Minutes
ACADEMIC, RESEARCH, AND STUDENT AFFAIRS COMMITTEE
Inn at Virginia Tech and Skelton Conference Center
Monday, March 26, 2018

Committee Members Present:
Debbie Petrine, chair, Tish Long, Brett Netto (graduate student representative), Hans Robinson (faculty representative), Wayne Robinson. Regrets: Chris Peterson

Board Members Present:
Greta Harris, Anna James, Seyi Olusina (undergraduate student representative), Robert Sebek (staff representative), Dennis Treacy, Horacio Valeiras.

Guests:
Tommy Amal, Beth Armstrong, Patty Becksted, Rosemary Blieszner, Tom Brown, Kris Bush, Bob Broyden, D'Elia Chandler, Cyril Clarke, David Clubb, Ali Cross, Brian Daniels, Karen DePauw, John Dooley, Juan Espinoza, Jack Finney, Chris Flynn, Mike Friedlander, Randal Fullhart, Rachel Gabriele, Alphonso Garrett, Alan Grant, Cathy Grimes, David Guerin, Kristina Hartman, Lee Hawthorne, Kay Heidbreder, Tim Hodge, Amy Hogan, Rachel Holloway, Megan Hughes, Cyndi Hutchinson, Rachel Iwicki, Robin Jones, Cathy Kropff, Sharon Kurek, Peggy Layne, Theresa Mayer, Erin McCann, Nancy Meacham, Scot Midkiff, Sally Morton, Kim O'Rourke, Mark Owczarski, Patty Perillo, Charlie Phlegar, Ellen Plummer, Menah Pratt-Clarke, April Myers, D.J. Preston, Scot Ransbottom, Karen Eley Sanders, Timothy Sands, Savita Sharma, Kayla Smith, Natasha Smith, Robert Sumichrast, Don Taylor, Judy Taylor, Jon Clark Teglas, Tracy Vosburgh, Lon Wagner, Paul Winistorfer, Chris Wise, Chris Yianilos.

OPEN SESSION

1. **Welcome and Acceptance of Agenda.** Debbie Petrine, chair of the committee, welcomed committee members and attendees to the Open Session. The agenda was accepted.

2. **Report of Closed Session Items.** D. Petrine reported on actions taken in the joint Closed Session of the Academic, Research, and Student Affairs Committee and the Finance and Resource Management Committee. The committee approved 15 appointments to Emeritus status, 14 appointments to Endowed Chairs, Professorships, or Fellowships, 75 faculty research leave requests, and one academic honor.

   The Faculty Personnel Changes Report for the quarter ending December 31, 2017 was unanimously ratified by the Academic, Research, and Student Affairs committee and the Finance, Audit, and Resource Management committee.

3. **Consent Agenda.** The committee unanimously approved or accepted the items listed on the Open Session Consent Agenda: the minutes of the committee's November 6, 2017 meeting, a report of reappointments to endowed chairs,

professorships, or fellowships, and one appointment to the Virginia Coal and Energy Research and Development Advisory Board.

The committee unanimously approved the items on the Consent Agenda.

4. **Provost's Update.** Cyril Clarke, interim executive vice president and provost, brought several items to the attention of the committee. The Beyond Boundaries initiative is a comprehensive evaluation of the future of the university that lays out core elements at the center of the institution's mission while underscoring the university's commitment to service. In addition to confirming the university's commitment to being a comprehensive institution, Beyond Boundaries positions the university to identify areas of excellence. These areas of excellence are expressed in the five Destination Areas and four Strategic Growth Areas. The implementation of these areas is supported by a new academic budgeting process that is adaptive and responsive to the university's aspirations. Resources for the Destination Areas to date include 54 dedicated faculty lines: 19 of the lines are filled and 35 searches are underway. Two-thirds of the current searches are cluster hires in which faculty from varied disciplines work collaboratively on the same Destination Area. Advancing diversity is an intentional element of these hires and the colleges and provost's office are financially supporting new hires with broad and diverse representation. The budgeting process, called the Partnership for an Incentive Based Budget (PIBB), is a comprehensive budget model designed to provide incentives for meeting established goals in departments and colleges.

   The university continues to make progress on the acquisition and integration into the university of the Virginia Tech Carilion School of Medicine (VTCSOM) scheduled for July 1, 2018. The Executive Committee of the Board of Visitors met and approved three resolutions necessary for submission to the university's accreditation agency, the Southern Association for Colleges and Schools Commission on Colleges (SACSCOC). The Faculty Senate, Commission on Faculty Affairs, and the University Council offered support of the integration. The VTCSOM Board of Directors met and approved the integration of the school into the university. Several agreements between the partners are in process and personnel are on track to be transferred from Carilion to the university in April.

   The university can celebrate the creation of a new program in the honors college supported by a generous gift from Virginia Tech alumnus David Calhoun, '79. The Calhoun Honors Discovery Program is a cross-college program that will use team-based learning dedicated to interdisciplinary problem solving. The initiative is an opportunity for the university to launch a substantive pilot program to test thematic areas of learning and scholarship.

   Overall, after several months as interim, the provost's observation is a positive one. As an entity within the university, academic affairs is running smoothly with good relationships between the administration, the Faculty Senate, and the Commission on Faculty Affairs. The academic deans are constructively engaged especially with foundational initiatives such as Destination Areas and the

associated hiring. There are exciting developments in Roanoke and in the National Capital Region including discussions on how the university can support initiatives that are important to the commonwealth's research and other goals.

5. **Research.** Theresa Mayer, vice president for research and innovation, led a discussion with the committee regarding Virginia Tech's role in advancing innovation-led growth and high-quality job creation across the commonwealth. A number of factors, including the formation of the Virginia Research Investment Fund (VRIF) and the release of the final report of the Commonwealth Research Asset Assessment Study, are changing statewide discussions and leading to exciting opportunities for higher education institutions in the commonwealth.

   Two Virginia Tech-led teams were awarded $2.92M by the VRIF by the VRIF in its first round.

   Released in January 2018, the TEConomy Partners LLC report, is an assessment of Virginia's research assets. The report, Strategic Directions to Advance Innovation-Led Growth and High-Quality Job Creation across the Commonwealth, was prepared for the State Council of Higher Education for Virginia (SCHEV) on behalf of the Virginia Research Investment Committee. The report evaluated Virginia's current capabilities in the commercialization of its academic research and development (R&D), assessed Virginia's future opportunities and capacities for commercializing the results of academic R&D, and developed recommendations on where and how the commonwealth should direct its resources to accomplish the Virginia Research Investment Committee's (VRIC) mandate.

   Among the report's findings, the study revealed that the commonwealth's innovation ecosystem is underperforming, and that Virginia declined in overall research funding from 2010 to 2015 while the nation grew. Virginia Tech is well positioned to support the efforts of the commonwealth and the recommendations outlined in the report. Strategies include growing public-private collaborations in advancing translational research; strengthen university technology transfer and commercialization; bridge the gap between university research and Virginia-based company innovation; shore up Virginia's regionally based innovation and generate more start-ups and advance high-growth companies.

6. **Student Affairs.** Patty Perillo, vice president for student affairs, led the committee in a discussion regarding trends shaping the current student culture and how student affairs is responding. Students born between 1995 and 2012 are sometimes referred to as the iGen or Generation Z (Twenge, 2017). Drawing from four large national studies, research has identified several trends that reflect changes in today's students and provide insight into how to best support student development and progress. The Division of Student Affairs continuously collects information and data from students and other sources to shape and inform decisions regarding supporting student development while they are at Virginia Tech. An integrated model of well-being guides the division's delivery of a vast

array of programs and services with the goal of providing continuity of care for every student.

7. Academic Affairs

A. Enrollment Management Update. J. Espinoza, assistant vice provost for enrollment management, reported to the committee on current efforts in admissions and other enrollment management areas. The enrollment management group is adjusting recruitment, admissions, and enrollment processes and programs to support and advance the university's priorities. These adjustments will continue to roll out over the next admissions cycle.

For the freshman class of 2021, the university received 27,266 applications, made offers of admission to 18,776 individuals, and 7,075 accepted admission. For the freshman class of 2022, the university received 32,121 applications, made early-decision offers to 1,341 individuals and made regular admission offers to 16,699 individuals. The growth in applications represents an 18.7% growth in total undergraduate applications received in 2017. The university continues to experience an annual increase in the percentage of in-state and out-of-state applicants, international applicants, and applicants who identify as American Indian/Alaska Native, African American, Hispanic, or two or more races.

B. College Update. Alan Grant, dean of the College of Agriculture and Life Sciences, provided the committee with an update on the college including Extension. The college continues to lead the university on meeting its land-grant teaching, research, and Extension missions for the commonwealth. The college uses evolving technology, scholarship, and research and has impact across the commonwealth through 108 local Extension offices, 11 Agricultural Research and Extension Centers (ARECs), two departmental research centers. Virginia Tech and Virginia State University (located in Petersburg, VA) serve as the two land grant institutions for the commonwealth. The college organizes its student, faculty, research, teaching, learning, and Extension activities and facilities through its mission to create healthy communities along several dimensions: environment, economy, food, and health.

8. Council of College Deans Update. Robert Sumichrast, dean of the Pamplin College of Business and representative to the committee from the Council of College Deans, shared with the committee that the university's promotion and tenure process has concluded successfully due to the tremendous amount of work on the part of all involved. The process was thorough and thoughtful. The college deans are in full support of the Destination Areas (DAs) including the current and future commitments to research and instruction by faculty members participating in the DAs. As Virginia Tech looks to the future, the deans welcome the opportunity to have the DAs and Strategic Growth Areas (SGAs) well represented in the university's strategic plan. Calibrating the speed with which DAs are implemented and the manner in which the university allocates resources to the DAs will be important for future planning.

College resources are challenged by needs associated with infrastructure and faculty start-ups. Resources are needed to address deferred maintenance (in lab space, for example). Sally Morton, dean of the college of science, convened an ad-hoc committee to look at department-level startup requests and found that the university was in line with national trends. The ad-hoc committee suggested the allocation of additional resources and developing mechanisms to share space and equipment.

9. **Agenda Items for June 2018 Committee Meeting.** D. Petrine asked for discussion of additional items for inclusion on the agenda for the June board meeting. Agenda development will be finalized by the end of April. In addition to standing items, and items requiring a committee or board vote, possible agenda items include: information from the Division of Student Affairs on ways in which the university is addressing diversity and inclusivity for students; a demonstration of the presentation delivered to prospective students; an update on technology transfer from the Research and Innovation Division; information on the retention of faculty from the office of the provost; and update on faculty hires associated with the Destination Areas.

10. **Adjourn**

ENDOWED PROFESSORSHIP
James S. Tucker Professorship

In concurrence with the recommendations of the honorifics committees of the Bradley Department of Electrical and Computer Engineering and the College of Engineering, Dean Julia Ross nominates Dr. Jason Lai to continue as the James S. Tucker Professor.

Dr. Lai earned the Ph.D. and M.S. in Electrical Engineering from the University of Tennessee, Knoxville, Tennessee in 1989 and 1985, respectively. He received the B.S. from the National Taiwan Normal University, Taipei, Taiwan in 1975. After receiving the Ph.D. in 1989, he worked at the Power Electronics Applications Center (1989-93) and Oak Ridge National Laboratory (1993-96). He joined the Bradley Department of Electrical and Computer Engineering in 1996 as a tenure-track associate professor. He received tenure and was promoted to the rank of full professor in 2004.

Dr. Lai has established an outstanding research program in power electronics for energy applications and has founded the highly successful Future Energy Electronics Center (FEEC). His research focuses on high-power converters for energy applications. He has established a strong reputation as a highly successful scholar who is able to couple his research with industrial applications and consider practical limitations such as cost and thermal issues. He has secured over $17M in external funding to support this research, with his personal share exceeding $13.7M. He has published 285 conference papers and has given numerous keynote addresses and other invited talks. His innovation is further demonstrated by the award of 27 U.S. and international patents and the IEEE Gerald Gliman Innovation Award in 2016.

Dr. Lai is a dedicated and effective educator and mentor. He teaches courses in power electronics and electronic circuit design. He is very active in teaching short courses on power inverters and other topics related to power electronics. He has advised 44 M.S. and 26 Ph.D. students to completion. Four of his former Ph.D. students are in faculty positions at other institutions. He is currently advising four M.S. and 10 Ph.D. students.

Dr. Lai actively involves undergraduate students in research and mentors student teams for design competitions. His team won the Third Place Finalist in the 2016 Google Little Box Challenge. It was the only U.S. and university team among 2,000 teams worldwide to win. Another student team won the Grand Prize Award in the International Future Energy Challenge (IFEC) in July 2011. Other student teams mentored by Dr. Lai won the Best Presentation Award in 2003 and the Best Performance Award in 2001 at the International Future Energy Challenge. An undergraduate student team mentored by Dr. Lai won the First Place Award of $10,000 from the TI Engibous Prize Analog Design Competition in 2009.

Dr. Lai has received numerous external and internal honors that recognize his success as a researcher and educator. He was named an IEEE Fellow in 2007 for “contributions to high performance high power inverters.” He has won 13 “best paper” or similar awards from leading conferences in his field. Within Virginia Tech, Professor Lai was presented with the Dean’s Award for Research Excellence in 2010.

Dr. Lai's service record is equally impressive. He has actively served on numerous leadership positions in professional societies. He served as the Program Chair, General Chair, and Steering Committee Chair for the IEEE Applied Power Electronics Conference (APEC) in 2004, 2005, and 2006, respectively. He founded the IEEE Asian Conference on Energy, Power, and Transportation Electrification (ACEPT) and has served as the General Chair annually since 2016. He was the founding chair in 2001 and the Steering Committee Chair in 2011 for IFEC, General Chair for the 2008 NSF Workshop on Advanced Power Conditioning for Alternate Energy Systems, General Chair for the 2000 IEEE Workshop on Computers in Power Electronics, and General Chair for the 1992 EPRI Power Electronics Devices and Components Workshop. He also served as chairs of the Standards Committee from 1995 to 2003 and Academic Affairs from 2011 to 2014 for the IEEE Power Electronics Society.

REAPPOINTMENT:

The president and interim executive vice president and provost have confirmed the reappointment of Dr. Jason Lai to the James S. Tucker Professorship for five years effective August 10, 2018 with a salary supplement provided by the endowment and, if available, with funds from the eminent scholars match program.

March 26, 2018

Student Affairs Presentation and Discussion, March 2018

Materials attached:

1. Powerpoint presentation (25 slides)
2. Article from March 9, 2018 The Atlantic (PDF)

Board of Visitors
March 26, 2018

Trends Shaping the Current Student Culture & How Student Affairs is Responding

Patricia A. Perillo, Vice President for Student Affairs
Chris Wise, Assistant Vice President for Student Affairs

STUDENT AFFAIRS
VIRGINIA TECH

UNDERSTANDING "iGen"

(sometimes referred to as Generation Z)

Born 1995 - 2012

Twenge, J.M. (2017). iGen: Why today's super-connected kids are growing up less rebellious, more tolerant, less happy - and completely unprepared for adulthood and what that means for the rest of us. New York, NY: Atria Books

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Data Collection

Drawing from 4 large, nationally representative surveys of 11 million Americans:

- **American Freshman Survey (1966)**
- **General Social Survey (1972)**
- **Monitoring the Future (1976)**
- **Youth Risk Behavior Surveillance System (1991)**

Trends Shaping Students (& Us)

- In no hurry
- Internet
- In person no more
- Insecure
- Irreligious
- Insulated but not intrinsic
- Income insecurity
- Indefinite
- Inclusive
- Independent

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Environmental Impacts on Student Well-Being

- Parents/family/friends
- Academic rigor
- Living situation
- Nutrition opportunities/eating habits
- Identity - individual and/or group
- Sickness/illness - long or short-term
- Exercise/movement
- Technology
- Money - financial situation
- Social choices - co-curricular activities
- Faith - religion/faith in the process and future
- Relationships
- Expectations of self and others
- National/international events
- Outdoors - fresh air/light

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Prevention and Intervention

- Integrated model of well-being
- Collecting and using data
- Where we are today
- Planning for the future
- Examples of well-being programs related to environmental impacts and data

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Questions, Comments or Concerns?

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The following are supplemental slides that may be discussed at the BOV Committee meeting, while also serving as background materials to previous slides.

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Trend - In No Hurry

The Extension of Childhood Into Adolescence

- The entire developmental trajectory, from childhood to adolescence, has slowed.
- Young adults are postponing the “usual” activities of adulthood such as getting a job or driver’s license, managing their money, staying at home alone, and socializing without parents.
- Teens keep in more constant contact with parents and fight less with them.
- Young adults spend less time on homework and they go out, date, drink, and have sex less.

Trend - Internet

How Much Time They Spend on Their Phones (and What That Has Replaced)

- High school seniors spend approximately 6 hours a day on social media: 2 ¼ hours texting; 2 hours using internet; 1.5 hours electronic gaming; and, ½ hour video-chatting.
- In the late 1970s, the majority of teens read a book or magazine nearly every day; in 2015 only 16% did.
- Newspaper readership plummeted from nearly 70% in the early 1990s to only 10% in 2015.

Trend - In Person No More

The Decline of In-Person Social Interaction

- From the late 1980s to 2016, teens spend 7 hours less a week with friends (one-on-one or at party).
- Teens are less likely to drive in a car with friends or go to a movie, party, or mall. In fact, teens are less likely to take part in face-to-face social activity measured across 4 data sets.
- Preliminary evidence shows that less social interaction will lead to less developed social skills.
- In an era of social media, social rejection increases and can increase aggression, create feelings of hopelessness, and affect emotional eating.

Trend - Insecure

The Sharp Rise in Mental Health Issues

- More time on screens = more likely to be unhappy; feel lonely more often; become more depressed and anxious; increased risk of suicide.
- Life satisfaction for teens is on the decline.
- Forty-eight percent more girls, and 27% more boys, felt left out in 2015 compared to teens in 2010.
- Fifty-seven percent more teens are more sleep deprived in 2015 than those in 1991.
- In 1983, 4% of high school seniors had seen a professional counselor; in 2015 it increased to 11%.

Trend - Irreligious

The Decline in Religion

- In 1970, 5% of college students stated their parents were not associated with religion; in 2016 it was 17%.
- Young people associate religion with rigidity and intolerance.
- The religious landscape is now more polarized on issues of identity (such as LGBT).
- Late millennials and iGens are least likely of all generations to say that they are spiritual. Forty five percent indicated they were a "spiritual person" in 2000 and in 2016 it was 36%.
- In 2016, one out of three, 18-24 year olds said they did not believe in God.
- In 2004, 84% of young adults prayed; in 2016 approximately 25% never prayed.

Trend - Insulated But Not Intrinsic

The Interest in Safety and the Decline in Civic Involvement

- Teens are more likely to avoid risk and danger and are more interested in physical and emotional safety.
- They have less tickets, less accidents, increased seat belt use, less binge drinking, less physical fighting and less empathy; they want to contribute but don't take action.
- They want to be safe from people who disagree with them and want higher authorities to fix the situation rather than do it themselves.
- They see college as a means to an end, are interested in making money and less interested in meaningful work.
- They place greater value on individualistic attitudes and less value on community involvement.

Trend - Income Insecurity

New Attitudes Toward Work

- Teens tend to be practical, forward thinking, and safe.
- Young adults are less interested in face-to-face interactions at work.
- In 1984, 50% had an interest in being successful in their own business while in 2016 only 37% shared this value.
- Between 1977 and 2015, there was a marked increase in beliefs about external locus of control (life was controlled by outside forces).
- Teens desire an increase in leisure time and work-life balance more than previous generations.
- High school seniors see more barriers getting in the way of success (e.g., gender discrimination and getting the job they want will take too much work.)

Trend - Indefinite

New Attitudes Toward Sex, Relationships, and Children

- Teens exhibit cautious attitudes toward relationships.
- In 2006, 50% of 18-29 year olds believed sex between unmarried adults was not wrong; in 2016 it has risen to 65%.
- 77% of 12th graders in 2015 said they wanted to get married (same in 1976).
- Fewer young adults are having sex, are in committed relationships and prioritize marriage and family; they believe that having children is economically challenging.
- Having a relationship conflicts with their individualistic value of “make self happy.”
- Since 1990, birth rates for women in their early 20s has plummeted by 36%.

Trend - Inclusive

Acceptance, Equality, and Free Speech Debates

- iGen expects equality.
- Reporting of same sex experiences is on the rise.
- There is a nascent movement to declare gender as fluid - not just changeable but not easily contained in two categories.
- The years 2000 and 2010 ushered in a sea change in attitudes toward LGBT people; some of the largest and most rapid generational and time-period differences in existence.
- In 2016, 60% of 18-30 year olds supported the Black Lives Matter movement compared to 37% of 50-64 year olds.
- In 2015, most 12th graders said high school was at least 50% another race, 2x that in 1980. But, only 25% of white teens say that diverse environments are desirable.

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Trend - Independent

Their Political Views

- Social media sites connect people to their personal cocoons, clustering people with people who think like them.
- More young Americans hold strong political views, yet few are interested in staying informed or taking action.
- In 2016, 54% of 18-29 year olds identified as independent compared to 33% in 1980.
- There is a significant increase in young adults' support for abortion, legalization of marijuana, and, no death penalty.
- Young adults are more apt to oppose gun control, national health care, and government environmental regulations.
- They want college and childcare funded by the government.

Ways Student Affairs is responding to iGen

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Addressing Well-Being

Integrated Model

- Moved from historically “siloed” departments to Student Affairs units working together
- Upstream approach to well-being
- Team delivery of programs/services
- Student well-being is everyone’s responsibility
- Enhanced collaborations
- More effective transitions (handoffs)
- Program development towards risk behaviors
- Improved continuity of care

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Addressing Well-Being

At Virginia Tech We Collect and Use Data to Make Decisions

- Cook Counseling Center data
- American College Health Association - National Collegiate Health Assessment (NCHA)
- Schiffert Health Center data
- Center for Collegiate Mental Health reports
- Healthy Minds Network study
- Frequency of exercise - GPA study
- Sense of belonging/pride - competitive sports
- Student employee leadership study

Addressing Well-Being

Data Collection - 2016

Top factors affecting individual academic performance (self-reported on NCHA by Virginia Tech students)

1. Stress *30%*
2. Anxiety *20%*
3. Sleep difficulties *19%*
4. Cold/flu/sore throat *16%*
5. Internet/computer use *13%*
6. Extra - curricular activities *13%*
7. Depression *11%*
8. Concern for family/friend *10%*
9. Work *10%*

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Addressing Well-Being

Where We Are Today

- Increased resources in mental health
- Increased educational opportunities
- Increased peer education efforts
- Research and assessment to evaluate impact
- Partnerships/collaborations outside of wellness units
- Development of programs/trainings targeting risk, based on data
- Well-being landing site
- Exploring technological opportunities to reach students

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Addressing Well-Being

Planning for the Future

- Improved facilities - War Memorial Hall project
- Well-Being Living-Learning Community
- Growth in on-site psychiatry services
- Continued increase in Cook Counseling Center counselors and potential for increased hours and/or opportunities to deliver services
- Technology-based services
- Financial wellness programming
- Partnership development opportunities

Addressing Well-Being

Well-Being Programs Related to Environmental Impacts and Data

- Individual and group counseling
- Pet therapy
- Friends help friends in distress
- How of Happiness program
- 21st Birthday program
- Better sleep techniques
- Mindfulness trainings
- Variety of health education trainings - peer-led
- Unwind Offline
- Healthy cooking classes
- Recovery community

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Addressing Well-Being

Well-Being Programs Related to Environmental Impacts and Data

- Disability accommodations & coaching
- Exercise referral program from Cook Counseling
- *Hokie Movement* campaign
- Anxiety and depression workshops
- HEART program for eating disorders
- Recreation programs with high touch exposure and reflection
- Anxiety and depression workshops
- Venture Out/Outdoor programs
- Body Matters
- Destination Spring Break

VIRGINIA TECH | STUDENT AFFAIRS

Have Smartphones Destroyed a Generation?

More comfortable online than out partying, post-Millennials are safer, physically, than adolescents have ever been. But they're on the brink of a mental-health crisis.

Jasu Hu

JEAN M. TWENGE

SEPTEMBER 2017 ISSUE | TECHNOLOGY

ONE DAY last summer, around noon, I called Athena, a 13-year-old who lives in Houston, Texas. She answered her phone—she's had an iPhone since she was 11—sounding as if she'd just woken up. We chatted about her favorite songs and TV shows, and I asked her what she likes to do with her friends. "We go to the mall," she said. "Do your parents drop you off?," I asked, recalling my own middle-school days, in the 1980s, when I'd enjoy a few parent-

free hours shopping with my friends. "No—I go with my family," she replied. "We'll go with my mom and brothers and walk a little behind them. I just have to tell my mom where we're going. I have to check in every hour or every 30 minutes."

Those mall trips are infrequent—about once a month. More often, Athena and her friends spend time together on their phones, unchaperoned. Unlike the teens of my generation, who might have spent an evening tying up the family landline with gossip, they talk on Snapchat, the smartphone app that allows users to send pictures and videos that quickly disappear. They make sure to keep up their Snapstreaks, which show how many days in a row they have Snapchatted with each other. Sometimes they save screenshots of particularly ridiculous pictures of friends. "It's good blackmail," Athena said. (Because she's a minor, I'm not using her real name.) She told me she'd spent most of the summer hanging out alone in her room with her phone. That's just the way her generation is, she said. "We didn't have a choice to know any life without iPads or iPhones. I think we like our phones more than we like actual people."

I've been researching generational differences for 25 years, starting when I was a 22-year-old doctoral student in psychology. Typically, the characteristics that come to define a generation appear gradually, and along a continuum. Beliefs and behaviors that were already rising simply continue to do so. Millennials, for instance, are a highly individualistic generation, but individualism had been increasing since the Baby Boomers turned on, tuned in, and dropped out. I had grown accustomed to line graphs of trends that looked like modest hills and valleys. Then I began studying Athena's generation.

Around 2012, I noticed abrupt shifts in teen behaviors and emotional states. The gentle slopes of the line graphs became steep mountains and sheer cliffs, and many of the distinctive characteristics of the Millennial generation began to disappear. In all my analyses of generational data—some reaching back to the 1930s—I had never seen anything like it.

The allure of independence, so powerful to previous generations, holds less sway over today's teens.

At first I presumed these might be blips, but the trends persisted, across several years and a series of national surveys. The changes weren't just in degree, but in kind. The biggest difference between the Millennials and their predecessors was in how they viewed the world; teens today differ from the Millennials not just in their views but in how they spend their time. The experiences they have every day are radically different from those of the generation that came of age just a few years before them.

What happened in 2012 to cause such dramatic shifts in behavior? It was after the Great Recession, which officially lasted from 2007 to 2009 and had a starker effect on Millennials trying to find a place in a sputtering economy. But it was exactly the moment when the proportion of Americans who owned a smartphone surpassed 50 percent.

THE MORE I pored over yearly surveys of teen attitudes and behaviors, and the more I talked with young people like Athena, the clearer it became that theirs is a generation shaped by the smartphone and by the concomitant rise of social media. I call them iGen. Born between 1995 and 2012, members of this generation are growing up with smartphones, have an Instagram account before they start high school, and do not remember a time before the internet. The Millennials grew up with the web as well, but it wasn't ever-present in their lives, at hand at all times, day and night. iGen's oldest members were early adolescents when the iPhone was introduced, in 2007, and high-school students when the iPad entered the scene, in 2010. A 2017 survey of more than 5,000 American teens found that three out of four owned an iPhone.

The advent of the smartphone and its cousin the tablet was followed quickly by hand-wringing about the deleterious effects of "screen time." But the impact of these devices has not been fully appreciated, and goes far beyond the usual

concerns about curtailed attention spans. The arrival of the smartphone has radically changed every aspect of teenagers' lives, from the nature of their social interactions to their mental health. These changes have affected young people in every corner of the nation and in every type of household. The trends appear among teens poor and rich; of every ethnic background; in cities, suburbs, and small towns. Where there are cell towers, there are teens living their lives on their smartphone.

To those of us who fondly recall a more analog adolescence, this may seem foreign and troubling. The aim of generational study, however, is not to succumb to nostalgia for the way things used to be; it's to understand how they are now. Some generational changes are positive, some are negative, and many are both. More comfortable in their bedrooms than in a car or at a party, today's teens are physically safer than teens have ever been. They're markedly less likely to get into a car accident and, having less of a taste for alcohol than their predecessors, are less susceptible to drinking's attendant ills.

Psychologically, however, they are more vulnerable than Millennials were: Rates of teen depression and suicide have skyrocketed since 2011. It's not an exaggeration to describe iGen as being on the brink of the worst mental-health crisis in decades. Much of this deterioration can be traced to their phones.

Even when a seismic event—a war, a technological leap, a free concert in the mud—plays an outsize role in shaping a group of young people, no single factor ever defines a generation. Parenting styles continue to change, as do school curricula and culture, and these things matter. But the twin rise of the smartphone and social media has caused an earthquake of a magnitude we've not seen in a very long time, if ever. There is compelling evidence that the devices we've placed in young people's hands are having profound effects on their lives—and making them seriously unhappy.

IN THE EARLY 1970s, the photographer Bill Yates shot a series of portraits at the Sweetheart Roller Skating Rink in Tampa, Florida. In one, a shirtless teen stands with a large bottle of peppermint schnapps stuck in the waistband of his

jeans. In another, a boy who looks no older than 12 poses with a cigarette in his mouth. The rink was a place where kids could get away from their parents and inhabit a world of their own, a world where they could drink, smoke, and make out in the backs of their cars. In stark black-and-white, the adolescent Boomers gaze at Yates's camera with the self-confidence born of making your own choices—even if, perhaps especially if, your parents wouldn't think they were the right ones.

Fifteen years later, during my own teenage years as a member of Generation X, smoking had lost some of its romance, but independence was definitely still in. My friends and I plotted to get our driver's license as soon as we could, making DMV appointments for the day we turned 16 and using our newfound freedom to escape the confines of our suburban neighborhood. Asked by our parents, "When will you be home?," we replied, "When do I have to be?"

But the allure of independence, so powerful to previous generations, holds less sway over today's teens, who are less likely to leave the house without their parents. The shift is stunning: 12th-graders in 2015 were going out less often than *eighth-graders* did as recently as 2009.

Today's teens are also less likely to date. The initial stage of courtship, which Gen Xers called "liking" (as in "Ooh, he likes you!"), kids now call "talking"—an ironic choice for a generation that prefers texting to actual conversation. After two teens have "talked" for a while, they might start dating. But only about 56 percent of high-school seniors in 2015 went out on dates; for Boomers and Gen Xers, the number was about 85 percent.

The decline in dating tracks with a decline in sexual activity. The drop is the sharpest for ninth-graders, among whom the number of sexually active teens has been cut by almost 40 percent since 1991. The average teen now has had sex for the first time by the spring of 11th grade, a full year later than the average Gen Xer. Fewer teens having sex has contributed to what many see as one of the most positive youth trends in recent years: The teen birth rate hit an all-time low in 2016, down 67 percent since its modern peak, in 1991.

Even driving, a symbol of adolescent freedom inscribed in American popular culture, from *Rebel Without a Cause* to *Ferris Bueller's Day Off*, has lost its appeal for today's teens. Nearly all Boomer high-school students had their driver's license by the spring of their senior year; more than one in four teens today still lack one at the end of high school. For some, Mom and Dad are such good chauffeurs that there's no urgent need to drive. "My parents drove me everywhere and never complained, so I always had rides," a 21-year-old student in San Diego told me. "I didn't get my license until my mom told me I had to because she could not keep driving me to school." She finally got her license six months after her 18th birthday. In conversation after conversation, teens described getting their license as something to be nagged into by their parents—a notion that would have been unthinkable to previous generations.

Independence isn't free—you need some money in your pocket to pay for gas, or for that bottle of schnapps. In earlier eras, kids worked in great numbers, eager to finance their freedom or prodded by their parents to learn the value of a dollar. But iGen teens aren't working (or managing their own money) as much. In the late 1970s, 77 percent of high-school seniors worked for pay during the school year; by the mid-2010s, only 55 percent did. The number of eighth-graders who work for pay has been cut in half. These declines accelerated during the Great Recession, but teen employment has not bounced back, even though job availability has.

Of course, putting off the responsibilities of adulthood is not an iGen innovation. Gen Xers, in the 1990s, were the first to postpone the traditional markers of adulthood. Young Gen Xers were just about as likely to drive, drink alcohol, and date as young Boomers had been, and more likely to have sex and get pregnant as teens. But as they left their teenage years behind, Gen Xers married and started careers later than their Boomer predecessors had.

Gen X managed to stretch adolescence beyond all previous limits: Its members started becoming adults earlier and finished becoming adults later. Beginning with Millennials and continuing with iGen, adolescence is contracting again—but only because its onset is being delayed. Across a range of behaviors—drinking, dating,

spending time unsupervised— 18-year-olds now act more like 15-year-olds used to, and 15-year-olds more like 13-year-olds. Childhood now stretches well into high school.

Why are today's teens waiting longer to take on both the responsibilities and the pleasures of adulthood? Shifts in the economy, and parenting, certainly play a role. In an information economy that rewards higher education more than early work history, parents may be inclined to encourage their kids to stay home and study rather than to get a part-time job. Teens, in turn, seem to be content with this homebody arrangement—not because they're so studious, but because their social life is lived on their phone. They don't need to leave home to spend time with their friends.

If today's teens were a generation of grinds, we'd see that in the data. But eighth-, 10th-, and 12th-graders in the 2010s actually spend less time on homework than Gen X teens did in the early 1990s. (High-school seniors headed for four-year colleges spend about the same amount of time on homework as their predecessors did.) The time that seniors spend on activities such as student clubs and sports and exercise has changed little in recent years. Combined with the decline in working for pay, this means iGen teens have more leisure time than Gen X teens did, not less.

So what are they doing with all that time? They are on their phone, in their room, alone and often distressed.

Jasu Hu

ONE OF THE IRONIES of iGen life is that despite spending far more time under the same roof as their parents, today's teens can hardly be said to be closer to their mothers and fathers than their predecessors were. "I've seen my friends with their families—they don't talk to them," Athena told me. "They just say 'Okay, okay, whatever' while they're on their phones. They don't pay attention to their family." Like her peers, Athena is an expert at tuning out her parents so she can focus on her phone. She spent much of her summer keeping up with friends, but nearly all of it was over text or Snapchat. "I've been on my phone more than I've been with actual people," she said. "My bed has, like, an imprint of my body."

In this, too, she is typical. The number of teens who get together with their friends nearly every day dropped by more than 40 percent from 2000 to 2015; the decline has been especially steep recently. It's not only a matter of fewer kids partying; fewer kids are spending time simply hanging out. That's something most teens used to do: nerds and jocks, poor kids and rich kids, C students and A students. The

roller rink, the basketball court, the town pool, the local necking spot—they've all been replaced by virtual spaces accessed through apps and the web.

You might expect that teens spend so much time in these new spaces because it makes them happy, but most data suggest that it does not. The Monitoring the Future survey, funded by the National Institute on Drug Abuse and designed to be nationally representative, has asked 12th-graders more than 1,000 questions every year since 1975 and queried eighth- and 10th-graders since 1991. The survey asks teens how happy they are and also how much of their leisure time they spend on various activities, including nonscreen activities such as in-person social interaction and exercise, and, in recent years, screen activities such as using social media, texting, and browsing the web. The results could not be clearer: Teens who spend more time than average on screen activities are more likely to be unhappy, and those who spend more time than average on nonscreen activities are more likely to be happy.

There's not a single exception. All screen activities are linked to less happiness, and all nonscreen activities are linked to more happiness. Eighth-graders who spend 10 or more hours a week on social media are 56 percent more likely to say they're unhappy than those who devote less time to social media. Admittedly, 10 hours a week is a lot. But those who spend six to nine hours a week on social media are still 47 percent more likely to say they are unhappy than those who use social media even less. The opposite is true of in-person interactions. Those who spend an above-average amount of time with their friends in person are 20 percent less likely to say they're unhappy than those who hang out for a below-average amount of time.

The more time teens spend looking at screens, the more likely they are to report symptoms of depression.

If you were going to give advice for a happy adolescence based on this survey, it would be straightforward: Put down the phone, turn off the laptop, and do

something—anything—that does not involve a screen. Of course, these analyses don't unequivocally prove that screen time *causes* unhappiness; it's possible that unhappy teens spend more time online. But recent research suggests that screen time, in particular social-media use, does indeed cause unhappiness. One study asked college students with a Facebook page to complete short surveys on their phone over the course of two weeks. They'd get a text message with a link five times a day, and report on their mood and how much they'd used Facebook. The more they'd used Facebook, the unhappier they felt, but feeling unhappy did not subsequently lead to more Facebook use.

Social-networking sites like Facebook promise to connect us to friends. But the portrait of iGen teens emerging from the data is one of a lonely, dislocated generation. Teens who visit social-networking sites every day but see their friends in person less frequently are the most likely to agree with the statements "A lot of times I feel lonely," "I often feel left out of things," and "I often wish I had more good friends." Teens' feelings of loneliness spiked in 2013 and have remained high since.

This doesn't always mean that, on an individual level, kids who spend more time online are lonelier than kids who spend less time online. Teens who spend more time on social media also spend more time with their friends in person, on average—highly social teens are more social in both venues, and less social teens are less so. But at the generational level, when teens spend more time on smartphones and less time on in-person social interactions, loneliness is more common.

So is depression. Once again, the effect of screen activities is unmistakable: The more time teens spend looking at screens, the more likely they are to report symptoms of depression. Eighth-graders who are heavy users of social media increase their risk of depression by 27 percent, while those who play sports, go to religious services, or even do homework more than the average teen cut their risk significantly.

Teens who spend three hours a day or more on electronic devices are 35 percent more likely to have a risk factor for suicide, such as making a suicide plan. (That's

much more than the risk related to, say, watching TV.) One piece of data that indirectly but stunningly captures kids' growing isolation, for good and for bad: Since 2007, the homicide rate among teens has declined, but the suicide rate has increased. As teens have started spending less time together, they have become less likely to kill one another, and more likely to kill themselves. In 2011, for the first time in 24 years, the teen suicide rate was higher than the teen homicide rate.

Depression and suicide have many causes; too much technology is clearly not the only one. And the teen suicide rate was even higher in the 1990s, long before smartphones existed. Then again, about four times as many Americans now take antidepressants, which are often effective in treating severe depression, the type most strongly linked to suicide.

WHAT'S THE CONNECTION between smartphones and the apparent psychological distress this generation is experiencing? For all their power to link kids day and night, social media also exacerbate the age-old teen concern about being left out. Today's teens may go to fewer parties and spend less time together in person, but when they do congregate, they document their hangouts relentlessly—on Snapchat, Instagram, Facebook. Those not invited to come along are keenly aware of it. Accordingly, the number of teens who feel left out has reached all-time highs across age groups. Like the increase in loneliness, the upswing in feeling left out has been swift and significant.

This trend has been especially steep among girls. Forty-eight percent more girls said they often felt left out in 2015 than in 2010, compared with 27 percent more boys. Girls use social media more often, giving them additional opportunities to feel excluded and lonely when they see their friends or classmates getting together without them. Social media levy a psychic tax on the teen doing the posting as well, as she anxiously awaits the affirmation of comments and likes. When Athena posts pictures to Instagram, she told me, "I'm nervous about what people think and are going to say. It sometimes bugs me when I don't get a certain amount of likes on a picture."

Girls have also borne the brunt of the rise in depressive symptoms among today's teens. Boys' depressive symptoms increased by 21 percent from 2012 to 2015, while girls' increased by 50 percent—more than twice as much. The rise in suicide, too, is more pronounced among girls. Although the rate increased for both sexes, three times as many 12-to-14-year-old girls killed themselves in 2015 as in 2007, compared with twice as many boys. The suicide rate is still higher for boys, in part because they use more-lethal methods, but girls are beginning to close the gap.

These more dire consequences for teenage girls could also be rooted in the fact that they're more likely to experience cyberbullying. Boys tend to bully one another physically, while girls are more likely to do so by undermining a victim's social status or relationships. Social media give middle- and high-school girls a platform on which to carry out the style of aggression they favor, ostracizing and excluding other girls around the clock.

Social-media companies are of course aware of these problems, and to one degree or another have endeavored to prevent cyberbullying. But their various motivations are, to say the least, complex. A recently leaked Facebook document indicated that the company had been touting to advertisers its ability to determine teens' emotional state based on their on-site behavior, and even to pinpoint "moments when young people need a confidence boost." Facebook acknowledged that the document was real, but denied that it offers "tools to target people based on their emotional state."

In July 2014, a 13-year-old girl in North Texas woke to the smell of something burning. Her phone had overheated and melted into the sheets. National news outlets picked up the story, stoking readers' fears that their cellphone might spontaneously combust. To me, however, the flaming cellphone wasn't the only surprising aspect of the story. *Why*, I wondered, *would anyone sleep with her phone beside her in bed?* It's not as though you can surf the web while you're sleeping. And who could slumber deeply inches from a buzzing phone?

Curious, I asked my undergraduate students at San Diego State University what they do with their phone while they sleep. Their answers were a profile in obsession. Nearly all slept with their phone, putting it under their pillow, on the mattress, or at the very least within arm's reach of the bed. They checked social media right before they went to sleep, and reached for their phone as soon as they woke up in the morning (they had to—all of them used it as their alarm clock). Their phone was the last thing they saw before they went to sleep and the first thing they saw when they woke up. If they woke in the middle of the night, they often ended up looking at their phone. Some used the language of addiction. "I know I shouldn't, but I just can't help it," one said about looking at her phone while in bed. Others saw their phone as an extension of their body—or even like a lover: "Having my phone closer to me while I'm sleeping is a comfort."

It may be a comfort, but the smartphone is cutting into teens' sleep: Many now sleep less than seven hours most nights. Sleep experts say that teens should get about nine hours of sleep a night; a teen who is getting less than seven hours a night is significantly sleep deprived. Fifty-seven percent more teens were sleep deprived in 2015 than in 1991. In just the four years from 2012 to 2015, 22 percent more teens failed to get seven hours of sleep.

The increase is suspiciously timed, once again starting around when most teens got a smartphone. Two national surveys show that teens who spend three or more hours a day on electronic devices are 28 percent more likely to get less than seven hours of sleep than those who spend fewer than three hours, and teens who visit social-media sites every day are 19 percent more likely to be sleep deprived. A meta-analysis of studies on electronic-device use among children found similar results: Children who use a media device right before bed are more likely to sleep less than they should, more likely to sleep poorly, and more than twice as likely to be sleepy during the day.

I've observed my toddler, barely old enough to walk, confidently swiping her way through an iPad.

Electronic devices and social media seem to have an especially strong ability to disrupt sleep. Teens who read books and magazines more often than the average are actually slightly less likely to be sleep deprived—either reading lulls them to sleep, or they can put the book down at bedtime. Watching TV for several hours a day is only weakly linked to sleeping less. But the allure of the smartphone is often too much to resist.

Sleep deprivation is linked to myriad issues, including compromised thinking and reasoning, susceptibility to illness, weight gain, and high blood pressure. It also affects mood: People who don't sleep enough are prone to depression and anxiety. Again, it's difficult to trace the precise paths of causation. Smartphones could be causing lack of sleep, which leads to depression, or the phones could be causing depression, which leads to lack of sleep. Or some other factor could be causing both depression and sleep deprivation to rise. But the smartphone, its blue light glowing in the dark, is likely playing a nefarious role.

THE CORRELATIONS BETWEEN depression and smartphone use are strong enough to suggest that more parents should be telling their kids to put down their phone. As the technology writer Nick Bilton has reported, it's a

policy some Silicon Valley executives follow. Even Steve Jobs limited his kids' use of the devices he brought into the world.

What's at stake isn't just how kids experience adolescence. The constant presence of smartphones is likely to affect them well into adulthood. Among people who suffer an episode of depression, at least half become depressed again later in life. Adolescence is a key time for developing social skills; as teens spend less time with their friends face-to-face, they have fewer opportunities to practice them. In the next decade, we may see more adults who know just the right emoji for a situation, but not the right facial expression.

I realize that restricting technology might be an unrealistic demand to impose on a generation of kids so accustomed to being wired at all times. My three daughters were born in 2006, 2009, and 2012. They're not yet old enough to display the traits of iGen teens, but I have already witnessed firsthand just how ingrained new media are in their young lives. I've observed my toddler, barely old enough to walk, confidently swiping her way through an iPad. I've experienced my 6-year-old asking for her own cellphone. I've overheard my 9-year-old discussing the latest app to sweep the fourth grade. Prying the phone out of our kids' hands will be difficult, even more so than the quixotic efforts of my parents' generation to get their kids to turn off MTV and get some fresh air. But more seems to be at stake in urging teens to use their phone responsibly, and there are benefits to be gained even if all we instill in our children is the importance of moderation. Significant effects on both mental health and sleep time appear after two or more hours a day on electronic devices. The average teen spends about two and a half hours a day on electronic devices. Some mild boundary-setting could keep kids from falling into harmful habits.

In my conversations with teens, I saw hopeful signs that kids themselves are beginning to link some of their troubles to their ever-present phone. Athena told me that when she does spend time with her friends in person, they are often looking at their device instead of at her. "I'm trying to talk to them about something, and they don't actually look at my face," she said. "They're looking at their phone, or they're

looking at their Apple Watch." "What does that feel like, when you're trying to talk to somebody face-to-face and they're not looking at you?," I asked. "It kind of hurts," she said. "It hurts. I know my parents' generation didn't do that. I could be talking about something super important to me, and they wouldn't even be listening."

Once, she told me, she was hanging out with a friend who was texting her boyfriend. "I was trying to talk to her about my family, and what was going on, and she was like, 'Uh-huh, yeah, whatever.' So I took her phone out of her hands and I threw it at my wall."

I couldn't help laughing. "You play volleyball," I said. "Do you have a pretty good arm?" "Yep," she replied.

This article has been adapted from Jean M. Twenge's forthcoming book, *iGen: Why Today's Super-Connected Kids Are Growing Up Less Rebellious, More Tolerant, Less Happy—and Completely Unprepared for Adulthood—and What That Means for the Rest of Us.*

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CLASS OF 2021

27,266
Freshman applicants

7,075
Accepting admission

22%
Early Decisions

18,776
Offered admission

369
Participating in the Corps of Cadets

1,835
Legacies
(legacy = parent, grandparent, sibling)

1,644
High schools represented

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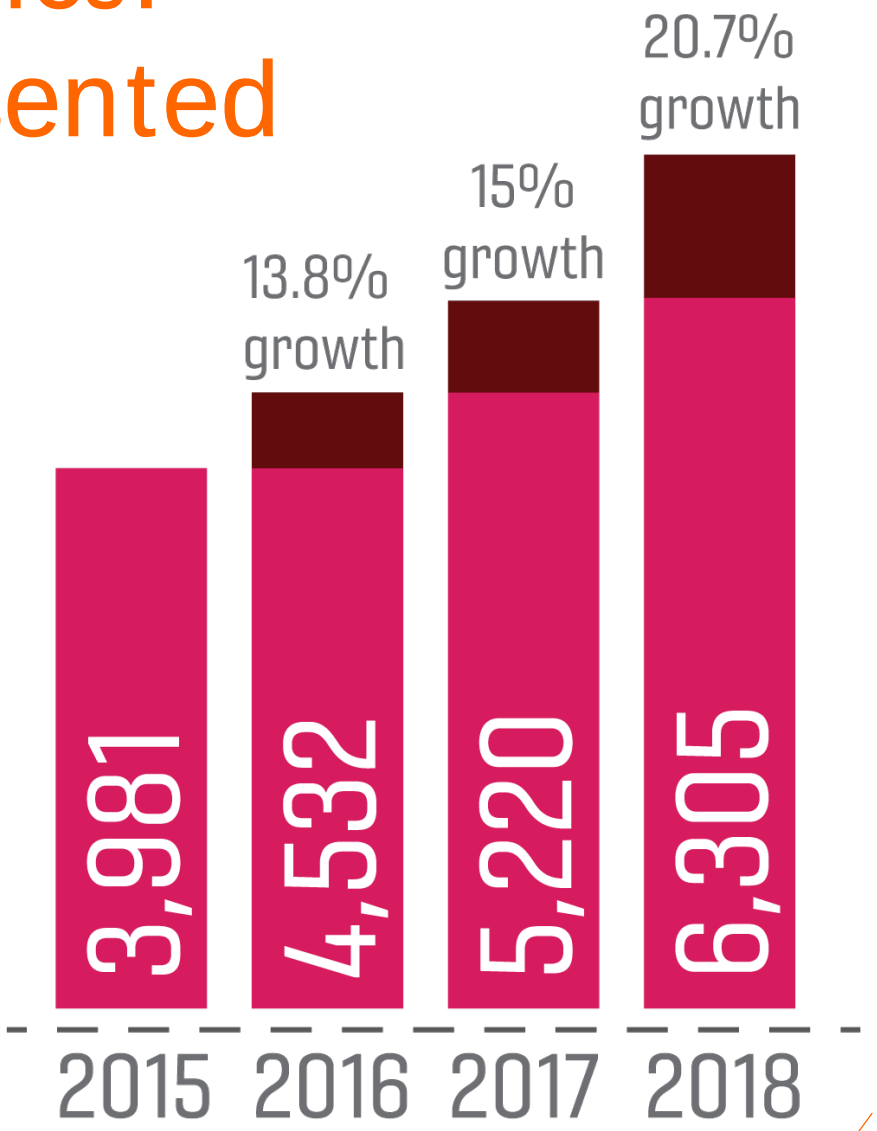
Admissions Diversity Statistics: Underserved / Underrepresented

Applications from students who identify as American Indian / Alaska Native, African American, Hispanic, or two or more races



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MOST POPULAR MAJORS

1. General Engineering
2. University Studies
3. Biology
4. Business (Undecided)
5. Human Nutrition, Foods, & Exercise
6. Animal and Poultry Sciences
7. Business Information Technology
8. Architecture
9. Mathematics
10. Psychology

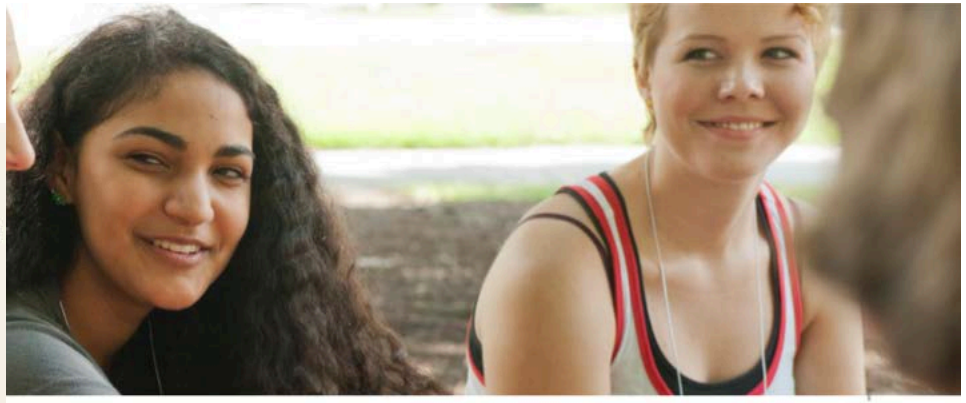
INCOMING FRESHMEN COME FROM

45	1	49	= 545
STATES	TERRITORY	NATIONS	TOTAL INT'L

Top 5 home states of out-of-state freshmen:

1. New Jersey
2. Maryland
3. North Carolina
4. Pennsylvania
5. New York

data as of 5/16/17



First Generation:	International:	Veterans:
4,210 Applications	2,587 Applications	36 Applications
2,307 Offers	1,881 Offers	16 Offers
986 Acceptances	545 Acceptances	8 Acceptances

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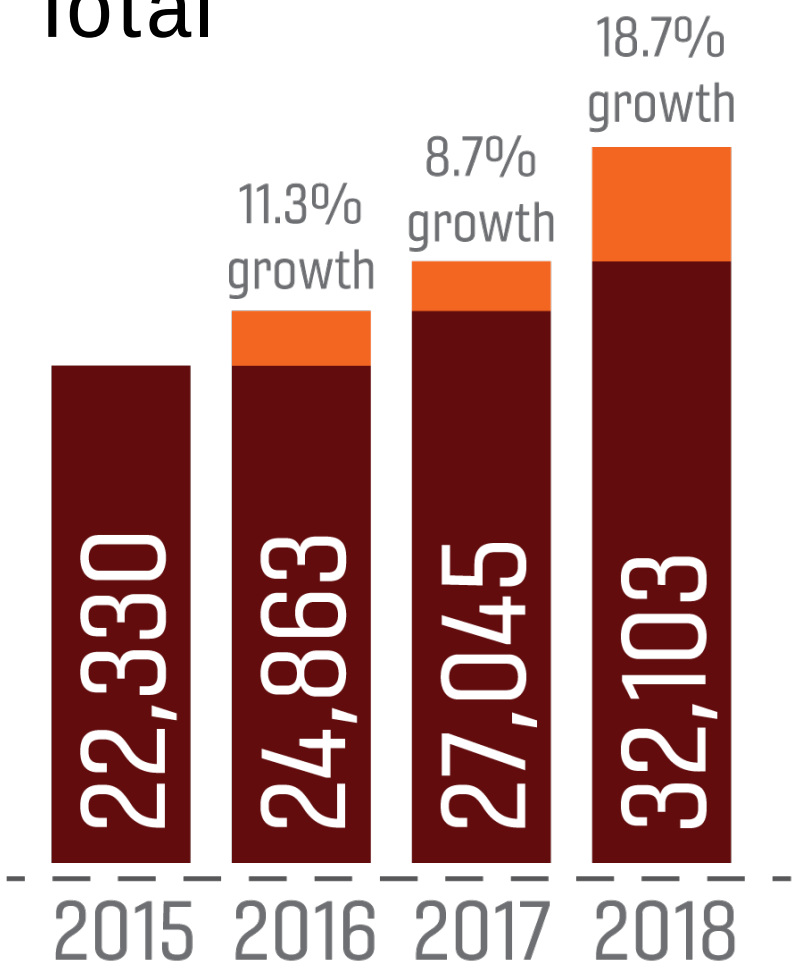
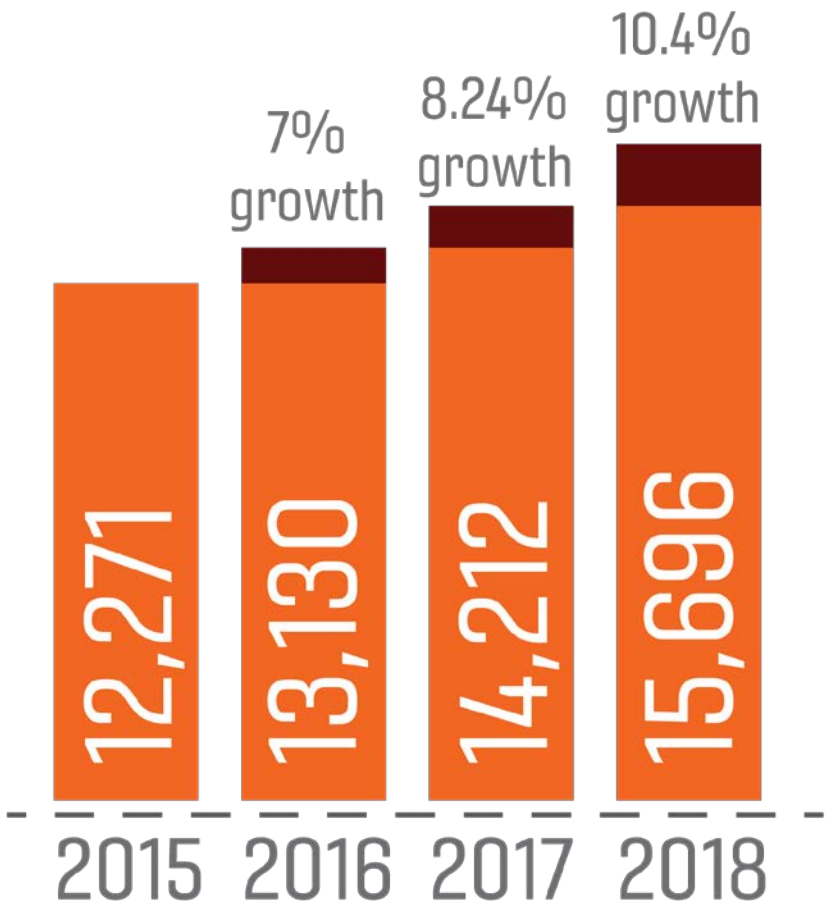
Historic Admissions Cycle

Total



In-State



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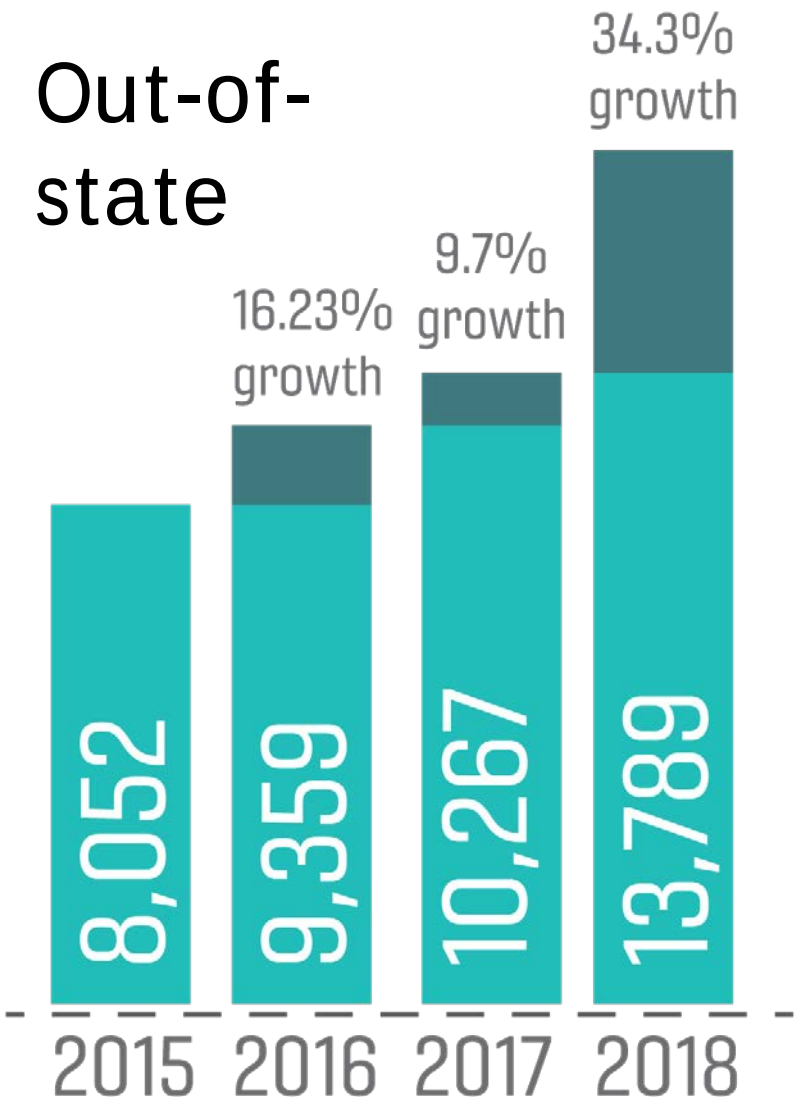
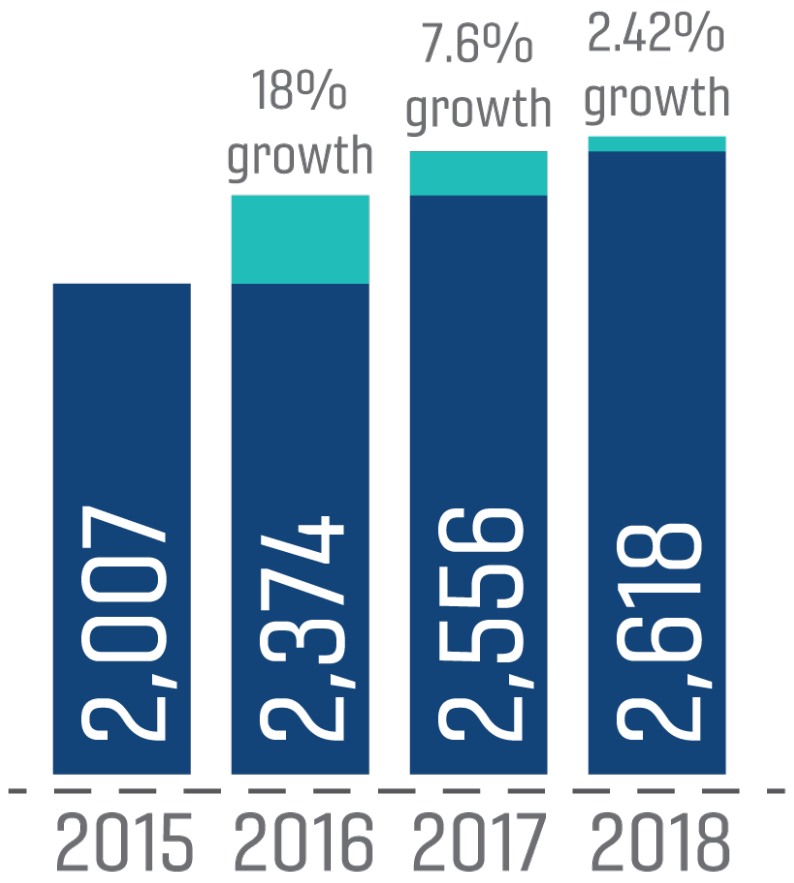
Historic Admissions Cycle

Out-of-state



International



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College of Agriculture and Life Sciences: A strategic path forward

ALAN GRANT, DEAN

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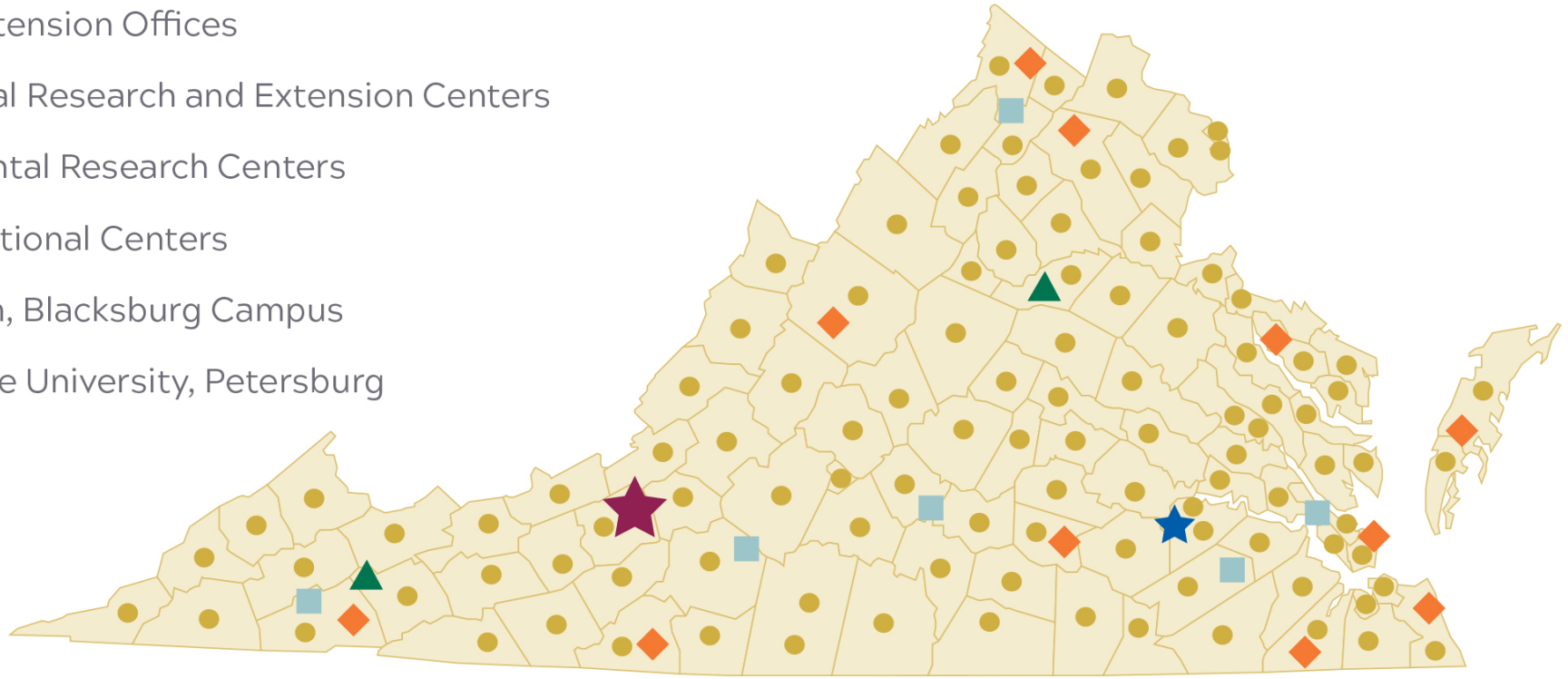
- 108 Local Extension Offices
- 11 Agricultural Research and Extension Centers
- 2 Departmental Research Centers
- 6 4-H Educational Centers
- Virginia Tech, Blacksburg Campus
- Virginia State University, Petersburg



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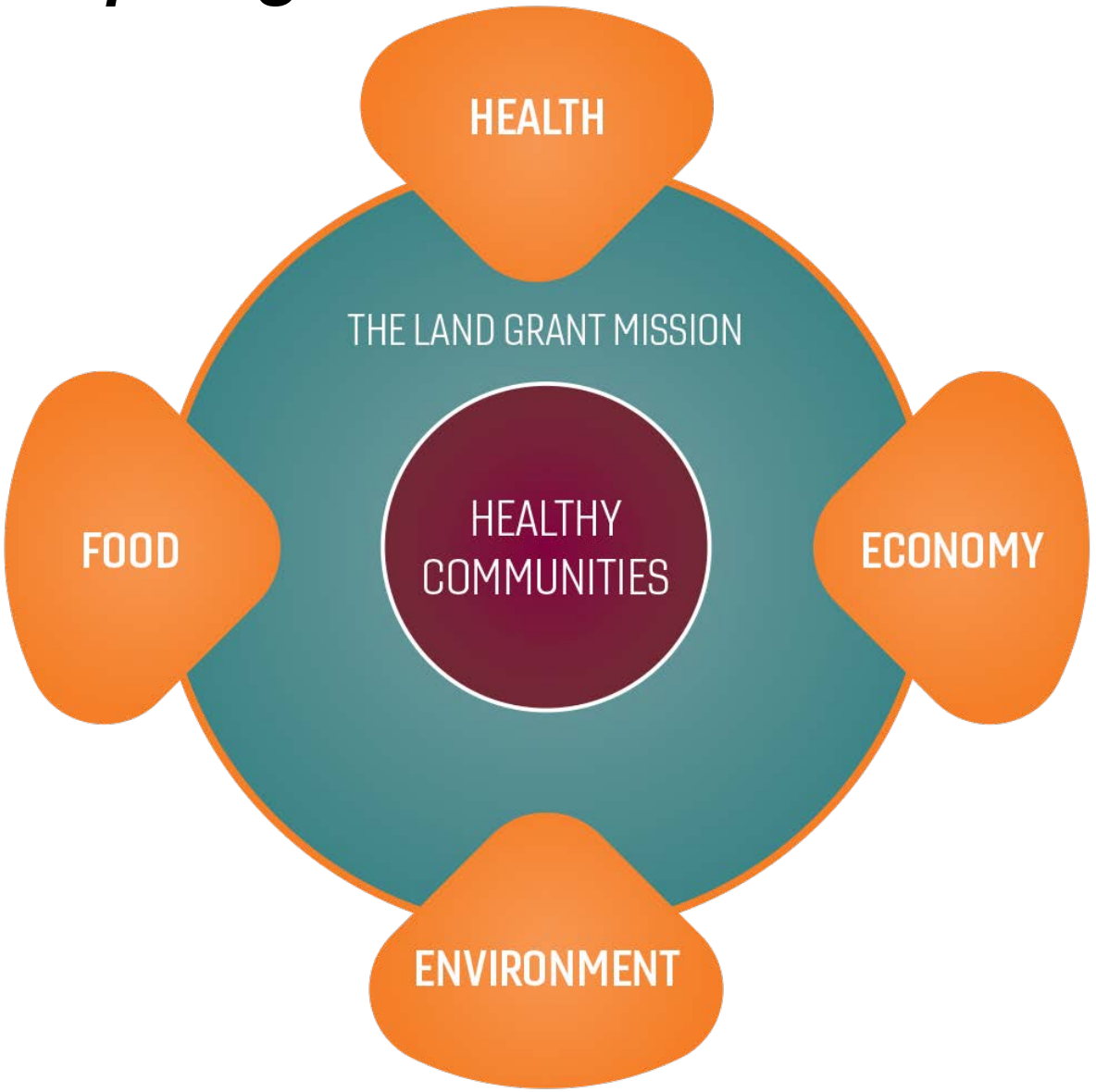

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2. Facilities – to enhance partnerships

3. World-class talent – a diverse faculty & staff

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+

Department of Plant Pathology, Physiology, and Weed Science

+

Department of Crop and Soil Environmental Sciences

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Investing in our communities

Our Focus:

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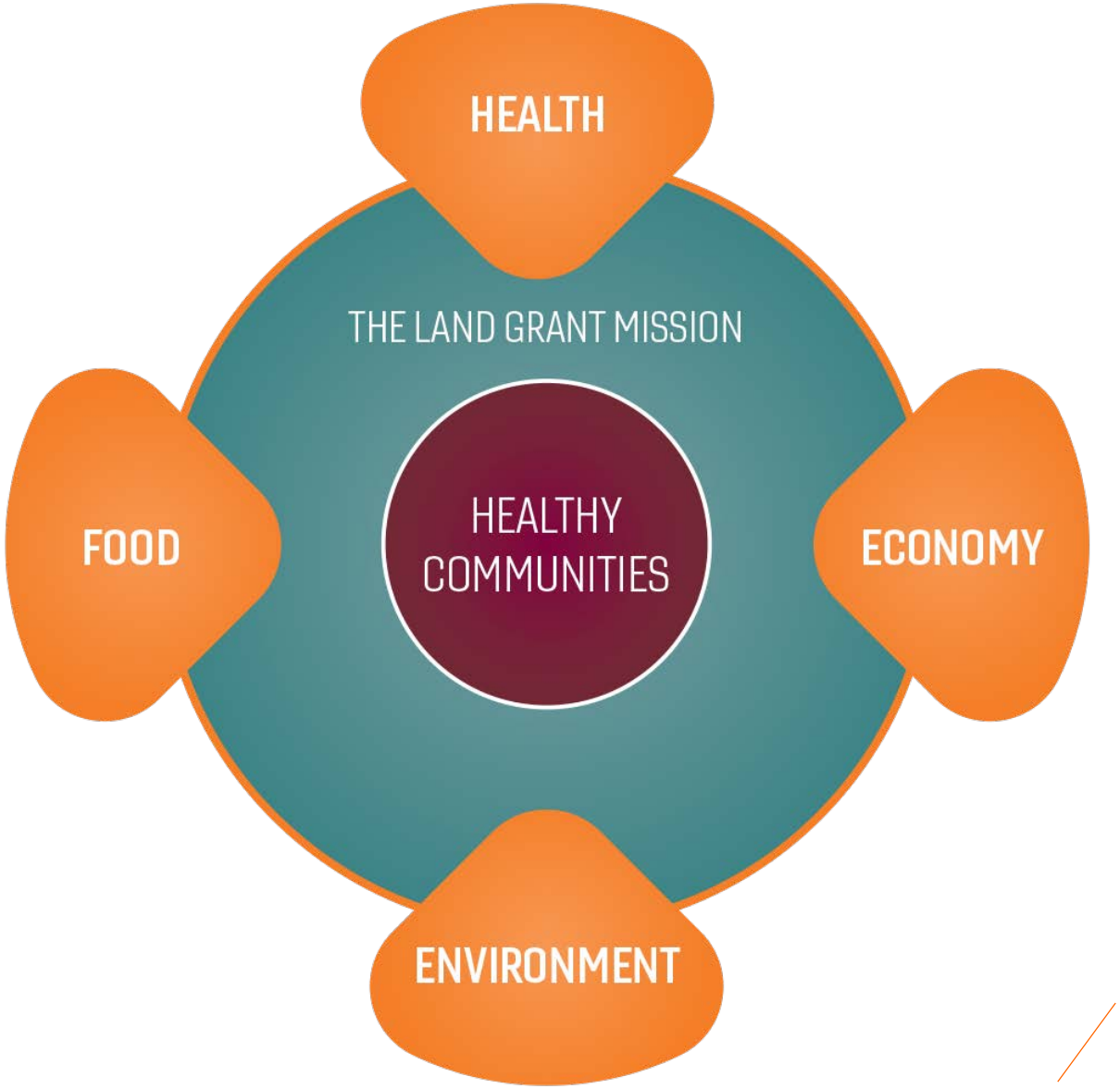
World-class talent
State-of-the-art facilities

Our Priorities:

Invest in students
Invest in faculty
Invest in facilities



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A bright future for CALS

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