A GENERATION FROM NOW

Life and work will be

more global, mobile, technology-mediated, specialized, interconnected; less steady/stable

Students will seek

knowledge, expertise, opportunity, flexibility, jobs; but also purpose and meaning

The campus will

comprise heterogeneous networks and innovation hubs facilitated by technology

Virginia Tech must

reflect the world in which students live and work, differentiate itself with unique value and personalized education; be sustainable, adaptable, and reflexive

Brennan Caddigan, A Hundred Years from Now, 1914
VT-SHAPED PEOPLE

‘VT-shaped’ students with:

Disciplinary depth

Interdisciplinary capacities

Purpose-driven engagement
COMMUNITIES OF DISCOVERY

Human-centered environments

Engage the whole person, cultivate empathy, inclusive, a culture of mentoring

Empowering opportunities

Flexible, experiential, interdisciplinary

Purpose-driven learning

Real-world projects on matters of concern in collaboration with multiple stakeholders
APPLYING DISCIPLINARY EXCELLENCE TO COMPLEX PROBLEMS

Students and faculty from various disciplines join to work on a problem.

Solutions are found at points of intersection.

“Destination areas” emerge from disciplinary excellence applied in novel ways.
Multiple disciplines form unique intersections

Combine with partners outside the university

Living laboratories yield better results

GLOBAL LIVING LABORATORY

Feed the World

Build the World
2047 FUNDING MODEL

Agile funding strategies

• Generating new learner-centered revenues
• Developing world-class philanthropy
• Creating new partnerships
• Evaluating Value to Experience (VTX)

World-class research

Ut Prosim

Academic excellence
We are always students

VT cultivates discovery from childhood throughout lifetime

Whole world is the campus

students access learning wherever and whenever they need it

Evolving pathways

curriculum is adaptive, customizable, inclusive

Framework for continuous innovation

ongoing evaluation, forward-looking
Destination Areas:

*a first pilot of the Beyond Boundaries Concepts*

Thanassis Rikakis

Provost
Disciplines and Complex Problems

Complex Problem
Destination Areas

Complex Properties of a Societal Problem

Feed the World

Defined Destination Area Component

Feed the World

Build the World
University organizational evolution:

- A matrix of established disciplines and evolving complex problems
- Incentive based budget – resources go to activity
- Bottom up optimization
Destination Areas are driven by Faculty Clusters

- Faculty clusters develop cross-cutting curriculum and research
- Based in the discipline, connected to the cluster: 70-30 split (5 year term)
- Reporting also 70-30
- Faculty opt in because they want the collaboration and opportunity for complex research and education of scale and impact
- Departments support because of new resources
  - One new clusters line for two existing committed to cluster
  - Access to DA innovation hubs
  - Leadership role in university wide research and fundraising efforts
  - Incentives in budget
- Opportunity for distinction and national prominence
- Clusters are dynamic – integrate and evolve
### Degree: Bachelor of Science in [X]

<table>
<thead>
<tr>
<th>Pathways General Education (42 hours)</th>
<th>Pathways Minor (18 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree Core:</strong> (25% of total degree hours minus general education) (~21 hours)</td>
<td></td>
</tr>
</tbody>
</table>

The degree core is comprised of courses through which students may achieve the central learning outcomes of the degree. The degree core may include foundational as well as advanced courses, both within the discipline and from related areas of knowledge central to student learning.

<table>
<thead>
<tr>
<th>Major: A specialized area within the degree</th>
<th>Destination Area Major (~30 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Destination Area Minor (~18 hours)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remaining Hours (Electives)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Total hours</th>
</tr>
</thead>
</table>
Hypothetical Destination Area Major
Destination Areas:
Graduate Curriculum and Research

- Intersections of research interests with existing PhD programs
- 14 Interdisciplinary Graduate Education Programs (IGEPs) aligned with all Das; ~300 students
- Use the IGEP model for DA graduate concentrations
- Interdisciplinary research course (GRAD 5134)
Destination Areas and Innovation Hubs

- High-end cross-university facilities
- Industry and community partnerships
- Living labs
- Faculty, students and external collaborators
- Diverse and inclusive
The VT-shaped Individual

Top 10 institution for this experience
Destination Areas: 
research results

Number of students actively pursuing data analytics

Major
Minor
Graduate
Destination Areas: 
research results

Data normalized from six criteria into two criteria: instruction and research

Data of two DAs showing all six criteria (i.e., why data rose above autonomous systems)
Data and Decision Sciences

Visualize, explain, and predict the response of massively interacting systems to address pressing challenges in health, habitat, and well-being
Data and Decision Sciences

Differentiators for Virginia Tech

- One-of-a-kind instrumented facilities and testbeds
- Partnerships with local, state, federal agencies
- Contextual data from disparate sources
- Human-in-the-loop analytics
- Synthetic information to simulate global populations
- Integrated framework for decision making
- NSF interdisciplinary grad training program
Integrated Security

Summary

Reduce vulnerability to emerging threats to critical infrastructure networks informed by public needs and policy. Address the impact of environmental, biological, and agricultural security on national and international security.
Integrated Security

Differentiators for Virginia Tech

- Critical infrastructure protection
- Cybersecurity technology, governance, and citizenship
- Defense technology, strategy, and policy
- Biological, environmental, and agricultural security
Intelligent Infrastructure and Human-Centered Communities

Create resilient human-centered communities with the mobility and communication systems that connect them, the power systems that energize them, and the built environments that house them in the presence of limited natural and economic resources, rapid population growth, and uncertain climates.
Intelligent Infrastructure and Human-Centered Communities

Differentiators for Virginia Tech

- Large-scale experimental test sites
- Socio-technical system simulation environment
- Connected and automated vehicles, safety, infrastructure
- Wireless and power electronics
- Human-centered building design and construction
- Service to the public, policy, and ethical implications
- Integrated environmental impact and climate
Resilient Earth Systems

Create practical solutions to pressing environment-society challenges in the presence of highly interconnected and rapidly changing global systems at the interfaces between ecosystems, food, water, energy, and health
Resilient Earth Systems

Differentiators for Virginia Tech

- Water quality and environmental sciences
- Host-pathogen-environment interactions and microbiomes
- Computational approaches in microbiology & ecosystem sciences
- Remote sensing, modeling, and forecasting of global processes
- Agriculture in response to pollution, bio-invasions, & climate change
- Coastal processes, biodiversity, and sustainable nanotechnology
- Six interdisciplinary graduate programs
Adaptive Brain and Behavior Across the Lifespan

Produce a clear dynamic picture of the brain to provide new scientific insights that enable treatments of disorders to improve human health across the lifespan
Adaptive Brain and Behavior Across the Lifespan

Differentiators for Virginia Tech

- Biomarkers that support dysfunctional behaviors
- Functional brain imaging of multiple interacting individuals
- Developmental health and aging from biology to sociology
- Animals as patients to study and treat disease
- Traumatic brain injury and recovery
- Therapeutics, drug discovery, and translation
- Implementation science and public policy/public opinion