academic year. This new cohort could be engaged online before and after their residential experience at MIT.

However, the necessary resources of various kinds—faculty teaching time, residential space, administrative management, cost to attend—would be significant.

These two recommendations are related. If the first portion of this recommendation is successful, greater numbers of undergraduates spending more time off-campus would allow for the accommodation of a new cohort of non-MIT students for an intense short-term learning experience on campus.

Therefore, the committee has elected to focus on aspects of this recommendation that are both practical in the short term and serve dual purposes in the long term. As a result this recommendation has been separated into two distinct proposals:

1. Extended off-campus educational experiences for MIT undergraduates
2. Short-term educational experiences for guest student cohorts

Each will be described separately below.

Extended off-campus educational experiences for MIT undergraduates

While the numbers are small, some MIT undergraduates *do* consider that time away from campus benefits their MIT education. These students fall into three categories;

1. Students who have an interest to spend time at unique scientific, research and industrial facilities not owned by MIT, such as CERN, SpaceX, Conservation International Field Station in the Amazon;
2. Time spent working with communities in the US and abroad including first nations in the US, Canada and elsewhere, marginalized and Black, Indigenous and People of Color (BIPOC) communities in biodiversity hotspots and more;
3. Time spent working in policy environments at the local and Federal levels of the US government or in an international non governmental organization, such as the World Bank, the International Monetary Fund or other.

To serve the best interests of students and ensure a substantial augmentation of an MIT education, these opportunities should be carefully selected and managed by particular offices at MIT (see below). Also, there may be untapped potential to align closely with emerging and expanding MIT priorities like equity in the US and abroad and climate change. Every experience should be reviewed and approved by MIT and serve as a substantial research experience. A faculty mentor should be assigned to each student undertaking this program.

The committee is well aware that this part of the recommendation aligns closely with the development of Experiential Learning Opportunities through the Vice Chancellor's office and is central to the work of MISTI. This committee, RIC 16, is also aware that similar ideas are being discussed by RIC 2.

Short-term educational experiences for non-MIT undergraduates

Punctuated, high quality educational experiences hold the promise of substantially affecting a young person's educational trajectory. Discussions about MIT expanding its reach to offer greater numbers of students the highest quality educational content have been ongoing for many years. Doing so online through OpenCourseWare and MITx has been very successful. This recommendation from Phase One of the Task Force describes a scenario in which MIT would offer a short-term residential experience for university level students from across the US and abroad.

Second, in the longer term there will be surplus capacity of beds in undergraduate dormitories if we need to pause renewal for a period of time. With the recent addition of New Vassar and when the soon to be completed renovation of Burton Conner is completed, the capacity will exceed demand by approximately 300 beds. This overcapacity offers the opportunity for a cohort of students to come to MIT for a punctuated, high quality educational—and potentially—research experience.

This could yield a positive revenue stream, though likely small relative to MIT's overall revenue flows. One of the residence halls would dedicate a portion of their rooms and public spaces to the incoming non-MIT cohort. Further work would be required to develop plans for the curriculum and educational experience offered to these visiting undergraduates, and to identify which department(s) would take responsibility for teaching them and/or developing projects that would be suitable for a specific cohort visiting from a specific other university; substantial engagement with the university from which these students come would also be needed

Implementation plan: September 2022 and 2023

Implementation of **extended off-campus educational experiences for MIT undergraduates.**

Oversight and administrative responsibility

Oversight of a set of high quality, curated research and learning experiences away from campus should be centralized in one office both for ease of administration and accessibility and communication to students. Currently, the group best positioned to do this is the Office of Experiential Learning (OEL). If the experience is international, the MISTI should also be involved.

Recommended timetable

Timeline for expanded off-campus experiences begins with Fall 2021 and should be launched with a comprehensive collection of data related to students' interests to pursue experiences off-campus. The survey could then be used to launch conversations between the Office of Experiential Learning and others about the best trajectory for this expansion.

Required resources

Beyond the resources already allotted to the OEL, this recommendation may or may not require additional resources depending on the desire to expand experiences away from campus.

Assessment methodology

Any assessment should be managed by the OEL in partnership with the Teaching and Learning Lab and Institutional Research.

Proposal for a pilot project

We propose that a pilot is not needed for the purposes of this recommendation. The OEL and others should coordinate a strategy for the expansion of off-campus experiences.

Implementation of **short-term educational experiences for guest student cohorts.**

Further conversations beyond the scope of this report need to occur to explore the viability and interest of this recommendation.

Community "Third" Spaces

Description

Common spaces are a critical element in the MIT experience that significantly contribute to the community of the Institute. Many Institute buildings, both residential and educational, feature community spaces that are well-used and well-loved. However, campus communities also feel that community spaces face challenges at MIT; they are not present in sufficient numbers and do not always perform to a desired level of comfort or utility. Nor is the process for creating such common spaces in new campus construction or renovation necessarily always clear or participatory. Additionally, maintenance and supervision of common spaces suffers somewhat from their 'in between' status. Given that common spaces do not always have a clear academic or functional purpose, it is not always evident which office at MIT is or should be responsible for maintaining and improving common spaces. And the incremental development of the MIT campus has led to some departments or areas of campus being well-served by common spaces, while other areas or buildings on campus remain underserved. In other words, common spaces at MIT are popular and desirable, but they currently underperform in terms of their quantity and quality; in the openness and participatory nature of their creation; and in their administrative location in the hierarchy of MIT spaces. We suggest resolutions for all three of these areas of concern, detailed as recommendations further below.

A series of convictions motivate this subgroup's recommendations. We believe that community spaces will benefit in some cases from being student-run spaces, with students driving the creation and management of these spaces. In other cases, the community space planning, design, creation, and administration process may be different. In all cases, an administrative backbone will be critical to the continual success of community spaces. We suggest the following community space principles as guides for future open space creation and stewardship. Future community-wide common spaces should be in central, visible locations, rather than hidden on upper floors where few recognize them as open areas. Other common spaces may in some cases be more appropriate to communities associated with particular departments, while some common spaces should have no specified academic or residential purpose, permitting the wider community, or a subgroup of that community, to use them freely. Additionally, common spaces should have a variety of purposes. Some should allow for individual work, with private spaces and phone booths. Others should include collaboration and teamwork spaces. In general, we feel that all common spaces, whatever community they serve, should enhance belonging through welcoming communities where relationships flourish. Additionally, common spaces should emphasize naturally building connections between different segments on campus, such as undergraduate and graduate students. We also anticipate that the survey and participatory processes that we recommend will generate a more fully resolved set of values to guide the creation and stewardship of MIT common spaces.

MIT has a rich inventory of common spaces, but they are unevenly distributed across campus and may not be serving all areas of the MIT community equally. Common spaces exist at a variety of scales; some

are open mainly to students in a single degree program, while others are open to the entire community or to subgroups within the MIT community. Some are open only to residents of a single floor, while others are open to residents of an entire building, or to all residents on the campus. Some spaces are new and well-maintained, others are poorly-maintained and even partially or entirely inaccessible. The overall inventory of common spaces is decentralized and not fully available to the MIT Community. To redress this situation, **we first recommend that MIT conduct a comprehensive survey, to be conducted by trained and professional MIT staff in consultation with a committee comprised of students, faculty, and staff, during the Fall of 2021** to analyze the location, quality, and utilization of community spaces, and that this survey be published as a report available to the MIT community by February, 2022. This survey will provide substantial clarity on the "state of MIT common spaces" in the immediate post-COVID era.

MIT has been engaged in the active development of new common spaces in recent years, but the process by which these common spaces have been created has been ad hoc, dependent on specific circumstances like a new building or shift in activities. As a result, common spaces are not always created in a fully participatory manner, consistent with their intended use by members of the MIT community. To redress this situation, we recommend that MIT institute a clear process for participatory planning and design for common spaces at the "super-departmental" level, in other words for common spaces that will serve all users of a specific building, or the entire MIT community. This process could include, for example, a requirement that all future building projects include specific consideration for community spaces during the ideation phase. This could even be formalized as a commitment to designate a percentage of the available budget to common areas. Participatory planning and design of common spaces will by necessity involve collaboration with stakeholders around campus—students in particular—to identify specific opportunities and approaches to community building through common space design. Such a process might also generate novel ideas for the management of common spaces around campus by a wide range of groups. Below, **we suggest that a committee of different parts of the MIT community be convened in the Fall of 2021 or Spring of 2022 to develop a set of recommendations for the mandatory, required participatory planning and design of future community spaces** at the "super departmental" level at MIT.

Due in part to the diverse methods by which they are created, MIT common spaces are subject to a decentralized set of administrative measures for their supervision, maintenance, and funding. Resolving a sustainable method for maintenance and improvement of common spaces is equally as important as planning, designing, and creating them. **We therefore recommend a review of the administration, oversight, maintenance and improvement of MIT common spaces in the Spring of 2022, following upon the inventory of community spaces to be conducted in Fall 2021.** The subgroup feels that common spaces are too important to be left in a kind of administrative limbo. As more common spaces are created, their maintenance, improvement, and overall stewardship will become increasingly important. It is possible that existing MIT administrative mechanisms or offices are not the ideal platform for such stewardship. We therefore recommend that MIT should also **create an ongoing committee on common spaces that will serve as a sounding board, ombuds office, and community convening space for dialogue around common spaces**. We provide further details on a process for the creation of such a committee below.

Implementation plan: September 2022 and 2023

We recommend **four implementation steps** (noted in bold above). Three are ad hoc committees to be convened in the 2021-22 and 2022-23 academic years. The fourth is an ongoing continuing committee. **First**, in Fall 2021, we recommend a comprehensive survey of common spaces at MIT, conducted by professional staff in consultation with a MIT community committee. **Second**, either in Fall 2021 or in Spring of 2022, we recommend that either the above community committee or a newly convened community committee develop a set of recommendations for mandatory participatory planning of future common spaces at "super-departmental" levels of MIT. **Third**, we recommend, either in Spring or Fall of 2022, a committee to review MIT administration procedures for community spaces, and to recommend ideas for improved administration. This committee's work could be combined with the participatory planning committee's work if that was appropriate. **Lastly**, we recommend a continuing committee composed of MIT community members (faculty, students, and staff) to provide a sounding board/ombuds office for concerns, ideas, recommendations, and other issues relating to community space at MIT. This committee would meet monthly or so on a continuing basis, with two or three-year terms.

Oversight and administrative responsibility

Oversight and administrative responsibility is a significant issue for community spaces at MIT. This issue will be addressed by the ad-hoc committee on administration (Spring or Fall 2022) recommended above as Step 3. This committee will consider and make recommendations for management procedures for maintaining spaces, including funding, custodial services, etc.

Recommended timetable

The recommended timetable for Step 1 (inventory of community spaces ad hoc committee) is recommended for Fall 2021. Step 2 (ad hoc committee on participation recommendations for community spaces) is recommended for Fall 2021 or Spring 2022. Step 3 (ad hoc committee on administration and management of community spaces) is recommended for Spring or Fall 2022. Step 4 (ongoing ombuds committee for community spaces) is recommended to commence upon or towards the conclusion of the ad hoc committees, e.g., beginning Fall 2022.

Required resources

The recommended committees (both ad hoc and ongoing/permanent) would benefit from institutional support in the form of administrative assistance for scheduling, coordination, and other communication. Similarly, this administrative assistant might contribute to editing and composing reports for the ad hoc committees and annual reports for the ongoing committee. Previous committees relating to institute space have benefited enormously from administrative assistance from the MIT Office of Campus Planning and Office of Facilities, and perhaps these offices might contribute to staffing these committees as well.

Assessment methodology

These ad hoc committees could ultimately share their reports with the MIT community as well as perhaps with MIT faculty or administrative bodies like the Faculty Policy Committee, Academic Council,

or Provost's Office. The exact reporting structure and administrative location of the ad hoc and ongoing committees on community space remain to be determined.

Proposal for a pilot project

Three new buildings and/or community spaces will in effect serve as 'pilot projects' for the future of MIT community spaces. The first is a new (as yet unnamed) community space on the Infinite Corridor near Lobby 10, in design in 2020-21 and (perhaps?) to be constructed beginning Fall 2021. Two additional buildings, the Schwarzman College of Computing and the new (as yet unnamed) Graduate dormitory on Vassar Street, provide possible 'test sites' for new approaches, concepts, or administrative arrangements of community space at MIT.

Oversight and administrative responsibility

Each of these three 'pilot' projects is administered by a different administrative or academic branch of MIT (Office of Student Services, Provost's Office, and Schwarzman College). Given this administrative diversity, it is even more important to have ad-hoc and ongoing committees to span the MIT community and to engage with these diverse entities, all of whom will be creating community spaces at MIT.

Recommended timetable

Engagement with the three pilot projects should be very active in 2021-22, since these projects are all in the design phase at the present time. Whether these projects will remain open to committee input in 2022-23 remains to be determined.

Required resources

The key resource for committee engagement with these pilot projects is administrative commitment from the three entities (Office of Student Services, Provost's Office, and Schwarzman College) administering the design of the larger facilities.

Assessment methodology

As a follow-up to the completion and initiation of community use of these spaces, the ongoing committee on community spaces could work with the Office of Campus Planning (or perhaps OSS, Provost, or Schwarzman) to administer a survey for community space users, perhaps during the 2023-24 academic year or whenever the facilities are complete. Regular surveys of users of community space should be an ongoing function of the committee on community spaces.

Green Outdoor Spaces

MIT in the year 2021 is in the midst of substantial change in the design, philosophy behind, and intended usage of its open spaces. Following a decade of large-scale investment in campus design and development, a variety of new open spaces of three types have either been or are nearing completion. These open space types, fortuitously completed either immediately before or during the TF2021 process, serve as testbeds for the future of open space design at MIT. In short, this subgroup recommends that these three types of open spaces, or combinations of two or more of these types, be considered as models for the future redesign of existing open spaces, and the design of all-new open spaces, at MIT.

The first, **a new type of campus open space that may be called a "signature open space,"** is nearing completion in the Kendall Square area of MIT, adjacent to the current MIT Medical Building and the new Eastgate housing. This open space will include hundreds of new trees of varied species, contributing to biodiversity and disease resistance, and just as importantly, has been designed to accommodate a range of programs and activities, administered by the new Office of Open Space Programming, directed by Jess Smith (openspace.mit.edu). This open space will be maintained to a high standard by a private entity, not MIT Grounds, and will serve the MIT and larger Cambridge community in tandem. A dedicated staff will execute events, coordinate logistics, ensure safety, and accept ideas for activities from the public. Pilot events have already begun and will resume once the campus is safely reopened from the COVID-19 pandemic. Signature open spaces represent critical and high-visibility opportunities to pilot new design and activity standards for open space. While potentially few in number, the high-visibility, high-traffic location of the Kendall space makes it a paradigm for the future of signature open spaces at MIT. The Volpe open space, still in the design process, represents the potential next step for the design of signature open spaces at MIT.

Given that MIT is a mostly-developed campus, **a second model of open space for the future are those "found open spaces" that already exist,** but are likely underperforming, limited in use or purpose, and underused. Transformations of such open spaces have occurred at a slow rate in tandem with redevelopment of nearby sites. Perhaps the best recent example is the North Corridor or "Outfinite Corridor" between Buildings 9, 12, and 13. This space was redesigned in tandem with the Nano Center (Building 12). A service alley and parking area was reconstructed as a multifunctional, people-oriented place befitting its location at the center of campus and high level of pedestrian activity. Over 100 trees and landscape were added with the purpose of providing shade, comfort for users, and stormwater filtration. This space was designed as high-performance, high-usage landscape and is an excellent example of a "found space," already existing but woefully under-designed (and formerly overused by automobiles and service vehicles). Completed in 2018, the North Corridor provides an inviting outdoor route between campus destinations, a place for programs and events; a demonstration and functional landscape for sustainability goals; and a building service corridor (its sole previous use). It is maintained by MIT Grounds. Many such found spaces exist on the MIT campus, awaiting transformation to diverse social, environmental, and functional uses as occurred in North Corridor. Amherst Alley is the most visible example but there are many more. The challenge for future, discussed further below, is linked both to cost and to the lack of a current master plan for landscape and open space at MIT.

Not all open space improvements need be costly or associated with major campus development projects. **A third model of future open space is small-scale and experimental in nature, using the campus as a testbed and living laboratory for learning.** One such "small-scale lab space" was completed in 2019 on Saxon Lawn (site of former tennis courts) adjacent to Walker Memorial. This space, called "The Hive" and managed by the Office of Sustainability (OS), is a small pollinator garden and outdoor gathering space. Students built the space's furniture. According to OS, the Hive is a testbed that encourages student learning about caring for one's self, community, and the planet (https://sustainability.mit.edu/ hive-garden). Another such small-scale lab space is a community garden in planning stages for a site between Westgate and Tang Hall, also on the site of former tennis courts.

This space replaces another community garden displaced by the College of Computing. The garden can help to address food insecurity among users, with a portion of the food produced going to Cambridge And Somerville Programs for Addiction Recovery (CASPAR). Small-scale open spaces have a bright future at MIT. By definition they are inexpensive, quick to construct, and can be administered and serve diverse populations at MIT. Such “lab spaces” hold promise for testing future innovations in not only sustainability, but community culture, arts, and landscape design as well. Such spaces should be broadly encouraged, perhaps stimulated by seed fund competitions analogous to that for Radcliffe Quadrangle at Harvard.

COVID-19 caused the evacuation of much of the MIT community from campus for well over a year, but the pandemic also stimulated creative thought for the use of outdoor open space in all seasons, to serve critical needs of the student community that could not be met safely indoors. Such “tactical urbanism” has been broadly promoted nationwide to meet community needs through spatial transformation at low cost, sometimes for only short periods of time. At MIT during the pandemic winter of 20-21, catenary lighting and outdoors seating, “lawn” games, light projections of artwork onto buildings, and active use of the often underused Stata Center Outdoor Amphitheater permitted students opportunities to safely assemble and socialize at a time when such activity was not permitted indoors for epidemiological reasons. Previous “tactical urbanism” has included the placement of Adirondack chairs for relaxation and socializing in various campus open spaces, including the above mentioned North Corridor Open Space. Tactical urbanism is by definition not always pre-planned, nor the need for it foreseeable. Openness to innovation and flexibility of approach are hallmarks of successful tactical urbanism and the MIT campus provides many opportunities for such efforts.

Tensions exist in the design, development, and implementation of future open spaces at MIT. Current best practice recommends that open spaces function in multiple ways: first and foremost, as community-building and placemaking spaces for the diverse community that is MIT. With global warming a pressing and likely permanent challenge, designing open spaces to serve as sustainable landscapes in tandem with their community functions introduces new pressures on open spaces to be increasingly multifunctional. And community and environmental needs must also mesh with ongoing demands for MIT open space to meet service needs like delivery and parking. Not all open spaces can be grassy lawns, but nor can they all be rain gardens or delivery courts. These needs do and will continue to need to coexist at MIT.

MIT has long taken an offhand approach to much open space usage, perhaps as a result of a pragmatic laboratory-oriented culture. Several of the courtyard spaces in and around Building 10 are utilized only for parking, or are little or never-used landscapes that are difficult to access. MIT plant species are not diverse and rarely reflect contemporary landscape design thinking. Asphalt, a fossil-fuel-based, impervious surface, reflects 20th-century, not 21st-century, innovation. Does asphalt have a place at MIT at all, in an era of climate change and new concepts of community wellness? Yet the “bones” of MIT are very strong: the campus has a long legacy of creative and successful campus design, and many existing open spaces are well-loved, symbolically powerful, and functionally active (Killian and Hockfield Courts being signature examples). And open space culture is changing, as seen in the above examples of innovations in signature open spaces, found open spaces, and small-scale open spaces.

The design and improvement of MIT open spaces has been opportunistic, responding more to market imperatives (Kendall Open Space) or to the development of new campus buildings (Nano) than to any holistic understanding, assessment, or conceptualization of what open space at MIT should be. This opportunistic model, which has shaped the design and planning of the MIT campus itself in recent decades as well, can and must change if open spaces at MIT are to achieve their maximum potential in meeting community desires, attaining environmental standards, and moving the dial on past landscape practices that do not reflect current thinking. **It will be important to seize new opportunities when they emerge**, as may occur along the Grand Junction railroad corridor, where two new MIT campus buildings are being constructed. **It will be important to survey the MIT community and to conduct meaningful research** on understanding patterns of usage and potential for change with respect to community needs and comfort. And as new buildings, with new architectural attitudes to space are constructed, **it will be important to strengthen connections between indoor and outdoors spaces**, as at the renewed Library and Schwarzman College. Today, green spaces are more than just green spaces (with a monoculture of lawn). Green spaces should be welcome and inviting spaces, luring community members out of labs and offices and into the Boston sunshine. Even in winter months, the potential for community usage is high. The MIT community will be the ultimate beneficiary of open space improvements. Below we outline three avenues for implementation of open space improvements, each implementable within the 2022-23 academic year.

Implementation plan: September 2022 and 2023

Our three recommendations relate to the three types of open spaces being created at MIT: signature spaces, found open spaces, and small-scale, laboratory open spaces.

- **Seed fund for new small-scale laboratory spaces at MIT.** As noted above, small-scale open spaces are comparatively inexpensive to construct, can involve a wide range of stakeholders, and can generate innovative design and programmatic solutions for open spaces. We therefore propose that MIT establish a seed fund that can finance the construction of a new, temporary open space on a small site on the MIT campus on a two-year revolving basis. Designs and programming for this 'lab open space' could be open by competition to all MIT community members. A jury for the competition could be comprised of diverse MIT community members.
- **Signature Open Space Community Process for Volpe Open Space.** The new Volpe site represents the next potential signature open space at MIT. While the Volpe Open Space is already well into the design process as of June 2021, there remains space and need for a more intensive MIT community process to determine activities and programs for the several new open spaces at Volpe. An ad-hoc committee of MIT community members should be created to provide community input on design of this open space in 2021-22.
- **Landscape Master Plan for MIT Campus.** Given that MIT currently lacks an effective, detailed master plan for its landscape, we recommend that one be created during the 2021-22 academic year in tandem with a professional consultant and the MIT Office of Campus Planning. An ad-hoc committee of community members should be created to provide community input and receive updates on the creation of this plan in 2021-22.

Oversight and administrative responsibility

The Office of Campus Planning can administer a campus wide open space committee (with faculty members from all six schools, plus students and staff) to formulate and evaluate a seed fund competition. The open space committee could also serve to advise MIT on open spaces more broadly, bringing additional visibility and MIT community participation to design and planning of campus open spaces. This seed fund should be ongoing.

MITIMCO, in tandem with the Office of Campus Planning, should advance the community process for design and programming priorities for the Volpe Open Space using the Kendall Open Space as a model. The Office of Open Space would administer site post construction as with Kendall space. The ad hoc committee would be convened by MIT under an administrative structure to be determined.

MIT currently lacks a landscape master plan. The result is piecemeal construction, renovation, design, and appearance of campus open spaces (see above) and underperformance of open spaces campus wide with respect to usage diversity, sustainability goals, esthetic appearance, and meeting of community needs. The Office of Campus Planning could supervise a RFP for a campus landscape master plan to address the above campus-wide shortcomings in open space at MIT. A landscape master plan or framework plan could be tied to key issues such as sustainability and biodiversity, mobility, climate resiliency, accessibility—and could also consider how our landscapes can benefit both our host city and campus communities. The ad hoc committee would be convened by MIT under an administrative structure to be determined.

Recommended timetable

The jury to frame the competition parameters could be convened in September of 2022 and announce competition by December. Entries could be due in February and construction could occur over late spring and summer of 2023. Spaces should exist for two years, but the competition could occur every year- thus there would be two different ‘seed spaces’ existing at any given time. The site of the space could be pre determined or could be determined by the competition entries.

The enhanced community process for Volpe should be convened as soon as possible given the ongoing construction and planning of the campus site. This would be a ‘one time’ process but its implementation is urgent since the risk exists that the Volpe Open Space will not reflect MIT community concerns. The ad hoc committee would exist during the 2021-22 and perhaps 2022-23 academic years.

This RFP could be prepared in Fall 2021, issued at the end of year, and a firm selected in Spring of 2022 for completion of the plan by Fall of 2022 or Spring of 2023. The ad hoc committee would exist during the 2021-22 and 2022-23 academic years. Implementation of plan ideas could occur thereafter.

Required resources

- Administrative permission, processing, and construction funding should be provided by the MIT Office of the Provost. Endowment could be sought. Early years should be centrally funded.

- Required administrative and implementation resources should be provided by MITIMCO and/or MIT (Office of Open Space), as with the Kendall site (Kendall details are not known to the author at present time).
- Costs of RFP preparation and plan preparation could be borne by the Office of the Provost at MIT.

Assessment methodology

- Users of spaces and the MIT community could be surveyed each year to judge the success of the competition process and utility and popularity of space created.
- The Office of Open Space could carry out user surveys during planning and post implementation to judge satisfaction with the process and utility and popularity of space created.
- The Master Plan firm selection process could occur with input from a broad campus audience (including faculty, students, and staff) and the plan preparation process should involve broad segments of the MIT community, including surveys to discuss community satisfaction with the plan preparation process.

Proposal for a pilot project

Please see above. All of the three types of open space suggestions are in effect pilot projects.

Community and Culture

Community-Building Events

Description

The decentralized nature of academic departments and programs at MIT can make it difficult for students, staff, and faculty to form community-level connections within the institute. Previously held community-building events have slowly disbanded over the years, due to a combination of a lack of centralized leadership, lack of funds, and/or a lack of continuity of leadership. The COVID-19 pandemic only exacerbated this decentralization, especially for students starting their MIT journeys virtually, but at the same time inspired creative approaches to community engagement and community building across our virtual campus. Even if the pandemic vanished tomorrow, we believe MIT should prioritize and actively invest in cultivating the energy, creativity, diversity, cohesion and playful spirit of our community by restoring some well-loved rituals and/or creating some new ones. Specifically, this could include ideas like:

- Committing to holding an MIT Open House every four years; staff used to report enormous pride in being able to bring their families to MIT
- Establishing “Pi Day” as a special day at MIT—not only the day when we admit new students and when some people recite a whole lot of digits after 3.14159, but as a day that includes something a lot more accessible (e.g., Pie! baking lessons, contests, eating, etc.)
- Hosting a MIT Fair every year or so, with carnival activities (potentially in collaboration with the Cambridge Science Festival) and a dance marathon with avenues for charitable donations.
- Holding an MIT-wide carnival every year or two, both to give everyone some end-of-term relief and to get everyone together -staff, students, and faculty!

- Holding a multicultural festival every year or two, that allow different groups to share music, dance, food that matters to them.

It's important to note that several of these ideas are derived from events that have been held in the past and that were discontinued due to the large costs associated with hosting them, so in addition to gauging the sentiment of the MIT community on potential event ideas, those in charge of overseeing these events may need to find and/or allocate substantial funding to host larger institute-wide events (i.e., an MIT carnival). Community building events also offer the opportunity to introduce students who may not otherwise encounter them to community "third" spaces where they may go on to informally gather in the future, facilitating the adoption of those spaces.

Implementation plan: September 2022 and 2023

Oversight and administrative responsibility

We imagine most of the student-focused events falling under some combination of the Division of Student Life, the ICEO, the President's Office, and Institute Events with the ICEO potentially taking the lead on institute-level events or events specifically for staff. The President's office previously managed the institute-level dance parties, so institute-level events should be managed in collaboration with (if not entirely by) the President's Office given their past experience with planning, financing, and executing events of this scale.

Recommended timetable

We can initially begin with virtual events in Summer/Fall 2021, modeling off of successful events that have been held in the past year. As campus reopens and social distancing requirements change, we can then move towards larger in-person events in Winter 2021/Spring 2022.

Required resources

- Organizing leadership, funding for the events themselves, staff to run the events, potentially IR for assessment after the event

Assessment methodology

- Post-event feedback forms, tracking of attendance, focus groups of students/staff/faculty to get ideas on what went well with previous events and how future events might be improved.

Proposal for a pilot project

One idea that could work well online, and therefore is suitable for more immediate implementation, could be a multicultural festival. We imagine it with elements similar to the Get Out The Vote Fest which was organized by the UA and many student cultural groups—presentations and performances from diverse groups of all kinds, open to the whole MIT community. This festival would not just be a party for the sake of partying. It would be a party that helps to further and elevate some of our key values: educating members of our community about other members' cultures and showing everyone that their culture is welcome, and celebrated, at MIT. This could be held virtually or in-person, depending on the state of COVID restrictions—proposals for both options are provided below.

Oversight and administrative responsibility

I could see this falling under ICEO or DSL but would lean towards ICEO.

Recommended timetable

Mid-Late Summer 2021—Essentially before people return to campus for in-person learning but not right after the current semester has ended, both to allow time to plan and to give students a break. Potentially during orientation as a "Welcome Back" event.

Required resources

- **Virtual.** Gathertown has been a popular platform for these types of events in the past year, although some research should go into other options and the pricing of Gathertown for large events.
- **In-Person.** The new East Campus courtyard behind E25/23 would be a nice open space to host such an event in a COVID-safe manner that still allows for large numbers of people to come through. Could also invite local food trucks in place of traditional catering.
- **Virtual or In-Person.** Outreach to multicultural student organizations for hosting and planning of the event. High-level organizing and publicity to the student body so that people are sufficiently aware of when the event is.

Assessment methodology

See above.

Additional Notes

- Open Houses should be every four years or so—enough for undergrads to be able to attend at least one
- Dance Parties came out of the President's Office, managed by Institute Events, very expensive to put on but a lot of fun
    - What about a fair?
- Cambridge Science Festival-esque
- Dance Marathon?
    - What about more spontaneous events/spaces that facilitate community building?
    - Community third spaces?
    - Take advantage of new spaces in a way that we hadn't considered
    - Food truck event on East Campus courtyard—how to manage distancing but that would be fun
- Graduate-UG interactions
    - Also grad-specific community building

Restore and Revive IAP

Description

The focus of this recommendation is to restore and revive the original spirit of MIT's Independent Activities Period, in which anyone at MIT was encouraged to take time in January to explore something new. Excerpted from the IAP website:

> *IAP provides members of the MIT community (students, faculty, staff, and alums) with a unique opportunity to organize, sponsor and participate in a wide variety of activities, including how-to sessions, forums, athletic endeavors, lecture series, films, tours, recitals, and contests.*
>
> *During IAP, students are encouraged to set their own educational agendas, pursue independent projects, meet with faculty, or pursue many other options not possible during the semester. Faculty are free to introduce innovative educational experiments as IAP activities. All members of the MIT Community, are encouraged to create offerings aimed at sharing a particular talent, expertise or interest with others at the Institute.*
>
> *Some individuals and departments offer seminars, lectures, and open houses as a way to showcase their year-round efforts in supporting the MIT Community. Others use IAP to share interests and talents not necessarily related to their day-to-day MIT roles. Many faculty, staff, and students organize activities based on personal interests, such as art, music, film, cooking, and hobbies. IAP offers the chance to learn something new about our fellow students, colleagues, and friends.*
>
> *IAP offerings are distinguished by their variety, innovative spirit, and fusion of fun and learning. Past IAP activities have ranged from credit activities such as human biochemistry lectures and community service workshops, to noncredit offerings such as Mediterranean cooking classes and improvisational comedy workshops.*
>
> *With IAP, the possibilities are endless.*

The value of this period cannot be overstated and is a central element of every academic year. Fond memories of novel experiences and important achievements have their origins in this interstitial period in the academic year. Offering students the opportunity to "set their own educational agendas" offers multiple short and long term benefits. Encouraging the faculty "to introduce innovative educational experiments" cultivates an ethos of pedagogical experimentation. Others are also encouraged to participate in creative ways; postdocs, staff, administrators, and the extended MIT network.

IAP is working well, though a concern raised in the discussion of a working group of the Task Force was the need to protect this original and important set of priorities and maintain the experimental and exploratory nature of the period. In particular, the need to contain the number of departmental

requirements from encroaching in IAP and expropriating this portion of the academic year was a major motivator of this recommendation.

A 2013 Faculty ad hoc committee was charged with examining IAP and concluded that "if it isn't broken, don't fix it." An analysis of data since that report suggests that the number of non-credit activities, academic offerings, and participation has remained relatively stable (with the exception of IAP 2021 which was impacted by pandemic related constraints) in subsequent years. In fact, the data suggests that there are a myriad of opportunities to explore something new for those who are on or near campus during IAP.

That analysis stated there might be an opportunity to fertilize creativity with dedicated financial resources that fund creative ideas, particularly among student groups. For example, someone (any MIT community member) who wants to provide a 1 hour session on card tricks could purchase decks of cards for X number of participants. Or, a student group could secure funding for a venue, music, food, etc. for a social activity or dance lessons or the like.

We also believe it is important to note a positive aspect of allowing departments to offer subjects during IAP; even required subjects in degree programs. We believe that offering certain departmental requirements only during IAP violates the spirit and intent of IAP, but offering subjects that are also offered during other semesters in the same academic year is a valuable service to students who can then open up some flexibility in their schedules during the regular Fall and Spring terms. If a student has no choice but to take a subject during IAP because that is the only period it is offered, then IAP is compromised. If the subject is also offered in another semester during that same academic year, then IAP serves as a way to open up other curricular "space" in a student's schedule. Therefore, we recommend that departmental subjects only be allowed during IAP if they (or suitable substitutes) are also offered during the same academic year in either the Fall or Spring semester.

Implementation plan: September 2022 and 2023

Oversight and administrative responsibility

Student funding may be provided through the Division of Student Life. Administrative funding could be provided through an OVC office such as the Office of the First Year (the current custodian of the non-credit activities repository software) or Office of Experiential Learning, but may require a new effort involving the MIT Office of Resource Development.

Recommended timetable

Funding proposal processes would need to be in place in the months preceding IAP, roughly the Fall term. Therefore, dedicated funds would need to be requested by the administrative oversight offices in their relevant budget request cycles.

Required resources

Some portion of administrative headcount would need to be allocated for any administrative funding pool.

Assessment methodology

The number and quality of proposals for funding as well as summaries of participation from funded activities could be used to measure success.

Proposal for a pilot project

The pilot project we are recommending is the startup of an IAP ideas project fund. If there is no appropriate fund available for this purpose, a new fund could be generated through an effort of the offices of MIT Resource Development and the Alumni Association.

Oversight and administrative responsibility

- Funds for Faculty, administrators, and staff could be managed through the Office of the First Year, though administrative resources would be required to incur this process.
- Funds for student programs could be managed through existing funding streams within the Division of Student Life.

Recommended timetable

- As soon as IAP 2021

Required resources

- A fund to support 5- 10 IAP projects at a range of $200 to $1500.
- Administrative support for the faculty and staff pool.

Assessment methodology

- The Office of the First Year currently reports the number of offerings and participation in programs that flow through its IAP infrastructure. Continued analysis of this data to ensure that programming occurs is recommended.
- Requests for and use of funding for projects can be assessed over time to determine if their intent is being utilized.