VIRGINIA TECH INNOVATION CAMPUS

Where people, research, industry, and ideas collide to catalyze transformation in the high-tech sector

VIRGINIA TECH

A GLOBAL EPICENTER OF TECH EXCELLENCE & TALENT PRODUCTION,

WHERE PEOPLE, RESEARCH, INDUSTRY, & IDEAS COLLIDE TO CATALYZE TRANSFORMATION IN THE HIGH-TECH SECTOR

A PARTNER FOR IMPACT

VIRGINIA TECH

#5

Nationally in STEM degrees awarded

American Society of Engineering Education

#5

Top-rated engineering and computer science graduates

Wall Street Journal Recruiter

#13

Best engineering (includes computer science) under-graduate program

U.S. News & World Report

#26

Top Public University

Times Higher Education

OUR VISION

Transform and sustain Northern Virginia as the leading magnet for tech talent and innovation on the east coast through a new Innovation Campus designed to be highly responsive to the rapidly evolving high-tech sector – with room to grow, adapt, and evolve as the market changes

THE INNOVATION CAMPUS WILL:

- Develop leading programs in computer science, machine learning, artificial intelligence, technology policy, and data sciences that support rapid, collaborative, and real-world technological innovation
- At scale, deliver a robust tech talent ecosystem, including a pipeline of 750+ new master's graduates per year, 2,000 students on campus, and hundreds of thousands of square feet of space dedicated to partnerships
- Provide a platform for economic and global impact at the frontier of public and private innovation, with research and partnerships that keep pace with the digital revolution

WHAT THE INNOVATION CAMPUS WILL OFFER

A	**MARKET-DRIVEN CENTERS OF EDUCATION EXCELLENCE**	Deliver 1-year master's degrees and undergraduate programs in computer science, software engineering, and related disciplines with focus areas informed by Amazon and market demand	Integrating **experiential learning** with **industry engagement** and a **rigorous approach to curriculum design** to create **customizable, cutting-edge educational programs in high-demand areas**
B	**WORLD-CLASS FACULTY**	Build a home for dozens of new world-class tenure-line, research, and instructional faculty, as well as professors of practice from industry	Assembling **world-class, multidisciplinary faculty who** combine **distinctive teaching skills, prominent use-inspired research portfolios, and experience in technology commercialization**
C	**PRACTICAL, BREAKTHROUGH RESEARCH**	Invest strategically to build on VT's foundation of strong research to advance breakthrough, use-inspired research in frontier areas	Influencing policy and commercial adoption through close proximity and **deep programmatic ties to the federal science and technology agencies**
D	**COLLABORATIVE PARTNERS IN INNOVATION**	Foster new ideas, support scaling of start-ups, and collaborate with regional corporations to transfer technologies, further enhancing the academic and research programs that will be co-located on the Innovation Campus	Combining thoughtful **design of the physical space**, a suite of **programs and services that span the innovation continuum,** and targeted **industry partnerships** to support startup creation and growth
E	**COMMUNITY EXCHANGES**	Create open, flexible spaces and academic programs designed to break down traditional silos, strengthen diverse talent pipelines, and engage the community	Creating an **inclusive and diverse campus** and **engaging the broader community** beyond, including **K-12 schools, community colleges, and our 60K alumni** network in NOVA

A DISTINCTIVE VISION

THE INNOVATION CAMPUS WILL CREATE A ROBUST TALENT PIPELINE QUICKLY

	KEY FOCUS AREAS OF THE INNOVATION CAMPUS	OUR GOAL BY 2025 Incremental annual increase in NOVA	OUR ASPIRATION FOR 2035 Incremental annual increase in NOVA
TALENT PRODUCTION	NEW GRADUATES	+750 master's degrees +20 PhDs awarded	+1,500 master's degrees +40 PhDs awarded
	STUDENTS ON CAMPUS	+750 master's students +250 undergraduate students +125 PhD students	+1,500 master's students +1,000 undergraduate students +250 PhD students
INNOVATION & COMMERCIALIZATION	R&D EXPENDITURES	+$25M in R&D expenditures	+$75M in R&D expenditures
ECONOMIC GROWTH	NOVA REGIONAL PRESENCE	+45 faculty +$500M invested +1M square feet	+110 faculty +$1B invested +2M square feet

750 master's graduates per year represents a 29% increase[1] to Metro DC's strong computer science talent production

1 2,548 total master's degree graduates in computer and information sciences in Metro DC in 2016; IPES

MARKET-DRIVEN CURRICULUM AND DEGREES WILL BE OFFERED

LEVERAGING OUR STRENGTHS AND ASSETS TO PIONEER NEW LEARNING EXPERIENCES AND CLOSE KEY LABOR MARKET GAPS

High-tech sectors such as software engineering, digital and computer sciences, cybersecurity, and autonomy are being integrated into virtually every sector and revealing significant talent and R&D gaps. Professions of the future will require multi-disciplinary technical and soft skills to tackle the complexity of the challenges ahead. The Innovation Campus will retain best-in-class faculty working at the intersections, embed industry partners, and adapt programs and projects to allow discoveries, ideas, and partnerships to take root and spread.

1

FOCUS AREAS AND APPLICATIONS

With foundations in computer science, concentrations will include:

- Computational Sciences and Engineering
- Data Science, Analytics, and Collective Decisions
- Security and IoT
- Technology and Policy

2

INNOVATIVE APPROACH TO LEARNING

Programs will integrate new pedagogies including:

- Industry-influenced curriculum
- Test and demonstration projects
- Hackathons
- Immersive learning projects

3

COMBINE FOUNDATION + SPECIALIZATION

Campus will deliver curricula that leverage integrated industry-government-academic partnerships, and upskill the talent pool with core competencies matched with specializations and deep expertise

EXAMPLE: BLOCKCHAIN CURRICULA DEVELOPMENT – AN INDUSTRY COLLABORATION MODEL

Virginia Tech is committed to meeting the work-force needs of employers struggling to keep up with the digital age

When Block.one approached Virginia Tech with the need for additional computer science talent to support blockchain programming, Virginia Tech welcomed the opportunity to broaden our offerings and assist Block.one in creating a talent pipeline quickly

Through a gift of $3 million to the Department of Computer Science in spring of 2018, Block.one is supporting development and delivery of an undergraduate minor or concentration in blockchain development, boot camps, and/or a short course to launch within the same calendar year. As part of the collaboration, Dan Larimer, Block.one chief technology officer and blockchain pioneer, will advise the university on curricula development, including participation in live classroom sessions, seminars, and symposia

IN PARTNERSHIP WITH THE CITY OF ALEXANDRIA, THE CAMPUS WILL SERVE AS AN ENDURING COMMUNITY FIXTURE

~300K SQUARE FEET OF ACADEMIC SPACE, HOME TO CUTTING-EDGE R&D FACILITIES

~250K SQUARE FEET OF PARTNER SPACE, DEDICATED TO STARTUPS AND CORPORATE FACILITIES

~350K SQUARE FEET OF HOUSING SPACE FOR STUDENTS AND FACULTY

~100K SQUARE FEET OF RETAIL AND SUPPORT SPACES

GOALS & MILESTONES

2018
- Recruiting of students and faculty begins
- Location secured
- Programs designed

2019
- First 50 students start classes

2020

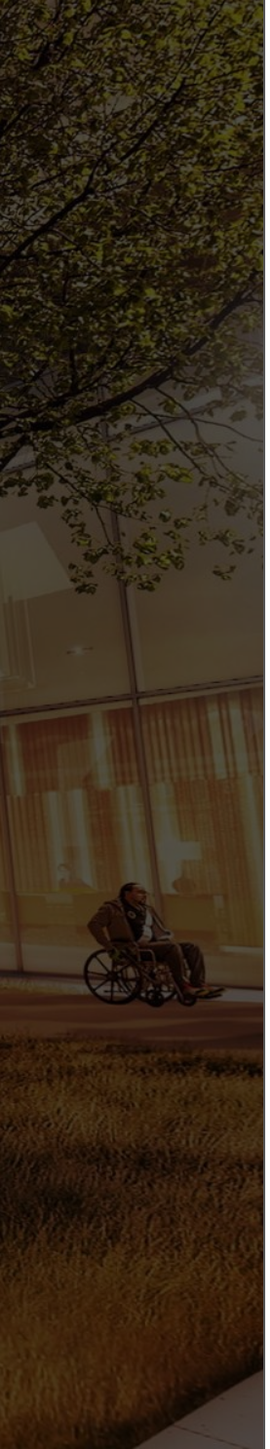
2021
- First 50 students graduate
- Anchor and naming gifts identified
- Ground breaks on permanent campus

2022
- Permanent 1M sq. ft campus operational

2023

2024
- 1000th MS student graduates

2025+
- Master's-level enrollment reaches 750+



THE CONSTRUCTION RAMP IS DESIGNED TO PRIORITIZE PRODUCTION OF DEGREES EARLY

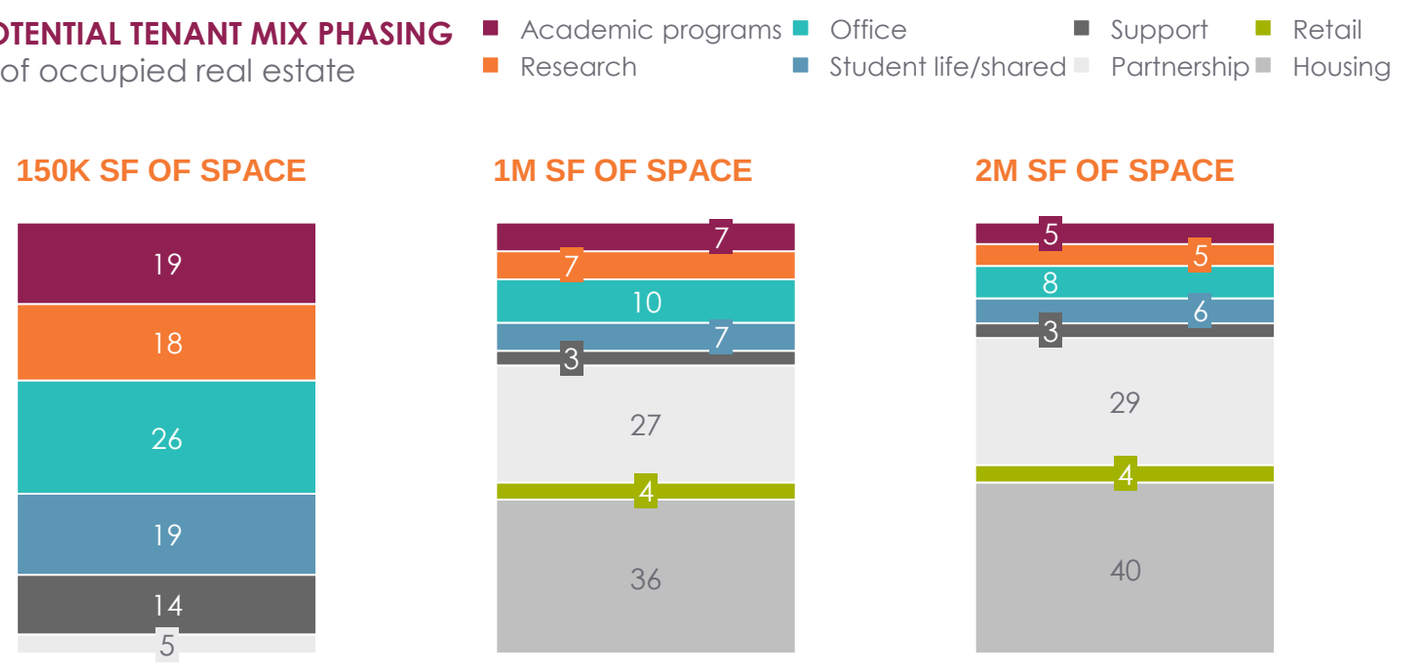
POTENTIAL FOR 2M SF OF SPACE

The site will be in Alexandria proximal to Amazon HQ NOVA and constructed over two growth phases, with a temporary space focused purely on academics to ensure that graduate degree enrollment begins almost immediately.

The first growth phase will focus on building out core academic functions to the level needed by Virginia Tech, while providing ample partnership space and ~350K square feet of housing. The aspiration for a second growth phase skews towards expanded partnership and housing areas, with the goal of supercharging the broader community feel of the campus.

POTENTIAL TENANT MIX PHASING

% of occupied real estate



TEMPORARY SPACE

Begin operations as early as possible, establishing a presence with academic space and initializing the talent pipeline

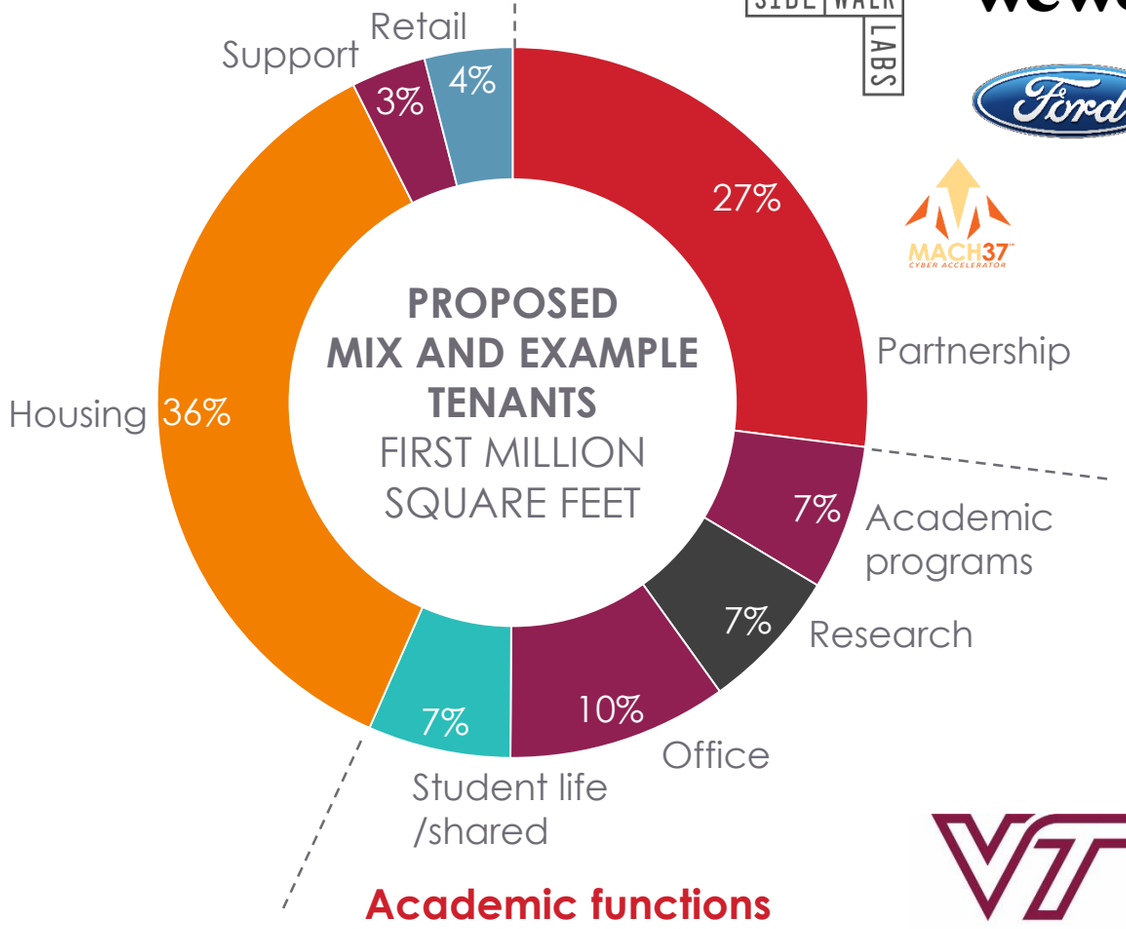
INITIAL COMMITMENT

Establish the permanent campus, scaling core activities such as academics and partnerships while bringing online new services, including retail and housing

POTENTIAL FUTURE DEVELOPMENT

Expand to enrich ecosystem, focusing on adding space for undergraduates, increasing partner space, and adding new housing

A MIX OF **STARTUPS, CORPORATES, & ACADEMIC** TENANTS CAN SUPPORT INNOVATION



Illustrative partners

BOEING · QUALCOMM · SIDEWALK LABS · wework · Ford · MACH37 CYBER ACCELERATOR

BALANCED USE OF SPACE

Across the first million square feet, the Innovation Campus will have a balanced portfolio of relevant assets spread across academic uses, partnerships, and housing

PARTNERSHIPS WILL CONTRIBUTE TO A THRIVING INNOVATION ECOSYSTEM

Partnerships will be a key tenet of the Innovation Campus, and collaboration will be the currency. For industry partners, we will support workforce and enterprise training needs, deliver sponsored programs, and license technologies to build pipelines. Our close proximity to and experience serving the federal government will support partnerships in and beyond campus grounds. Collaborations with other state and regional universities will bring critical scale and build opportunities for students, faculty, and partners.

Example tenants

1

CREATE SPACE FOR NASCENT IDEAS AND TEAM SCIENCE

Provide startup services, including networking events, dedicated lab and co-working spaces, formal accelerator programs, in-house advising, and legal counsel

wework

MC MASSCHALLENGE

2

SUPPORT STARTUPS IN THEIR PUSH TO SCALE

Expand our centers for industry partnerships and new ventures and take an active approach to collaboration and startup formation by working with faculty and students to transfer technologies

techstars

revolutiongrowth

3

FOSTER INTRAPRENEURSHIP AND CORPORATE INNOVATION

Share innovation and ideation spaces with large corporate partners focused on in-house innovation, tech teams, and pre-competitive research to support priority needs of industry and market-driven innovations

BOEING

Capital One

4

BUILD CONNECTIONS WITH OTHER RESEARCH AND TEACHING UNIVERSITIES

Assemble leading students and faculty from the region and around the world, building strategic connections with leading technology universities to foster valuable collaborations and collisions

GHENT UNIVERSITY

JOHNS HOPKINS UNIVERSITY

UNIVERSITY of VIRGINIA

NOVA Northern Virginia Community College

EXAMPLE: CORPORATE ENGAGEMENT OPPORTUNITIES

Virginia Tech has an extensive suite of corporate engagement opportunities that will be built into the very fabric of the Campus, from features and spaces to the programs and people.

Close to 15% of Virginia Tech research expenditures derive from industry-sponsored programs. Leading companies such as Lockheed Martin, Proctor & Gamble, Ford, General Motors, 3M, Intel, and Microsoft meet their R&D needs through sponsored programs, whether to solve near-term technical challenges or undertake long-range innovation development.

VT's **Link, the Center for Advancing Industry Partnerships** "connects great companies with great opportunities at Virginia Tech", offering a business-friendly, holistic approach.

DIVERSE CAMPUS WILL CREATE COMMUNITY CONNECTIONS

1. **Extend our reach beyond our walls** by offering K-12 partnerships to improve STEM education and pathways for community college graduates to succeed.
2. **Community college pathway programs** to enhance access with alternative paths to enroll students in STEM degrees.
3. **Create an inclusive and diverse campus**, helping fulfill our VT goals to enroll from underrepresented minorities and communities, and support employers in hiring from a broad base of talent.

REPLICATING SUCCESSFUL K-12 STEM PROGRAMS AT SCALE

- The Innovation Campus will offer space, resources, and expertise to support a full range of K-12 STEM program
- **The Qualcomm Thinkabit Lab** engages students from all cultural and socioeconomic backgrounds in unique STEM experiences, exposing students to STEM-related careers and providing educators an opportunity to observe best practices for teaching STEM
- In the two years since its creation, the Qualcomm Thinkabit Lab has supported:
  - Teacher visits: 1937
  - Student visits: 9230
  - Partnering schools: 175
  - Total Lab events: 1892
  - Total days of Lab activity: 481.

PARTNERING WITH COMMUNITY COLLEGES TO INCREASE ACCESS

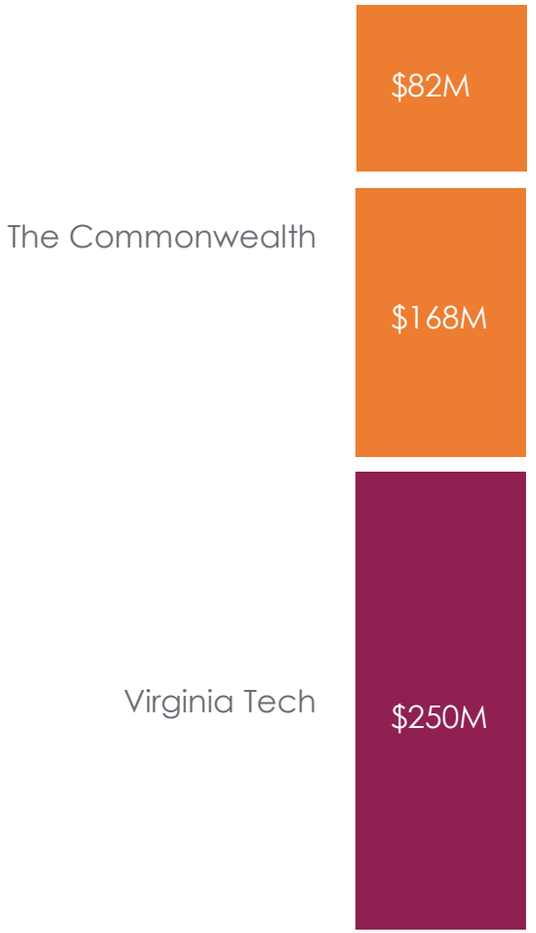
- Consistent with our land grant mission and commitment to service, Virginia Tech offers a range of pathway programs from local and state community colleges
- **VT-NETS** is a recent collaboration among Virginia Tech, Virginia Western Community College, and Northern Virginia Community College to enhance pathways from partner community colleges to Virginia Tech's College of Engineering. Once accepted, students receive faculty mentoring, gain support from a cohort of their peers, undertake professional development, and visit the Virginia Tech campus

COMMITTING TO DIVERSITY AND INCLUSION AT VIRGINIA TECH

- **InclusiveVT** is Virginia Tech's strategic imperative to improve diversity and inclusion as well as an institutional commitment to **double** underrepresented minority enrollment by 2022
- The **College Access Collaborative** has recently been launched to strengthen Virginia Tech's connections with key high schools in Virginia. Since its launch in 2016, Virginia Tech has partnered with 15 high schools to attract students who are historically underrepresented at four-year universities

WE PLAN TO REPLICATE THE SUCCESSFUL K-12 AND COMMUNITY COLLEGE PARTNERSHIPS – IDEALLY CO-LOCATING WITH THESE EDUCATION PARTNERS AT THE INNOVATION CAMPUS

VIRGINIA TECH WILL MATCH CONTRIBUTIONS FROM THE STATE FOR A TOTAL OF $500M; DAY-TO-DAY OPERATIONS EXPECTED TO GENERATE POSITIVE CASHFLOW



STATE & VT COMMITMENTS

The state has approved $82M in operating expenditures for the Innovation Campus

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The state has approved $168M in capital expenditures for the Innovation Campus

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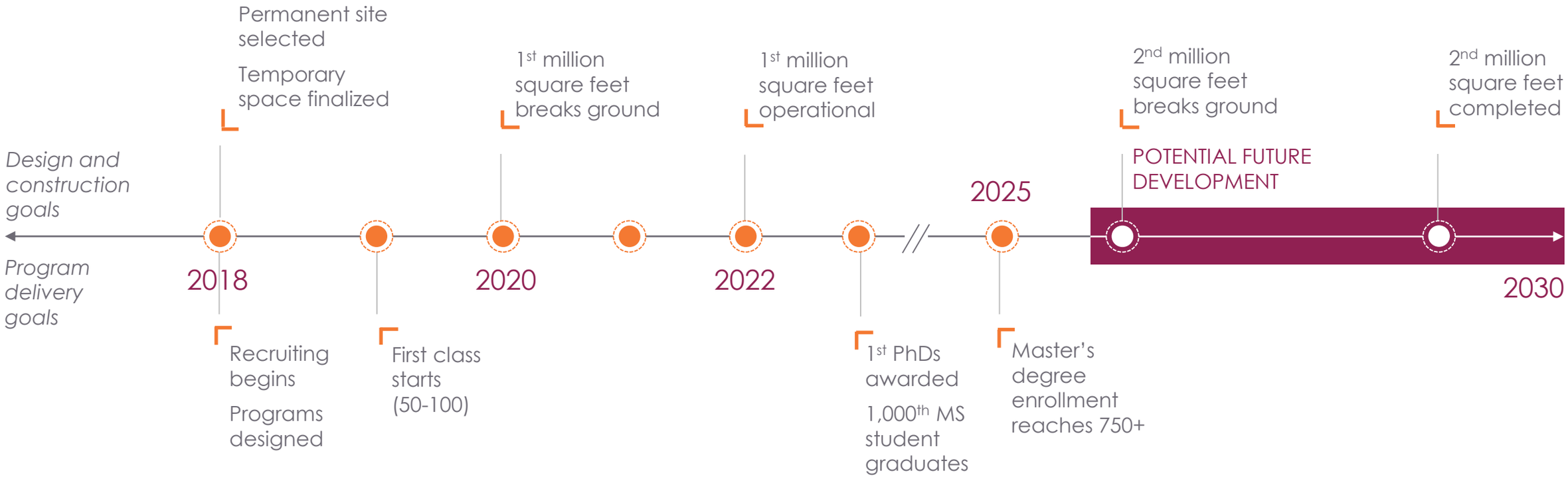
Major capital sources for Virginia Tech to raise the $250M it has committed include:

- Philanthropy
- Non E&G revenue
- Developer contributions
- Extramural research revenue

In addition to commitments above made over a 20 year timeline, additional funding will likely be required to complete the Innovation Campus, and will be raised through at least four sources:

- Private sector investment in return for ownership and revenues generated from commercial or residential spaces
- Site specific incentives from localities and the Commonwealth
- Additional fundraising efforts above and beyond the $250m Virginia Tech has committed
- Debt issuance

A BLUEPRINT FOR THE FUTURE: KEY MILESTONES REFLECT SCALE AND PROGRESS



THE CAMPUS WILL DELIVER BROAD-BASED BENEFITS

WORKFORCE

- Access to an array of program formats and offerings, including master's and doctoral degrees
- Experiential learning in connection with industry, main campus, and partners
- New professional opportunities through exposure to multi-disciplinary curricula designed to broaden marketable skills

INDUSTRY AND GOVERNMENT

- Programs that anticipate professions of the future (e.g., artificial intelligence and machine learning)
- Access to expanded talent pipeline within key high-tech fields (e.g., computer sciences. data analytics. cybersecurity autonomy)
- Access to R&D capabilities and expertise

STATE & BEYOND

- Higher-paying and new jobs
- Increased investment capital, start-ups and new enterprises
- Focus on use-inspired projects and start-ups, streamlining pathways for impact
- Critical density and proximity of key players to support opportunistic collisions and full spectrum of partnerships

VIRGINIA TECH BRINGS STRENGTHS AND ASSETS TO ANCHOR AN INNOVATION DISTRICT IN NORTHERN VIRGINIA

VT is the fifth largest producer of undergraduate STEM talent; with this investment, VT is building a campus capable of responding rapidly to market needs

VT has made **considerable strategic investments in northern Virginia**, establishing deep roots and strong foundations in NOVA and across the state

VT has a strong track record of transformation through **large-scale public-private partnerships** that have revitalized local communities and promoted economic development

Undergraduate degrees in engineering

1.	Georgia Institute of Technology	2,140
2.	Univ. of Illinois, Urbana-Champaign	1,732
3.	Purdue University	1,684
4.	Pennsylvania State University	1,547
5.	**VIRGINIA TECH**	**1,422**
6.	Texas A&M< University	1,376
7.	Iowa State University	1,315
8.	Arizona State University	1,308
9.	North Carolina State university	1,296
10.	University of California, Berkeley	1,273
11.	The Ohio State University	1,268
12.	University of Michigan	1,266
13.	The University of Texas at Austin	1,207
14.	University of Florida	1,102
15.	California Polytechnic State Univ.	1,060
16.	Univ. of Maryland, College Park	1,011
17.	University of California, San Diego	976
18.	University of Central Florida	966
19.	Missouri Univ. of Science & Tech	932
20.	Colorado School of Mines	910
21.	Drexel University	865
22.	Rutgers University	839
23.	Clemson University	827
24.	University of Wisconsin-Madison	826
25.	University of Washington	805
26.	Univ. of Minnesota, Twin Cities	709