University of Maryland sustainability council

Meeting Summary
April 29, 2024

**Council Members Present: (via Zoom):**

Carlo Colella – Vice President for Administration (Chair)
Scott Lupin – Assoc Dir., Environmental Safety, Sustainability & Risk; Director, Office of Sustainability
Bryan Quinn – Director of Technical Operation, Department of Electrical & Computer Engineering
Maureen Kotlas – Executive Director, Environmental Safety, Sustainability & Risk
Tom McMullen – Special Assistant to the Provost for Facilities
Colleen Wright-Riva – Assistant Vice President, Division of Student Affairs
Mark Addy – Executive Director, Systems and Networking, Division of Information Technology
Susan Corry – Director, Engineering & Energy
Yueming Lucy Qiu – Prof & Assoc Dean • PLCY-School of Public
Margaret Mothershed – Undergraduate Student Representative
Paromita Basak – Graduate Student Representative

**Guests Present:**

Kris Phillips – Director • VPA-FM-P&C-Facilities Planning
Charles Robert Reuning – Assoc VP & Chief Fac Officer • VPA-FM-AVP
Aynsley Toews – Spec Asst to Assoc VP • VPA-FM-AVP
Sally De Leon – Manager, Department of Environmental Safety Sustainability & Risk



Meeting Highlights

**Welcome 1:02PM**

**Revisions to CAP 3.0**
The discussion started with questions from some council members regarding the CAP's local to global framework which were addressed by Sally De Leon. Sally also worked with Marc to add language about Information Technology as a future strategy. Other edits were made to the education and research section regarding new programs. Approval was obtained from the council to move forward with finalizing CAP 3.O and create a communications strategy. Carlo motioned to approve Scott and Colleen second. It was a Unanimous Yes.

**Campus Facilities Plan**

Kris Phillips provided a comprehensive review of the campus facilities plan and its sustainability aspects. The facilities plan included three phases:

- **Phase 1:** Assessment Phase

  This phase included a space needs assessment, a review of other campus plans, condition analysis, community feedback sessions, development of guiding principles, and design drivers.

- **Phase 2:** Draft Plan Development

  This phase included the creating a draft plan, campus wide frameworks, and district frameworks

- **Phase 3:** Final Campus Facilities Plan Draft

During their planning process certain themes became apparent. They consistently heard comments regarding limited land to accommodate long term growth, Our land is at a premium, Topography is a big issue on campus, and accessibility for people with disabilities is a big concern. There were also comments regarding proximity of research and academic spaces and that it's difficult to move around campus.

Kris and his team assessed existing building conditions, campus space needs, and flood zones.

As they began planning, they asked how they could get research and academics the space that they need to do the work that they do. They developed these guiding principles: High Impact Campus environment, Holistic Place Making, People First Mobility, Sustainable Stewardship and Investment.

Sustainable stewardship and investment are infused naturally into all aspects of the plan but they did think it was important to highlight it separately. Some project considerations include:

- N zero building design, Zupnik Hall
- AgroEcology corridor
- Low Impact development
- Resilient stormwater landscapes.

However, there are utilities and infrastructure challenges

- Long term campus development
- Achieve zero carbon goals
- Addressing inefficient steam infrastructure
- Addressing electric infrastructure vulnerability and imminent capacity limitations

After the presentation there were a few questions from the council regarding the timeframe of some of the proposed projects, plans for parking lots, and worker safety. All questions were addressed, and Kris was commended for the work that has been put into the plan.

**Next Gen Energy Program:**

Carlo introduced Charles Rober Reuning who presented on Next Gen. He covered the following topics in his presentation.

- Why are we engaged in next gen:
  - The current system is showing wear and tear.
  - A lot of the parts needed for our system are no longer made
  - Our steam distribution system needs repairs as you can see around campus.
  - We've reached capacity with the chill water system
  - No question our current system is currently wasting resources. Next Gen is the aggressive and sustainable answer to energize our campus
- what's at stake:
  - Disruption to campus operations
  - Money spent on repairs
  - Wanted energy, results in higher carbon footprint
  - Nextgen will protect us against energy disruptions
- NextGen is supported by President Pines with his commitment to being fossil fuel free by 2035

- Next Gen Timeline
    - Support co-generation based on industry feedback
    - In 2022 based on feedback and cost they reduced the size of what was originally proposed by 50%
    - In 2024 obtained approval from BOR and is now seeking approval from BPW.
- Procurement update
    - MD Energy impact partners have been selected as our partners
    - Next step is getting board of public works approval
- NextGen will
    - update aging distribution system
    - Honeywell will be maintaining and updating the system
    - Replace critical infrastructure to make our campus more energy efficient
    - Multiple paths to carbon neutrality by 2025 and a fossil fuel free energy system by 2035.
- Aligned with State of Maryland's Climate Goals

The presentation was followed by questions from the council regarding concerns if the Board of public works doesn't approve? They explained that it was very unlikely. Carlo thanked everyone for their accomplishments and mentioned that Jennifer Hadden and Giovanni would be rotating off the council. He gave a special thanks to Margaret and Paromita as the student representatives for this year.

**Open Forum**

*Adjourn 2:48PM*

**Appendices:**

*Appendix A:* ***Campus Facilities Plan Slides***

*Appendix B:* ***Next Gen Slides***

# Campus Facilities Plan

Sustainability Council, 2024

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FEARLESSLY FORWARD

# UMD Today

1,340-Acre
College Park
Campus

15.3M
Gross Square Feet
Campus Facilities

252
Buildings
On Main Campus

14,505
Faculty and Staff
Members

40,792
Headcount
Enrollment

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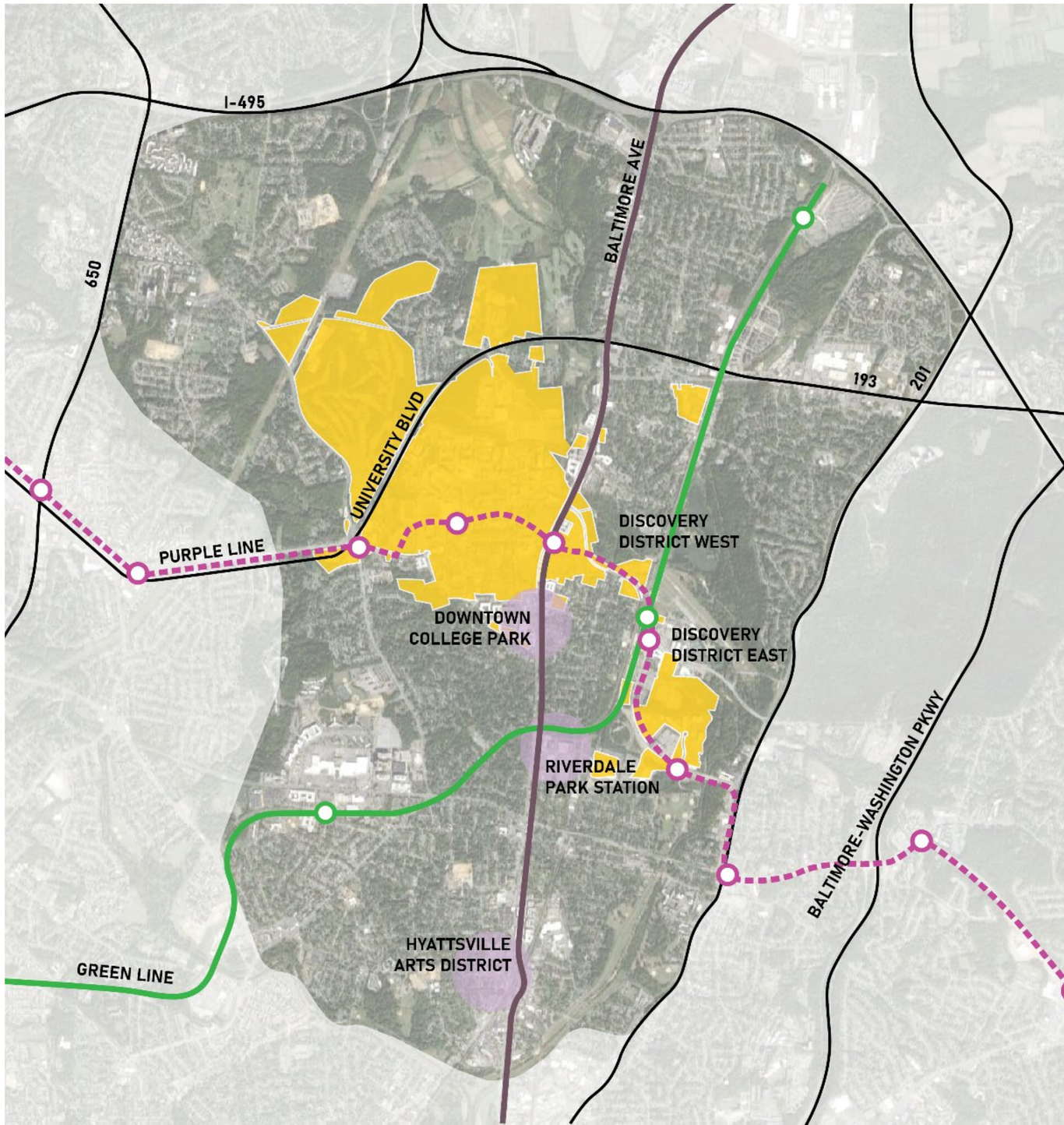
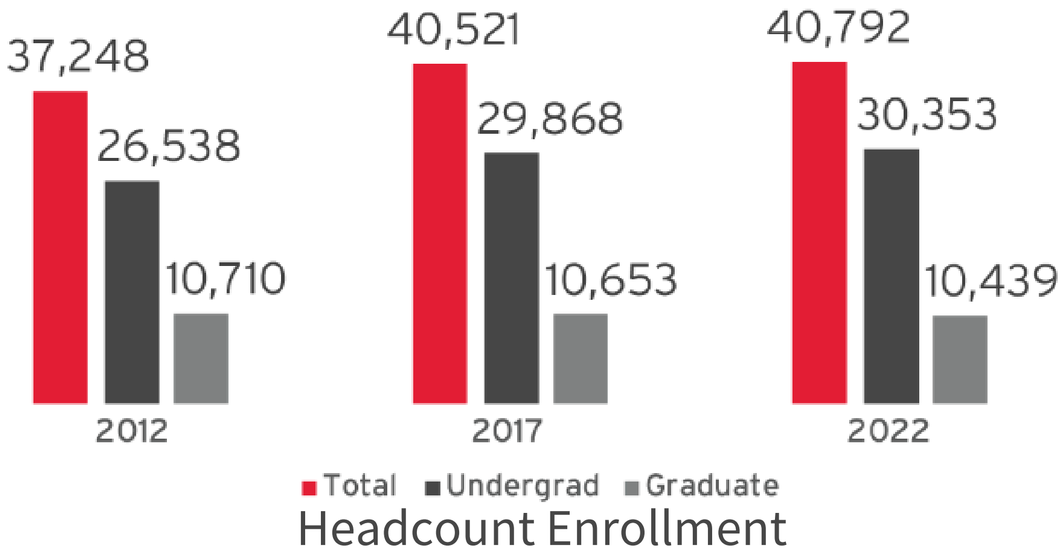


# UMD Today




Headcount Enrollment


Total Research Awards

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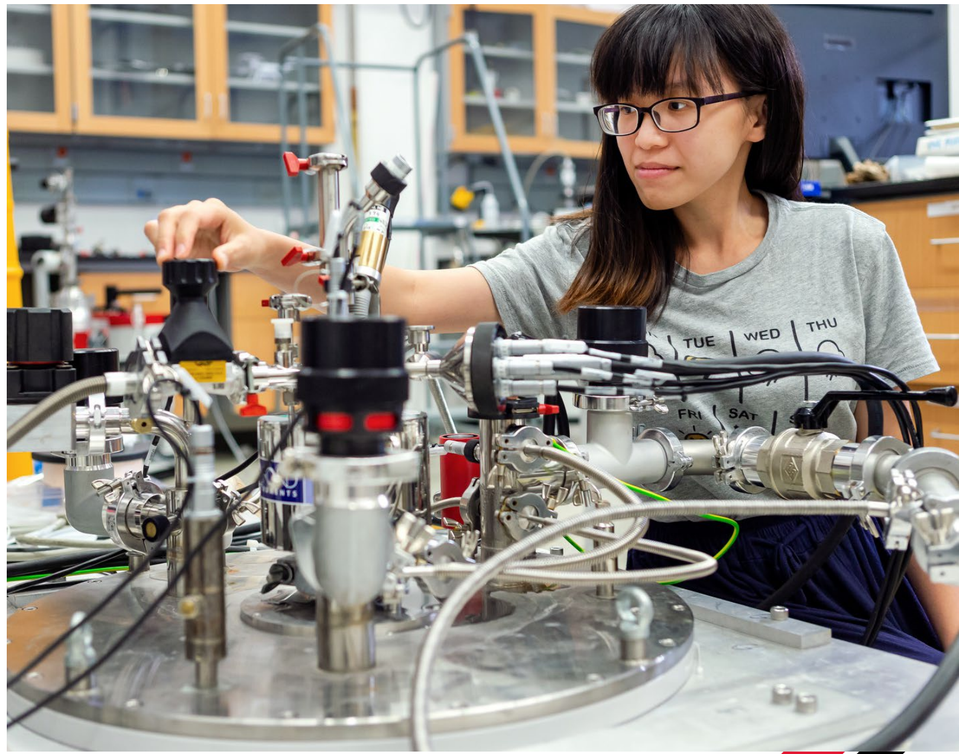

# UMD Today

- UMD Annual Economic Impact for the State of Maryland: $3.7 Billion
- U.S. News & World Report - 19th among US Public Institutions.
- Forbes America’s Top College– 13th among public universities
- Fall 2022 Applied & Enrolled
  - 56,766 applicants / 4,742 enrolled
- Forbes America's Best Employers By State - (NASA is ranked #1 in the state.) UMD ranks #7 in the State of Maryland.

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# The Planning Process


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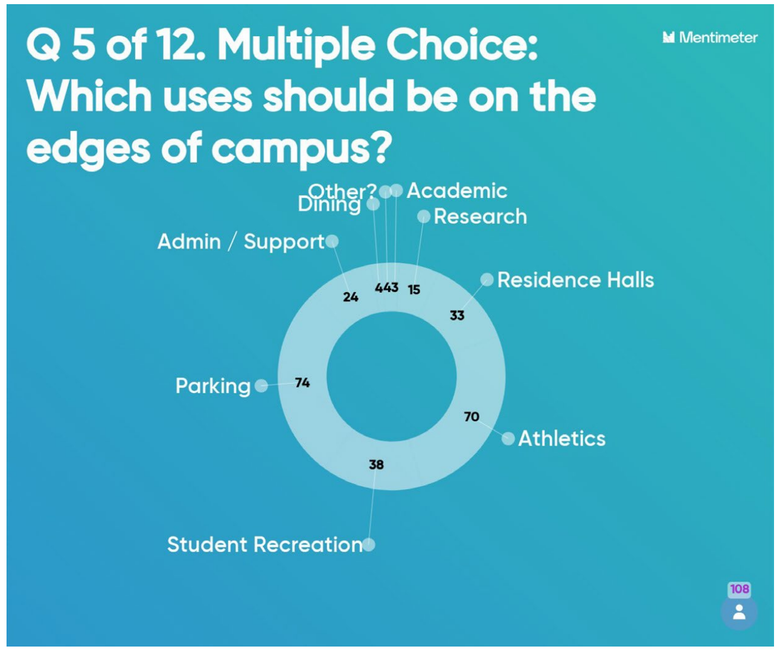
# Outreach and Engagement Process





Project Website

Campus Tours

Focus Groups

Virtual Webinars

Online Survey

MAPP Design Charrette

Live Polling

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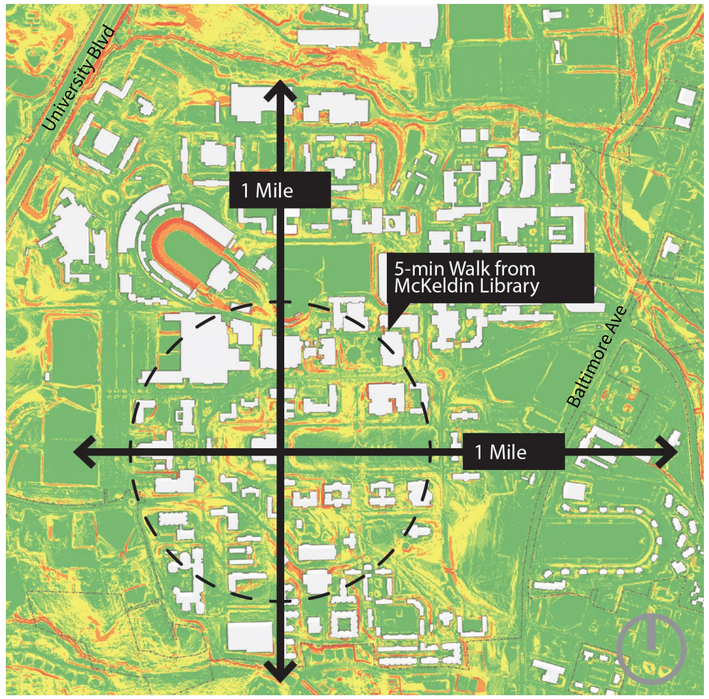
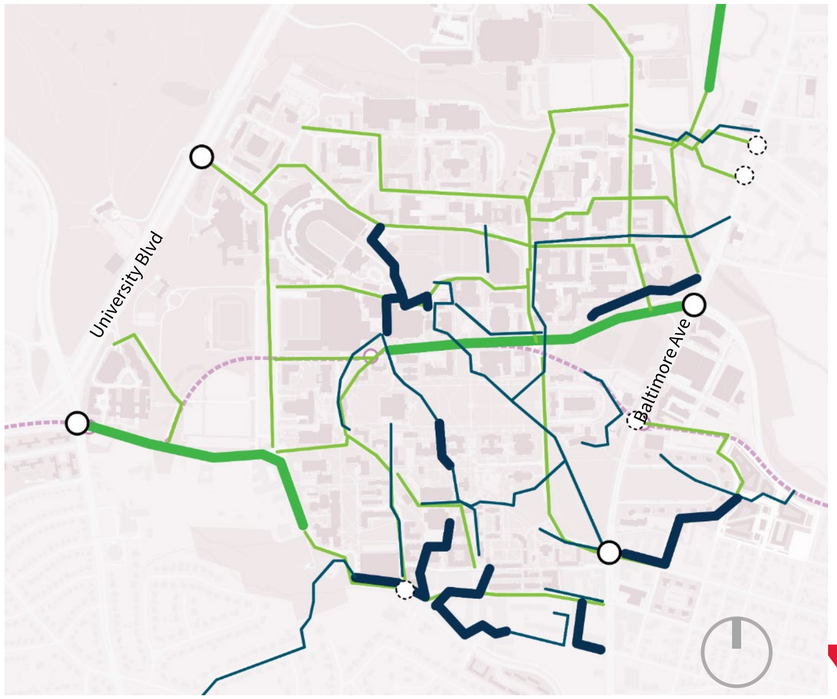
# What We Heard

- Limited land available to accommodate long-term growth
- Topography challenges for both circulation and ADA accessibility
- Several districts lack accessible open spaces
- Leverage the Purple Line to enhance campus connectivity
- Geographic location and proximity of academic and research spaces are critical for collaboration and student success.
- Update outdated classrooms, instructional labs, and research space in older buildings
- Lack of study and collaboration space in older buildings

Campus Open Forum



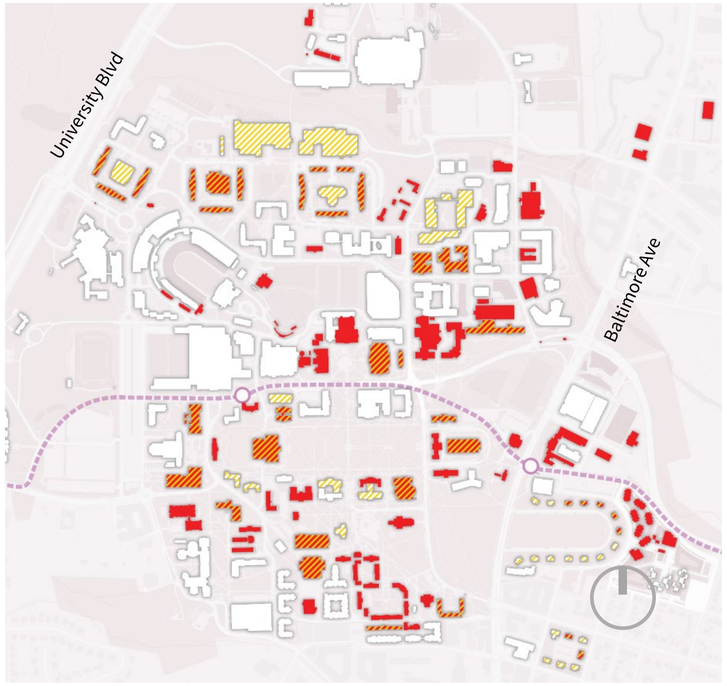
Campus Scale / Topography Comparison



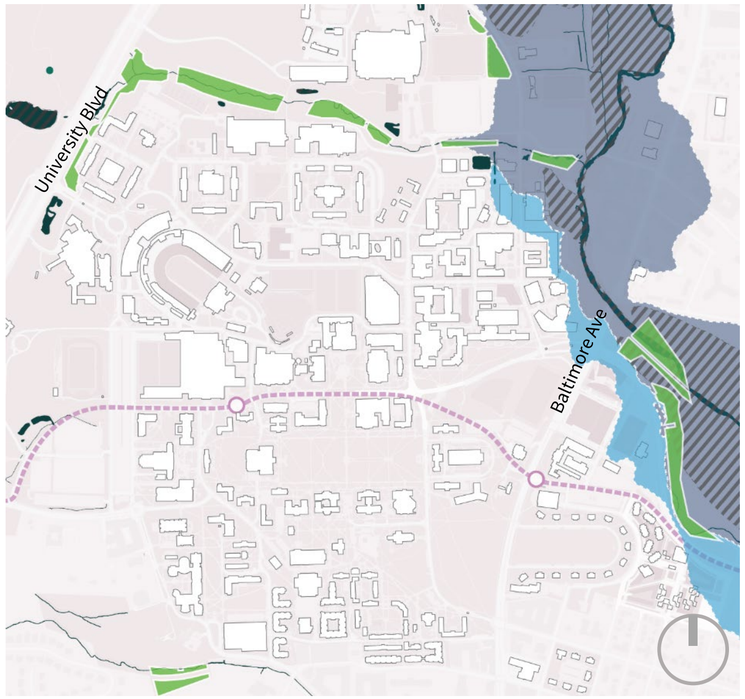
Typical Pedestrian (Blue) and Bike (Green) Movement by Volume

# What We Assessed

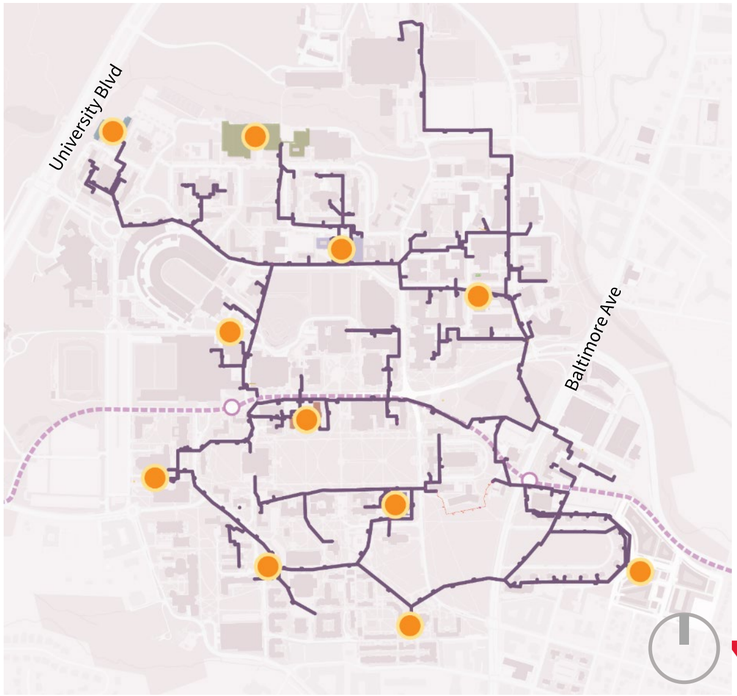
- Existing building condition codes and building age, use, location, and history to determine renovation or replacement
- Campus space needs by use code per state guidelines
- Existing infrastructure upgrades needed to support sustainability goals
- Current and projected parking supply and demand
- Flooding risk in various areas of campus
- Vehicular and pedestrian traffic  conflicts, patterns, and volumes



Campus Buildings: Physical and Functional Conditions



Flood Zones (Blue), Protected Easements (Green)



Campus Steam (Purple) and SCUB (Orange) Network

# Planning Scenario

| Category | Current Conditions (2022) | | Planning Scenario |
|---|---|---|---|
| Space (NASF) | | Current Deficit | |
| Academic/Research/Academic Support | 4.6M | 1.1M | 6.2M |
| Intercollegiate Athletics | 780k | N/A | 860k |
| Auxiliary (excludes Res) | 600 | 110k | 900k |
| Beds (CNT) | 12,550 | N/A | 14,250 |
| Recreational Fields | 5 | 4 | 9 |
| Parking | 17k (Supply); 15k (Demand) | N/A | 17k (Supply); 14k-16k (Demand) |
| Purple Line Ridership | 0 | N/A | 2.7k |

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# Guiding Principles


## High-Impact Campus Environments

Establish a physical campus framework that guides the University towards excellence in research, learning, resident life, Intercollegiate Athletics, and community partnerships

## Holistic Placemaking

Create a connected network of vibrant and expressive districts and places that reflect University values, diverse community needs, and campus heritage

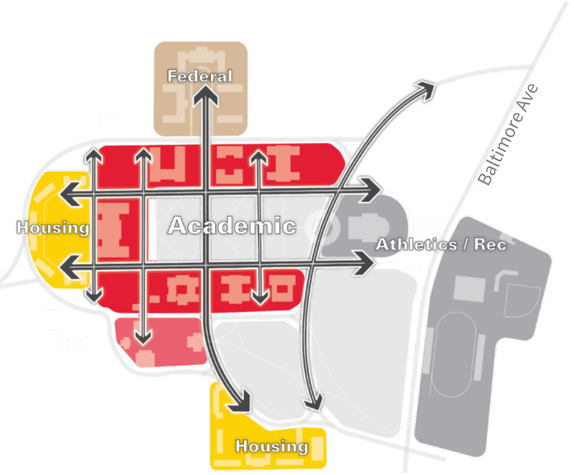
## People-First Mobility

Develop an accessible, people-first, and connected campus mobility experience that is integrated with the greater College Park community and beyond

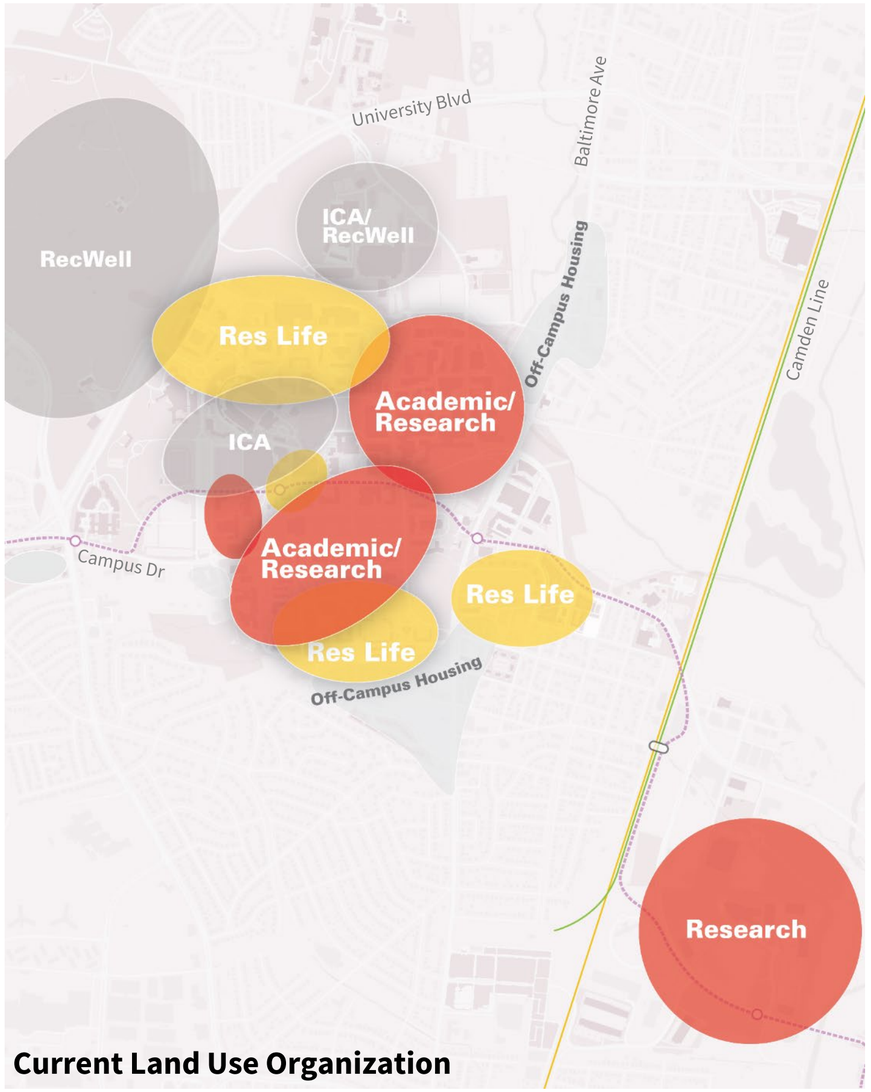
## Sustainable Stewardship and Investment

Chart a path towards sustainable growth of campus and invest in the long-term resilience of the campus to take on the grand challenges of tomorrow

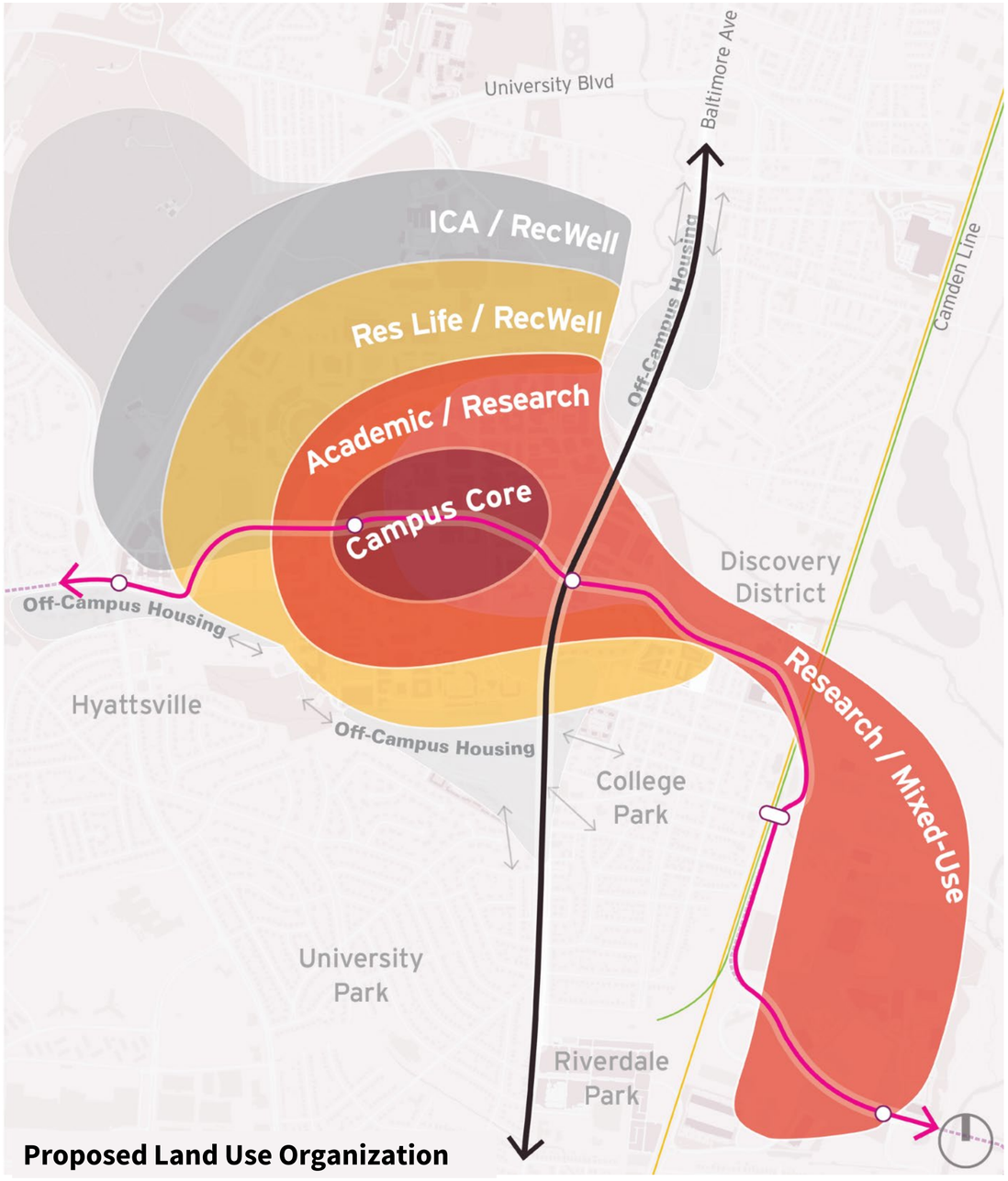
# Shaping the Plan




1939 Cutler Plan

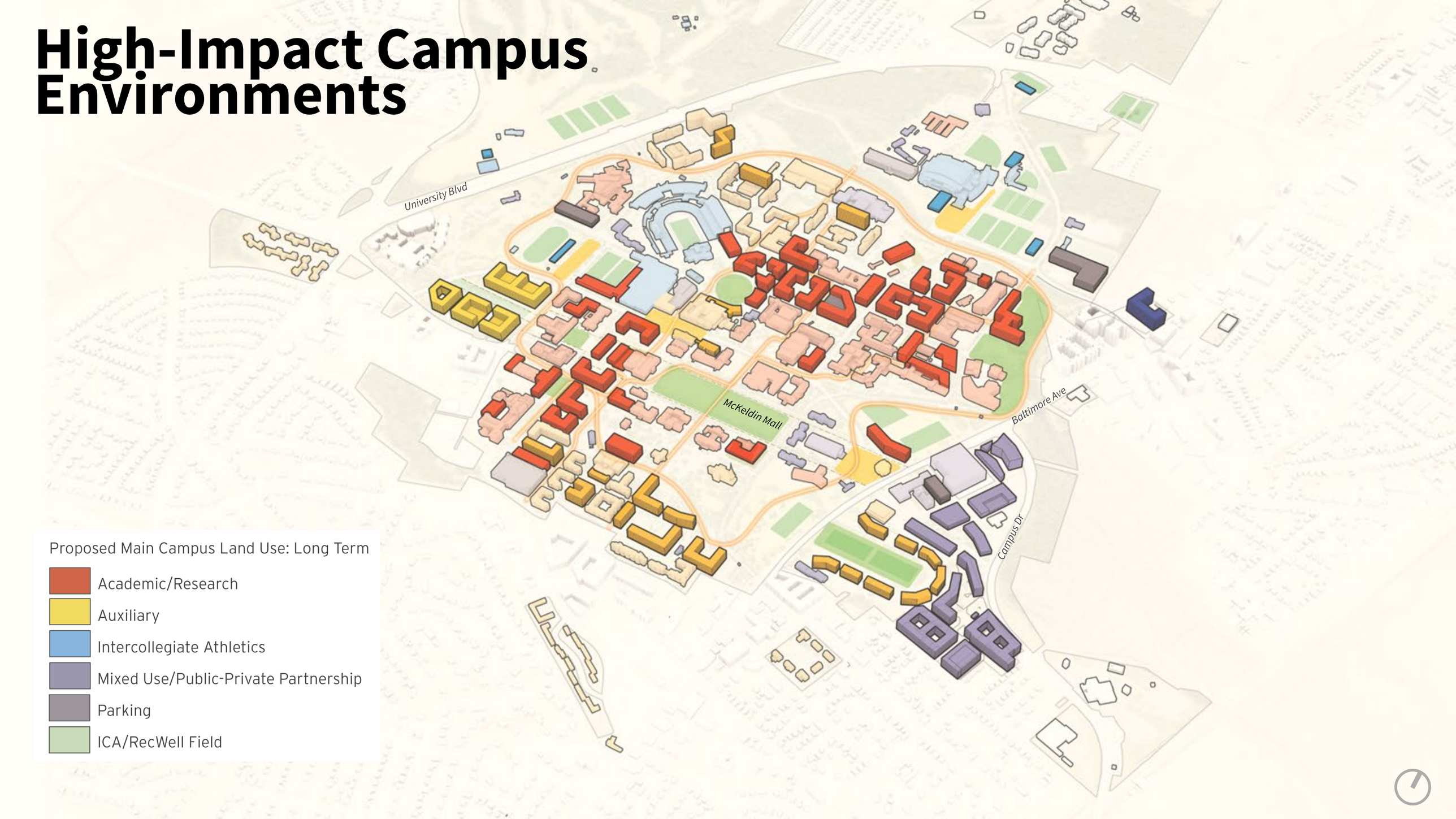



Current Land Use Organization

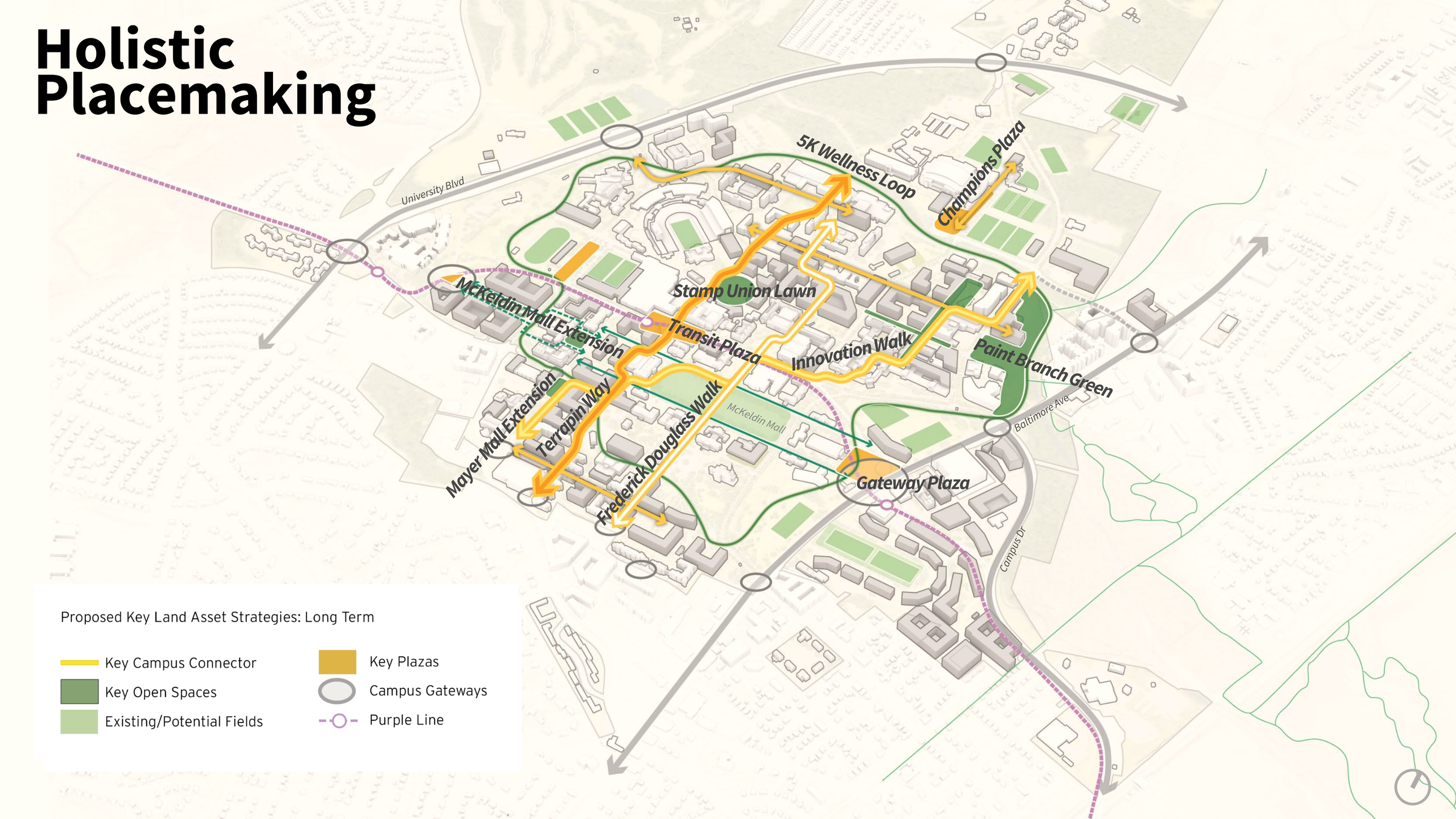



Proposed Land Use Organization

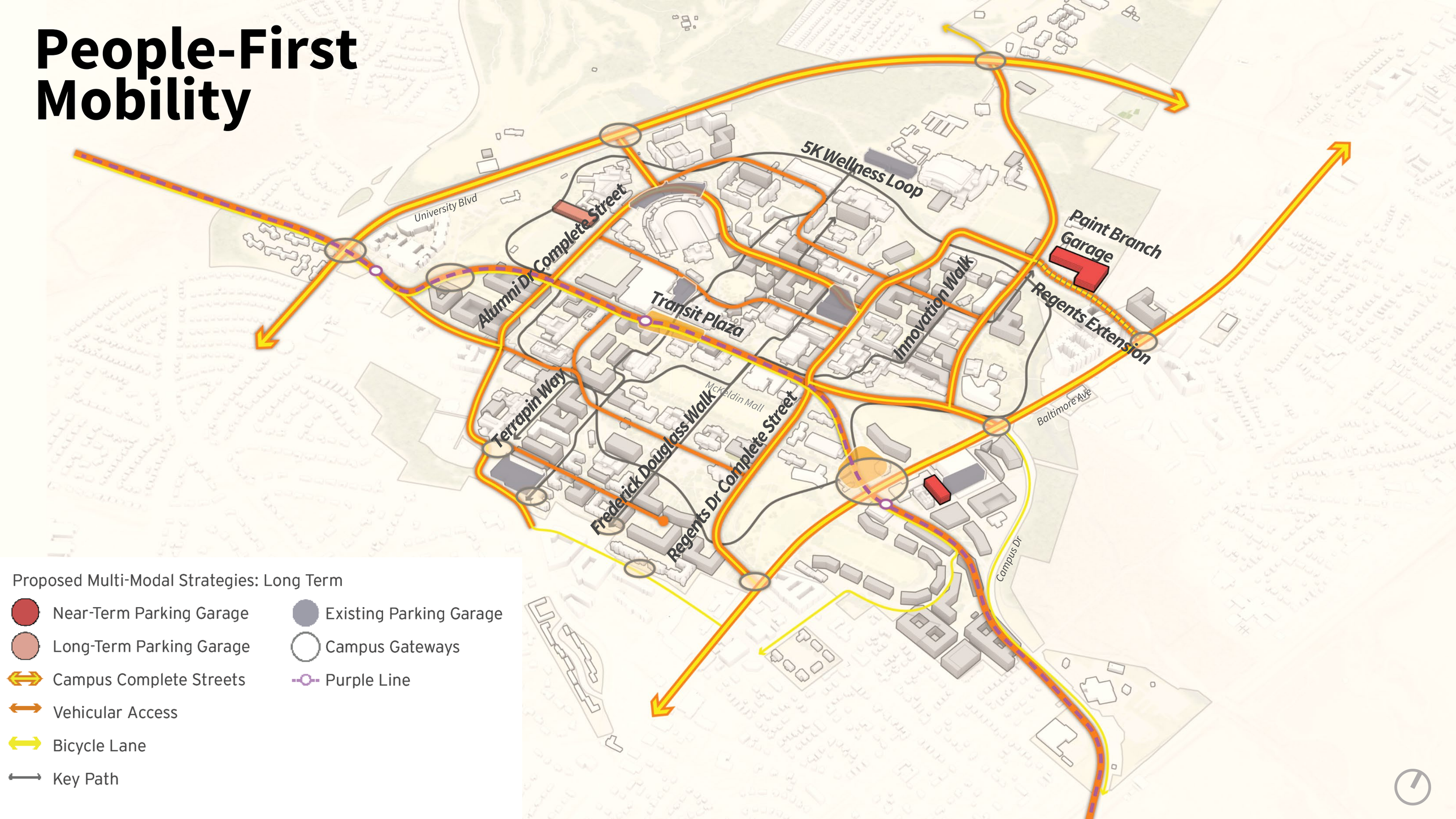
# High-Impact Campus Environments



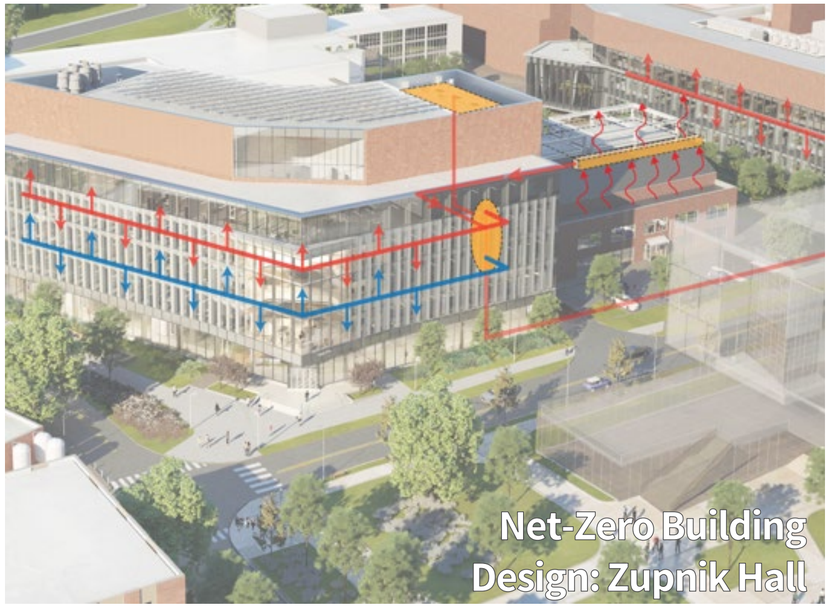
# Holistic Placemaking



# People-First Mobility



# Sustainable Stewardship and Investment


Net-Zero Building Design: Zupnik Hall


AgroEcology Corridor


Low-Impact Development


Rooftop Photovoltaics


Resilient Stormwater Landscapes

# Utilities and Infrastructure: The Challenge

1) **Enable long-term campus development: Campus Plan**
   - ~15M GSF total campus existing.
   - ~22.6M GSF total campus future.
   - Plan includes 2.5M GSF  renovation, 10.1M GSF new construction.

2) **Achieve zero carbon goals:**
   - 2025 with Credits and
   - 2035 with Decarbonation

3) **Address aging grossly inefficient steam infrastructure.**

4) **Address electric infrastructure vulnerability and imminent capacity limitations.**


*Diagrams are illustrative in nature and are not intended to reflect true scale

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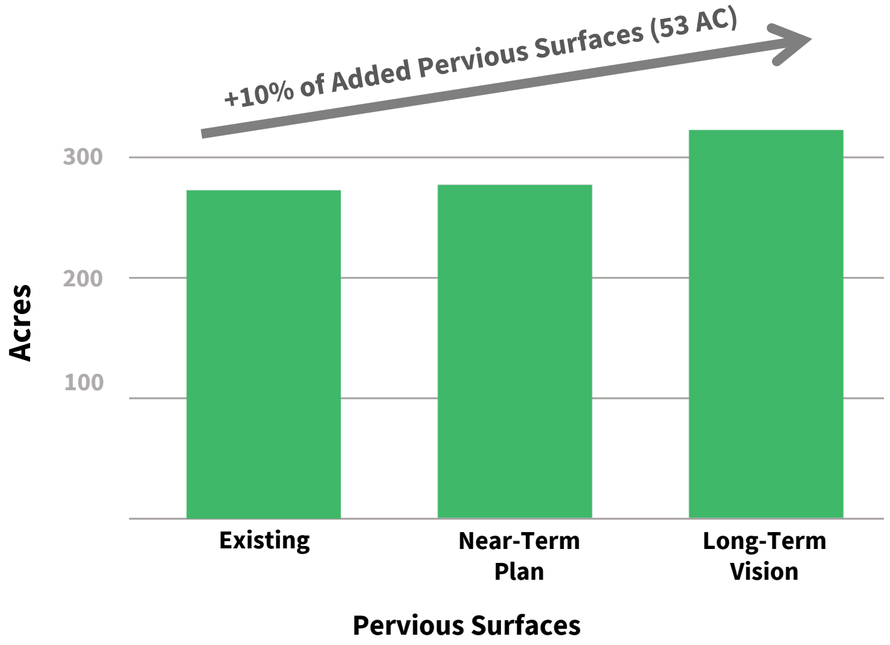
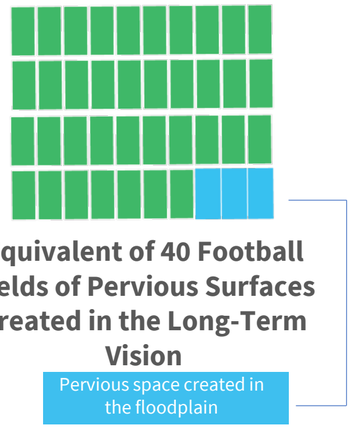
# Strategies for Zero Carbon Utilities Plan

- **Strategy #1:** Prioritize Upgrades to Campus Energy Plant.
- **Strategy #2:** Prioritize Replacing Obsolete SCUBs.
- **Strategy #3:** Prioritize Highest Carbon / Energy Impact Improvements.
- **Strategy #4:** Prioritize Based on Campus Development.

# Stormwater

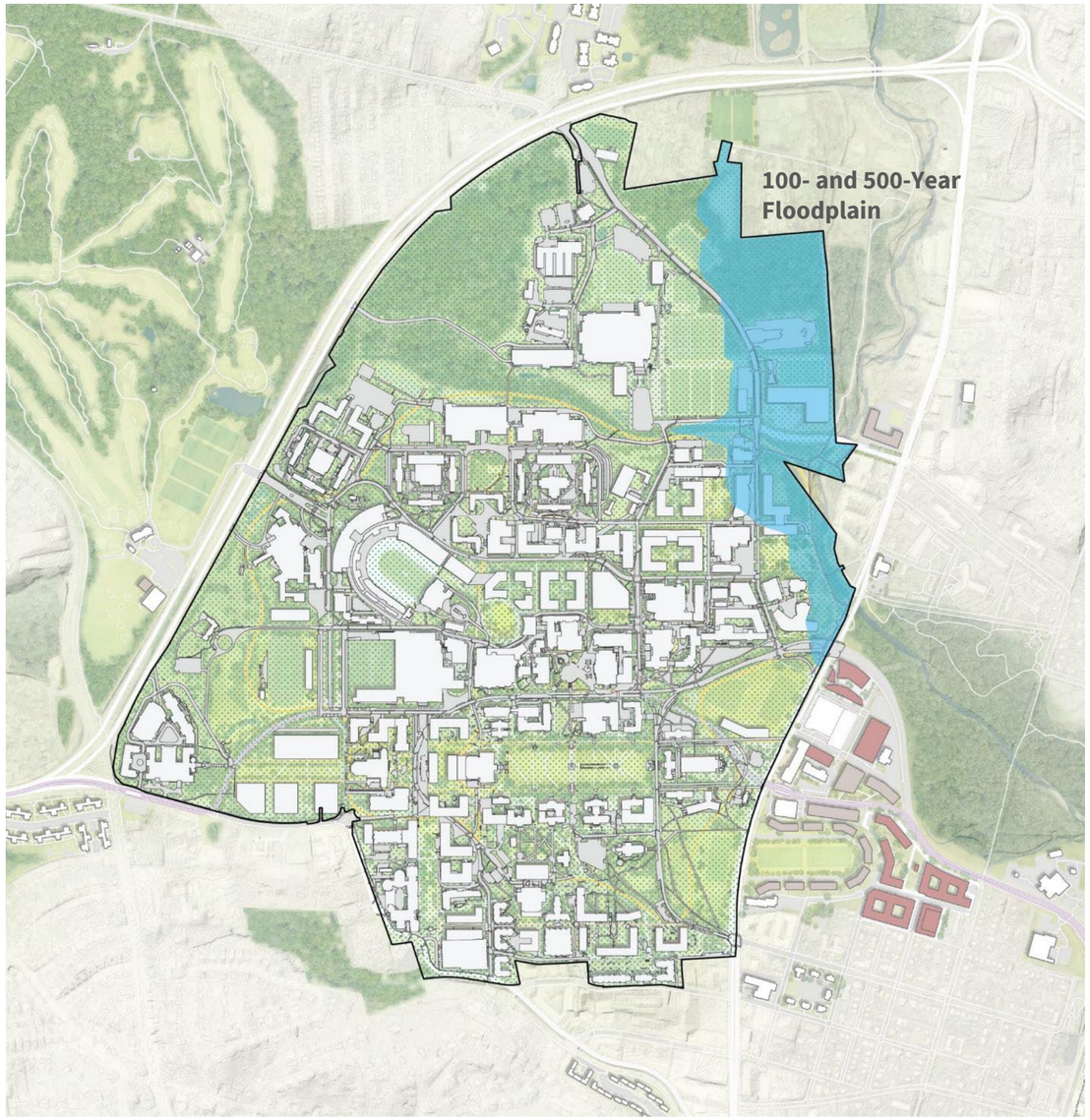
**Increase pervious surfaces campuswide, with a focus on increases in the floodplain**



**Equivalent of 40 Football Fields of Pervious Surfaces Created in the Long-Term Vision**

Pervious space created in the floodplain




Assumptions:

- 50% of new roof areas have green roofs
- All new complete streets will include sidewalk retention areas
- 70% of new plaza areas will be permeable

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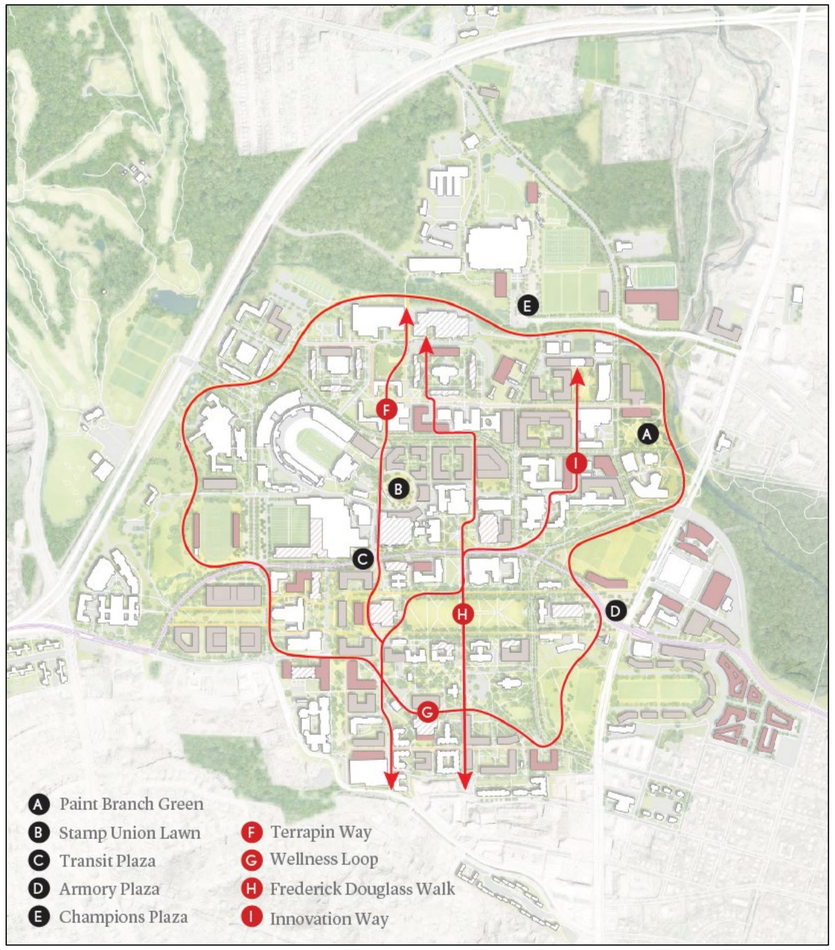
# CFP Priority Landscape Design Guidance

Provides specific guidance to reference existing standards and communicate the Campus Plan's design vision and intent for priority open space and pathway projects:

- Paint Branch Green
- Stamp Union Lawn
- Transit Plaza
- Armory Plaza
- Champions Plaza
- Terrapin Way
- Wellness Loop
- Frederick Douglass Walk
- Innovation Way




## B STAMP UNION LAWN

• The Stamp Union Lawn has three primary **program areas: 1)** an open lawn intended for flexible uses; 2) a terraced slope with integral seatwalls intended for gathering, performance, and passive recreation; 3) a pedestrian promenade that encircles the open space and connects the buildings, and accommodates service access to the buildings and football stadium.

• **Grading** should allow for barrier free access to the lawn terraces from the promenade to the east of the seatwalls. Openings should be provided in the seatwalls to accommodate access from the uphill side down to the lawn. Openings/steps should be offset so as not to create a straight line of steps from the pedestrian promenade to the lawn. A crescent shaped landform should wrap around the southern portion of the lawn to make grade connections between the pedestrian bridge, the pedestrian promenade, and the ellipse lawn. Promenade to be ADA accessible along length and elevations to be coordinated with building design.

• **Planting** should be primarily comprised of large canopy trees that provide light shade over the terraced lawn, frame the ellipse lawn, and create a consistent edge alongside the promenade. A mix of evergreen and flowering shrubs are to be used in masses on steep slopes to prevent erosion, provide a sense of spatial enclosure and habitat.

• **Paving** for the promenade should be small scale unit pavers with some variation in color/finish.

• **Terraced seating** is conceived as stone or precast concrete benches in an arcing form roughly paralleling the landform.

• **Lighting** is to be incorporated in terraced seatwalls and pedestrian scale light standards should be installed along pedestrian promenade and walkways.

• **Site furnishings**, including benches, trash and recycling receptacles, should be deployed along the promenade and primary walkways to create areas for gathering areas associated with building entrances, and to manage waste.

• Areas underneath pedestrian bridge should incorporate **public art** to encourage programming and increase perception of safety.

Rendered view of Stamp Union Lawn as seen from pedestrian bridge

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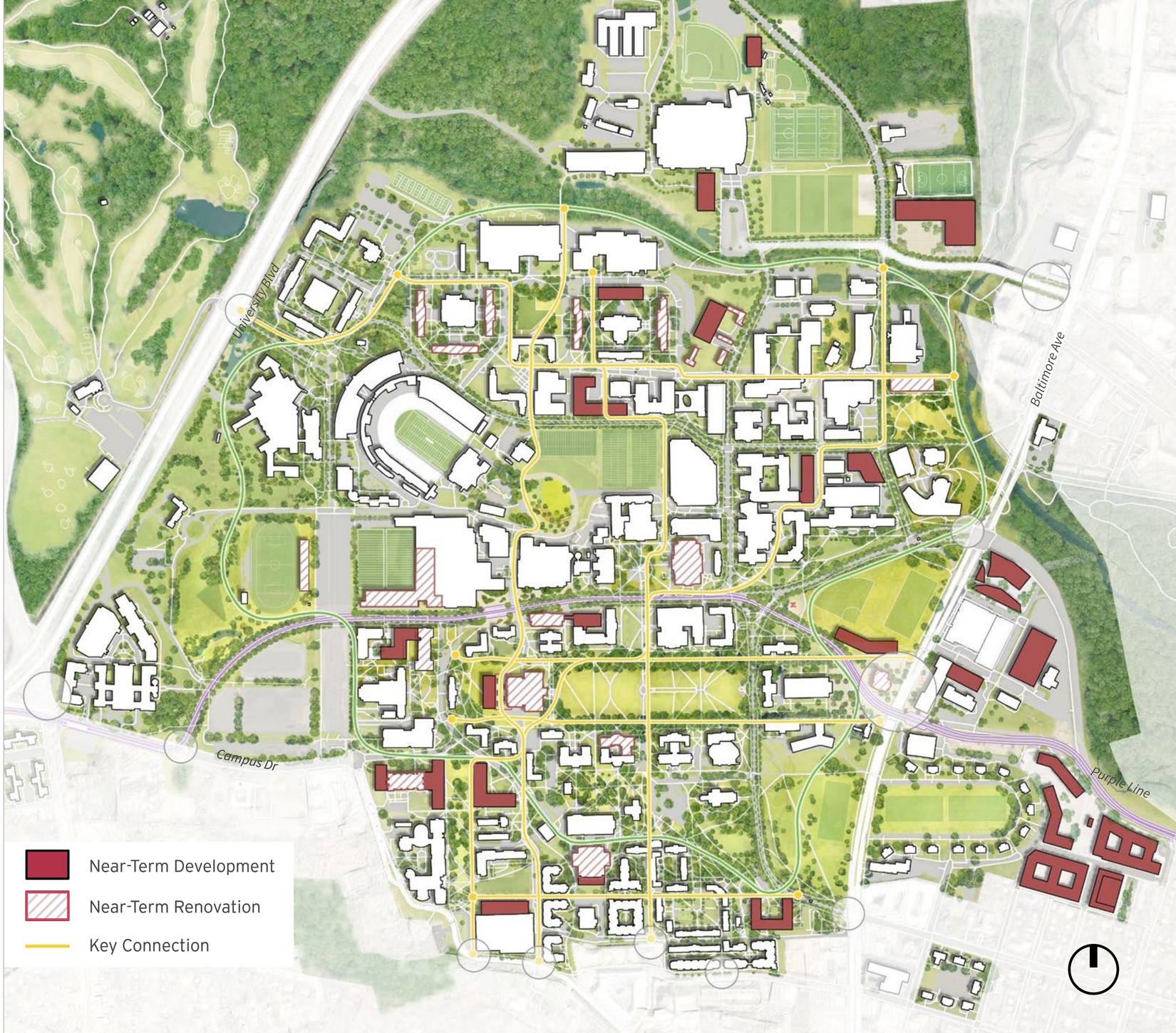
# Campus Today
2023

# **Campus Facilities Plan**
## Near-Term (10 Year) Plan

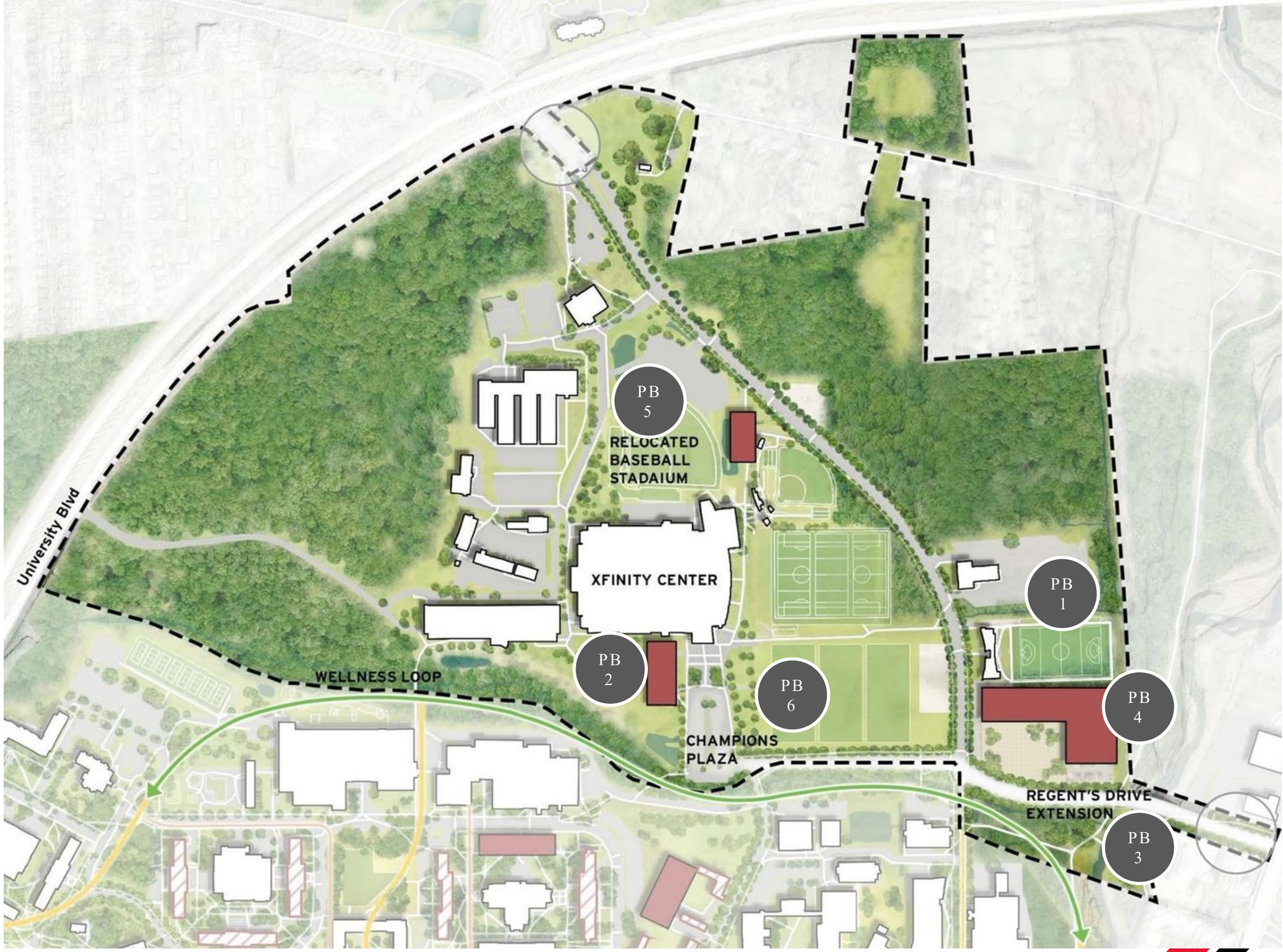
- Prioritize academic and research uses in the campus core.
- Construct and renovate ~1.0 M GSF of academic, research, and support spaces.
- Renovate Ellicott and Cambridge residential communities.
- Provide new and renovated student amenities in the south campus and expand the existing Health Center.
- Enhance pedestrian pathways and bike connectivity.
- Develop new open spaces in under-served areas of campus and provide additional recreational fields in perimeter locations.
- Upgrade energy systems to support decarbonization goals.
- Prioritize stormwater management and flood mitigation practices in vulnerable areas.



# Paint Branch District

## Near-Term (10 Year) Plan

- PB 1 — Field Hockey Renovation
- PB 2 — Basketball Performance Center
- PB 3 — Regents Drive Extension
- PB 4 — Paint Branch Garage and Mobility Hub
- PB 5 — Baseball Stadium / Development Center& Union Lawn
- PB 6 — Relocate Athletic Practice Fields



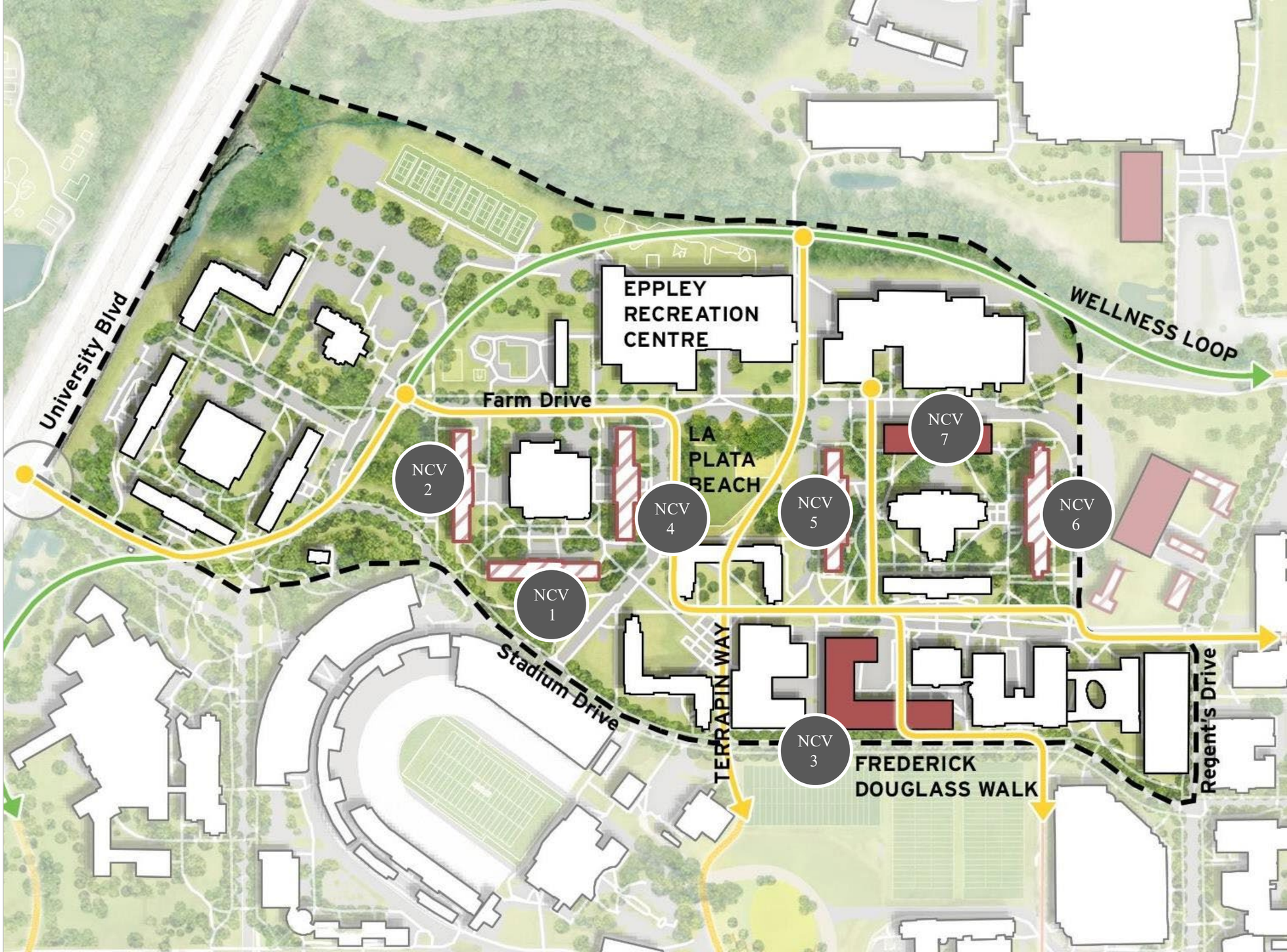
# Paint Branch District
Existing at Regent's Drive

# Paint Branch District
## Regents Drive Extension


Looking west along a new roadway entrance into campus from Baltimore Avenue into the Paint Branch Athletics District. This new campus gateway crosses Paint Branch creek with a new bridge, flanked by native landscapes, leading visitors to the Xfinity Center and other Terp athletic venues.

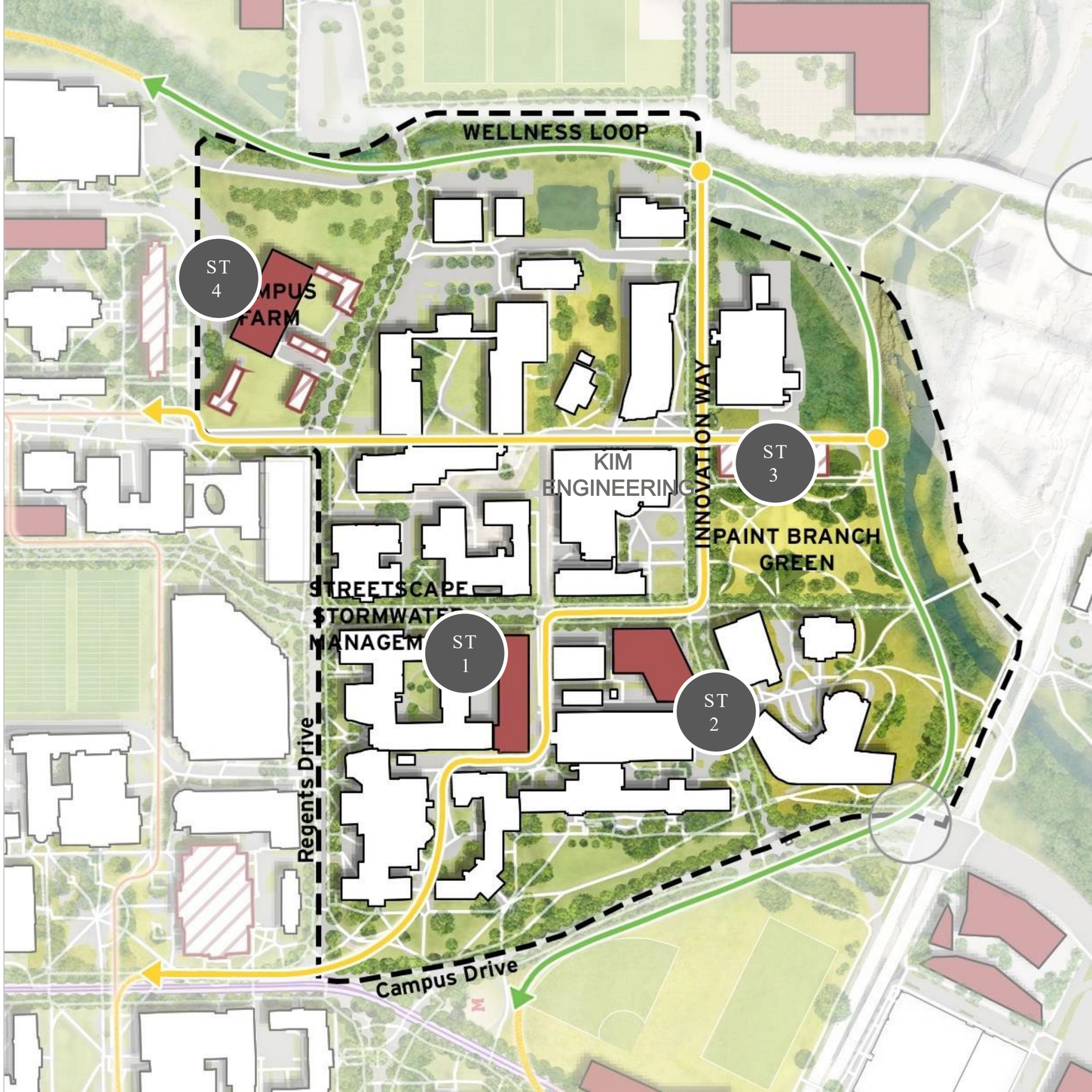
# North Campus Village
## Near-Term (10 Year) Plan

- NCV 1 — Ellicott Hall Renovation
- NCV 2 — Hagerstown Hall Renovation
- NCV 3 — Earth & Climate Science Building
  Jull Hall Demolition
- NCV 4 — La Plata Hall Renovation
- NCV 5 — Cumberland Hall Renovation
- NCV 6 — Centreville Hall Renovation
- NCV 7 — Proposed New Housing



# Science and Technology
## Near-Term (10 Year) Plan

- ST 1 — Chemistry Building Wing 1
- ST 2 — Stanley R. Zupnik Hall
- ST 3 — A.V. Williams Demolition & Paint Branch Green Open Space
- ST 4 — Campus Farm Improvements



# **Science & Technology**
Pathway behind A.V. Williams

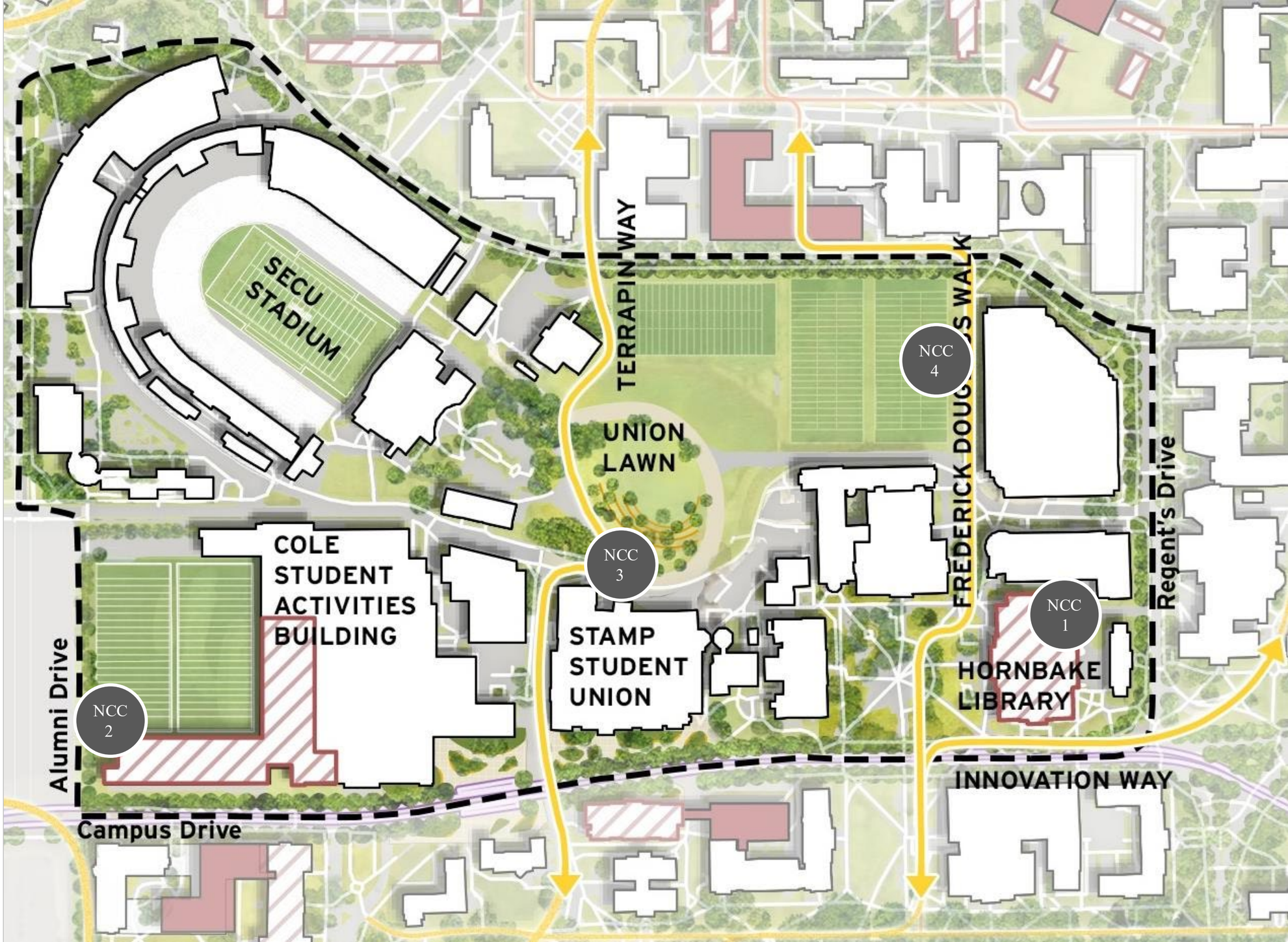
# Science & Technology
## Proposed Paint Branch Green


Looking west at the E.A. Fernandez IDEA Factory and Jeong H. Kim Building at the Paint Branch Green, a new resilient and multi-purpose open space lined with science and technology programs that can use the area to showcase academic innovations and engage in outdoor learning, as envisioned in this view of an engineering student demonstration fair.

# North Campus Core

## Near-Term (10 Year) Plan

- NCC 1 — College of Information Studies Renovation
- NCC 2 — Health & Human Sciences Building
- NCC 3 — Baseball relocation and Union Lawn
- NCC 4 — Relocate Athletic Practice Fields for Future Academic Development



# North Campus Core
## Campus Drive & Union Lane

# North Campus Core
## Proposed Transit Center


Looking from the steps of the Stamp Union entry west toward a reimagined Campus Drive with the new Purple Line stop, bike lanes and Terrapin Way connecting this central hub to campus in all directions.

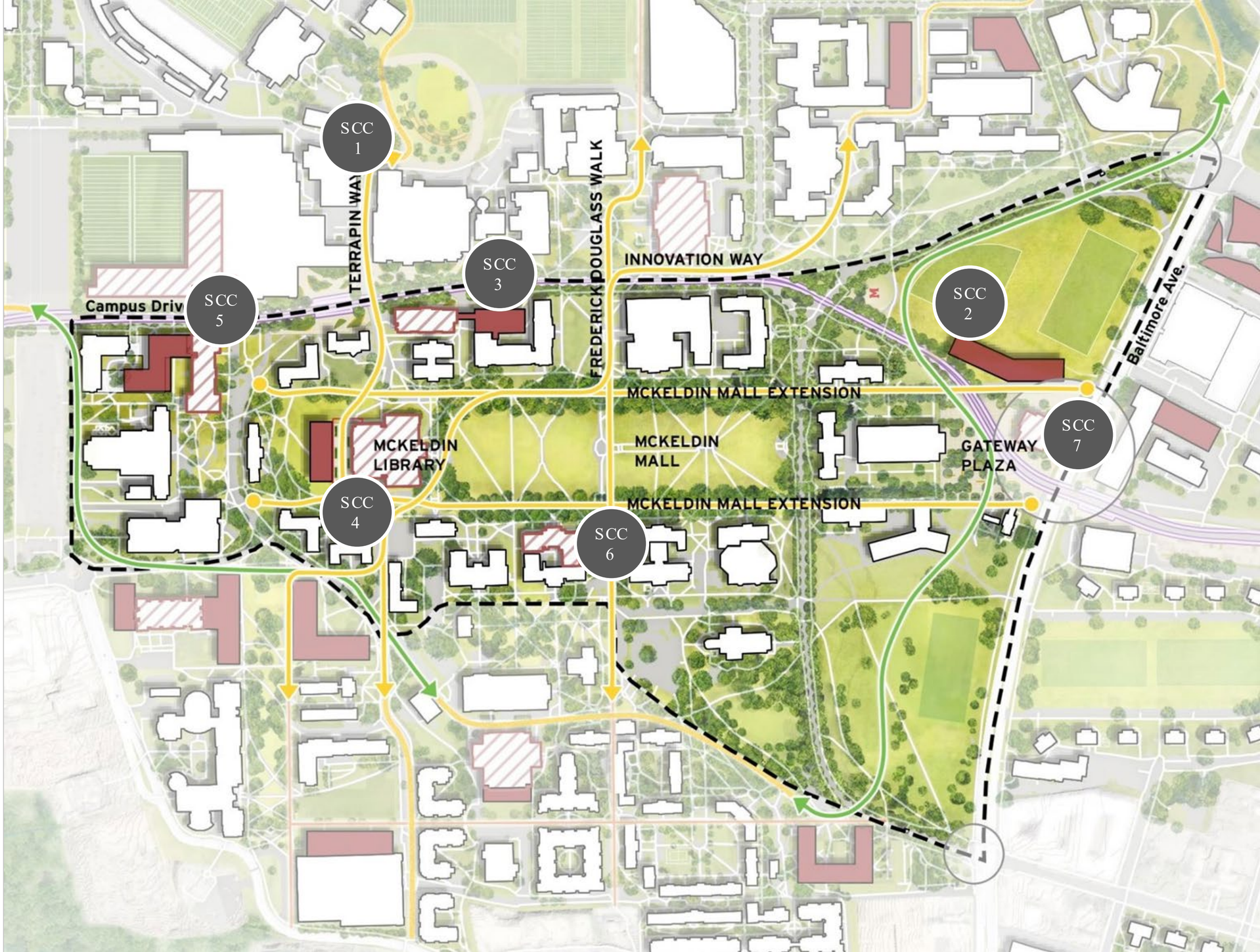
# North Campus Core
Looking toward Student Union

# North Campus Core
## New View toward Student Union


Students travel south above the existing service drive and parking lots along Terrapin Way to the expanded Stamp Union and Union Lawn located at the former location of Shipley Field.

# South Campus Core
## Near-Term (10 Year) Plan

- SCC 1 — Campus Site & Safety Project
- SCC 2 — AI & Machine Learning Building & Gateway Plaza
- SCC 3 — Health Center Addition & Renovation
- SCC 4 — McKeldin Library Addition & Renovation
- SCC 5 — Benjamin Building Addition & Renovation
- SCC 6 — Francis Scott Key Hall Renovation
- SCC 7 — Turner Hall Renovation



# South Campus Core
West of McKeldin Library Today

# South Campus Core
## West of McKeldin Library

*Looking from the terrace of a new building on the west of McKeldin Library over a new plaza and western library entrance, with Terrapin Way connecting the plaza to Campus Drive and the Stamp Student Union in the distance.*

# South Campus Core
## Gateway Transit Plaza


*The Gateway Plaza is a new signature entry into campus, prominently located across from a new Purple Line station and fronted by the iconic Armory facade and a new flagship academic building.*

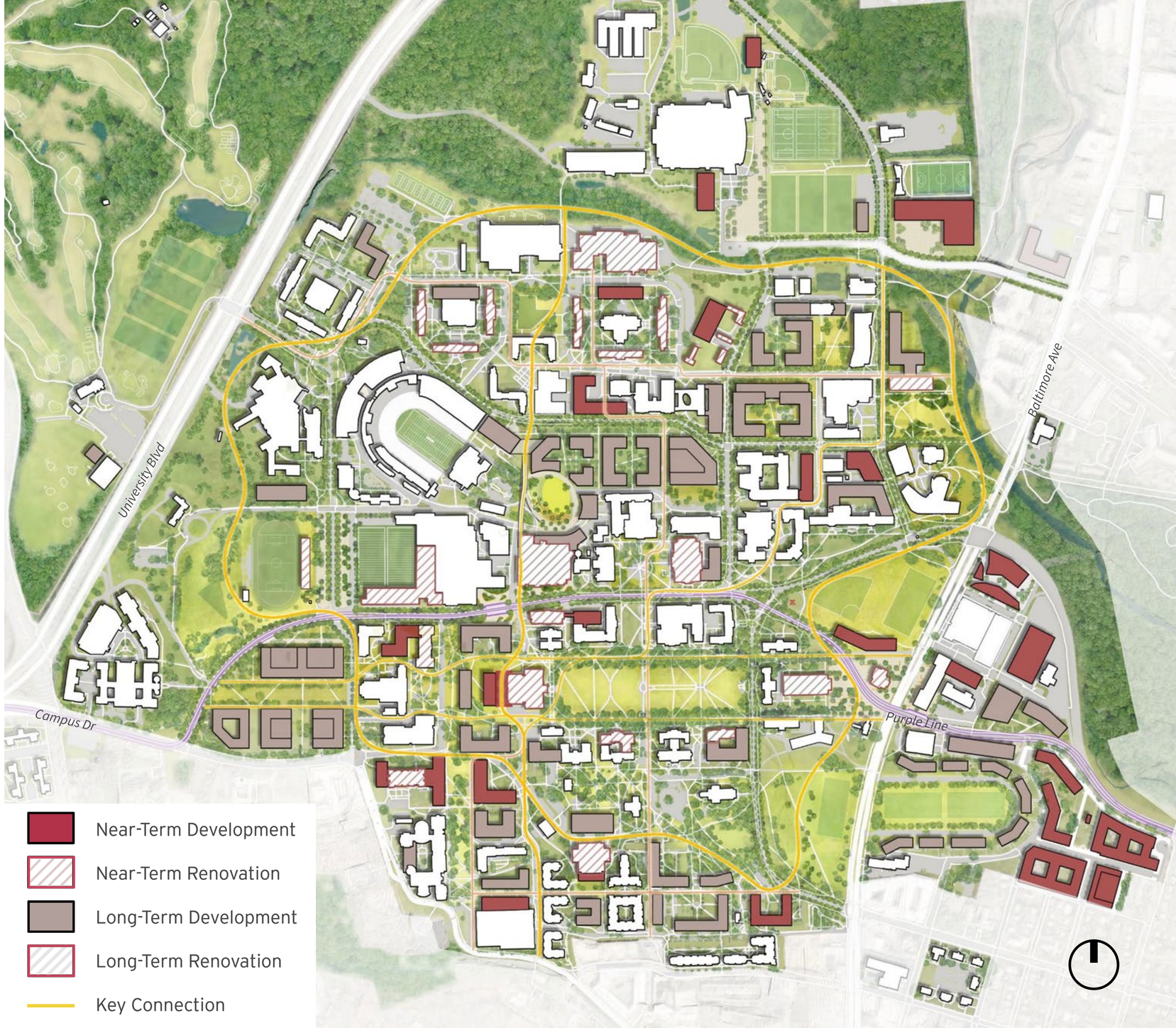
# South Campus Village

## Near-Term (10 Year) Plan

- SCV 1 — Architecture Building Addition & Renovation
- SCV 2 — South Campus Recreation Center
- SCV 3 — South Campus Dining Hall Renovation
- SCV 4 — New BSOS Building & LeFrak Demolition
- SCV 5 — Montgomery Hall Demolition & New Housing

# **Campus Facilities Plan**
# Long-Term Vision

- Continue campus academic, research, and support-focused building development and redevelopment within the campus core, including areas formerly occupied by sports fields.
- Renovation and potential redevelopment of residential communities.
- Support expanded innovation and mixed-use development in the Discovery District.
- Expand net-zero development and infrastructure across campus, including district thermal plants.
- Extend McKeldin Mall to the west with potential future student housing.




FEARLESSLY
FORWARD
GAME
DAY
UNIVERSITY OF MARYLAND
MARYLAND
TERRAPINS
Thank You

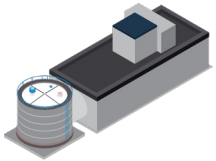
# The NextGen Energy Program

## The Path to Our Sustainable Energy Future

Sustainability Council Spring 2024 Meeting

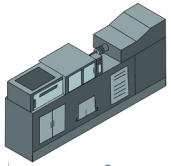
April 29, 2024

# Our Aging Energy System



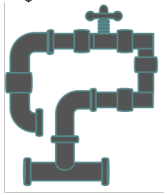
### Central Energy Plant

- Risk of **permanent turbine failure** as combustion turbines are beyond 25 years of age, while Boilers are beyond 50 years old



### Chilled Water System

- Chillers are **well past their useful life** beyond 20 years of age with no room for growth



### Steam Distribution

- Visible steam leaks across campus, creating **expensive inefficiencies**, leading to a loss of 38 million gallons of water

Limited pathways to renewable energy sources due to end-of-life turbines and reliance on steam.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# What's at Stake?

- More frequent interruptions to critical campus operations
- Wasted energy, which results in a higher carbon footprint
- Continual need for emergency repairs, keeping us from investing in long-term reliability of the system

**Maintaining the status quo** means depending on increasingly inefficient systems, resulting in **decreased sustainability and reliability**

# President's Pine's Commitment

*"A carbon-neutral campus is a significant step, but now it's time to set our sights on reducing UMD's dependency on fossil fuels. We are committed to a fossil fuel-free power plant under the NextGen Energy Program."*

*- President Pines, Spring 2024*

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# NextGen Development Timeline and Next Steps

***Phase 1 Definition***

*(2018-2021)*

**2018**
Service Delivery Options Analysis to address end of life assets, system O&M reliability & sunset of Operator agreement

Initial Size: 30MW

**2019**
Commercial Model Options Analysis & Selection of Concession P3 for system O&M and Phase 1 implementation

**Oct – Dec 2019**
USM BOR Approval of Solicitation of Concession P3 for Phase 1

**Jan – Apr 2020**
MD BPW Approval of Solicitation of Concession P3 for Phase 1

**2020**
Phase 1 RFQ Issued & Proposer Shortlisting

***Phase 1 Solicitation & Delivery***

*(2022-2027)*

**Apr-May 2022**
**Initial Proposals Due & Notification of Finalists**

RFP responses submitted by shortlisted firms & shortlisting of 2 firms

**Spring 2023**
**Best and Final Offers (BAFO) Proposals Due**

BAFO Proposal review process

Reduced Size 15MW

**June 2023**
**Preferred Finalist Designation**

Preferred proposer identified and notified

**Feb 2024**
**Approval received from BOR**

Finalization of technical and financial scope

**Spring 2024**
**Approvals from the MD BPW**

UMD to seek other needed approvals & execute Concession Agreement

**Summer 2024**
**Financial Closing & Phase 1 NTP**

Completion of Phase 1 design and mobilization for transition from existing to new Operator

**2027**
**Phase 1 Completion**

Completion of CEP, DTP-4 & critical distribution system upgrades

# Procurement Update

Selected **Maryland Energy Impact Partners (MEIP)** as our partner

- Includes Plenary America US Holdings Inc., Kiewit Development Company/Kiewit Power Constructors Co., Honeywell International & Ramboll Americas Engineering Solutions, Inc.

## Procurement Recap

- 2021 – Competitive process with shortlisted proposers
- 2022 – Two finalists selected for BAFO stage
- 2023-24 – Identified private sector partner, next step is BPW approval

# In Partnership With MEIP, NextGen Will

1. Update the aging distribution system to make heating and cooling campus buildings more efficient and minimize outages
2. Implement measures to increase efficiency
3. Make modifications to incorporate renewable energy sources and technologies

**MEIP will provide academic collaborations that include opportunities for undergraduates, graduates, and faculty members and researchers, including:**

- Student scholarships
- Internships
- Opportunities to collaborate with faculty and students


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# NextGen Is Our Path to a Sustainable Energy Future

**Replaces critical infrastructure** to make our campus more energy efficient

**Multiple paths** to carbon neutrality by 2025 and a fossil fuel-free energy system by 2035

**Flexibility** to incorporate renewable fuels and technologies of the future

**NextGen Achievements:**

**23% reduction in emissions** from smaller cogeneration plant*

**50% reduction in water** annually through steam distribution and condensate return systems repair*

In line with UMD **sustainability goals**

Inclusion in **CAP 3.0** as primary vehicle to reduce scope 1 emissions

Exceeds Maryland state **emission reduction** targets

*23% reduction in emissions and 50% reduction in water usage from the Central Energy Plant

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# Aligned With State of Maryland's Climate Goals

## State of Maryland Emission Reduction Targets

- **Reduce GHG emissions** by **60%** (over 2006) by **2031**
- **Carbon neutral** by **2045**

## University of Maryland Emission Reduction Targets

- **Carbon neutral** by **2025**
- **Fossil fuel-free Campus** by **2035**

For more information, visit

# NextGen.umd.edu

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