
VIRGINIA
TECH
150
1872-2022

Utilities Master Plan

STAKEHOLDER INTRODUCTION MEETING
OCTOBER 24TH, 2022

INN AT VIRGINIA TECH

VIRGINIA TECH | 150

Today's Town Hall Outline

- **Opening Remarks - Charge to the group and Importance of the UMP Project**
  Dr. Christopher H. Kiwus, PE, PhD, VP for Capital Planning, Infrastructure, & Facilities.

- **Project Structure** - *Ms. Mary-Ann Ibeziako, AVP Infrastructure & Chief Sustainability Officer*
- **Project Team & Stakeholder Engagement** - *Mr. Matt Stolte, PE, Engineering Services Director*

- **Overview, Approach & Preliminary Schedule** - *Mr. Mark Atkinson, PE Wiley & Wilson*

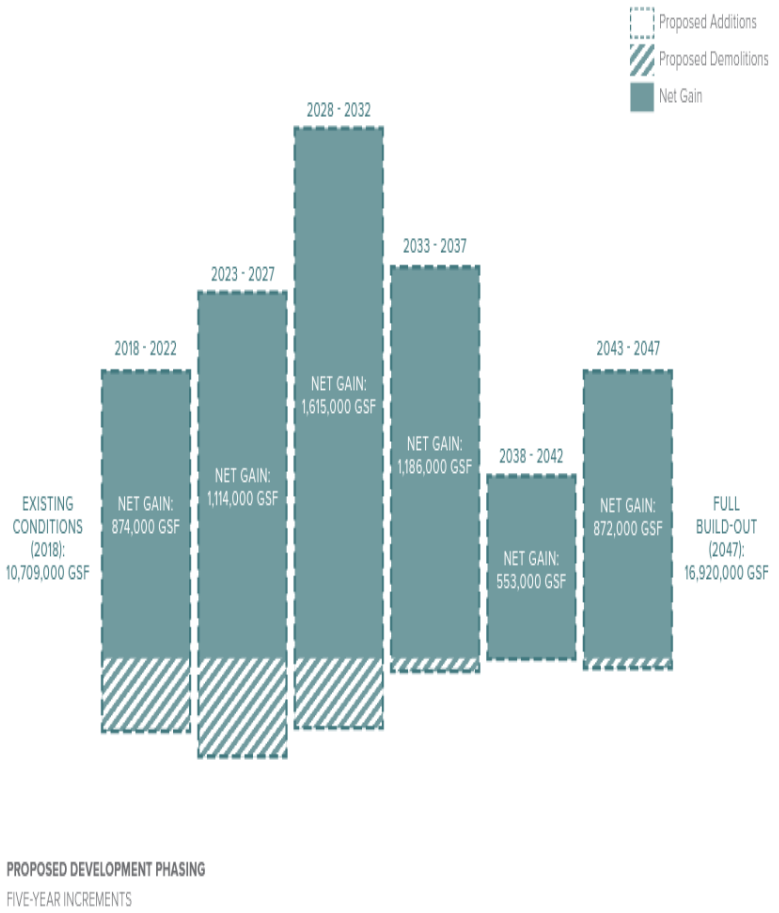
- **Next Steps - Questions & Answers** - *Mr. Matt Stolte, PE, Engineering Services*

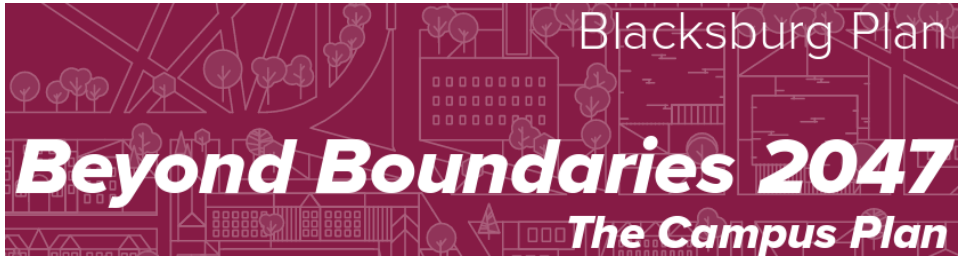
Utility Master Plan Project

- *This project accompanies the efforts and resources that the University has previously invested in to grow the influence of Virginia Tech in a Visionary and Sustainable fashion.*

Campus Vision - 2047

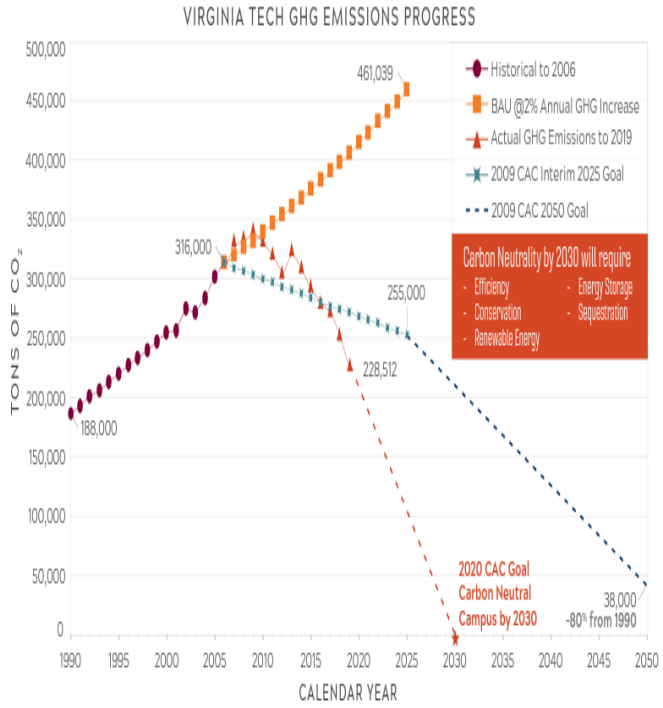
- *Increased number of undergraduates across campuses*
- *Building GSF increased 58% (16.9M at buildout)*
- *Districts & Hubs - Mixed Uses*
- *Pedestrian mobility, mass transit, autos to perimeters*
- *Watershed impacts - flood plain/TMDL, water & sewer*
- *Landscapes/Green Infrastructure/Heat effects*
- *Thermal & Electrical systems for the future*
- *Sustainability themes to meet CAC*





Climate Action Commitments - 2050

- *Reduction of 2006 CO2 levels (316,000 tons)*
- *Convert Power sources from Coal to Natural Gas*
- *Decrease Building energy & thermal demands*
- *Increase efficiency with Waste/Transportation/land use*
- *Increase Renewable Electricity/Storage/Sequestration*
- *Better 10 year Energy Management Planning*
- *Signature Net-Zero Energy Building/Solar Photo voltaics*
- *Fossil fuel free campus*



Campus Utility Systems

The University Operates and Maintains:

- *Co-generation Power Plant (Electricity & Steam Generation)*
- *Central Compressed Air Utility*
- *Central Domestic Hot Water*
- *Electric Distribution Infrastructure*
- *Central Chilled Water Plants*
- *Back-up diesel generators*
- *Air Handling and HVAC Systems*
- *Stormwater BMP's*
- *Associated Distribution Systems Required to Transport Utility Services*
  - *Central Utilities Listed Above*
  - *Potable Water, Sanitary Sewage, and Storm Water*

UMP - Bridges 2047 Plan & CAC

- *In 2018, Virginia Tech completed its most recent master planning effort resulting in 'Beyond Boundaries 2047: The Campus Plan.'*
- *In 2020, Virginia Tech finalized its Climate Action Commitment, setting goals and Milestones thru 2050.*
- *The 2022 Utility Master Plan project will provide the Road Map to align campus wide utility systems with the Beyond Boundaries development plan and the CAC sustainability goals.*

Utility Master Plan 4 Phases (1 & 2)

- *Phase -1: Assess existing capacity and condition of utility systems to meet Current Levels of Service - (Primary Partners input)*
  - *Engage Utilities to capture & compile existing data*
  - *Field Investigate Critical Features & Attributes*
  - *Evaluate Risk for Current Operations*
  - *Identify Operational/Maintenance/Capital options*
  - *Existing conditions report for review*
- *Phase-2: Evaluate utility needs for 2047 Plan & CAC*
  - *Engage the OUP and CASE Partners for latest plans*
  - *Determine future capacity and condition for utilities*

Utility Systems

- Electrical
- Chillers
- Steam
- Communications
- Potable water
- Wastewater
- Stormwater

Utility Master Plan Phases (3 & 4)

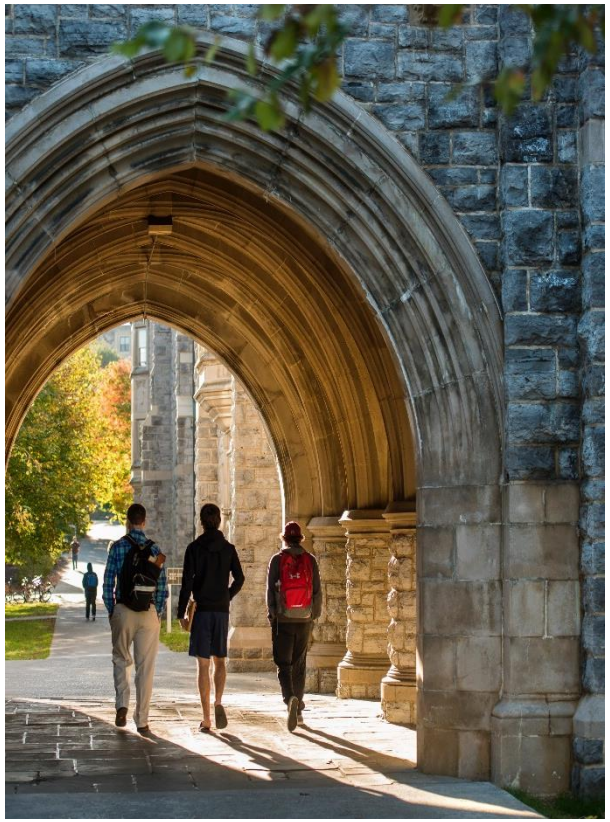
- *Phase -3: Identify specific strategies, projects and programs for utility systems to meet the Future Levels of Service -*
  - *Develop Operational/Maintenance/Capital options*
  - *Provide evaluation of system risks*
  - *Identify performance, sustainability and resilient metrics.*
  - *Evaluate capital improvements to align with CapCon 6yr, 10yr, and 2047 capital planning intervals.*
- *Phase-4: Compilation of Final Utility Plan*
  - *Inclusion of Stakeholder feed back*
  - *Structure for continual Utility Evaluation & Programing*

Utility Systems

- Electrical
- Chillers
- Steam
- Communications
- Potable water
- Wastewater
- Stormwater

Expected Benefits & Outcomes

- *Stakeholder collaboration campus wide on a regularly scheduled and reoccurring basis throughout the project.*
- *Development of a Asset Management centric program to evaluate the Capacity and Condition of major utilities.*
- *Development of a methodology to prioritize service level risks regarding systems performance, sustainability and resilience.*
- *Prioritize projects to align with existing capital & renewal programs (MR fund, 6yr & 10yr capital planning programs)*
- *Programmatic structure embedded into a CPIF strategy for utility planning process that can be used into the future.*



Project Management & Stakeholders

- *Engineering Services - manages the project and Consultant for VT*
- *Three Groups of Stakeholder are vital to Project*

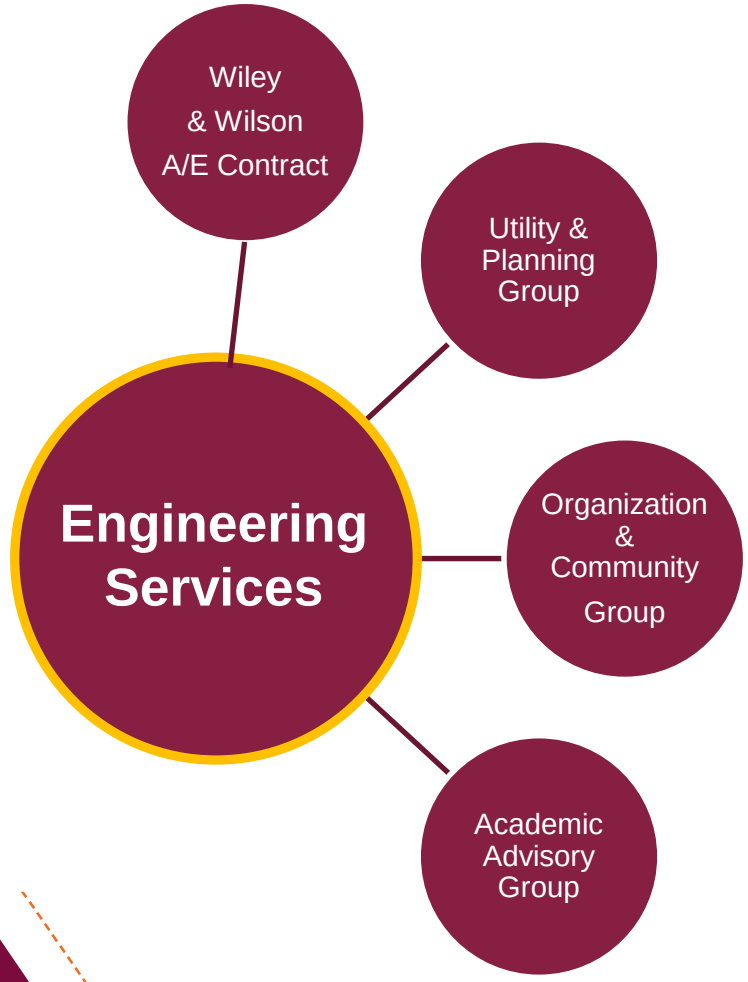
  Group -1 : Utility and Planning

  - *Engineering Services - Sector Project Managers*
  - *Utility Enterprises*
  - *Strategic Planners*

  Group-2 : Organization & Community

  Group-3 : Academic Advisory

Engineering Services



- *Project Owner - Mary-Ann Ibeziako, CSO, AVP Infrastructure*
- *Project Manager - Matt Stolte PE, Director*
- *Project Sector Managers*
  - *Lowell Jessee, PE- Mechanical & Thermal Systems*
  - *Robert Bopp, PE- Electrical Systems*
  - *Chuck Dietz PE- Stormwater*
  - *Mark Witt PE- Telecom and Municipal Infrastructure*
  - *Adam Krantz LS - Piping Infrastructure*
  - *Mike Ryba - Geographical Information Systems*

Utilities & Planning

- *Bobby Polly - Buried Utilities*
- *Scott Hebdon - VT Elec. Services*
- *Todd Robertson - Central Steam Plant*
- *Jason Pearman - ICM*
- *Chris Tedder - Central Chillers Plant*
- *Ron Keller - NI&S*
- *Liza Morris, AIA, Campus Plan 2047*
- *Stephen Durfee, CEM - Energy Manager*
- *Nathan King - Sustainability*
- *Jack Leff - Climate Action Commitment*
- *Paul Ely - Capital Construction*
- *Open Position - Assistant AVP & Utilities Director.*

Organization & Community

- Facilities Ops – Wendy Halsey PE, AVP Facility Operations.
- Facilities – Anthony Watson
- Finance – Travis Hundley
- Grounds – Matt Gart
- Arborist – Jamie King
- Analytics & Acct – Gannon Davis
- Division of Student Affairs – Frances Keene, Ken Belcher
- Athletics – Tom Gabbard
- Research & Innovation – Laurel Miner
- Enterprise & Business Services – Lynsay Belshe
- Information Technology – Ken McCrery
- Real Estate – Heidi Myers
- College of Agriculture and Life Sciences – Patrick Hilt
- College of Engineering – Dr. Ed Nelson, PhD, PE
- The Inn – Bob Muse
- BVPISA – Micheal Vaught
- NRVWA – Caleb Taylor, PE
- University Relations – Alexa Briehl
- Town of Blacksburg – Steve Ross, Office of Town Manager

Academic Advisory

- *Electrical and Computer Engineering - Dr. Luke Lester, Ph.D.*
- *Civil & Environmental Engineering -Dr. Mark Widdowson, Ph.D.*
- *Mechanical Engineering - Dr. Azim Eskandarian, Ph.D.*
- *College Natural Resources and Environment - Dr. Paul Winistorfer, Ph.D.*
- *College Architecture and Urban Studies - Dr. Rosemary Bliesznер, Ph.D.*
- *Electrical and Computer Engineering - Dr. Dushan Boroyevich, Ph.D.*
- *Electrical and Computer Engineering - Dr. Chen-Ching Liu, Ph.D.*
- *Materials Science and Engineering - Dr. Sean McGinnis, Ph.D.*
- *Community Representative - Dr. Tamim Younos Ph.D.*
- *VT SWIM Center - Dr. Sunil Sinha, Ph.D.*

Participation Request 18-24months

- *Engineering Services - manages project and Consultant for VT*
- *Three Groups of Stakeholder Varied Time Commitment*

<u>Group -1 : Utility and Planning</u>

2-4 hours/week - Data collection and field presence

monthly one hour Stakeholder update - Teams/Zoom

3 to 4 - ½ day workshops

<u>Group-2 & 3 : Organization/Community & Academic Advisory</u>

A monthly one hour Stakeholder update - Teams/Zoom

3 to 4 - ½ day workshops

Scope Overview & Approach

VIRGINIA TECH

Utilities Included in Master Planning

- *Thermal Systems - Steam, Chilled Water*
- *Civil Utilities - Sanitary Sewer, Storm Water, Potable Water, Domestic Hot Water*
- *Electrical Utilities - VTES Campus Distribution*
- *Technology Systems - NI&S Outside Plant (Data/Telecom Infrastructure)*

Approach

Listen & Plan
01

- ❑ Project Kickoff
- ❑ Stakeholder engagement & collaboration
- ❑ Set key performance indicators

Collaborative Workshop
02

- ❑ Initial workshops
- ❑ Collaboration meetings and preliminary decision making

Data Collection
03

- ❑ Field inspection of utilities systems
- ❑ Documentation of systems and updates to drawings and GIS
- ❑ Development of current state utilities models

Existing Conditions Reporting
04

- ❑ Interim Report
- ❑ Existing conditions presentation

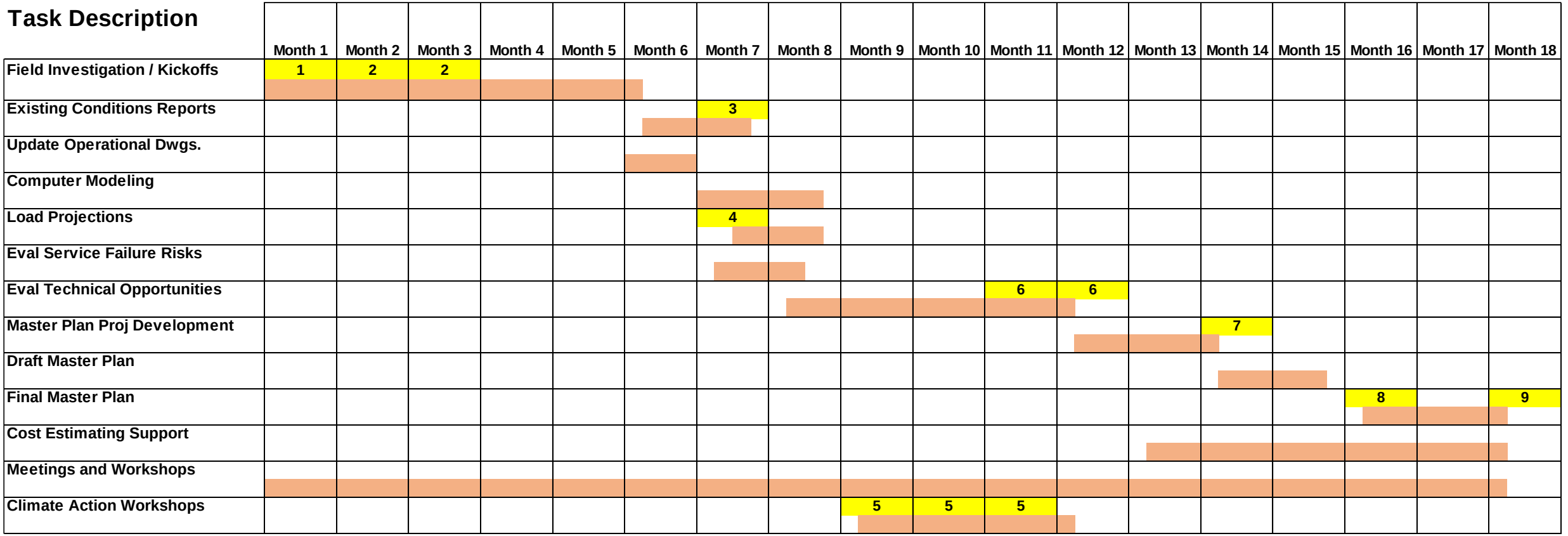
Approach

Determine Future Needs 05	Investigate Technologies 06	Develop Alternatives 07	Final Project Vetting & Selection 08	Master Plan Reporting 09
❑ University Master Plan Briefing ❑ University Metering and records, metric-based estimation ❑ Vet load assumptions	❑ Innovative technologies workshop ❑ Climate Action Commitment workshops	❑ Development of potential projects and implementation horizons ❑ Alternatives workshop to select potential UMP upgrades, project cost est.	❑ Detailed analysis and cost estimating development of project templates ❑ Final stakeholder workshops	❑ Final project definitions and cost opinions ❑ Graphically-driven core Master Plan ❑ Draft Report and Presentation ❑ Final Report and Presentation to Admin.

Major Meetings & Workshops

Meeting / Workshop	Duration	Attendees	Scope
Project Kickoff	½ Day	VT Stakeholders – all utilities	Introductions, Logistics, Field Work Planning
Existing Conditions Workshop (Preliminary)	½ Day	VT Stakeholders – All Utilities	Review existing utilities conditions
30% Review Meeting	2 Hours	VT Stakeholders – All Utilities	Review Existing Conditions Report
VT Master Plan 2047 Review Workshop	½ Day	Technical VT stakeholders	Understand 2047 VT Master Plan impacts on infrastructure
Climate Action Workshop #1 - Decarbonizing	2 Hours	VT Stakeholders – All Utilities, Selected VT community members	Strategies for moving away from fossil fuel technologies on campus
Climate Action Workshop #2 – Air Emissions	2 Hours	VT Stakeholders – All Utilities, Selected VT community members	Mitigation of air emissions through on campus and off campus actions
Climate Action Workshop #3 – Measures of Success	2 Hours	VT Stakeholders – All Utilities, Selected VT community members	Discussions of what milestones achievements indicate success in fulfilling the Climate Action Commitment
Initial Project Development Workshop	½ Day	Technical VT stakeholders	Collaborative session to brainstorm an initial slate of Master Plan projects
Concept Vetting Workshop (60%)	½ Day	VT Stakeholders – All Utilities	Collaborative session to narrow the list of projects to those that will be included in the final plan
90% Review Meeting	2 Hours	VT Stakeholders – All Utilities	Review of the initial report draft and solicitation of input and comments
100% Plan Presentation	2 Hours	VT Stakeholders – All Utilities	Formal presentation to Administration

Preliminary Schedule



1) Project Kickoff Meetings
2) Existing Conditions Workshops (Prelim)
3) 30% Review Meeting
4) Master Plan 2047 Review
5) Climate Action Workshops
6) Project Development Workshops
7) Concept Vetting Workshops
8) 90% Review Meeting
9) 100% Plan Presentation

VIRGINIA TECH 150

Next Steps

VIRGINIA TECH | 150

Moving Forward

- *Final Consultant Contract - December, 2022*
- *Project Schedule Updated.*
- *Electronic Project Website setup.*
- *Monthly Stakeholder meetings and workshops to be Scheduled in advance.*
- *Mid-summer to fall 2023 field work done.*

Looking Ahead – Phase completion

- *Phase -1: Assess existing capacity and condition of utility systems.*

  Fall 2023

- *Phase-2: Evaluate utility needs for 2047 Plan & CAC*

  Winter 2023

- *Phase -3: Identify specific strategies, projects and programs*

  Spring 2024

- *Phase-4: Compilation of Final Utility Plan*

  Fall 2024

Discussion or Questions

Matt Stolte, PE Director, Engineering Services

Virginia Tech | Campus Planning, Infrastructure, and Facilities
230 Sterrett Drive, Office 71B
Blacksburg, VA 24061
540-231-3939 (o) | mstolte@vt.edu