

# President's Committee on Sustainability

May 21, 2009

# Background

Organized by School and Department Initiatives Subcommittee

Open to Undergraduate, Graduate, and Professional Students

Designed to Foster Student-led Sustainability Projects

Also Designed to Generate Multi-disciplinary Collaboration

Sustainability Project Competition

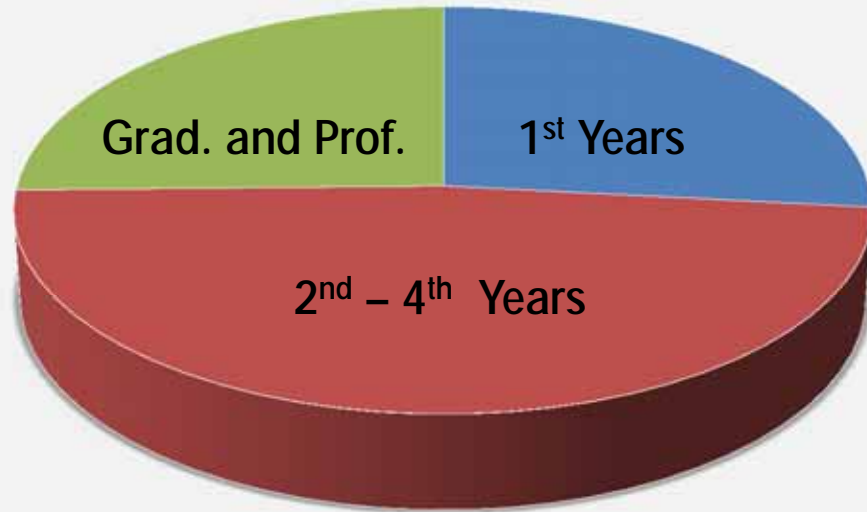
 UNIVERSITY of VIRGINIA

Office of the Architect



April 24 - Event Photos

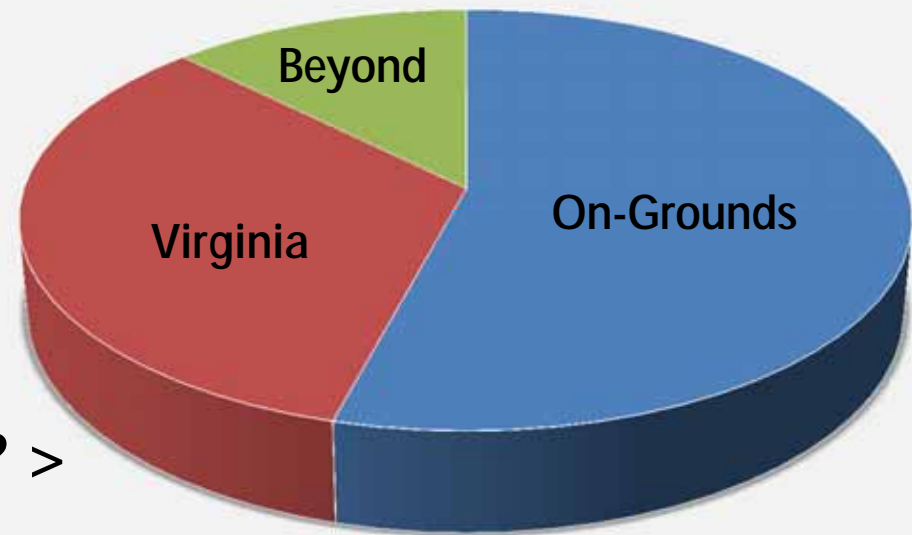
## < Who Submitted Projects?



< Total of 75 Students

Total of 24 Projects >

## Where Were Projects Focused? >



Project Submissions

## Project Purpose

Two thirds of UVA community members use the most inefficient mode of transportation —a car—at least once per week. Just as many wish there was a more eco-friendly way to get around Grounds.

We as a community want to change the way we get around. We are thinking about our carbon footprint and looking for a new, eco-friendly alternative. UVA Bikes are what we've been waiting for.

## Project Description

UVA Bikes are a revolutionary system of one-way on-Grounds bike rentals for the UVA community. TIME magazine called bike systems one of the "50 Best Innovations" for 2009. The system is essentially ZipCar for bikes: by using their University IDs, UVA students, faculty, and staff can check in and check out bikes from self-locking bike racks, or "hubs," conveniently placed around Grounds. For example, a first year could check out a bike at his dorm, ride to central Grounds, and check in the bike at a different hub near the library. Or, instead of driving, a Darden professor could bike to a meeting in the Rotunda.

In the first year alone the system will decrease UVA's carbon footprint by 54 tons of emissions and reduce dependence on oil by saving 5,594 gallons of gas. Transportation accounts for one fourth of the world's carbon emissions. By bringing UVA to the forefront of transportation development, the system's potential impact is worldwide. At the same time, the concept's scope is actionable at a university level.

Technology is what makes UVA Bikes so environmentally efficient. Solar-powered hubs and "drop-n-go" installation enable the system to operate off the grid. Bikes can be tracked from hub to hub to manage traffic flow. The system's bikes are especially designed for bike systems to minimize costs associated with wear and tear and theft. UVA Bikes complement the University Transit Service by reducing traffic on packed bus routes, resulting in a more efficient transportation mode split. In all, the system will save the university almost \$83,000 in environmental costs per year. Additionally the system improves cost efficiency on an individual level; using a UVA Bikes is cheaper than driving a car and less hassle than owning a bike.

Some of UVA Bikes' greatest benefits are those that cannot be measured. UVA Bikes will connect undergrads to grads to faculty and staff by connecting distant parts of campus like North Grounds and Hew Dorns. The system will bring together departments of the university such as Parking and Transportation, Office of the Architect, and Student Affairs to brainstorm more environmentally friendly transportation methods. Most importantly, UVA Bikes users can tangibly and personally interact with the issue of sustainability every day.

## Future Plans: System launch in August 2010

Immediate goals:

- Identify sufficient funding sources
- Select bike system vendor through Request for Proposal (RFP) Process
- Market system to potential users

## Project Team

PAOLA DORRONSORO  
JASON LIU  
BETSIE VASON  
SIMONE WOJTASZEK  
MCINTIRE SCHOOL OF COMMERCE, CLASS OF 2009



# UVA Bikes

Student Sustainability Symposium

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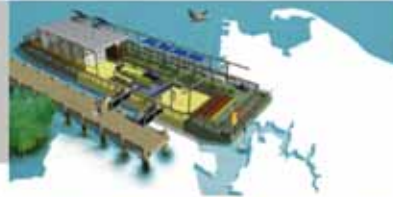
Winners – UVA Bikes

UNIVERSITY of VIRGINIA

Office of the Architect

## Project Purpose

The Learning Barge is an innovative student project that wonderfully demonstrates the "three E's" of sustainability. Environmental resource management and education, the edification of equitable social communities and greater economic efficiency are completely intertwined in the concept and realization of the Learning Barge, a 32'x120' floating classroom and environmental field station.



## Project Description

An interdisciplinary team of students from the Schools of Architecture and Engineering and Applied Science have collaborated with the Portsmouth-based nonprofit organization, the Elizabeth River Project (ERP), to design and build this unique vessel. The Learning Barge will provide interactive K-12 and adult education about how the river and human activities are inextricably linked. Unlike environmental education centers located in pristine "nature," the Learning Barge will traverse an important urban river linking Norfolk, Portsmouth, Chesapeake and Virginia Beach. Moving to a different river restoration site every few months, the Learning Barge will teach participants about the tidal estuary ecosystem, wetland and oyster restoration, sediment remediation efforts, and the Elizabeth's economic and transportation significance as a major port. The rainwater collection and renewable energy systems that use inexpensive and readily available technology demonstrate how visitors can replicate these cost saving alternatives and reduce utility expenditure by installing rain barrels, constructing rain gardens, utilizing photovoltaic or solar hot water systems or implementing simple features like more ventilation, day lighting, or alternative materials to reduce consumption in their own homes. Eight 200W photovoltaic panels and two 200W wind generators completely supply the electricity for the Barge. In the winter, the classroom of the Barge will be heated by energy collected from two 30-tube solar evacuated tube arrays that power a radiant heating system. All of the systems of the Barge will be highly visible to participants in the Barge's programs through a comprehensive custom designed wireless monitoring system that will provide instantaneous information on the Barge's energy generation and consumption as well as current environmental conditions.



## Results

Once completed this summer, the Learning Barge will serve as a sustainable classroom and working platform to help make the Elizabeth River fishable and swimmable by 2020. It is estimated that more than 19,000 students and adults will visit the Barge annually. The Learning Barge will operate in several underserved districts with high poverty levels that are not typically exposed to the river and the invaluable education that it offers.

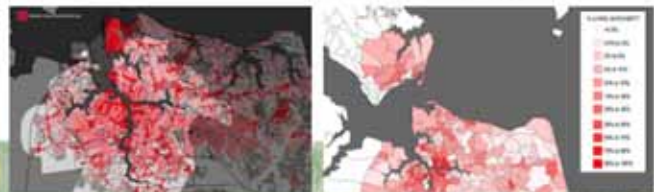
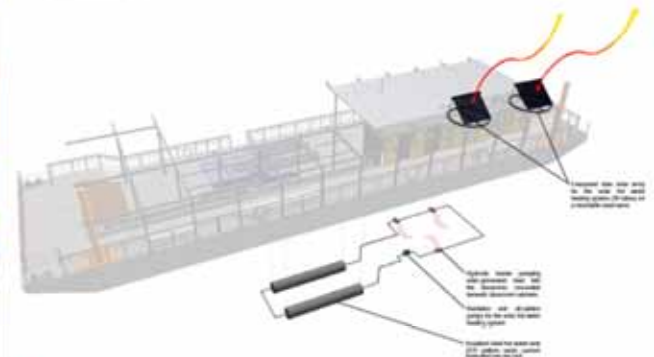
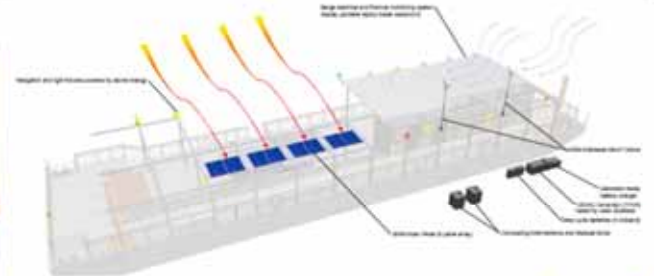
## Future Plans

Our hypothesis is that an environmental education field station built using rigorous environmental criteria will have a positive impact on the students, the community, and in the broadest sense, the planet. Students have been engaged in this project for multiple semesters and we are now nearing the culmination; funds secured from the UVa Sustainability Project Competition will directly support the student team completing construction in Norfolk this summer.



## Project Team

Danielle Willkens, Project Manager, School of Architecture  
Farhad Omar, Electrical Team Leader, School of Engineering & Applied Science  
Whitney Nowton, SolarThermal Team Leader, School of Engineering & Applied Science  
Faculty Advisors: Phoebe Crisman, School of Architecture  
Paxton Marshall, School of Engineering and Applied Science



# The Learning Barge

Student Sustainability Symposium

UNIVERSITY OF VIRGINIA

Winners – Learning Barge

UNIVERSITY OF VIRGINIA

Office of the Architect

## Project Purpose

- Minimize the volume of waste water generated at VDOT's 300+ salt storage facilities
- Identify and evaluate potential treatment alternatives
- Investigate the feasibility of reusing waste water as a feed source for brine generation for purposes of anti-icing

## Project Description

### Problem

- The Virginia Department of Transportation collects approximately 60 million gallons of salt-laden stormwater at its chemical storage facilities each year
- Disposal options for this waste water are both limited and costly (\$0.13 to \$0.55 per gallon)
- This waste also has the potential to contaminate surface and ground water if managed improperly

### Research Approach

The research effort consisted of:

- Collecting and analyzing water samples from 45 randomly selected storage locations throughout the state
- Calculating the volumes of stormwater captured statewide using site-specific characteristics and historical precipitation and evaporation data
- Developing waste minimization recommendations by improving on current site designs and management practices
- Evaluating the feasibility of three treatment alternatives (electrodialysis, ion exchange, and reverse osmosis) through lab and field experiments
- Evaluating the reuse of the waste for brine generation through lab-scale and in-field experiments
- Performing a benefit/cost analysis using historical disposal costs and deicing chemical usage data

## Results

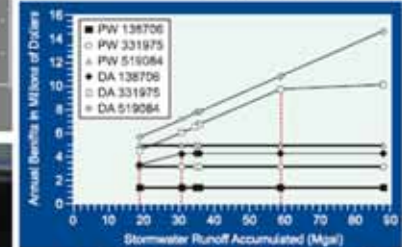
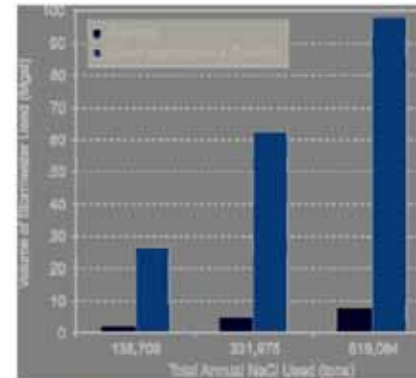
- Specific methods for reducing the volume of waste generated could cut current volumes by nearly 50%
- While no feasible treatment methods were identified, a method for reusing the reduced volume of waste generated was assessed and deemed to be practical
- Reuse of salt-laden stormwater runoff for brine creation would not only result in significant savings (\$1 million to \$6 million annually), roadway chloride loading would also be significantly reduced (35%), and less fresh water would be needed for brine creation

## Future Plans

- Three salt storage facilities will be retrofitted to incorporate all or part of the recommendations for minimizing waste collection and reusing waste that is generated on site
- These sites will be closely monitored during the winter of 2009-2010
- The findings of this implementation pilot will further quantify the savings and environmental benefits of this new approach to saltwater waste management and inspire other facility managers to alter their current practices

## Project Team

G. Michael Fitch, Dept. of Civil and Environmental Engineering, University of Virginia / VTRC  
Vinka Oyanedel-Craver, University of Rhode Island  
Shannon L. Bartolt-Hunt, University of Nebraska - Lincoln  
Megan Fuller, University College Dublin  
James A. Smith, Dept. of Civil and Environmental Engineering, University of Virginia



Management and Reuse of Salt-Contaminated Stormwater Runoff  
Student Sustainability Symposium

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Winners – Stormwater Runoff

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Joint Funded by VP Research,  
VP Student Affairs, Facilities  
Management and Office of  
the Architect

Distributed via PTAO for  
ongoing project  
implementation



Project Awards



## Next Steps

Repeat, potentially on Fall Competition - Spring Implementation

Create Award Categories

Explore Additional Funding Opportunities

Development

Green Fund

Others...

**Search Business**  
News, Stocks, Funds, Companies

**Financial Tools**  
Select a Financial Tool

**More in Business »**  
[Global Business](#) [Markets](#) [Economy](#)

## Green Inc.

Energy, the Environment and the Bottom Line

May 11, 2009, 10:50 AM

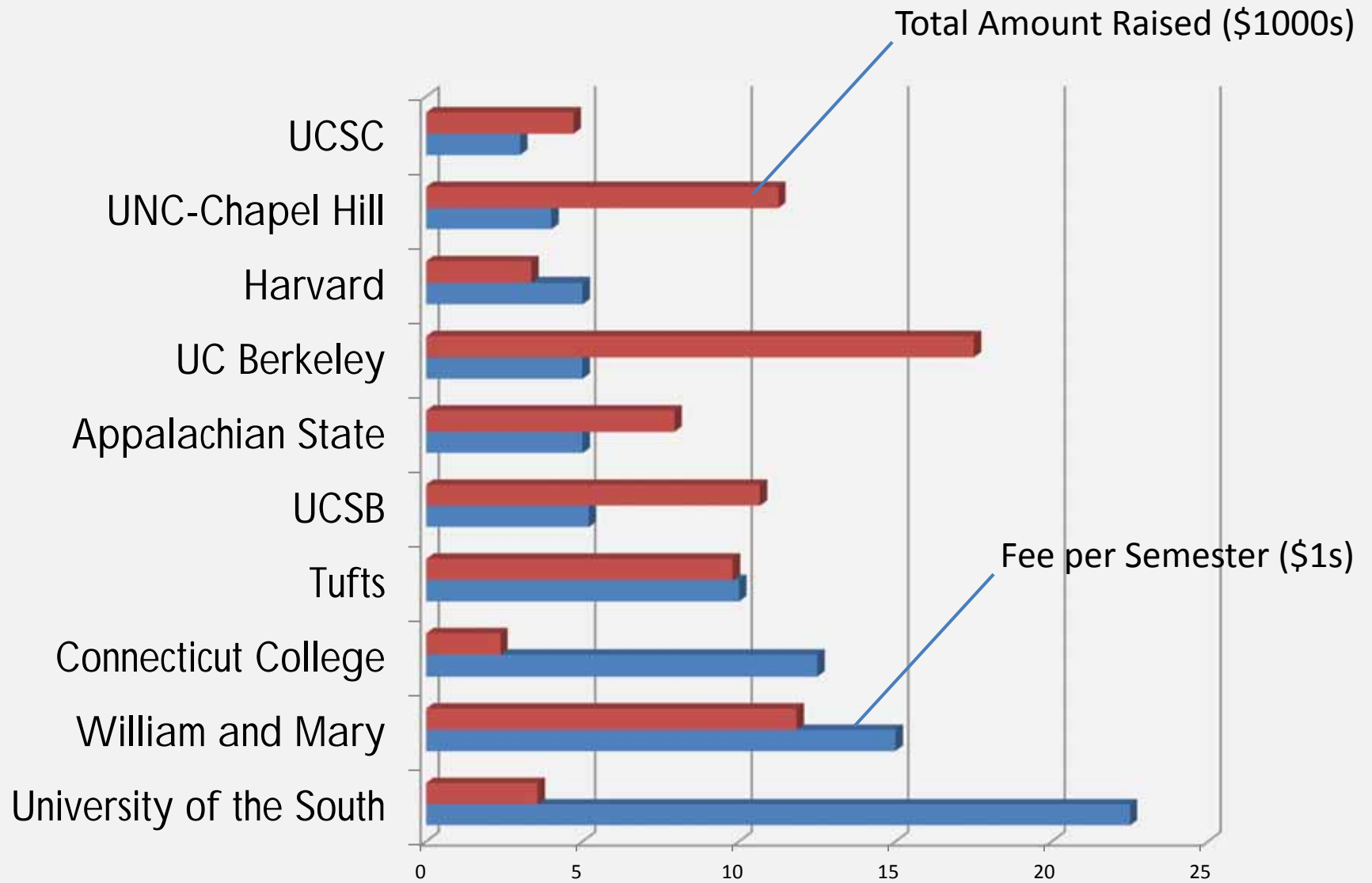
### College Students Clamor for "Green Fees"

By KATE GALBRAITH

College students often protest when administrators threaten to raise their fees.

But rising numbers of students seem willing to self-impose a "green" fee, to help the environment and purchase renewable energy. The [Association for the Advancement of Sustainability in Higher Education](#) posts a list of universities that





**William and Mary** - Eco-House Energy Use Monitoring (\$5,300): From Lauren Edmonds on behalf of Eco-House. To provide energy metering for the Eco-House. One of the goals of Eco-House is to learn how changes in resident life can improve energy efficiencies in the W&M residence halls. Metering will allow for a variety of test cases and competitions among residents that will yield useful data on best energy practices.



**TGIF – The Green Initiative Fund – UC-B, UCSB, UCLA**

**Fume Hood Sash Stickers (\$807.00)** - This project will install stickers on fume hoods in labs around campus to remind users to lower their sashes in order to save energy.

**Berkeley Student Food Cooperative (\$91,000)** – Provide fresh, healthy, environmentally sustainable, and ethnically produced food at affordable prices through a student-run food café and market

Green Funds

# **Grounds Improvement Fund Office of the Architect**



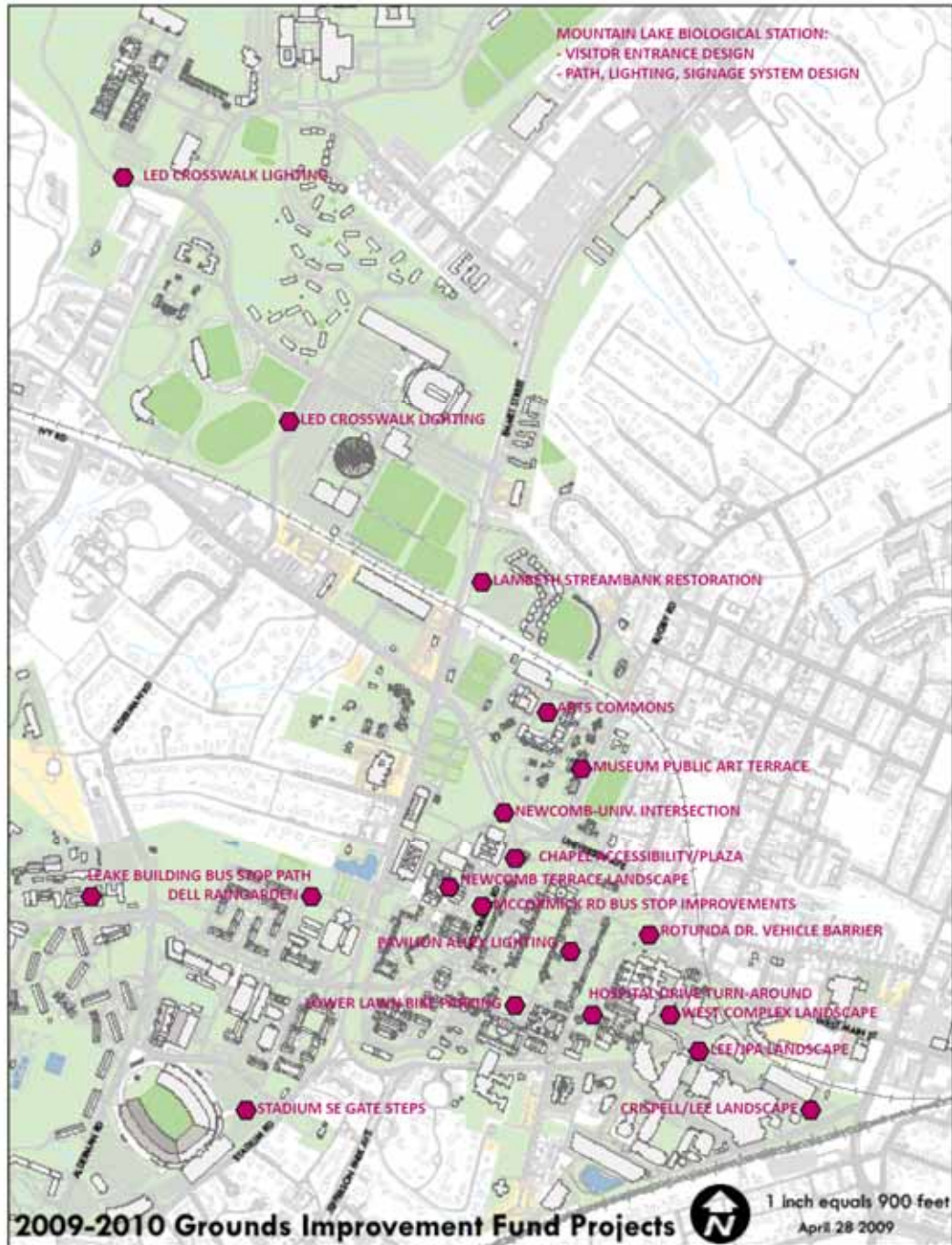
**Report to Master Planning Council  
May 20, 2009**

## **Grounds Improvement Fund (GIF) Facts at a Glance**

- **Approved by the University's Board of Visitors in January of 2007**
- **1.5% Assessment to capital projects in the Academic Division, Medical Center and College at Wise**
- **Maximum contribution per project is \$500,000, collected at the time of construction contract award**
- **\$1,000,000 per year is available in an expendable account for the support of projects proposed by academic or auxiliary programs on the main University grounds or research stations; University is pursuing the ability to spend beyond this amount for year 2009-2010**
- **Types of projects considered for funding include improvements to pedestrian and bicycle facilities, lighting, site furnishing, plantings and public art**
- **Annual project list has been recommended by Executive Review Committee; next step will be final approval by President Casteen**

## **Grounds Improvement Fund (GIF) Selection Criteria**

- **Eliminates/prevents an existing health, environmental or safety hazard**
- **Satisfy an academic or auxiliary program need**
- **Reduces total capital and operating expenses**
- **Supports campus planning objectives**
- **Provides renewal of a deteriorating infrastructure asset**
- **Enhances the aesthetic quality of the public domain, including the addition of public art**





# Art Museum Public Art Terrace



# Chapel Plaza & Accessibility



# Hospital Drive Turn-around & Pedestrian Paths and Steps



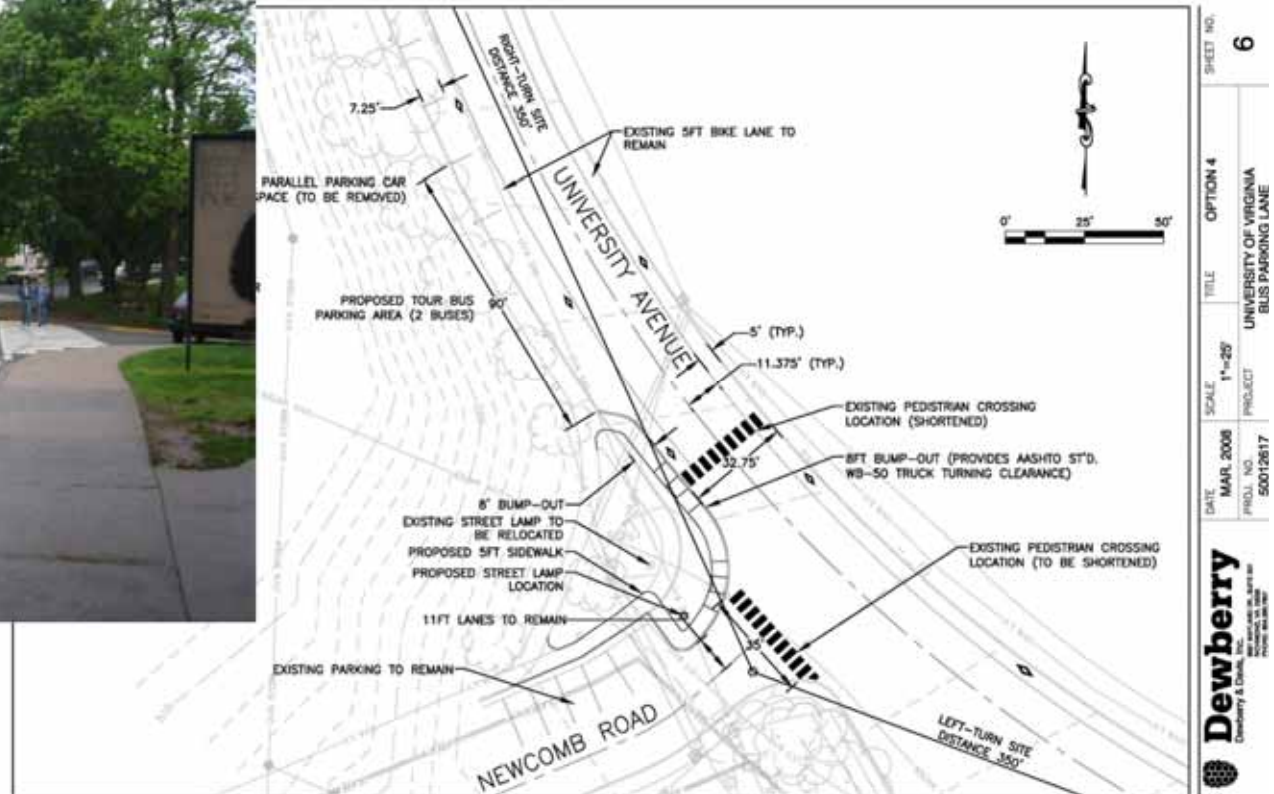
# Pavilion Alley Light Replacement



# Arts Commons, Phase I & II



# Newcomb-University Ave. Intersection/Safety Improvements



# Lambeth Streambank & Pedestrian Bridge Accommodation



# LED In-ground Crosswalk Lights

On Leonard Sandridge Drive at Darden and Massie at U-Hall/Klockner







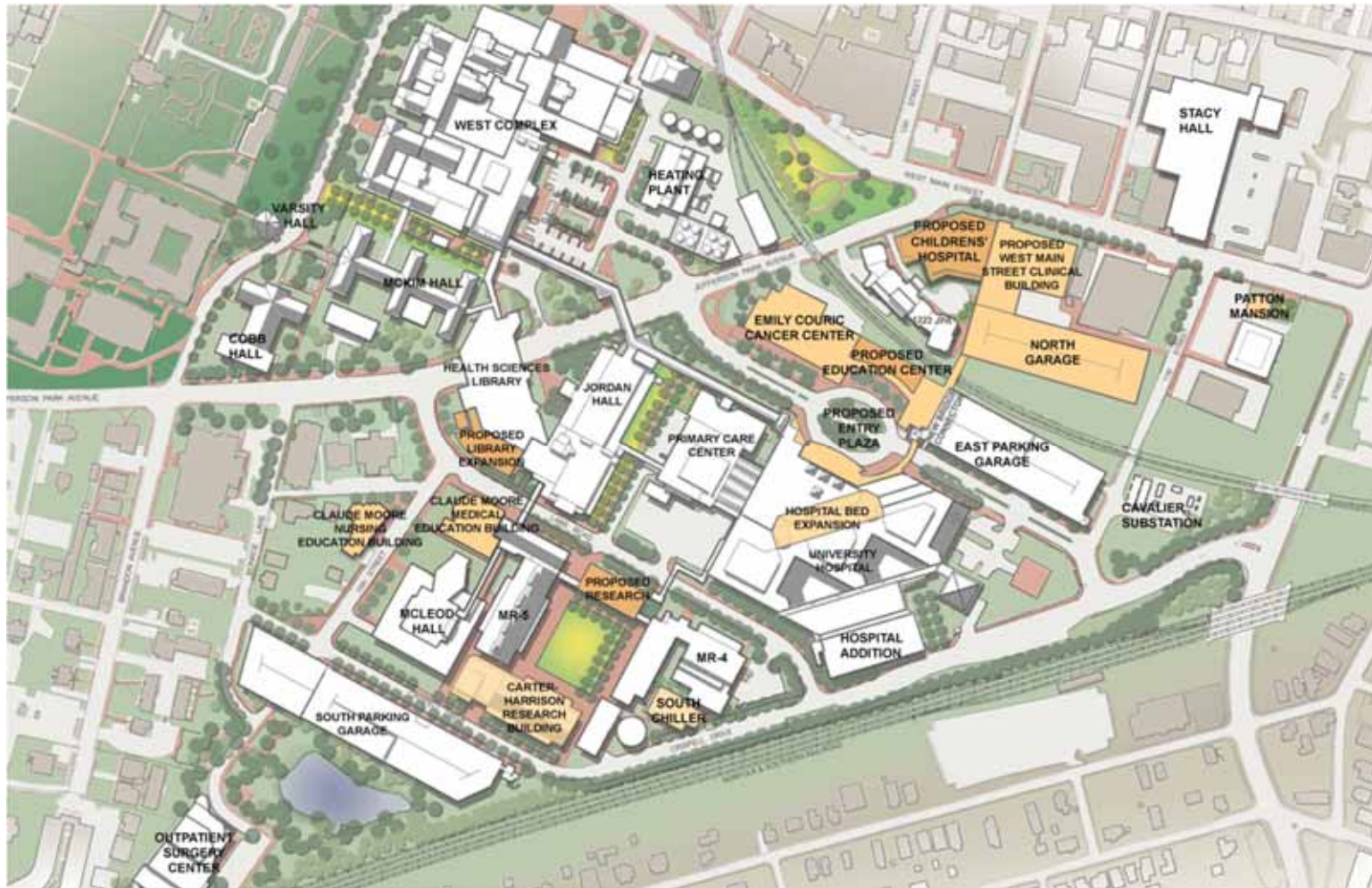
# Master Planning Council Agenda May 20, 2009

Student Sustainability Initiatives  
Grounds Improvement Fund Update  
Health System Area Plan (HSAP)



# Health System Area Plan (HSAP) Master Planning Council May 20, 2009

David Neuman, FAIA  
Julia Monteith, AICP  
Luis Carrazana, AIA



# HSAP | 2004 Health System Area Plan



VIEW TO EAST OF UNIVERSITY HOSPITAL AND LEE STREET



VIEW FROM JPA



VIEW OF EAST GARAGE



VIEW OF LEE STREET



VIEW OF WEST GARAGE



VIEW OF WEST COMPLEX



VIEW OF HOSPITAL DROP OFF PLAZA

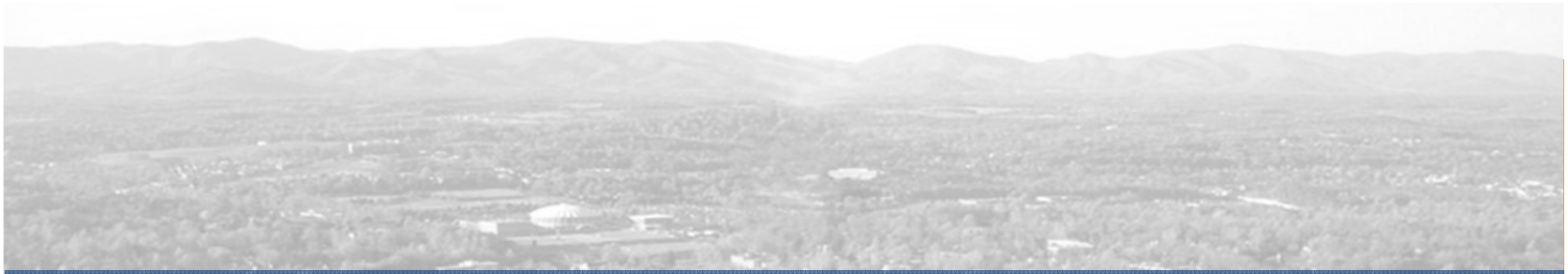


VIEW OF LEE STREET / CHESPELL DRIVE

# HSAP | Existing Conditions



# HSAP | Existing Conditions



- Enhance visitor and daily user experience
- Improve the safety of pedestrian, bike and vehicular circulation throughout the study area
- Implement a unifying design concept for the district
- Strengthen UVA Medical Center image
- Create a campus-like environment
- Develop a landscape hierarchy and recreation opportunities
- Allow for future renewal and replacement of facilities



Claude Moore  
Nursing Education Building

- + In Construction
- + Project Cost: \$15.6 m
- + Architect: Bowie Gridley Architects
- + Contractor: Martin & Horn, Inc.
- + Construction Start: October 2006  
Finish: July 2008





### Carter-Harrison Research Building (MR-6)

- Project Cost: \$84.1 m
- Architect: Henningson, Durham & Richardson
- Contractor: Barton Malow
- Construction Start: March 2006, Finish: March 2009







Claude Moore  
Medical Education Building

- + In Construction
- + Project Cost: \$30.0 m
- + Architect: CO Architects
- + Contractor: Barton Malow
- + Construction Start: Fall 2007  
Finish: Fall 2009





### Hospital Bed Expansion & Infrastructure

- + In Design
- + Project Cost: \$80.2 m
- + Architect: SmithGroup
- + Contractor: Gilbane
- + Construction Start: Spring 2008  
Finish: Fall 2010

# HSAP | Hospital Bed Expansion



### Emily Couric Clinical Cancer Center

- + In Design
- + Project Cost: \$74.0 m
- + Architect: Zimmer Gunsul Frasca Architects
- + Contractor: Gilbane
- + Construction Start: Spring 2008  
Finish: Fall 2010





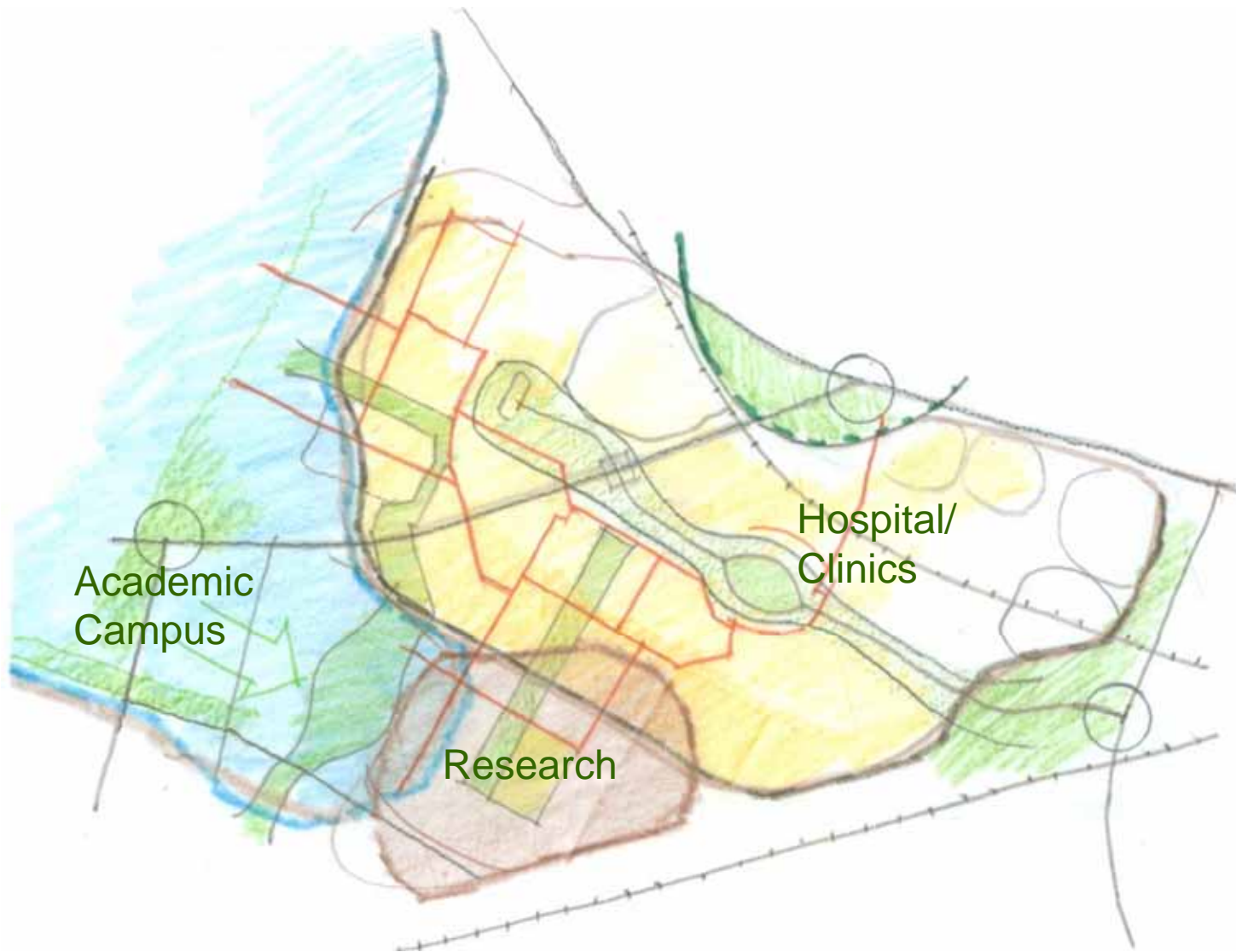
# HSAP | Lee Street Corridor



# HSAP | Lee Street Corridor



# HSAP | Redevelopment Opportunities



# HSAP | Primary Zones of Use



# HSAP | Greenbelt and Renewed Space





# HSAP | Circulation and Wayfinding



# HSAP | Green Space Improvements



# HSAP | Green Space Improvements: Major Entrances



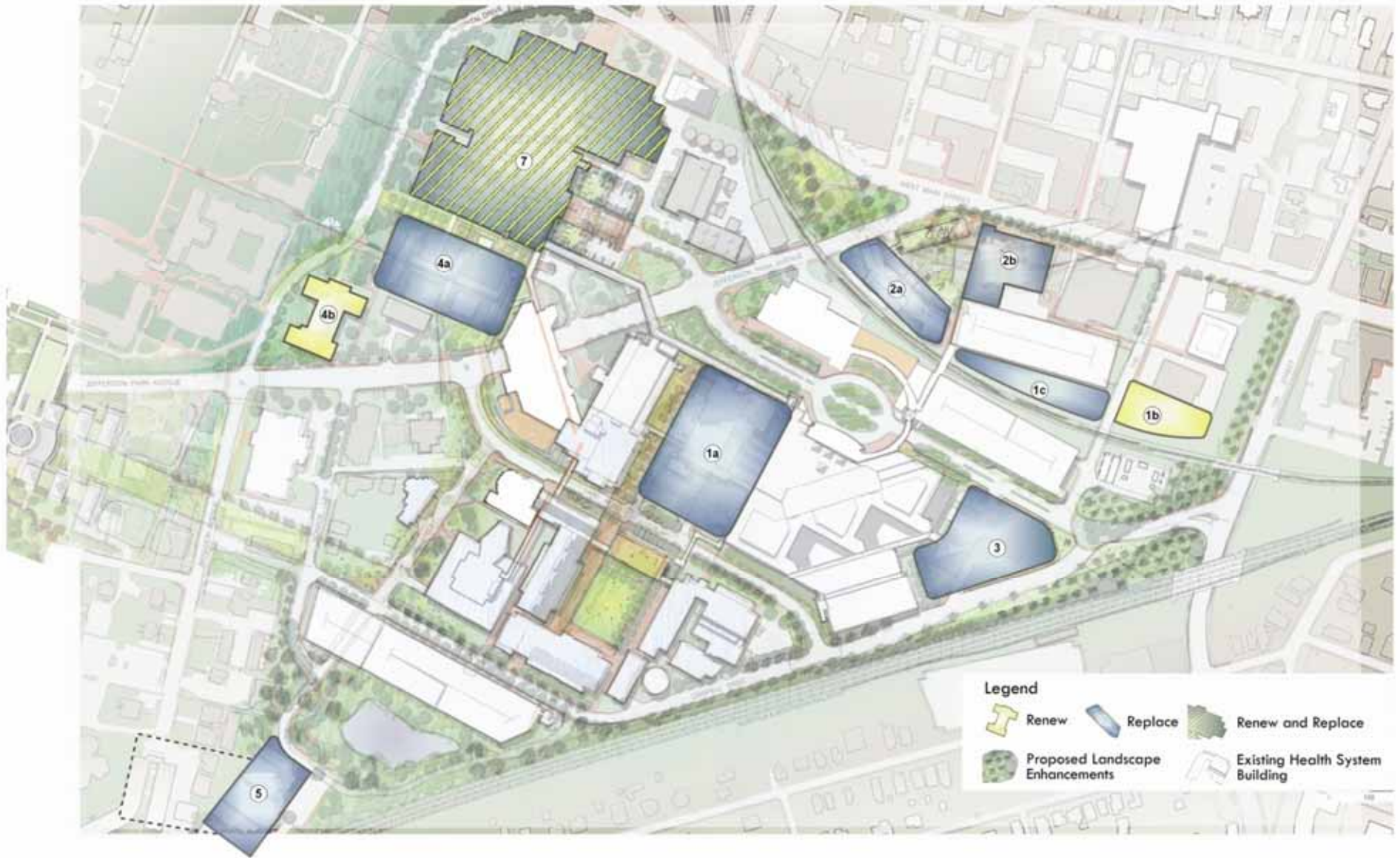
# HSAP | Green Space Improvements: Pedestrian Links



# HSAP | Green Space Improvements: Pedestrian Links



## HSAP | Green Space Improvements: Recreation



# HSAP | 2009 Health System Area Plan