



Natural Systems Planning

Master Planning Council

February 2013

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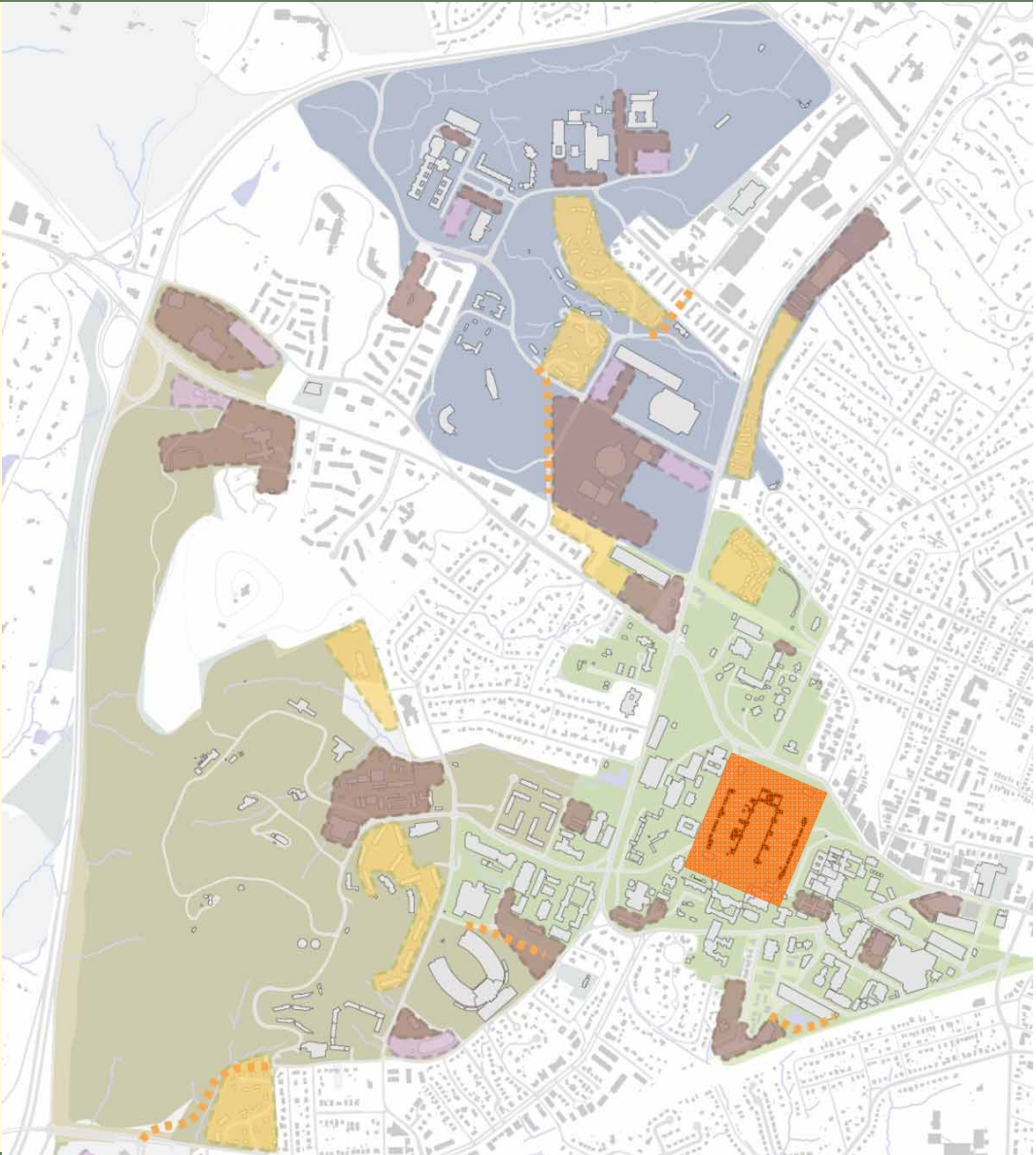
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Environmental
Health and Safety

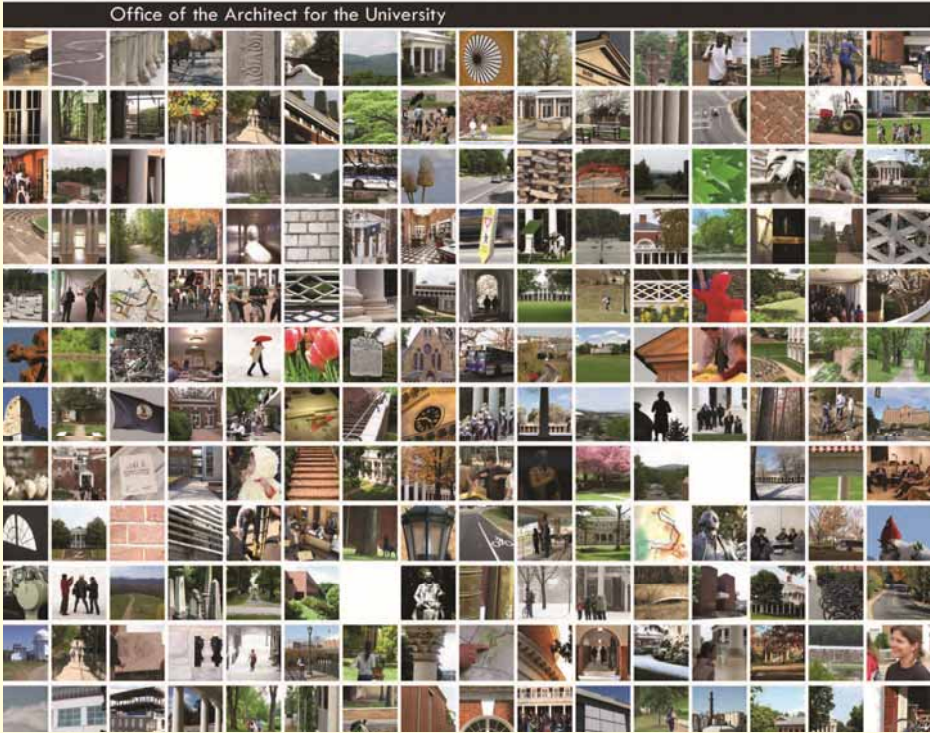
NATURAL SYSTEMS PLANNING

- Environment
- Connectivity
- Multi-Disciplinary Learning
- Context
- Preservation



Grounds Plan Principles

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UVa Health System Area Plan

UVa Design Guidelines

UVa Guidelines for Sustainable Buildings and Environmental Design

UVa Historic Preservation Framework Plan

UVa Transportation Demand Management Plan, Phase 1 & 2

UVa Biodiversity Analysis and Conservation Assessment

UVa Strategic Plan for Water Resources Management

UVa Current Planning and Projects Report

Detailed Studies in Coordination with the Grounds Plan

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- Carbon Sequestration (CO2 reduction)
- Tree Canopy Expansion
- Forest Diversity
- Stormwater Quality
- Stormwater Quantity



Natural System Planning Elements

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Recent Regulatory Actions are giving us direction



- TMDL's for Chesapeake Bay and local streams
- Enhanced Stormwater regulations for development
- New MS4 Permit – Significant new requirements (2013)
- Greenhouse Gas reporting is a reality

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Provides a framework to integrate regulatory and sustainability goals allowing UVA to continue to grow

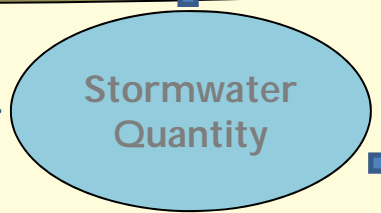
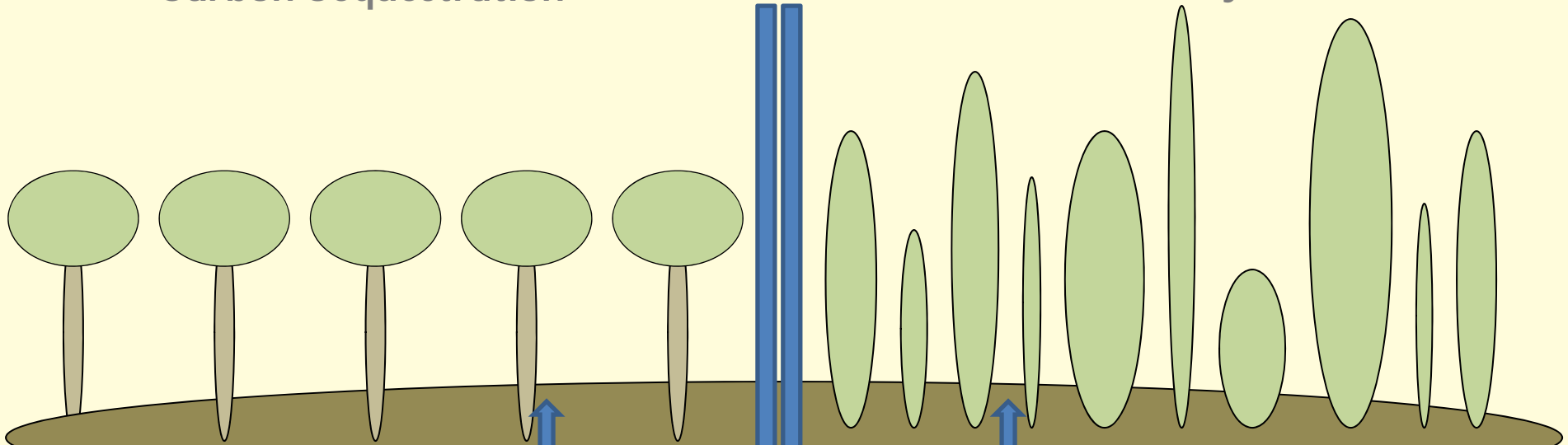
- Establish resource management direction and goals
- Provides a written framework for cooperative interactions with the local community
- Provides a written plan to document compliance

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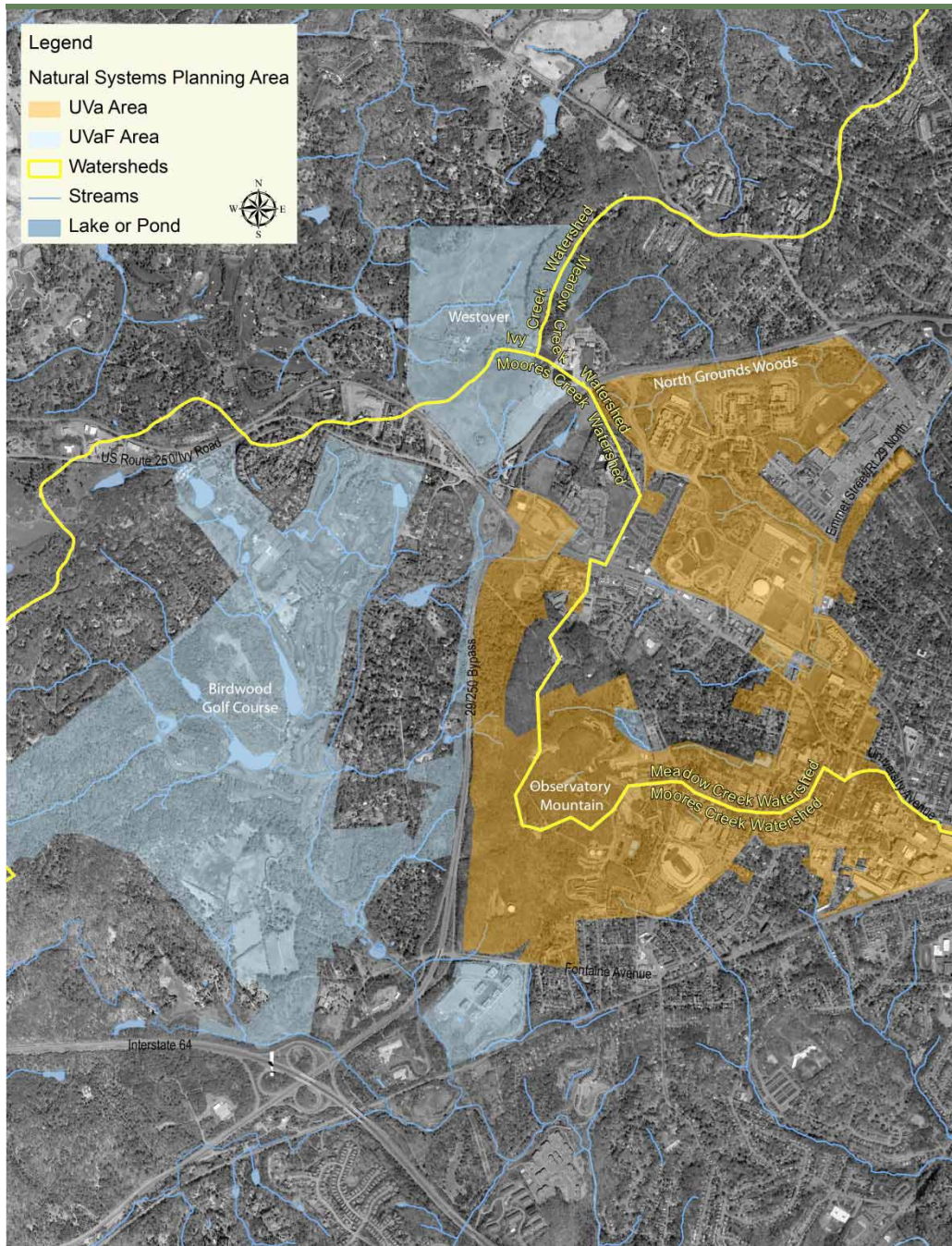


Carbon Sequestration

Forest Diversity and Health



Interrelationship of Systems



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Planning team included multiple entities and disciplines including:

- Office of the Architect
- Facilities Management
- Environmental Health and Safety
- UVa Foundation
- Academics & Research
- TMDL Regional Planning Team

Geographic Scope

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Carbon Sequestration



Stormwater Quantity Reduction



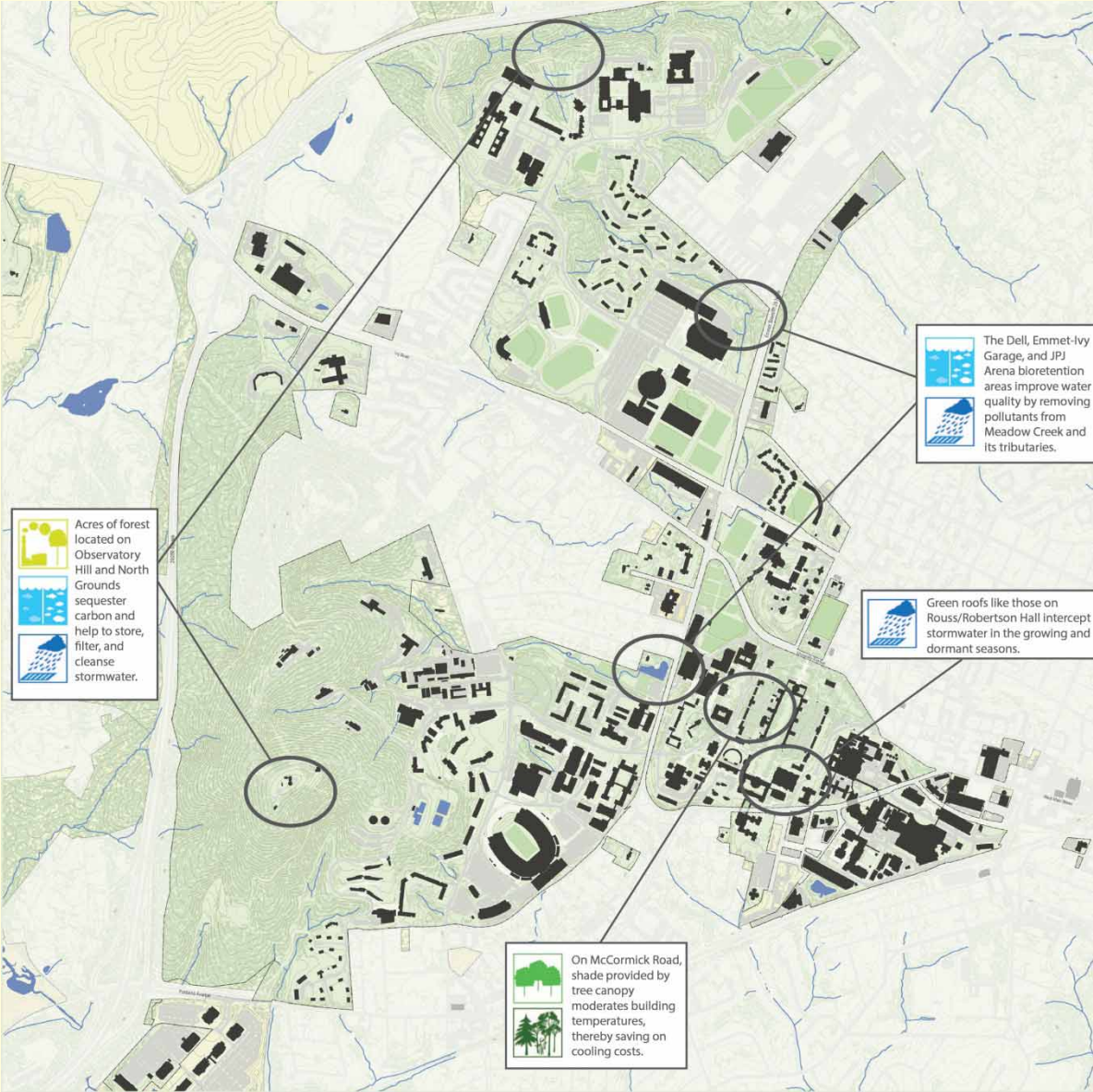
Stormwater Quality Improvement



Tree Canopy Expansion



Tree Diversity Improvement



Examples of Current Practices



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- UVa is a partner in the program to mitigate the total maximum daily load (TMDL) for the Chesapeake Bay
- UVa has been implementing its Stormwater Master Plan since 2001 across Grounds
- UVa has an active stormwater banking system for its two watersheds – Moore's and Meadow creeks
- UVa has been implementing low impact design (LID) installations across Grounds such as stream daylighting & restoration green roofs to improve stormwater quality and quantity
- Cisterns and are used under buildings to conserve water
- Stream bank stabilization and constructed wetlands implementations have improved the stormwater quality in our two watersheds

Stormwater Quality and Quantity



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- Water quality monitoring programs are actively used on Grounds to assess beneficial results for LID implementations
- Construction sites are managed with best management practices to reduce stormwater pollution
- Use of fertilizers on Grounds have been minimized to reduce stormwater pollution

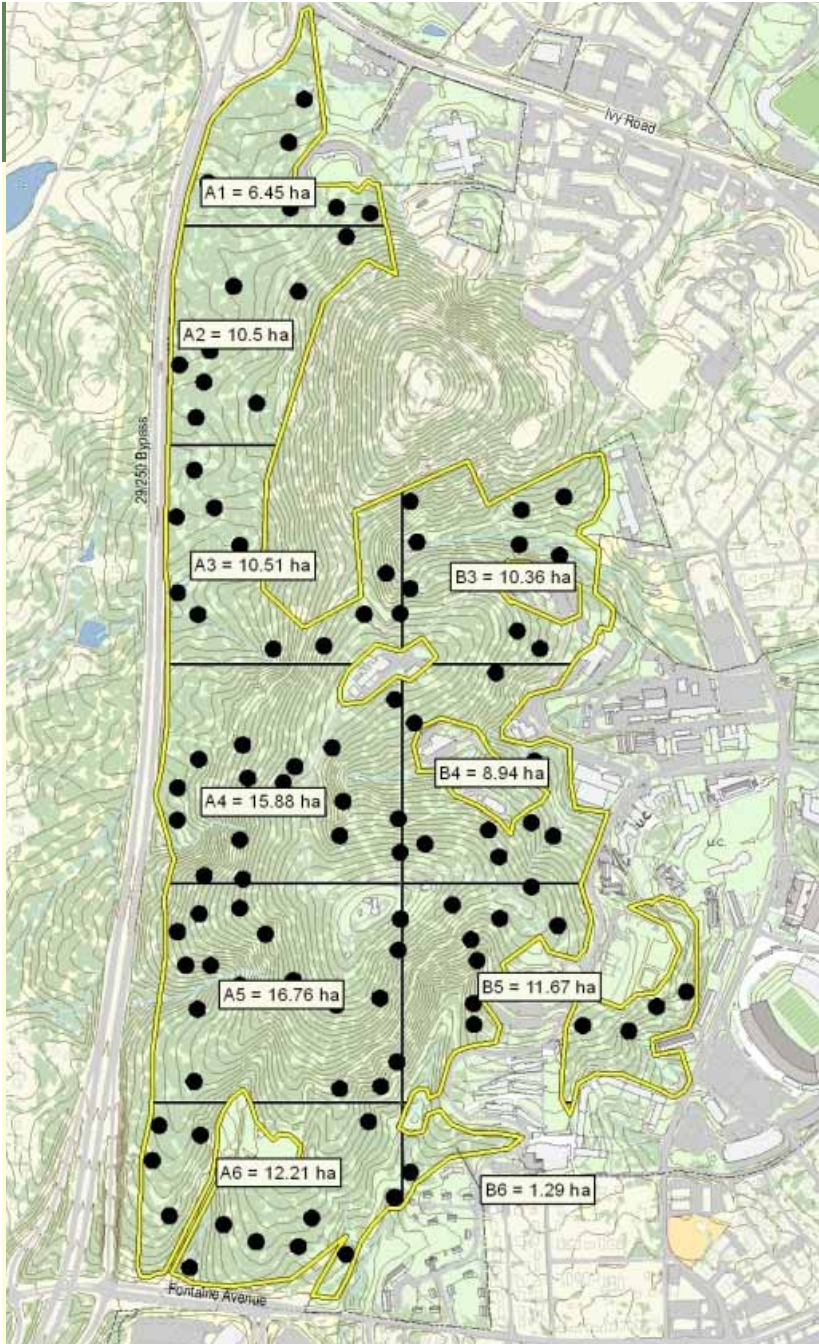


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- Reduce greenhouse gas emissions by 25% from 2009 levels by 2025
- Forested land sequesters metric tons of carbon per year
- Forested lands of Observatory Hill, North Grounds, and Foundation properties support tree diversity and provide habitat
- UVa uses compact development through infill on Grounds to retain green spaces and the systems they support
- Tree canopy on UVa grounds covers over 50% which reduces heat island, and mitigates stormwater quantity and quality
- UVa has an established tree replacement program that has been in effect over 40 years and trees on Grounds are managed and supported by the UVa arborist

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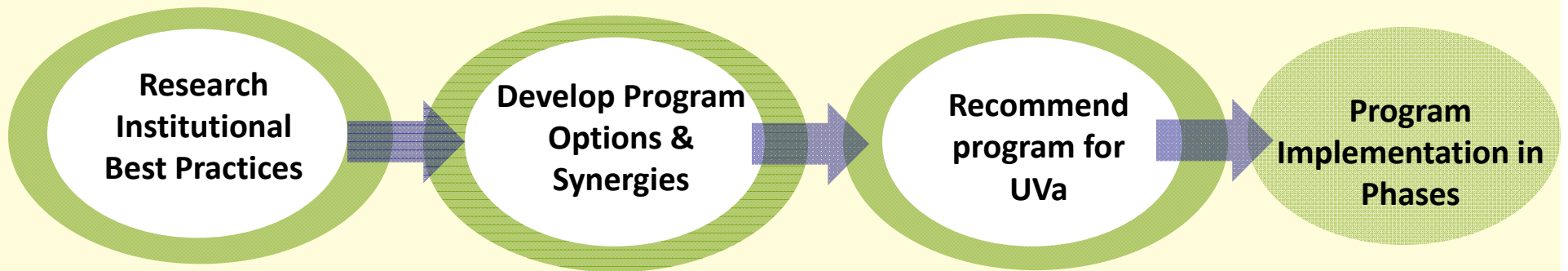
- Tree diversity research sites developed for randomized sample on Observatory Hill, Fall 2011
- Forest Sampling course set up research sites with student teams, Spring 2012
- Analyze tree diversity and advise at to how diversity could be improved, 2013



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Tree Diversity



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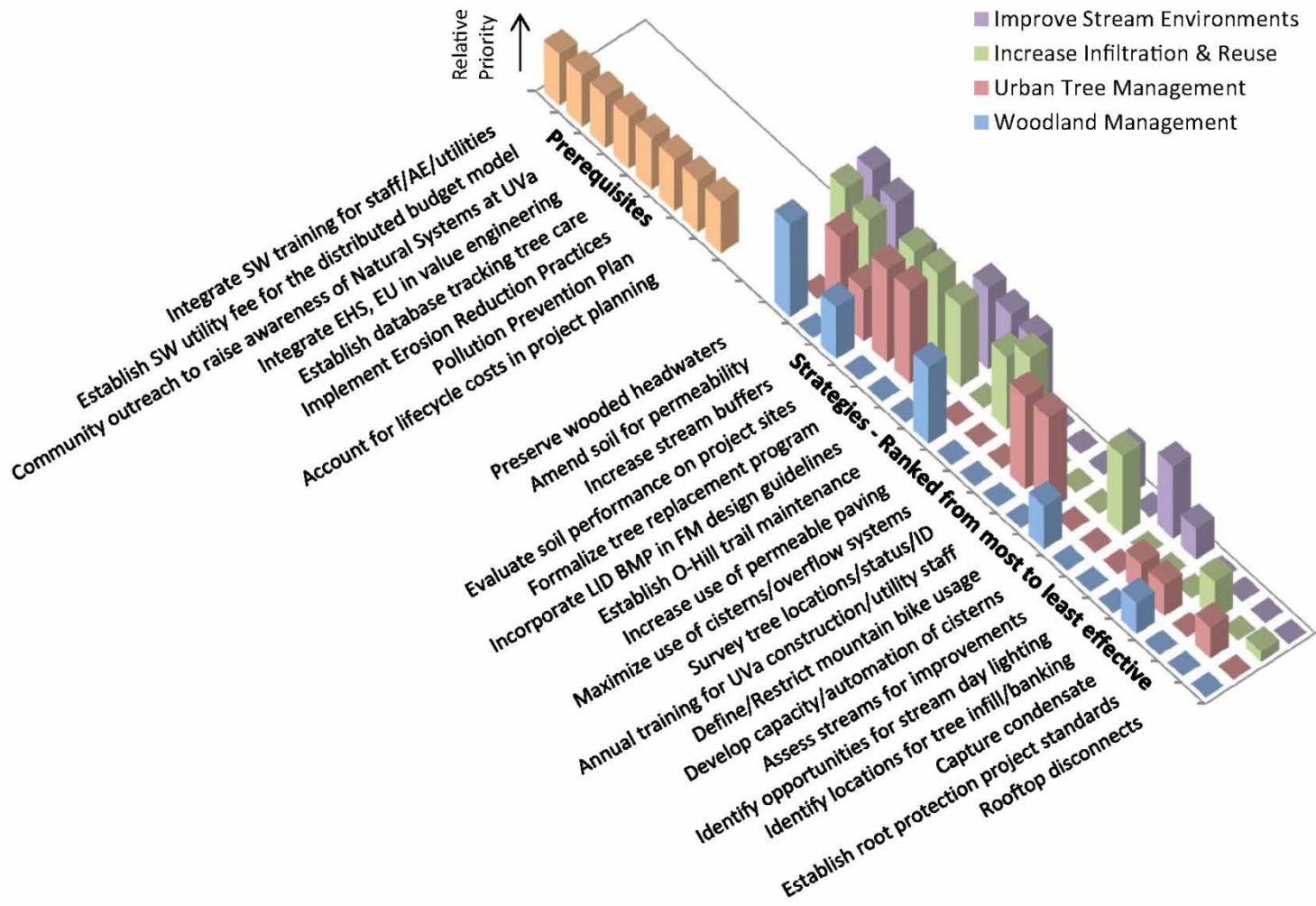
Analysis of future program implementation included multiple factors:

- Time Frame
- Priority Ranking
- Funding
- Ease of Implementation
- Urban/Woodland
- Current Practice
- Policies
- Precursors

Approach	N, M, L	Ranking	Implementation	Woodland	Current Practice	Comments	Policy	Stewards/hip/Policy	Retrofit/Management	Studies/Monitoring	New Design
1 Woodland Conservation											
1a	M	1	moderate	W	No practice	Significance of O-Hill has been identified in planning documents	↑				
1b	L	6	moderate-hard	W	No practice			↑			
1c	L	5	hard	W	Passive approach to restrictions	No redevelopment as designated in the Grounds Plan + significant designations in the HPEP	↑				
1d	N	2	moderate	W	No UVA practice	No active UVA practice - RTI			↑		
1e	N	4	moderate	W	No practice	Services have been offered by CAMIC, but no agreements have been accepted			↑		
1f	M	3	easy	W	Varies	Practiced on edges of Grounds			↑		
2 Tree Canopy Expansion											
2a	M	3	hard	U	Varies	Parking - policy change needed / Buildings should be addressed in project design review			↑		↑
2b	N	1	easy	U	Varies	Existing program inconsistent - specific funding needed			↑		
2c	N	4	easy	U	Varies	No comprehensive approach - spot locations only					↑
2d	M	5	easy	U	Varies	Practiced at specific locations - needs normalization and coordination with fa			↑	↑	
2e	L	2	moderate-hard	U	None						
3 Preserve Existing Trees											
3a	N	4	easy	U	Yes, but not consistently enforced	When design guidelines enforcement and education is needed with utilities and PM monitoring				↑	↑
3b	L	5	moderate	U	None	No formalized approach - policy change is needed and should be tied to tree replacement program			↑		
3c	M	2	easy	U	Varies	Hazards are covered, grating on as-needed basis with 3 vendors - only needed for additional maintenance				↑	
3d	N	1	moderate	U	Not comprehensive	Outdated partial survey exists, desire to develop capacity in-house and tie to				↑	
3e	N	3	moderate	U	Not comprehensive	No current database except JB Journal, desire to develop in-house capacity and tie to old					↑
4 Education/Training/Value											
1 Reduce Volume: Infiltration/Pollution											
1a	M	5	hard	U	None	Could be required to meet new TMDL's			S		
1b	N	2	easy	U	Lawn every other year	Subsoil may need to be amended also			S	S	S
1c	N	3	moderate	U	Case by case	Amended soil from JVA Landscaping			S		S
1d	N	6	moderate	U	Case by case				S		
1e	N	8	hard	U	Case by case				S		S
1f	N	7	hard	U	None				S		S
1g	M	4	moderate	U	Some new projects - rain gardens	Site specific			S		S
1h	N	1	easy	U	None	Could be done as part of geotech study				S	S
1i	N	9	moderate	U	Used in some new construction	Must make sure basements are not impacted			S		
2 Reduce Volume: Reuse											
2a	N	7	hard	U	Emmet/Ivy Garage	Very specific site requirements					S
2b	L	4	moderate to hard	U	Case by case	Specific to each end use - Health Department guidance lacking for in-building use			S		S
2c	N	5	moderate	U	Case by case				S		S
2d	L	6	hard	U	None				S		S
2e	N	1	easy	U	Currently used predominantly in drought situations	Current cisterns are not conveniently located for use by Landscaping			S		S
2f	N	2	moderate	U	Only one with pump (Garrett Hall)	Currently the area no monitoring systems in place			S		S
2g	N	3	moderate to hard	U	None	Because of quality concerns, may be restricted to use of roof top water			S	S	S
3 Improve Stream Environments											

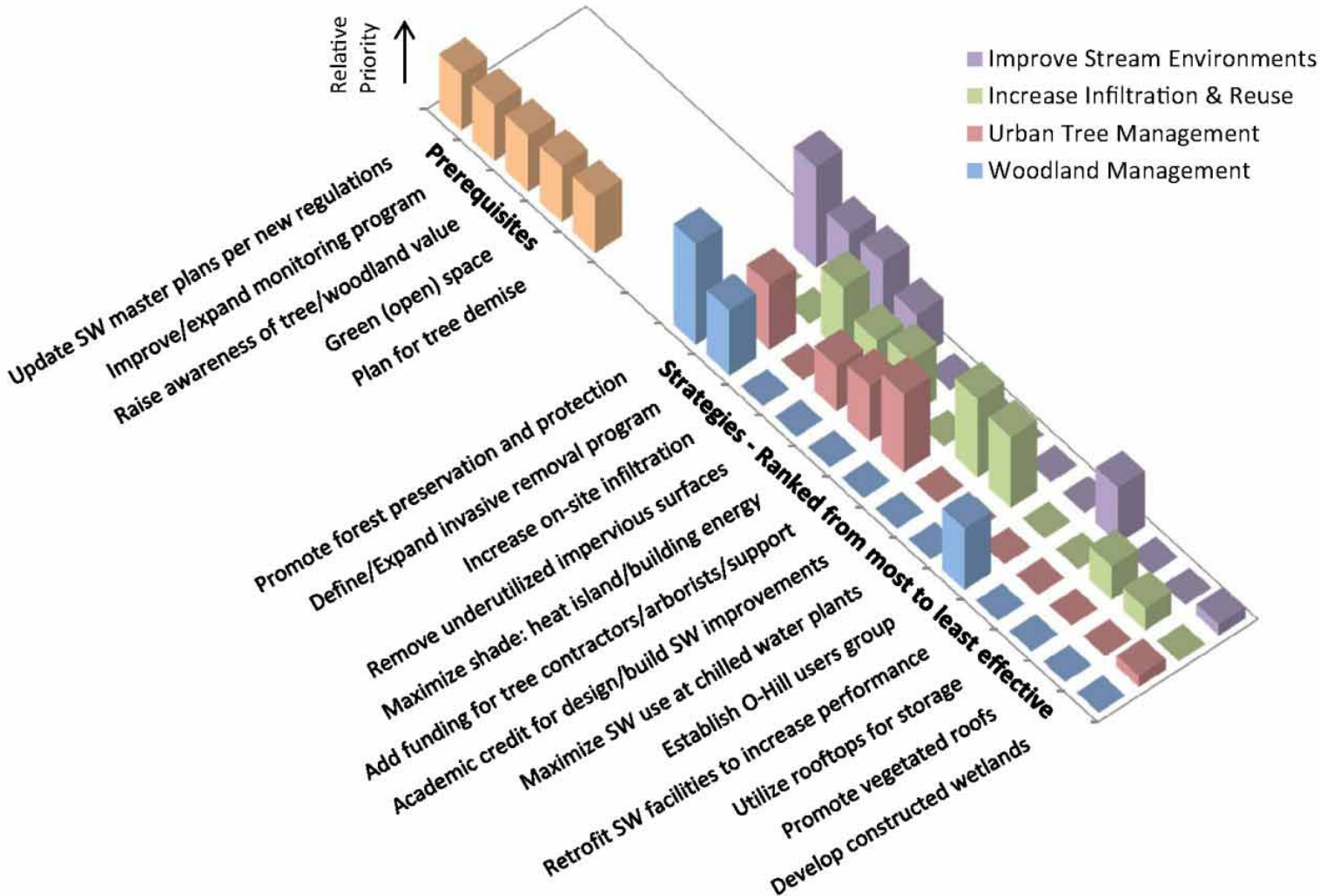
Program Development Data Tracking

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Near-term Implementation

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Medium-term Implementation

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1 acre of woodland sequesters 3.3 metric tons of carbon per year. UVA and neighboring UVAF lands include 1,100 acres of forest - equating to 3,630 metric tons of carbon reduction per year. This benefit comes at no cost to the University and the carbon offset equates to an investment of \$25 million in solar panels.



These same 1,100 acres of forest also help to store, filter and cleanse stormwater. Forest landscapes are estimated to retain 45% more stormwater on-site and infiltrate 15 to 20% stormwater into the ground. UVA and neighboring UVaF forests retain up to 220 tons of sediment per year from impairing areas streams and rivers.



Bioretention areas improve water quality by removing pollutants - 20% nitrogen, 45% phosphorous, 60% sediment per year at UVA. The Dell, Emmet-Ivy Garage and JPJ Arena bioretention basins treat 65 acres of impervious cover and remove pollutants from Meadow Creek and its tributaries.



Green roofs intercept 70-90% of stormwater in the growing season and 25-40% in the dormant season. The University currently has 75,000 square feet of green roofs which intercept 1,375,000 gallons of stormwater per year.



Tree canopy provides valuable shade that saves on cooling costs and lessens the heat island effect that is inherent to development. Tree canopy at UVA moderates temperatures by 5-9°F in the summer.



Regardless of their size at maturity, trees provide a net positive benefit for carbon sequestration, stormwater storage, stormwater and air pollution removal, and energy reduction savings. For UVA, the benefit to cost ratio (BCR) of 2.4 means that for every \$1 spent on tree care, \$2.4 in benefits are created.



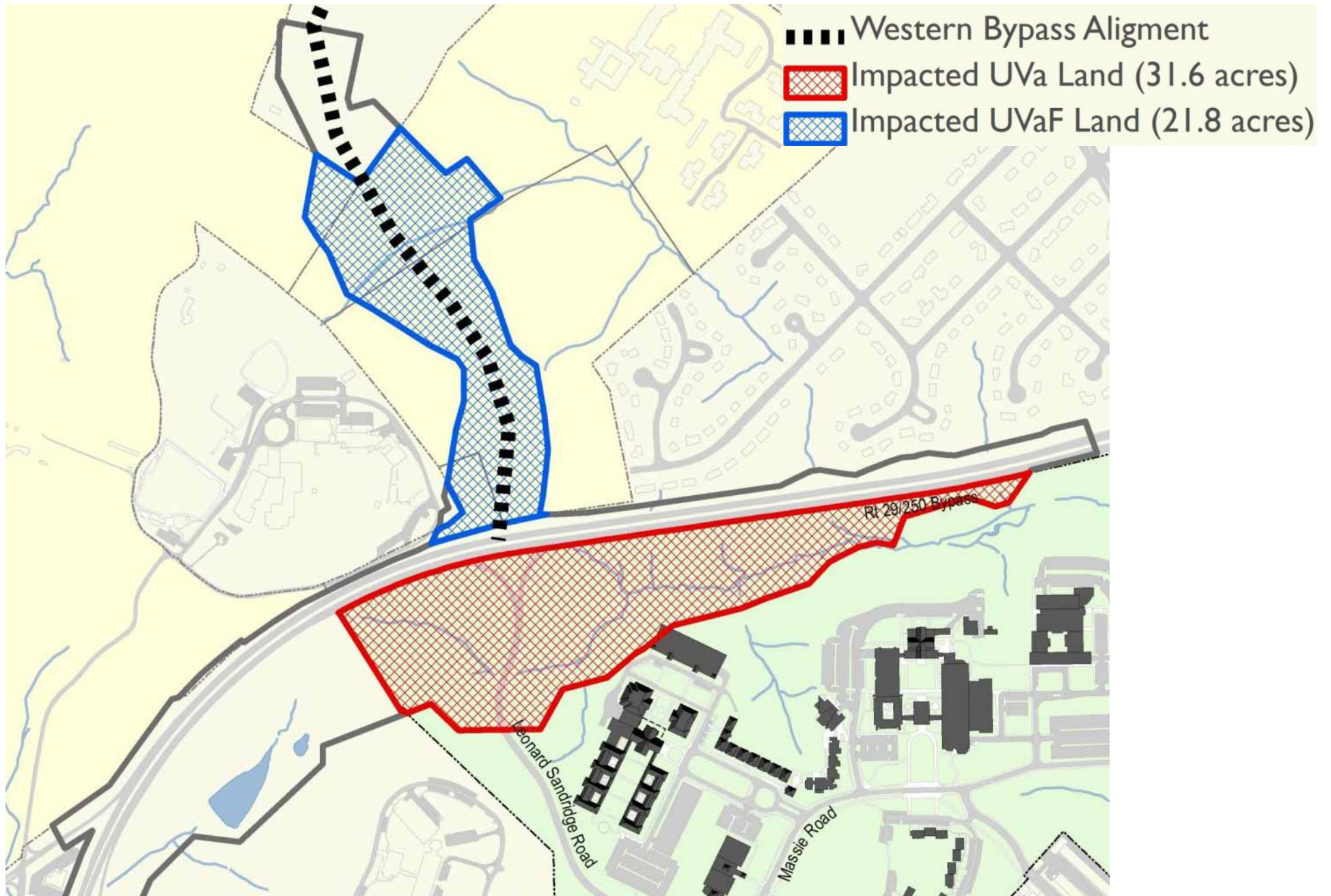
Proposed State Route 29 Western Bypass Status Report: Feb 2013



Overall Route Alignment

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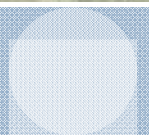


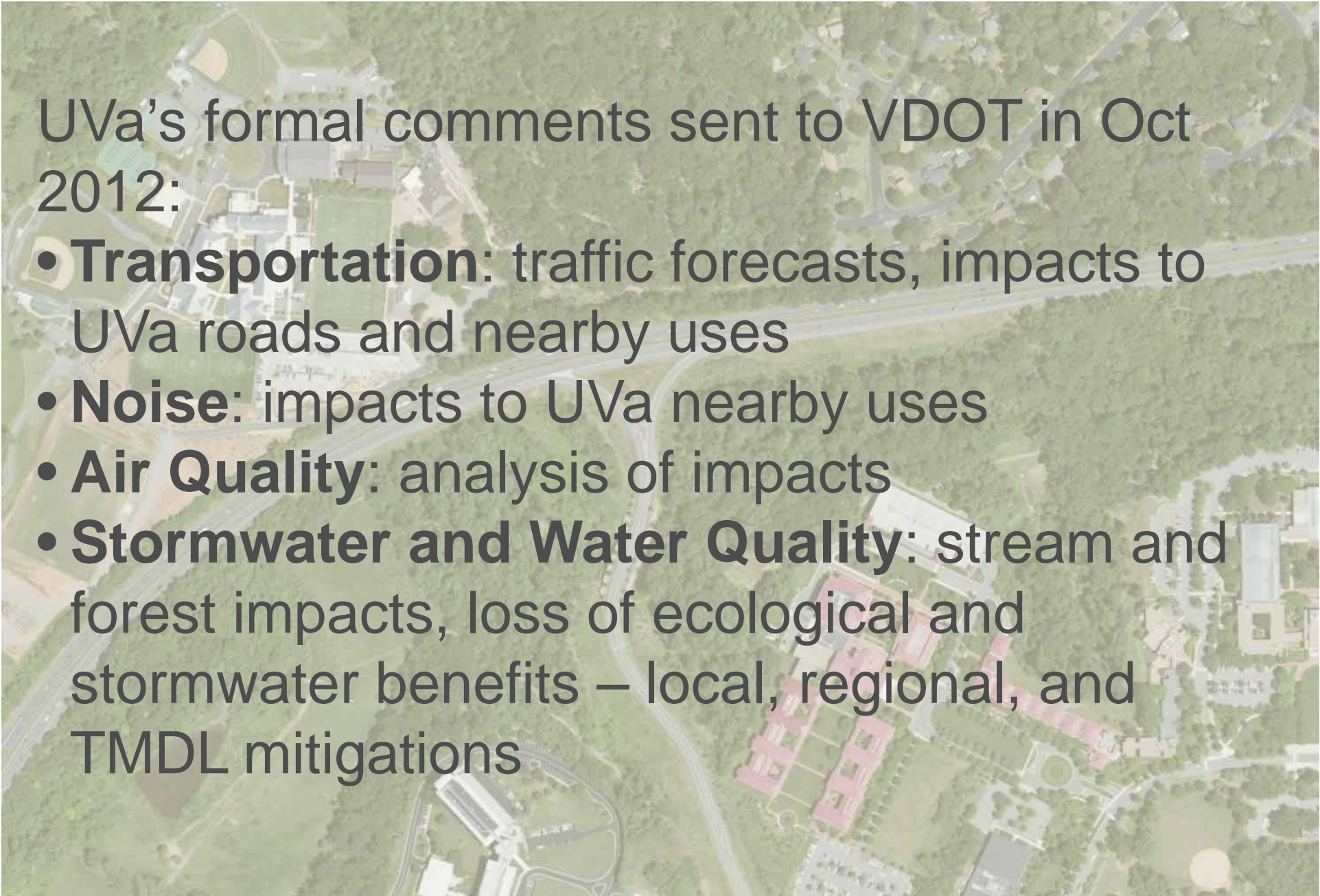


Right of Ways: UVA / UVaF Properties



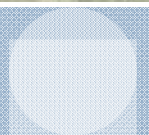
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- FHWA environmental evaluation – In process
 - Completion of project design – Mid-2013
 - Approval of required permits – Oct 2013
 - Estimated construction start – Nov 2013
 - Completion of property acquisition – Feb 2014
 - Project completion & Widening 29 North – 2017





UVa's formal comments sent to VDOT in Oct 2012:

- **Transportation:** traffic forecasts, impacts to UVa roads and nearby uses
- **Noise:** impacts to UVa nearby uses
- **Air Quality:** analysis of impacts
- **Stormwater and Water Quality:** stream and forest impacts, loss of ecological and stormwater benefits – local, regional, and TMDL mitigations

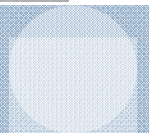


McCormick Bridge Replacement



Current Bridge Conditions

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McCormick Bridge from Emmet Street

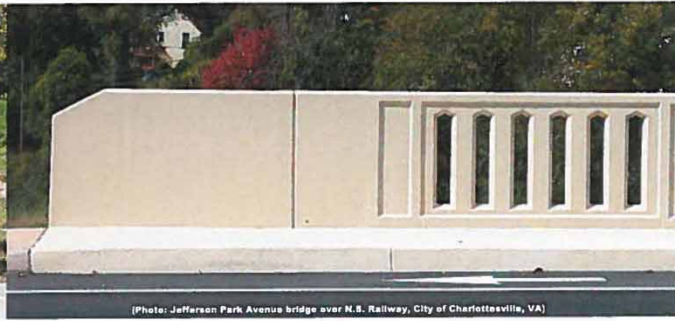




Proposed

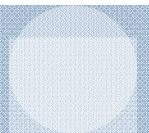


Existing



[Photo: Jefferson Park Avenue bridge over N.B. Railway, City of Charlottesville, VA]

Proposed Railing





Existing



Proposed



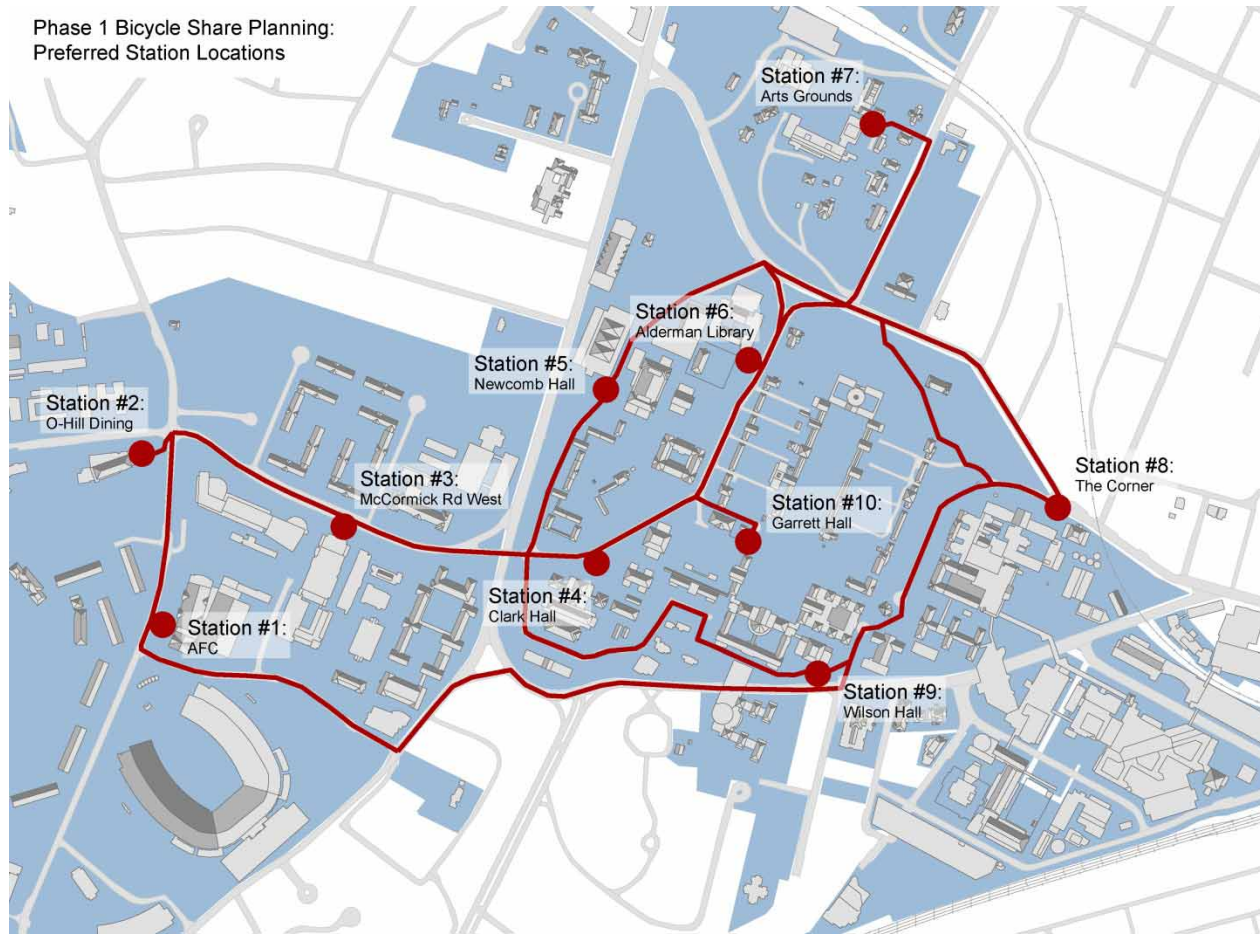
- Project begins May 2013 – following graduation
- Project completed August 2013 – prior to start of classes

No access on bridge during construction



UVa Bikeshare

Phase 1 Bicycle Share Planning:
Preferred Station Locations



Planned Station Locations

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University





Solar Powered Kiosk

Custom
Designed
Bicycles

Secured Docking
Station

Bicycle Sharing Station

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UVa Bicycle Share RFP Schedule, 2012-2013		SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR
VDOT Coordination on project/funding	Sep	█	█						
SP issues revised goldenrod to VDOT	Sep	█	█						
Develop RFP	Sep 15 - Oct 19		█	█	█				
Visit DC bikeshare program	Oct		█						
Research other bikeshare programs	Oct - Nov		█	█	█				
VDOT RFP Review	Nov - Jan				█	█	█		
Committee selection	Nov			█					
RFP revise and revision	Jan 1 - 18					█	█		
Issue Requisition	Week of Jan 21					█			
Issue RFP	Week of Feb 11						█		
Pre-proposal conference	Week of Mar. 4							█	
Pre-proposal questions due	Week of Mar 11							█	
Responses to RFP due	Week of March 18							█	
Proposal review complete/short list	Week of March 25							█	
Interviews	Week of April 1								█
Provider selection	Week of April 1								█



Selection:

Rebecca White, Director, Parking & Transportation

Jonathan Monceaux, TDM, Parking & Transportation

Julia Monteith, Land Use Planner, Office of the Architect

Andrew Greene, Sustainability Planner, Office of the Architect

Advisory:

Angela Tabler (UPD)

Len Schoppa (Faculty)

Rich Hopkins (Facilities Management, Landscape)

Nina Morris (FM Sustainability)

Amanda Poncy (City of Charlottesville)

Will Andrewes (Student Council)

Brantley Tyndall (VCU)

