

**RESOLUTION TO ADOPT THE UNIVERSITY'S STRATEGIC PLAN:
"THE VIRGINIA TECH DIFFERENCE: Advancing Beyond Boundaries"**

WHEREAS, "A Plan for a New Horizon: Envisioning Virginia Tech 2012-2018" was the culmination of the university's long-range planning process that explored the implications of global interdependence, the challenges of a data-driven society, meeting research expectations, and improving organizational efficiency and flexibility; and

WHEREAS, during his installation in October 2014, President Tim Sands shared aspirational themes that built upon and extended the goals and objectives of that strategic plan, and he subsequently challenged the Virginia Tech community to envision Virginia Tech and its role in higher education a generation into the future without the confines of today, resulting in "Beyond Boundaries: A 2047 Vision," which offers a framework for the future as the university looks ahead to its 175th anniversary; and

WHEREAS, shaped around Virginia Tech's core values, existing strengths, and living motto of *Ut Prosim*, this vision reinforces Virginia Tech's commitment to value, access, and affordability; its rich land-grant tradition of community service and outreach; its strength in interdisciplinary collaboration that leverages the comprehensive nature of Virginia Tech; and its role in the commonwealth as a global portal for talent and partnerships through impactful research and technology development; and

WHEREAS, Beyond Boundaries formed the foundation of a continually evolving strategic plan to guide and measure the university's direction forward; and

WHEREAS, led by the Office of Strategic Affairs, the strategic planning process began officially in the fall of 2017 with the formation of several strategic planning committees and continued throughout the 2018-19 academic year with broad input from the campus community through more than 100 meetings, presentations, round-table discussions, and town hall meetings, including regular briefings with the Board of Visitors;

NOW, THEREFORE, BE IT RESOLVED that the Virginia Tech Board of Visitors adopts the new strategic plan for the university entitled "The Virginia Tech Difference: Advancing Beyond Boundaries," and the vision statement, mission statement, core values, strategic priorities, and initial metrics and milestones incorporated therein, effective immediately, and endorses a culture of continual planning; and

BE IT FURTHER RESOLVED that the President or his designee(s) will develop a dashboard with appropriate metrics and report to the Board of Visitors at least annually on progress towards achieving milestones and will propose new and/or revise existing strategic priorities, metrics and milestones that may emerge as part of the continual planning process.

RECOMMENDATION:

That the new strategic plan, "The Virginia Tech Difference: Advancing Beyond Boundaries," be adopted immediately with the expectation that the plan will undergo further adaptation consistent with a process of continual planning, and that the President or his designee(s) will provide a progress report at least annually to the Board of Visitors beginning in November of 2019.

Adopted June 3, 2019



THAT I M

THE VIRGINIA TECH DIFFERENCE

ADVANCING BEYOND BOUNDARIES

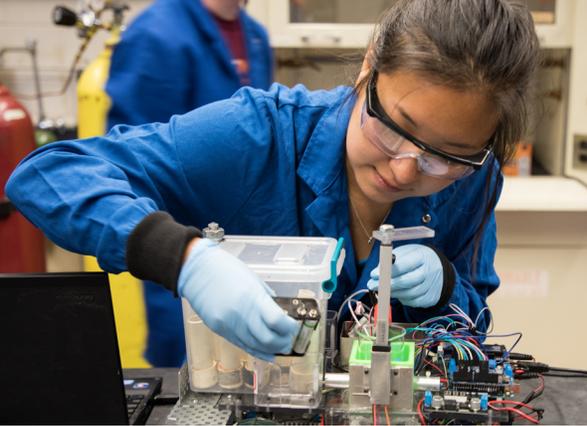


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VIRGINIA
TECH



STRATEGIC PLANNING TIMELINE

2015-2017

Beyond Boundaries long-term vision was created.

FALL 2017/SPRING 2018

Strategic Planning Committees were formed to explore metrics and rankings and advancing research. Campus engagements commenced.

SUMMER 2018

Roundtable Discussions, Diversity Summit, and Fall Engagements were held to inform key themes and priorities.

FALL 2018

Fall Engagements were held. Committees continued their work, campus feedback was synthesized and emerging themes were communicated.

SPRING 2019

Ongoing discussions were held with key stakeholders, faculty, and staff to inform Executive Summary and comprehensive document.

SUMMER 2019

The final version of the Strategic Plan was presented in June 2019.

2019 - 2020

Collaborative, partnership-driven continuous planning process launches, including the development of unit-level strategic plans and feasibility studies to inform prioritization and implementation.



ADVANCING OUR UNIVERSITY

This strategic plan, *The Virginia Tech Difference: Advancing Beyond Boundaries*, was developed in collaboration with faculty, staff, students, and alumni across our colleges, institutes, offices, and campuses, and shaped by partners and employers.

The Virginia Tech Difference: *Advancing Beyond Boundaries* guides initial steps to achieving our long-term **BEYOND BOUNDARIES** future as a comprehensive research land-grant university by affirming our vision, mission, and core values; defining university priorities; and outlining goals and initial milestones to achieve each priority.



VIRGINIA TECH BEYOND BOUNDARIES

Led by President Tim Sands, **BEYOND BOUNDARIES: A 2047 VISION** culminated in a generational visioning process to position Virginia Tech as an internationally recognized land-grant university that strategically addresses the challenges and opportunities presented by the changing higher education landscape. **BEYOND BOUNDARIES** identified three guiding concepts to transform Virginia Tech into the university of the future: VT-shaped Discovery (purpose-driven discovery), Communities of Discovery (campus, regional, and global engagement hubs), and Nexus of Discovery (transdisciplinary discovery).

Integral to this transformation is Virginia Tech's continued commitment to **UT PROSIM (THAT I MAY SERVE)**, academic excellence, and world-class research. In addition, engaging the whole person; innovation; and affordability and accessibility are guiding principles that have informed the strategic planning process and initial steps toward achieving Virginia Tech's **BEYOND BOUNDARIES** vision.



SHAPED BY OUR COMMUNITY

The strategic planning process involved significant iteration, engagement, and collaboration with the university community. Throughout this comprehensive and inclusive process, the Virginia Tech community was engaged to discuss initial and evolving drafts and gather and incorporate feedback on the strategic planning framework. Strategic planning materials were continually updated throughout this process to reflect iterative, ongoing feedback.

These conversations and feedback sessions included participants from colleges, departments, institutes, offices, student groups, commissions, committees, associations, alumni groups, university leadership, and the Board of Visitors. Feedback discussions involved participants from various disciplines and levels, and took place across geographic locations including Blacksburg, Roanoke, Alexandria, Arlington, and Falls Church.

Feedback session participants provided more than 1,000 written, digital, or verbal forms of feedback. Data was continually synthesized and analyzed to shape the mission, vision, core values, priorities, goals, and initial milestones.

BUILDING UPON BEYOND BOUNDARIES

Attachment HH

FUTURE DIRECTIONS AND INITIATIVES



BEYOND BOUNDARIES**KEY PRINCIPLES
AND CONCEPTS**

- *Ut Prosim* (That I May Serve), Academic Excellence, and World Class Research
- Engagement with the Whole Person
- Innovation
- Affordability and Accessibility
- VT-shaped Discovery
- Communities of Discovery
- Nexus of Discovery

BEYOND BOUNDARIES**CURRENT INITIATIVES**

- Experiential Learning
- Campus Master Plan
- Industry Partnerships, Licensing, and Entrepreneurship
- InclusiveVT
- Innovation Campus and the greater Washington, D.C., area expansion including Academic Incubator/Accelerator
- Virginia Tech Carilion Partnership in Roanoke
- Rural Virginia Initiative
- Agricultural and Natural Resources Initiative
- Commonwealth Cyber Initiative
- Beyond Boundaries Scholarship Program
- Transdisciplinary Research and Learning Communities (Research Institutes, Centers, Areas)
- Pathways General Education Curriculum
- Partnership for an Incentive-Based Budget (PIBB) Model

BEYOND BOUNDARIES**STRATEGIC PRIORITIES**

- Regional, National, and Global Impact
- *Ut Prosim* (That I May Serve) Difference
- Talent Destination
- Institutional Excellence

OUR MOTTO

Our motto, **UT PROSIM** (That I May Serve), emphasizes our commitment to serve individuals and society.

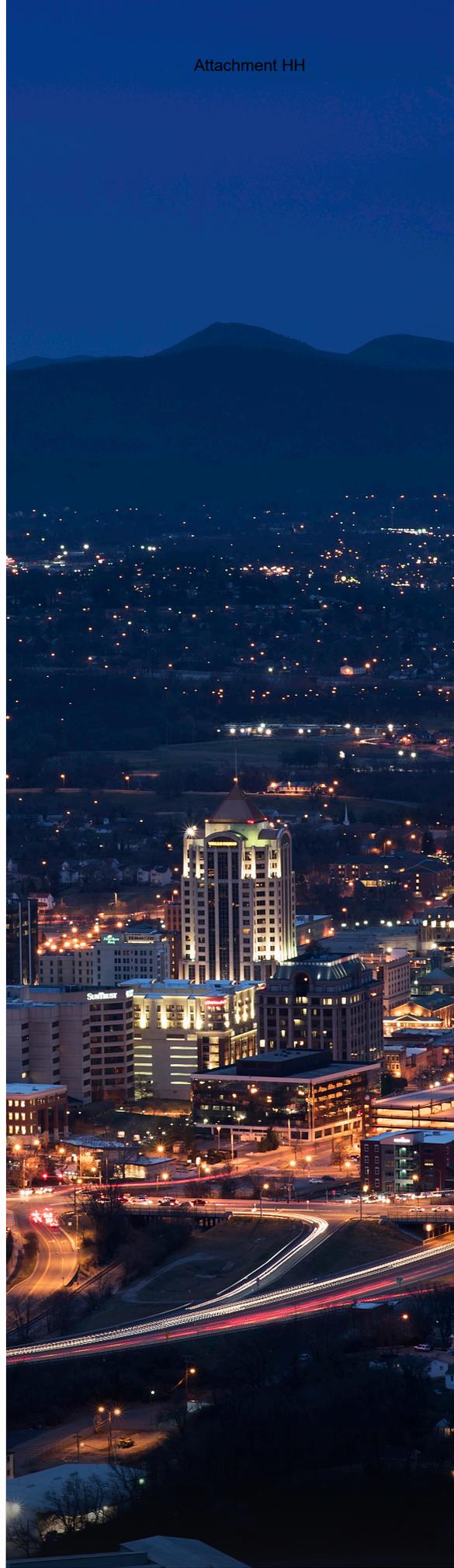
OUR VISION

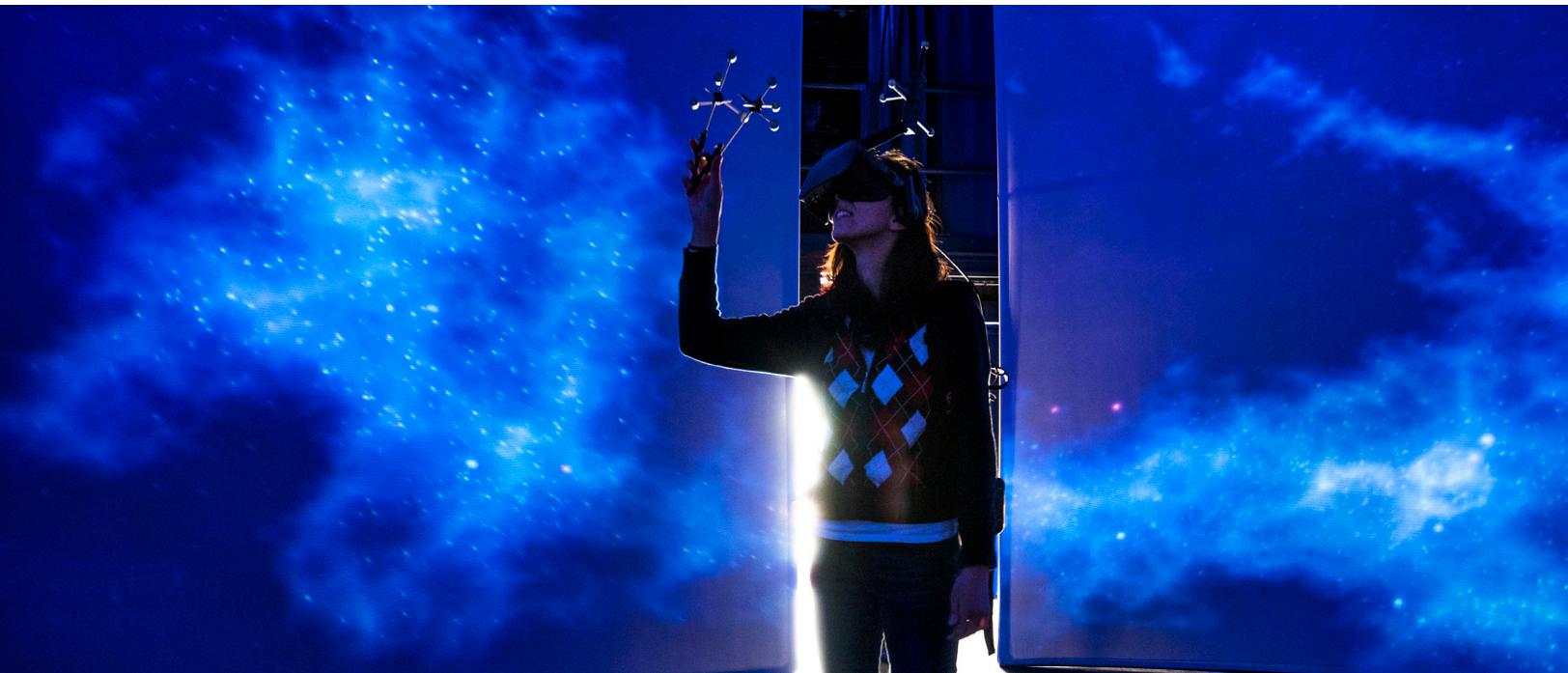
Virginia Tech will be a global leader by inspiring and empowering people to learn, innovate, and serve beyond boundaries.

OUR MISSION

Inspired by our land-grant identity and guided by our motto, *Ut Prosim* (That I May Serve), Virginia Tech is an inclusive community of knowledge, discovery, and creativity dedicated to improving the quality of life and the human condition within the Commonwealth of Virginia and throughout the world.







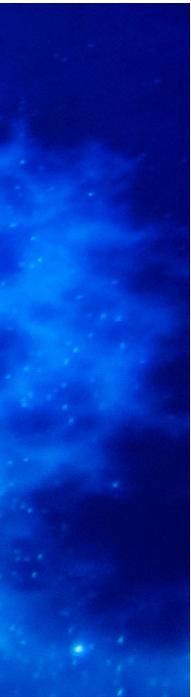
**THE VIRGINIA TECH DIFFERENCE:
ADVANCING BEYOND BOUNDARIES**



OUR CORE VALUES

Virginia Tech embraces four core values: Diverse and Inclusive Communities, Knowledge and Innovation, Opportunity and Affordability, and Excellence.

DIVERSE AND INCLUSIVE COMMUNITIES



We value the educational benefits of diverse ideas, peoples, and cultures in order to contribute to the equitable inclusion and just engagement of the world's communities through collaboration and partnerships, guided by open expression, self-awareness, and mutual respect.

KNOWLEDGE AND INNOVATION

We value lifelong learning and freedom of inquiry through research, innovation, and the creative process within and outside of the university to promote the continuous seeking of knowledge to enhance society and address difficult and complex issues affecting the human condition.

OPPORTUNITY AND AFFORDABILITY



We value providing affordable educational opportunities for the Commonwealth of Virginia consistent with our land-grant mission.

EXCELLENCE AND INTEGRITY

We value continuous evaluation, improvement, and excellence to advance individual and institutional objectives with the highest standards of integrity and ethical behavior.



LAND-GRANT IDENTITY AND STRATEGIC PRIORITIES





Based upon the motto, vision, mission, core values, and comprehensive research land-grant identity of research and discovery; teaching and learning; and outreach and engagement, the community identified four strategic priorities:

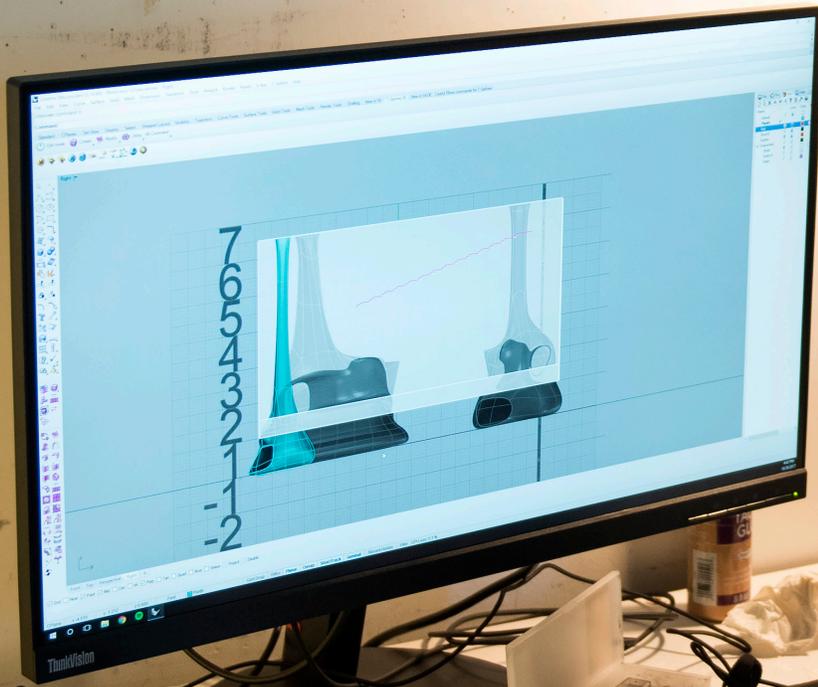
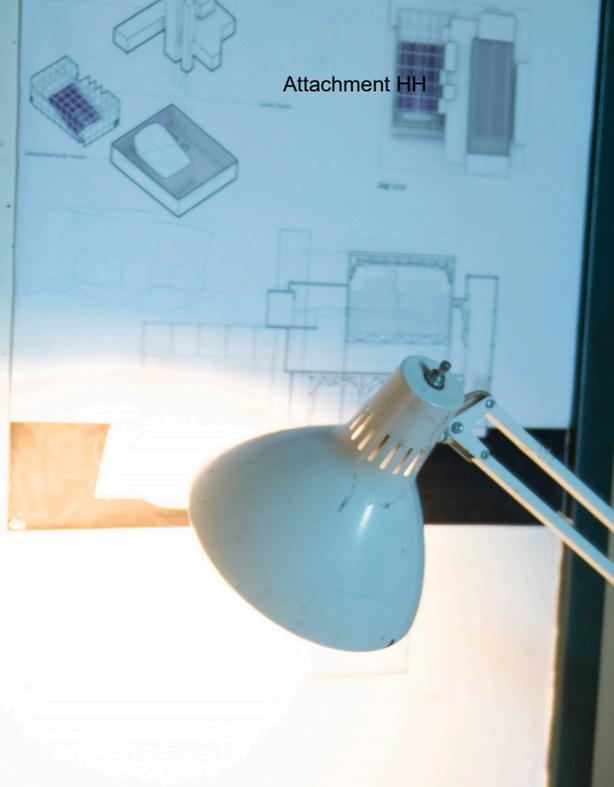
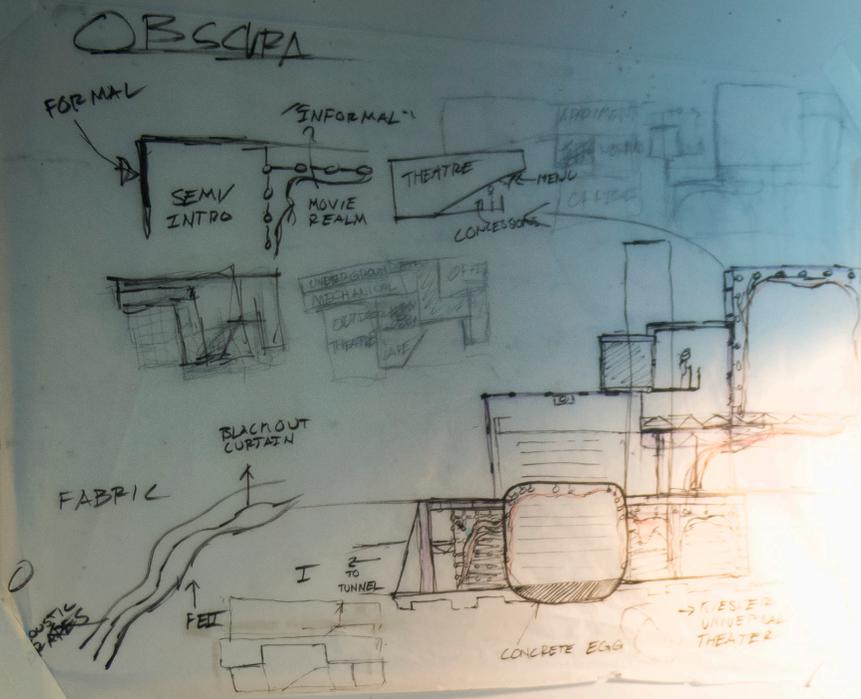
ADVANCE REGIONAL, NATIONAL, AND GLOBAL IMPACT

ELEVATE THE UT PROSIM (THAT I MAY SERVE) DIFFERENCE

BE A DESTINATION FOR TALENT

ENSURE INSTITUTIONAL EXCELLENCE

As part of the continuous strategic planning process, each strategic priority includes goals and initial milestones across a three to five year timeline that will be evaluated and reviewed annually.



STRATEGIC PRIORITY 1

ADVANCE REGIONAL, NATIONAL, AND GLOBAL IMPACT

ASPIRATIONAL VISION

Virginia Tech will be globally recognized for its research strengths, world-class faculty, and ability to integrate its learning, discovery, and engagement missions as a comprehensive research land-grant university. Virginia Tech will prepare graduates to contribute and lead in a complex world by offering person-centered and purpose-driven student experiences designed to educate the whole person. Virginia Tech's impact will be regional, national, and global.

GOAL 1

Increase excellence in research, discovery, and creativity

GOAL 2

Increase teaching and learning excellence for a holistic education

GOAL 3

Increase institutional impact and visibility



STRATEGIC PRIORITY 2

ELEVATE THE UT PROSIM (THAT I MAY SERVE) DIFFERENCE

ASPIRATIONAL VISION

The Ut Prosim (That I May Serve) Difference, a foundational differentiator for Virginia Tech, recognizes the integral connection with Virginia Tech's land-grant responsibility of access and opportunity and its mission of service to humanity. Consistent with InclusiveVT, the institutional and individual commitment to Ut Prosim (That I May Serve) in the spirit of community, diversity, and excellence, Virginia Tech will build and support communities of discovery where global citizens engage with different ideas, beliefs, perspectives, experiences, identities, backgrounds, and cultures.

GOAL 1

Increase representational diversity

GOAL 2

Increase cultural competency

GOAL 3

Address critical societal issues impacting humanity and equity



STRATEGIC PRIORITY 3

BE A DESTINATION FOR TALENT

ASPIRATIONAL VISION

Virginia Tech will attract bold and dynamic faculty, staff, and students to a diverse and inclusive community to be a force for positive change. Virginia Tech will support the well-being and quality of life of students, staff, and faculty. Alumni and local communities will recognize Virginia Tech as a lifelong learning destination. Virginia Tech will invest, empower, support, and value a workforce that will champion our vision for the future.

GOAL 1

Attract, retain, and develop the talents of faculty and staff

GOAL 2

Attract, retain, and graduate students prepared to serve a global community

GOAL 3

Support lifelong engagement and learning for alumni and local communities



STRATEGIC PRIORITY 4

ENSURE INSTITUTIONAL EXCELLENCE

ASPIRATIONAL VISION

Virginia Tech will, through continuous strategic planning, create opportunities to solicit and explore innovative ideas, inform resource allocation, and engage the university's system of shared governance. Virginia Tech will also optimize efficiency and effectiveness of administrative functions to ensure alignment of personnel, physical campus, and fiscal resources and processes in support of strategic goals.

GOAL 1

Continue to develop the physical campus and technology infrastructure

GOAL 2

Develop comprehensive and transparent budget and financial models with diverse and sustainable revenue sources

GOAL 3

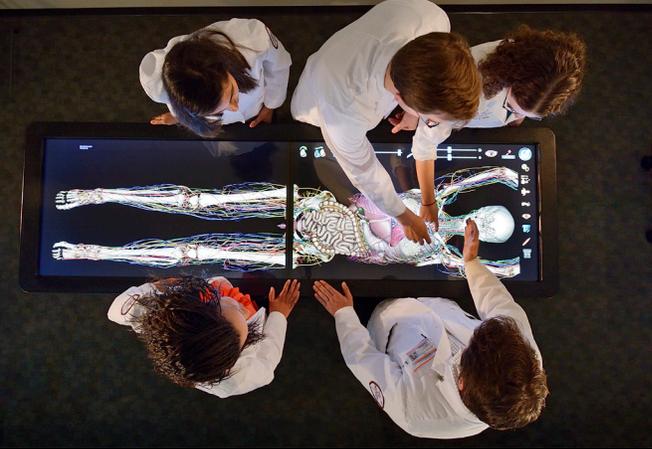
Develop and launch an adaptive, inclusive process for continuous strategic planning

BE A DESTINATION FOR TALENT

- › Achieve progress in competitive faculty salaries towards 50th percentile of top 20 Research (R1) Public Land-Grant Universities by 2024
- › Achieve progress in competitive administrative and professional faculty and staff salaries towards the 50th percentile of relevant market range by 2024
- › Increase the four-year graduation rates for all undergraduate (entering freshmen) students to 70%
- › Increase the three-year graduation rates for all undergraduate transfer students to 75%
- › Reduce the average student loan debt per graduating senior to \$25k by 2024
- › Increase faculty and staff satisfaction with career advancement opportunities to at least 75% as reported in Employee Climate Survey by 2022
- › Increase faculty and staff satisfaction with work-life balance to at least 75% as reported in the Employee Climate Survey by 2022
- › Increase students participating in Hokie Mentorship Connect Program to 25% by 2022
- › Increase on-campus students living in Living Learning Programs to 67% by 2024

ENSURE INSTITUTIONAL EXCELLENCE

- › Achieve 100% completion of college and unit-level strategic plans by May 2020
- › Achieve maintenance reserve funding in the range of 1 - 1.5% of facility values for auxiliaries
- › Maintain Debt Rating in the AA or Aa Range
- › Maintain = or < 5% University debt ratio
- › Increase the University's unrestricted net assets by \$20 million annually by 2024
- › Achieve an increase of at least 10% in total SWaM expenditures for each of the SWaM categories annually by FY22
- › Increase the endowment to \$1.6B by FY22
- › Increase alumni giving to 22% by FY22
- › Increase funds raised annually to \$175 million by FY23



LOOKING TOWARD THE FUTURE

A core component of Beyond Boundaries seeks to grow a culture of “continuous planning” at Virginia Tech. Continuous strategic planning involves monitoring goals, metrics, and milestones for existing priorities; identifying, developing, and advancing new strategic priorities; and ensuring a culture of self-evaluation, innovation, agility, and adaptability.

As Virginia Tech builds upon this strategic planning framework and develops a culture of continuous planning across the university, this framework will be a university-level guide for colleges, institutes, offices, departments, and units as they develop their respective strategies and plans to advance institutional priorities.

Feasibility studies will inform prioritization, implementation, and the development of processes to identify and incubate new ideas and increase decision-making transparency and efficiency throughout the institution. Key university leaders will be identified to champion specific initiatives, and a collaborative, partnership-driven continuous planning process will help Virginia Tech achieve milestones and advance its **BEYOND BOUNDARIES** vision.

TOGETHER, WE WILL ADVANCE THE VIRGINIA TECH DIFFERENCE.







BEYOND BOUNDARIES

THE VIRGINIA TECH DIFFERENCE

AN INCLUSIVE PROCESS



OFFICE FOR STRATEGIC AFFAIRS
VIRGINIA TECH.

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OVERVIEW

OFFICE FOR STRATEGIC AFFAIRS

The Office for Strategic Affairs plays an integral role at Virginia Tech in strategic and continuous planning and the exploration of Virginia Tech's history.

Building upon Beyond Boundaries, the Office for Strategic Affairs collaborates with the Virginia Tech community to understand challenges and opportunities, guide strategic and continuous planning, and help advance the university through feasible, measurable, and sustainable objectives.

The Office for Strategic Affairs also leads the Council on Virginia Tech History to explore how Virginia Tech recognizes and acknowledges its history in the context of today. As part of this process, the Council engages with the university community to document Virginia Tech's history and its connection to the histories of the Commonwealth of Virginia and the nation.

STRATEGIC PLANNING LEADERSHIP TEAM

Menah Pratt-Clarke

Vice President for Diversity,
Inclusion, and Strategic Affairs

Erin McCann

Director for Strategic Planning

Patty Becksted

Assistant Director for
Strategic Planning

Lauren Henson

Program Coordinator
for Strategic Affairs

Meghan Marsh

Program Coordinator
(Communications) for
Strategic Affairs

Shahidur Rashid Talukdar

Graduate Student Assistant

Stacey Wilkerson

Graduate Student Assistant

STRATEGIC PLANNING STEERING COMMITTEE

Charge: To guide the university strategic planning process in collaboration with the Strategic Planning Leadership Team based on Virginia Tech's Beyond Boundaries vision

Menah Pratt-Clarke, Chair

Vice President for Diversity, Inclusion, and Strategic Affairs

Sylvester Johnson

Professor and Director of the Center for Humanities

Theresa Mayer

Vice President for Research and Innovation

Patty Becksted

Assistant Director for Strategic Planning

Anne Khademian

Professor and Presidential Fellow

Erin McCann

Director for Strategic Planning

Ronald Fricker

Associate Dean for Faculty Affairs and Administration, College of Science

Lara Khansa

Associate Professor and Associate Dean for Undergraduate Programs, Pamplin College of Business

Mallory Miller

Project Director for Academic Resource Management

Matthew Holt

Professor and Department Head, Agricultural and Applied Economics

Benjamin Knapp

Professor and Director, Institute for Creativity, Arts, and Technology

Laurel Miner

Chief of Staff to the Vice President for Research and Innovation

STRATEGIC PLANNING ADVISORY COMMITTEE

Charge: To collaborate, assist, and offer recommendations for the university's strategic planning efforts based on Virginia Tech's Beyond Boundaries vision

Menah Pratt-Clarke, Chair

Vice President for Diversity, Inclusion, and Strategic Affairs

Catherine Amelink

Assistant Vice Provost for Learning Systems Innovation and Effectiveness

Patty Becksted

Assistant Director for Strategic Planning

Jennifer Case

Professor and Department Head, Engineering Education

Chelsea Corkins

Graduate Student Representative

Tom Crawford

Professor and Department Head, Geography

Jeff Earley

Associate Vice Provost for Finance

Matthew Ferby

Graduate Student Representative

Ronald Fricker

Associate Dean for Faculty Affairs and Administration, College of Science

Bryan Garey

Vice President for Human Resources

Robert Gourdie

Professor, Biomedical Engineering and Mechanics and Director, Center for Heart and Reparative Medicine Research, Fralin Biomedical Research Institute

David Guerin

Associate Vice Provost for Communications

James Harder

Research and Project Specialist, Center for Excellence in Teaching and Learning

Kwame Harrison

Associate Professor, Sociology

Erin Heller

Graduate Student Representative

Steve Holbrook

Professor and Department Head, Geosciences

Matthew Holt

Professor and Department Head, Agricultural and Applied Economics

Laura Hungerford

Professor and Department Head, Population Health Sciences

Benjamin Jantzen

Associate Professor, Philosophy

Sylvester Johnson

Professor and Director of the Center for Humanities

Anne Khademian

Professor and Presidential Fellow

Lara Khansa

Associate Professor and Associate Dean for Undergraduate Programs, Pamplin College of Business

Benjamin Knapp

Professor and Director, Institute for Creativity, Arts, and Technology

Bill Knocke

Professor, Civil & Environmental Engineering

Brandon Lambert

Undergraduate Student Representative

Theresa Mayer

Vice President for Research and Innovation

Erin McCann

Director for Strategic Planning

Mallory Miller

Project Director for Academic Resource Management

Laurel Miner

Chief of Staff to the Vice President for Research and Innovation

David Musick

Professor and Associate Dean for Faculty Affairs, Virginia Tech Carilion School of Medicine

Mercedes Ramirez Fernandez

Associate Vice Provost for Strategic Affairs and Diversity

Karen Roberto

University Distinguished Professor and Director, Institute for Society, Culture and Environment

Marcy Schnitzer

Assistant Provost for Diversity and Strategic Planning

Savita Sharma

Chief of Staff to the Vice President for Finance

Angela Simmons

Assistant Vice President for Student Affairs

Tammie Smith

Business Operations Specialist, Enrollment Management Communication

Nick Stone

Director, National Capital Region Operations

Paige Talley

Undergraduate Student Representative

Lisa Wilkes

Vice President for Business Affairs

Kenneth Wong

Associate Dean of the Graduate School National Capital Region, Director of Northern Virginia Center

STRATEGIC PLANNING METRICS AND RANKINGS SUB-COMMITTEE

Charge: To explore metrics and rankings as part of the university's strategic planning efforts

Ronald Fricker, Co-Chair

Associate Dean for Faculty Affairs and Administration, College of Science

Lara Khansa, Co-Chair

Associate Professor and Associate Dean for Undergraduate Programs, Pamplin College of Business

Mallory Miller, Co-Chair

Project Director for Academic Resource Management

Catherine Amelink

Assistant Vice Provost for Learning Systems Innovation and Effectiveness

Patty Becksted

Assistant Director for Strategic Planning

Lauren Bulka

Associate Director for Strategic Initiatives, National Capital Region

Jeff Earley

Associate Vice Provost for Finance

James Harder

Research and Project Specialist, Center for Excellence in Teaching and Learning

Luisa Havens Gerardo

Vice Provost for Enrollment Management

Sylvester Johnson

Professor and Director of the Center for Humanities

Erin McCann

Director for Strategic Planning

Menah Pratt-Clarke

Vice President for Diversity, Inclusion, and Strategic Affairs

John Provo

Director, Office of Economic Development

Marcy Schnitzer

Assistant Provost for Diversity and Strategic Planning

Savita Sharma

Chief of Staff to the Vice President for Finance

Vijay Singal

J. Gray Ferguson Professor of Finance

Kenneth Wong

Associate Dean of the Graduate School National Capital Region, Director of Northern Virginia Center

STRATEGIC PLANNING RESEARCH SUB-COMMITTEE

Charge: To explore opportunities and challenges for strategically advancing research and innovation as part of the university's strategic planning efforts

Matthew Holt, Co-Chair

Professor and Department Head,
Agricultural and Applied Economics

Benjamin Knapp, Co-Chair

Professor and Director, Institute for
Creativity, Arts, and Technology

Theresa Mayer, Co-Chair

Vice President for Research and
Innovation

Catherine Amelink

Assistant Vice Provost for Learning
Systems Innovation and Effectiveness

Patty Becksted

Assistant Director for Strategic Planning

Karen DePauw

Vice President and Dean for Graduate
Education

Tom Dingus

Professor and Director, Virginia Tech
Transportation Institute

Ronald Fricker

Associate Dean for Faculty Affairs and
Administration, College of Science

Cassandra Hockman

Communications Correspondent, Fralin
Life Science Institute

Steve Holbrook

Professor and Department Head,
Geosciences

Laura Hungerford

Professor and Department Head,
Population Health Sciences

Lara Khansa

Associate Professor and Associate Dean
for Undergraduate Programs, Pamplin
College of Business

Bill Knocke

Professor, Civil & Environmental
Engineering

Erin McCann

Director for Strategic Planning

Laurel Miner

Chief of Staff to the Vice President for
Research and Innovation

Miguel Perez

Associate Professor and Director, Center
for Data Reduction and Analysis Support,
Virginia Tech Transportation Institute

Menah Pratt-Clarke

Vice President for Diversity, Inclusion,
and Strategic Affairs

Karen Roberto

University Distinguished Professor and
Director, Institute for Society, Culture
and Environment

Don Taylor

Professor and Vice Provost for Learning
Systems Innovation and Effectiveness

Loy Van Crowder

Professor and Executive Director, Center
for International Research, Education,
and Development

Kenneth Wong

Research Assistant Professor and
Associate Dean of the Graduate School
National Capital Region, Director of
Northern Virginia Center

STRATEGIC PLANNING VISION AND MISSION SUB-COMMITTEE

Charge: To analyze ongoing feedback received on evolving drafts of the university's mission and vision statements as part of the university's strategic planning efforts

Patty Becksted

Assistant Director for Strategic Planning

Matthew Holt

Professor and Department Head, Agricultural and Applied Economics

Erin McCann

Director for Strategic Planning

David Guerin

Associate Vice Provost for Communications

Laura Hungerford

Professor and Department Head, Population Health Sciences

Angela Simmons

Assistant Vice President for Student Affairs

BUILDING UPON BEYOND BOUNDARIES

Led by President Tim Sands from 2015 to 2017, [Beyond Boundaries: A 2047 Vision](http://www.beyondboundaries.vt.edu) (www.beyondboundaries.vt.edu) culminated in a generational visioning process to position Virginia Tech as an internationally recognized land-grant university that strategically addresses the challenges and opportunities presented by the changing higher education landscape. Beyond Boundaries identified three guiding concepts to transform Virginia Tech into the university of the future: VT-shaped Discovery, Communities of Discovery, and Nexus of Discovery.

VT-shaped Discovery at Virginia Tech relies on purpose-driven and person-centered curriculum grounded in flexible and personalized education. Rather than leverage traditional higher education models in which degrees remain siloed from one another, Virginia Tech will ensure students benefit from a fully integrated and more effective curriculum of diverse experiences.

Communities of Discovery enhance experiential learning to reflect the communities in which Virginia Tech serves. Through Communities of Discovery, Virginia Tech will extend beyond its physical footprint through distance-learning and non-campus spaces that are both publicly and privately operated; led by mentors, faculty, industry partners, and alumni who equip students with necessary real-world collaborative decision-making.

Virginia Tech, as a Nexus of Discovery, will realign educational goals toward degrees anchored in transdisciplinary education and collaborate with local communities to solve complex societal challenges. These intersections will foster enhanced collaboration between communities, disciplines, educators, industry partners, and philanthropic partners.

Integral to this transformation is Virginia Tech's continued commitment to *Ut Prosim* (That I May Serve), academic excellence and world-class research; engaging the whole person; innovation; and affordability and accessibility. These principles have informed the strategic planning process and initial steps toward achieving Virginia Tech's Beyond Boundaries vision.

DEVELOPING THE STRATEGIC PLANNING FRAMEWORK

The strategic planning process, which began in fall 2017, involved significant iteration, engagement, and collaboration with the university community. In early 2018, the Strategic Planning Leadership Team and Committees gathered knowledge about the university and the Beyond Boundaries vision and engaged in three full day retreats that included presentations by all colleges, institutes and several administrative units. Subcommittees were developed to explore opportunities and challenges for strategically advancing research and innovation, explore rankings and metrics as part of the strategic planning process, and analyze ongoing feedback received on the vision and mission statements. Committee members also oversaw a separate research strategic planning process.

In spring 2018, the Strategic Planning Leadership Team hosted town halls and engaged with more than 19 commissions, committees, student and alumni groups to share updates and gather feedback on initial drafts of the vision, mission, core values, and strategic objectives. After synthesizing the Beyond Boundaries goals and emerging themes from these discussions, the Strategic Planning Leadership Team presented updates and received feedback from President Tim Sands, Provost Cyril Clarke, and the Board of Visitors.

Throughout fall 2018, the Strategic Planning Leadership Team and Committee members updated the strategic planning framework and continued to provide the university community with new opportunities for engagement and feedback. These conversations and feedback sessions took place across geographic locations including Blacksburg, Roanoke, Alexandria, Arlington, and Falls Church involving faculty, staff, students, alumni, and external advisory board members from various disciplines, levels, colleges, institutes, and units.

Faculty, staff, students, and alumni from various disciplines and at all levels across the university participated in the strategic planning process and feedback sessions. Of the participants who attended the events, over 1070 individuals agreed to provide feedback in various written or digital forms, including approximately 275 participants in Roundtable Discussions, 270 participants at the Diversity Summit, and over 525 participants in Fall Engagements. Feedback submitted in writing, digitally, as well as shared verbally helped inform ongoing, iterative updates to the strategic planning materials throughout this process (See Appendix A for more detailed strategic planning process data analysis).

In spring 2019, the Office of Strategic Affairs began drafting the final Strategic Plan for Virginia Tech. White papers on the design and use of metrics, rankings, and the Partnership for an Incentive-Based Budget (PIBB) model were also developed (see Appendix B for these white papers). Drafts of the Strategic Plan were shared with the Committee members and presented to the Board of Visitors in April. The final version was presented in June 2019.

QUALITATIVE DATA COLLECTION AND ANALYSIS PROCESS

Data collection methods included Google forms (both individual and group responses), emails to the Office for Strategic Affairs, verbal conversations, and group collaboration report-outs from campus engagements. Based on the types of engagements, the raw data collected were grouped into three categories:

- 1) Roundtable Discussions,
- 2) Diversity Summit, and
- 3) Fall Engagements.

The raw data were then coded line-by-line using an open coding process.

Continual data analysis allowed for identification of emerging themes (see Figure 1 for emerging themes from strategic planning conversations and feedback sessions), related concepts, and suggestions (see Appendix A for a more detailed strategic planning process data analysis). White papers were also created on metrics, rankings, and the Partnership for an Incentive Based Budget model (see Appendix B for all white papers).

ROUNDTABLE DISCUSSIONS	1. Teaching, learning, and research	8. Experiential and service learning
	2. Personal and professional growth of students	9. Hiring and retention
	3. Streamlining functions and processes	10. Engaging alumni and philanthropies
	4. Diversity and inclusion	11. Outreach and community engagement
	5. Strategic use of resources	12. <i>Ut Prosim</i> (That I May Serve) and service
	6. Increasing revenues and endowment	13. Reducing cost
	7. Partnership and collaboration	14. Reputation and branding
DIVERSITY SUMMIT	1. Diversity and inclusion	6. Collaboration and partnerships
	2. Community engagement	7. Innovative teaching and research
	3. Experiential and service learning	8. Strengthening capabilities
	4. Research for real world impact	9. Rewards and incentives
	5. Teaching, research, and service	10. Access and affordability
FALL ENGAGEMENTS	1. <i>Ut Prosim</i> (That I May Serve) and land-grant mission	6. Facilities, space, and infrastructure
	2. Student success	7. Innovative teaching and curriculum
	3. Faculty and staff	8. Diversity and inclusion
	4. Research and discovery	9. Virginia Tech footprint and programs
	5. University processes and financial resources	10. Technology

Figure 1: Emerging Themes from Strategic Planning Engagements

DIVERSITY STRATEGIC PLANNING PROCESS

The Virginia Tech Difference: Advancing Beyond Boundaries marks the first university-wide strategic plan to integrate inclusion and diversity as a key university priority. Previously, diversity strategic plans were separate from university-wide strategic plans.

Prior to the development of this university-wide plan, the Office for Inclusion and Diversity coordinated the diversity strategic planning process for all administrative units, colleges, and departments. From 2017 to 2018, each unit was asked to formulate a plan addressing the four key goals of InclusiveVT—the institutional and individual commitment to *Ut Prosim* (That I May Serve) in the spirit of community, diversity, and excellence. The four goals include institutionalizing structures to promote sustainable transformation; increasing faculty, staff, and student diversity; ensuring a welcoming, affirming, safe, and accessible campus climate; and advancing the academic mission through inclusion and diversity.

The diversity strategic planning process was divided into three sections: overview of structure and assessment of representational diversity; summary of current initiatives on climate, inclusion, and advancing the academic mission; and developing action items and timelines (see pages 10-14 of Appendix C for a template of diversity strategic plans). Unit diversity plans were developed by deans and administrators then reviewed by the Office of Inclusion and Diversity. As the Strategic Plan moves to implementation, unit-level diversity strategic plans will help ensure alignment between unit-level and university-level priorities, goals, and milestones.

RESEARCH STRATEGIC PLANNING PROCESS

Over the course of 2018 and early 2019, the Office of the Vice President of Research and Innovation led a series of strategic discussions with hundreds of members of Virginia Tech's research community and discussions with external stakeholders to establish priorities for advancing Virginia Tech's research enterprise. These conversations included one-on-one conversations; half-day community engagements; faculty surveys; literature reviews; blue-sky, open-ended innovation sessions; and focused brainstorming on specific topics.

The Office of the Vice President of Research and Innovation also engaged several partners and conducted landscape analysis to inform the research strategic planning process (see pages 1-5 of Appendix C for a more detailed discussion of the research strategic planning process). These efforts included partnering with the Education Advisory Board; engaging with RTI International and the Virginia Research Investment Committee; participating on the Virginia Research Investment Committee Implementation Advisory Team; evaluating current technology commercialization operations, which included a climate survey to evaluate needs and opportunities; and initiating a landscape analysis for shared research laboratories.

Throughout the engagements, several themes and priorities emerged. Strategic Planning Committees reviewed data and conclusions provided by the research strategic planning process as well as university-wide qualitative data analysis to refine and affirm Virginia Tech's research mission, vision, and core values. Several high-level priorities are reflected in the Strategic Plan, and more in-depth, granular strategies and initiatives will be described in forthcoming implementation and strategic plans for the research enterprise.

STRATEGIC PLAN FRAMEWORK

MOTTO

Our motto, *Ut Prosim* (That I May Serve), emphasizes our commitment to serve individuals and society.

VISION

Virginia Tech will be a global leader by inspiring and empowering people to learn, innovate, and serve beyond boundaries.

MISSION

Inspired by our land-grant identity and guided by our motto, *Ut Prosim* (That I May Serve), Virginia Tech is an inclusive community of knowledge, discovery, and creativity dedicated to improving the quality of life and the human condition within the Commonwealth of Virginia and throughout the world.

CORE VALUES

The Strategic Planning Committees created eleven initial core values informed from feedback from the university community. The eleven core values were consolidated into the four core values below:

DIVERSE AND INCLUSIVE COMMUNITIES: We value the educational benefits of diverse ideas, peoples, and cultures in order to contribute to the equitable inclusion and just engagement of the world's communities through collaboration and partnerships, guided by open expression, self-awareness, and mutual respect.

KNOWLEDGE AND INNOVATION: We value lifelong learning and freedom of inquiry through research, innovation, and the creative process within and outside of the university to promote the continuous seeking of knowledge to enhance society and address difficult and complex issues affecting the human condition.

OPPORTUNITY AND AFFORDABILITY: We value providing affordable educational opportunities for the Commonwealth of Virginia consistent with our land-grant mission.

EXCELLENCE AND INTEGRITY: We value continuous evaluation, improvement, and excellence to advance individual and institutional objectives with the highest standards of integrity and ethical behavior.

INITIAL CORE VALUES DEVELOPED BY STRATEGIC PLANNING COMMITTEES

UT PROSIM (THAT I MAY SERVE): Our motto, *Ut Prosim* (That I May Serve), emphasizes our value and commitment to service to individuals and society.

DIVERSE COMMUNITIES: We value the educational benefits of diverse ideas, peoples, and cultures in order to contribute to the just engagement of the world's communities.

OPPORTUNITY AND AFFORDABILITY: We value affordable educational opportunities for the Commonwealth of Virginia consistent with our land-grant mission.

COLLABORATION AND PARTNERSHIPS: We value collaboration and the collective value of using multiple perspectives to address difficult and complex issues.

MUTUAL RESPECT AND OPEN EXPRESSION: We value and promote open expression, self-awareness, and mutual respect.

ETHICS AND INTEGRITY: We value the highest standards of integrity and ethical behavior in academics and personal and professional relationships.

INCLUSIVE ENVIRONMENT: We value equitable inclusion and the quality of relationships between faculty, staff, and students to ensure an inclusive, welcoming, and affirming living-learning-working environment.

LIFELONG LEARNING: We value lifelong learning and inquiry within and outside of the university for personal growth and to promote the continuous seeking of knowledge to enhance society.

DISCOVERY AND INNOVATION: We value research, innovation, and the creative process.

FREEDOM OF INQUIRY AND ACADEMIC EXCELLENCE: We value freedom of inquiry and an environment that supports academic excellence.

CONTINUOUS EVALUATION AND IMPROVEMENT: We value continuous evaluation and improvement to advance individual and institutional objectives.

STRATEGIC PRIORITY 1: ADVANCE REGIONAL, NATIONAL, AND GLOBAL IMPACT

Aspirational Vision:

Virginia Tech will be globally recognized for its research strengths, world-class faculty, and ability to integrate its learning, discovery, and engagement missions as a comprehensive research land-grant university. Virginia Tech will prepare graduates to contribute and lead in a complex world by offering person-centered and purpose-driven student experiences designed to educate the whole person. Virginia Tech's impact will be regional, national, and global.

Goal 1: Increase excellence in research, discovery, and creativity

Goal 2: Increase teaching and learning excellence for a holistic education

Goal 3: Increase institutional impact and visibility

INITIAL MILESTONES:

- Increase extramural research expenditures to \$480M by 2024
- Achieve Top 10 US public land-grant (WSJ/THE US College Rankings) by 2024
- Achieve Top 13 US land-grant (THE World University Rankings) by 2024
- Ensure 100% of academic majors have a required experiential learning component by 2024
- Reach 30,000 undergraduate students by 2023
- Increase graduate student enrollment to 22% of undergraduate enrollment by 2024 (includes Innovation Campus Master Degree Students)
- Achieve Top 1/3rd (66th percentile) of internationally and nationally recognized faculty awards by 2022
- Achieve Top 1/3rd (66th percentile) of internationally and nationally recognized faculty publications and citations by 2022
- Increase the diversity (number of countries represented) of international faculty to 100 by 2024
- Increase the diversity (number of countries represented) of international students by reducing the representation from the top two countries to no more than 50% by 2024
- Advance the Rural Virginia Initiative with 20 funded projects by 2022

PROPOSED ACTION STEPS:

- Leverage Research Institutes to coordinate and align investments in faculty and shared research facilities to catalyze collaboration and build teams for center-level research programs
- Continue to develop and support department-level faculty scholarship expectations by discipline, including relevant metrics and peer comparison groups
- Develop an integrated strategy for expanding and enhancing Virginia Tech's international presence
- Further develop Virginia Tech Carilion partnership and presence in Roanoke
- Launch the Innovation Campus and develop an integrated strategy for Virginia Tech's presence in the greater Washington, D.C., area
- Collaborate with partners across Virginia to build strong research and innovation programs supporting the Commonwealth Cyber Initiative
- Develop and enhance the number and quality of partnerships with industry, other universities, and state and federal agencies
- Build upon opportunities for student and faculty engagement in transdisciplinary programs, such as Transdisciplinary Communities (Destination Areas and Strategic Growth Areas) and Interdisciplinary Graduate Education Programs
- Advance engagement of Virginia Cooperative Extension and the Virginia Agricultural Experiment Station with a diverse set of external partners through the Agricultural and Natural Resources initiative
- Optimize the research infrastructure for the size and diversity of the enterprise, including the creation of centrally funded world class research facilities, and providing the requisite laboratory and administrative support to facilitate research
- Secure at least two externally funded national center-level awards
- Explore central funding support for faculty presentations at international conferences
- Develop a strategic vision for distance learning
- Expand support for experiential learning, personalized learning, and living-learning programs that will enhance the student learning experience
- Develop a strategy and coordinated process for colleges to address the needs of underserved communities, including opportunities through the Rural Virginia Initiative
- Continue to support technology transfer for economic and human impact as supported and protected through the collaborative efforts of an integrated Discovery to Market (D2M) model

CURRENT INITIATIVES:

Institutes and Research Centers

The [Research Institutes of Virginia Tech](http://www.research.vt.edu/institutes) (www.research.vt.edu/institutes) enhance the university's ability to address large-scale research opportunities by crossing traditional disciplinary and college lines. The institutes provide access to world-class expertise across many disciplines and advance research and productivity through shared assets, facilities, equipment, and knowledge. The Research Institutes, as well as Research Centers, Labs, and Groups, help position Virginia Tech to contribute impactful research that serves the Commonwealth of Virginia and the world.

VT-shaped Student Experience

Beyond Boundaries affirms the importance of innovative applications in teaching and learning. One area of focus broadens current curricular models beyond what is considered “T-shaped” learning education, focused on disciplinary depth enhanced with transdisciplinary experience. In addition to “T-shaped” learning, Virginia Tech will build VT-shaped experiences for students to learn through person-centered and purpose-driven experiences that are both inclusive and flexible. VT-shaped learning aligns academic objectives with real-world problems and supports students’ engagement with *Ut Prosim* (That I May Serve) throughout their education. This unique learning model will accommodate students’ varying academic paths to prepare them for the diverse and complex social challenges of the future.

Pathways General Education Curriculum

The [Pathways General Education Curriculum](http://www.pathways.prov.vt.edu/about) (www.pathways.prov.vt.edu/about) provides students with a vibrant, flexible, meaningful general education program. Undergraduate students take 45 Pathways credits inclusive of disciplines and domains in discourse, critical thinking in the humanities, reasoning in the social sciences, reasoning in the natural sciences, quantitative and computational thinking, critique and practice in design and the arts, as well as critical analysis of identity and equity in the United States. All core concepts relate to broader integrative concepts of ethical reasoning and/or intercultural and global awareness that engage students in principles of integration, inclusivity, and relevance. Students may choose to complete a Pathways Minor that builds upon the general education requirement or complete their general education through alternative methods such as study abroad. Pathways General Education Curriculum reaches beyond traditional higher education and reimagines how students apply their focus areas in unique and innovative settings.

Experiential Learning

Degree-embedded experiential learning at Virginia Tech is characterized by an approach that builds skills and competencies through experience across the curriculum for all students in the discipline. Extending students’ traditional classroom learning to tackle authentic problems and work in context motivates students to synthesize theory, concepts, and habits of mind.

The concept of a VT-shaped education provides a framework to plan and implement learning experiences with flexibility and challenge in order for students to become agents of their personal and professional development. Through experiential learning, each Virginia Tech student will have a unique learning journey through curricular, co-curricular, and personal learning opportunities. Through this journey, they will discover new ideas, new talents, and what motivates them. Faculty engaged in intentional planning, development, and implementation of degree-based experiential learning will facilitate a purpose-driven educational journey for all Virginia Tech students (see Appendix D for more discussion on experiential learning).

Transdisciplinary Education and Communities

Transcending traditional plans of study centered around one discipline, Transdisciplinary Communities seek to prepare students with the necessary critical thinking skills and innovative problem-centered mindset to effectively drive change after graduation by offering problem-centered experiences implemented through innovative minors, course curriculum, and engagement programs like internships. Areas of focus combine academic and research strengths with innovative transdisciplinary teams, tools, and processes. Current areas include Adaptive Brain and Behavior, Creativity and Innovation, Data and Decisions, Economical and Sustainable Materials, Equity and Social Disparity in the Human Condition, Global Systems Science, Integrated Security, Intelligent Infrastructure for Human Centered Communities, and Policy. Transdisciplinary education goes beyond supplementary gaps of interdisciplinary learning to provide a broader and immersive learning environment.

Presence in the Greater Washington, D.C., Area

The university's presence in the greater Washington, D.C., area is a strategic resource for advancing Virginia Tech. Virginia Tech's presence in the area began in 1949 and has grown over the past five decades to include multiple graduate degree and research programs and the establishment of three primary urban locations in Alexandria, Arlington, and Falls Church (www.ncr.vt.edu). The university's presence is bolstered by approximately 160 faculty including approximately 60 tenure-track faculty across seven colleges and five Research Institutes. Fifteen percent of the university's sponsored research is generated by faculty based in the area. A similar percentage of graduate students receive their degrees in the region. The university partners with local governments, organizations, and businesses, and the university's presence in the area supports multiple experiential learning programs. Transdisciplinary learning priorities complement job force needs of the greater Washington, D.C., area including science and technology, business and innovation, data-driven decision-making and policy, integrated security, and intelligent infrastructure.

The relationship between the university's presence in the greater Washington, D.C., area and the main Blacksburg campus allows Virginia Tech to leverage its locations to respond to dynamic social groups and regional variation that translates to global discovery. Significant population density differences, cultural and ethnic diversity, regional wealth disparity, technology ecosystems, and urban versus rural living labs position Virginia Tech to innovate across multifaceted environments. Virginia Tech is well placed to support innovation, growth, and development that could foster economic opportunities and advance the human condition (see pages 1-7 of Appendix E for more discussion on Virginia Tech's presence in the greater Washington, D.C., area).

Virginia Tech Innovation Campus

The [Virginia Tech Innovation Campus](http://www.vt.edu/innovationcampus) (www.vt.edu/innovationcampus) will expand the university's graduate and research programs while also expanding the university's existing fifty-year presence in greater Washington D.C., area. The campus will serve as a leading magnet for high-tech talent and innovation while increasing regional and national competitiveness in the high-tech sector. Arising out of a historic higher education package that Virginia included in its Amazon HQ2 (new Amazon headquarters) proposal, the Innovation Campus will complement significant expansion in Blacksburg, support a full range of partnerships with leading public and private entities, provide a comprehensive education that traverses disciplines, and deliver on the university's land-grant mission by transforming the regional and state economic ecosystem.

The addition of the Innovation Campus and expansion in Blacksburg are designed to double the tech-talent pipeline in the state and diversify the innovation economy. The Innovation Campus will be a global center of technology excellence and talent production, support graduate education, attract top-tier faculty, spark research and partnerships, and ignite the region's innovation economy. Virginia Tech will be positioned to advance diversity and inclusion goals, enrich the experience of students in all locations, and prepare graduates for today's global and diverse workplace (see pages 8-13 of Appendix E for more discussion on the Virginia Tech Innovation Campus).

Commonwealth Cyber Initiative

The Commonwealth Cyber Initiative is a highly-connected network that engages institutions of higher education, industry, and government, along with non-governmental and economic development organizations, in a commonwealth-wide ecosystem of innovation excellence in cyberphysical systems, with an emphasis on trust and security. The Commonwealth Cyber Initiative will ensure Virginia is recognized as a global leader in secure cyberphysical systems and in the digital economy by supporting world-class research at the intersection of data, autonomy, and security; promoting technology commercialization and entrepreneurship; and preparing future generations of innovators and research leaders.

The Commonwealth Cyber Initiative must address today's workforce gap and tomorrow's new economy. To do so, it will build on Virginia's strong base of research excellence, its innovative and diverse higher education system, its vibrant ecosystem of venture capital investment and high-growth firms, and the unparalleled density of cybersecurity talent. The Commonwealth Cyber Initiative will develop new programs and promote, amplify, align, and grow existing efforts across Virginia. Efforts will include building a research alliance, supporting curriculum alignment for more seamless credit transfers across the commonwealth and cultivating holistic relationships with industry and government partners to support research, education, and experiential learning across the commonwealth. The Commonwealth Cyber Initiative will be measured by well-defined indicators like faculty participation, scholarly publications, competitive research expenditures, student employment in cyber fields in Virginia industry, patent licensing, and venture capital invested in spin-outs (see pages 6-9 of Appendix C for more discussion on the Commonwealth Cyber Initiative).

Presence in Roanoke

The Virginia Tech Carilion (VTC) partnership and presence in Roanoke, including the Virginia Tech Carilion School of Medicine (VTC SOM) and Fralin Biomedical Research Institute at Virginia Tech Carilion (previously known as the Virginia Tech Carilion Research Institute or VTCRI), combines the university's ongoing excellence in academic health science and comprehensive biomedical research capacity to respond to complex problems of the commonwealth and the world.

Originally established as a complementary private and public collaboration between an independent medical school, the Carilion Clinic, and Virginia Tech Carilion Research Institute, in 2016 the medical school became Virginia Tech's ninth college. The Fralin Biomedical Research Institute at VTC houses the efforts of almost thirty research teams in biological, behavioral, computational, and engineering disciplines working towards health and disease challenges and has generated nearly \$100 million in extramural research grant funding. VTC incorporates traditionally siloed disciplines of research and practice within living-learning educational environments, enabling students to put their research into practice and streamline their capacity for bench-to-bedside healthcare. Bridging science research and clinical expertise, the Virginia Tech Carilion partnership is positioned to activate biomedical research and care across the region and beyond (see pages 14-16 of Appendix E for more discussion on Virginia Tech's presence in Roanoke).

Industry Partnerships, Licensing, and Entrepreneurship

As part of the commitment to support industry partnership and start-ups, the university has recently refreshed its approach via an integrated Discovery to Market (D2M) model. Attending to all aspects of industry partnerships, the D2M team works together to nurture partnerships, secure needed investment, and ensure the discoveries made at the university deliver economic and human impact through three complementary centers: LINK – The Center for Advancing Industry Partnerships, LICENSING – The Center for Technology Commercialization, and LAUNCH – The Center for New Ventures (www.vt.edu/link). These centers provide support for a continuum of engagement opportunities including research collaborations, experiential learning projects, technology licensing, technology transfer, and new ventures.

Discovery to Market conveys a wide range of benefits to the university. A thriving partnership and innovation ecosystem supports growth of the research enterprise, philanthropic goals, faculty recruitment and retention, translation and impact, and an entrepreneurial and collaborative culture. Reputation is enhanced and risks are lessened as Virginia Tech honors its commitment to its research mission, as well as federal and state obligations associated with receipt of private and public sector funding.

Agriculture and Natural Resources Initiative

The Agriculture and Natural Resources Initiative supports and partners with agriculture and natural resource industries by promoting translational research, experiential learning, and technological advancements to drive private industry, economic growth, and benefit the commonwealth and the world. Virginia Tech is uniquely positioned to support the Agriculture and Natural Resources Initiative through its 11 Agricultural Research and Extension Centers (ARECs), 107 local Virginia Cooperative Extension offices across Virginia, and the university's significant presence in Blacksburg, Roanoke, and the greater Washington, D.C., area.

The Agriculture and Natural Resources Initiative recognizes that small-businesses, corporate partners, and commodity industry partners need continued innovation and discovery to build upon the commonwealth's leadership in agriculture and natural resource production. The newly named SmartFarm Innovation Network leverages existing technology centers across Agricultural Research and Extension Centers and campuses to build transdisciplinary research teams positioned to collaborate with nearby Agriculture and Natural Resources Initiative industry partners and develop technologies for sustainability, socio-economics, systems technology, human behavior, and policy challenges. To help address the global need for food production in light of population growth, the Agriculture and Natural Resources Initiative plans to host innovation summits; build a consortium of industry partners; provide experiential learning opportunities; engage faculty from across campus; facilitate acceleration of technological innovations; and complement many university transdisciplinary initiatives.

Rural Virginia Initiative

The Rural Virginia Initiative convenes an ongoing working group of partners from across public, private and non-profit sectors to develop a strategic framework for investing in shared prosperity across Virginia. The goal is to craft specific policy solutions within the local context of the rural communities themselves that are both immediately actionable and opportunities for future implementation.

The Rural Virginia Initiative's recommendation for rural Virginia's future, compiled by higher education institutions including the University of Virginia, Virginia State University, and Virginia Tech, was presented in fall 2018 to the Virginia Governor and Chairmen of the Senate Finance and House Appropriations Committees. This recommendation highlights extensive research into the existing contrasts of Virginia's urban and rural economies and associated disparities in community well-being, and examines what steps can be taken to close gaps where needed as well as benefit from such diverse features of the commonwealth.

As a result, initial areas of focus include innovation and job creation; education and talent; civic innovation and leadership development; agriculture and place-based entrepreneurship; and healthcare, early childhood, and community well-being. As the Rural Virginia Initiative develops, it will continue to evaluate coinciding rural Virginia initiatives across other higher education institutions as well as develop and build upon networks of influence throughout the commonwealth.

STRATEGIC PRIORITY 2: ELEVATE THE UT PROSIM (THAT I MAY SERVE) DIFFERENCE

Aspirational Vision:

The *Ut Prosim* (That I May Serve) Difference, a foundational differentiator for Virginia Tech, recognizes the integral connection with Virginia Tech's land-grant responsibility of access and opportunity and its mission of service to humanity. Consistent with InclusiveVT, the institutional and individual commitment to *Ut Prosim* (That I May Serve) in the spirit of community, diversity, and excellence, Virginia Tech will build and support communities of discovery where global citizens engage with different ideas, beliefs, perspectives, experiences, identities, backgrounds, and cultures.

Goal 1: Increase representational diversity

Goal 2: Increase cultural competency

Goal 3: Address critical societal issues impacting humanity and equity

INITIAL MILESTONES:

- Achieve 25% representation of underrepresented minority students in the entering class (freshmen and transfers) by 2022
- Achieve 40% representation of underrepresented minority or underserved students (Pell-eligible, first generation, and veterans) in the entering class (freshmen and transfers) by 2022
- Increase the total enrollment in the Corps of Cadets to 1400 by 2022
- Achieve 20% representation of underrepresented minority graduate and minority professional students by 2024
- Increase underrepresented minority faculty to 15% (which is equal to or greater than the mean Research (R1) Public Land-Grant Universities) by 2024
- Increase female faculty representation to 50% (which is equal to or greater than the mean Research (R1) Public Land-Grant Universities) by 2024
- Increase underrepresented minority faculty new hires to 25% annually by 2022
- Increase female faculty new hires to 50% annually by 2022
- Ensure 100% of graduate programs of study include a required cultural competency component by 2022
- Increase undergraduate students graduating with at least two Pathways courses that satisfy the Critical Analysis of Equity and Identity in the United States core concept to 25% by 2024
- Increase undergraduate students graduating with at least two Pathways courses that satisfy the Intercultural and Global Awareness integrative concept to 25% by 2024
- Increase representation of underrepresented minority staff and administrative and professional faculty to 25% by 2024

PROPOSED ACTION STEPS:

- Optimize strategies to increase the representational diversity of underrepresented minority students and underserved students through recruitment, retention, and success
- Review financial aid, and funding for co-curricular and experiential learning experiences of underrepresented minority and underserved students
- Enhance and expand programs such as the Target of Talent, the Future Faculty Development Program, and the Faculty Community of Scholars Program
- Develop strategies to increase enrollment in undergraduate courses and co-curricular opportunities that include diversity and inclusion competencies and capacities
- Ensure integration of Graduate School diversity education requirement
- Explore strategies to increase the development and incorporation of inclusive pedagogy practices into academic courses
- Review Campus Climate Survey response results and develop approaches to address trends
- Develop and build upon current efforts for global engagement to create positive change in a world without boundaries
- Develop international outreach and engagement strategies for increasing diversity of international students and faculty
- Continue oversight of college and administrative unit-level diversity strategic plans
- Develop a process for tracking engagement in social issues in curricular and co-curricular programming
- Determine appropriate metrics for employee veterans and persons with disabilities

CURRENT INITIATIVES:

Beyond Boundaries Scholarship Program

Virginia Tech values access and affordability for students. The Beyond Boundaries Scholarship program was announced in 2016 in order to put the university's access and affordability values into practice. Beyond Boundaries advances the university's goals related to Project 2022 to increase the number of underrepresented minority students and underserved students at Virginia Tech. The program reduces unmet need for underrepresented students and underserved students through qualifying gifts, each of which are matched by the university. The scholarship program also helps to advance and attract talented students from within the commonwealth and across the country.

InclusiveVT

[InclusiveVT](http://www.inclusive.vt.edu) (www.inclusive.vt.edu) is the institutional and individual commitment to *Ut Prosim* (That I May Serve) in the spirit of community, diversity, and excellence. The InclusiveVT Framework (See Figure 2) has been developed to help advance four institutional goals:

- Institutionalizing structures to promote sustainable transformation;
- Increasing faculty, staff, and student diversity;
- Ensuring a welcoming, affirming, safe, and accessible campus climate; and
- Advancing equity through the academic mission

A decentralized, but centrally coordinated, commitment to advancing equity and diversity is managed through the Office of Inclusion and Diversity, the President's InclusiveVT Executive Council, unit-level Diversity Committees, Diversity Directors, the InclusiveVT Faculty Diversity Committee, caucuses and alliances, and the Commission on Equal Opportunity and Diversity. The Office of Inclusion and Diversity leads, manages, and coordinates the institution's diversity and inclusion portfolio. Approximately 100 InclusiveVT representatives promote inclusive climates, share information and resources, and highlight events with their units, working collaboratively with unit-level Diversity Directors. The Diversity Summit, which explores critical objectives and new strategic initiatives, and the Advancing Diversity Program, which showcases successful initiatives and offers professional development opportunities are annual programs that support InclusiveVT. Additionally, unit-level community-building programming occurs during InclusiveVT Week to welcome new employees and students, and Principles of Community Week promotes inclusion and reaffirms Virginia Tech's commitment to the [Principles of Community](http://www.inclusive.vt.edu/Initiatives/vtpoc0) (www.inclusive.vt.edu/Initiatives/vtpoc0).

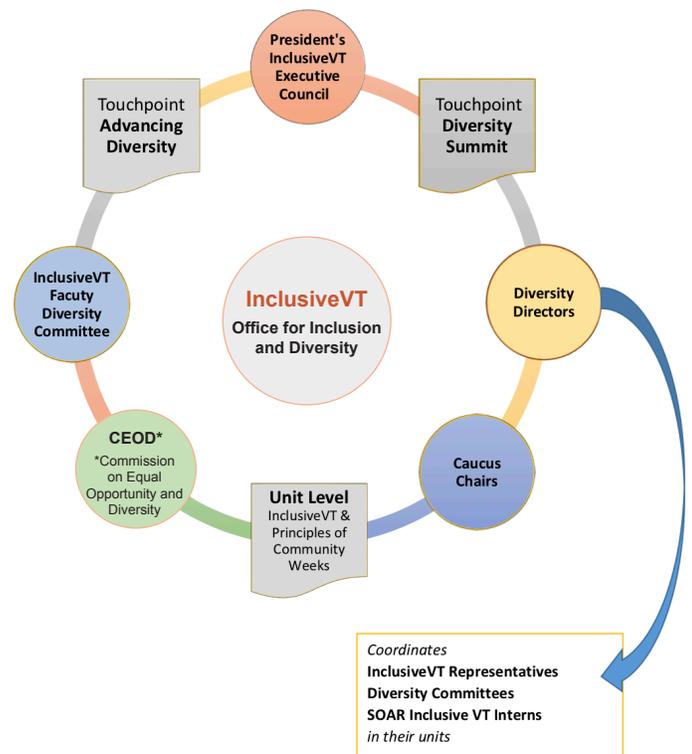


Figure 2: InclusiveVT Framework

As Virginia Tech moves beyond boundaries to advance diverse communities of learning equipped for a 21st century education, it will be critical for each college, unit, and department to hold themselves accountable for their diversity strategic plans. The unit plans are essential to achieving the university's goals of an increasingly diverse faculty, staff, and student population, and preparing students to address issues facing a global and interconnected world. Each college and unit has a plan based on the template in Appendix C (see pages 10-14). In addition, the new Partnership for an Incentive Based Budget model incorporates diversity metrics as it asks colleges and units to formulate multi-year goals with an emphasis on national benchmarking (see pages 22-26 of Appendix B for more information on the Partnership for an Incentive Based Budget Model).

Faculty Diversity

Since 2017, Virginia Tech has accelerated its faculty diversity efforts. Through the leadership of a new position, Director of Faculty Diversity, the Office for Inclusion and Diversity coordinates college and campus-wide efforts in partnerships with the InclusiveVT Faculty Diversity Committee and Diversity Advocates on search committees. In addition, all search committee members must complete an unconscious bias online course.

The Future Faculty Development Program is a two-day program open to doctoral candidates and post-doctoral scholars from underrepresented backgrounds interested in a career in academia. Each year, approximately 40 selected participants are matched to Virginia Tech academic departments and introduced to university facilities, faculty peers, and key aspects of a faculty position. Participants are selected based on academic and research potential as well as their alignment to Virginia Tech's institutional commitment to service and diversity.

Inviting prospective faculty to Virginia Tech builds professional relationships, expands peer networks, and maintains institutional visibility as a premier career destination. Since the program's inception in 2011, a number of participants have accepted faculty positions at Virginia Tech in response to university wide growth in student enrollment, research initiatives, and community impact.

Target of Talent

Virginia Tech's faculty diversity commitment follows two guiding principles: 1) the imperative of faculty identifying talented scholars through different strategies, recruiting candidates, and mentoring for success, and 2) an expectation of a shared commitment between the campus administration, departments, and colleges as a partnership model to advance faculty diversity. The Target of Talent program provides an incentive for hiring strategic priority candidates into academic faculty positions.

Funding for ten permanent recurring faculty lines was budgeted in support of this program in the 2018 fiscal year, following successful strategic priority candidate recruitments by colleges the previous year. The program was again funded in fiscal year 2019 to reward successful strategic priority recruitments of up to ten faculty in fiscal year 2018. To date, all 20 of the available Target of Talent lines for the first and second rounds have been awarded to colleges with participation in the program benefiting eight of the Blacksburg campus colleges.

As Virginia Tech pledges to grow the underrepresented student body and underserved student body, it will need employees that mirror and reflect the student population. Virginia Tech must ensure that students have the opportunity to learn from faculty and staff that are intellectually and culturally diverse.

Native American Engagement

Since 2016, Virginia Tech has been very active in engaging the eleven federally recognized tribal communities. It hosted the Native American Tribal Summit with all the tribal nations, and as a follow up to the summit, has developed tribal-focused engagement strategies. Engagement has focused on attending tribal nation pow-wows, but also hosting an annual pow-wow at Virginia Tech. In 2019, Virginia Tech hosted its third annual pow-wow. Specific engagement efforts include student recruitment, student retention, and tribal leadership partnerships. In addition, in 2019, Virginia Tech approved a resolution to recognize Indigenous Peoples' Day on the day that has been historically recognized as Columbus Day. These efforts are complemented by the programming in the Native American and Indigenous Community Center.

Inclusion and Diversity Resolution for Graduate Education

Seeking to build and support communities of diverse cultures and ideas, Virginia Tech ensures students learn, experience, and value inclusion and diversity. As a result, university leadership approved the 2018 resolution mandating all graduate students participate in an inclusion and diversity education component. This education will be iterative and adaptable across each academic unit and will complement the needs of each discipline. Graduate students will meet the inclusion and diversity educational requirement via workshops, training modules, lectures and discourse, and/or existing courses documented in students' Plans of Study, approved by unit leadership, and verified by the Graduate School. Implementation of this resolution will begin in fall 2019 with 100 percent participation across the all graduate programs no later than spring 2022.

Student Diversity

In 2017, Project 2022 was launched to encourage the university to accelerate its diversity and inclusion goals. Project 2022 set an ambitious goal that 25% of the entering class (freshmen and transfer) should be underrepresented minorities and 40% should be underrepresented minorities or underserved (first generation, Pell-eligible, and veterans). To advance this goal, the Office for Inclusion and Diversity has coordinated, sponsored, supported, and collaborated with several programs and campus units. In addition to the Hispanic College Institute which has been in place since 2014 with almost 100 students, the Black College Institute attracted 50 students in its first year in 2017 over 150 in 2018, and 300 in 2019. These institutes are residential summer pre-college programs for rising high school juniors and seniors. The Office for Inclusion and Diversity partners with the Vice Provost for Enrollment Management and the College Access Collaborative (CAC) to support student recruitment, outreach, and engagement efforts. The College Access Collaborative is an organizational unit dedicated to increasing college access, which focuses on building collaborative partnerships throughout the commonwealth.

Another distinctive outreach, recruitment, and engagement office is [the Center for the Enhancement of Engineering Diversity](https://eng.vt.edu/ceed.html) (CEED) (<https://eng.vt.edu/ceed.html>). Since 1992, the Center for the Enhancement of Engineering Diversity has provided encouragement and support to engineering students, with a focus on the underrepresented population. The Center for the Enhancement of Engineering Diversity sponsors several summer camps and outreach initiatives for women and underrepresented students.

As a parallel effort with recruitment, the campus supports several programs and units related to retention. The Black Cultural Center was created in 1991, and for some time, the Black Cultural Center and Multicultural Center were the only centers available for underrepresented minority students. In 2016, the LGBTQ+ Resource Center, El Centro, the Native American and Indigenous Center, and the Asian and Asian American Engagement Center were added. The centers offer several programs for students, develop programming during cultural heritage months, and sponsor cultural celebrations during graduation week.

In 2018, the [Student Opportunity and Achievement Resources program \(SOAR\)](http://www.inclusive.vt.edu/SOAR) (www.inclusive.vt.edu/SOAR) program was created to work with entities across the university to help students who are underrepresented and underserved. The program works with University Advising and the Student Success Center to enhance outreach and support for underrepresented minority students. The Student Success Center offers tutoring and mentoring to students across campus.

Another related mentoring program is the Life Sciences Mentoring Program. The program supports underrepresented minority, underserved, and female students majoring in the life sciences with a peer-to-peer mentoring program partnering offered with the College of Agriculture and Life Sciences, College of Science, and College of Natural Resources and Environment. This program offers a research component to explore performance in math, chemistry, and biology.

Finally, to ensure a welcoming, affirming, safe, and accessible campus climate, all incoming students are required to complete DiversityEdu, an online course on InclusiveVT and the Principles of Community. This course, along with other pre-enrollment online courses, has been required of enrolled undergraduate and graduate students since 2017.

Advancing the Academic Mission through Inclusion and Diversity

To advance the academic mission through inclusion and diversity, a transdisciplinary community of Equity and Social Disparity in the Human Condition was developed. This research and learning community cuts across other transdisciplinary communities to advance issues impacting the human condition. The community was instrumental in leading the approval of a new Pathways General Education core concept of Critical Analysis of Equity and Social Disparity in the United States. Students are required to take at least one class in this area during their time enrolled at Virginia Tech.

In addition to curricular efforts, there are also co-curricular programming. The Advancing the Human Condition Symposium, held since 2017, engages scholars, academics, and practitioners in transdisciplinary inquiry around the critical questions of our age, with a primary emphasis on equity as the driving force of discussions. Other co-curricular programming includes the Faculty Women of Color in the Academy conference (hosted at Virginia Tech since 2017), in order to offer women of color faculty, university administrators, post-doctoral fellows, graduate students and undergraduates a unique educational and professional opportunity to network, engage, and learn with peers from around the country. Each year, the conference attracts over 350 attendees.

STRATEGIC PRIORITY 3: BE A DESTINATION FOR TALENT

Aspirational Vision:

Virginia Tech will attract bold and dynamic faculty, staff, and students to a diverse and inclusive community to be a force for positive change. Virginia Tech will support the well-being and quality of life of students, staff, and faculty. Alumni and local communities will recognize Virginia Tech as a lifelong learning destination. Virginia Tech will invest, empower, support, and value a workforce that will champion our vision for the future.

Goal 1: Attract, retain, and develop the talents of faculty and staff

Goal 2: Attract, retain, and graduate students prepared to serve a global community

Goal 3: Support lifelong engagement and learning for alumni and local communities

INITIAL MILESTONES:

- Achieve progress in competitive faculty salaries towards 50th percentile of top 20 Research (R1) Public Land-Grant Universities by 2024
- Achieve progress in competitive administrative and professional and staff salaries towards the 50th percentile of relevant market range by 2024
- Increase the four-year graduation rates for all undergraduate (entering freshmen) students to 70%
- Increase the three-year graduation rates for all undergraduate transfer students to 75%
- Reduce the average student loan debt per graduating senior to \$25k by 2024
- Increase faculty and staff satisfaction with career advancement opportunities to at least 75% as reported in Employee Climate Survey by 2022
- Increase faculty and staff satisfaction with work-life balance to at least 75% as reported in the Employee Climate Survey by 2022
- Increase students participating in Hokie Mentorship Connect Program to 25% by 2022
- Increase on-campus students living in Living Learning Programs to 67% by 2024

PROPOSED ACTION STEPS:

- Identify funding opportunities for new and existing endowed professorships
- Review student-to-faculty ratio
- Develop staff recruitment and retention programs
- Increase access and affordability for first-generation and low-income students
- Improve the educational return on investment for students by evaluating student debt at the college level as compared to salaries after graduation
- Enhance comprehensive professional development and professional opportunities for academic professionals, for staff, and teaching and research faculty
- Develop programming to promote well-being for faculty and staff
- Identify strategies and develop partnerships to offer extramural and institutional funding for graduate students
- Develop a process to support alumni engagement and lifelong learning
- Enhance and expand curricular and co-curricular programs and student services that support the social, financial, community, and physical well-being of students
- Increase the number of graduates in high-demand, transdisciplinary areas
- Increase percentage of new graduates employed or continuing education

CURRENT INITIATIVES:

Human Resources Transformation

As Virginia Tech expands in Blacksburg, advances the Virginia Tech Carilion partnership and presence in Roanoke, and significantly increases its presence in the greater Washington, D.C., area at the Innovation Campus, the Division of Human Resources must transform operations to attract and retain needed talent. The Division of Human Resources actively works to deploy and enable proactive recruitment expertise through upgraded technology and investment in resources, targeted professional development, and positive work-climate through wellness and employee relations. Operational excellence throughout the division such as readily available resources, improved web presence and information, service teams, improved tools and processes, and a culture of process improvement will underscore a commitment to transformation.

The Division of Human Resources has already achieved significant progress towards developing a new workplace culture. In mid-2017, new senior management for human resources established three division areas: administrative, strategic, and consultative, and implemented a new division mission and vision. A newly hired Vice President for Human Resources has re-established governance within the division. Several goals include implementing a new recruitment and onboarding system in 2019 and clarifying compensation priorities to build a work culture at Virginia Tech prepared to serve each other and the community.

University Climate Survey

Virginia Tech is committed to creating and supporting a climate that fosters inclusion and diversity and allows all students and employees to be productive and engaged members of our campus communities. To understand progress toward these goals, a university-wide climate survey was administered during the 2018-2019 academic year. Feedback from the survey helps the university to understand the perceptions of employees and students in relation to diversity, inclusion, leadership, work and learning environment, job satisfaction, and the student experience. Feedback provides a better understanding of the campus experience and enables the university to develop strategies and make informed decisions that inspire positive change in the campus climate over time.

Faculty and Staff Compensation

Inspired by ongoing initiatives to enhance human resources processes, the Division of Human Resources continues to prioritize suitable compensation for Virginia Tech faculty and staff as well as respond to recommendations elevated by such university groups as Faculty and Staff Senates. One such example includes the university's July 2019 increase of minimum starting pay for full-time benefits-eligible staff as well as financial supplements to offset the cost of childcare and other work-related expenses for employees making a certain salary to help offset expenses. These efforts, in addition to ongoing review of faculty salaries, will help bring university salaries closer to market, increase the university's competitiveness, and help Virginia Tech be a destination for talent.

Enhanced Admissions

Led by the Office for Enrollment Management, the undergraduate application process underwent an extensive evaluation, review, and refinement in the 2019-2020 academic year. The enhanced admissions process seeks to eliminate barriers and improve access for students, particularly those from underserved, first-generation, or low-income backgrounds. Using the Coalition for Access, Affordability, and Success model, Virginia Tech's admissions process utilizes readjusted decision timelines and automated application fee waivers for new types of qualifying applicants. Driven by the university's land-grant identity to serve the needs of the commonwealth, Virginia Tech is the first Virginia university to accept self-reported transcripts in the application process to improve processing time and decrease the financial burden of college applications.

The enhanced application process generated immediate success as demonstrated by an increase in applications. These gains advance Virginia Tech's commitment to building student talent and reimagining the boundaries of higher education admissions. The refined application process includes opportunities for prospective students to share experiences in leadership, service, and integrity, resulting in a more holistic, comprehensive application beyond a successful academic record. As a result, the application process ensures Virginia Tech attracts prospective students most aligned with our mission for knowledge, discovery, and creativity.

Alumni Engagement

Alumni play a vital role in achieving our Beyond Boundaries vision through their continued relationship with Virginia Tech. As we work towards developing living-learning communities of positive impact throughout the world, we rely on an extensive network of alumni who can share experiential learning opportunities, connect future employers, and develop industry partnerships with the university. To strengthen these alumni networks, Alumni Relations continues to encourage alumni ambassador opportunities, alumni mentorship with current students, and alumni participation in local alumni chapters. Virginia Tech will be a resource for alumni who seek lifelong learning opportunities to energize their dedication to service and ultimately implement that energy within their communities beyond Virginia Tech. We recognize the power in a strong alumni network and witness the strengthening of that network during events such as the recently reimagined Reunion Weekend that encourages alumni from all classes to convene and celebrate their Virginia Tech experiences. Continued efforts towards building and sustaining opportunities for alumni to connect with the university preserves and amplifies the bonds of the Hokie Nation. The Hokie Mentoring Connect Program will provide a core point of contact for alumni and students to connect.

Living-Learning Communities

Living-learning communities embody Virginia Tech's dedication to offering VT-shaped, flexible, and personalized education for all students. These communities offer students transdisciplinary engagement across their academic and personal lives and promote broad interaction with peers.

STRATEGIC PRIORITY 4: ENSURE INSTITUTIONAL EXCELLENCE

Aspirational Vision:

Virginia Tech will, through continuous strategic planning, create opportunities to solicit and explore innovative ideas, inform resource allocation, and engage the university's system of shared governance. Virginia Tech will also optimize efficiency and effectiveness of administrative functions to ensure alignment of personnel, physical campus, and fiscal resources and processes in support of strategic goals.

Goal 1: Continue to develop the physical campus and technology infrastructure

Goal 2: Develop comprehensive and transparent budget and financial models with diverse and sustainable revenue sources

Goal 3: Develop and launch an adaptive, inclusive process for continuous strategic planning

INITIAL MILESTONES:

- Achieve 100% completion of college and unit-level strategic plans by May 2020
- Achieve maintenance reserve funding in the range of 1- 1.5% of facility values for auxiliaries
- Maintain Debt Rating in the AA or Aa Range
- Maintain \leq 5% University debt ratio
- Increase the University's unrestricted net assets by \$20 million annually by 2024
- Achieve an increase of at least 10% in total SWaM expenditures for each of the SWaM categories annually by FY22
- Increase the endowment to \$1.6B by FY22
- Increase alumni giving to 22% by FY22
- Increase funds raised annually to \$175 million by FY23

PROPOSED ACTION STEPS:

- Provide, enhance, and maintain quality research, living, and learning spaces
- Ensure safety and security of the campus
- Implement universal design and accessibility of facilities
- Continue to improve energy efficiency and sustainable use of resources
- Develop consistent technology, universal design principles, and connectivity across locations
- Advance and align financial management, resource management, and transparent budget models
- Implement best-in-class customer service in all aspects of university operations
- Develop and support unit-level strategic plans and related initiatives
- Develop a process to identify and incubate new innovative ideas
- Facilitate decision-making transparency and efficiency throughout the institution
- Implement new workflows that increase efficiency and effectiveness of university policies and procedures
- Continue to grow the endowment held and managed by Virginia Tech Foundation
- Continue to grow alumni giving participation and annual fundraising

CURRENT INITIATIVES:

Partnership for an Incentive-Based Budget (PIBB) Model

Beyond Boundaries imagined a university with greater financial resilience, funded by a diverse resource base and supported by budget models that enable adaptability and innovation in an increasingly dynamic academic financial landscape. As the main funding model for Virginia Tech's academic programs, the Partnership for an Incentive Based Budget model is strategic, inclusive, predictable, and responsive; designed to ensure resources are allocated in a manner that supports the university's mission and vision.

The Office of the Executive Vice President and Provost continues to work with degree-granting colleges to develop a model that sufficiently resources the academic enterprise, while incenting strategic activities. To accomplish this, the Partnership for an Incentive Based Budget model has been developed to reflect a broader array of outcomes and activities that are expected from a comprehensive university, with emphases on incentivizing growth in revenue generating activities, faculty success, student success, and administrative effectiveness (among other activities). The goal-based nature of the Partnership for an Incentive Based Budget model and the intentional connections to university strategic priorities differentiates it from the pure revenue-sharing budget models currently being established at many peer institutions (see Appendix B for more information on the Partnership for an Incentive-Based Budget model).

Master Plan Development

Preparing Virginia Tech for the next generation of higher education requires appropriate capacity in facilities and infrastructure. Inspired by Beyond Boundaries, the entire university community contributed to a multi-phased Campus Master Plan approved by the Board of Visitors in November 2018. Aligned with President Sands' Beyond Boundaries charge, the Campus Master Plan relied on six core drivers: the VT experience, sense of place, connections, growth, access for all, and sustainability. These drivers shape the Campus Master Plan's vision for living-learning communities anchored by flexible learning spaces; continued respect and emphasis for Virginia Tech's tradition and distinct character; cohesion across all Virginia Tech locations as the university expands to scale; spaces designed for all members of the community; and policy and practice in environmental awareness.

Climate Action Commitment

Approved by the Board of Visitors on June 1, 2009, the Virginia Tech Climate Action Commitment envisions Virginia Tech as a model community for a sustainable society. The Virginia Tech Climate Action Commitment affirms that Virginia Tech will be a leader in campus sustainability and outlines several goals and milestones for improving sustainability. Areas of focus include reducing emissions, improving sustainability of the built environment, minimizing waste, and improving electricity, heating, and transportation efficiency. Virginia Tech engages and involves the university community in these efforts through multiple activities including the development and implementation of sustainability-related academic programs and innovative strategies for efficient and sustainable use of energy, water, and materials in all university-owned facilities.

Organizational Excellence

As Virginia Tech strives for global distinction, organizational and operational excellence is imperative and foundational to the long-term success of the university's vision and aspirations. Organizational Excellence will expand long-standing excellence in academics and research to include administration and operations. Initial pilot projects launched focus on accessibility, total compensation, and administrative and operations transformation. Organizational Excellence will be guided by a culture of service excellence that values continuous improvement, responsible stewardship of resources (financial, physical, technological, and human), efficiency and effectiveness, transparency, real change, and program assessment.

Traditional organizational models and departmental silos will move towards collaboration and high performing work teams (representing multiple units), seeking university-wide partnerships and valuing diversity of thoughts. Duplication of administrative programs and services will be identified and alternatives for coordinated services and cost savings will be implemented, reducing bureaucracy and maximizing flexibility through governance, policies, processes, and systems.

Technological advancements will create opportunities to provide 24/7 access and on-demand services, enhancing community engagement. Constraints around physical locations will be minimized. Investments in infrastructure, at all campus locations, will ensure facilities, technology, and services provide inclusive and accessible experiences and support academic and research priorities. While respecting the university's shared governance system, decentralized operating environment, and geographic locations, Virginia Tech will strive for excellence throughout its organization and operations.

Infrastructure Technology

The [Division of Information Technology](http://www.it.vt.edu) (www.it.vt.edu) will undertake important planning and deployment actions to meet connectivity needs across Virginia Tech locations including the Innovation Campus and other locations in the greater Washington, D.C., area and Roanoke. This process will include developing and supporting a vision for distance learning, as well as lifelong learning and living-learning programs.

To further improve universal accessibility to technological interfaces, the Division of Information Technology plans to advance accessibility of information services, striving for a common experience for all Virginia Tech users regardless of location. This effort includes rearchitecting wide area network connections between key university locations, national networks, and public cloud and other service providers; deploying common services and technologies for device connectivity and classrooms; providing ease of access to Information Technology support through online and on-site resources; ensuring effective and timely identity and access management to appropriate university resources; and continuing to explore new technologies that improve services for the university community.

In collaboration with the Office of the Executive Vice President and Provost, the Division of Information Technology will support planning and operational effectiveness through data governance, improve access to disparate data sources through a "data lake" approach as an addition to the data warehouse, provide support for data analytics tools, and enable a community of practice.

Continuous Planning

A core component of Beyond Boundaries seeks to grow a culture of “continuous planning” at Virginia Tech. Continuous strategic planning involves monitoring goals, metrics, and milestones for existing priorities; identifying, developing, and advancing new strategic priorities; and ensuring a culture of self-evaluation, innovation, agility, and adaptability. Continuous planning is an institutional ability to set priorities and goals; develop paths to achieving milestones; create opportunities to assess progress using robust data; flexibly invest in priorities and goals; and adapt or revise approaches, priorities, and goals if needed.

Strategies are guides for organizations, visions with narratives, and templates for resource allocation decisions. In short, they provide guidance for where the organization wants to be to realize priorities and goals. Large institutions must connect what the strategy is with how the organization can implement the strategy in the most effective and efficacious way that allows for an ongoing and transparent dialogue.

On-going challenges and opportunities include university governance; resource management and prioritization; curriculum innovation and implementation; research collaboration; and initiatives that cross jurisdictions, campus locations, or disciplinary boundaries. The ability to determine budgets, innovate practices, and quickly implement and adapt through strategic planning are affected by long standing, often intermittently developed practices.

The Virginia Tech Difference: Advancing Beyond Boundaries identifies values and pursuits that guide and inform Virginia Tech’s strategic direction, which include the concept of continuous planning. Through continuous planning, Virginia Tech will create and support the infrastructure to connect initiatives to strategic priorities; to measure, assess and adapt so that priorities can be evaluated, achieved, or adjusted; and pursue new priorities altogether.

An opportunity exists for incremental and pilot efforts to maximize opportunities for institutional experimentation and learning while also minimizing the resources that would be required for comprehensive implementation. The smaller initiative approach allows for learning in an embedded context, and the opportunity to scale. Most likely, the smaller scale might foster learning across boundaries within the university as one unit works with another, learns, and practices it elsewhere.

CONCLUSION

As Virginia Tech builds upon this strategic planning framework and develops a culture of continuous planning across the university, this framework will be a university-level guide for colleges, institutes, offices, departments, and units across campus as they develop their respective strategies and plans to advance institutional priorities.

The Office for Strategic Affairs will guide the transition from planning to implementation through a collaborative, partnership-driven continuous planning process to help units develop their strategic plans. Immediate next steps for the continuous planning process include working with administrative and academic units to develop unit-level strategic plans by spring 2020.

In addition, feasibility studies will inform prioritization, implementation, and the development of processes to identify and incubate new ideas and increase decision-making transparency and efficiency throughout the institution. Key university leaders will be identified to champion specific initiatives, and a collaborative, partnership-driven continuous planning process will help Virginia Tech achieve milestones and advance its Beyond Boundaries vision.

Together, we will advance the Virginia Tech Difference.

APPENDIX LIST

Appendix A: Strategic Planning Data Analysis

Appendix B: Metrics, Rankings, and Partnership for an Incentive-Based Budget

Appendix C: Research Strategic Planning, Commonwealth Cyber Initiative, and Diversity Strategic Planning

Appendix D: Experiential Learning

Appendix E: Presence in the Greater Washington, D.C., Area and Roanoke



APPENDIX A: STRATEGIC PLANNING DATA ANALYSIS

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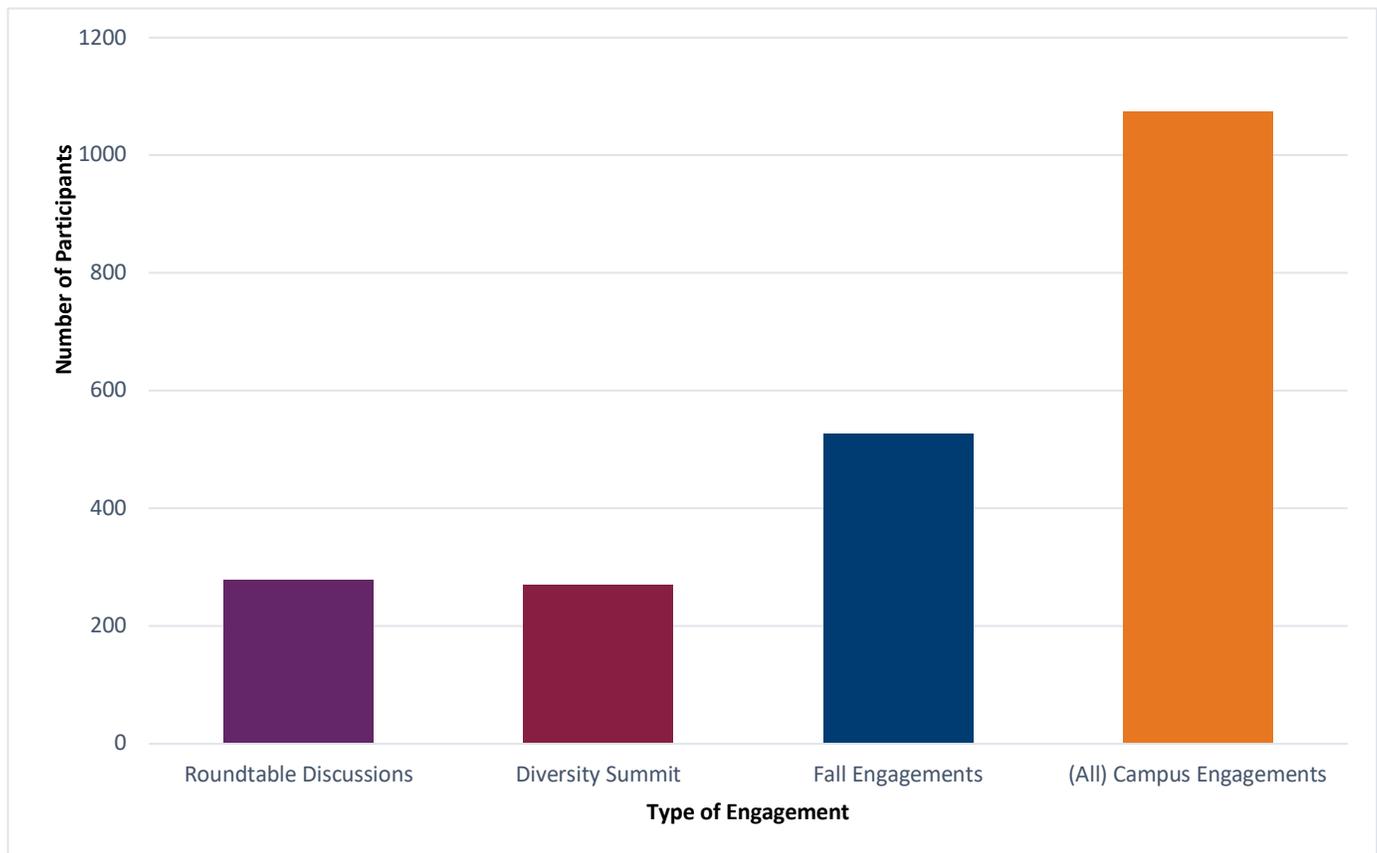
Terms:
Emerging Theme - A fairly broad idea under which related concepts are discussed
Related Concepts - Thoughts, ideas and suggestions categorized in association with a view or notion

STRATEGIC PLANNING DATA ANALYSIS

INTRODUCTION

This report presents a summary of qualitative data gathered during strategic planning conversations and feedback sessions conducted throughout 2018. Data were collected from various types of sessions -- **ROUNDTABLE DISCUSSIONS**, the **DIVERSITY SUMMIT**, and **FALL ENGAGEMENTS** -- which were held beginning in spring 2018 through fall 2018 and took place across geographic locations including Blacksburg, Roanoke, Alexandria, Arlington, and Falls Church. Strategic planning conversations and feedback sessions involved faculty, staff, students, alumni, and external advisory board members from various disciplines, levels, colleges, institutes, and units. These sessions focused on discussion topics including strategic priorities, key areas of focus, and challenges and opportunities from the participants' own perspectives and experiences at the university.

Figure 1. Number of Participants per Engagement



A number of faculty, staff, students, and alumni from various disciplines and at all levels across the university participated in the strategic planning conversations and feedback sessions. Of the participants who attended these events, over 1070 individuals agreed to provide feedback in various forms for which this data is based upon.

Beginning in spring 2018, the **ROUNDTABLE DISCUSSIONS** resulted in feedback from more than 275 participants from across the university community on specific topics such as advancement, student success, continuous planning, infrastructure, financial sustainability, and alumni engagement.

The **DIVERSITY SUMMIT** was a one-day event held in summer 2018 which garnered feedback from nearly 270 participants on three topics: *Ut Prosim* (That I May Serve) and teaching, *Ut Prosim* (That I May Serve) and research, and *Ut Prosim* (That I May Serve) and service.

The **FALL ENGAGEMENTS** resulted in feedback from over 525 individuals through 19 committees and councils, 37 meetings at the department and college level, 26 meetings with institute directors, and 12 open campus conversations.

The number of actual participants may have exceeded the figures cited above due to the open nature of some of these conversations, as not all participants registered in advance or wished to provide feedback.

Data collection methods included Google forms (both individual and group responses), emails to the Office for Strategic Affairs, verbal conversations, and collaborative group report-outs from strategic planning conversations and feedback sessions. Following each session, the raw data collected were grouped according to the type of session: 1) **ROUNDTABLE DISCUSSIONS**, 2) **DIVERSITY SUMMIT**, and 3) **FALL ENGAGEMENTS**.

The raw data were then coded line-by-line using an open coding process (Van Manen 1984; Tesch 1987; Corbin and Strauss 1990). Continual sifting and sorting of the data allowed for the identification of emerging themes, related concepts, ideas, and suggestions. In this context, an **“EMERGING THEME”** refers to a relatively broad idea under which related concepts are discussed. Data were analyzed and synthesized at two levels: an *Overview of Findings* and a *Detailed Analysis of Findings*.

The *Overview of Findings* offers the **EMERGING THEMES** from each type of strategic planning conversation and feedback session with the **MOST FREQUENT RELATED CONCEPTS**.

In the *Detailed Analysis of Findings*, **EMERGING THEMES** from each type of strategic planning conversation and feedback session are presented by *discussion topic*, with **MOST FREQUENT RELATED CONCEPTS** and **KEY IDEAS AND SUGGESTIONS** from participants.

OVERVIEW OF FINDINGS

This section offers results from high level data analysis including **EMERGING THEMES** and **MOST FREQUENTLY RELATED CONCEPTS** from participant feedback. The high level emerging themes are shown below (Figure 2) from the strategic planning campus engagements.

Figure 2. Emerging themes (in order) from strategic planning conversations and feedback sessions

ROUNDTABLE DISCUSSIONS	1. Teaching, learning, and research	8. Experiential and service learning
	2. Personal and professional growth of students	9. Hiring and retention
	3. Streamlining functions and processes	10. Engaging alumni and philanthropies
	4. Diversity and inclusion	11. Outreach and community engagement
	5. Strategic use of resources	12. <i>Ut Prosim</i> (That I May Serve) and service
	6. Increasing revenues and endowment	13. Reducing cost
	7. Partnership and collaboration	14. Reputation and branding
DIVERSITY SUMMIT	1. Diversity and inclusion	6. Collaboration and partnerships
	2. Community engagement	7. Innovative teaching and research
	3. Experiential and service learning	8. Strengthening capabilities
	4. Research for real world impact	9. Rewards and incentives
	5. Teaching, research, and service	10. Access and affordability
FALL ENGAGEMENTS	1. <i>Ut Prosim</i> (That I May Serve) and land-grant mission	6. Facilities, space, and infrastructure
	2. Student success	7. Innovative teaching and curriculum
	3. Faculty and staff	8. Diversity and inclusion
	4. Research and discovery	9. Virginia Tech footprint and programs
	5. University processes and financial resources	10. Technology

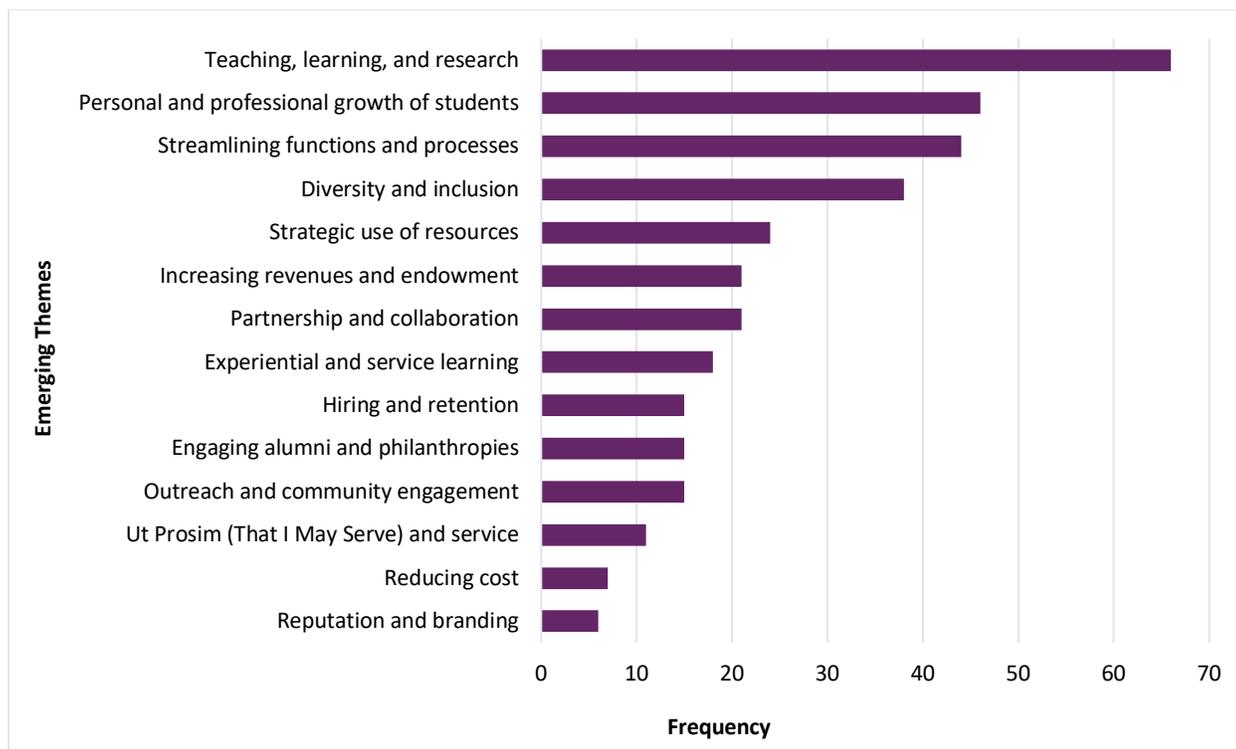
A. ROUNDTABLE DISCUSSIONS

Participants were asked to provide individual and collaborative group feedback via Google forms during roundtable sessions that focused on *specific* discussion topics:

- Financial Sustainability and Alumni Engagement
- Continuous Planning and Assessment
- Faculty Success
- Land-Grant Mission and *Ut Prosim* (That I May Serve)
- Undergraduate Student Success
- Graduate Student Success

From these **ROUNDTABLE DISCUSSIONS**, the following **EMERGING THEMES** (Figure 3) were defined and coded based on the **MOST FREQUENT RELATED CONCEPTS** from the participants' feedback.

Figure 3. Emerging themes from Roundtable Discussions



The following lists the **EMERGING THEMES** from the **ROUNDTABLE DISCUSSIONS** (numbered in bold) with the **MOST FREQUENT RELATED CONCEPTS** (in bullet points) in the order they appear in the graph:

A1. Teaching, learning, and research

- Innovative teaching and learning
- Supporting students' needs and concerns
- Advising and mentoring

A2. Personal and professional growth of students

- Integrate co-curricular and extra-curricular activities
- Developing disciplinary competence and emotional intelligence of students
- Instilling self-reliance, advocacy, and efficacy among students

A3. Streamlining functions and processes

- Making informed decisions based on data; acquire reliable systems, automatic data collection, and sharing
- Providing resources to understand and operate the systems
- Conducting periodic review of administrative efforts and make the continuous assessment less onerous but meaningful

A4. Diversity and inclusion

- Diversity of perspectives, backgrounds, and experiences
- Recognizing different capacities and levels of preparedness
- Access and affordability

A5. Strategic use of resources

- Strategic enrollment management—focusing on high demand disciplines
- Strategic investment of funds—in key infrastructure and technology
- Focusing on key regions and areas

A6. Increasing revenues and endowment

- Introducing differential fee structure for courses and programs with varying levels of costs
- Charging for services provided by the university and its auxiliary units
- Commercializing research outputs

A7. Partnership and collaboration

- International partnership to reduce cost
- Strategic partnership with the state government
- Offering under-enrolled courses and programs in partnership with other universities

A8. Experiential and service learning

- Integrating experiential and service learning to ensure student success
- Involving faculty in experiential learning
- Offer community-based learning opportunities

A9. Hiring and retention

- Hiring faculty whose interests align with those of Virginia Tech
- Offering better compensation and incentives
- Developing better evaluation metrics for junior and collegiate faculty

A10. Engaging alumni and philanthropies

- Defining engagement and set the goals of engagement
- Ensuring active stewardship and meaningful engagement
- Engage with alumni and large philanthropic donors and organizations

A11. Outreach and community engagement

- Leverage the land-grant status of the university
- Engage with diverse communities; bridge the rural-urban divide
- Facilitate community and professional engagement of faculty

A12. *Ut Prosim* (That I May Serve) and service

- Integrating *Ut Prosim* (That I May Serve) and service in every aspect
- Defining service and stress the importance of it
- Promoting *Ut Prosim* (That I May Serve) as a brand and mission of the university

A13. Reducing cost

- Exploring ways to offer online teaching and learning and outsource services to reduce cost
- Leveraging private investment in facilities, equipment, and student development
- Offering under-enrolled courses and programs in partnership with other universities

A14. Reputation and branding

- Investing in research
- Improving the reputation and ranking of the university
- Branding and marketing the strengths of the university

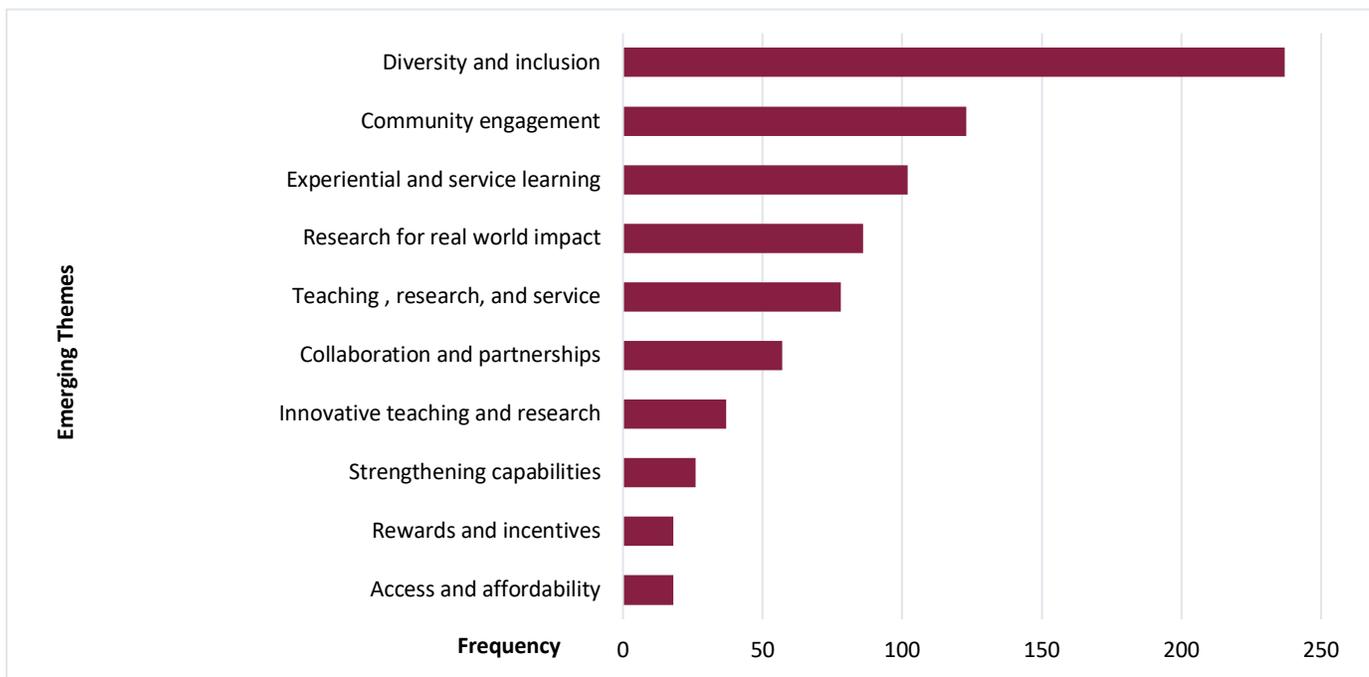
B. DIVERSITY SUMMIT

At the 2018 **DIVERSITY SUMMIT**, participants were asked to provide individual and collaborative group feedback via Google forms that focused on *specific* topics:

- *Ut Prosim* (That I May Serve) and Teaching
- *Ut Prosim* (That I May Serve) and Research
- *Ut Prosim* (That I May Serve) and Service

From the **DIVERSITY SUMMIT**, the following the **EMERGING THEMES** (Figure 4) were defined and coded based on the **MOST FREQUENT RELATED CONCEPTS** from participants' feedback.

Figure 4. Emerging themes from the Diversity Summit



The following provides the **EMERGING THEMES** from the **DIVERSITY SUMMIT** (numbered in bold) with the **MOST FREQUENT RELATED CONCEPTS** (in bullet points) in the order they appear in the graph:

B1. Diversity and inclusion

- Diverse research teams; diversity among teachers, students, and staff
- Research on diverse communities
- Research on diverse communities

B2. Community engagement

- Outreach and community engagement for teaching and service
- Communicating research with the public
- Local community, regional, and global concerns

B3. Experiential and service learning

- Experiential and service learning in teaching
- Experiential and service learning in service
- Engage students in research

B4. Research for real world impact

- Conducting service-focused research
- Conducting research benefitting humanity
- Conducting research for real world impact

B5. Teaching, research, and service

- Integrating teaching and research
- Integrating service with teaching and research
- Considering teaching as a service

B6. Collaboration and partnerships

- Collaboration within the university and other universities
- Partnership and collaboration with industry
- Partnership and collaboration with government and nonprofit organizations

B7. Innovative teaching and research

- Continuous improvement
- Radical and innovative research
- Leadership and entrepreneurship skills

B8. Strengthening capabilities (of Virginia Tech)

- Funding for research
- Incentives, recognition, and reward
- Access and affordability

B9. Rewards and incentives

- Recognizing good work of faculty and staff in promoting diversity and inclusion
- Rewarding those individuals and institutions for their contribution to diversity

- Putting in place incentives for those interested in promoting inclusion

B10. Access and affordability

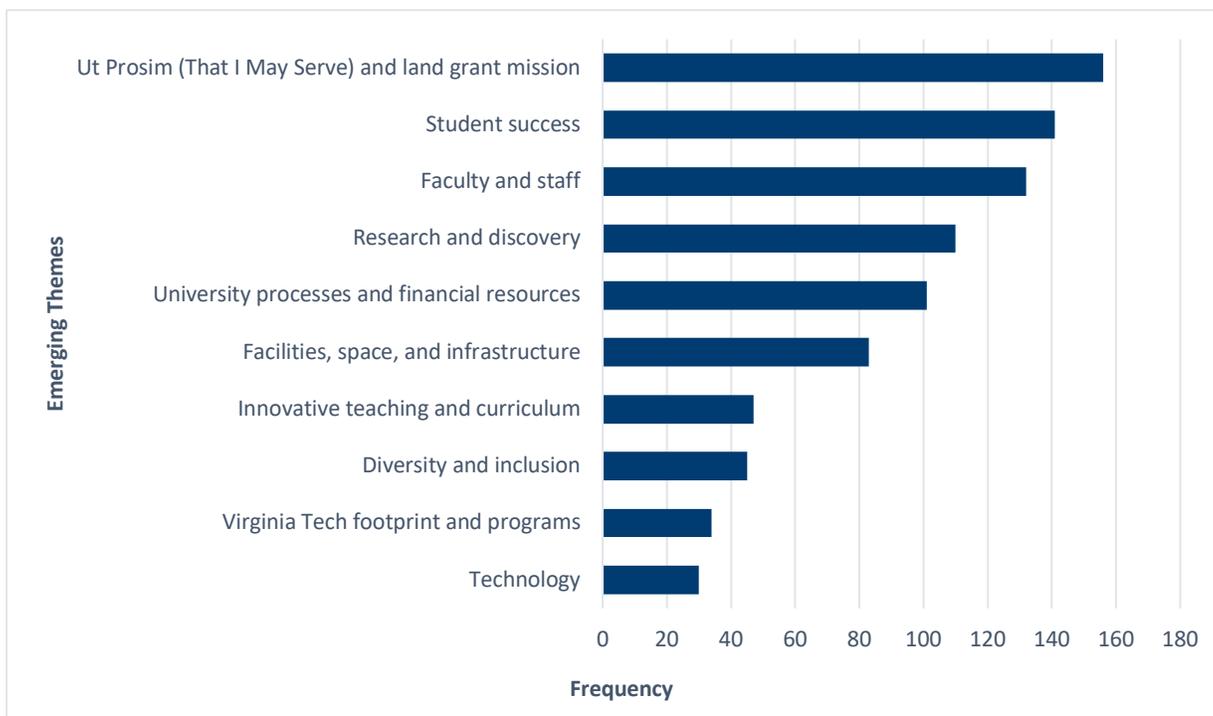
- Improving access for all sections of population
- Making Virginia Tech an affordable institution
- Offering scholarships and fellowships to those from marginalized communities

C. FALL ENGAGEMENTS

Participants were asked to provide individual and group feedback in open forums and meetings that included council, commission, and committee sessions, strategic planning presentations and discussions across numerous Virginia Tech locations, and college and unit level conversations. These discussions explored various topics including feedback on the mission, vision, core values, and strategic objectives; challenges and opportunities; key areas of focus; and open conversations on a variety of strategic planning topics.

From the Fall Engagements, the following the **EMERGING THEMES** (Figure 5) were defined and coded based on the **MOST FREQUENT RELATED CONCEPTS** from participants' feedback.

Figure 5. Emerging themes from Fall Engagements



The following provides the **EMERGING THEMES** from the **FALL ENGAGEMENTS** (numbered in bold) with the **MOST FREQUENT RELATED CONCEPTS** (in bullet points) in the order they appear in the graph:

C1. *Ut Prosim* (That I May Serve) and land-grant mission

- Mission, vision, and image of university
- Local and global engagement
- Global land-grant

C2. Student success

- Access and affordability
- Alumni engagement
- Recruitment, retention, and support

C3. Faculty and staff

- Recruitment and retention of high performing faculty and staff
- Faculty and staff satisfaction
- More full-time tenure track faculty lines

C4. Research and discovery

- Graduate education; student participation in research
- Interdisciplinary and transdisciplinary research
- Research infrastructure

C5. University processes and financial resources

- Alternative revenue streams
- Business operations and processes
- Research funding

C6. Facilities, space, and infrastructure

- Investment in current infrastructure
- Additional space needs
- Creativity and discovery classroom or lab space

C7. Innovative teaching and curriculum

- Online education and programs
- Investment in disciplines or majors
- Interdisciplinary and transdisciplinary courses or programs

C8. Diversity and inclusion

- Diversity and inclusion as a priority
- Recruitment, retention, and support of underrepresented students
- Accessible infrastructure and technology

C9. Virginia Tech footprint and programs

- Support and resources for greater Washington, D.C., and Roanoke area locations
- Mission and vision for greater Washington, D.C., area locations
- Infrastructure in greater Washington, D.C., and Roanoke area locations

C10. Technology

- Technology infrastructure
- Human technology interface
- Technology support

DETAILED ANALYSIS OF FINDINGS

This section offers results from a deeper level of data analysis by engagement category, that include *discussion topics* followed by detailed **KEY IDEAS** and **SUGGESTIONS** from participants' feedback.

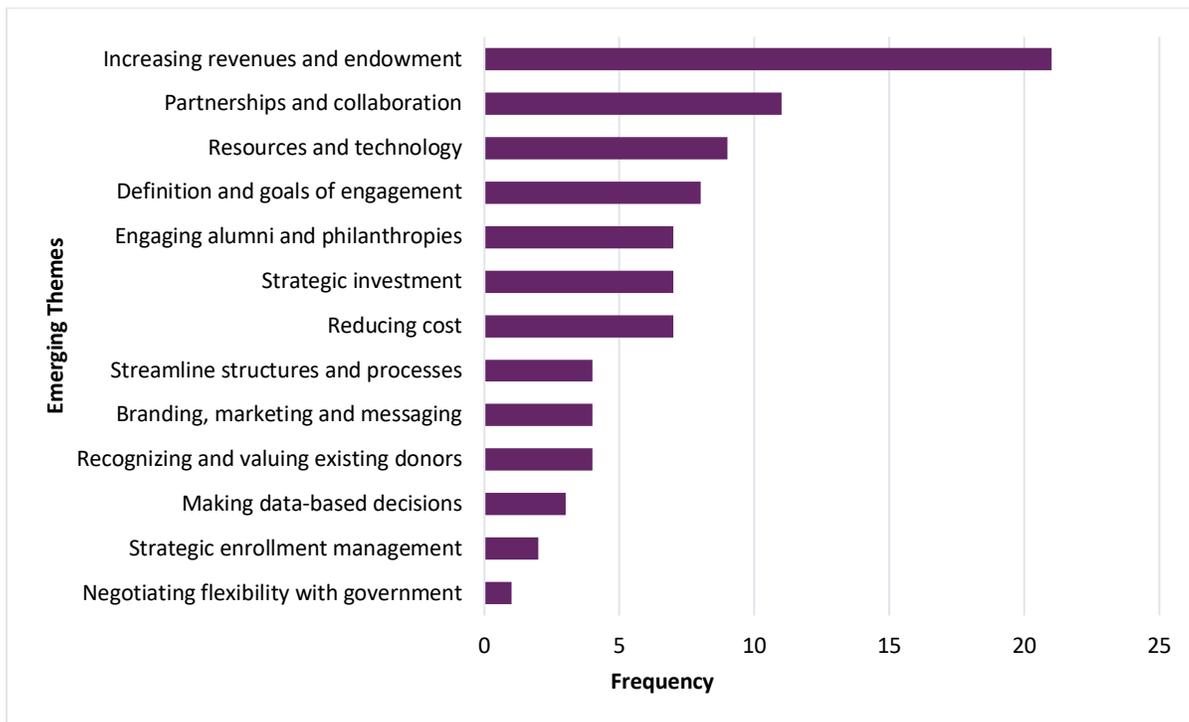
ROUNDTABLE DISCUSSIONS:

DETAILED FEEDBACK FROM PARTICIPANTS BY DISCUSSION TOPIC:

Participants were asked to provide individual and collaborative group feedback via Google forms that focused on *specific* topics during various **ROUNDTABLE DISCUSSIONS**. Each *discussion topic* is outlined below and includes **EMERGING THEMES** with a summarized detail listing of participant **KEY IDEAS AND SUGGESTIONS**.

DISCUSSION TOPIC A: FINANCIAL SUSTAINABILITY AND ALUMNI ENGAGEMENT

Figure 6. Emerging themes from Financial Sustainability and Alumni Engagement



The following provides the **EMERGING THEMES** from the *discussion topic* **FINANCIAL SUSTAINABILITY AND ALUMNI ENGAGEMENT** (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

A1. Increasing revenues and endowment

- Increase revenue by offering more winter courses, summer courses, certificates, professional courses, and degrees
- Create professional career development opportunities for professional organizations
- Identify and focus on core programs and divest from non-core programs
- Employ adaptive business models
- Allow external parties to rent facilities and buy services from Virginia Tech
- Charge for services to communities such as those provided by extension
- Leverage public-private partnerships for new sources of revenues
- Expand interdisciplinary research opportunities for faculty to increase sponsored program grant funding
- Expand industrial and commercial partnerships that generate value; maximize investment opportunities
- Develop more efficient instructional delivery to expand customer base
- Increase return on existing assets and better use of physical, financial, and human capital
- Expand externally funded research
- Provide services to private sector agencies for fees
- Expand online and other on-demand credit courses
- Increase endowment funds and more sustainable revenues from fundraising activities
- Charge special rate/fees for programs that are more expensive and for majors that pay a higher starting salary
- Convert units away from an auxiliary model such as Printing and Fleet Services back into cost recovery units in order for those units to focus more on services the university needs rather than recovering auxiliary costs

A2. Partnerships and collaboration

- Strategic partnerships with private organizations
- Offer more professional courses and degrees in collaboration with international universities
- Collaborate with the private sector in areas of instruction, research, and outreach
- International partnership to reduce cost
- Form strategic partnerships and outsourcing opportunities with other organizations wherever possible
- Engage in strategic partnership with the state government

A3. Resources and technology

- Employ adaptive business models
- Utilize existing infrastructure optimally during non-traditional instructional time periods, such as summer, to offer both student and public programs
- Explore alternative undergraduate approaches, such as 3-year degrees, or evening degree programs
- Leverage technology and resources better
- Encourage efficiency in university administration, for instance through pay for performance
- Implement better system for budget submission

A4. Definition and goals of engagement

- Clarify what is meant by engagement
- Define financial sustainability
- Outline clear goals for engagement and financial sustainability

A5. Engaging alumni and philanthropies

- Increase philanthropic donations
- Reach out within and beyond Virginia Tech
- Encourage philanthropic investment in specific programs
- Make the process of donating to Virginia Tech easy
- Identify roles for alumni and the progression that moves them from Hokie fans to Hokie donors
- Provide engagement opportunities at every age and stage of the life of an alumnus
- Build mutually beneficial relationships with our alumni populations through continuing education, Massive Open Online Courses (MOOCs), short-term certificate programs, and similar events and programs that help our alumni sustain skills
- Active stewardship and meaningful engagement: organize targeted events and annual fund solicitations, utilize alumni expertise for specific needs of the university

A6. Strategic investment

- Invest in data privacy
- Enhance cyber security infrastructure
- Invest in innovative techniques and resources for enhancing engagement
- Invest in research to help us stay connected with and updated on alumni (where are they, how can we contact them, what are they doing)
- Invest in human capital for research and engagement
- Recognize and reward better performing divisions
- Hire and train remote staff to target alumni in different regions
- Ensure that all new models and systems will protect sensitive data
- Pursue unified systems throughout the university to enable all areas to communicate within a single system

A7. Reducing cost

- Divest from non-core programs and consider adaptive business models
- International partnerships (with Asian and European countries) to reduce cost
- Wind down programs that no longer drive the mission of the organization and are not net positive
- Contain costs: build cost structures which resist inflationary pressures without sacrificing quality

A8. Streamlining structures and processes

- Measure Virginia Tech's success and use measurement in a process of continuous process improvement
- Nurture collaboration between offices, faculty, programs, colleges, and other units
- Create opportunities for comprehensive engagement with current and potential funding sources
- Reduce confusion and redundancy

A9. Branding, marketing, and messaging

- Improve Virginia Tech's image outside of Virginia
- Invest more in research to make Virginia Tech a top 100 university
- Focus on better marketing messaging

A10. Recognizing and valuing existing donors

- Recognize and value those who care about Virginia Tech
- Thank people: let them know that see what they care about and how they've made a difference

A11. Making data-based decisions

- Work closely with Budget and Controller's Office to understand costs and resource availability and allocations for financial planning and modeling
- Invest in new technologies that will allow and enhance the university's ability to engage alumni in an effective way

A12. Strategic enrollment management

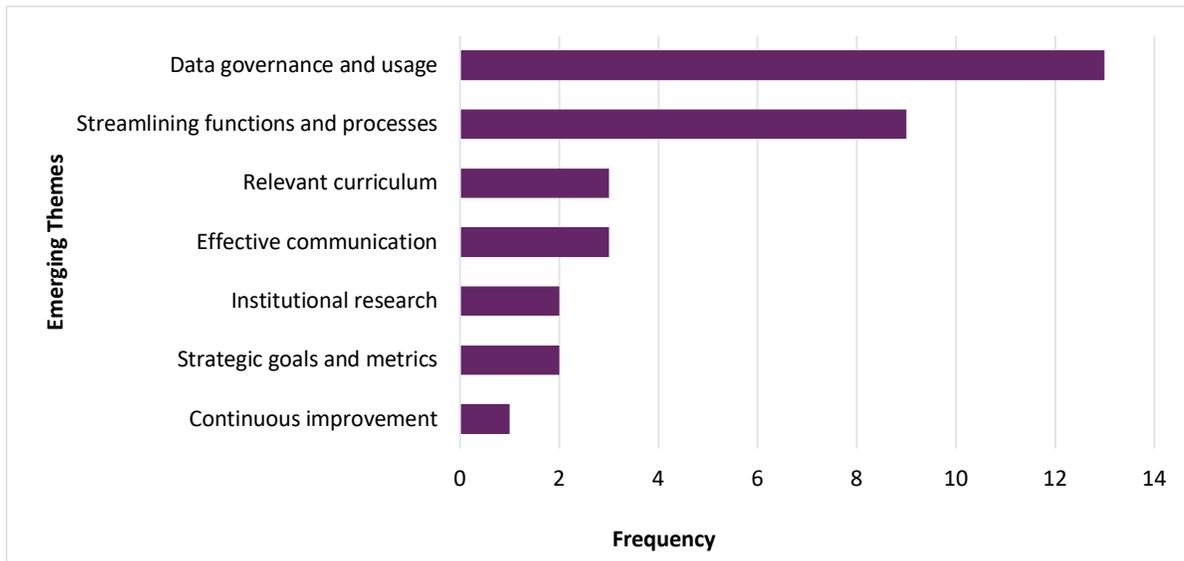
- Strategic enrollment growth - leverage nonresidents while serving Virginia's enrollment needs
- Eliminate some programs that have very low enrollment yet a high cost of instruction

A13. Negotiating flexibility with government

- Negotiate additional autonomy with the government agencies to obtain capacity to increase and manage resources

DISCUSSION TOPIC B: CONTINUOUS PLANNING AND ASSESSMENT

Figure 7. Emerging themes from Continuous Planning and Assessment



The following provides the **EMERGING THEMES** from the *discussion topic CONTINUOUS PLANNING AND ASSESSMENT* (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

B1. Data governance and usage

- Good data and data governance
- Common definitions for metadata
- Have readily available data to inform planning and assessment
- Collect and use data effectively to inform planning and make decisions about scheduling, space use, dining, and transportation
- Implement dashboards for management review
- Develop effective tools to analyze and evaluate outcomes to drive better decisions backed by data
- Enhance data access and integrity
- Use data analytics technology; increase data access and sharing; data-driven performance metrics and evaluation

B2. Streamlining functions and processes

- Research and assess operational efficiency for cost controls
- Reimagine processes and plan strategically
- Periodic assessment of academic and administrative functions leading to action plans
- Coordination with Budget and Controller and other university departments to understand costs, resource allocations, funding sources, etc.
- Streamline administrative functions, offices, structure and make efficient use of resources
- No unnecessary reporting, meaningful continuous assessment, and collection of data automatically through reliable systems
- Adopt simplified and transparent budget processes; better integration of systems and redesigning of outdated processes
- Introduce budget enterprise system
- Better coordination between teaching faculty and administrative staff; better communication between offices and departments
- Planning and assessment in academic departments and administrative units; efficient use of financial resources; assess the organizational structure to make sure that it is efficient
- Breaking down silos for better integration

B3. Relevant curriculum

- Begin with the end in mind - identify market opportunities and industry needs of university programs
- Curriculum and courses that cater to the interests and needs of the students

B4. Effective communication

- Accessible reporting
- Effective continuous stakeholder communication

B5. Institutional research

- Better align Institutional Research with the university strategic plan
- Benchmarking within and outside the higher education industry

B6. Strategic goals and metrics

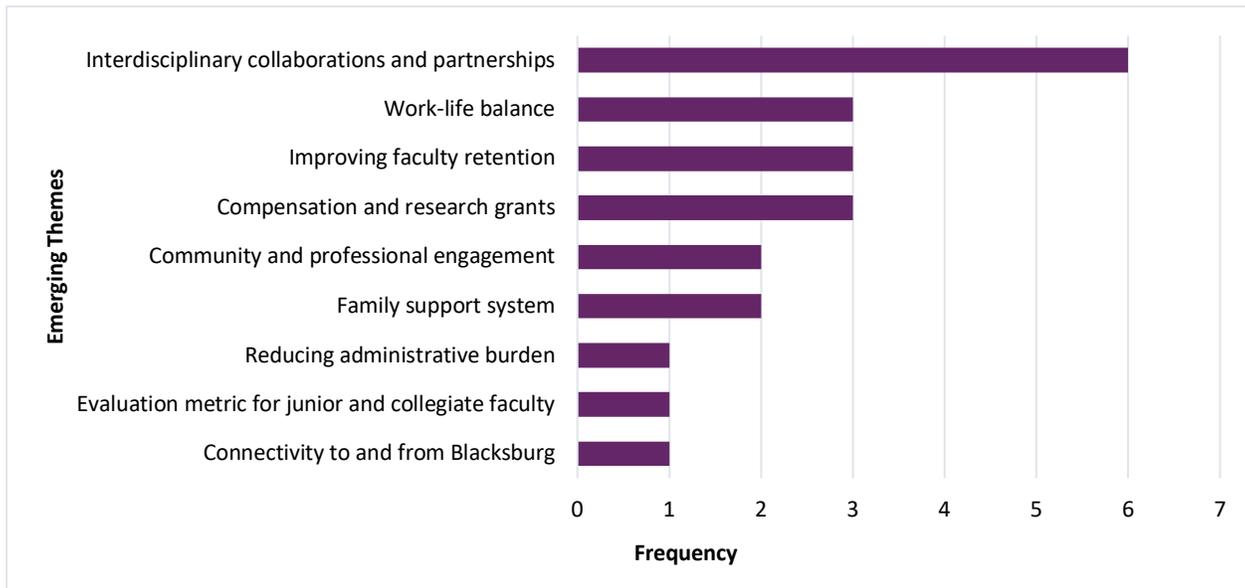
- Operational and strategic goals with actionable measures
- Widespread need to understand the institution's goals and objectives to inform continuous planning
- Benchmarking within and outside the higher education industry
- Understanding the metrics and evaluation methods being used

B7. Continuous improvement

- Develop and implement a continuous improvement program across academic and administrative functions with clear objectives and realized efficiencies

DISCUSSION TOPIC C: FACULTY SUCCESS

Figure 8. Emerging themes from Faculty Success



The following provides the **EMERGING THEMES** from the *discussion topic FACULTY SUCCESS* (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

C1. Interdisciplinary collaborations and partnerships

- Facilitate interdisciplinary collaborations across colleges
- Provide resources and platforms for interdisciplinary collaborations and partnerships
- Promote collaboration across disciplines with small research grants (e.g. travel grant)
- Adopt suitable reward systems for transdisciplinary research
- Provide mentoring and incentives for transdisciplinary research
- Support transdisciplinary research by offering junior leave and opportunities for co-teaching

C2. Work-life balance

- Provide more opportunities for work-life balance
- Provide research speed-dating, networking and socialization opportunities for junior faculty
- Increase faculty access to life amenities

C3. Improving faculty retention

- Provide mentoring for junior and collegiate faculty
- Provide grant development assistance to junior faculty
- Reduce administrative burden on the faculty

C4. Compensation and research grants

- To attract and retain faculty, offer better salaries and start-up packages
- Offer more research grants, especially small grants
- Provide access to some unrestricted research funds

C5. Community and professional engagement

- Provide opportunities for community and professional engagement
- Facilitate more industry and public-focused engagement
- Make the faculty stakeholders in their areas of expertise

C6. Family support system

- Provide better support to the families of faculty and staff
- Facilitate dual career options for spouses and better childcare services
- Provide access to other regions and localities

C7. Reducing administrative burden

- Reduce administrative burden on the faculty so that they can focus more on teaching and research

C8. Evaluation metric for junior and collegiate faculty

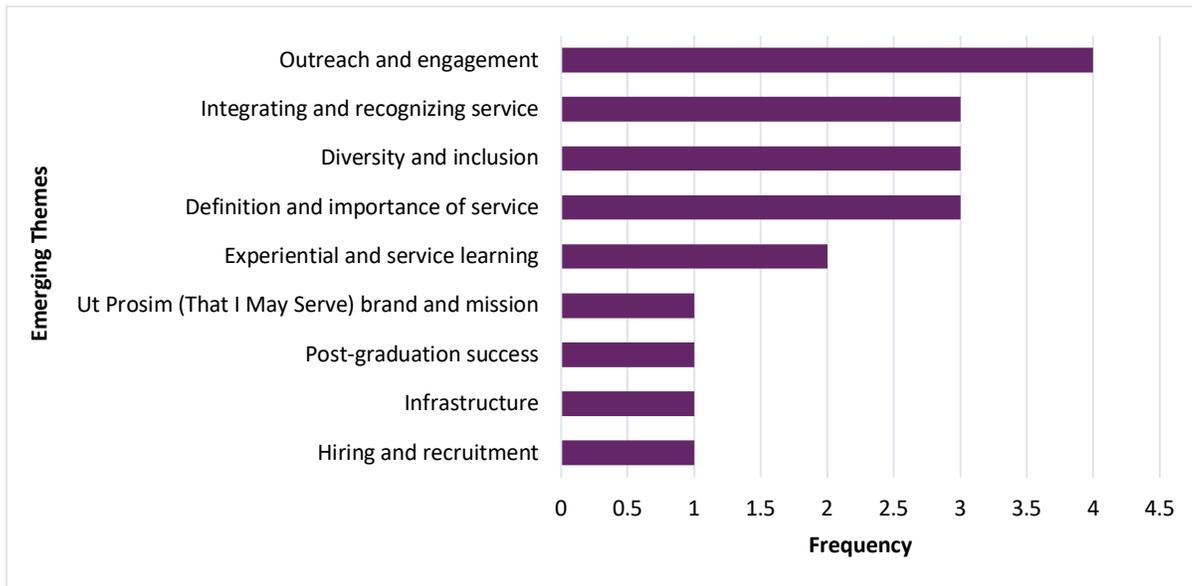
- Develop better evaluation metric(s) for junior faculty and collegiate faculty

C9. Connectivity to and from Blacksburg

- Make access to other cities and regions from Blacksburg easy

DISCUSSION TOPIC D: LAND-GRANT MISSION AND UT PROSIM (THAT I MAY SERVE)

Figure 9. Emerging themes from land-grant mission and *Ut Prosim* (That I May Serve)



The following provides the **EMERGING THEMES** from the *discussion topic LAND-GRANT MISSION AND UT PROSIM (THAT I MAY SERVE)* (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

D1. Outreach and engagement

- Global footprint is the key missing component, while not giving up a regional and national presence
- Develop more research and teaching in developing countries
- Build on existing structures and relationships with Virginia communities
- Engage with rural and urban communities; bridging the rural-urban divide

D2. Integrating and recognizing service

- Integrate service with teaching and research
- Recognize existing efforts toward integrating service with teaching and research
- Include service into our evaluation criteria

D3. Diversity and inclusion

- Facilitate the enrollment of underrepresented students in Virginia Tech
- Provide access to Virginia Tech to larger and more diverse groups of students
- Ensure teams of researchers from diverse backgrounds

D4. Definition and importance of service

- Define service and explain its significance
- Let the entire campus community define "*Ut Prosim* (That I May Serve)"

D5. Experiential and service learning

- Engage students with communities through experiential and service learning programs
- Bring experiences of both rural and urban lives to the classroom

D1. *Ut Prosim* (That I May Serve) brand and mission

- Define and operationalize *Ut Prosim* (That I May Serve) as a brand and mission

D6. Post-graduation success

- Measure the success of students after graduation

D7. Infrastructure

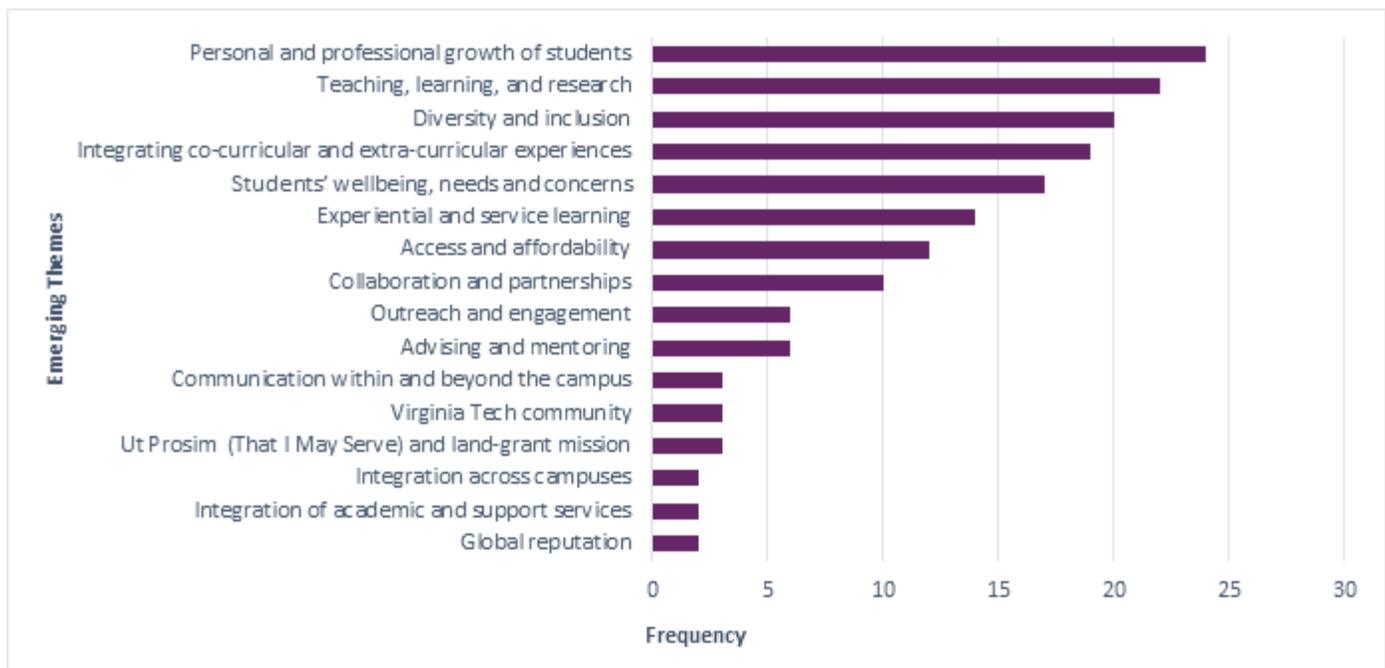
- Fix existing infrastructure; build new infrastructure if needed to advance the land-grant mission

D8. Hiring and recruitment

- Focus on recruiting service-minded students and faculty

DISCUSSION TOPIC E: STUDENT SUCCESS (UNDERGRADUATE)

Figure 10. Emerging themes from Student Success (Undergraduate)



The following provides the **EMERGING THEMES** from the *discussion topic STUDENT SUCCESS (UNDERGRADUATE)* (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

E1. Personal and professional growth of students

- Accept failure; let it not be a barrier to students' success
- Developing emotional intelligence (EQ) of students
- Disciplinary competence and skills
- Foster intellectual maturity and well-roundedness among students
- Foster leadership skills
- Pay attention to post-graduation success
- Personal and professional growth of students
- Develop professional skills among students
- Focus on reasoning and critical thinking skills
- Recognize student leadership
- Develop self-reliance and self-efficacy among students
- Strengthen and enhance the scope of student success center

E2. Teaching, learning, and research

- Encourage active learning
- Encourage collaborative learning
- Introduce flexible and efficient degree system
- Create inclusive pedagogies
- Innovative teaching and learning
- Integrate teaching and research
- Focus on interdisciplinary and transdisciplinary teaching and research
- Encourage peer-to-peer learning
- Share examples of good teaching practices
- Train and nurture inspiring instructors
- Focus on the quality of teaching
- Use Education Advisory Board (EAB) data to improve the quality of education
- Allow students to explore beyond their major

E3. Diversity and inclusion

- Building inclusive classrooms
- Grow cultural competence
- Develop and conduct cultural learning program
- Take into account diversity perspectives
- Increase diversity among students
- Address unconscious bias

E4. Integrating co-curricular and extra-curricular experiences

- Integrate co-curricular experiences such as Living Learning Communities (LLCs) or First Year Experiences (FYE)
- Engage more with Living Learning Communities (LLCs) and First Year Experiences (FYE)
- Encourage extra-curricular activities and experiences
- Provide hands-on, minds-on experience to students
- Facilitate student participation in co-curricular and extra-curricular experiences
- Incorporate more athletics and outdoor opportunities

E5. Students' wellbeing, needs, and concerns

- Focus on students' well-being (health and wellness)
- Strengthen the Cook Counseling Center
- Pay attention to and take care of students needs and concerns
- Listen to students' voices
- Address concerns regarding "academic bullying"
- Understand different students' needs
- Support students' needs
- Pay attention to the students' interests, learning styles, and needs
- Organize well-being focused events: social, sports and physical activity, tradition-building, and outdoor adventure

E6. Experiential and service learning

- Integrate experiential and service learning activities
- Provide experiential and service learning opportunities
- Develop mechanisms to help with internships and experiential learning
- Involve faculty in experiential learning
- Engage students with service in the spirit of *Ut Prosim* (That I May Serve)
- Provide guaranteed study abroad or study away experiences
- Address financial concerns that constrain access to experiential learning
- Secure more funding to support both domestic and international learning opportunities for underrepresented students
- Encourage and facilitate community-engaged-learning
- Ensure that all students have access (i.e., knowledge about opportunities, funding) to participate in all high impact practices
- Arrange for paid internships for students

E7. Access and affordability

- Focus on access and affordability
- Implement sustainable financial support mechanism for ensuring access to experiential learning
- Provide scholarships and housing for transfer students
- Make sure that all students have access to participate in all high impact practices
- Increase financial support for students
- Provide assistantships and paid internships
- Focus on access and affordability aimed at minimizing debt load
- Provide affordable housing and health insurance
- Develop appropriate funding model for students

E8. Collaboration and partnerships

- Collaboration across the campus
- Collaboration across colleges
- Collaboration among different Virginia Tech locations
- Partnership and collaboration with governmental agencies
- Partnership and collaboration with practitioners and non-governmental organizations (NGOs)
- Partnership and collaboration with industry

E9. Outreach and engagement

- Focus on community-engaged learning
- Engage with local communities
- Extend outreach to include students' families and communities
- Allocate resources for outreach and engagement
- Conduct outreach and engagement with underrepresented communities
- Engage with global communities through study abroad program and centers
- Increase outreach to enhance Virginia Tech's reputation

E10. Advising and mentoring

- Academic advising
- Faculty mentoring
- Peer-to-peer mentoring
- Create and support mentorship programs
- Support mentors and faculty members that help students develop diverse interests

E11. Communication within and beyond the campus

- Clarity of concepts and messages across the campus
- Define student success
- Make knowledge available to the public
- Make sure that everyone is aware of the Principles of Community

E13. Virginia Tech community

- Promote a sense of belonging in the Virginia Tech community
- Uphold the Principles of Community

E14. *Ut Prosim* (That I May Serve) and land-grant mission

- Improve the human condition
- Let *Ut Prosim* (That I May Serve) permeate many of our goals
- Leverage land-grant status to engage with communities and service

E15. Integration across campuses

- Better serve students at extended campus locations
- Provide better connectivity, housing, and support system for students across different Virginia Tech campuses

E16. Integration of academic and support services

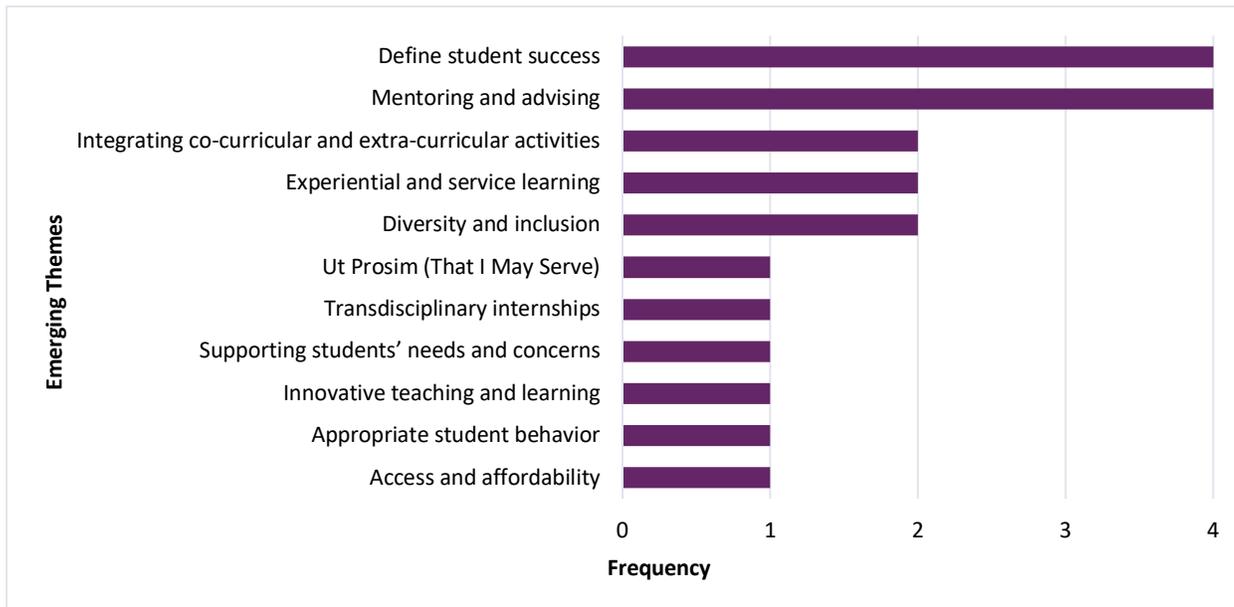
- Break down silos
- Integrate Academic Affairs and Student Affairs

E17. Global reputation

- Engage in research that improves the human condition on a global scale
- Global reputation is important, but not at the cost of Virginia Tech's land-grant mission

DISCUSSION TOPIC F: STUDENT SUCCESS (GRADUATE)

Figure 11. Emerging themes from Student Success (Graduate)



The following provides the **EMERGING THEMES** from the *discussion topic STUDENT SUCCESS (GRADUATE)* (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

F1. Define student success

- Define and clearly articulate what is meant by student success
- Take into consideration the post-graduation success of students
- Identify the barriers to students' success

F2. Mentoring and advising

- Give importance to mentoring students
- Faculty should get due credit for mentoring for promotion and tenure purposes
- Continual mentoring at each stage in their program
- Mentorship besides academic advising

F3. Integrating co-curricular and extra-curricular activities

- The integration between academics and student activities needs to be strengthened
- A combination of course work and co-curricular activities is most effective in laying the foundation for student success

F4. Experiential and service learning

- Focus on the integration of experiential learning
- Make experiential and service learning more accessible to all students

F5. Diversity and inclusion

- Try to understand the diverse motivation and life experiences of different students
- Address the serious under-representation of minorities and international scholars in certain fields
- Address unconscious bias

F6. *Ut Prosim* (That I May Serve)

- *Ut Prosim* (That I May Serve) should be transferred more seriously into practice for undergraduate and graduate students

F7. Transdisciplinary internships

- Encourage transdisciplinary collaborations through internships

F8. Supporting students' needs and concerns

- Faculty can better engage with students with a proper understanding of the background and motivation of the students

F9. Innovative teaching and learning

- Encourage collaborative teaching practices

F10. Appropriate student behavior

- Students must behave professionally and respectfully with other students, faculty, and visitors

F11. Access and affordability

- Make Virginia Tech affordable and accessible to all

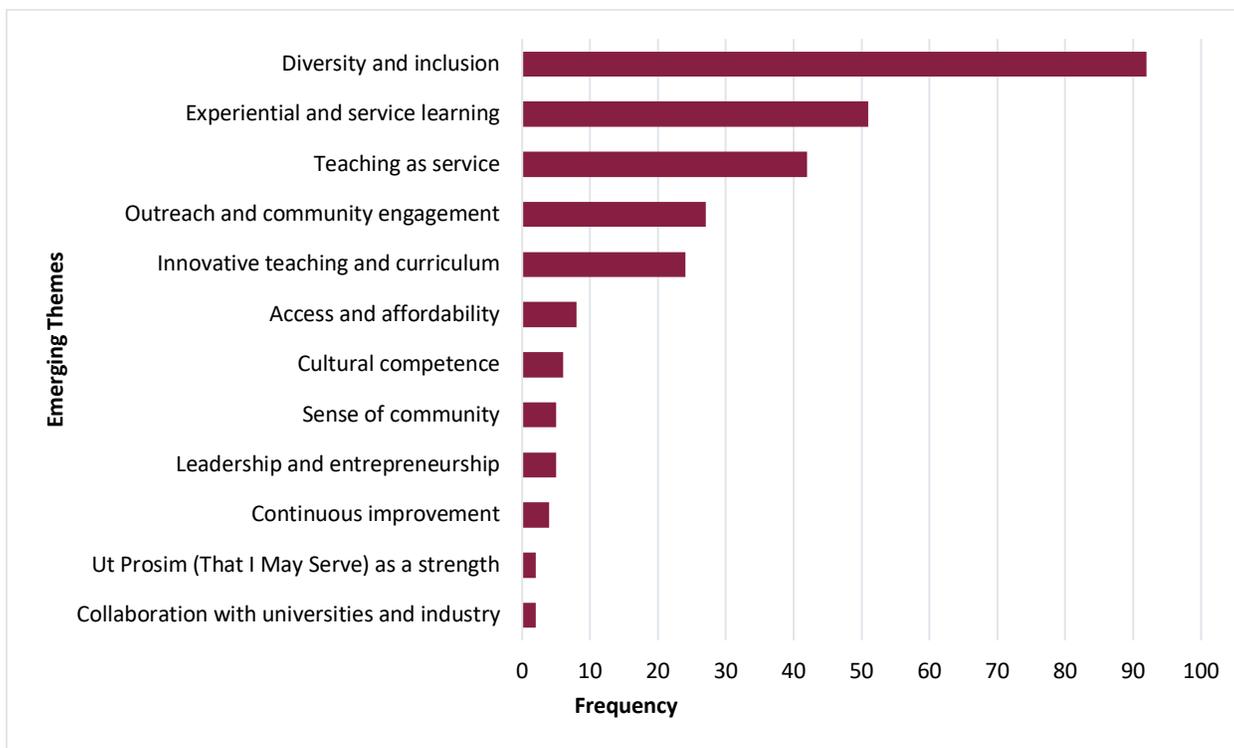
DIVERSITY SUMMIT:

DETAILED FEEDBACK FROM PARTICIPANTS BY DISCUSSION TOPIC:

Participants were asked to provide individual and group collaborative feedback via Google forms that focused on *specific* topics during the **DIVERSITY SUMMIT**. Each *discussion topic* is outlined below and includes **EMERGING THEMES** with a summarized detail listing of participant **KEY IDEAS AND SUGGESTIONS**.

DISCUSSION TOPIC G: UT PROSIM (THAT I MAY SERVE) AND TEACHING

Figure 12. Emerging themes from *Ut Prosim* (That I May Serve) and Teaching



The following provides the **EMERGING THEMES** from the *discussion topic* **UT PROSIM (THAT I MAY SERVE) AND TEACHING** (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

G1. Diversity and inclusion

- Encourage diversity and inclusion in the student community
- Ensure that students, faculty, and staff are all committed to the idea of diversity and inclusion
- Engage students and teachers with underrepresented communities and areas in order to expose them to issues of diversity
- Strengthen partnerships with Historically Black Colleges and Universities (HBCUs); create dual degree programs with such institutions
- Integrate inclusive pedagogies into the classroom
- Listen to the students: hear the voices of the underserved, unheard, quiet students; allow them to speak out; provide inclusive and equitable education
- Enable every participant to not only survive, but to grow and flourish
- Accommodate not only needs, but also preferences
- Celebrate the diversity of experiences, voices, and perspectives
- Focus on diversity in the curriculum, and among teachers; recruit teachers from diverse backgrounds
- Eliminate violence and hatred from campus
- Focus on the systemic aspects of inequality and racism; make students conscious of "why we do what we do"

G2. Experiential and service learning

- Integrate experiential and service learning into the course curriculum; provide experiential and service learning opportunities; include capstone classes
- Focus on the goals of liberal arts education as well as job prospects after graduation
- Provide networking opportunities for entry level undergraduates
- Require all students to do either a Virginia Tech Engage program of 2-weeks or more
- Provide students a multicultural perspective: teach the students global differences through study abroad programs; give them a global perspective
- Leverage existing programs such as Pathways minors, the Virginia Tech Engage program, and living learning communities
- Integrate *Ut Prosim* (That I May Serve) into all areas of education: instill values of service into the next generation
- Include compulsory service in every class; value service as a component in the college application
- Provide funding and facilitate experiential learning; more specifically service learning and study abroad
- Allow a semester doing service; integrate service at each stage: admission, orientation, academic, and social lives
- Service experiences should be measurable and enforceable for faculty and staff

G3. Teaching as service

- Teach well so that students become good engineers and professionals to serve the needs of diverse communities
- Focus on students' learning goals and needs; work on the idea of the "whole student," get to know the students, and teach them to make them successful
- Recognize and incentivize quality teaching; incentivize excellence in teaching; give importance to teaching quality in tenure
- Teachers should give students new perspectives
- Allow the voices of non-tenured faculty to be heard; provide better support for pre-tenured faculty members
- Teaching and training should be focused toward the idea of "improving human condition"
- Bridge the knowledge gap among students; take the diversity and different backgrounds of students into account; focus on the students' needs; make them successful in a global economy
- Provide equal education to students from all backgrounds; facilitate an appreciation of diversity in the classroom
- Promote evidence-based teaching strategies
- Make sure that all faculty and graduate teaching assistants embrace *Ut Prosim* (That I May Serve) within their teaching values; instill a spirit of service in them
- Encourage two-way communication in the classroom; mentor students to help them develop the skills that they will need to succeed in our modern technological society
- Encourage student-centered teaching practices; establish personal connection with students; don't let technology distance students from teachers

G4. Outreach and community engagement

- Increase outreach and community engagement across the state of Virginia; leverage the land-grant status; make use of Virginia Cooperative Extension (VCE) offices
- Engage in cultural and educational exchange programs with other universities such as, Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs), Native American-Serving, Nontribal Institutions (NASNTIs)
- Science and Engineering departments can engage in "scientific literacy"
- Encourage diversity of knowledge and perspectives; create purposeful integration and space for people of different backgrounds to work together
- Teach cultural diversity by taking students out to different communities; teach in the community settings; offer outreach-based learning as a requirement
- Promote engagement and community outreach regionally and globally; while national and global outreach is important, the university should focus on the Appalachian region
- Require students to become engaged in helping to solve community issues and industry problems
- Recruit from the neediest communities; build bridges to Haiti, Bangladesh, Rwanda and other poorest countries
- Focus at two levels: individual communities that need attention and the university as a community and what it can do
- Take science to communities; teach about and engage with Appalachia; engage with the communities to identify their needs
- Position VT Engage as a center to coordinate with various departments and institutions
- Connect the rural and the urban Virginia

G5. Innovative teaching and curriculum

- Focus on interdisciplinary problems and facilitate collaborative learning: encourage peer to peer mentoring; create mentoring programs where diverse matches are emphasized
- Use technology to improve content delivery and outreach
- Modify traditional delivery methods - instead of lectures, use active and participatory learning methods in every class; adopt alternative teaching methods such as online, flipped, and/or hybrid classes
- Teachers should provide the context and a purpose while teaching
- Introduce course observers to visit and give feedback
- Encourage participation from students; offer discussion-based courses
- Focus on critical thinking and real-life problems; teach critical thinking; focus on individual growth
- Establish English as second language (ESL) classes
- Place students in diverse groups in a range of "problem spaces" so that they can understand the problem and devise solutions
- Inspire fresh minds with the help of our star researchers
- Invite global perspectives from students while teaching
- Make students stakeholders in course development; use culturally relevant classroom examples
- Find alternative means and cheaper ways to disseminate information so that students with limited resources can access the information
- Challenge students to be bold in terms of thought, action, and perspective
- Provide platforms, assignments, projects, etc. at the intersection of disciplines and cultural identities
- Encourage learning in a problem space or vocational area; provide students with spaces for deep interaction with other students, faculty, and external audiences

G6. Access and affordability

- Make Virginia Tech affordable and accessible to all students irrespective of their backgrounds; provide accessible and affordable education to all Virginians
- Allocate adequate funding to make experiential learning feasible for all
- Provide generous scholarships to ensure access and affordability
- Make education accessible to the underrepresented population

G7. Cultural competence

- Grow cultural competencies among faculty; teachers should be taught diversity and curriculum diversification services should be provided to them
- Include cultural learning in the curriculum: teach in the community settings
- Grow cultural competencies among the faculty, staff, and graduate assistants
- Train faculty and staff on engaging with diverse students and accommodating cultural differences

G8. Sense of community

- Develop and nurture a sense of community
- Promote the "Principles of Community"
- Teach students to abide and uphold the "Principles of Community"

- Enforce the "Principles of Community"

G9. Leadership and entrepreneurship

- Virginia Tech should become a leader in service learning
- Become a role model for other universities to follow our example
- Teach soft skills such as empathy, teamwork, and communication
- Foster entrepreneurship
- Develop leadership; teach students from all backgrounds in ways that will prepare them to be successful leaders in the world

G10. Continuous improvement

- Don't stay static, update constantly - curriculum, support groups, and activities; ensure continual innovation
- Introduce course observers to visit and give feedback; encourage participation from students
- Continue to improve diversity on the campus and sustaining the improvement is also important

G11. *Ut Prosim* (That I May Serve) as a strength

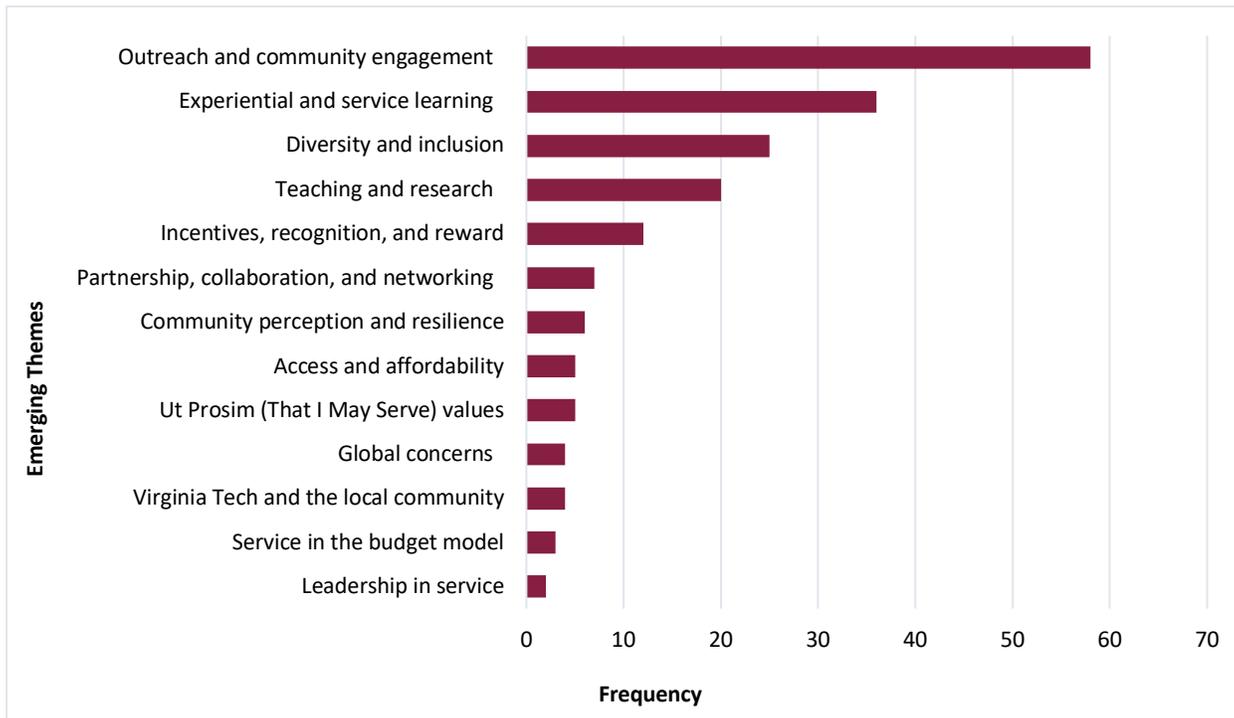
- Highlight *Ut Prosim* (That I May Serve) as a strength
- Students should be able to explain the meaning of *Ut Prosim* (That I May Serve) to prospective employers
- Develop a Pathway minor around this topic - *Ut Prosim* (That I May Serve)

G12. Collaboration with universities and industry

- Follow other excellent universities as role models
- Crowd source problems from industry to train students

DISCUSSION TOPIC H: UT PROSIM (THAT I MAY SERVE) AND SERVICE

Figure 13. Emerging themes from *Ut Prosim* (That I May Serve) and Service



The following provides the **EMERGING THEMES** from the *discussion topic* **UT PROSIM (THAT I MAY SERVE) AND SERVICE** (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

H1. Outreach and community engagement

- Engage with communities both locally as well as globally; engagement with communities, not providing service for them
- Focus on low income communities; reach out to underrepresented communities; intentionally use engagement of underserved communities to enhance diversity
- Capitalize on the land-grant status of the university; leverage Virginia Cooperative Extension (VCE) to expand outreach activities
- Capitalize on the land-grant status of the university
- Ensure involvement of Virginia Tech community – engage faculty, staff, and graduate students
- Declare a “Virginia Tech service day” and close the university operations for a day so that everyone can participate in service
- Create suggestion boxes and digital platforms to invite ideas from the community
- Make annual faculty service to minority institutions (for example, Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs), Native American-Serving, Nontribal Institutions (NASNTIs)
- a requirement
- Engage in the regional sustainability and development issues of Southwest Virginia
- Reach out to high schools; engage well-qualified high school teachers; prepare and promote STEM high school teachers

H2. Experiential and service learning

- Engage the entire Virginia Tech community (students, faculty, staff) in service
- Many comments emphasized the need for integrating experiential and service learning with the curriculum, a few comments encouraged participation in experiential and service learning by keeping it voluntary; [experiential and service learning] “should not be a mandatory requirement but be a voluntary choice ... most people resent being told to accomplish something that they have little to no interest in”
- Evaluate, recognize, and promote the existing service activities going on at Virginia Tech
- Set a goal(s) for community service and experiential learning
- Identify the strengths and weaknesses of service activities at Virginia Tech to help make further improvements
- Documenting and recording our service accomplishments is important; ensure critical evaluation and reflection on existing service programs

H3. Diversity and inclusion

- Focus on diversity and inclusion in the Virginia Tech community so that we can serve diverse communities better: pay attention to diversity and inclusiveness when hiring new faculty, staff, and students
- Provide robust funding and support for the cultural and community centers, and remove all barriers to success
- Address imbalance of power issues; promote social justice; ensure restorative justice
- Create a mechanism to address the concerns of minority and/or marginalized students
- Create "safe places" where students from diverse backgrounds can go and share their feelings and concerns
- Highlight our cultural diversity as a strength
- Develop cultural competence among students and faculty members before they take on a service project

H4. Teaching and research

- Strengthen and highlight the link between teaching, research, and service and community engagement
- Focus on student outcomes; focus on educating students to help them become better members of society; encourage graduate students to become citizen scholars
- Engage well-qualified high school teachers; prepare and promote STEM high school teachers
- Communicate science (innovation and research findings) to the community outside of Virginia Tech
- Clinical service (undertaken by the Virginia Cooperative Extension program) should be given credit as basic science research
- Provide training and nurturing to recent graduates

H5. Incentives, recognition, and reward

- Find exemplary faculty and staff on campus who are contributing to service and recognize their work
- Provide scholarships and fellowships to promote service
- Include service in the hiring, promotion, and tenure decisions

H6. Partnership, collaboration, and networking

- Form internal collaborations within and across the campuses for service; promote intra-university collaboration to integrate service learning with the curriculum
- Form partnerships with diverse stakeholders such as universities, (for example, Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs), Native American-Serving, Nontribal Institutions (NASNTIs) high schools, and prisons to expand outreach and community engagement

- Strengthen partnerships with the local community to genuinely serve them

H7. Community perception and resilience

- Consider the perspectives and feedback of the Virginia Tech community regarding what kind of service should be done and how it should be done
- Take the perspectives of the outside community about how Virginia Tech is serving the community
- Highlight Virginia Tech’s institutional resilience as a strength
- Focus on strengthening the resilience of underrepresented communities

H8. Access and affordability

- Virginia Tech should be accessible for all communities
- Promote Virginia Tech as a non-elite institution
- Provide scholarships to students from low-income and underserved communities
- Remove barriers to access and participation

H9. *Ut Prosim* (That I May Serve) values

- Inculcate a service and civic mentality among students, teachers, and staff
- Equip students with rich "lived experiences" through experiential learning and a sense of "service ethic;" serve with humility
- Make efforts to remove our own biases, instill value-based behavior, and declare a "Virginia Tech day of service"
- Engage in service in true spirit, not to show off; do service with humility
- Big Event –some comments highlighted that this event brings the community together for service and engagement, while other comments suggest that this event should not be upheld in the name of service; “the institution MUST ... reimagine ways [in which] we are harming and helping inequality, access, and success of communities”

H10. Global concerns

- Expand the definition of service
- Take *Ut Prosim* (That I May Serve) to address global issues (for instance, focus on global health concerns)
- Engage with communities both locally as well as globally

H11. Virginia Tech and the local community

- The university should engage more with the local community
- Strengthen its partnership with the local community
- Implement, uphold, and protect the Principles of Community proposed in 2005
- Continue to foster the relationship between students and the community
- Organize more events such as the Big Event and Food Pantry and engage more with the YMCA

H12. Service in the budget model

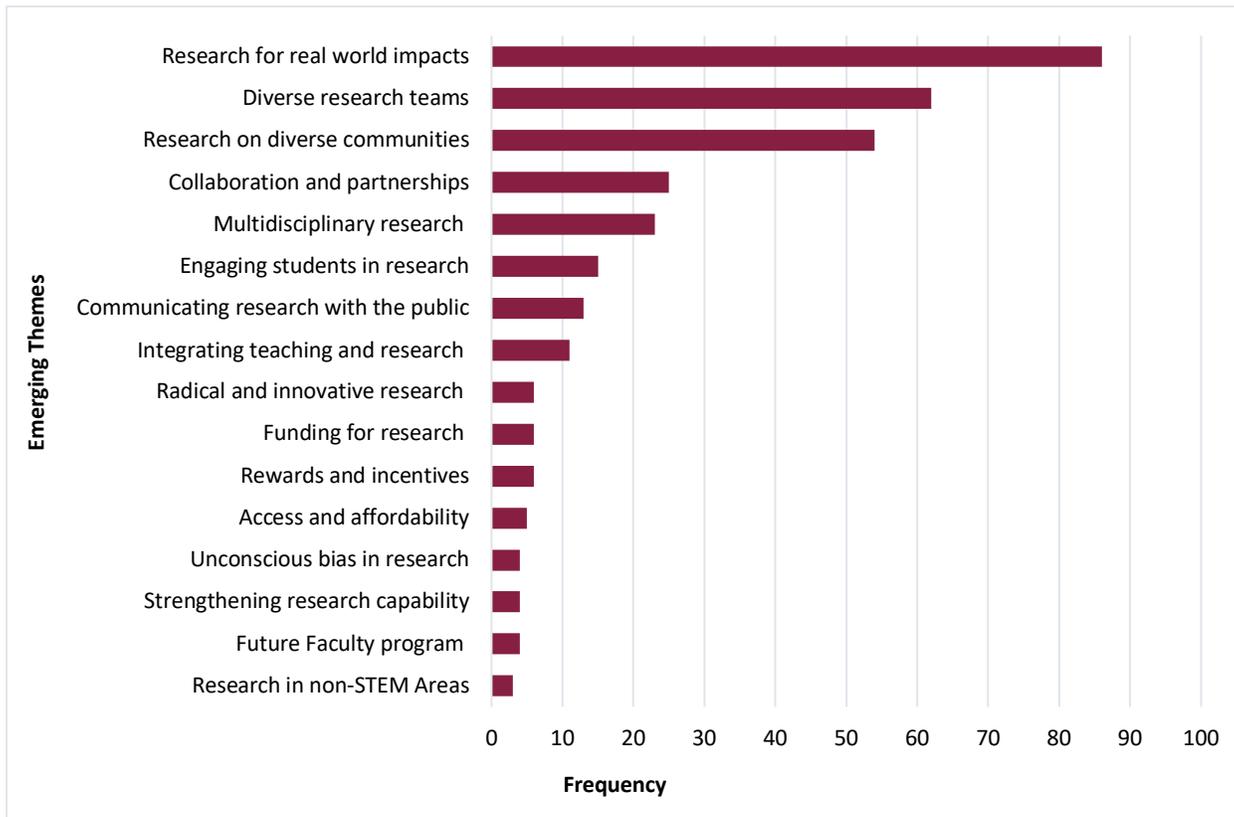
- Allocate adequate funding toward implementing service goals
- Reallocate scholarships to accommodate the needs to low income students and promote diversity
- Include service and engagement in the Partnership for an Incentive Based Budget (PIBB) model

H13. Leadership in service

- Innovate, collaborate, and strategize to become a leader in community engagement and service
- Create leaders for positive change
- Reach out to communities, make connections and alliances, and educate others outside of the Virginia Tech community about the *Ut Prosim* (That I May Serve) Difference
- Integrate service into our curriculum and all of our activities, and engage the entire Virginia Tech community (students, faculty, staff) in service

DISCUSSION TOPIC I: UT PROSIM (THAT I MAY SERVE) AND RESEARCH

Figure 14. Emerging Themes from *Ut Prosim* (That I May Serve) and Research



The following provides the **EMERGING THEMES** from the *discussion topic UT PROSIM (THAT I MAY SERVE) AND RESEARCH* (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

11. Research for real world impact

- Focus on a portfolio of critical, important and challenging world problems
- Conduct translational research that has the potential to affect conditions for real people; translate our research results into policy decisions and actions on the ground
- Focus on improving the human condition, ethics, and policy and law; prioritize research that addresses advancing human condition
- Perform research related to diversity and inclusion to diversify the university's research portfolio
- Promote research as a community effort
- Pick research topics and questions whose outcomes will directly impact the general populace
- Consider research projects that address the needs of humanity – food, water, shelter, health, environment, education - and that truly help our world become a better place for all people
- Conduct research that helps to improve the quality of life
- We must immediately do what we can to save the human species from extinction; seriously pursue (environmental and social) sustainability research

12. Diverse research teams

- Attract, retain, and reward a diverse research faculty
- Promote diversity among teachers, post-doctoral researchers, and students
- Include diversity and inclusion as criteria for hiring, promotion, and tenure
- Pay attention to diversity in terms of gender, race, ethnicity, nationality, experiences (fresh as well as experienced researchers), physical abilities, marginalized groups, rural, urban, low income, etc.
- Allow diversity of perspectives; ensure diversity in recruitment; make research inclusive and increase the number of underrepresented students in research
- Incorporate diversity into different research disciplines; recruiting students from Historically Black Colleges and Universities (HBCUs)
- Recruit international students from regions beyond the developed world; engage international students in research and take their perspectives into account
- Require a minimum percentage of researchers from underrepresented communities in research grants and proposals
- Expand creativity of our research through the creation of diverse research teams
- Make our research labs truly inclusive, this will lead to more innovative discoveries
- Perform research related to diversity and inclusion to diversify our research portfolio
- Focus on diversity and collaborative learning
- Promote successful research performed by underrepresented faculty, as it encourages other researchers and allows students to see role models in them
- Greater pursuit of graduate students from underrepresented populations, as well as postdoctoral fellows, can help build the pipeline of future research professionals and a more diverse professoriate

13. Research on diverse communities

- Conduct research to identify and address the needs, concerns, and problems of underrepresented and underserved communities
- Enable, encourage and reward research in diversity and various aspects of society, starting with the Commonwealth of Virginia
- Continue to lift up our regional and local obligations as a land grant research university located in Appalachian Virginia
- Grow the meaning and scope of Virginia Cooperative Extension (VCE) at Virginia Tech to potentially engage every researcher to tackle complex questions faced by our society
- Give each of us the opportunity to be an extension agent for a limited period
- Before hiring faculty ask them how their research will complement the university in the areas of diversity and inclusion
- Recruit students that are passionate about diversity and inclusion
- Consider and include issues of diversity and disparities in all research questions and design
- Require all Destination Areas to include components of social equity and how differences can be addressed
- Make sure that all stakeholders (including members of impacted communities) are at the table in terms of identifying major research initiatives at Virginia Tech
- Engage with underserved communities on research projects
- Researchers should aim to embrace the little-known complex problems that are challenges for our local communities
- Identify research projects that can be worked on by a group of researchers from different perspectives
- Engage in critical service learning- using community-identified needs as a basis for a lot of the research we do
- Work with communities "to help them develop self-efficacy for a problem that they are facing "
- Research should focus on impacting the lives of underrepresented communities
- Require at least one research project/activity centered on positively affecting change in diverse communities within a specified period

14. Collaboration and partnerships

- Focus on Virginia Tech research and scholarship across colleges and institutes
- Collaborate for funding (with government agencies, voluntary agencies, with industry partners)
- Collaborate with other universities within the state (Virginia); do not compete with them
- Collaborate with international partners
- Increase partnerships with minority-serving institutions (for example, Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs), Native American-Serving, Nontribal Institutions (NASNTIs)
- Continue our partnerships with Historically Black Colleges and Universities (HBCUs) for the Multicultural Academic Opportunities Program (MAOP) Summer Research Internships
- Collaboration within university: engage higher educational administrators in research for research partnerships with other universities
- Focus Virginia Tech research and scholarship across colleges and institutes

15. Multidisciplinary research

- Adopt a cross-disciplinary approach to research; incentivize interdisciplinary collaborations in research (for example, sustainability research, climate change research, improving quality of life)
- Bring Big Sticky projects; engage multiple Historically Black Colleges and Universities (HBCUs), departments and/or disciplines in such projects; combine disciplinary and inter/trans/multi-disciplinary approaches to those challenges
- Focus on "wicked" or complex problems that require multi- and inter-disciplinary collaborators; such approaches will build necessary appreciation for diversity
- To help solve socioeconomic issues, issues of poverty, issues related to bias, etc. should be a focus of some of our Beyond Boundaries (i.e. across disciplines) research
- Allocate resources for research into the Destination Areas (DAs) and Strategic Growth Areas (SGAs)
- Solve complex problems that span traditional disciplinary areas and impact a variety of communities
- Build focused teams for transdisciplinary research and have them propose their research initiatives

16. Engaging students in research

- Involve undergraduate students in research; find more ways for undergraduate students to engage in research
- Involve graduate students in research; involve graduate students in research as mentors
- Diverse communities of students should be engaged in research; support students with disabilities in research

17. Communicating research with the public

- Communicate science to the public; establish effective communication between researchers and non-researchers
- Allow open access and wider sharing opportunities, provide (and value) alternative platforms for access and sharing research; make research available to the public
- Communicate what research is and why it is important; make sure general public understands research and its value to improving life for all
- Show examples of how research is a humanistic endeavor and show that it is ultimately for the benefit of society
- Publicize the College of Engineering outreach activities, and increase the outreach activities to meet the needs beyond engineering programs
- Value alternative platforms to communicate science with the public

18. Integrating teaching and research

- Integrate research in every discipline; balance teaching and research
- Research should inform teaching, research should not be done at the cost of teaching
- Teach in the context of research, rather than research at the cost of teaching
- Make research required for all undergraduate majors
- Provide undergraduate and graduate research assistance
- Encourage researchers to take risks and engage in non-traditional research projects

19. Radical and innovative research

- Researchers should be bold, not afraid of failures, take risks; engage researchers in challenging topics
- Open up new ways of thinking; create problem/discovery space
- Focus on innovative research areas such as quantum computing, nano-earth
- Take up "big sticky problems" to which significant resources of people, space, time, and money will be devoted

110. Funding for research

- Look for funding opportunities beyond the federal agencies; collaborate with different agencies and the industry for funding
- Look for funding and support research on diversity related issues; provide funding for diversity research to faculty members
- Provide funding for translational research or research with real world impacts; provide funding for research travel

I11. Rewards and incentives

- Recognize and reward excellent researchers
- Reward faculty who build diverse research groups
- Incentivize interdisciplinary collaborations in research
- Senior level administrators could provide funds for research-based service learning

I12. Access and affordability

- Make research accessible for all communities
- Make sure that researchers from all communities can participate in research

I13. Unconscious bias in research

- Acknowledge researchers' possible bias, researchers should be cognizant of their unconscious biases and how they affect their methodologies and dissemination of results
- Summarize results from diverse viewpoints
- Consider things like training on unconscious bias in research and reporting

I14. Strengthening research capability

- Hire the best researchers; support and help junior faculty; help junior faculty secure research grants
- Improve abilities to work with international partners/consultants; in terms of payments, remove barriers
- Identify where our strengths overlap with our ambitions and push those areas - with money, with hires, with support

I15. Future Faculty program

- Have bridging post-docs to jumpstart faculty placements
- Use our facilities to be a magnet for diverse talent; recruit passionate researchers
- Focus on attracting postdocs in the Future Faculty program

I16. Research in non-STEM areas

- Invest more in social science research that is focused on some real-world problems, while integrating that with our expertise in STEM
- Conduct research in areas beyond STEM, such as the impact of diverse business on the US economy and the impact of diversity within corporate supply chains

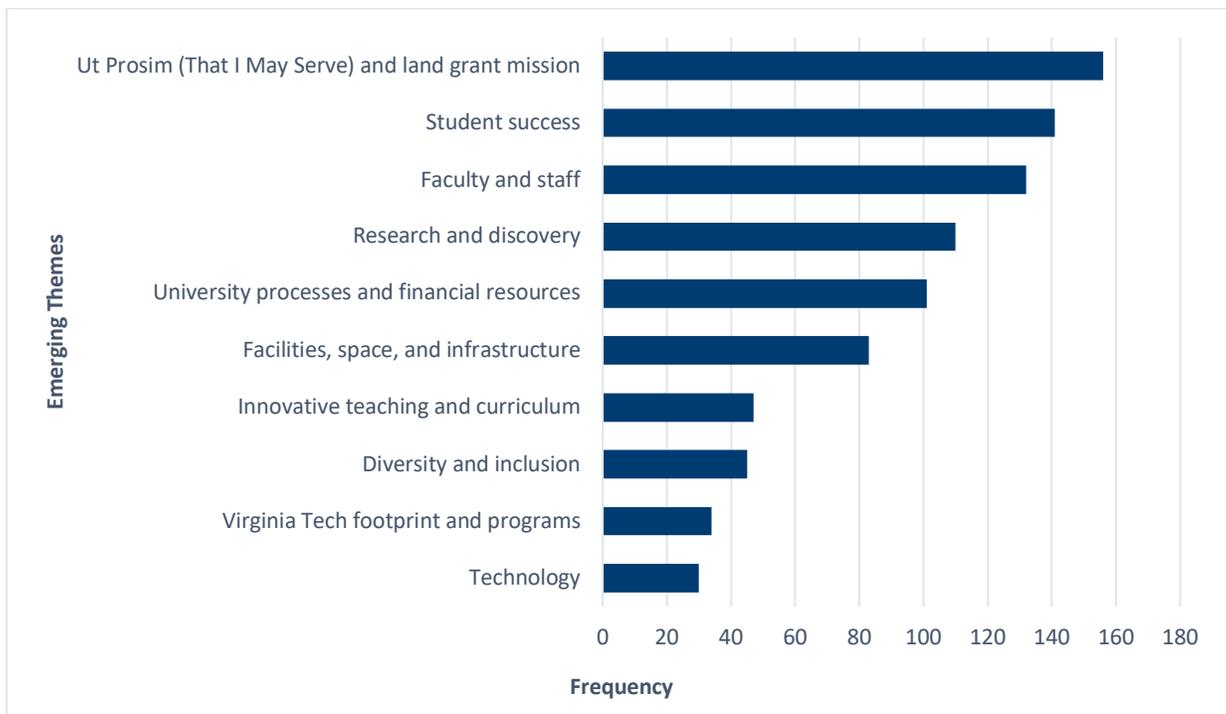
FALL ENGAGEMENTS:

DETAILED FEEDBACK FROM PARTICIPANTS IN OPEN FORUMS

Participants were asked to provide individual and group collaborative feedback from open forums and meetings which included council, commission, and committee meetings, iterative strategic planning presentations across university locations, and college and unit level discussions. Feedback from the **FALL ENGAGEMENTS** is outlined below and includes **EMERGING THEMES** with a summarized detail listing of participant **KEY IDEAS AND SUGGESTIONS**.

Participant feedback from all of the **FALL ENGAGEMENTS** were combined and included conversations associated with the draft mission, vision, core values, and strategic objectives; challenges and opportunities; and strategic planning key areas of focus.

Figure 15. Emerging themes from Fall Engagements



The following provides the **EMERGING THEMES** from the **FALL ENGAGEMENTS** (numbered in bold) with participants' **KEY IDEAS AND SUGGESTIONS** (in bullets) in the order they appear in the graph:

1. *Ut Prosim* (That I May Serve) and land-grant mission

- Supporting local teachers
- Lifelong learning
- Service to humanity and society
- *Ut Prosim* (That I May Serve) within curriculum
- Economic impact
- Partnerships and relationship building
- Mission, vision, and image of university
- Outreach and engagement
- Local and global engagement
- University wide participation in engagement projects
- Maintain student enrollment percentage for land-grant funding
- Urban and rural divide
- Global land-grant mission
- Opening resources (library, etc.)
- Virginia Cooperative Extension (VCE)

2. Student success

- Program marketing
- Student engagement
- Access and affordability
- Recruitment, retention, and support
- Incentives for timely graduation
- Graduation rates
- Experiential learning
- Alumni engagement
- Parent and family engagement
- Transfer student processes
- VT-shaped experience for students
- Small class sizes
- Corporate engagement
- Career network or employment
- Bus transportation access after 5pm
- Housing
- Student fit
- Good citizenship and civility

3. Faculty and staff

- Faculty engagement
- Recruitment and retention of competitive and talented faculty and staff
- Equitable and competitive faculty and staff compensation
- Faculty and staff satisfaction
- More full-time tenure track faculty lines
- More staff lines
- Reinvent dual career program
- Investment in staff
- Staff engagement
- Childcare for employees
- Reduced or free tuition for children of employees
- VT-shaped experiences for faculty and staff
- Work-life balance
- Employees versus faculty and staff nomenclature
- Professional development for employees
- Recognition of staff
- Family support and maternity leave
- Faculty collaboration
- Staff retention in dining services

4. Research and discovery

- Student research opportunities
- Interdisciplinary and transdisciplinary research
- Building relationships for research
- Applied research
- Graduate education
- Interface between colleges and institutes
- Flying cars
- Research infrastructure
- Startup funds

5. University processes and financial resources

- Research funding
- Continuous planning
- Alternative tuition models
- Alternative revenue streams
- Business operations and processes
- Capital funding processes
- Partnership for an Incentive Based Budget (PIBB) model
- Organizational culture
- Reevaluate tenure process
- Stadium Woods preservation
- Town and gown relationship

6. Facilities, space, and infrastructure

- Creative and discovery classroom or lab space
- Additional space needed
- Investment in campus facilities
- Investment in current infrastructure
- Natural history museum or exploration or apartments for visitors
- New center or institute
- Parking
- Space committee and space survey
- Shared equipment
- Accessible infrastructure

7. Innovative teaching and curriculum

- Interdisciplinary and transdisciplinary courses or programs
- First year seminars
- Team teaching
- Updated teaching model
- Online education and programs
- Service embedded into curriculum
- Investment in disciplines or majors (Beyond Boundaries)
- Virginia Tech Climate Action Committee

8. Diversity and inclusion

- Recruitment, retention, and support of underrepresented students
- Recruitment, retention, and support of underrepresented faculty and staff
- Funding for diversity hires
- Social justice and equity issues
- Diversity and inclusion as a priority
- Cultural centers
- International students and support
- Accessible infrastructure
- Additional funding for underrepresented minority students
- Majority student engagement in diversity efforts

9. Virginia Tech footprint and programs

- Mission and vision for the greater Washington, D.C., area
- Support and resources for the greater Washington, D.C., area
- Faculty and Staff compensation specific to the greater Washington, D.C., area
- Infrastructure in the greater Washington, D.C., area
- Collaboration with Roanoke area
- Virginia Tech India
- Steger center
- Support and resources for all Virginia Tech campuses

10. Technology

- Human technology interface
- Data and data usage
- Technological solutions
- Data security
- Technology infrastructure
- World leaders in technology
- Technology support

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APPENDIX B:

METRICS, RANKINGS, AND PARTNERSHIP FOR INCENTIVE-BASED BUDGET

METRICS WHITE PAPER



ON THE DESIGN AND USE OF METRICS

By the Strategic Planning Metrics Subcommittee

June 22, 2018

The purpose of this document is two-fold. First, it serves as a guide for the Strategic Planning Committee as it drafts the 2019-2025 Virginia Tech Strategic Plan, particularly in terms of the metrics the Committee will choose to assess progress towards the strategic objectives. Second, it provides some guidelines for the larger Virginia Tech community, particularly administrators responsible for defining and implementing metrics throughout other parts of the academic enterprise, on how to design and use metrics.

In writing this, we take the point of view that in any large organization key metrics are indispensable for understanding and communicating organizational performance: They help report progress and guide decision making. Furthermore, we recognize that some metrics will be used, whether Virginia Tech likes it or not, by external organizations in such things as university rankings. Given the impact of these rankings on the university, it is thus critical that such metrics are not ignored and, in fact, perhaps actively managed.

On the other hand, we are also cognizant that there is a proliferation of metrics throughout society that follows from a frequently misplaced faith that metrics: (1) can be used to fully characterize an individual's or organization's performance, and (2) that they are useful for properly and positively incentivizing behavior. As Wilsdon et al. (2015) say in their report, *The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management*,

Metrics evoke a mixed reaction from the research community. A commitment to using data and evidence to inform decisions makes many of us sympathetic, even enthusiastic, about the prospect of granular, real-time analysis of our own activities. If we as a sector can't take full advantage of the possibilities of big data, then who can?

Yet we only have to look around us, at the blunt use of metrics such as journal impact factors, h-indices and grant income targets to be reminded of the pitfalls. Some of the most precious qualities of academic culture resist simple quantification, and individual indicators can struggle to do justice to the richness and plurality of our research. Too often, poorly designed evaluation criteria are "dominating minds, distorting behaviour and determining careers." At their worst, metrics can contribute to what Rowan Williams, the former Archbishop of Canterbury, calls a "new barbarity" in our universities. The tragic case of Stefan Grimm, whose suicide in September 2014 led Imperial College to launch a review of its use of performance metrics, is a jolting reminder that what's at stake in these debates is more than just the design of effective management systems. Metrics hold real power: they are constitutive of values, identities and livelihoods.

As this paper should make clear, it is critical to carefully select and define metrics, as well as ensure the quality of the data upon which the metrics are calculated. It is equally critical that consumers of the metrics have a nuanced understanding of what each metric does and does not measure as well as how a metric may incentivize behavior, potentially with both intended and unintended consequences.

EXECUTIVE SUMMARY

In the following, we explain what constitutes a good metric. Several factors are paramount: ease of measurement, direct correlation to institutional success, predictive of good performance, control by the group being measured, and comparableness to competitors' measures. We also identify key characteristics of quality data: relevance, accuracy, timeliness, accessibility, interpretability, coherence, and credibility. Finally, we foreground key principles for developing metrics. These encompass careful definition, paucity in number, reliable data, isomorphic comparison, cost sensitivity, meaningful ratio expression, minimization of perverse incentives, distinction between target and measurement, and care to ensure ease of measurement does not determine target of measure.

DEFINITIONS

In this section, we provide a few key definitions, including defining the term "metric," then we discuss the characteristics of a good metric, and finally we distinguish between "direct" and "proxy" metrics/measures.

To begin, the use of the word "metric" in the context of strategic planning or organizational management is somewhat more specific than the typical dictionary definition. For example, Merriam-Webster (2018) defines a metric either as "a standard of measurement" or in terms of its formal use in mathematics. The Oxford Living Dictionary (2018) comes closer to our usage amplifying the main definition of "A system or standard of measurement" with "(in business) a set of figures or statistics that measure results." For our purposes, we use the following definition:

METRIC: *A quantifiable measure used to track or assess an individual's, organization's, or process's progress towards a specific objective.*

Citation-based metrics are often referred to as *bibliometrics*, and the term *altmetrics* refers to alternative metrics that focus on trying to measure the impact of research in alternative forums such as social media. Metrics can be *direct* or *proxy* measures of progress towards an objective. A direct measure is one that, as the name suggests, is based on data that directly measure the objective. For example, for an objective focused on achieving a particular enrollment target, a direct metric is the number of students enrolled in the university at, say, the start of the fall semester. On the other hand, a proxy measure is one that is based on data that only indirectly measure the objective. For example, SPOT scores directly measure student perceptions of teaching but are intended to be proxy measures of actual teaching performance.

Metrics can be used to *assess performance and communicate preferences* or as a way to *influence organizational behavior*. As is discussed in more detail below, designing metrics to influence behavior is the more difficult of the two, both because the measurement becomes less reliable over time as behavior adapts and because it can have unintended consequences potentially leading to unforeseen outcomes.

DEFINING A GOOD METRIC

Not all metrics are good in the sense that they can be ill-defined and/or ill-applied in any number of ways. See, for example, Muller (2018a). And, while it is impossible to catalog all the ways that metrics can be misapplied and misused, there are some guidelines about what makes a good metric.

We begin by paraphrasing the five characteristics of a good metric by Trammell (2016):

- **EASILY MEASURABLE:** A good metric should be relatively simple to measure. If you have to build a new system or implement a complicated process just to measure the metric, it's probably not worth measuring in the first place.
- **DIRECTLY CORRELATED TO INSTITUTIONAL PERFORMANCE:** The metric should be tied to institution-oriented goals you establish for the department, group, or company. The right metric will tell you if you are successfully executing the fundamentals.
- **PREDICTIVE OF FUTURE PERFORMANCE:** The best metrics do not tell you just how well you've done (for a business, financials provide that measure); they tell you how well you're going to do - in the next month, semester, or year.
- **ISOLATED TO FACTORS CONTROLLED BY THE GROUP IT IS MEASURING:** It's difficult to do, but identifying those fundamentals pertaining to a particular team will tell you much more about their strengths and performance.
- **COMPARABLE TO COMPETITORS' METRICS:** It's helpful to track your progress against peer institutions. This will help judge how well you're building or maintaining an operational advantage, holding on to top talent, and retaining students.

Inherent in these characteristics is the quality of the data, since easily measured poor data is still just poor data, and that to have comparable metrics one must also have data on one's competitors that is directly comparable. As Godfrey (2008) said,

"Data quality is a critically important subject. Unfortunately, it is one of the least understood subjects in quality management and, far too often, is simply ignored."

We return to the question data quality in the next section.

Building on these, Yoskovitz (2013) says a good metric is:

- **COMPARATIVE:** Being able to compare a metric across time periods, groups of users, or competitors helps you understand which way things are moving."
- **UNDERSTANDABLE:** Take the numbers you're tracking now...if people can't remember the numbers you're focused on and discuss them effectively, it becomes much harder to turn a change in the data into a change in the culture."
- **A RATIO OR A RATE:** Ratios and rates are inherently comparative. For example, if you compare a daily metric to the same metric over a month, you'll see whether you're looking at a sudden spike or a long-term trend."
- **CHANGES THE WAY YOU BEHAVE:** This is by far the most important criterion for a metric: what will you do differently based on changes in the number? If you don't know, it's a bad metric."

Of course, the assumption in the last characteristic above is that the metric changes behavior in a positive way (which could also mean reinforcing current behavior) and not a negative one. In choosing metrics, it is critical to assess this, and particularly the issue of whether the metric could drive *unintended* changes in behavior (perverse incentives). See Muller (2018a) for examples of unintended consequences and Edwards and Roy (2016) for illustrations of how well intended metrics can result in perverse incentives. We return to this point later.

The TWDI Blog (2010) lists twelve characteristics of effective metrics. Some of these are redundant with the previous characteristics, so here we list the unique ones:

- **STRATEGIC:** To create effective performance metrics, you must start at the end point--with the goals, objectives or outcomes you want to achieve--and then work backwards. A good performance metric embodies a strategic objective.”
- **TIMELY:** Actionable metrics require timely data. Performance metrics must be updated frequently enough so the accountable individual or team can intervene to improve performance...”
- **REFERENCEABLE:** For users to trust a performance metric, they must understand its origins. This means every metric should give users the option to view its metadata, including the name of the owner, the time the metric was last updated, how it was calculated, systems of origin, and so on.”
- **ACCURATE:** It is difficult to create performance metrics that accurately measure an activity. Part of this stems from the underlying data, which often needs to be scanned for defects, standardized, deduped, and integrated before displaying to users. Poor systems data creates lousy performance metrics that users won’t trust. Garbage in, garbage out.”
- **CORRELATED:** Performance metrics are designed to drive desired outcomes. Many organizations create performance metrics but never calculate the degree to which they influence the behaviors or outcomes they want.”
- **RELEVANT:** A performance metric has a natural life cycle.” When first introduced, the performance metric energizes the institution and performance improves. Over time, the metric loses its impact and must be refreshed, revised, or discarded.

Some of these characteristics have to do with the quality of the data, including the **TIMELY**, **REFERENCEABLE**, and **ACCURATE** characteristics, and we will delve into the question of defining data quality more in the next section. The **CORRELATED** characteristic makes the point that metrics intended to influence behaviors should influence the desired behaviors and the **RELEVANT** characteristic connects back to the notion of continuous planning.

A good metric is one that is well defined, quantifiably measurable, and if we model it in the form of a “key result” as described by Doerr (2018), it has a numeric goal. As described in Doerr (2018, p. 23), Andy Grove, the former CEO of Intel, described his system of objectives and key results as follows:

Now the two key phrases...are objectives and the key result. And they match the two purposes. The objective is the direction: “We want to dominate the mid-range microcomputer component business.” That’s an objective. That’s where we’re going to go. Key results for this quarter: “Win ten new designed for the 8085” is one key result. It’s a milestone. The two are not the same...

The key result has to be measurable. But at the end you can look, and without any arguments: Did I do that or did I not do it? Yes? No? Simple. No judgements in it.

Now, did we dominate the mid-range microcomputer business? That's for us to argue in the years to come, but over the next quarter we'll know whether we've won ten new designs or not.

What is interesting in this approach is the combination of a numeric goal with the metric itself to form a “key result.” In so doing, this unburdens the objective from having to have a numeric goal and so it can simply express the desired organizational direction. Such a system has the potential to help the strategic plan align better with the notion of continual planning where, say, the strategic plan can specify six-year objectives and perhaps key results but the key results (and thus intermediate goals) can be updated more frequently.

In the context of a university, the Educational Advisory Board (EAB) defined the following seven metrics characteristics in their report “Academic Vital Signs: Aligning Departmental Evaluation with Institutional Priorities.” Their intention is to ensure that “[b]road institutional metrics [can be] translated into clear, actionable goals for academic departments in order to motivate improvement” (EAB, 2018, p. 8):

- **ALIGNED:** Do department-level changes in the metric reflect the relevant institutional goal(s)?
- **MEASURABLE:** Can the institution collect longitudinal information about the metric?
- **REALISTIC/FAIR:** Does the metric control for variables outside departmental influence?
- **ACTIONABLE:** Does the department have direct influence over this metric?
- **TIME-BOUND:** Can the department significantly influence the metric in the given time frame?
- **DIFFICULT TO GAME:** Does the metric eliminate “perverse incentives” to avoid true improvement?
- **SIMPLIFIED:** Is the metric easy to understand and not an amalgamation of many calculations?

While these are framed in terms of department-level metrics, they clearly apply at all levels of a university. And, finally, Wilsdon et al. (2015) refined *responsible metrics* as having the following dimensions:

- **ROBUSTNESS:** basing metrics on the best possible data in terms of accuracy and scope;
- **HUMILITY:** recognizing that quantitative evaluation should support – but not supplant – qualitative, expert assessment;
- **TRANSPARENCY:** keeping data collection and analytical processes open and transparent, so that those being evaluated can test and verify the results;
- **DIVERSITY:** accounting for variation by field, and using a range of indicators to reflect and support a plurality of research and researcher career paths across the system;
- **REFLEXIVITY:** recognizing and anticipating the systemic and potential effects of indicators and updating them in response.

In lieu of adopting the objectives/key results approach, we have proposed the adoption of the EAB and Wilsdon et al. characteristics as the most relevant to academia. In addition, in concert with the measures of data quality in the next section, they largely capture the previous sets of metric characteristics.

DEFINING “QUALITY DATA”

The International Monetary Fund (2003) and the Organisation for Economic Co-operation and Development (OECD, 2011) specify seven dimensions of data quality. Here we paraphrase their definitions within the context of strategic planning and other types of organizational performance metrics.

- **RELEVANCE:** the degree to which the data are useful in a metric for quantifying progress towards a goal or objective.
- **ACCURACY:** the degree to which the data, via the metric, correctly estimate or describe the characteristics that they are intended to measure.
- **TIMELINESS:** the temporal relevance of the data, generally in the sense that the data are available sufficiently quickly so that the resulting metric is of value and may still be acted upon.
- **ACCESSIBILITY:** the ease with which the data can be obtained, including the ease with which the data can be accessed.
- **INTERPRETABILITY:** the ease with which the user may understand and properly use the data for the calculation of the metric or metrics.
- **COHERENCE:** the degree to which the data are logically connected and mutually consistent so that they can be successfully brought together with other statistical information within the framework of the metrics and over time.
- **CREDIBILITY:** the confidence that users place in the data, where an important aspect is trust in the objectivity of the data.

Other aspects of data quality include the **COMPLETENESS** of the data or, conversely, the lack of missing values in a dataset. Incomplete data may result in *biased* metrics, meaning metrics that systematically under- or over-estimate the quantity of interest.

Quality data should not be based on *convenience* samples, meaning incomplete data sets that are assembled simply because they are easy to collect. For example, SPOT scores based only on those students who choose to submit scores are convenience samples. Data scraped off the web and only from select databases by Academic Analytics are convenience samples.¹

Instead, metrics using internal data should be based on census sampling, meaning all the data that is available or, in consultation with a statistician, an appropriate sampling scheme. Properly designed, these methods should help ensure that the metric is accurately estimating the characteristics they are intended to measure (per the Accuracy dimension above).

Finally, no data set is perfectly complete, nor will the resulting metric perfectly measure the characteristic of interest. Thus, a final measure of quality is the extent to which the data and associated metric are transparent about what they *do not measure*.

¹ For additional concerns about Academic Analytics, see the American Association of University Professors March 22, 2016 “Statement on ‘Academic Analytics’ and Research Metrics.”

KEY PRINCIPLES

This section presents and describes 10 key principles for properly defining and applying metrics. They assume that those defining and selecting metrics will take into consideration the previous discussions on what it means for a metric to be “good” as well as what it means for data to be of high quality.

PRINCIPLE #1: The very first step should always be careful definition of the objective or goal. Only after careful definition of the objective or goal should the metric or metrics be selected.

The most important consideration when selecting the metric or metrics is how well the metric or metrics will characterize progress towards the goal or objective. Thus, it is key that the metric or metrics be selected with the particular goal or objective in mind.

Corollaries:

- Metrics that do not measure progress towards the goal or objective are of no use.
- Selecting metrics in advance of defining the goal or objective to be achieved is potentially a waste of time.

PRINCIPLE #2: The number of metrics affiliated with any given goal or objective should be kept as small as possible; more is not always better.

One should always select the smallest number of metrics that adequately characterize performance towards the goal or objective. “In general, each objective should be tied to five or fewer key results [i.e., metrics]” (Doerr, 2018, p. 33). Too many metrics make it easy to lose sight of the objective, perhaps to game the system, and to understand what action to take.

Corollaries:

- Complexity is the enemy of understanding. When in doubt, apply the KISS principle: Keep It Simple, Stupid.
- If it’s not possible to characterize performance towards the goal or objective with a reasonably small number of metrics, it may be that the goal or objective is either too complicated or ill-defined.

PRINCIPLE #3: A metric based on weak or poor data, no matter how well defined and intentioned, should not be used.

The quality of the data upon which a metric is based is critical and it is not possible to have a good metric that is based on poor or weak data. When using proxy measures, because direct measurement is not possible for some reason, it is equally important to base the proxy measurements on good data. Most importantly, the notion that a metric based on poor data will lead to good decision making is simply wishful thinking.

Corollaries:

- Just as we require rigorous data collection leading to good data in our academic research, so we should require equally good data practices in the management of our academic enterprise.
- It is easier to collect good data on our own operations and internal processes than on external processes or entities.

PRINCIPLE #4: When using metrics to compare between two or more organizations, the data upon which the metrics are calculated must be equivalent between the organizations.

This is nothing more than common sense for avoiding apples-to-oranges comparisons. It is possible that two different sets of data will be highly correlated, and thus it may be possible to at least compare trends over time between organizations, but without equivalent data no direct performance comparisons can be made.

Corollaries:

- This means that in general it will be difficult at best, and likely impossible, to compare metrics based on internal data with external entities since the equivalent data for the external entities is unlikely to be available.

PRINCIPLE #5: The cost of calculating the metric, either in terms of dollars and/or time, should be taken into consideration. All things be equal or nearly equal, the metric that costs less or that can be calculated quicker or easier should be preferred.

As the section on Defining a Good Metric discussed, metrics should be relatively simple to measure and thus be both inexpensive and quick to calculate, again relatively speaking. For metrics based on internal data, the costs may be in terms of staff time to compile the data if it is already routinely collected.

Corollaries:

- If the data are not already being collected, then the cost in terms of dollars and/or time will likely be significant.

PRINCIPLE #6: Metrics should be defined in the appropriate units and with the proper denominator (in the case of a ratio) so that they reflect the desired organizational performance and do not confound that performance with exogenous factors.

Corollaries:

- Financial data displayed as trends over time must be presented in constant dollars. Using real dollars confounds the effect of inflation with actual performance and should be avoided. For example, showing growth over time without adjusting for inflation overstates the actual growth.
- Metrics that are a function of organizational size or some aspect of size should be reported on a per capita basis. For example, reporting the number of SCHs delivered should be per capita because changes in total SCHs will be confounded with changes in faculty size.

PRINCIPLE #7: Metrics should be crafted to minimize the tendencies toward perverse incentives. This means metrics should always be subjected to anticipatory analysis to discern likely problems that might emerge as a manifestation of perverse incentivization.

As discussed in Edwards and Roy (2016, see Table I), well-intended metrics can result in perverse incentives. Thus, to the extent possible, metrics should be chosen or crafted that minimize these perverse incentives.

PRINCIPLE #8: Metrics for assessing research and scholarship must follow the ten principles of The Leiden Manifesto.

The Leiden Manifesto was written as a “distillation of best practice in metrics-based research assessment so that researchers can hold evaluators to account, and evaluators can hold their indicators to account” (Hicks et al, 2015, p. 430). These practices should be applied in all aspects of university operations that use metrics to assess research and scholarship, including the Partnership for Incentive-Based Budget as well as promotion and tenure.²

The Leiden Manifesto specifies the following ten principles:

1. Quantitative evaluation should support qualitative, expert assessment.
2. Measure performance should be against the research missions of the institution, group, or researcher.
3. Protect excellence in locally relevant research.
4. Keep data collection and analytical processes open, transparent and simple.
5. Allow those evaluated to verify data and analysis.
6. Account for variation by field in publication and citation practices.
7. Base assessment of individual researchers on a qualitative judgment of their portfolio.
8. Avoid misplaced concreteness and false precision.
9. Recognize the systemic effects of assessment and indicators.
10. Scrutinize indicators regularly and update them.

Of course, many of these also apply to the use of metrics for other purposes, including strategic planning, particularly items 2, 4, 5 and 8-10. Indeed, had these six not been included in The Leiden Manifesto, then this section would have consisted of 15 principles.

PRINCIPLE #9: The process of measurement should not influence the objects being measured, else the measurement is made less valid. (Muller, 2018, p. 177).

Goodhart’s Law states that “when a measure becomes a target, it ceases to be a good measure” which means that systems will tend to optimize performance in terms of the metrics, often in spite of the consequences (Koehrsen, 2018). This effect can be particularly pernicious when the metric or measurement is tied to funding, but it can also arise in teaching evaluation scores and other systems where the object of measurement is a person’s or organization’s performance.

Corollary:

- If the goal of a metric or metrics is to influence performance, then significant care must be taken to avoid negative outcomes, including perverse incentivization (see Principle #7), “metric fixation,” and “short-termism” (see Muller, 2018b).

² Other useful references related to scholarship metrics include McNutt (2014), Ioannidis and Khoury (2014), Carpenter, Cone, and Sarli (2014), Jump (2015), Wilsdon et al. (2015), Benedictus and Miedema (2016), Ferguson (2016), Edwards and Roy (2016), and Moher (2018).

PRINCIPLE #10: “Not everything that can be counted counts, and not everything that counts can be counted” (Cameron, 1963, p. 13).

We conclude with this principle to underscore the point that reducing complex issues/objectives to summary metrics may not always be the best strategy. In particular, metrics are not a substitute for management and, particularly when assessing performance, qualitative information can be critically important for understanding and putting the quantitative metrics results in an appropriate context.

DISCUSSION: METRICS AND THE STRATEGIC PLAN

The definition, application, and use of metrics in our strategic planning process should also be consistent with the following points.

- Strategic planning is a continual process and should be approached as such by scheduling periodic review of active objectives and implementation. As time passes and new opportunities emerge, it will become essential to adjust for these developments.
- The strategic planning should distinguish between metrics for assessment and metrics for incentivization, particularly incentive metrics in the Partnership for Incentive-Based Budget model. In addition, strategic planning should distinguish between stretch/aspirational goals and actual/essential goals.
- Metrics should support the key objectives of the strategic planning process while simultaneously being consistent with and supportive of the strategic plan's core values. In no case, should a metric contradict a core value or incentivize behavior that would violate a core value.
- Metrics should be aligned between all levels of the organization. In particular, metrics for the Partnership for Incentive-Based Budget should flow from and support the objectives and core values of the strategic plan.
- Metrics should be conscious of the broader context and work in concert to address negative externalities and secondary effects that undermine other objectives. For instance, a metric basis that incentivizes offering large-enrollment courses will need to be paired with another metric that incentivizes teaching small courses that privilege experiential learning and seminar-style engagement.
- Per the Leiden Manifesto, metrics should be based on the plurality of ways that excellence is manifested across multiples colleges and disciplines throughout the university. For instance, research metrics in STEM disciplines should not be applied as a universal norm across the entire university (Alliance for the Arts in Research University, 2018). Disciplinary norms for research or creative discovery in performing arts or literary fields should be applied with equal sensitivity as that associated with traditional norms in STEM fields.
- Metrics should be designed for iteration over the long-term so that the institution can recalibrate progress toward metrics over the long-term. Examples include periodically assessing fundraising/advancement progress and recalibrating the targets for enrollment growth.
- Core values and strategic objectives should drive the balance between internal and external factors for metrics.
- Iterative, continuous assessment with feedback is essential to successful continual planning. In the context of metrics, it is important to create constructive ways to retool objective and metrics when targets are missed.

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RANKINGS WHITE PAPER



A TOP NATIONALLY AND GLOBALLY RECOGNIZED UNIVERSITY

Virginia Tech aspires to be a top nationally and globally recognized public land-grant university. Specifically, our goal is to be a member of that rarified set of universities that are recognized nationally and globally for their excellence in research and education, for their superiority in creativity and innovation, and for their worldwide outreach and service.

Evaluating our progress towards becoming a top recognized public land-grant university will be partially based on various rankings such as the Times Higher Education (THE) World University Rankings and Wall Street Journal/Times Higher Education (WSJ/THE) U.S. College Rankings. However, we recognize that these rankings are, at best, proxy measures that neither fully reflect our unique aspirations as a university nor all the relevant and important dimensions of our reputation.

That said, we also recognize that each of the university ranking schemes captures some important aspects of a university's performance. We further recognize that, broadly speaking, both tangible and intangible benefits accrue to universities that are highly ranked. For example, global reputation is important for both international partnerships, collaborations, and enrollments. Similarly, prestigious international institutions, governments, and corporations are increasingly considering global rankings as they look for the institutions, academic programs, and faculty with whom they would like to partner. Furthermore, qualified international students look to rankings in making their enrollment decisions.

However, while we will use the various university rankings as one way to assess our progress towards becoming a nationally and globally recognized top public land-grant university, Virginia Tech will not change who we are to match or optimize our performance in the rankings. We are proud of who we are, particularly of our land-grant heritage, and we seek to bring that reputation to the world.

In this Strategic Plan, we take the point of view that tracking and managing metrics related to university rankings need not come at the expense of compromising Virginia Tech's values and core identity, particularly *Ut Prosim* (That I May Serve). The key idea is not to pursue rankings at the expense of our identity – it is to improve our ranking while maintaining our unique identity. We will accurately reflect university activities to improve our standing in the various rankings, and we will align activities and practices within university operations to maximally support and promote our research and creative enterprise, and we will do so without compromising our principles or our unique identity as a university.

TIMES HIGHER EDUCATION WORLD UNIVERSITY RANKINGS AND WALL STREET JOURNAL/TIMES HIGHER EDUCATION U.S. COLLEGE RANKINGS, IN BRIEF

Rankings are based on a variety of measures, all quantified and weighted differently by the various ranking schemes. The charts below summarize the measures used by the two ranking organizations previously mentioned:

Figure 1. Wall Street Journal/Times Higher Education U.S. College Rankings Methodology

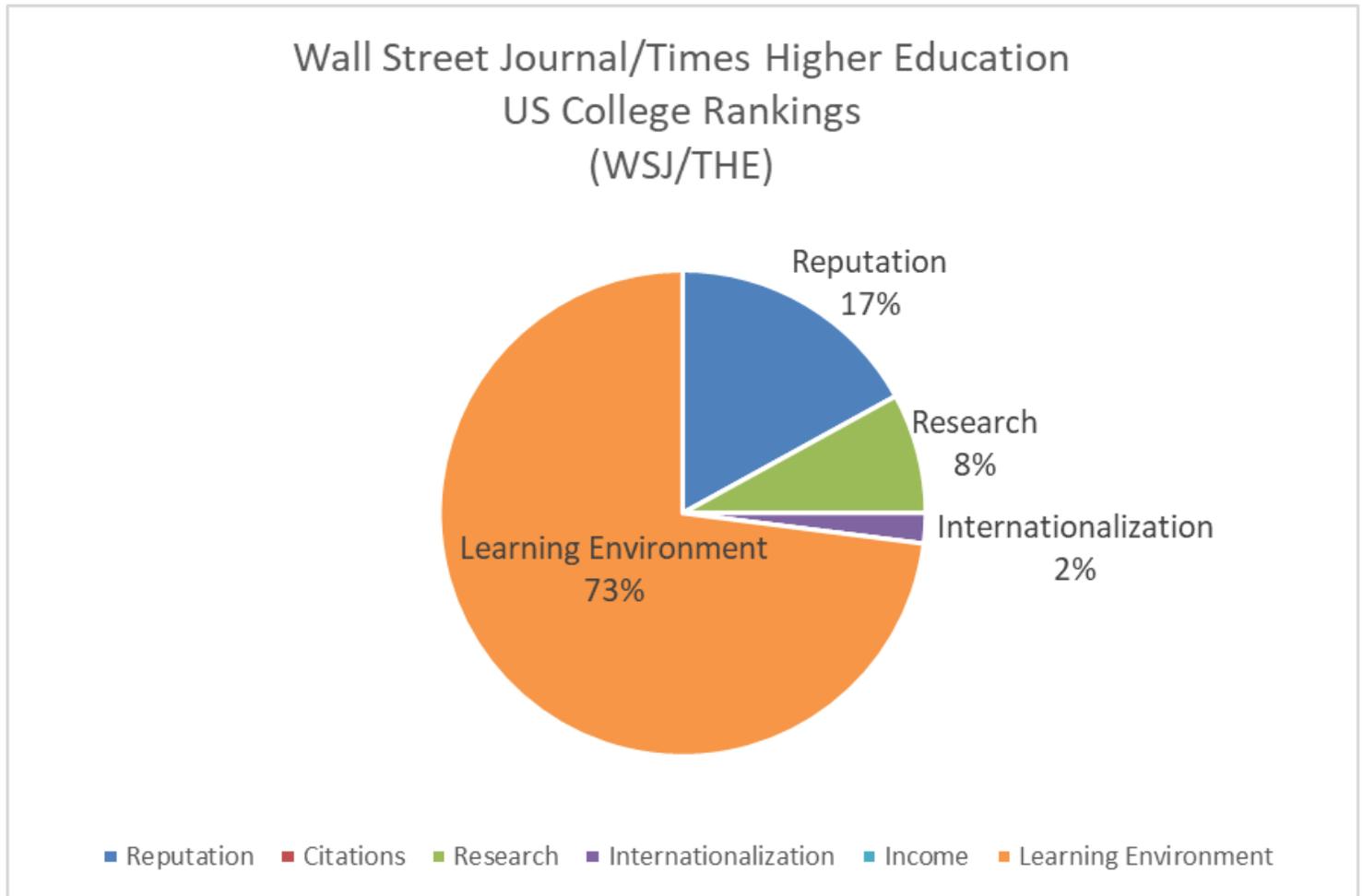
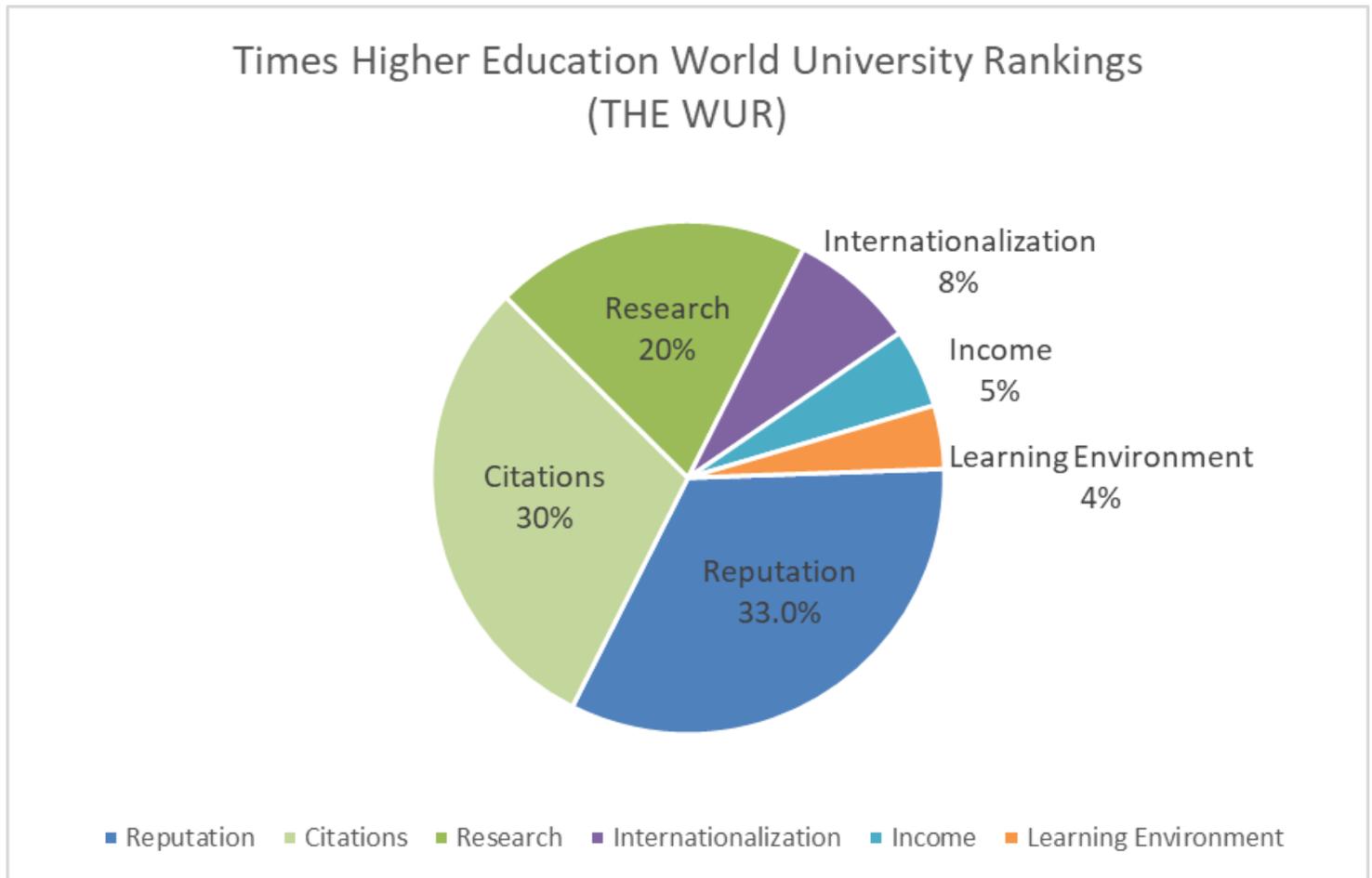


Figure 2. Times Higher Education World University Rankings Methodology



As the charts show, Wall Street Journal/Times Higher Education U.S. College Rankings is undergraduate and teaching oriented, focusing on the following pillars: outcomes, resources, engagement, and environment. While Times Higher Education World University Rankings is a more comprehensive ranking scheme that is research oriented, focusing on the following pillars: teaching, research, citations, industry income, international outlook. When considered collectively, these rankings provide a comprehensive view of the of the land-grant mission on both a national and global scale.

There are two common factors that cut across both ranking systems. They are:

- Reputation measures based on surveys of academics and students to gather their subjective judgements;
- Research measures, including citation measures, based on data collected from the institution and Elsevier’s Scopus, a database of peer-reviewed literature.

Closely related to, and indeed underlying the citations measures, are publications, where quality and high impact publications typically and ideally drive the citation rates. Other factors that contribute to a global reputation include:

- National and international visibility, including faculty participation, particularly speaking at international conferences and other events;
- An effective communications strategy that raises the visibility of the institution in a variety of national and international media, including both traditional media and emerging new forms of media;
- And an effective strategy for engaging and leveraging alumni networks.

A naive approach to improving a university's reputation, particularly as measured by the number of publications and the citation rate, would be to encourage and/or incentivize the faculty to increase their output as measured by these metrics. This strategic plan explicitly rejects this approach for the following two reasons. First, simply encouraging faculty to increase publication output and/or citation rates is an exercise fraught with perverse incentives. The objective of research conducted at Virginia Tech is impactful, high quality scholarship; publication output and citation rates are but proxy measures for this type of activity, not the end goals. Second, incentivizing publication and/or citation rates may yield short-term improvements, but it will not likely result in sustained output. Quality scholarly publications and high citation rates are output measures of a faculty engaged in impactful research. The inputs are the critical drivers of long-term success: recruitment and retention of a world class faculty supported by systems, processes, and resources that facilitate the conduct of high-quality research.

NEXT STEPS

The university has set the following milestones within the strategic planning framework: Virginia Tech will be a top 10 U.S. public land-grant according to Wall Street Journal/Times Higher Education U.S. College Rankings and a top 13 U.S. public land-grant according to Times Higher Education World University Rankings by 2024. Immediate steps that Virginia Tech will take, indeed is already taking, to make sure that the university's current performance is appropriately and properly reflected in the rankings include:

1. Ensuring the various rankings organizations are capturing all the university's scholarly and creative activities and publications.
2. Similarly, ensuring that those databases used to quantify citation counts, such as Scopus, are fully utilized so that all citations are captured. For example, ensuring that faculty have the necessary access and training to access Scopus so that they may correct any errors in their data.
3. Significantly increasing placements in both national and international media that promote the university and increase Virginia Tech's research profile. Similarly, redoubling efforts to increase brand recognition more broadly worldwide.
4. Undertaking a study of those typically surveyed by the ranking organizations to understand how Virginia Tech is perceived in terms of scholarship and other measures contributing to our national and international reputation. Implement appropriate measures to address any shortcomings.

To substantially improve the university's national and international reputation, in order for Virginia Tech to meet the above milestones, requires significant and sustained investment in faculty and infrastructure.

PARTNERSHIP FOR AN INCENTIVE-BASED BUDGET (PIBB) MODEL



PARTNERSHIP FOR INCENTIVE-BASED BUDGET (PIBB) MODEL

Beyond Boundaries imagines a university with greater financial resilience, funded by a diverse resource base and supported by budget models that enable adaptability and innovation in an increasingly dynamic academic environment and shifting financial landscape. The Partnership for Incentive-Based Budget model is one of the new funding models established within the university to realize this vision.

GUIDING PRINCIPLES

As the main funding model for the university's academic programs, the Partnership for Incentive-Based Budget model is intended to integrate university strategic planning with the budget process to ensure that resources are allocated in a manner that supports the university's core mission and vision. Primary principles guiding the development of the Partnership for Incentive-Based Budget model are as follows:

STRATEGIC:

- The budget model must connect resource allocations to accomplishing objectives of university strategic plan
- The budget model should promote growth and diversification of university resources
- The budget model should reward performance outputs and outcomes that are relevant, clearly defined, and easily measured

INCLUSIVE:

- The set of chosen performance metrics should reflect both shared and distinctive strategic outcomes expected from a comprehensive university
- Performance goals and milestones should be established in collaboration with units being assessed
- The budget model should encourage and reward inter- and transdisciplinary instruction, research, and outreach

PREDICTABLE:

- The budget model should promote institutional decision-making based on valid data accessible to units being assessed
- The budget model and associated budget development processes must ensure transparency in resource decision-making
- The budget model must foster the ability to conduct long-range planning

RESPONSIVE:

- The budget model must enable the university to manage resources effectively in a dynamic academic and financial environment
- The budget model must enable adjustments to resource allocations based on actual performance

STRUCTURE OF THE PARTNERSHIP FOR INCENTIVE-BASED BUDGET MODEL

The Office of the Executive Vice President and Provost continues to work with degree-granting colleges to develop a model that sufficiently resources the academic enterprise, while incenting activities in strategically important directions. To accomplish this, the Partnership for Incentive-Based Budget model has been structured around three major budget components that are combined to calculate the overall budget for

academic areas as shown in Figure 1: Unit Allocations, Scorecard Allocations, and Earmarked Allocations. The Unit Allocations and Scorecard Allocations are part of a formulaic distribution of resources based on the achievement of annually established milestones across a broad range of performance metrics. Earmarked Allocations are funding reserved to support specific activities in certain areas of the university.

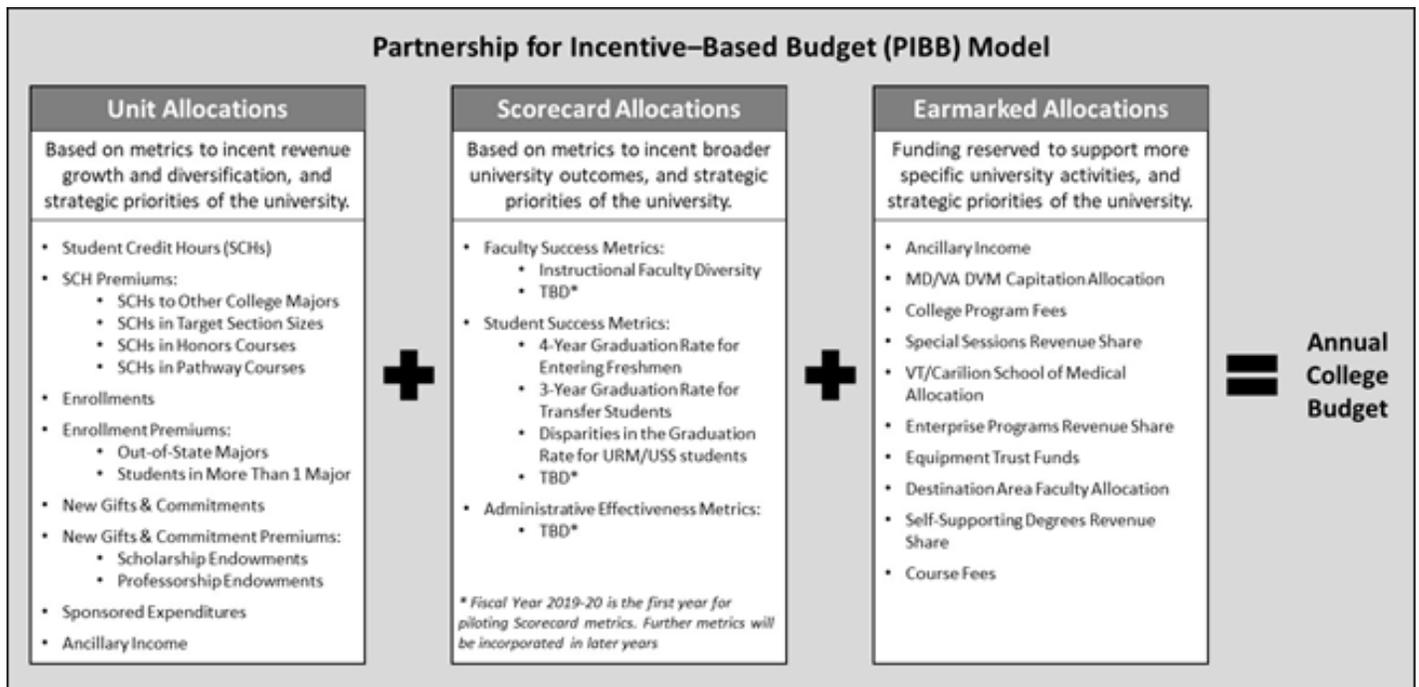


Figure 1: Major Budget Components of the Partnership for Incentive-Based Budget Model

Unit Allocations

Metrics associated with Unit Allocations of the Partnership for Incentive-Based Budget model are primarily intended to incentivize growth in major revenue generating activities of the institution. These include, student credit hours and enrollments to reflect the institution’s increased reliance on tuition to support educational costs. Also reflected in this portion of the budget model are metrics associated with growing the external funding that the university receives to support operations, including new gifts and commitments provided through fundraising, extramural grant and contract funding for sponsored expenditures, and ancillary income generated from university sales and services. These metrics are termed “unit allocation” metrics because they are assigned a unit of value for each unit of output. For example, in Fiscal Year 2018-19, the Partnership for Incentive-Based Budget model allocated \$107.75 per student credit hour to colleges as part of the Unit Allocations budget component.

Some Unit Allocation metrics have an additional budget value, or premium, attached to a subset of the metric’s output in order to incentivize strategically important activities that go beyond revenue generation. For example, in Fiscal Year 2018-19 student credit hours delivered to students whose majors were outside of the instructing college received a premium of \$10.00 per student credit hour to incentivize interdisciplinary instruction. In this example, this \$10.00 premium is added to the baseline student credit hour value of \$107.75, increasing the per unit budget value to \$117.75 per student credit hour. Similar premiums are or will be provided for courses within targeted class sizes, honors courses, Pathways to General Education courses, courses supporting the university’s Destination Areas initiative, out-of-state enrollments, students enrolled in

more than one major, industry-funded sponsored expenditures, and new gifts and commitments that support scholarship or professorship endowments. Additional premiums may be developed over time to incentivize activities that support the university's strategic plan.

In the Unit Allocation portion of the Partnership for Incentive-Based Budget model long-range goals and short-term milestones are established for each metric annually in consultation with the colleges and university administration to ensure that the university's infrastructure can accommodate projected enrollments, that sufficient instructional resources can be deployed to teach projected class loads, and that external funding targets are attainable. The goal-based nature of the Partnership for Incentive-Based Budget model and its intentional connections to university strategic priorities differentiates it from the pure revenue-sharing budget models currently established at many peer institutions.

Scorecard Allocations

Another characteristic that distinguishes the Partnership for Incentive-Based Budget model from other university budget models is its reliance on a broader array of outcomes and activities expected from a comprehensive university. The metrics in the Scorecard Allocation portion of the Partnership for Incentive-Based Budget model captures these outcomes in three broad categories: faculty success, student success, and administrative effectiveness.

The Scorecard will include summarized measures of faculty activity and faculty composition. These metrics will be drawn from teaching data, faculty activity reporting systems, and other sources to include broad categories like faculty teaching, scholarship, engagement, and diversity.

The Scorecard will also include a broad range of commonly understood student outcomes. These will include admissions process metrics, progress s to degree metrics, outcomes for graduating students, and student participation in the broad range of curricular and extracurricular experiences that promote the "VT-shaped" student goals of the Strategic Plan. It will also include measures of student diversity and the opportunity to look at a broad range of outcomes for various populations of underrepresented and underserved students.

A third area of metrics will be related to administrative effectiveness. These metrics will monitor institutional efforts in continuous improvement and compliance with important external regulatory requirements.

The Scorecard portion of the budget is not a metric-by-metric calculation but rather treated as a block grant with a portion subject to a review and allotment process. Annually, the Provost, the College Dean and related Vice Provosts or Vice Presidents will jointly review Scorecard goals and achievements toward those goals. When progress towards expected outcomes in a Scorecard Metric is not made, a cooperative, qualitative evaluation of the activity will be undertaken and funds from the college, academic administration and, where appropriate, central resources will be applied to a jointly developed plan addressing outcomes in the particular area.

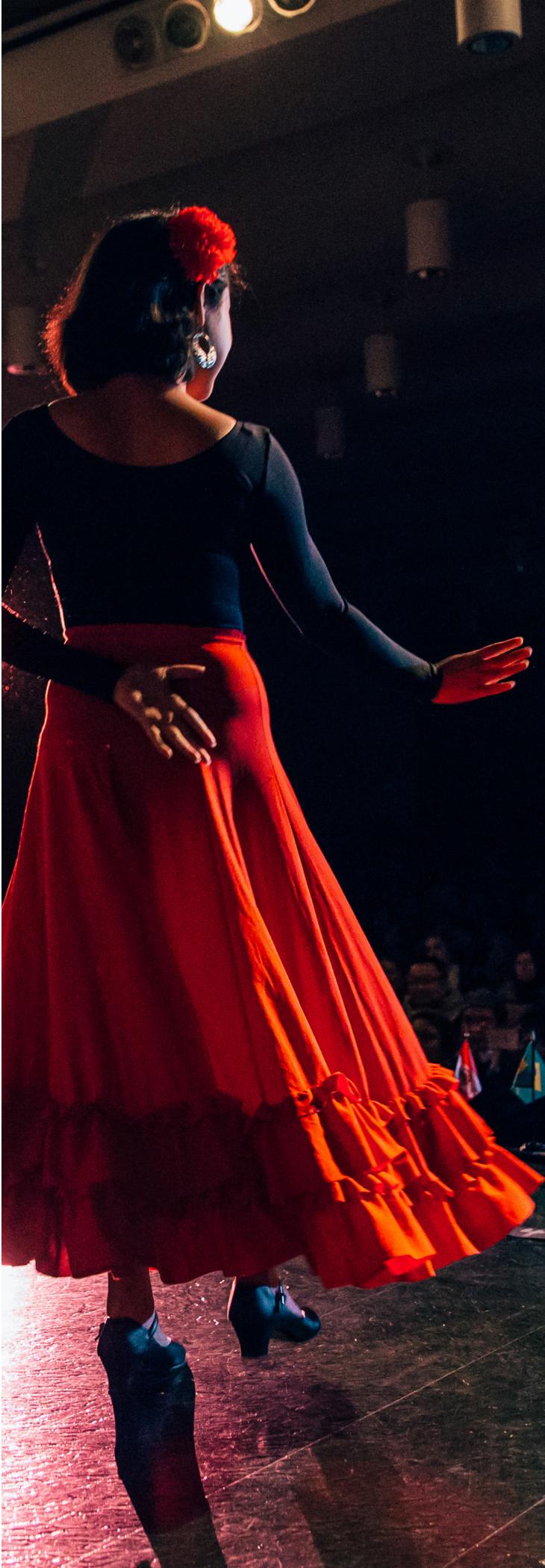
Fiscal Year 2019-20 will be the first year that detailed Scorecard metrics are incorporated in the Partnership for Incentive-Based Budget. The first Scorecard metrics will focus on gender and racial diversity among tenured/tenured track and non-tenured instructional faculty, the 4-year graduation rates for students who enter the university as freshmen, the 3-year graduation rates for students who enter the university as transfers, and disparities in the graduation rates for underrepresented minority and underserved students.

Earmarked Allocations

The third component of the Partnership for Incentive-Based Budget model is Earmarked Allocations that support specific university activities. These include program and course fees allocated directly to colleges to cover extraordinary costs of instruction associated with some degrees and courses; special session revenues for courses taught during winter and summer terms that are shared with the colleges (approximately 70% returned to the college and 30% retained centrally); self-supporting, professionally oriented programs that are anticipated to charge a market rate of tuition and enroll sufficient students to generate net income that will enhance the resources for the college, department and the institution; external income from ancillary operations who charge for services that also support their instructional activities (e.g., the Veterinary Teaching Hospital, the Adult Day Care Center, the Child Development Center); and other college-specific allocations in support of strategic academic programs and initiatives.

NEXT STEPS

The Office of the Executive Vice President and Provost will continue work with the colleges and the university's administration to refine and, as appropriate, develop new metrics that support the strategic goals of the university. In parallel with this effort, the university is continuously improving the information systems necessary to support the new budget model and other associated strategic decision-making processes and structures (e.g., undergraduate enrollment management, faculty activity reporting, graduate program management, strategic planning metric tracking, and other ad hoc analyses).



APPENDIX C:

RESEARCH STRATEGIC PLANNING, COMMONWEALTH CYBER INITIATIVE, AND DIVERSITY STRATEGIC PLANNING

RESEARCH STRATEGIC PLANNING PROCESS



RESEARCH STRATEGIC PLANNING PROCESS

Over the course of 2018 and early 2019, the Office of the Vice President of Research and Innovation led a series of strategic discussions with hundreds of members of Virginia Tech's research community, peer benchmarking, and discussions with external stakeholders to establish priorities for advancing Virginia Tech's research enterprise. These conversations included everything from one-on-one conversations to half-day community engagements, from faculty surveys to literature reviews, and from blue-sky, open-ended innovation sessions to focused brainstorming on specific topics.

Throughout the engagements, several themes and priorities emerged. Several high-level priorities are reflected in the strategic plan. More in-depth, granular strategies and initiatives will be described in forthcoming implementation and strategic plans for the research enterprise.

CAMPUS ENGAGEMENT

Innovation Session

To begin framing the research strategic plan, faculty members and administrators, nominated by their Colleges and Departments, attended an innovation session in June 2018. This engagement asked participants to approach three prompts through the lens of where Virginia Tech is strong, where Virginia Tech has gaps, where Virginia Tech's structure isn't working, and where there may be risk. The three prompts were based on the components of the Beyond Boundaries vision that overlap with research:

1. Virginia Tech strives to become a top 100 global university
2. Externally-funded transdisciplinary research is key to growing Virginia Tech's research enterprise
3. Virginia Tech's research infrastructure is critical to supporting research and innovation

Through small group brainstorming, full group discussion, and voting, several major themes emerged. Attendees highlighted the need for resources and support to pursue and capture major opportunities, including federal business development support, shared instrumentation and facilities, and seed grants. They expressed support for existing mechanisms for transdisciplinary research and advocated for decreasing barriers and counterproductive incentives to collaborative projects. Attendees emphasized the need for raising Virginia Tech's national and international profile, for example, through improved storytelling and liaisons with key partners. They asked for improved mechanisms for identifying, protecting, and commercializing intellectual property. Finally, there were several aspects of research administration, processes, and support that warranted attention.

Gallery-Style Community Connection

To build on the framework developed during the innovation session, and to gather input from research enterprise stakeholders across campus, the Office of the Vice President of Research and Innovation held a gallery-style community connection. The session was designed to provide both independent and reactive thinking and communication and engage the participants with both visual and verbal cues that encouraged input, including building on the commentary of previous participants. More than 65 members of the Virginia Tech faculty, staff, and leadership attended the session, and engaged with facilitators, reviewed the opinions of prior attendees, and transcribed their own thoughts on several prompts within five principal categories:

1. How might Virginia Tech identify and pursue opportunities, both thematically and geographically?
2. How might Virginia Tech build a shared focus to create critical mass in strategic areas?
3. How might Virginia Tech highlight and leverage Virginia Tech’s research strengths and capabilities with partners and the community at large?
4. How might Virginia Tech optimize research administration, processes, and support?
5. How might Virginia Tech better translate research discoveries into commercial products and global impact?

These all suggest an opportunity to reaffirm and refine a sense of identity, purpose, and community for Virginia Tech’s research enterprise. They reflected a need to better clarify, communicate, strengthen and broaden Virginia Tech’s core and cross-disciplinary research areas. The resounding message was to build community and find ways to change processes relating to department budgeting, governance, and promotion/tenure to encourage cross-disciplinary collaboration. Faculty want leadership to drive efforts to remove barriers and creating incentives but a faculty-led approach to finding and creating cross-disciplinary research.

To build larger teams and projects, participants supported approaches to foster and build faculty connections and community, as well as for more investment in faculty and facilities. Participants requested an improved cadence, coordination, and level of support, including efforts related to capturing research opportunities. This aligns with the recurring call for a more comprehensive and diverse view of Virginia Tech’s research strengths, including the perspective that research should include humanities, social science, medicine, and strive to become a more cross-disciplinary and comprehensive university.

Leadership Discussions

To understand the priorities of leadership across the university’s colleges, departments, and institutes, the Office of the Vice President of Research and Innovation held focused discussions with many leaders across Virginia Tech. The Vice President for Research and Innovation held small-group discussions with the Directors of all university-level research institutes and centers, with the Associate Deans for Research of each College, as well as focused discussions with colleges and large departments. These discussions framed the structure and priorities of the Office of Research and Innovation – including recent reorganization and new leadership – and explored the participants’ priorities in advancing the research enterprise. Recurring themes included the desire for better coordination and investment in shared research facilities and instrumentation; increased support for the development of large, complex sponsored research programs; and improving structures for technology transfer and entrepreneurship.

LANDSCAPE ANALYSIS AND PARTNERS

EAB Strategic Plan Framing

Virginia Tech partnered with EAB to provide guidance and structure to the research strategic planning process. At a strategic planning framework attended by leadership in the Office of Research and Innovation as well as the Virginia Tech Office for Strategic Affairs, EAB provided a common framework of challenges and changes facing higher education in the United States, as well as some common approaches to strategic planning in the higher education environment.

RTI Strategic Planning Support

Throughout the fall, the Office of the Vice President of Research and Innovation engaged RTI International to facilitate strategic discussions, community engagement, and landscape analysis. This partnership helped explore and benchmark common approaches to research strategic plans, facilitated brainstorming to develop potential frameworks for community engagement, supported community events, and provided critical data analysis to synthesize feedback into major themes.

IAT / TEconomy

In parallel with the strategic planning efforts at Virginia Tech, the Vice President of Research and Innovation was engaged with state-wide research strategic planning through engagement with the Virginia Research Investment Committee. This strategic framework was charged through the Virginia Research Investment Committee's enabling legislation, to "Develop a cohesive and comprehensive framework through which to encourage collaboration between the commonwealth's institutions of higher education, private sector industries and economic development entities in order to focus on the complete life cycle of research, development and commercialization."

As described on the Virginia Research Investment Committee's website, "The State Council of Higher Education for Virginia, on behalf of the Virginia Research Investment Committee, launched a comprehensive study to assess the commonwealth's research assets, including those at its public and private universities, federal research facilities and private sector companies. SCHEV retained TEconomy Partners, LLC, to conduct the study, which was completed in January 2018."

Subsequent to the TEconomy study, the Vice President of Research and Innovation participated on the Implementation Advisory Team for the Virginia Research Investment Committee, which sought to inform the priorities and guide the approach to aligning strategic directions and actions for implementation. The Implementation Advisory Team specifically focused on high-impact approaches to improving technology transfer, entrepreneurship, and economic development fueled by university research and discovery.

SPECIFIC AREA FOCUS

IP Survey

Technology commercialization and transfer is critical to ensuring Virginia Tech delivers on its land-grant mission to disseminate knowledge and discoveries for public impact and economic development. Given the criticality of this to Virginia Tech's land-grant mission and research enterprise, the Office of the Vice President of Research and Innovation took extensive measures to evaluate our technology commercialization operations. Along with consulting partners, the Office of the Vice President of Research and Innovation assessed a full range of past performance indicators, as well as benchmarked staffing, investment, and ancillary activities. In June 2018, the Office of the Vice President of Research and Innovation launched a climate survey to take stock of the needs and opportunities as expressed by our own community.

Shared Research Capabilities

During the strategic planning process, the need for access to state-of-the-art research instrumentation and facilities was a recurring theme. In fact, in 2017, the Commission on Research surveyed researchers across campus, and this topic was the third most often cited barrier to advancing the research enterprise. "Space within state-of-the-art facilities with well-maintained equipment and adequate staff was indicated as essential for successful quality research programs. Faculty with older space and resources expressed greater concerns for the impact on quality research. All faculty seem to face lack of funding for adequate staff, new equipment, maintenance agreements and repairs, and items that cannot be charged to sponsored programs." Based on this consistent feedback, the Office of the Vice President of Research and Innovation initiated a landscape analysis for shared research laboratories. This included focused discussions with stakeholders across the research enterprise to understand the highest-priority areas for investment, assessment of capabilities and access models of peers, and analysis of landscape studies on core facilities. Based on this feedback and findings, the Office of the Vice President of Research and Innovation is initiating a thoughtful and comprehensive approach to improving its shared research laboratories.

COMMONWEALTH CYBER INITIATIVE



COMMONWEALTH CYBER INITIATIVE

The Commonwealth Cyber Initiative will create a commonwealth-wide ecosystem of innovation excellence in cyberphysical systems with an emphasis on trust and security. The Commonwealth Cyber Initiative will ensure Virginia is recognized as a global leader in secure cyberphysical systems and in the digital economy more broadly for decades to come by supporting world-class research at the intersection of data, autonomy, and security; promoting technology commercialization and entrepreneurship; and preparing future generations of innovators and research leaders. The Commonwealth Cyber Initiative will build on Virginia's strong base of research excellence, its innovative and diverse higher education system, vibrant ecosystem of venture capital investment and high-growth firms, and unparalleled density of cybersecurity talent.

The Commonwealth Cyber Initiative must address two challenges: today's workforce gap, and tomorrow's new economy. They are different facets of the same problem and opportunity. To focus only on today's workforce challenge is to miss an opportunity to diversify the economy. Today's assessment is a look in the rear-view mirror. Conversely, to focus only on the future economy is to ignore the fact that the basis for that economy is threatened by the workforce gap.

The Commonwealth Cyber Initiative is a highly-connected Network that engages institutions of higher education, industry, and government, along with non-governmental and economic development organizations. It will connect Regional Nodes across the commonwealth, each led by an institution of higher education. Regional Nodes will be vibrant centers of research, learning, and innovation tailored to their local ecosystem. To ensure success, Commonwealth Cyber Initiative Regional Nodes will be certified by the Virginia Research Investment Committee consistent with the commitment of Regional Node partners to the goals of the initiative.

The Hub, anchored by Virginia Tech and located in the greater Washington, D.C., area, will enable world-class research focused on cybersecurity. By hosting faculty from Commonwealth Cyber Initiative Network institutions, industry partners, and entrepreneurship programs, the Commonwealth Cyber Initiative Hub will provide a center of mass for the cybersecurity innovation ecosystem across the Network, acting as a beacon to draw talent and partners to the commonwealth.

The Hub will also coordinate the Network, strengthening connectivity and programs to build and align assets across Virginia, amplifying the efforts already underway and providing a one-stop access point to Commonwealth Cyber Initiative resources for all stakeholders, current and future. To achieve its goals, the Commonwealth Cyber Initiative will both develop new programs and promote, amplify, align, and grow existing efforts across Virginia. The Commonwealth Cyber Initiative's success relies on the active collaboration of institutions of higher education across the commonwealth, contributing their experience, ideas, and expertise. The Commonwealth Cyber Initiative Network will create an ecosystem that is greater than the sum of its parts.

The Commonwealth Cyber Initiative will build a research alliance across the Network to build a commonwealth-wide cyber innovation ecosystem, support curriculum alignment for more seamless credit transfers across the commonwealth, cultivate holistic relationships with industry and government partners to support research, education, and experiential learning across the commonwealth; and collect market research and performance data, supporting strategic decision-making and continuous performance improvement.

Key activities include:

- **CYBERPHYSICAL SYSTEM SECURITY RESEARCH:** Cyberphysical systems and the internet of things promise to enhance the quality of life in many ways but require advances in security and trust to ensure robust, safe, and widespread adoption and impact. This includes world-class research teams at the Hub and across the Network focused on the next-generation communication technologies that will support the internet of things, as well as machine learning and artificial intelligence for cybersecurity. Through a Network-wide research alliance, the team will partner with and host Commonwealth Cyber Initiative-aligned researchers from institutions across the commonwealth, bolstering Commonwealth Cyber Initiative Network ties and enhancing synergies across the Nodes.
- **ENTREPRENEURIAL ECOSYSTEM:** The Commonwealth Cyber Initiative Network is committed to ensuring that research outcomes make their way to market quickly and effectively. Commonwealth Cyber Initiative investments will grow and diversify the Virginia cyber economy by promoting the commercialization of cyberphysical system security products and launching cyber-focused startups. The Commonwealth Cyber Initiative Hub will support entrepreneurship across the Network by providing access to venture capital and supporting startups. The Commonwealth Cyber Initiative will support technology de-risking through approaches like proof-of-concept grants. In addition, Nodes will promote cyberphysical system security research and entrepreneurship in their regional ecosystems.
- **CO-OP 2.0 PORTAL:** To ensure that Virginia students are fully prepared to enter the innovation workforce upon graduation, the Commonwealth Cyber Initiative Network will promote and support opportunities for long-term and year-round experiential learning in ways that do not prolong student time-to-degree. These longer-term relationships increase value for both stakeholder groups. The Commonwealth Cyber Initiative will support the distance learning, flexible educational schedules, and industry partnerships required to establish and scale these experiences across the commonwealth. Commonwealth Cyber Initiative funding will be made available for matching industry investment in student stipends.

The Virginia State Budget invests \$5 million in one-time capital expenditures for renovations, space enhancements, and equipment and \$20 million in annual funds for the Commonwealth Cyber Initiative. The annual appropriation includes \$10 million to scale the initiative and recruit faculty at both the Hub and Node sites. An additional \$10 million is provided to establish the Hub, including research faculty, entrepreneurship programs, and student internships.

The Commonwealth Cyber Initiative will be measured by well-defined indicators like faculty participation, scholarly publications, and competitive research expenditures. It also aims to produce real outcomes for the commonwealth, such as student employment in cyber fields in Virginia industry, patent licensing, and venture capital invested in spin-outs.

INCLUSION AND DIVERSITY STRATEGIC PLANNING GUIDE



INCLUSION AND DIVERSITY STRATEGIC PLANNING GUIDE

This template was used by every college and administrative unit to create their own unit-specific strategic plan. The plans were required to address the four goals of InclusiveVT – the institutional and individual commitment to *Ut Prosim* (That I May Serve) in the spirit of community, diversity, and excellence. The four goals are sustainable institutional transformation; representational diversity; campus climate; and academic mission.

Unit Name: _____

Person(s) responsible for completing form: _____

PART I: OVERVIEW

- Does your department have a diversity statement? If so, please share. How is this statement publicized and communicated to faculty, students, and staff?
- Please describe any model/signature inclusion and diversity programs within the unit that significantly advance or advanced (if the program was discontinued) diversity and inclusion (ideally there would be measurable outcomes/evaluation, evidence of effectiveness).
- Please describe the structure for implementation, oversight, and accountability for diversity in your unit, (*i.e.*, *Dean and Associate Deans; Diversity committee(s); AdvanceVT/InclusiveVT representatives; InclusiveVT Senior representatives; student organizations in the disciplines*).

PART II: REPRESENTATIONAL DIVERSITY

Please share your current department’s compositional diversity for gender and traditionally underrepresented racial/ethnic populations:

	<u>Undergraduate</u>	<u>Graduate</u>	<u>Faculty</u>	<u>Staff</u>
American Indian/Alaska Native				
Asian				
Black/African American				
Hispanic/Latino				
Native Hawaiian/Pacific Islander				
Two or more races*				

	<u>Undergraduate</u>	<u>Graduate</u>	<u>Faculty</u>	<u>Staff</u>
Female				
Male				
Non-binary				

- How does your unit compare in terms of representational diversity with its peers for faculty and student diversity? What is the average diversity by race/gender in the field for undergraduate students, graduate students, and faculty? Who are our aspirational peers/programs and why? (ie. “Our pre-assessment reveals that the percentage of female faculty within the unit is underrepresented in comparison to the national population at universities and Virginia Tech. We are at comparable status with our peer units and other universities.”)
- Do your disciplinary associations have committees on women/minority concerns? If so, please list the association(s) and website(s)? What is the unit’s relationship with these associations?

* Include those from traditionally underrepresented groups.

PART III: CLIMATE AND INCLUSION

How does your unit promote an inclusive, welcoming, affirming, safe, and accessible climate for all?

- What issues impact the climate in your unit, and how are you addressing them? Are there unique concerns for particular identity groups/populations (race, ethnicity, gender, veterans, LGBTQ, disability, and other groups reflected in the Principles of Community)?
- How does the department/unit track, promote and encourage participation and engagement in programs, mentoring, training, etc. that promote an inclusive climate? How are these addressed in performance evaluations?
- Describe your unit's collaborations/partnerships with programs that support the above groups (ie. faculty/staff caucuses, student cultural centers, student organizations – including those associated with academic disciplines, alumni chapters, community-based organizations).

PART IV: ADVANCING THE ACADEMIC MISSION OF VIRGINIA TECH THROUGH INCLUSION AND DIVERSITY

In what ways are inclusion and diversity integrated in teaching, research, and service in your unit?

- **TEACHING** (*Pathways General Education Curriculum, upper level and graduate courses*)
- **RESEARCH** (*sponsored research, Equity and Social Disparity in the Human Condition Strategic Growth Area*)
- **SERVICE** (*student/faculty/staff disciplinary associations, community outreach/partnerships*)

PART V: GOALS AND TIMELINE

What are your 1, 2, and 5-year inclusion and diversity goals? Explain how they connect to and integrate with the InclusiveVT strategic goals above.

Part V: For each of the goals above, articulate 3-5 action steps/resources/and evaluations needed to achieve the goal.				
Departmental goal (What do we want to accomplish?)	Action steps (What key steps will be taken to achieve success?)	Resources available and needed (What funding, personnel, or other resources will be committed and/or sought to support this action item?)	Measures of success / accountability (Describe the methods you will use to measure the success of the action item. Use both qualitative and quantitative measures.)	Timeline/Sustainable transformation (How will your department support progress on this action item in the long term? Where do you want to be in 2-3 years?)
Goal 1:				
Goal 2:				
Goal 3:				
Goal 4:				
Goal 5:				



APPENDIX D: EXPERIENTIAL LEARNING

EXPERIENTIAL LEARNING

LEARNING EXPERIENCES DESIGNED TO PREPARE FUTURE GRADUATES TO CONTRIBUTE AND LEAD IN A COMPLEX WORLD

Virginia Tech has embarked on a bold vision for the future, a future in which graduates will be prepared for the complex world in which they will work and live. The Beyond Boundaries vision charges us to build on the foundation of educational excellence at Virginia Tech to prepare students to address 21st century challenges. As stated in the Beyond Boundaries: Thematic Area Group Report (2016, p. 3),

...we know that disciplinary depth alone is insufficient to prepare a student to become a productive contributor in society...we believe that Virginia Tech is uniquely positioned to offer a holistic and experiential education that engages the whole person...We envision a Virginia Tech education in 2047 will be grounded in work and learning that is purpose-driven, a manifestation of Ut Prosim and the land-grant mission that is no longer just co-curricular but embedded in and indeed integral to the curriculum.

Making this vision a reality challenges us to reflect on the ways in which our graduates are well-prepared, and the ways in which our graduates can be better prepared, for a purpose-driven career and life. Extending students' traditional classroom learning to tackle authentic problems and work in real-world contexts provides students motivation and passion to synthesize theory, concepts, and habits of mind thus maximizing their learning and development at Virginia Tech. If this is to become a hallmark of a Virginia Tech education, it is not sufficient for these learning experiences to be had by some of our students in particular programs with particular means of participation. Rather, such experiences must be for all of our students.

For all students to engage in authentic learning through experience, we will need a student-focused perspective to redesigning programs, courses, and learning activities. For the learning experiences to have a positive impact on student preparation, they must be accessible, high quality, and designed to deepen and enrich the disciplinary knowledge and skills of a program of study.

Implementing an educational model integrating disciplinary concepts and skills with interdisciplinary capacities through embedded experiential learning will take expertise in educational design and teaching in departments and programs. In the midst of research and teaching responsibilities, faculty will need to be students and scholars of a different type of education, an education readying our students to handle increasingly complex global issues. Faculty will need support, learning opportunities, and communities of practice to ensure valuable time is well spent in this pursuit.

Intentional design and implementation are required for quality, degree-embedded experiential learning. While we strive for life-long learning outcomes for our students, experiential learning efforts will be judged by the quality of the curriculum, learning opportunities, student products, and student competencies. High quality, degree-embedded experiential learning at Virginia Tech is characterized by an approach that builds skills and competencies through experience across the curriculum for all students in the discipline.

PRINCIPLES OF PRACTICE

To advance experiential learning for all students at Virginia Tech, the work will be guided by principles of practice. The principles of practice serve to keep the work focused with a spirit of improvement and recognition of the good work of those who laid the foundation for an enhanced educational model.

Principle 1: Evidence-Based

Program components and design will be informed by the educational research of experiential learning and what the research has demonstrated as the measured outcomes of student participation.

EXPERIENTIAL LEARNING IN CONTEXT: Developing degree-embedded experiential learning allows for the synthesis of the components of a VT-shaped education. At Virginia Tech, the experiential learning opportunities, which will be selected and customized to meet the professional and personal development needs of students in particular disciplines, are undergraduate research, internships, study abroad, service learning, or a hybrid of two or more types.

EXPERIENTIAL LEARNING TYPES: Different experiential learning opportunities will be appropriate to different disciplines. The important design considerations must include what faculty hope students will learn from the experience: What concepts will students need to apply? What types of problems will they be asked to address in context? What life-long learning skills will be most appropriate and useful for future success? What habits of mind will support persistence and resilience in the face of challenge? The potential student learning outcomes of experiential learning will differ by design.

- **Undergraduate Research** provides research experiences for students in all disciplines. With strong support from the National Science Foundation and the research community, courses and outside experiences are designed to connect key concepts and questions with students' active involvement in systematic investigation and research.
- **Internships** provide students with direct experience in a work setting—usually related to their career interests—to give them the benefit of supervision and coaching from professionals in the field.
- **Study Abroad** provides students educational opportunities abroad that result in progress toward an academic degree at Virginia Tech. It might include field research, internship programs, field schools, as well as study at an overseas branch campus.
- **Service Learning** experiences are designed to be beneficial for both student and community. Students perform a sustained task in the community and reflect on the service from multiple perspectives.

CUSTOMIZING COMPONENTS FOR TRANSFORMATIVE LEARNING: There are countless ways to customize experiential learning for integration and application of disciplinary knowledge, interdisciplinary capacities, and habits of mind. Some of the more common types of customized experiential learning in disciplines include (from Loretto, 2011 and Northern Illinois FDIDC, 2018):

- **Apprenticeship Experiences** allow students to take on a job role with an experienced professional in the field acting as a mentor. Apprenticeships may lead to a certificate or can be organized within a large organization or employer.
- **Clinical Experiences** are tied to practice in an area of study such as pre-med students participating in a hospital-based experience or teacher education students participating in classroom settings.
- **Cooperative Education Experiences (co-ops)** are more extensive than internships and are usually longer in duration. Co-ops are often more structured, integrated programs specific to students' career goals.
- **Field Work Experiences** require students to explore and apply classroom learning in an authentic context. Field work can serve to bridge educational experiences with the outside community and can range from public health education in the community to anthropological digs to work in a laboratory.
- **Competitions** challenge students to apply their skills to developing a product, solving a problem, as well as delivering an idea or talk. Often students work in teams throughout the competition.

Faculty will design customized learning experiences to meet the learning goals for students in their program. Faculty will work together to develop creative and innovative experiential learning opportunities to prepare students to address complex problems and issues. With support and resources, faculty can create experiential learning opportunities much more innovative than those described above.

Principle 2: Build from the Bright Spots

Recognize and respect the good work being done and find ways to build on successes to elevate best practices and make participation inclusive. Virginia Tech's existing commitment to experiential learning reflects the work of many across campus who engage students with transformative learning opportunities.

PARTNER OFFICES: To support faculty development and implementation of degree-embedded experiential learning in the program of study, existing offices will be key partners and support faculty initiatives: Office of Undergraduate Research, Career and Professional Development, VT Engage, Global Education Office, Office of Housing and Residence Life, College and Academic Departments

CO-CURRICULAR OFFERINGS: Virginia Tech's Division of Student Affairs provides leadership and coordination for a plethora of high-quality co-curricular opportunities.

EXEMPLARY DEPARTMENT AWARD WINNERS: In 2017, the Provost's Award for Exemplary Departments focused on "Hands-on, Minds-on" instructional environments. Twenty departments submitted review packets. All of the departments' practices exemplified student-focused, purpose-driven education with most highlighting experiential learning opportunities.

Principle 3: Integrated Operations

Practices will work within the culture and context of Virginia Tech using the communication and student decision-making structures that we know exist and will drive the work.

MAKING IT VISIBLE: One of the greatest challenges for engaging all Virginia Tech graduates in experiential education is the visibility of experiences. A focus on degree-embedded, customized experiential learning engages students within the program of study. Transformative experiences will be integrated in ways that reinforce disciplinary learning and bring relevance to concepts and skills.

MAKING IT MEANINGFUL: In academic departments and programs, faculty will work to integrate experiential learning in a way that brings meaning to disciplinary learning and that clearly communicates the meaning and relevance of experiential learning for students' success. Through the customization of experiential learning to the degree, learning opportunities will 'make sense' to students through real-world application and learning in authentic contexts.

MAKING IT POSSIBLE: Just as experiential learning opportunities will be diverse as they are customized to academic programs, the barriers to experiential learning will too be diverse. Some programs may want to scale undergraduate research opportunities, others may want to expand internship opportunities in the greater Washington, D.C., area requiring affordable housing and paid internships, while others may want to have all students study abroad to develop their language skills and cultural knowledge. Each opportunity will bring its unique challenges for student access and success. Faculty, staff, and administrators will need to engage in collaborative, creative problem solving, to identify potential barriers and seek solutions to enable equitable participation in transformative learning experiences.

Principle 4: Qualified Academy Professionals

Ensure those coordinating the design work are well-versed in the learning and program outcome literature and understand what is, and is not, working at other universities in the area of experiential learning.

A BEYOND BOUNDARIES EDUCATION

Students enter Virginia Tech from diverse backgrounds; with diverse skills, talents, and experiences; and, for diverse purposes. The concept of a VT-shaped education serves as a framework to plan and implement learning experiences with the flexibility and challenge for students to become agents of their personal and professional development. Each Virginia Tech student will have a unique learning journey through curricular, co-curricular, and personal learning opportunities. Through twists and turns on the journey, students will discover new ideas, new talents, and what motivates them. Faculty engaged in intentional planning, development, and implementation of degree-based experiential learning will facilitate a purpose-driven educational journey for all Virginia Tech students.



APPENDIX E:

PRESENCE IN THE GREATER WASHINGTON, D.C., AREA AND ROANOKE

PRESENCE IN THE GREATER WASHINGTON, D.C., AREA



PRESENCE IN THE GREATER WASHINGTON, D.C., AREA

Virginia Tech has pursued land-grant inspired engagement in the greater Washington, D.C., area since the philanthropist Paul Mellon donated the 420-acre Middleburg farm to Virginia Tech in 1949 for equine treatment and research. The inaugural graduate program in Urban Affairs and Planning began admitting students in 1963, and a graduate studies center opened in 1969. Over the next five decades, multiple graduate degree and research programs were initiated independently in the greater Washington, D.C., area by departments, colleges, institutes, and centers, and the university consolidated programs in various ways, leading to the establishment of three primary urban locations inside the Beltway: in Alexandria, Arlington and Falls Church. Though currently managed independently, the connected sites across the footprint represent land-grant inspired engagement, education, and research with a broad range of partners.

The greater Washington, D.C., area is both a strategic resource and key location for advancing Virginia Tech as a thought leader and global land grant in the spirit of Beyond Boundaries. It is the capital of the United States, a global gateway, an expanding technology corridor, and one of the fastest growing megaregions in the country. Yet it is an area where economic opportunity and advancement is offset by a broad range of disparities. Conditions for wellness vary dramatically across the region, with tremendous contrasts in opportunity for education, access to transportation, healthy food, jobs, environmental conditions, secure housing, and more.

Virginia Tech is well placed to engage and address the challenges of regional disparities in the location, as well as to support innovation, growth and development that could foster a broader range of economic opportunities and lift the human condition through a focus on sectors critical to the region like technology, data science, business innovation, artificial intelligence, policy, education, and cybersecurity. As a strategic resource for Virginia Tech, these locations in the greater Washington, D.C., area support multiple experiential learning programs. Fifteen percent of the university's sponsored research is generated by greater Washington, D.C.-based faculty. A similar percentage of graduate students receive their degrees in the region, and university partnerships with local governments, organizations, and businesses thrive.

This arc of land-grant-inspired engagement, learning, and discovery in the area is now set to accelerate with the commonwealth and local governments' establishment of National Landing, a newly branded geographic location and innovation district, anchored by Amazon's HQ2 and Virginia Tech's Innovation Campus. The \$1B Innovation Campus will be a global center of technology excellence and talent production, nearly doubling Tech's regional graduate programming, sparking research and partnerships, and igniting the region's innovation economy. The Innovation Campus will build on the university's base to expand visibility, increase scale and resources, and propel Virginia Tech forward as a global land-grant university and thought leader.

Driven by its land-grant mission, Virginia Tech and Virginia Cooperative Extension maintains a presence in every Virginia County. This presence includes fourteen Agricultural Research & Extension Centers, several 4H Centers, and Graduate Centers; totaling approximately 130 locations across the commonwealth. However, only in Blacksburg and the greater Washington, D.C., area does Virginia Tech offer degree programs and research that span the full range of the university with locally based faculty and staff.

Virginia Tech's presence in the area dates from the late 1940's with the acquisition of the Middleburg farm. The first graduate program in the region, in Urban Affairs and Planning, began in 1963, and the university has operated a Graduate Center in the region since 1969.

Virginia Tech's greater Washington, D.C., area presence extends across three principal locations inside the Capital Beltway region to include the City of Alexandria, Arlington County, and the City of Falls Church. As of spring 2019, each location is a State Council of Higher Education for Virginia (SCHEV)-approved off-campus instructional site for Virginia Tech, and each has resident faculty, staff, and graduate students. These locations are separated by urban infrastructure challenges but each incorporate Metro access. In addition to the three principal locations, Virginia Tech also operates facilities in Middleburg, Leesburg, and Manassas.

Programming across these locations has significantly transformed since Virginia Tech's initial presence in the area. As a result of varied development and regional separation, programs vary by location. The Alexandria location is solely programs within Virginia Tech's College of Architecture and Urban Studies. Housed in the historic buildings of Old Town Alexandria, this location includes graduate programs in Architecture and Design as well as the School of Public and International Affairs, until later 2019 when the School of Public and International Affairs will relocate to the Arlington location.

The Arlington location operates approximately fifteen university programs across four colleges and four research institutes and maintains most of the regions sponsored research as well as administrative functions for the region. To manage the number of programs, the Arlington location is housed in a Virginia Tech branded 144,000 square foot research center. Research at the Arlington location focuses primarily on computationally intensive areas including cyber security, data analytics, computational social sciences, transportation technologies, energy, and health information technology.

The Northern Virginia Center in Falls Church is largely focused on graduate instruction but has added a significant research portfolio over the last two decades. It houses the College of Business's MBA programs and programs in the College of Liberal Arts and Human Sciences and the College of Engineering, as well as the ThinkABit lab, a STEM-focused K-12 outreach effort in partnership with QualComm.

In addition to three primary locations in Alexandria, Arlington, and Falls Church; Virginia Tech maintains several operations across the broader region. Civil & Environmental Engineering operates the Occoquan Watershed Research Lab in Manassas, focused on water quality and water reuse. Outreach and Engagement, particularly the Language & Culture Institute, has a significant presence currently in leased space in Merrifield but will move back to the Northern Virginia Center in 2019. Cooperative Extension has locations in each county in Northern Virginia, and the Ag Experiment Station operates the Middleburg Agricultural Research and Extension Center, focused on equine research. The College of Veterinary Medicine operates its Leesburg Center, also focused on equine systems.

University presence is bolstered by approximately 160 faculty including approximately 60 tenure-track faculty across seven colleges and five Research Institutes. These faculty account for approximately fifteen percent of Virginia Tech's sponsored research activity awards. Approximately fifteen percent of Virginia Tech's graduate students are physically based in the greater Washington, D.C., area or enrolled in online graduate programs

based in the region. As a result, Virginia Tech conducts graduation ceremonies each spring in this area are the only sanctioned ceremony outside of Blacksburg. These achievements and future efforts in the area are the primary focus of President Sands' executive advisory group, the National Capital Region Leadership Council.

STRATEGIC OPPORTUNITY AND BINARY STAR

The greater Washington, D.C., area facilitates and amplifies Virginia Tech's strategic reach for excellence through the region's financial prosperity, workforce potential, and international collaboration. The region is ranked #5 in US regional GDP; hosts 15 Fortune 500 headquarters in addition to numerous federal agency headquarters such as the National Science Foundation, Defense Advanced Research Projects Agency, National Institutes of Health among others; and is ranked #4 nationally in venture capital. The financial resources generated by these opportunities can fund innovative research, retain inspired faculty, and promote improved university infrastructure across units. Positioning Virginia Tech across the greater Washington, D.C., area leverages exceptional prospective students and workforce. The surrounding area is home to nationally ranked public schools and approximately a quarter of local residents work in a STEM related field. In addition, there are an estimated 55,000 Virginia Tech alumni residing in the region. Each of these groups are strategic assets to the university. Finally, the proximity of surrounding 176 international embassies facilitates connections beyond the commonwealth to engage diverse communities and solve global problems.

Every urban-based innovation economy is built around a core of strong academic institutions actively partnering in its home. However, the greater Washington, D.C., area, particularly northern Virginia, lacks that university base. Regional studies (e.g., [Techonomy report](#)) have recognized that the region needs a greater university presence to attract talent and promote economic growth. Virginia Tech's strengths complement critical regional demand. Continued development of transdisciplinary communities through destination areas (in integrated security, critical intelligent infrastructure and human centered design; data and decisions; global systems science; and adaptive brain and behavior) and strategic growth areas (creativity and innovation; policy; equity and social disparity in the human condition; economic and sustainable materials) promote interdisciplinary, problem-focused research and curriculum, and align with many of the needs and priorities of the greater Washington, D.C., area, such as science and technology, business and innovation, data-driven decision making and policy, integrated security, and intelligent infrastructure.

The relationship between the greater Washington, D.C., area and Virginia Tech's main Blacksburg campus challenges Virginia Tech to respond to dynamic social groups and regional variation that translates to global discovery. Significant population density differences, cultural and ethnic diversity, regional wealth disparity, technology ecosystems, and urban versus rural living labs position Virginia Tech to innovate across multifaceted environments.

Strategically responding to the unique challenges of the area positions Virginia Tech to connect deeper with broader communities in the commonwealth. The university Master Plan and on-going strategic plan recognizes Virginia Tech's coordinated campuses in Blacksburg, Roanoke, and the greater Washington, D.C., area. The university executes a strategy in each location by coordinating aspects of its physical presence, its programming, and its relationship to the local community.

At the university level, the institution's strategy in the region is to grow; be it enrollments, research activity and funding, footprint and presence, as well as deliver differentiating, transdisciplinary programs, and to provide thought leadership toward the future of the region. At the Academic Unit level, the strategy is adaptive, reading signals of change, identifying opportunities quickly, effectively mobilizing and leveraging internal and external stakeholders to deliver competitive, well positioned programs. Regionally, the strategy is processing supportive resources that enable academic units to successfully compete in the region, while implementing the university's plans for growth and differentiation.

Virginia Tech's presence in the greater Washington, D.C., area is critical to achieving its land-grant mission to advancing the commonwealth and extending that mission to our global community. In response to this potential, Virginia Tech has ambitious goals to strengthen its existing programs in the area and activate new ways of thinking when it comes to academia, innovation, and creation.

Key points of this renewed commitment to Virginia Tech's presence in the greater Washington, D.C., area are the Academic Incubator/Accelerator and Innovation Campus.

ACADEMIC INCUBATOR/ACCELERATOR (AI/A)

The Academic Incubator/Accelerator provides the organizational structure and processes to help faculty modify existing programs or develop and launch new academic programs tailored to the greater Washington, D.C., area, enabling Virginia Tech to deliver competitive, transdisciplinary, market-driven, revenue-generating, partnership-driven research and instruction programs in the region. The AI/A incorporates three phases (see Figure 1) to link and address specific bottlenecks in existing processes and facilitate progress through university governance, integrating review, planning, investment, assessment, and evaluation to promote success and mitigate risk.



1. The Application phase uses a call for concept papers or proposals from individuals or faculty teams and uses a transparent review process with comment by professional staff. Proposals may be returned for revision, redirected to another process, rejected, or accepted into the second phase.

2. The Strategy and Planning phase is focused on internal and external analysis, development and evaluation of overall program options, including the development of an implementation plan with built-in evaluation benchmarks and decision points. This concludes with a comprehensive review to determine if the program proceeds to the third phase.

3. The Incubation and Evaluation phase, implements the plan designed in phase two, providing investment, as needed, to launch new programs or rebrand existing ones. Programs and initiatives that meet their benchmarks ultimately exit the AI/A to their university home (e.g., college, or department). Programs that cannot adapt to successfully meet agreed upon benchmarks are terminated.

Figure 1: Academic Incubator/Accelerator Phases

Fundamental Resources to the Academic Incubator/Accelerator are:

- Permanent professional staff with expertise in key areas like market analysis, curriculum development, and finance, to work with proposing faculty on developing concepts into well-structured plans and to assist in proposal and plan evaluation.
- A business model that provides seed funding and recovers funds through revenue sharing over time.
- Strong integration with administrative units and coordination across university processes.
- An adaptive process that monitors, evaluates, and adjusts program plans to respond to changes in the market or to other unanticipated events.
- Integrated review, monitoring, evaluation, and adjustment throughout by both a representative review committee and an oversight body representing senior university leadership.

The AI/A establishes an ongoing way to ensure that Virginia Tech's greater Washington, D.C., area-based academic programs are differentiating for the university, well positioned in and responsive to the regional competitive landscape, revenue-generating, and an overall asset for students, faculty, staff, and partners.

VIRGINIA TECH INNOVATION CAMPUS



VIRGINIA TECH INNOVATION CAMPUS

The Virginia Tech Innovation Campus is among the university's top strategic priorities and will expand the university's graduate and research programs for the digital age while also expanding the university's hub in the greater Washington, D.C., area. The campus will deliver on a bold vision to serve as a leading magnet for high-tech talent and innovation and increase regional and national competitiveness in the high-tech sector. Built from the ground up, the campus in Alexandria will extend from our foundation as the commonwealth's leading research land-grant university, our significant presence across Virginia, and our role as one of the largest and most highly-regarded producers of STEM degrees in the nation. Arising out of a historic higher education package that Virginia included in its Amazon HQ2 proposal, the Innovation Campus will complement significant expansion in Blacksburg to impart generational benefits, support a full range of partnerships with leading public and private entities, and deliver on our mission to transform the regional and state economic ecosystem.

BACKGROUND

While the Amazon proposal was an important catalyst that helped to inspire the commonwealth's higher education package, the concept of the Innovation Campus is not new. The campus aligns with Virginia Tech's stated intentions and strategic investments to expand our presence in Northern Virginia, and the campus complements activities in Blacksburg and throughout the commonwealth.

When asked, Virginia Tech worked with Virginia officials for more than a year to craft a response to the Amazon HQ2 Request for Proposal, which ultimately included the vision for the \$1 billion Virginia Tech Innovation Campus, as well as expansion in Blacksburg—both of which are designed to support doubling the tech talent pipeline in the state and diversify the innovation economy.

The Innovation Campus will be a global center of technology excellence and talent production, support graduate education, attract top-tier faculty, spark research and partnerships, and ignite the region's innovation economy. With leading programs in computer science and computer engineering and specializations in domains such as technology and policy, human-machine interface, machine learning, and artificial intelligence, the Innovation Campus will deliver key programs for the digital age.

Top-tier programs and research foci will be designed to keep pace with market needs and the rapidly advancing high-tech sector. Globally-recognized faculty will collaborate with industry and public-sector partners to offer innovative programs that anticipate and meet the needs of the professions of the future, deliver research to advance the human condition, encourage startups, and create enduring foundations for economic and global impact at the frontier of public and private innovation.

The campus's design features, spaces, and location in Alexandria will position the campus to serve as a hub for tech talent. The Innovation Campus will fuse academics with integrated spaces for partners of all types—companies, startups, and public.

The plans for the Innovation Campus align with the university's long-standing roadmap for growing its presence in Northern Virginia, where Virginia Tech boasts seven sites and a 50-year history of educational

excellence. Nearly 60,000 alumni live in the region, and Virginia Tech maintains seven facilities and operates programs in Old Town Alexandria, Arlington, Fairfax, Falls Church, Leesburg, Manassas, and Middleburg. Moreover, the commonwealth's higher education package allows for a significant expansion of undergraduate enrollment in computer science and software engineering on the Blacksburg campus.

BUILDING ON THE INNOVATION CAMPUS VALUE PROPOSITION

The Innovation Campus will be a game-changer for the region, the high-tech sector, and Virginia Tech. The campus will become a reality during perhaps the most important time in human history as the fourth industrial revolution unfolds and the promise and peril of advanced digital technologies are realized. Not only will the world be undergoing significant technological disruption, but so too will the region and the commonwealth, as Amazon's HQ2 and other entities grow and reach scale in proximity to the nation's capital.

The Innovation Campus will take shape based on a number of value drivers, including:

- **A UNIQUE PLACE:** Our history in Northern Virginia and our location in proximity to Amazon's HQ2 and the federal government in Washington, D.C., offer unprecedented opportunity
- **VIRGINIA TECH'S ENDURING FOUNDATIONS:** Our long-standing strengths as Virginia's research land-grant institution—combined with excellence in STEM, a track record of collaboration, a presence in both urban and rural communities, and our ability to meet market needs—position us to transform the region
- **HUMAN-CENTERED APPROACH:** Designed to move beyond a focus on technology alone and the boundaries of traditional academics, the campus will allow us to deliver a transdisciplinary, human-centered approach to address challenges of the digital age at the human-computing frontier
- **FOCUS ON BROAD THEMES:** By coalescing around big ideas and broad themes to bring disparate competencies and ideas to the complex and interrelated opportunities and challenges of the digital age, we will solve problems that truly matter

FEATURES AND SPECIFICS

The new campus will serve as a main feature of an Innovation District with a myriad of other organizations, corporate entities, amenities, arts, and more, which together will be part of a modern, urban, and vibrant ecosystem. At the Innovation Campus, we envision:

- A complete campus (versus a single building) that includes an academic building, innovation center, and residential accommodations
- Delivery of graduate-level education and research with 750 master's degrees at scale
- Focus on computer science and computer engineering, as well as complementary programs at the interface of humans and computing
- Specializations offered in high-demand areas, including data sciences, analytics and collective decisions; security and the Internet of Things; and technology and policy
- Robust doctoral and undergraduate opportunities

At the Virginia Tech Innovation Campus, we will initially hire up to 50 tenure-line and research faculty. The top-tier faculty and industry and public-sector collaborators will lead the world in cutting-edge, technology-based research areas such as machine learning and artificial intelligence.

The campus' proximity to the nation's global center of power and influence will allow Virginia Tech to collaborate with leading businesses, K-12 schools, community colleges, academic peers, industry partners, and a vibrant alumni network to ensure a robust pipeline of technology talent for generations to come.

Moving forward, we will continue to engage with partners in the state, the Alexandria community, and others throughout the region, while forging new partnerships across public and private sectors.

While the Innovation Campus is a focal point for the university and the commonwealth's higher education package, the expansion in Blacksburg is critically important and complementary to our efforts in Northern Virginia.

In Blacksburg, we envision:

- Significant enrollment increase, with 2,000 additional undergraduates
- Computer science and software engineering focus
- 140-plus new faculty positions
- Capital project support

The Innovation Campus will serve as a platform for growth and opportunity in complementary domains. Additionally, Virginia Tech will ensure that every student takes classes in a number of fields, across different colleges. Hiring will reflect that growth across disciplines and departments. In particular, we expect the College of Liberal Arts and Human Sciences and the College of Science to add faculty to support teaching, research, and scholarship in English, chemistry, physics, and other core domains.

LOCATION

Located in Alexandria near U.S. Route 1 in National Landing, the Innovation Campus is a first-of-its-kind effort for Virginia and the Washington, D.C., region. The 1 million-square-foot campus will offer a unique mix of academic and research space, co-located with business and industry partners where students and faculty live and work. The campus will be a collaborative magnet for leading tech talent, research, and education. It will include:

- ~300,000 square feet of academic space and cutting-edge R&D facilities
- ~250,000 square feet of partner space dedicated to startups and corporate facilities;
- ~350,000 square feet of housing space for students and faculty
- ~100,000 square feet of retail and support spaces

TIMELINE

Planning and preparation is under way as we create programming, design curriculum, and begin recruiting. The first master's degree class of the Innovation Campus will enroll in the fall 2020 semester in start-up space in Alexandria. During 2019, we will honor our commitment to the state to immediately expand the tech talent pipeline and increase graduate enrollment in existing computer science programs at the university's Falls Church site. An Innovation Campus Fellows program will be offered in fall 2019 to engage a small number of selected students as ambassadors during an important time in the history of the campus.

President Tim Sands will retain an executive search firm in spring 2019 to assist in hiring of a world-class leader to shape the future of the Innovation Campus.

While we are moving with urgency, we recognize that the Innovation Campus and Blacksburg expansion will unfold over a number of years, framed as follows:

- Planning: 1 year
- Building: 2-5 years
- Scaling: 10 years
- Propelling: the next 100 years

BLENDING RURAL AND URBAN STRENGTHS

The Innovation Campus is the next step in the evolution of Virginia Tech as a premier institution for learning and research for all students and faculty. The campus will inspire innovation, not only in terms of research and education, but also in the very approach to higher education—one purposefully designed to deliver specific workforce, societal, and economic benefits.

As the commonwealth's land-grant research university, Virginia Tech will be extending its strong roots in Blacksburg, where it has the space and facilities to conduct cutting-edge research in all areas—from dairy science to creative writing to nuclear engineering—to the state's urban center. And as programs in Northern Virginia grow, the university will boast a rural-and-urban balance that places us at the forefront of a sustainable higher-education model into the 21st century.

On the global stage and in the heart of the nation's capital, Virginia Tech will be positioned to advance diversity and inclusion goals, enrich the experience of students in all locations, and prepare graduates for today's global and diverse workplace.

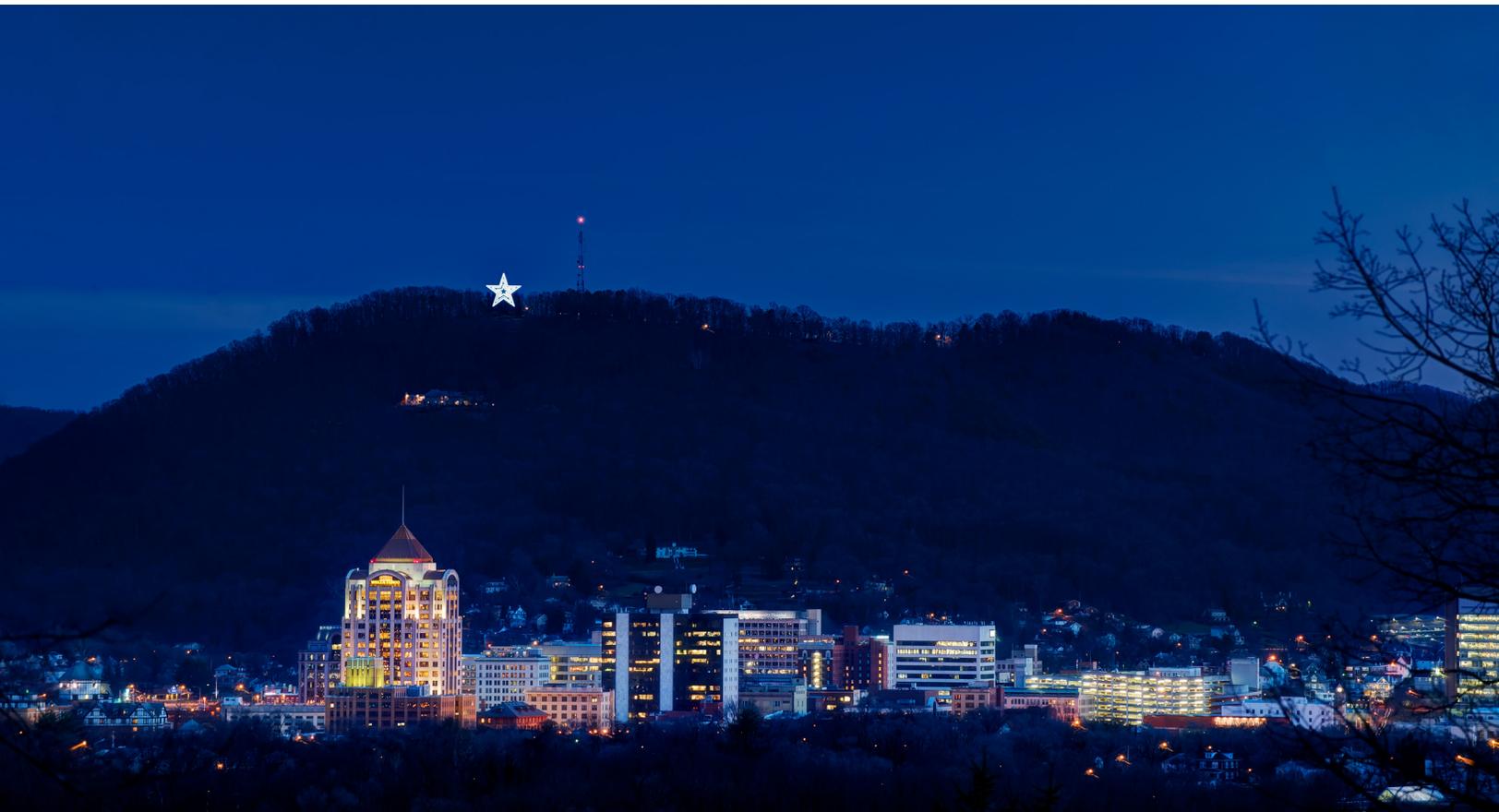
The added benefit of an increased urban presence to faculty in areas outside of computer science is unbounded. The property development on the campus will serve as a thriving hub for students, faculty, and staff to live, work, and play and catalyze creativity and innovation. Faculty from Blacksburg will be strongly encouraged to explore the benefits of the new campus. As we link Virginia Tech locations, faculty will be better equipped to pursue discovery and research in both urban environments and rural environments and to apply our findings in one environment to the other.

As a number of Virginia Tech research institutes have discovered, tremendous benefits arise in blending rural and urban mindsets when solving problems. The blend offers a broader perspective and a more comprehensive solution to any societal problem, from coastal mitigation to public health, from transportation to human-centered infrastructure. A stronger Virginia Tech presence in the D.C. area, with a more recognizable institutional brand around the globe, will improve our ability to attract world-class faculty, staff, and students to our sites in every corner of the commonwealth.

For nearly 150 years, Virginia Tech has led technological breakthroughs, created long-lasting industry partnerships, and planted deep roots throughout the commonwealth. We are uniquely committed to teaching and learning, research and discovery, and outreach, engagement, and service, all in the name of our motto, *Ut Prosim* (That I May Serve).

The Innovation Campus is a natural—and thrilling—outcome of all that we hold true about Virginia Tech.

PRESENCE IN ROANOKE



PRESENCE IN ROANOKE

VIRGINIA TECH CARILION ACADEMIC HEALTH CENTER

Virginia Tech's presence in Roanoke including the Virginia Tech Carilion School of Medicine and Fralin Biomedical Research Institute at Virginia Tech Carilion (previously known as the Virginia Tech Carilion Research Institute) combines the university's on-going excellence in academic health science and comprehensive biomedical research capacity to respond to complex problems of the commonwealth and the world. Virginia Tech Carilion (VTC) refers to the extensive partnership between Virginia Tech and private health care provider Carilion Clinic, as well as the collaborative relationship between the Virginia Tech Carilion School of Medicine and the newly renamed Fralin Biomedical Research Institute (formerly Virginia Tech Carilion Research Institute). The continued success of Virginia Tech and Carilion Clinic's partnership embodies the research to market mind-set necessary to not only foster innovative 21st century research but also apply that research to the community and actualize social biomedical impact.

The 2007 announcement and 2010 creation of the Virginia Tech Carilion School of Medicine and Research Institute was a complementary private and public long-term collaboration between the independent medical school and Virginia Tech Carilion Research Institute. This partnership was amplified in 2018 when the medical school became Virginia Tech's ninth college to facilitate the academic health center's existing emphasis between practice and research. Virginia Tech's pursuit of biomedical innovation and application will incorporate traditionally siloed disciplines of research and practice within living-learning educational environments and enable students to put their research into practice and streamline their capacity for bench to bedside healthcare.

The Roanoke campus is comprised of a variety of shared administrative, medical, and research space between Virginia Tech and Carilion Clinic. Continued collaboration between these partners and resulting growth in research projects and funding have necessitated exponential growth of the Roanoke campus. As a result, in 2016 Virginia Tech announced it would construct a more than 100,000 square-foot facility for medical and research functions through joint contributions of \$46.7 million in state funding and \$21 million in matched funds from the university and Carilion Clinic. This expansion and associated improvements will nearly double the previous campus footprint. As the social application of biomedical research, technology, and implementation continues to change, the Roanoke campus will continuously evaluate and respond to future infrastructure needs including connectivity improvement, shared data access, state-of-the-art technologies and equipment, and future capital projects.

Virginia Tech Carilion School of Medicine

The Virginia Tech Carilion School of Medicine set out to introduce physicians and clinicians in-training with transdisciplinary experiences grounded in foundational learning themes such as medical knowledge, patient care, and professionalism. Beyond this foundation, the Virginia Tech Carilion School of Medicine ensures students strengthen their education through a novel curriculum including bioethics, quality care and safety, use of clinical guidelines, and research implications. As a result, students are better prepared to apply their training to real-world situations and provide personal care.

Fralin Biomedical Research Institute at Virginia Tech Carilion

Fralin Biomedical Research Institute at Virginia Tech Carilion (previously Virginia Tech Carilion Research Institute) houses the efforts of almost thirty research teams in biological, behavioral, computational, and engineering disciplines working towards health and disease challenges. Of note, the primarily biomedical research at the institute generates nearly \$100 million in extramural research grant funding, most often from the National Institutes of Health. Previously known as the Virginia Tech Carilion Research Institute, the institute was renamed in 2018 to honor the \$50 million commitment by Heywood Fralin, Cynthia Fralin, and the Horace G. Fralin Charitable Trust.

NEXT STEPS

Virginia Tech's presence in Roanoke activates biomedical research and care across the region. It will continue to pursue commercialization from lab to application and ways to incentivize purpose-built partnerships. Higher-education partnerships and state-funding like the iTHRIV initiative will continue to amplify the university's reach across the commonwealth and foster translational research into practice for effective physicians and research teams. The academic health center will remain dedicated to its diversity and inclusion commitments across all programs as exemplified by the Virginia Tech Carilion's 2016 and 2018 INSIGHT Into Diversity's HEED awards. Faculty, staff, and students at the academic health center will utilize experiential learning opportunities to build on human-centered projects that foster deeper connections and promote retention. Finally, the academic health center will continue its success in philanthropic partnerships that result in improved facilities, connectivity, and ability to serve students capable of solving complex problems for the future.