Beyond Boundaries Steering Committee Toolkit

December 7, 2015

Introduction

An essential part of the Beyond Boundaries initiative is the work of the four thematic area groups: Advancing as a Global Land-Grant Institution, Preparing Students for the World, Envisioning the Campus of the Future, and Discovering New Funding Models. The groups have been diligently working over the course of the fall semester to lay the groundwork for the Steering Committee to use in constructing its vision of Virginia Tech at its 175th anniversary in 2047.

Each group approached both the process they undertook and the tools enclosed in this document in an organic fashion to take into account both the talents of their group members and the particularities inherent to their thematic areas. The tools offered here are still in draft form as not all groups have met yet for the final time this semester and other groups are in the process of scheduling additional meetings for the spring semester.

The following sections are provided to the steering committee for use as a toolkit of visions, guides, and proposals that can help to enhance the committee's own vision-planning activities. Beyond the contribution of the working groups, this tool kit also contains information and insights pulled from input sessions with faculty, graduate students, and undergraduate student groups as well as from submissions to the online idea bank.

Working Group: Advancing as a Global Land-Grant Institution

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Summary of Activities to Date

Advancing as a Global Land-Grant Institution Group Summary

The Advancing as a Global Land-Grant Institution Group (GLG) has had four meetings since the Beyond Boundaries kickoff event. Our first meeting focused on broad global and higher-education trends, getting to know one another, and loosely defining what a global land-grant university is. The second meeting asked group members to write a case scenario of the year 2047 that would stimulate a discussion about strengths, opportunities, boundaries and challenges for the university moving forward. In the second meeting, three scenarios were selected by the GLG and breakout groups were created to strengthen each scenario. The third meeting focused on fusion of the scenarios and allowed the group to workshop a recommendation for the Steering Committee. The fourth meeting provided a forum to refine and polish the deliverables produced by the committee over the first three meetings.

Draft Tools

The group's meetings have produced four deliverables that should be useful to the Steering Committee. First, the GLG has constructed and finalized three case scenarios that propose hypotheticals of what the world, and Virginia Tech, might look like in the year 2047. These scenarios offer the Steering Committee a framework to imagine how Virginia Tech might respond to differing circumstances, as well as provide a vehicle for thinking on a thirty year timeline.

Second, the GLG created a list of the tensions that a global land-grant university should take under consideration when evaluating alternatives and directions. These tensions identify "givens" that the GLG has accepted to be influences on the future university.

Third, the GLG has begun to workshop a definition of a global land-grant. The global land-grant definition is still being refined, but its current iteration provides the Steering Committee with an idea of what the modern land-grant should value and embody.

Fourth, the GLG is currently refining a recommendation (aka Moonshot) that looks at how Virginia Tech might use its basis as a land-grant institution to its advantage in 2015 and 2047. This recommendation is still being shaped but focuses on creating an adaptable, reusable framework to create discrete, short-term partnerships that address large-scale problems. The recommendation – called LGENeration – provides a framework that helps the university cultivate partnerships with

external partners that capitalize on Virginia Tech's distinct advantages and address the university's boundaries and challenges.

Tool A: GLG Case Scenarios

Radical Climate Change

The effects of climate change, pollution, invasive species, and emerging diseases have become issues that impact the daily lives of all Virginians. For example, coastal VA is subjected to such frequent flooding that more than 1.6 million citizens are expected to relocate from the coastal region by 2070, creating unprecedented planning challenges across inland urban areas. The water quality of the Chesapeake Bay and coastal regions has plummeted due to the combined influence of acidification from CO_2 emissions and nutrient/pollution loading from agriculture/urbanization, and important fisheries are now depleted. Likewise, droughts, increased surface temperatures, and invasive insects have decimated plant, invertebrate, and vertebrate biodiversity across Appalachia, altering these unique mountain communities and compromising the ecosystem services that they provide to society. Increased frequency and intensity of drought caused by climate change, coupled with diminished soil quality across much of VA, have reduced crop yields to a fraction of what they were in 2015. To make matters worse, a fungus introduced from Asia has eliminated soybeans from the Commonwealth's once diverse agricultural portfolio and the poultry industry in VA has been severely compromised by a newly introduced, highly contagious strain of bird flu that also infects people and challenges our healthcare system.

These cumulative issues have put the Commonwealth's economy in a precarious position with limited federal assistance available, and government funding for education and medical care in rural communities has plummeted due to increased demands in densely populated urban areas. Rapid technological innovation is required to solve these issues, and the dynamic interplay amongst them, yet these new technologies raise their own set of problems, risks, and ethical considerations. Virginia Tech now relies almost entirely on tuition, philanthropy, and corporate and federal partnerships to fund its operations. Global competition for philanthropic and private sources of funding, as well as for the best students and faculty, is now intense among new global actors pursuing these critical resources.

The problems facing the Commonwealth of Virginia and Virginia Tech are not unique. Instead, they are becoming the global norm. Coupled with famine, inter-state conflicts, terrorism, fiscal crises, and rising energy prices, the complex global scenario reveals that robust global partnerships are required to find solutions. Yet, with increased population growth and a growing global economy, the political landscape has become increasingly complex at state, federal, and international levels.

Developing Countries, Developing Infrastructures

By 2047, the developing countries and continents of 2010s are rapidly building their infrastructures and addressing societal problems. For instance, some of the developing world's regions have growing economies that require new infrastructures, e.g. improved roads, electrical grids and other

energy plants, new facilities, reliable clean water supply to cities, modern sewer systems, and the latest in fiber optic networks. Many of the world's leading companies are present in these regions and building the new infrastructures. On a global level, clean water sources that were thought to be nearly inexhaustible are being depleted by human consumption and industries. Petroleum as a leading energy source is growing in scarcity as well and becoming increasingly difficult to extract from the Earth. Basic technologies exist to broadly commercialize renewable energy sources at affordable levels. Among these are solar, wind, plant-based, and other bio- and geo-chemical energy sources. However, these technologies still have not been commercialized and deployed globally.

In response to these conditions, there is a rise in regionally-based, multi-national research coordinating organizations that prioritize and commission research at a large scale to solve these challenges of infrastructure and energy, as well as other global problems. Once commissioned, these research coordinating organizations aid in assembling multi-national groups comprised of faculty, students, and other researchers from universities, governments, corporations, and private research organizations worldwide. For the students involved, participating in these research initiatives adds a layer of experiential learning from the field that they would otherwise not gain. This gives them a leg up when competing in the job market globally upon graduation and makes them more attuned to working with people from a wide variety of cultures.

The participating U.S. land-grant institutions leverage their federal partnership in the Cooperative Extension Service (CES) to work directly with the people living in some of these world regions and apply the research findings as they are generated. Specifically, they help people in learning more about how to use and conserve clean water and energy in their homes and businesses. There are emerging practices coming from the initial research being conducted by the regional research group. The CES takes the lead on addressing clean water and energy supply issues not only as technical problems, but as problems of a socio-economic, political, and ethical nature as well. The CES begins by holding meetings and workshops regarding the choices governments are making about which businesses and people will be supplied with new water and energy resources first, as they emerge. The emphasized message is that these decisions are intended to be made in a transparent and ethical manner; one that improves the regional people's general welfare as well as their economies. As the new research, local practices, and governmental processes are being tested and implemented, the CES begins testing these in back in Virginia, as the Commonwealth attempts to reduce pressures on its own clean water supply. Despite the support and enthusiasm for the regional research-coordinating organizations, there remain deep impediments confronting their research groups. Most notable are the significant differences in legal systems and research-related policies across the participating nations, particularly with regard to the regulation of biological hazardous materials.

Leading universities involved in the regional research groups come not only from the U.S. and Europe, but also from countries such as Australia, Brazil, China, India, Japan, Russia, and South Africa. Virginia Tech is a participating research university and initially leverages its research portfolios in clean water and in biofuels to be utilized by the regional research group in which it participates. Virginia Tech and the other institutions and organizations in the research group will

proceed together as a consortium with commercializing technologies in these two areas, once they are perfected enough for broad use.

Preparing Students/Autonomous Systems

In 2047, Virginia Tech has capitalized on its position as a land grant university of Virginia and its connections to other land-grant universities in order to focus on how individuals and families in the Commonwealth can flourish economically and personally in the new global world.

Global forces - including climate change, political and religious extremism, unrest and migration, and other conditions - have affected the way Virginians live. As a result, the needs of Virginians in terms of daily life (including how they live in households and how they earn income) have changed, with changes in ecosystems and infrastructure including but not limited to agriculture. Global industries have affected quality of life for Virginians. Vocational and practical skills training for children, youth, and families, as well as aging adults needing to earn income throughout their lives, have resulted in the land-grant university providing training for micro-industries and entrepreneurship in the global economy, post-information economies, and caregiving. Similarly, the research generated by scientists at Virginia Tech related to the environment, economies, and well-being of individuals has broad impact around the world as individuals, families, and communities are confronted with social and environmental problems. Virginia Tech has had to develop strong presences across the state as the ways large-scale circumstances have affected Virginians has varied.

From a global perspective, Virginia Tech now serves a culturally diverse population. Degree-seeking students will increasingly come from other regions of the world, with increases in students from Latin America and Africa most notable. A deep understanding of cultural history and current global politics is essential for instructing these students. Graduate education will continue to be interdisciplinary and bifurcated between scholarship in the academy and industry. Physical face-to-face interactions, while still important, have been replaced with realistic and engaging virtual interactions, lessening the need for specific, dedicated physical spaces. Because many of life's daily tasks have been shifted to autonomous systems and people can engage in deep and meaningful ways from anywhere, more people are taking advantage of continual learning through universities and other institutions beyond the traditional four-year model.

Tool B: GLG Tensions

1. *What are the effects of losing public funding on scholars' ability to conduct exploratory research?* Public funding provides the capacity for scholarship to act as a knowledge center and a beacon of discovery. As the university moves toward increased reliance on funding models that are attached to external audience's objectives and motives, even market forces, how will the university maintain its presence as an independent advocate of ideas?
2. *How does disruptive technology influence the university?* Increasingly powerful (and cheap) computers, automated systems, social media, flipped classrooms, online forms of learning, online peer-reviewed journals, the unknown drastically change the world that we live in. Moving toward 2047, disruptive technologies will present boundaries for the

university to cope with and overcome. For example, the virtual classroom and other advances in technology could increase the ease of access to upper-echelon universities. Because of this change, Virginia Tech may be engaged in a battle for students and research dollars with elite universities. How will Virginia Tech maintain its relevance under these conditions and exploit disruptive technology vis-a-vis other higher education institutions?

3. *How does the university become more adaptable and less risk averse?* Some groups in the beyond boundaries project have discussed the idea of moving away from disciplinary degrees, or even the colleges system, toward more open-minded approaches for organization (perhaps under the university's institute model). If higher education undergoes drastic realignment, the university must be positioned to quickly react to shifting market forces. Yet universities are renowned for their ability to calcify "how things are done" and resist change. How will Virginia Tech bolster its capacity to respond and transform?
4. How does the university navigate political forces that can drain financial resources, create regulatory systems, and inhibit the university's ability to react? It is easy to imagine that the state legislature will drive down its financial contribution to the university (just about every presentation and group I've attended has discussed this). Similarly, it's likely that the university will receive additional unfunded mandates and regulatory obligations. It's not even hard to imagine political leaders prohibiting the university from achieving an innovative presence in the NCR (e.g. gatekeeper, sluggish process, financial obstruction). How does the university articulate its needs to state and federal political leaders in a way that leads to expedient, efficient and effective outcomes?
5. *How does the university weigh/evaluate the costs and benefits of partnerships?* Partnerships, alliances, consortiums offer clear benefits; however, these benefits are in tension with several downsides and vulnerabilities. Over the long-run partnerships can be difficult to sustain interest within members (especially across sectors). Global unrest (e.g. new cold war, financial turmoil) could also complicate foreign partners, who often serve as the primary funders of partnerships. Further, valid criticisms underlie the model of providing Western solutions to global and/or third world problems (e.g. neo-colonialism, advancing American companies' interests, drain on local economies/cultures). Before entering a partnership, or breaking ground on a Virginia Tech-led project on foreign soil, the university needs address these concerns with long-term time horizon in mind.
6. *How does the university cope with current financial limitations?* The university's current endowment - ranked 116th at $796,437 - is a major constraint to the university's capacity moving forward. Many of the university's competitors are better positioned in this area. Disruptions - due to global unrest, financial markets, or technology - could create a consolidation in higher education that could drastically realign the industry. Virginia Tech's current financial limitations could constrain its capacity to respond under extreme conditions.

Tool D: LGENeration

Virginia Tech would lead the organization of a distributed research and extension network that will co-evolve alongside the world's complex problems. The Land Grant Extension Network (LGENeration) capitalizes on the dispersed nature and existing infrastructure of the national land-

grant system to enhance teaching, research and engagement in new ways. It relies on institutions' distinctive academic and geographic strengths and as such, is adaptable over time as new relevant topics emerge and institutional capacities evolve. The LGENeration is based on the rational that it will provide a competitive advantage to participating institutions that increases their collective leverage to gain access to research dollars, partnerships, as well as solving complex global issues.

Scalable: Projects existing within LGENeration would be discrete, transient experiments that could be scaled depending on specific demands of the problem being engaged. Iterations of LGENeration could have a single partner or a wide-ranging coalition of institutions from various sectors. Time and size of LGENeration projects could be scaled to the context/circumstances of the specific issue and would typically dissolve upon completion.

Attractive to talent: LGENeration institutions would have open-disciplinary focus structured to draw faculty, students and researchers from across Virginia Tech, as well as visiting professors, researchers and students from collaborating institutions. The model allows for mobility for faculty and students (cf the Erasmus Programme).

Adaptive and survivable: The model relies on institutions' particular academic and geographic strengths and as such, is adaptable over time as new relevant topics emerge.

Partnering formula: The original LGENeration idea was designed to provide a framework for partners in other land-grant universities to utilize their distinct advantages (e.g. extension system, common specializations, deeply rooted engagement) as a means for creating a robust, collective capacity. However, this original intent is too narrow. LGENeration's success hinges on incorporating a broad range of international and domestic institutions that could be drawn from higher-education, the public sector, private industry, think tanks, research labs, NGOs, and NPOs. An intentional aspect of the LGENeration system is the opportunity to facilitate coordination/collaboration across a broad set of actors. Addressing complex global issues requires a diverse set of skills (and resources), and creating temporary strategic groupings around problems is an attractive model to Virginia Tech and potential participants.

Unique advantage: Universities from outside LGENeration system would struggle to match the capacity of collaborating institutions. For example, a partnership of several land-grant universities would have a competitive advantage in solving health and environmental issues due to their existing networks of engagement, extension and outreach in communities.

Politically salient: LGENeration helps Virginia become a leader in solving important national and international issues. Using the land-grant overlay extends Virginia Tech beyond Blacksburg to incorporate the broader Commonwealth.

Student/Faculty Experience: LGENeration has the opportunity to support broader initiatives like increasing student and faculty portability between member institutions. This could take the form of course transfer agreements and faculty research collaborations.

Working Group: Preparing Students for the World

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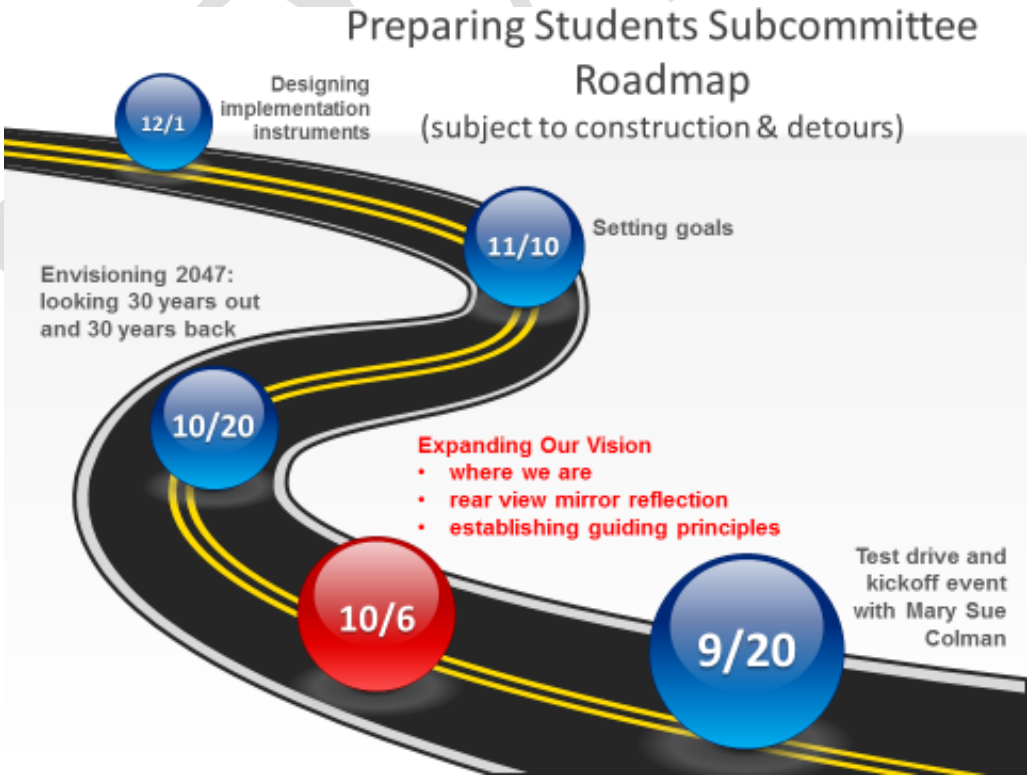
Summary of Activities to Date

The Preparing Students for the World group met a total of four times this semester with each of their meetings building on prior ones. In between meetings, group members completed readings and other activities that would help inform them about the future and facilitate the visioning process. In addition to the white papers provided by the Beyond Boundaries team, committee members used sources on the topics of technology and global history, preparing students for the workforce of the future, history of higher education, predictions of the future, and leadership. In between meetings, members completed individual activities that required them to think about radical (and positive) suggestions for preparing students for 2047 and about what would be the same or different in 2047 than today. The group also used findings from the undergraduate student input session and an additional in-person student survey that was conducted to further inform their discussions.

Figure 2: Agenda



Group's Discussions

The Preparing Students for the World group discussed how students engage in higher education. These discussions focused on what group members had found meaningful as students; what guiding principles they believe an education should have; what they think about the future including barriers that will be encountered; the differences between fads, trends, and deep forces; and VT's strengths. The group then used these findings to develop three scenarios, each focusing on one area: Experiential/participatory learning, T-shaped learning, and *Ut Prosim*.

A Meaningful Education

By sharing each other's meaningful student experiences, committee members were able to get to know one another better and identify aspects of an education that make an impression on people. This discussion help set the stage to identify further the principles that would guide how students should be prepared for the future. Below are the guiding principles as agreed upon by the committee.

Guiding Principles

- Person centered
- Engage the whole person
- Reflexivity
- Accessibility
- Inclusivity
- Flexibility

Members discussed that learning should be centered on the person. The focus should be on the student's learning and establishing a desire for them to learn for the sake of knowledge and not a grade. To keep education centered on the individual, the whole person must be engaged. Therefore, it becomes important to educate the whole student and to use approaches such as T-shaped learning. The committee envisions learning that involves opportunities for student reflexivity about experiences in and out of the classroom. Members agreed that students' education must be inclusive of viewpoints, ideas, and voices and should provide access for all students. Furthermore, flexibility in how students learn is also important. Problems of the future are too large for individual disciplines to help students tackle. Rather, silos should be removed so that students are encouraged to explore and collaborate across disciplines.

Envisioning 2047

While thinking about the future, the committee discussed speculations vs. predictions vs. design and thought about these in relation to fads, trends, and deep forces. Committee members were focused more on the deep forces that would shape the world and higher education by extension. Prior to this meeting, they surveyed students on campus about what they thought would be similar or different from today in 2047. Findings from the survey were used to inform their discussion. Below are the deep forces that they identified.

Deep Forces

- Globalization
- Climate change
- Population growth
- Urbanization
- Information technology
- Economic inequality
- New educational models

Group members discussed that due to existing demographic information and forecasts for the next few decades, the population is expected to grow causing for communities to become denser. The "traditional college student" is also likely to change (e.g., older and with a completed career) requiring more flexible curriculums. The world will be more interconnected with an increased use of technology and the exchange of cultures. As the process of globalization continues into 2047 students will require global learning experiences that include diversity (e.g., study abroad). The group also discussed that current literature indicates that climate change is another deep force. Environment changes may impact students' college educational experiences (e.g. majors offered). Other forces that are likely to impact the world are economic inequality. As a result, there is speculation that higher education may become harder to access. Members discussed the need for Virginia Tech to have continuous accessibility. All of these forces will foster educational models that will include an increase in interdisciplinary majors and experiential learning.

Virginia Tech's Challenges

- Geography
- Scale
- Rewarding Faculty
- Diversity

In preparing future students there are a number of university challenges that the group identified. Virginia Tech's geographic location can make it difficult for students to access global and diverse opportunities. As a result, it is crucial for the university to continue working towards diversifying the learning environments on campus. The scale of the university also makes it difficult to ensure that students across campus have access to the same level of quality opportunities. Additionally, as new learning models develop, faculty will need to be rewarded and supported in the work that they do to offer students innovative educational experiences (e.g., interdisciplinary courses).

Draft Tools

Work in Progress

The group used the guiding principles, external deep forces, and the university's challenges to create three scenarios. Each scenario focused on one of the following areas: Experiential/Participatory Learning, T-Shaped Education, and Purpose-driven Learning (*Ut Prosim).* These scenarios have been designed to brainstorm on how Virginia Tech will prepare future students.

Members believe that educational models in the future will require for a growth in experiential learning beyond the classroom, allowing for more hands on experiences and exposure to diverse populations and settings. Students will experience T-shape learning and gain knowledge across disciplines and settings (e.g., communities) to better prepare them to solve complex world problems. They will need to contribute to areas outside their expertise. Courses and co-curricular activities will provide a seamless integration of learning experiences. Students will be able to make strong connections across their learning in and out of the classroom. Communities of faculty, staff, students, and community members will be created for students; the whole world will be a place for learning. In these communities students will use their interdisciplinary knowledge and further develop it along-side of faculty, staff, and community members. They will be forced to interact with people that are different than them. Students and faculty will be engaged in purposeful driven work that fuses learning, scholarship, and outreach. While technology will continue to develop in the next three decades, it will merely serve as a tool to educate students and not by replacing human interaction. The following are the three scenarios that have been developed to this date and are being discussed by the group.

Experiential/Participatory Learning

Students will live in a world that will be highly diverse and interconnected, requiring them to know more about other people and have diverse experiences beyond the classroom. To better prepare students for the world in which they will live, in 2047 Virginia Tech will require all students to complete at least (but are not limited to) one multi-semester long experiential/participatory learning activities. Activities that fall under experiential/participatory learning will include service learning, leadership training, research, internships, study abroad, vision trip, community involvement, educational trip, student organizations, and project-based courses. The options that students will have to fulfill the experiential/ participatory learning requirement are person-centered, reflexive, accessible, inclusive, flexible, and engage the whole person.

To ensure that the experiential/participatory activities are of high quality, there are several aspects that must occur. First, students will be prepared prior to initiating these experiences with course work and other knowledge (e.g., historical context if different location). Preparation prior to these learning activities will allow students to feel invested, be self-motivated, and take ownership during their experiences. Second, the experiences must yield lasting bonds with faculty, students, and those in which they engage. The experiences must be diverse in ideas or interactions. Third, the experiences must not end abruptly; this might mean that the experiential learning activity lasts

multiple semesters. The experience will be integrated into the remainder of the student's learning experiences through a cross disciplinary capstone university course, poster symposiums, seminars for students to reflect on these experiences, etc. It is important for students to reflect on new acquired knowledge and how to make sense of it in relation to rest of their life (academically, professionally, and personally).

To make these opportunities accessible to all students, the university can offer experiences that vary in time (e.g., one week, a month, etc.) and also address the additional cost by including it into the tuition price, have scholarships and grants available to students, find ways to pull from the large network of alumni, and the use of technology.

The T-Shaped University (Interdisciplinary)

The world that VT graduates of 2047 enter will present ever more broad-ranging, complex and difficult problems to solve. It is unlikely that one discipline, working in isolation will be able to resolve these problems. Even today it is hard to consider any of the significant problems facing society without considering all of their ramifications: economic, social, political, health, environmental, etc.

It is more likely that the solutions to these problems will come from teams of interdisciplinary researchers, each member with a different discipline-specific expertise, but each well trained in interdisciplinary team work.

Working with disparate specialties is not a passive activity; members of cross-disciplinary teams need to be able to actively *contribute* to areas outside their expertise. Learning how to do this does not come naturally and needs to begin while students are still in the University.

The T-Shaped Graduate of VT2047 is one who has a vertical expertise in their particular discipline as well as the interdisciplinary skills to horizontally reach out to other disciplines and contribute meaningfully to their work. This starts with the T-Shaped Student of 2015.

Separating the work or contributions of one person from another in an interdisciplinary team is extremely difficult and is in effect self-defeating. Project oriented work needs to focus on the project and not on the grade; individual grades are essentially shorthand and tell very little about the contributions of a specific team member.

As we move towards interdisciplinary teams the University needs to reconsider the role of faculty: their new role as interdisciplinary team managers; the place of individually evaluated research; the purpose of tenure.

When working on difficult problems, teams will often try solutions that are "out there" and are eventually proven to not work. We need these teams to risk "failure." If we want these teams to continue to push boundaries, they can't be afraid of getting a bad grade. Grading Interdisciplinary work should be evaluated on a pass/fail basis, focused primarily on how well the team worked together.

Students across the University should graduate with discipline-specific portfolios, which focus on demonstrated skills and competencies of their chosen field.

Besides broadening a student's education, a T-Shaped Student also has an individualized education – no two students will have the exact same portfolio.

Purpose-driven Learning at Virginia Tech in 2047: Ut Prosim Imbued Education

In 2047, students will come to Virginia Tech because they thirst for learning to become experts in biology, management, agriculture, psychology, or theatre, but also because they are called to serve humankind and our planet, and are not willing to wait for a degree or diploma before they can start contributing and making a difference.

These students might be 17 or 18, straight out of a high school education, if these still exist, but they might be much younger, with strong foundational knowledge (possibly even as a VT K-8 student) and ready to apply that learning. They might be 67, having completed a successful career in one field and are now eager to both lend their expertise and build their own capacity with new learning as a part of a scholarly and engaged community.

Students will still come to Blacksburg to experience life in residence at one of the most beautiful college campuses in the world, but they know that their learning will not be bounded by geography. Blacksburg (and for some, a satellite or virtual alternative) will be home base, a place for meaningful face-to-face interactions with fellow human beings committed to learning and a shared cause. But students, faculty and staff, working together in close-knit teams, will travel the world to learn and to serve. The whole world will be the extended campus.

Virginia Tech will honor its rich history as a land grant university and military school. Most importantly, Virginia Tech will honor its motto, *Ut Prosim*, as the bedrock of the institution and the feature that distinguishes a Virginia Tech education from any other. Students and faculty who come to Virginia Tech know that they will be engaged in **purpose driven work**, in which the tripartite mission of learning, scholarship and outreach fuse through **collaborative experiential learning**.

In 2015 and undoubtedly 2047, the manifestations of *Ut Prosim* need to be different to serve a society, where much is constantly in flux. Service demands a strong capacity in **problem solving** as well as **engaging socially in communities**. No longer will a scientist working alone is his or her laboratory be able to make major contributions to solving world issues nor will Peace Corps volunteers be certain of having a positive impact without deep disciplinary skills and a broader understanding of the complex world in which they are working.

The primary learning goal will be to develop **T-shaped (and π-shaped)** students with the distinguishing feature that at Virginia Tech, there is intentional development of learners in how they **connect with each other in community**. Students will have the option to engage with deep learning in one discipline or a more interdisciplinary major or both. Students, faculty and staff will come to Virginia Tech and affiliate with others around an issue of mutual concern, and students

will apply what they are learning in service of this issue. These affinities will form the basis of communities that engage in collaborative experiential learning in a model that is **emergent**, both **flexible and adaptive**. Self-reinforcing communities will consist of ~150 members, diverse in all conceivable ways, which operate functionally in working groups of 15 people (10 groups per community). There may be multiple communities centered around the same issue as well as cross-fertilizations across different communities. A community will be constructed with all of the necessary capacities: intellectual, financial, human, social, and cultural. Communities will **disrupt the hierarchy** by engaging people **across all levels of education** - K12, undergraduate, graduate, faculty and people outside of Virginia Tech. Mentorship will be built in at all levels.

Some organizational elements that exist today will continue to serve in this new model of learning. Departments or some kind of disciplinary unit organized around deep knowledge will still serve as a place for people to come together to gain and share expertise, resources, and culture. Institutes may serve as entities that provide support and resources to communities working on particular issues.

However, other aspects of university organization and culture will need to change. The rigid college structure does not serve the dynamic, interdisciplinary, and inclusive nature of the community model. Moreover, expectations, rewards, and support for faculty would need to change with engaged scholarship rewarded. The current curricular, credit bearing structure is not a good fit for this work, and is a barrier to facile collaborations between Academic and Student Affairs. These collaborations would need to be seamless to support the work of these communities. Relationships with the broader community outside of Virginia Tech, local and global, would need to be strengthened.

Future Conversations

The two goals of the Beyond Boundaries initiative are advancing Virginia Tech as a global land-grant institution; and strategically addressing the challenges and opportunities presented by the changing landscape of higher education. In consideration of the initiative's two goals, future conversations in relation to these scenarios will need to consider the following points:

- What are the barriers to establishing experiential, T-shaped, and purpose driven learning at Virginia Tech?
- What does this mean for time to degree?
- Will a college education continue to be viewed as a 4-year degree?
- Does the relationship between faculty and students change? If so, how?
- How do these student education experiences directly help Virginia Tech advance as a global land-grant institution?

Working Group: Envisioning the Campus of the Future

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Summary of Activities to Date

Beginning with the September 24 Beyond Boundaries kick-off event, the Campus of the Future working group met five times, with the most recent meeting on December 3, 2015. In addition to the SFRD office's prepared reports on topics related to the campus of the future, the group also solicited information regarding the creation, history, and structure of research institutes at Virginia Tech, which was provided by Beth Tranter, associate vice president for research planning in the Office of the Vice President for Research. This information helped the group to think about alternative organizational structures that could have greater flexibility and transdisciplinary reach than the current college-oriented system.

Topics discussed during meetings over the course of the semester included:

- Factors influencing the campus of the future,
- How to facilitate the creation of T-shaped individuals,
- Creating flexible and adaptive spaces,
- Encouraging an applied learning environment,
- Real-world, multi-disciplinary, experiential learning,
- Developing collaborative and contemplative spaces,
- Virginia Tech's future relationships with the state and world, and
- Interactions and relationships between curriculum and spaces.

Work completed collaboratively between meetings facilitated continued engagement, brainstorming and idea creation. Members contributed to collaborative documents regarding assumptions underlying our conversations and proposals and inventories of university principles, design characteristics of spaces, and different types of infrastructure in use today on campus or that might be used in the future.

The group is still in the formative stage of creating a comprehensive vision statement and will continue meeting into the spring to reach a full draft of this statement as well as additional visioning work. A work in progress document coming out of the Working Group's discussions is articulated below. This document is divided into guiding thoughts on how the group imagines the future and what will be needed to support it, overarching university principles, design characteristics, and exemplars.

Draft Tools

Guiding our vision includes observational and aspirational perspectives on the future:

1) WHEREAS, some aspects of the university community and environment will stay quite the same while others will change dramatically. A variety of forms of physical infrastructure will accommodate these aspects of campus life in some cases and, in other cases, drive them.
    a. Human to human interaction occurs along a spectrum of interactions including "productive collisions." The system will be designed to produce more productive collisions than unproductive. Interactions also occur between person and natural, physical, and virtual environments.
    b. The campus of the future is one that remains flexible in its approach to curriculum, infrastructure, and technology to promote individuality while encouraging community through multi-disciplinary, multi-generational, and multi-cultural engagement.
2) WHEREAS, to achieve this possible future, the university will need to be comprised of complex heterogeneous networks and innovation districts facilitated by technology. The university of the future will contain learning spaces, faculty offices, libraries, labs, residences, dining halls, recreation and wellness opportunities, connection to field experiences, and commons areas, among others.
3) The university must undertake iterative reflections on behaviors and how well its environment accommodates and adapts. Design by its nature is iterative. Looking at itself. Build an ecosystem. Some things dies and some things thrive. Value and acceptance of new ideas doesn't come immediately. Comes later.

University Principles

1) A land-grant legacy combined with 21st century opportunities. The university can translate research into finding the solutions to global problems
2) *Ut Prosim*—A prevailing sense of service
3) Hands-on, minds-on
4) Innovation
5) Binary star concept—tightly-coupled system of non-collocated campuses. Reflects our challenges of today. Right now, we are two major locations with Blacksburg and NCR, but we will find more binary stars and use those centers of mass to connect to others.
6) Maintaining both a global and a local presence and focus
7) Urban/rural footprints – Having a presence in both types of settings gives Virginia Tech a distinct advantage while also presenting challenges. Two settings which differ in many ways that create both challenges and opportunities to treat as a living laboratories
8) Building the T-shaped individual
9) Diversity and Inclusivity
10) Equity of access

Design Characteristics include spaces and places that allow:

1) Flexibility (change within fixed situations)
   a. Continuum – spaces that foster collaboration (in person and technology) as well as spaces that allow quiet, focus, and privacy
2) Adaptability (change over time, new situations)
   a. Autonomous systems and smart rooms that adapt to user (the Nest)
3) Creativity
4) Connectivity - Physical (inter- and intra-site/campus) and Virtual
5) People with a common set of interests together in a community; fusing intellectual life with co-curricular life that could encompass a whole community and not only students
6) Improved virtual presence for distributed campus/global environment

Exemplars

a. *Spaces and places on current campus that are meeting our emerging vision, principles and design characteristics*

   Living-learning communities—Co-curricular spaces allow students to interact with others who have shared interests in a concentrated form outside of the classroom.

   Flipped classroom—For example, this semester's "Introduction to Accounting" course offers students the flexibility to attend the class in person or to watch recorded lectures. Students have the flexibility to go back and forth between the two versions based on their current needs, and even the lecture format itself has shifted to not strictly be a one-to-many information flow.

   Commons space - Pamplin commons

   Alongside the need for collaborative spaces, we need to maintain contemplative spaces for individual reflection and discovery.

b. *Spaces and places that have been proposed by other universities and organizations to meet nationally emerging vision of campuses of the future*

   Discovery-focused international sites, such as Dr. Mueller's lab in China, that are linked to main campuses by technology

   T-shaped individuals created through customized learning and research opportunities.

c. *Envisioning spaces and places of the future enabled by new technologies ("Star Trek"-like visions)*

   Augmented-reality environments such as ICAT's "Mirror Worlds" —a movement towards Star Trek-inspired holodecks as virtual labs

   Exquisite remote telepresence to enable "live" collaboration among remote sites

   "Simulation district" – Would allow students and researchers to experiment and learn to fail safely in controlled environments, both physical and virtual.

   d. *Movement; recreation and wellness*

Working Group: Discovering New Funding Models

CO-CHAIRS

Thomas Dingus
Director / Newport News Shipbuilding Professor - VTTl

Lara Khansa
Associate Professor / Business Information Technology

Summary of Activities to Date

Under the leadership of co-chairs Tom Dingus and Lara Khansa, the Funding Models Working Group met four times during the fall semester. One meeting featured a presentation on funding and financial trends; another featured giving and endowment. At each meeting, members had opportunities to ask questions, share ideas, and participate in discussions about future funding models for Virginia Tech.

Current funding

Committee member Tim Hodge shared a presentation about the funding, trends, and future of finance at Virginia Tech. The university division educational and general program (i.e. the core instructional mission of the university) totals $638.7 million and is supported by funds from in-state (34%) and out-of-state (36%) tuition, the general fund appropriation (24%), and other income and sales and services (4% and 2%, respectively). Auxiliary programs total $308.8 million and generate revenue from the sale of services and fees, for example room (16.1%), board (16.6%), comprehensive fees (17.5%), and self-generated (49.8%). Sponsored research programs total $288.5 million with 78% funded by the Federal Government, 9% by commercial sources, 5% by the state, 4% by the VT Foundation, and 4% by others.

Over time, in constant dollars, the general fund appropriation per resident FTE student has diminished from $9,501 in 2000 to $4,331 in 2015. To maintain even a diminished amount of funding per student, tuition has increased to replace state funding. The university is undertaking initiatives to adapt its current funding modes for the future by: a) increasing financial aid, b) managing enrollment growth, c) using incentives for growth of research and instruction, d) pursuing cost containment, e) supporting creative ideas, f) ensuring VT has authority to operate efficiently, and f) pursuing private philanthropy.

Giving and endowment

Vice President for Advancement, Mr. Charlie Phlegar shared a presentation about giving, endowments, and the future of Virginia Tech. Presently, the Virginia Tech endowment stands at approximately $800M, which is near the bottom when ranked among our fundraising and academic peer groups. Similarly, the university is last in alumni giving participation, which stands at only 9%, when experts consider 18-25% typical. Therefore, the university will be pursuing a ten-year growth model for philanthropy that has the potential to triple annual fundraising from $80M to

$240M. Emphasizing research that addresses big problems attracts larger gifts from donors who desire to invest in "winners," i.e. those with a track record of world-class accomplishments. Additionally, a realistic 10-year target for the endowment is $2B, growing its value through investment returns and $750M in new giving to targeted projects like interdisciplinary research destination areas or faculty recruitment and retention.

The Discovering New Funding Models Working Group will meet two additional times to finalize their work, once in December and once in January.

Draft Tools

Funding ideas

Throughout the meetings, group members had the opportunity to share ideas concerning aspects of funding and cost models appropriate for Virginia Tech. While many were discussed, the group seemed to come together around a few ideas concerning funding:

- **Eight areas where universities maximize revenue**: state funding, in-state tuition, out-of-state tuition, fees and differential tuition, sponsored research and in-direct cost recovery, foundation or endowment income, cost containment, and private industry.
- **Providing free or low-cost tuition**. Completely free tuition may not be possible nor desirable. Tuition dollars could be replaced through company internships (i.e. companies pay tuition for student who then works for a number or years after graduation). Another way would be for the student to commit to a number of years of public service in return for tuition. Students could also work for the university, perhaps filling some staff roles as appropriate.
- **Establishing a Citizenship Model**. Members of the university community assume responsibility for its success. An ethos of service should pervade the culture at Virginia Tech. Beginning as freshmen, students should know that giving back to the university, whether through financial support, volunteer hours, or service to others, is an integral part of Ut Prosim. By developing this attitude of giving, the VT community are better prepared to help others in the future through mentoring, internships, and gifts that support the mission of the university.
- **Giving to the university**. We must capitalize on the high percentage of goodwill among graduates, translating goodwill into donations. Endowment funds must be strategically emphasized. The VT endowment, and future growth without new donations, is anemic at best. Endowment funds could be targeted for students, as one source for replacing tuition dollars.

Other ideas centered on funding strategies. Here are some categories and examples:

- **Learning-centered revenue strategies**. Provide opportunities for certification and continuing or professional education. Utilize hybrid education – residential and remote. Incentivize faculty to generate revenue.

- **Giving-emphasis revenue strategies**. Increase alumni giving – set expectations early, ask often. Allow transparency for donors, budget, and financial activity.
- **Operations strategies**. Streamline operations (administration, etc.) as appropriate. Leverage public/private partnerships. Provide services for local/regional economy.
- **Cultural strategies**. Choose our financial model: Walmart, Ikea, Neiman Marcus (volume/cost, customizable, high-end). Encourage entrepreneurship with incentives, start-up funds.

Costs

The working group has also begun a discussion on university costs (although this is preliminary and will continue at its next meeting):

- **Leverage investments to optimal advantage**. Capitalize on VT's presence in Northern Virginia. Develop a research challenge trust fund to resource and develop world-class emerging faculty. Prioritize program investments. Adopt variable tuition.
- **Identify efficiencies to improve resource utilization**. Perform a thorough cost/efficiency study. Reduce idle capacity during calendar year (e.g. winter, summer). Maintain a strong brand. Allow for flexibility. Improve operational efficiency.
- **Improve decision-making with appropriate processes**. Make ROI based decisions. Adopt due process mechanism to sunset programs, etc. Address change through an evolving process of evaluation.

Finally, the working group will be considering the following funding vision based on several identities key to Virginia Tech.

- **Funding Vision**: As Virginia Tech moves forward as a global land-grant university, it will develop and implement a dynamic financial model dedicated to academic excellence, while ensuring access and affordability. The university will prepare students for the world in which they will live and work through hands-on, minds-on learning, world-class research, and *Ut Prosim*.

- Key Identities:
  - Academic excellence
  - Accessibility
  - Affordability
  - Global land-grant
  - Hands-on, minds-on learning
  - Public mission/purpose
  - *Ut Prosim*
  - World-class research

Input

Launched in September 2015, the Idea Bank was created to engage the Virginia Tech community with the Beyond Boundaries Initiative. Located on the Beyond Boundaries website, participants were given the opportunity to respond to six prompts with the intent to gather ideas that would allow Virginia Tech to achieve its mission to become an internationally-recognized, global land-grant institution while dealing with the changing landscape of higher education:

- What barriers can Virginia Tech address to increase access?
- You have been tasked with designing a live/work/study environment that will be built in 2047. Describe this environment. What needs to be included? What will no longer be necessary?
- You are mentoring members of the class of 2047. What skills would you encourage these students to develop in preparation for the world in which they will live and work?
- How will the practice of Ut Prosim (That I May Serve) change between now and 2047?
- If you could make one hire on behalf of the university, who would it be and why?
- Did we miss anything? Please share your ideas for Virginia Tech in advance of its 175th anniversary in 2047.

Respondents were asked to self-identify when entering the "Participate" section of the Beyond Boundaries website as faculty, alumni, AP faculty, student, staff, or other. Participants were allowed to respond to all or any of the prompts, and could return to questions repeatedly if necessary. As of November 30, 2015, 258 responses to the six prompts had been captured. Of these, 48 percent of the respondents were faculty, 23 percent students, 11 percent AP faculty, 8 percent alumni, 5 percent staff and 3 percent other. The most frequently answered prompts were "You are mentoring members of the class of 2047. What skills would you encourage these students to develop in preparation for the world in which they will live and work?" with 60 responses and "What barriers can Virginia Tech address to increase access?" which was answered 57 times.

For the purpose of data collection, each individual response to a single question is counted as a data point. Information was not tracked on how many questions each respondent answered, nor does the data reflect whether the same question was answered multiple times by a single participant. Appendix A contains a sample of the responses; some have been shortened to meet space requirements.

Sessions and Briefings

Undergraduate Students

On October 8th Beyond Boundaries held an undergraduate student input session at Owens Hall. The purpose of this session was for undergraduate students to brainstorm possible ways that Virginia Tech can become an internationally recognized, global land-grant institution while addressing the realities of the changing landscape of higher education as we move towards 2047. Our office worked in collaboration with administrators from the Division of Student Affairs to ensure that a diverse group of students attended. There were several personalized invitations sent to student leaders and the event was also advertised on GobblerConnect. Approximately 130 undergraduate students attended the session.

During the event students sat at roundtables of eight. Each table was assigned a facilitator. Students held discussions in relation to the following four questions:

- What will be the purpose of higher education in 30 years?
- How will your children's education be funded?
- What does the university look like in 2047?
- What is Virginia Tech's role in the world in 2047?

Notes were recorded at each table. The data collected addressed the future of higher education and Virginia Tech from four different angles: Purpose, Funding, Campuses, and Curriculum.

Purpose

Students discussed that the purpose of higher education 30 years from now would be in relation to career, experience, and skills. Participants believed that in the future a bachelor's degree would be needed for almost all jobs and that a college education should prepare students with skills (e.g., interpersonal skills) to be successful in their jobs. Students expressed that in the future there will need to be more career services, networking opportunities, and internships at Virginia Tech. Some also suggested that students would be required to develop extracurricular resumes.

Participants discussed higher education as a way for students to experience new subject areas and different ways of learning. In addition to providing courses, Virginia Tech will need to offer more international opportunities (e.g., study abroad) that better align with the current curriculum and do not increase time to graduation. Students in the future will likely have jobs in different countries and will need to have experiences abroad to be prepared for these career choices. Students expressed that Virginia Tech will need to move from providing students with knowledge to providing them with experiences (e.g., co-ops, internships).

Higher education will have a role in ensuring that students develop the necessary life or practical skills needed for them to be good citizens. Students will learn how "things are done" and need to be provided resources and leadership to improve and challenge processes. Other necessary skills for students to have in the future include: cultural competency, open-mindedness, and

collaborativeness. Students believe that for this purpose to be fulfilled, Virginia Tech will need to transition to evaluating students using fluid requirements and taking acquired skills into account.

In addition to the ideas above, some students questioned if there were other higher education models that did not have a four-year cap on the college experience. Furthermore, some students proposed that Virginia Tech implement a university international exchange program to help it position itself for 2047.

Funding

Participants believe that students would continue to fund their college education using the traditional model (parents, student loan, grants, and scholarships). Families will continue to rely on the government to subsidize education and on institutions to increase their endowments to keep costs low. However, others also proposed the need for Virginia Tech to develop partnerships with private organizations. Private companies in the U.S. and abroad can sponsor scholarships and provide work opportunities for students that would help them keep their debt low while in college.

Additionally, participants discussed issues of state higher education funding decreasing and the need to increase access to college. Others discussed that there needs to be more transparency in terms of what tuition includes and where funding goes. The idea of creating a Virginia Tech/ alumni funded loan program was proposed. This new loan program would help make Virginia Tech more accessible.

New funding models to help Virginia Tech increase revenue and keep tuition affordable were also proposed. First, the university could attempt to counter where it loses money with new ideas. For example it could use "energy walkways" that generate power using sidewalks that students walk on. Second, Virginia Tech could expand “what we are” and develop a nursing school. Third, the university could produce consumable goods. Engineering students build, business students manage, agriculture students grow, etc. In this manner, each college could do something to diversify the university’s revenue streams.

Campuses

When discussing what the Virginia Tech campus will look like in 2047, participants described three different aspects of the campus: physical campus, global campus, and people campus. The physical campus will include more technology in the classrooms (e.g., smart boards vs. chalkboards) and there will be a stronger virtual presence. Students expressed the need to develop more living and learning communities and more spaces for collaboration to happen between students (e.g., new student center). Participants also believed that because more students are expected to attend Virginia Tech in 2047, the campus will become larger. Transportation, including buses, bike lanes and walking paths, will need to change to meet both the greater population and the larger footprint of the campus. Students proposed for a commuter train that runs on campus and to other Virginia Tech campuses (e.g., Richmond and northern Virginia) to be built.

In addition to growing the Blacksburg campus, Virginia Tech will need to look into building relationships with other universities or build its own campuses abroad. Students loved the idea of having a second, third, and fourth campus. Others believed that to be more global, the university needs to create partnerships with other countries. By making Virginia Tech more global, students will be able to learn at international campuses, travel more, and gain a world perspective.

The campus of the future will also look different because of human interactions. Students expressed that the campus will be more diverse and that the university needs to be a catalyst for creating inclusion. It needs to be a model of diversity. Participants also expressed that there needs to be more emphasis and support services for mental well-being. Additionally, as the campus continues to grow the university will need to make sure that more passionate faculty and instructors are hired and that they are more engaged with students (e.g., better mentoring).

What Virginia Tech will look like is a large question. For some this question became more about what the role of the institution will be in 2047. Many students believed that as Virginia Tech becomes a top research institution it must look to engage in problems affecting the world. It should have a role in addressing food shortages, oils spills, cancer, etc.

Curriculum

Another area that participants believe will change at Virginia Tech in 2047 is the curriculum. There will be an increase of flipped classes and seminar style courses. More learning will occur beyond the classroom. Students will gain a more holistic education by being encouraged to take learning out of the classroom and become more involved.

Participants also discussed that classes will be provided online or in-person and there will be an increase of hybrid classes. Others thought it would be best to minimize online courses or eliminate them all together. Additionally, courses offered will need to cover topics of diversity and inclusion and be more interconnected.

Many students mentioned that the problems of the world are becoming more complex and that students of the future will need to be prepared to address these issues. The curriculum will need to become more interdisciplinary. Some students proposed for Virginia Tech to move away from the traditional discipline-specific majors and instead offer global problem solving majors. This would allow for majors to be focused on equipping students with the necessary skills and knowledge to solve problems at a global scale. Students would be able to select a problem that they are passionate about and learn ways to address it.

In conclusion, the discussion yielded conversations on how higher education and Virginia Tech will change and need to adapt in terms on purpose, funding, campuses, and curriculum. Information collected from the undergraduate student session will be used to inform Virginia Tech's vision for 2047.

Graduate Students

On October 19, 2015, the staff of Beyond Boundaries, along project co-chair Dr. Rosemary Blieszner, held a Graduate Student Input Session in conjunction with Dean Karen DePauw's Preparing Future Professoriate class. The purpose of the input session was to engage graduate students in the Beyond Boundaries conversation, seeking ideas on propelling Virginia Tech in its mission to become an internationally recognized, global land-grant institution while addressing the changing landscape of higher education in the next 30 years. Approximately 70 graduate students met in small groups of 4-5 with a facilitator for 60 minutes. During this time, students were asked to address at least one of the questions below:

- What will be the purpose of higher education in 30 years?
- How will your children's education be funded?
- What does the university look like in 2047?
- What is Virginia Tech's role in the world in 2047?

Data was collected in the form of notes received from each small group and from facilitators. It was then classified into the following categories: Purpose, Funding, Campuses, and Curriculum. Below are common themes, as well as moonshot ideas, that were expressed by the participating graduate students.

Purpose

Graduate students were asked to consider the purpose of higher education in general, and at Virginia Tech specifically, as we move into the future. Common responses across the groups emphasized the importance of retaining the "college experience" while still focusing on the preparation that students need for the job market. One group claimed that "university makes you a better person" and as a result, it is critical that Virginia Tech expands its outreach and inclusion missions.

"Expansion of the world view" was another popular topic that was discussed both in regards to the purpose of education and in the campus of the future question. Graduate students felt that the university of the future would include greater opportunities and even requirements for study abroad programs. Participants believe that this could also include opportunities for students to conduct research around the world with distinguished scholars.

Other ideas regarding the purpose of higher education included:

- Expanding relationships with industry in order to ensure employment after graduation.
- Creating platforms where students could spend time working with individuals in their fields as part of their college experience.
- Ensuring skills are taught in the classroom, such as critical thinking, decision making, and technology basics.

Funding

Graduate students talked a lot about the implications of financing college in 2047. They discussed traditional funding models and partnerships with private organizations. Many participants expressed their concern in the movement of public education from a public to private good and discussed the need for the government to continue to subsidize higher education. This, they suggested could be done through continued government loans and grants, and creating new models of funding that would allow for a free college education. It was suggested that these ideas could be funded by increasing taxes, such as in Northern Europe or by "considering a higher tax rate for wealthy persons to subsidize education." One group talked extensively about the student loan problem. They suggested that the federal government instead of subsidizing students in the future should pay institutions of higher education directly. This course of action would deal with the fact that "students cannot reliably repay their student loans."

Participants also believed that the role of public/private partnerships would grow in the future as a way of creating new revenue streams for higher education. Groups suggested the idea of company funded scholarships, as well as tailoring curriculum to meet the needs of top employers. One group suggested the idea of creating corporate specific degrees, such as a Google degree, where companies specified skills that needed to be taught and paid for students' education in return for a work commitment after graduation.

In addition to looking at traditional government funding and corporate partnerships, graduate student groups also suggested the following ideas in regards to the future of higher education in terms of cost and funding:

- Lottery funded scholarships for students (similar to the Georgia Hope Scholarship program).
- Decreases in the number of colleges in existence (the Sweet Briar effect). Only elite universities will remain.
- Expanding Virginia Tech merchandising as a way to generate revenue for student scholarships.
- Funding research and start-ups; research portfolios will become a part of student funding for graduate school.
- People will be able to buy stock in Virginia Tech. It will be publicly traded.
- Open access will alleviate the need for students to pay for textbooks.

Campuses

The campus of the future at Virginia Tech will be expanded both throughout the Commonwealth and the world through the increased use of technology. The use of technology in the classroom, and instead of the classroom, were common themes among participating groups. Suggestions for the future included increasing the use of hybrid classes, e-learning, and virtual reality to expand the offerings of the university. In addition, many students suggested that the campus would grow the number of locations it had, creating smaller satellite campuses across the U.S. and the world. Participants believed that the Blacksburg campus would have more flexible and multipurpose spaces and that there would be less division between living and working environments. The

residential experience will expand to include not only undergraduate students, but also address the changing demographics in higher education.

A more globalized version of Virginia Tech is seen as the norm in 2047. Groups suggested this creates students who are more culturally aware, bilingual and "glocal (global plus local)." Partnerships will be created with universities worldwide, making study abroad and research opportunities more accessible to all students. Hokies will have a presence in every nation creating a more diverse student population.

Additional ideas for how the campus of the future will look at Virginia Tech in Blacksburg and around the world include:

- International development and engagement to expand the impact of research.
- Creative admission processes that allow for Virginia Tech to recruit interesting students from around the globe.
- Art everywhere!
- Getting rid of siloed space and mixing departmental space to encourage collaboration across disciplines.

Curriculum

Three common themes arose in the discussion of curriculum. The first dealt with the idea that in the future, curriculum will become more interdisciplinary. While many groups believe that majors will still exist, they stressed the importance of eliminating the "compartmentalization of knowledge" through multidisciplinary majors, the elimination of departments, collaborative work, and team science. Participants believe that this increased collaboration across the university will augment innovation and allow Virginia Tech to solve world problems.

In the classroom, curriculum will change in order to better prepare students for the increasing complex world. This includes the creation of "societal driven courses" that make "better use of history" as a way to improve future work. In addition, professors will challenge and evaluate students not based only on basic skills, but also on their ability to demonstrate leadership skills, work as a team, creatively problem solve, and harness new technological advancements.

Faculty is a key component to creating a world-class Virginia Tech. In the future, faculty will be incentivized not only based on their research, but also for their teaching skills. The lines between faculty and students will no longer exist as they research, live and learn together. Faculty will have the opportunity to share positions, allowing them to participate in research and teaching at an attainable level.

In addition to discussing interdisciplinary studies, classroom skills, and the role of faculty, the graduate student groups made the following comments about the future of Virginia Tech:

- Guidance counselors for students and peer mentorship as a way to provide students a solid path to becoming global citizens.

- Mix and Match degrees allow students to focus on problem based learning.
- Classes will be offered in smaller blocks than on a semester scale. Students can choose units of classes based on their desire for certain "pieces" of knowledge. This also allows for non-traditional students to update their skills as needed.
- "Collecting dots, connecting dots" allows students to create majors based on what they are interested in.

Faculty Senate

Funding Models

Discussion Leaders: Lara Khansa and Pamela Teaster

1. There is a crucial need for responsibility-centered management, accountability, efficiency, and complete transparency (need to know exactly how much each college/department is being subsidized and on what economic basis).
    a. Conduct a cost and efficiency study- It is conceivable that Virginia Tech could become a much more efficient institution
2. There are turf wars between the departments and college development, and between college development and university development concerning potential donors. Donor lists appear to be protected like trade secrets and contact with any alumnus is forbidden.
3. There needs to be a cultural change with university development, as its present policies hamstring individuals, departments, and colleges in their attempts to secure funding from potential donors.
    a. Some participants would like to be given access to a report on endowment dollars raised, including where the dollars were allocated.
    b. Before the problem of university development is resolved, many felt that making changes be superficial and short-lived.
4. The high VT overhead for federal grants presents challenges in trying to secure funding.
    a. Apparently, institutes do not pay the same overhead as research centers. Why is that?
5. Small departments feel disadvantaged as far as donations relative to the overhead they are being charged
6. The escalating VT fringe dollars present challenges in trying to secure funding.
7. Researchers receive no incentive funding for securing competitive grants and contracts beyond realizing summer money. Incentive awards for securing such dollars would be helpful for investigators.
8. Research centers should reimburse faculty for conducting research.
9. A concentrated effort should be conducted going after donations from loyal Hokie alumni/ae.

10. Explore VT scholarships or partial scholarships for children of staff and faculty members. Perhaps merit-based?
11. What is the role of the institutes? There was a feeling that the institutes should fund students rather than staff members.
    a. Education should be recognized as a core value.
12. Explore synergy between VT and retirement homes and residents there (e.g., University of Kentucky model).

Preparing Students for the World

Discussion Leaders: Susan Clark and Matthew Wisnioski

Our conversation focused on three areas:

(1) Summary what we've done thus far

- We conveyed how our committee understood the goals of Beyond Boundaries
- How we're tackling the project by exploring past, present, and future
- What we've found/discussed within the group and via engagement with students
- Our next steps

(2) Mechanisms for sustained and meaningful involvement/conversation with faculty senate

- How could faculty beyond those on the committees engage in dialogue/feedback in a way that was not reactive and that was not simply in the form of surveys?
- Put differently, how could the Beyond Boundaries enhance collective faculty involvement in shaping the strategic direction of the university? How could the BB process itself be a model for achieving this goal?
- Emphasis on transparency (e.g. perhaps making public the minutes of our conversations)
- Some ways for achieving above could be digital and others could be direct personal interactions

(3) Discussion of specific themes/ideas on the future students

Significant insights/questions from the discussion included:

1. How can we think beyond our own biases?
2. How to effectively differentiate and enhance what learning experiences are better facilitated through personal/campus connections and which by other means?
3. How to cultivate environment for sustained attention on academic work?
4. How to treat students as adults?
5. How to make sure students are prepared before they arrive?
6. How to think beyond our common image of students as 18-21?

Advancing as a Global Land-Grant Institution

Discussion Leaders: Bill Hopkins and Anisa Zvonkovic

Overview from the committee members:

"Today's land-grant university must address economic, societal, and technological needs of this generation. Our graduates must have the capacity to solve complex problems of a regional, national, and global scale that have yet to be envisioned. Now and in the future, we will use research and service to address global issues such as health, sustainability, resilience and security, and advance knowledge through technical assistance. Global recognition is a testimonial to comprehensive excellence". From webpage.

President Sands has said he is looking for:

1. Attributes of a global land-grant
2. 2-3 possible scenarios of the future, including opportunities and constraints
3. How the university can be more flexible to overcome boundaries and constraints

We have talked a bit about attributes but would like your input and perspectives on them.

Creating global citizens, students will live in a diverse community, integrating missions of university, two-way street, bidirectional relationships with global partners

We have developed some scenarios involving:

1. Reduced state funding
2. Increasing regulatory environment at state and federal levels
3. Environmental conflict and pressure
4. Global partnerships
5. Complex world problems – for example, water, food, energy
6. Dynamic politics
7. Issues of security and resilience
8. How to create an adaptable and resilient workforce, students who have those attributes
9. Ethical dimensions

This is what the Faculty Senators mentioned. All in all, it was a nice discussion. The people who attended our small group, by and large, had international research and teaching interests and were very interested to hear what we were working on. We basically asked them what elements of scenarios seemed important and they also discussed experiences they had had that gave them insights about how Virginia Tech should work toward being a global land grant in 2047.

- The rapid rate of information technology change globally means that remote, isolated, rural locations will have connectivity. The reach of a global land grant could truly be worldwide.

- Ralph Hall talked about a group associated with LISA (the applied statistics lab) – it's called STATSPLUS and was presented at World Statistics Day on campus recently. It involved bringing in statisticians from several universities across the world, with a goal of setting up 20 LISAs by 2020. This program will build the intellectual infrastructure in selected countries for the scholars at those universities to approach problems and challenges (in accord with a land grant mission). It is an intensive training program for those statisticians, in how to actually consult with people, and it is also bidirectional (the global partners come here and share insights they have learned and improve what LISA here does as well). Not only did this seem like a good model, it also lays the seeds for partnerships at those selected locations.
- True partnerships need to be developed through existing collaborations (like LISA) and can also be developed to incorporate courses taught through Google Glass for example. The point was that the rapid rate of technology means we can skip stages like finding physical rooms and buildings to use.
- We talked about the dangers of buying physical locations for VT in other countries (political risks, geopolitical changes). We talked about the need to be flexible and nimble.
- In considering international work, we need to be sensitive to culture and capacity building. We mentioned a certain colonialism that could be at work in these ventures.
- Issues about the land-grant component concern how to deal with the state as a source of funding and how to generate buy-in at the state level for activities that are global.
- One senator had experience dealing with Richmond, as she put it, and mentioned that "politics as practiced in the state" had to be considered.
- Diplomacy will be required. How to sell global to Richmond? One answer is to consider the state as a training ground, to consider global as a business advantage, and to consider that training Virginians (such as our students and citizens) to succeed in a global world is important for Virginia's economy.
- Another land-grant perspective reminded us that the mission of a land-grant was translating research to Virginians across the state and giving access to the university to all Virginians. The notion was that this makes us distinct among other universities in the state.
- Concerns about tuition pricing students out of being able to participate were raised.
- How can Virginia Tech in the future deliver information to all state residents?
- Giving "access to the world" to our students was seen as consistent with the land grant mission.
- In this light, we talked about the Library. Someone from the Library was in our group. He mentioned the Library of the Future and the ways the library is working on open access to research, Open Research Resources. The Library seems like a key player in opening up Virginia Tech to the world and in helping to make connections within the university.
- A fundamental problem was raised about how to connect faculty who are already doing international work. It was mentioned that survey of faculty doing international work was started maybe 4 years ago but fizzled. However, a faculty senator talked about how a group of faculty who happen to be doing research in Malawi have gotten together (Team Malawi) in a very productive way. These are people doing separate research projects and the team is highly interdisciplinary. Can we figure out a way to construct similar groups so that the efforts are synergistic and Virginia Tech's footprints are more visible (rather than the individual faculty model)? People raised concerns about University interests dictating where they do research

and the artificiality of someone else constructing teams rather than organically finding colleagues.

- We discussed the challenges of how to have conversations around international work? How to know what each other does and where they work? How can that be part of our land-grant mission (though we didn't discuss it as such, these are challenges for research going on here too!).
- We thought that clustering groups, establishing intellectual clusters of faculty around key ideas was important. Perhaps the message of how these contribute to the land-grant mission could be more coherent with clusters that are exemplars.
- One possible solution was the Library. If data and research are deposited or reposited in the Library, the library could be part of the solution. Similarly, if a new platform for faculty activity reports will exist (way before 2047), having a way that international work could be easily queried could assist in establishing clusters and geographical areas.

Campus of the Future

Discussion Leaders: Tim Baird and Aki Ishida

The group was primarily comprised of faculty from computational and natural sciences, though there were a few outliers. To begin, participants seemed concerned with the current state of their buildings and were interested to learn what plans were in place for the future. We briefly summarized our discussions from the Campus of the Future working group. Specifically, we highlighted the fact that the working group has spent a significant amount of time discussing users' needs in the future and the various forms in which campus may be manifest (i.e., physical to virtual; local to non-local). With the Faculty Senate group, we then discussed what undergraduate curricula might look like, what learning spaces may be needed in the next 30 years, how/where students will spend their time while at Virginia Tech, and what applied experienced students may get in their field of study before they graduate.

The conversation moved between several topics. Some questioned whether we needed any more study abroad programs than we currently have. A question was raised about whether the current bilateral exchange programs are sufficient. We discussed whether it might be better to partner with other institutions overseas than to build our own permanent campuses or buildings outside of the US. A suggestion was made to study at what the university had planned thirty years ago to see what has remained constant and what has changed. The question of balancing professional training with education of a professional was raised. Arguments were made that we have a responsibility to teach students critical thinking skills, including liberal arts studies beyond their professional disciplines, and want to protect the time and space needed for that.

Generally, the group exhibited a range of perspectives on what education in the future might look like. Ultimately, this discussion precluded a more substantive discussion of that types of spaces might be needed to support education in the future.

Next Steps

The materials presented in this document are working drafts of the tools and deliverables. Final versions will be provided to the steering committee in January after they have been completed by the working groups. The groups may decide to continue meeting beyond that time as work from the individual thematic area groups becomes more integrated. For Beyond Boundaries, next steps include:

- Continued working group meetings through January
- December 7 and February 23 Steering Committee meetings
- Symposium in the National Capital Region in spring 2016
- April announcement of Beyond Boundaries outcomes, Destination Areas and trajectory for the future

Appendix A: Idea Bank Responses

The following is a sample of the more than 250 responses to prompts on the Beyond Boundaries website received by November 30, 2015. Respondents are identified only by their self-identified role in the university (alumni, staff, student, faculty, AP faculty, other).

Prompt: What barriers can Virginia Tech address to increase access?

Affordability

"Why not follow the lead of UIUC or Purdue? UIUC freezes tuition and housing to the rate it was when you accepted. That makes it a lot easier to plan. It is limited to the following 4 years. Purdue hasn't had a tuition increase in 3 years. UNC, Wake Forest and others provide a reduced tuition rate for summer school to increase summer attendance. It is actually cheaper for my son (OOS) to attend UNC summer school than full time during the fall or spring. We send him every summer--helps the local economy as well. My other son attended Virginia Tech during this past summer and the costs were extremely high." *Alumni*

"We must seriously address cost drivers in non-academic areas such as housing, dining, recreational sports, athletics and comprehensive fees. While the excellent amenities associated with student life are nice to have, some of them are unnecessary luxuries that students without financial means are having to borrow money to afford. Some might argue that we could charge some students more for the enhanced services they want and offer cheaper alternatives to students who don't want or can't afford those things. This might work for some activities but I fear it would further divide the student community by income, particularly in the area of housing. If we value access and value diversity of background in our student body, we should closely control non-essential costs that must be borne solely by students and their families." *AP Faculty*

"Possible increased use of differential tuition (i.e. Engineering Fee or similar) to help maintain lower tuition rates in other colleges." *Faculty*

"Provide tuition remission or discount to family members of staff and faculty." *Staff*

"Tuition is a massive huddle for many students, including out-of-state. Perhaps the University Bursar could identify those students who are taking out thousands of dollars in debt and find some payment plan or scholarship suggestions. Perhaps some alumni donations could start subsidizing tuition costs. Making scholarship opportunities more visible could help. Some understanding and empathy when students discuss financial trouble or hardship." *Student*

Access

"If we could perhaps lower the steep written requirements for foreign students, we could attract a more diverse student group. Also, with more students from abroad, we would be hedging against any downturns in the US economy. Perhaps we could have a certificate program for visiting

international students where the standards could be more relaxed and part of the draw of coming here would be to sharpen their English skills." *Faculty*

"The biggest barriers are invisible. Somehow, Virginia Tech needs to become more welcoming and appealing to non-athlete students of color and diverse background (diverse in a way that differs from the majority)." *Student*

"Virginia Tech should address lack of preparation. There are many talented students who are being left out of higher education due to the lack of preparation in the K-12 system. I think it's up to universities like Virginia Tech to take a leading role in addressing preparation prior to college." *Faculty*

"More friendly to adults returning to school throughout our region." *Faculty*

You have been tasked with designing a live/work/study environment that will be built in 2047. Describe this environment. What needs to be included? What will no longer be necessary?

"The campus of the future will almost certainly be a distributed heterogeneous structure that includes geographically clustered sites, sites distributed across the world, and sites in non-traditional settings. This is the reality of the work environment now in all areas (mine happens to be in science). With that challenge, what is the best way to organize and educate in such a setting? To me, the answer is something like managed flexibility - that is, an ability to monitor progress, new trends, and outcomes in such a way that there is a route for feedback and change on the same timescales that change is happening in different areas. In this sense, universities (to remain the central relevant focal points for workplace training) must act very much like market-makers or match-makers." *Faculty*

"We aren't going to have any type of live/work/study environment unless we can invest is sustainable technology instead of using coal to power the campus. So let's work on putting in solar panels on the roofs, wind turbines on the lights of Lane Stadium, and other forms of sustainable technology." *Student*

"Included: modular spaces; seamless, wireless power and data technologies; privacy and quiet; encouraged opportunities for health and wellness (ample access to exercise equipment, de-stressing venues such as spas, 24/7 counseling); open doors to the surrounding community to foster a regional identity of inclusion; small, discussion and mentor based classes; time, space, and permission to explore ideas as part of the higher education process. No longer necessary: A person standing on a stage reading PowerPoint slides." *Staff*

"Physical proximity with other people--sharing living space, sharing working space, sharing study space--to facilitate the unplanned and informal exchange of ideas. Close connections (both through tasks/functionally and physically) with a mix of people, especially an intergenerational mix; people at different states educationally (e.g. undergrad/grad/doctoral/faculty) and occupationally (e.g. student, faculty, researcher, staff) and inside/outside the institution. This place needs to be a place for interaction between different disciplines, that disciplinary walls are fine for defining content

knowledge, but not conducive for generating new ideas. Also live/work/study should have a downtime component: Play. A good mind has downtime." *Student*

Prompt: You are mentoring members of the class of 2047. What skills would you encourage these students to develop in preparation for the world in which they will live and work?

"The ability to grasp the larger scope of any given matter, i.e. the global perspective on any issue/topic - global courses relating to different cultures, politics, etc., should be required. Understanding the importance of teamwork and how every individual has a unique talent/skill set that can be utilized; integrating these talents into workable solutions - each major should offer team exercises relating to their disciplines. Attaining deep critical thinking skills, to include highly creative resolution capabilities - each major should offer a multi-dimensional creative challenge to be mastered uniquely (no right or wrong answers) before graduating." *Alumni*

"Compassion, understanding, patience, and grace...are a few that come to mind. I would also add contentiousness, empathy, emotional intelligence, tenacity, and commitment. A person can learn WHAT and HOW to do something. She can learn rules, laws, regulations, and understand compliance. What she cannot do, if she's not been taught, is collaborate well with others. We owe it to our students to prepare them how to lead, but also how to be led." *AP Faculty*

"Writing. Public speaking. Visual design. Coding." *Faculty*

"Students must learn to focus on new problems that cut across disciplines. For this they do not need the abundance of task-specific courses offered in some areas but rather a set of transferable skills in reading, collaborating, quantitative and qualitative analysis, and writing, along with habits of sustained concentration and stubborn persistence." *Faculty*

"Work/life balance- Currently, I would say that college poorly prepares students for what the 'real' world is like - especially as they enter into a point in their lives where they are thinking about finances, marriage, and children in the years after they graduate. Included in this would be time management, as college offers a lot of freedom, but the 9 to 5 working world is much more restrictive, especially as more responsibilities are taken on right after college." *Other (Federal Affiliate)*

"While a job is often the end goal for many students, the hope is that academia provides them with an impetus for lifelong learning and the ability to re-teach themselves as technology and the world moves forward." *Student*

"Students are put on a track far too early. Math, stats, economics, writing and communication skills will always be valuable and are applicable to a variety of fields. Most workers will have to navigate through a number of fields in their careers anyways." *Student*

Prompt: How will the practice of Ut Prosim (That I May Serve) change between now and 2047?

"Service at Virginia Tech will extend beyond the boundaries of Virginia and become a more national and global endeavor. Students will have the opportunity to do service projects abroad that coincide with their educational goals. Teaching English for a semester, working on a water project for a year in Uganda, figuring out food issues in Africa." *Student*

"I believe we will transition discussion of Ut Prosim to ideas about a life of service, highlighting lifetime achievements of alumni more than individual acts of service. I believe we will talk about how our careers can be a practice of Ut Prosim, rather than thinking Ut Prosim is something we do in our spare time." *Faculty*

"Students will be charged with solving real world problems and being able to design their course of study/degrees around these projects." *Faculty*

"Ut Prosim may be the most powerful thought in the entire institution known as Virginia Tech. It needs to become even more embedded than it is. I would propose a formal service component in every area of study, a service component that exposes students to the cultural, economic, ethnic, and sexual diversity and helps them develop the empathy to understand the suffering that is endemic to many individuals in this world. I would want our students to come out with the belief that their job in life is to relieve suffering wherever they find it, to acquire the skills, understandings, and personal strength of character to do so. I firmly believe that if our graduates come out with this understanding they will make significant contributions to the family of humankind and be much happier for it." *Faculty*

"Perhaps the application of Ut Prosim will change through further broadening it permeation of activities of Virginia Tech and its graduates. I think the idea of service through research will take on added emphasis. Another area which may be more of a hope than prediction is that the philosophy of Ut Prosim will begin to have more effect in government functions and in the political process. Servant leaders are badly needed and the Virginia Tech Cadet Corps and curriculum and activities at Virginia Tech could be made aware of this great need." *Alumni*

"It will become both more local and more global. We will need to be firm and strategic in determining WHAT and HOW we serve." *Faculty*

Prompt: If you could make one hire on behalf of the university, who would it be and why?

"A savvy, experienced, private sector-trained marketing director to advertise our program in all locations. It is frustrating to see that our wonderful schools and research centers in Northern VA remain unknown. Given how many resources are dedicated to maintaining and expanding Virginia Tech's presence in Northern VA, it seems that to have a dedicated (yet small) team of marketing/development professionals tasked with putting us on the map would be a smart and long overdue investment." *Faculty*

"Patrick Lencioni; he has developed an integrated model on the establishment of teams and how to get them to function cohesively and collaboratively." *AP Faculty*

"Christian Matheis. He teaches as if he came from the future." *Faculty*

"Individual research liaisons. What I mean by this is someone in the discipline who can work with students to develop research ideas in conjunction with their topic of study, but then could talk to other liaisons for matching people up with ideas, but do not have the means to find each other. These position would be specifically for integrating teaching with research across disciplines but would also help as a funding mechanism for student research." *Student*

"I'm going to take a different approach to answering this question. The university is a large, multi-layered bureaucracy and the silos that have formed over decades of uneven development across colleges, schools, and departments has resulted in "the left arm not always knowing what the right arm is doing". I envision a new system of organization that removes silos (to as much a degree as possible) and encourages (and rewards- through promotion and pay) cross-communication and multidisciplinary work. So, rather than add a new position or look to one person to help move us forward, I would like to see a new organizational structure." *Faculty*

"A loan officer with direct connections to the federal government that could assist all students questions about college financing." *Student*

"An Arts Czar. Someone who would oversee the way the arts are being integrated into every discipline. What are some common artistic experiences that the whole university would share each year (much like the common book)?" *Faculty*

"Dean of Adjunct Faculty. At Virginia Tech, as at many other institutions, adjunct faculty carry a significant portion of the teaching load. The tasks of the Dean of Adjunct Faculty might include the following: assessing the contribution that adjunct faculty can make to Virginia Tech beyond teaching (curriculum development, research, and so on), securing appropriate support from the university to enable and reward this contribution, and ensuring that Virginia Tech does not exploit adjunct faculty." *Faculty*

"If anything administrative roles need to be streamlined, not augmented. Every week there's a new hire for esoteric roles and students pick up the bill. It's a problem all across the country, but I don't

like to see it at a place so close to my heart. I'd rather see thousands of new Hokies thanks to affordable tuition over several dozen new Directors of Fluff." *Student*

"Steve Jobs. Visionary people with the ability to create new technology and bring ideas to fruition." *AP Faculty*

"A tenure-track professor of Mandarin. We have so many Chinese and Chinese-American students, and China is the second-largest economy in the world." *Faculty*

"I would hire a major intellectual leader from the humanities to serve in a central leadership position involving research and undergraduate education. Virginia Tech has embraced the STEM fields and more recently built its arts programs; it has a long history of success training military leaders, serving the Commonwealth in applied fields of knowledge, and filling its football stadium. Yet Virginia Tech has excellent departments and programs in the humanities and social sciences, and they give us an edge over schools like JMU, ODU, and George Mason. But the public and even our own students know little about these programs. If Virginia Tech wishes to compete with these in-state schools and advance its standing internationally, the University must decide either to promote its excellent programs in the humanities and social sciences or consider changing its comprehensive mission. Hiring a leader in this area would help." *Faculty*

"Jimmy Wales. He alone among the network infrastructure giants did not become a multi-billionaire. He could stimulate students to develop their ideas in order to bring benefit to people, without denying others a livelihood. He could help develop the new models of fair distribution of resources, to bring an end to the concept of entitled consumerism, how to create a new world society, and maybe how to get ideas out of the patent office and into the hands of those who want to live in that kind of world." *Staff*

Prompt: Did we miss anything? Please share your ideas for Virginia Tech in advance of its 175th anniversary in 2047.

"Freshman courses, those that are assigned to students coming in with little to no credit from high school, need to be changed. It is clear from discussion with advisors and faculty, with those involved in the discussion of higher education overall, and with the recent CLE discussions and changes, that studies at the undergraduate level should be interlinked and very interdisciplinary. Freshman year should be about a student discovering all of the ideas they never knew before, drawing links between those ideas, and selecting the ones they are most passionate about - rather than continuing on the same basic class schedule they have been subject to for the last 13 or so years." *Alumni*

"The campus of the future should have educational spaces, e.g. classrooms and instructional labs, research spaces, and faculty offices under one roof to the maximum extent possible. The current model of consigning students to an academic ghetto where faculty make brief appearances only to deliver a lecture is extremely counterproductive. Education should be an immersive experience where students rub elbows with faculty, postdocs, grad students, etc.; where students look into labs and observe the activities taking place therein while waiting for their next class. Many, if not most, of our current leaders in STEM got their start through a chance encounter of the type that we are eliminating through the current pattern of segregating research behind locked doors." *Faculty*

"I am surprised and somewhat disappointed that there is nothing specifically about the faculty. Does this mean that the vision of the university of the future does not include faculty? The faculty at Virginia Tech have been asked to do more with less and received no reward for doing so for such a long time now that there is very little in the way of enthusiasm for new initiatives and programs. The last eight years have been brutal on us financially and when you find out that your salary, with 25 years in academia, is equivalent to an assistant professor's salary in the same area at a big 10 school you start realizing that your future doesn't look very bright. All the lofty ideas about moving the university forward are going to require buy in and support from the faculty." *Faculty*

"Remember that Virginia Tech is above all a place for people to get an education. I see too often that there are campus projects that seem aimed to boost rankings and impress reviewers but not actually help the student body. Take Turner Place for example - there is a ridiculously low amount of seating for the customers it brings in. The new Engineering building has glass-walled meeting rooms that look really cool, but offer nothing functionally over an ordinary room with a projector. My concern is that when I return to Virginia Tech in 2047, it will be an elaborate Hogwarts of glass and Hokie Stone that few people will be able to afford. If spending is going up, it should be to hire top faculty members. Improve the education, not "the experience." *Student*

"Virginia, Maryland, North Carolina, and Washington DC should have a mutual tuition agreement where graduates who work in one of the states have their out-of-state tuition refunded down to in-state levels. If they work and pay taxes for a year, 1 semester of that cost is refunded through their tax returns for up to 10 years (5 years of school)." *Student*

"Increasing the technology on campus: solar pathway/roads, real-time bus tracking, touchscreen at major bus stops, smartboards in classrooms, improved Wi-Fi signal, Virginia Tech app of all events with locations and information that is easily searchable, better parking/ ways to find parking, more bike lanes, smoother pathways, a zip-line from the residential side to the academic side of campus (lol)" *Student*

"Complementary off-campus parking garage for students and employees who do not wish to pay for the convenience of on-campus parking. This should have a BT shuttle service to and from campus as well as a walking/biking route to campus for those who wish to take the more scenic route. This will be an opportunity to decrease traffic on campus as well as spaces needed for parking. Leaving more room for academic buildings and natural areas." *Student*

"As a highly biased music professor, what I would like to see is for this university to view the arts (performing arts in particular) as a magnet for campus community and a place to renew inspiration and creativity. For students in every major, the arts should be made available as a creative outlet, There is no reason every engineering major shouldn't be able to dance, take piano lessons, play chamber music, or sing in a choir. With the mental health crisis that is sweeping our country's universities, we can set ourselves apart from other tech-oriented schools by letting the STEM students hang on to their humanity (and sanity) after a long day of crunching calculus proofs at the math emporium. An investment should be made in ensuring that students are able to continue doing things that they love (creative expression) while pursuing their technical degrees." *Faculty*

"We need to make sure that Virginia Tech stays true to its values as a Land Grant system serving agriculture stakeholders around the Commonwealth, along with being a diversified liberal arts, engineering, etc. university as well." *Faculty*

Appendix B Fall 2015 Meeting Schedule

September 24	Beyond Boundaries Kick-off Event
October 5	Advancing as a Global Land-Grant Institution Working Group
October 5	University Council Meeting
October 6	Preparing Students for the World Working Group
October 7	Discovering New Funding Models Working Group
October 8	Undergraduate Student Input Session
October 8	Campus of the Future Working Group
October 19	Graduate Student Input Session
October 20	Preparing Students for the World Working Group
October 22	Campus of the Future Working Group
October 26	Advancing as a Global Land-Grant Institution Working Group
Oct. 13 & 27	Faculty Senate Meetings
October 28	Discovering New Funding Models Working Group
November 10	Preparing Students for the World Working Group
November 11	Discovering New Funding Models Working Group
November 11	Advancing as a Global Land-Grant Institution Working Group
November 11	Commission on Administrative and Professional Faculty Meeting
November 12	Campus of the Future Working Group
November 12	Commission on Outreach and International Affairs Meeting
November 30	Advancing as a Global Land-Grant Institution Working Group
December 1	Preparing Students for the World Working Group

December 2 NCR Student Input Sessions (Arlington and Falls Church)

December 3 Campus of the Future Working Group

December 7 Steering Committee

December 9 Discovering New Funding Models Working Group