University of Maine Master Plan

Master Plan Work Session
March 19th, 2008

1865 THE UNIVERSITY OF MAINE

SASAKI
COPLON ASSOCIATES

Meeting Agenda

1. Analysis
2. Development Framework / Strategy
3. Preliminary Master Plan Recommendations
4. Preliminary Master Plan Components
5. Discussion

Campus Context

Economic/Cultural Context
Environmental Context
Planning Context

Economic/Cultural Context

250 mile radius

Bangor	10 mi
Augusta	70 mi
St. John	125 mi
Quebec	180 mi
Boston	215 mi
Montreal	250 mi
Halifax	250 mi

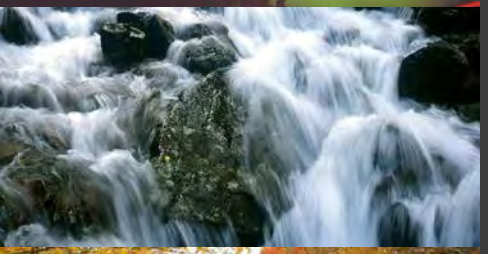
Additional

Ottawa	340 mi
N.Y. City	400 mi

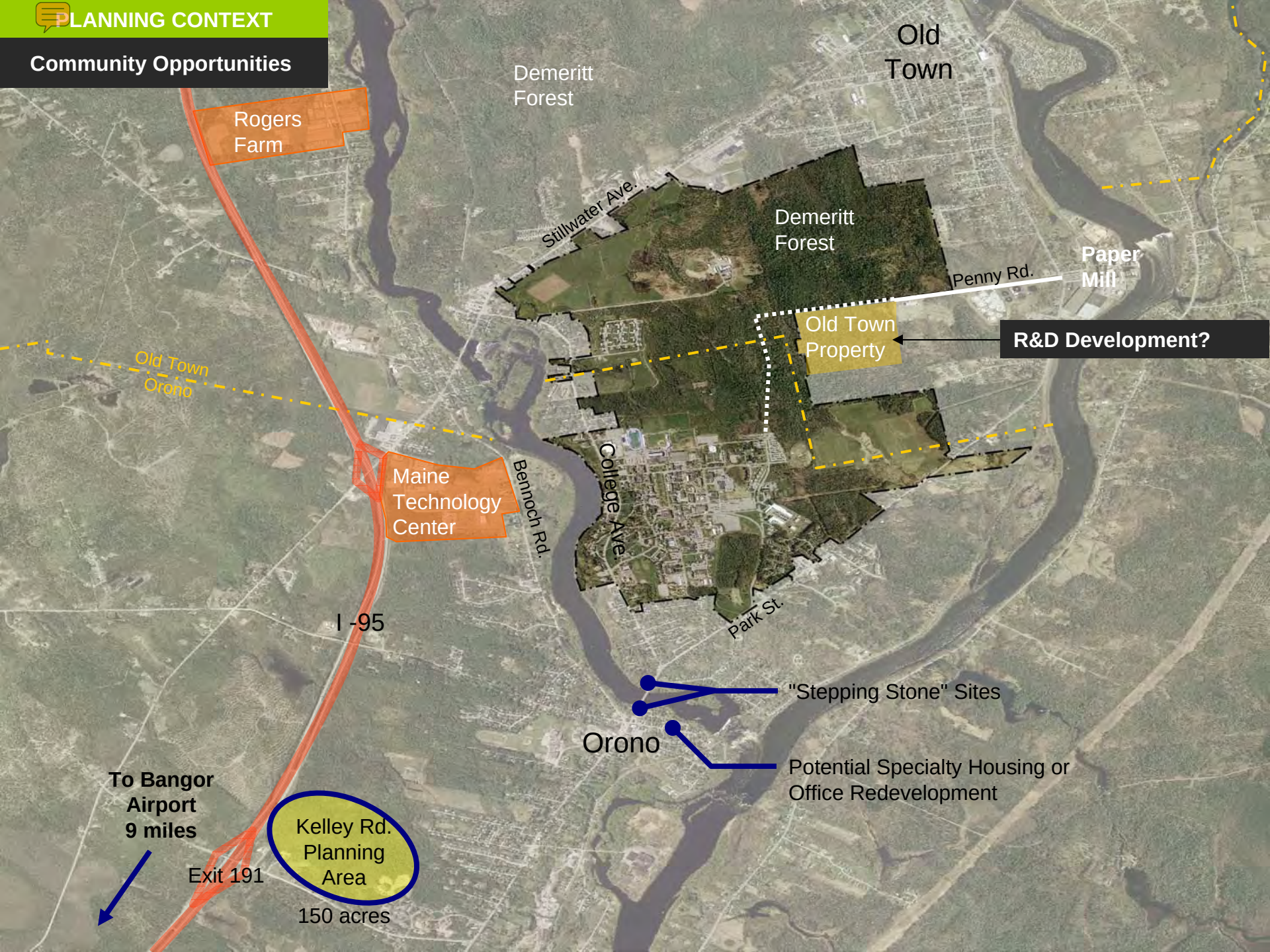
Ecological / Tourism Context

200 mile radius

Acadia	40 mi
Baxter	70 mi
White Mnts.	120 mi
Laurentides	200 mi



1865 THE UNIVERSITY OF MAINE


PLANNING CONTEXT
Community Opportunities
Old Town
Demeritt Forest
Rogers Farm
Stillwater Ave.
Demeritt Forest
Paper Mill
Penny Rd.
Old Town Property
R&D Development?
Old Town
Orono
Maine Technology Center
Bennoch Rd.
College Ave.
Park St.
I -95
"Stepping Stone" Sites
Orono
Potential Specialty Housing or Office Redevelopment
To Bangor Airport 9 miles
Kelley Rd. Planning Area
Exit 191
150 acres

Campus Analysis & Principles

Master Plan Goals
Campus Analysis Topics
Design Principles Based on Analysis

Master Plan Goals

- *Sustainability and Stewardship*
- *Collegiality and Community*
- *Compact Land Use Pattern*
- *Campus Access*
- *Landscape*
- *Architectural Design*
- *Partnerships and Community Interface*
- *Academic and Research*

Master Plan Goals

- *Sustainability & Stewardship*
  - The Plan should advance the philosophy of sustainability, quality of life and human betterment as a 21st century expression of the land grant mission of UMaine. It should promote prudent stewardship and sound management of physical resources and make the campus a working model of sustainability and smart growth. It should enhance the connections between the developed areas of the campus and the surrounding natural systems to reinforce UMaine's origins as a land grant institution.

- *Collegiality and Community*
  - The Plan should create an environment that facilitates community and an academic setting that fosters robust, innovative and collaborative research, scholarship and creative activity, including strong connections between graduate and undergraduate programs.

Master Plan Goals

- *Compact Land Use Pattern*
  - The Plan should maintain a compact land-use pattern in order to: reinforce the pedestrian qualities of the campus; maintain operational and infrastructure efficiencies; preserve natural systems; and, enhance campus vitality by placing a variety of activities in close proximity to one another.

- *Campus Access*
  - The Plan should promote the pedestrianization of the central campus, taking into consideration issues of climate, security, comfort and convenience, including interior/exterior pedestrian circulation connectivity. In conjunction, it should encourage alternative modes of transportation in line with sustainability and carbon emissions reduction goals.

Master Plan Goals

- *Landscape*
  - The Plan should restore, enhance and extend the quality and character of the historic campus core landscape by means of a well-defined framework of open spaces and linkages as well as sustainable implementation guidelines.

- *Architectural Design*
  - The Plan should inform guidelines for historic and future buildings taking into account the materials, building forms, massing and building-to-site ratios of existing buildings while addressing energy efficiency, modern program requirements, and accessibility.

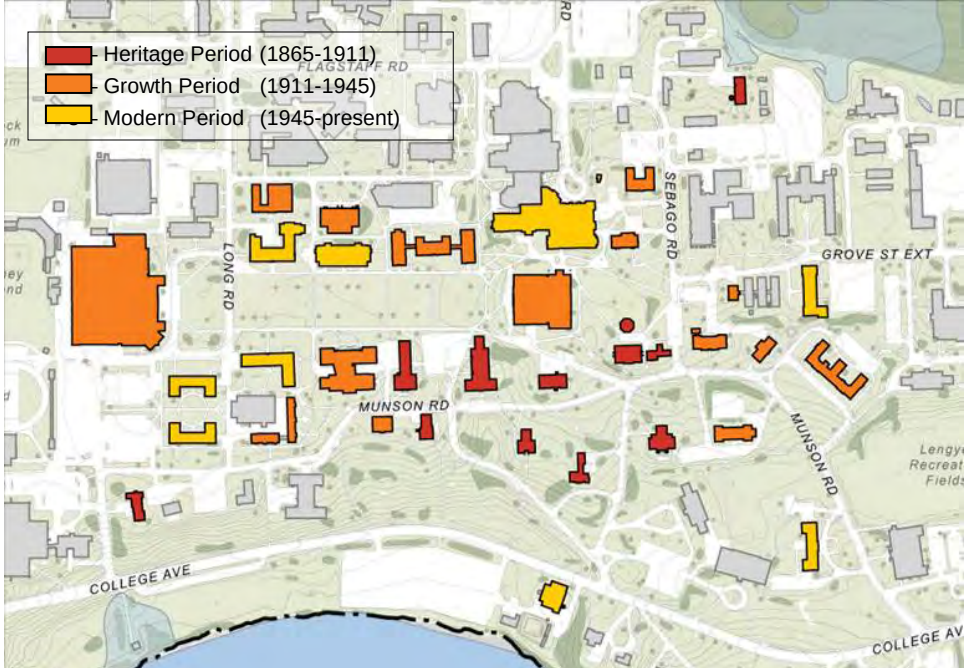
Master Plan Goals

- *Partnerships and Community Interface*
  - The Plan should maintain the existing compatible land use relationships with the surrounding business and residential districts of Orono and Old Town in order to enhance partnership opportunities with the local community. New partnerships should be carefully weighed as potential economic and community revitalization generators for both the University and the broader community.

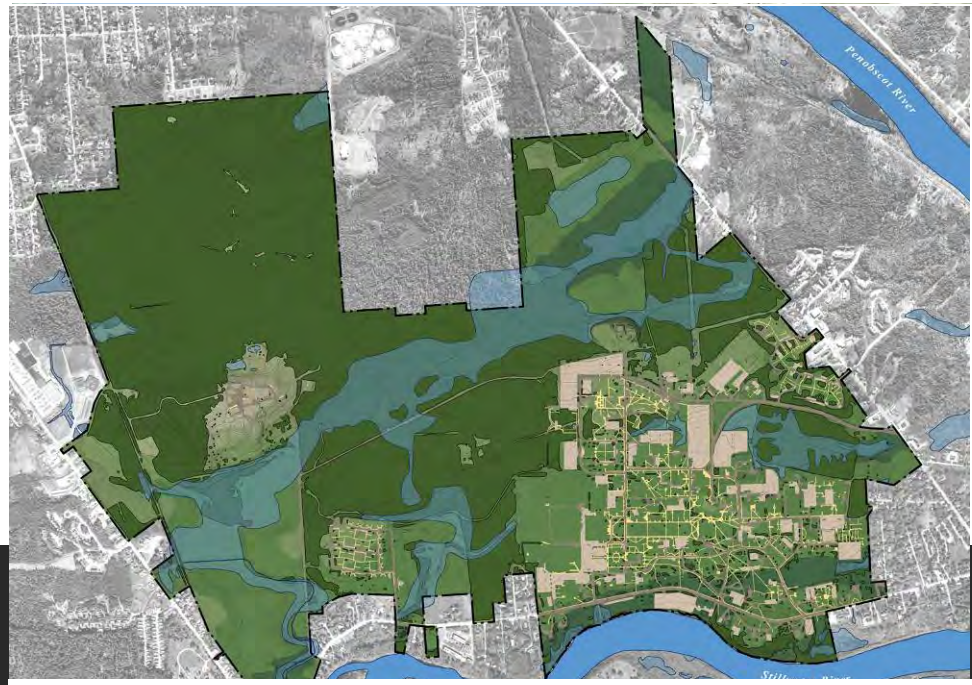
- *Academic and Research*
  - The Plan should define the terms by which the University's strategic academic and research vision can be physically accommodated to best effect—through integration of basic and applied research in the campus learning environment and technology transfer initiatives located to benefit the community.

Campus Analysis

1. Mission
2. Context
3. Natural Systems
4. Water Resources
5. Development Patterns
6. Building Conditions
7. Community
8. Cultural Resources
9. Access
10. Energy and Atmosphere
11. Materials and Resources
12. Program



Source: The University of Maine: ***Historic Preservation Master Plan****, March 2007*



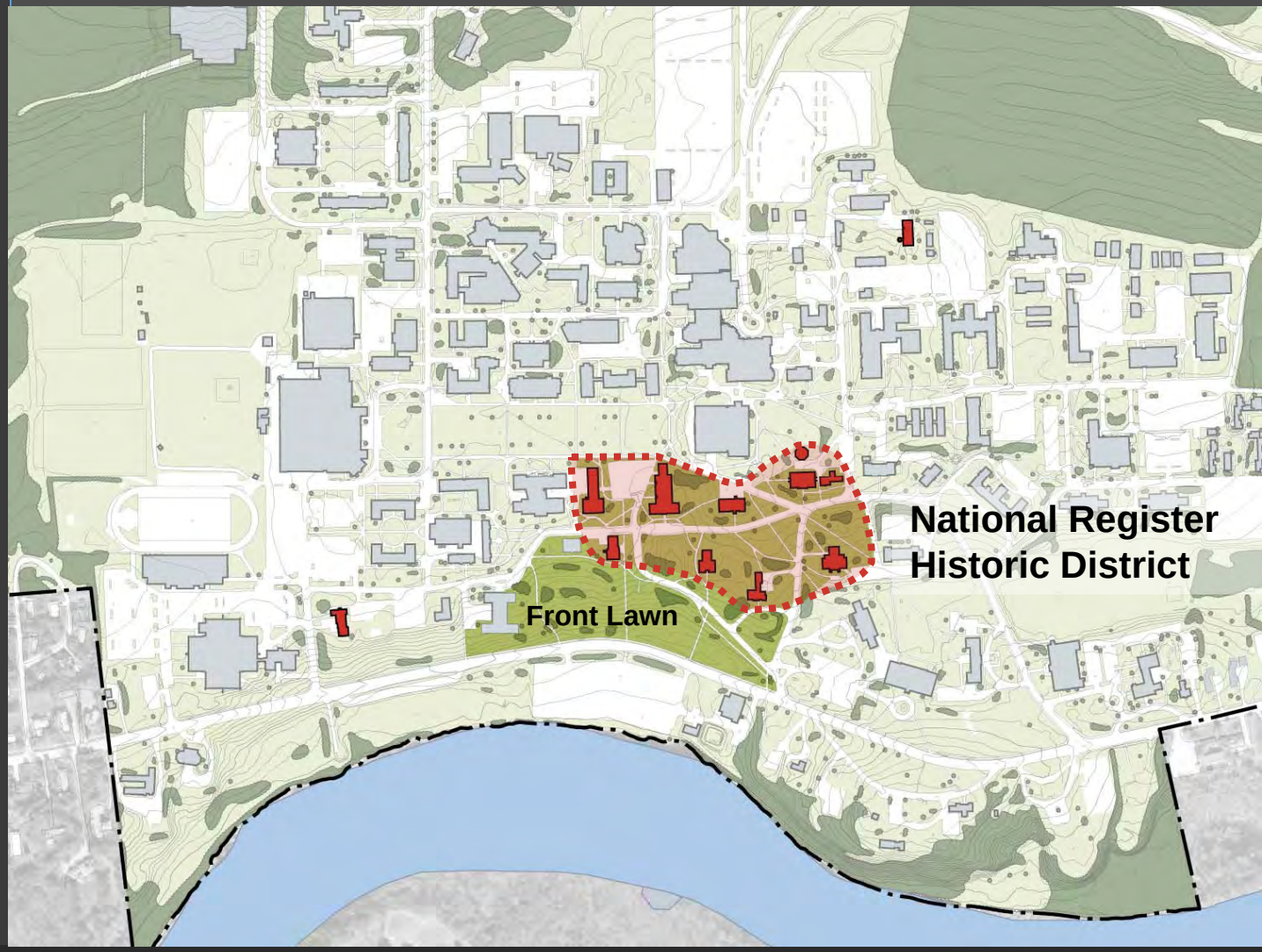
Natural Systems Analysis

1865 THE UNIVERSITY OF MAINE

Historic Buildings – Getty designation

Tier 1: Heritage Period
1865 -1911

- Alumni Hall
- Carnegie Hall
- Coburn Hall
- Crossland Hall
- Cyrus Pavilion
- Fernald Hall
- Holmes Hall
- Lord Hall
- The Maples
- Page Barn
- Edith Patch House & Barn
- President's House
- Winslow Hall

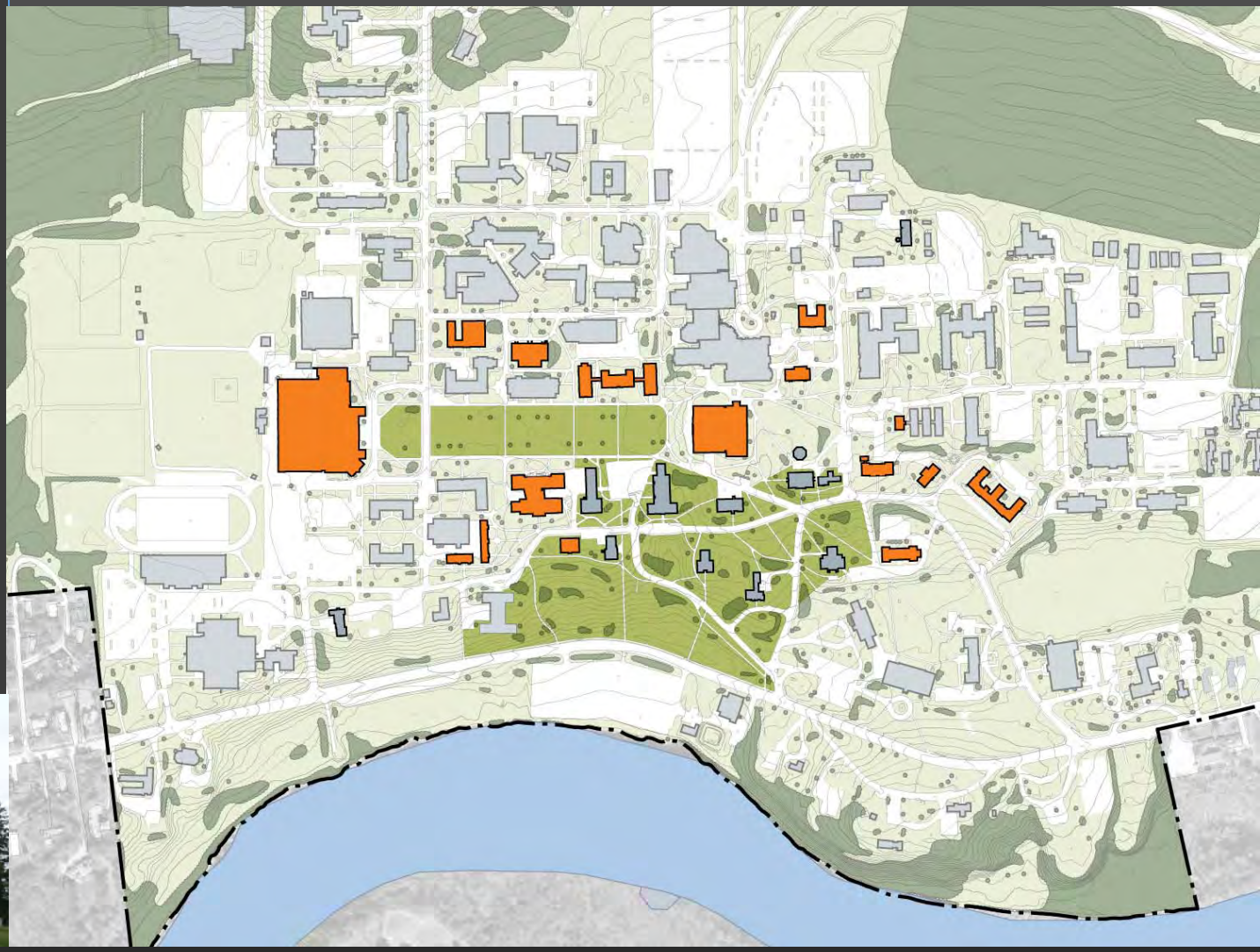


Source: The University of Maine: Historic Preservation Master Plan, March 2007

Historic Buildings – Getty designation

Tier 2: Growth Period
1911 - 1945

- Aubert Hall
- Balentine Hall
- Roger Clapp Greenhouse
- Colvin Hall
- Crosby Hall
- Estabrooke Hall
- Fogler Library
- Hannibal Hamlin Hall
- Machine Tool Laboratory
- Merrill Hall
- Memorial Gymnasium
- Oak Hall
- Rogers Hall
- Norman Smith Hall
- Stevens Hall
- Wingate Hall



Source: The University of Maine: Historic Preservation Master Plan, March 2007

Historic Buildings – Getty designation

Tier 3: Modern Period
1945 - present

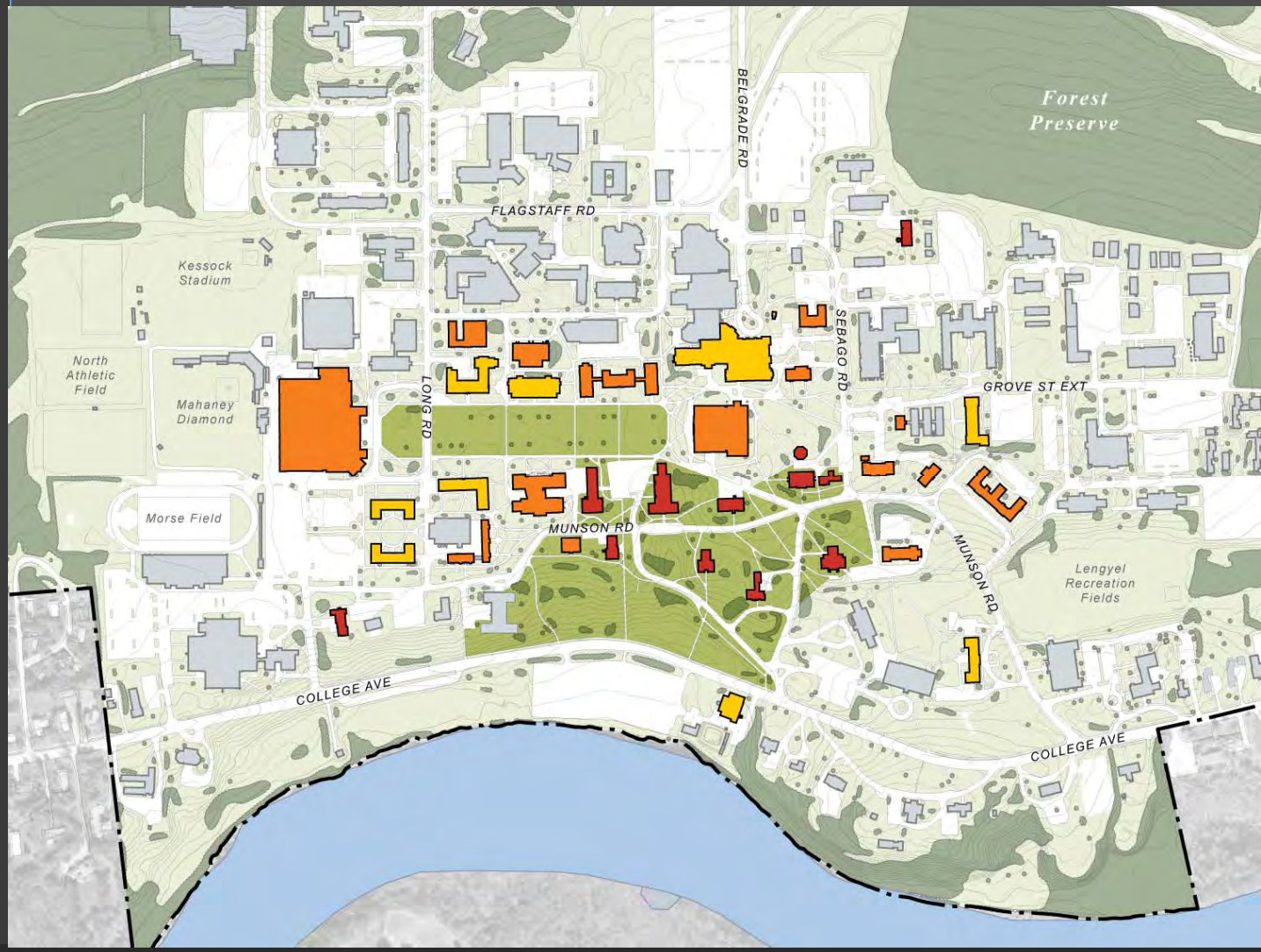
- Boardman Hall
- Chadbourne Hall
- Corbett Hall
- Deering Hall
- Dunn Hall
- Hart Hall
- Jordan Observatory
- Little Hall
- Memorial Union
- Steam Plant

Source: The University of Maine: Historic Preservation Master Plan, March 2007

Historic Buildings – Getty designation

Tiers

- Tier 1
- Tier 2
- Tier 3

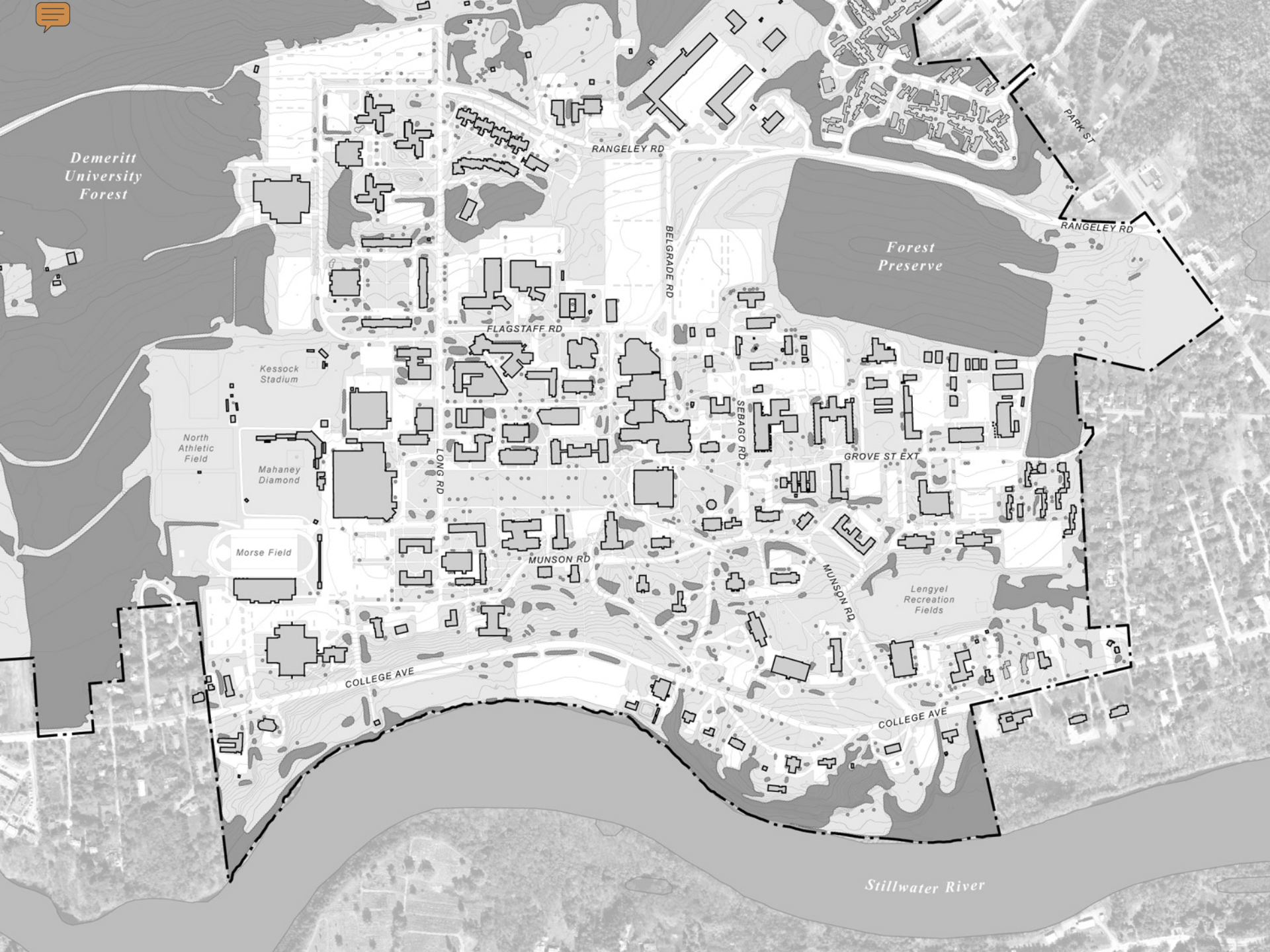


Source: The University of Maine: Historic Preservation Master Plan, March 2007

Natural Systems Principles

- Reduce impervious surfaces in each watershed
- Reclaim wetland areas
- Buffer northern winds: Landscape intervention & East-West building orientation
- Preserve / Restore forest
- Preserve / Restore Olmsted landscape
- Extend South Mall as 21st Century landscape intervention
- Connect site and habitat through landscape corridors: Infrastructure approach to stormwater management


Windrow


Demeritt University Forest
RANGELEY RD
PARK ST
RANGELEY RD
Forest Preserve
BELGRADE RD
FLAGSTAFF RD
Kessock Stadium
North Athletic Field
Mahaney Diamond
LONG RD
SEBAGO RD
GROVE ST EXT
Morse Field
MUNSON RD
MUNSON RD
Lengyel Recreation Fields
COLLEGE AVE
COLLEGE AVE
Stillwater River

Tree Cover

Net Area within campus boundary

830 acres

Demerritt Forest

Dominant Species

White Pine

Spruce 29%

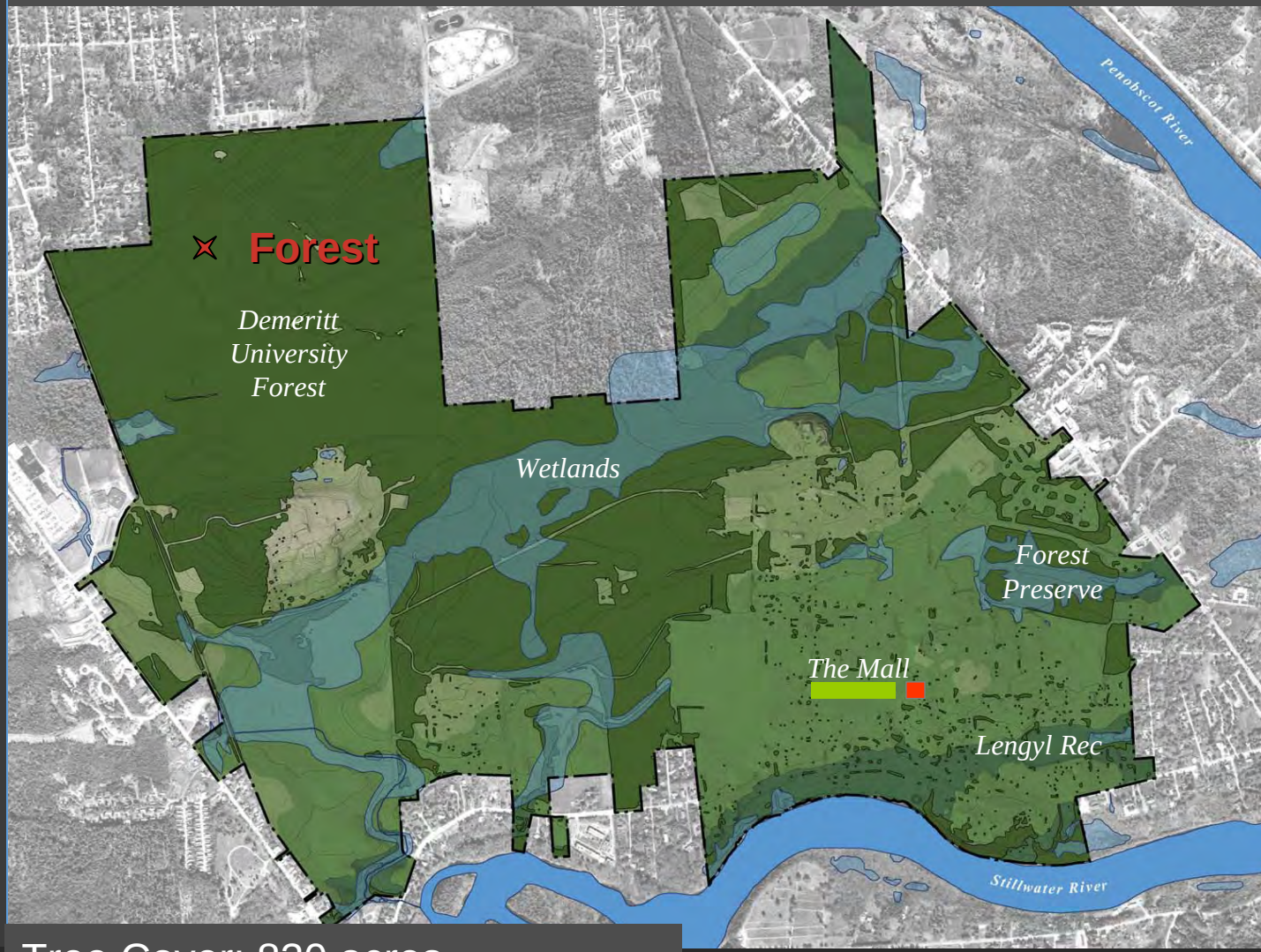
Red Maple 18%

Balsom Fir 14%

Hemlock 12%

Birch 10%

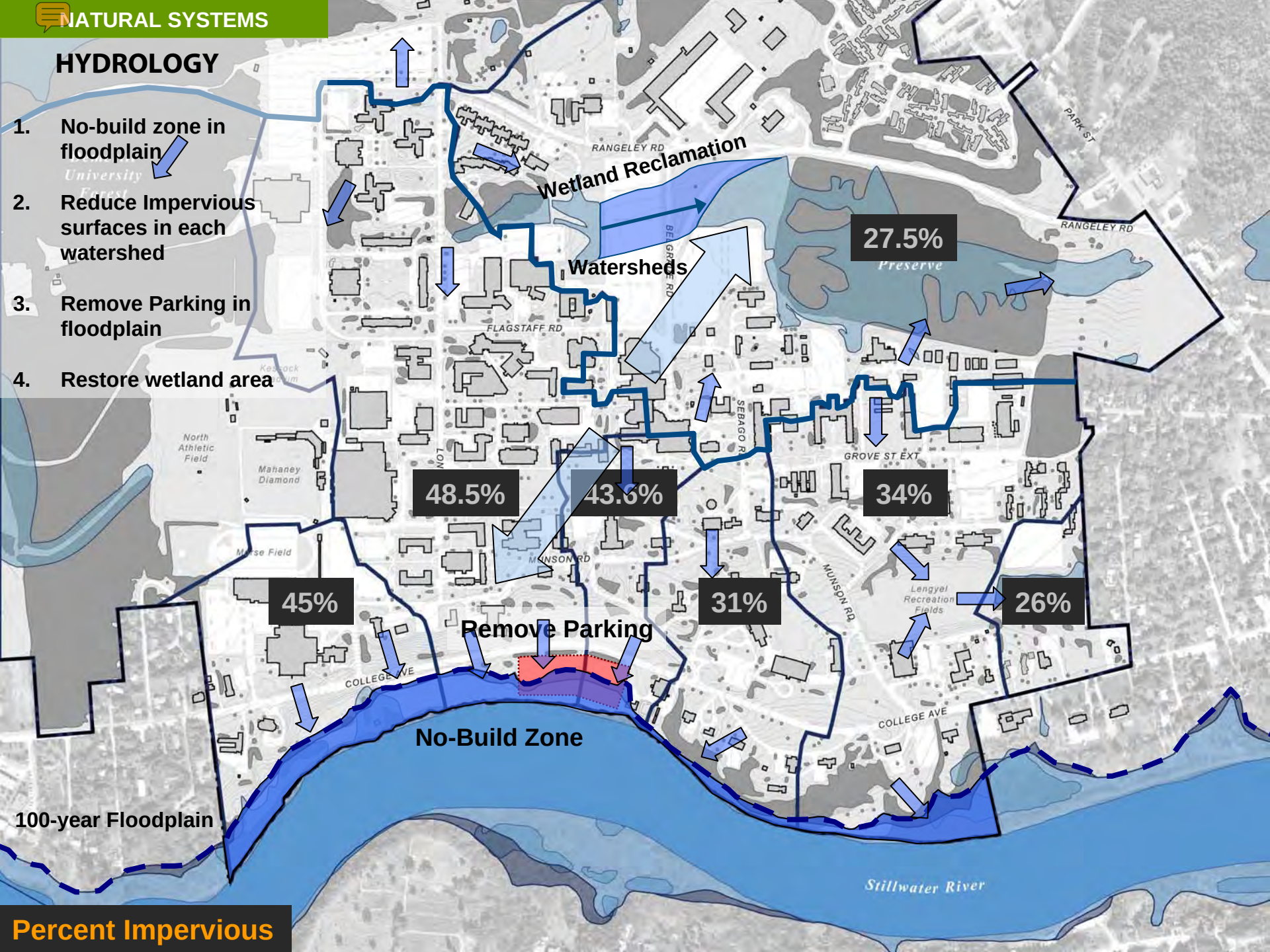
Source: College of Forest Resources 1968



Tree Cover: 830 acres

Water Resource Principles

- **Utilize baseline calculations to develop strategies for stressed watersheds**
- **Develop strategies for reducing impervious area in stressed watersheds**
- **Develop a comprehensive strategy for stormwater management in the developed core taking into account the requirements of the "Site Law"**
- **Consider stormwater strategies in the context of a "working landscape"**
- **Utilize stormwater strategies as a means of integrating the campus fabric with the natural environment**


HYDROLOGY
1. No-build zone in floodplain
2. Reduce Impervious surfaces in each watershed
3. Remove Parking in floodplain
4. Restore wetland area
Wetland Reclamation
Watersheds
27.5%
48.5%
43.6%
34%
45%
31%
26%
Remove Parking
No-Build Zone
100-year Floodplain
Percent Impervious
RANGELEY RD
FLAGSTAFF RD
MUNSON RD
COLLEGE AVE
GROVE ST EXT
PARK ST
Stillwater River
North Athletic Field
Mahaney Diamond
Lengyel Recreation Fields
University Forest
Preserve

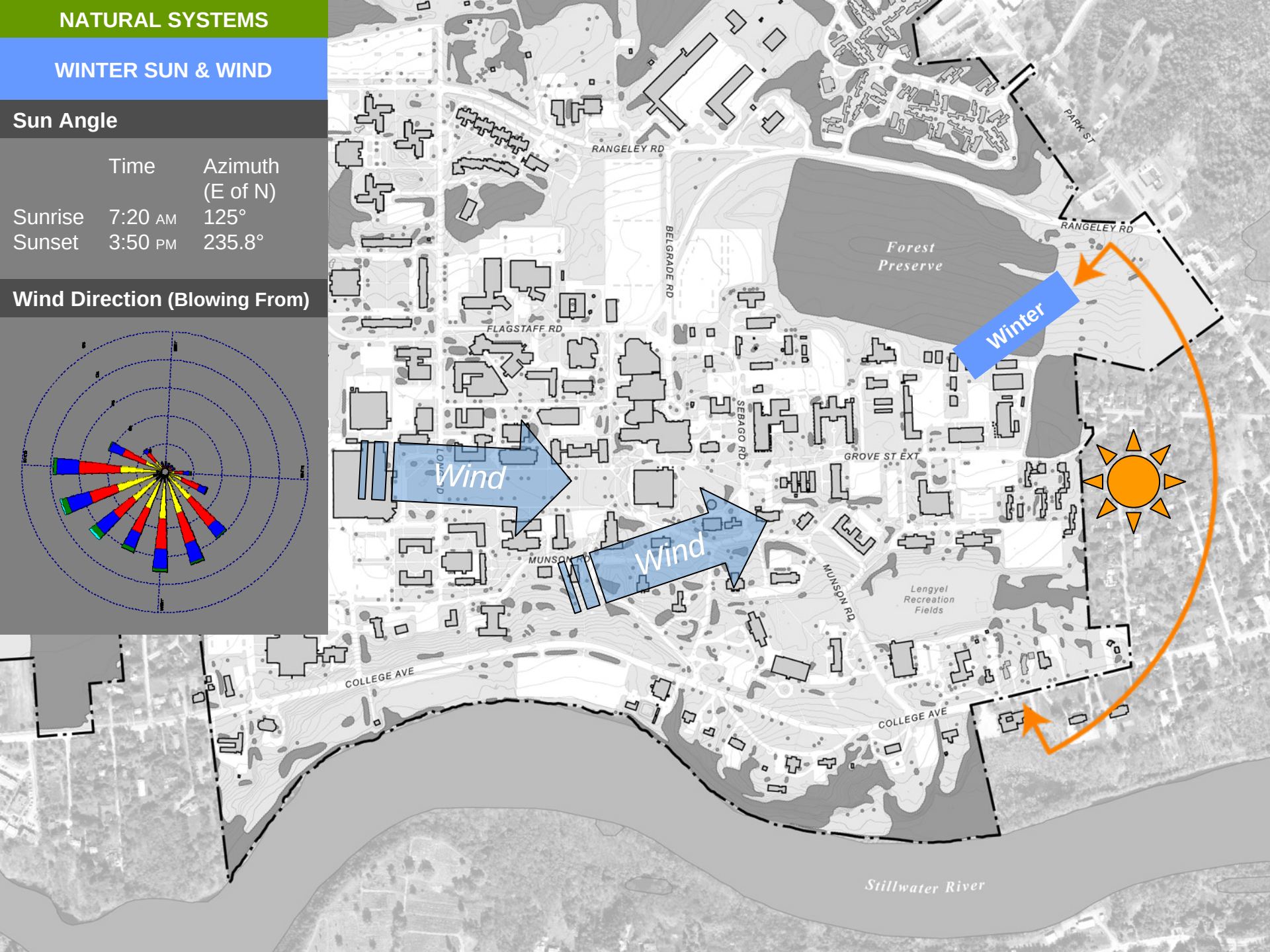
NATURAL SYSTEMS

WINTER SUN & WIND

Sun Angle

	Time	Azimuth (E of N)
Sunrise	7:20 AM	125°
Sunset	3:50 PM	235.8°

Wind Direction (Blowing From)



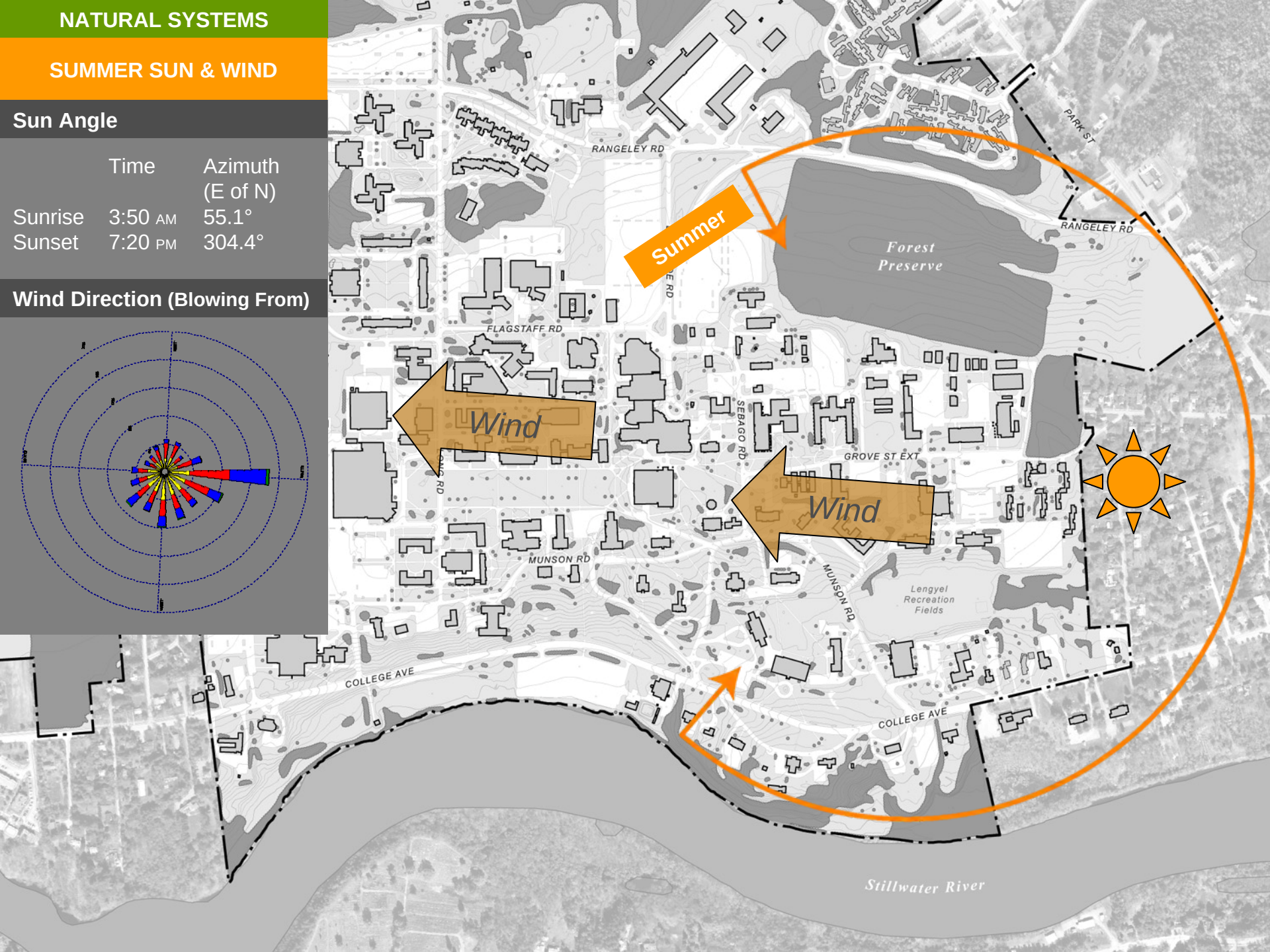
NATURAL SYSTEMS

SUMMER SUN & WIND

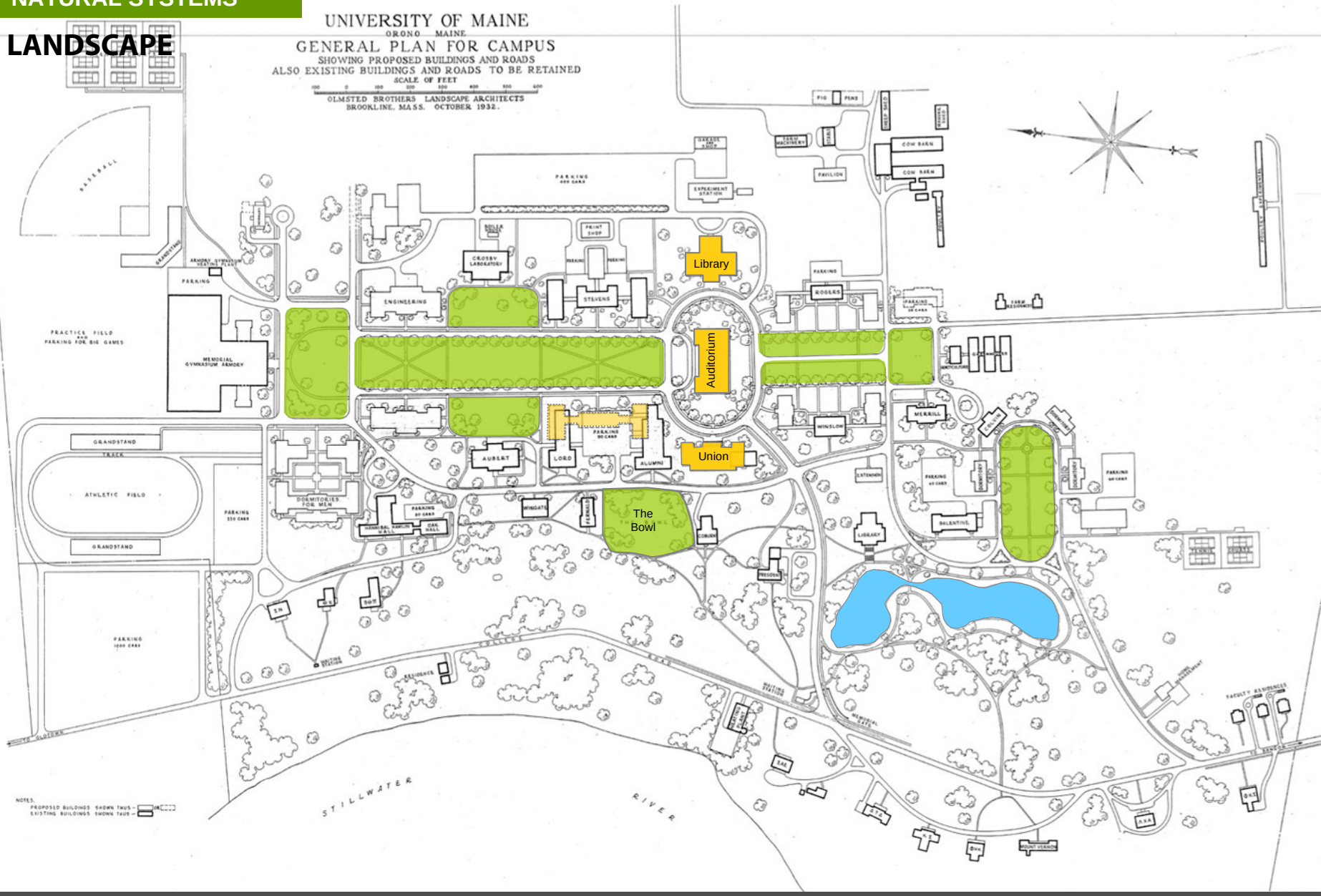
Sun Angle

	Time	Azimuth (E of N)
Sunrise	3:50 AM	55.1°
Sunset	7:20 PM	304.4°

Wind Direction (Blowing From)

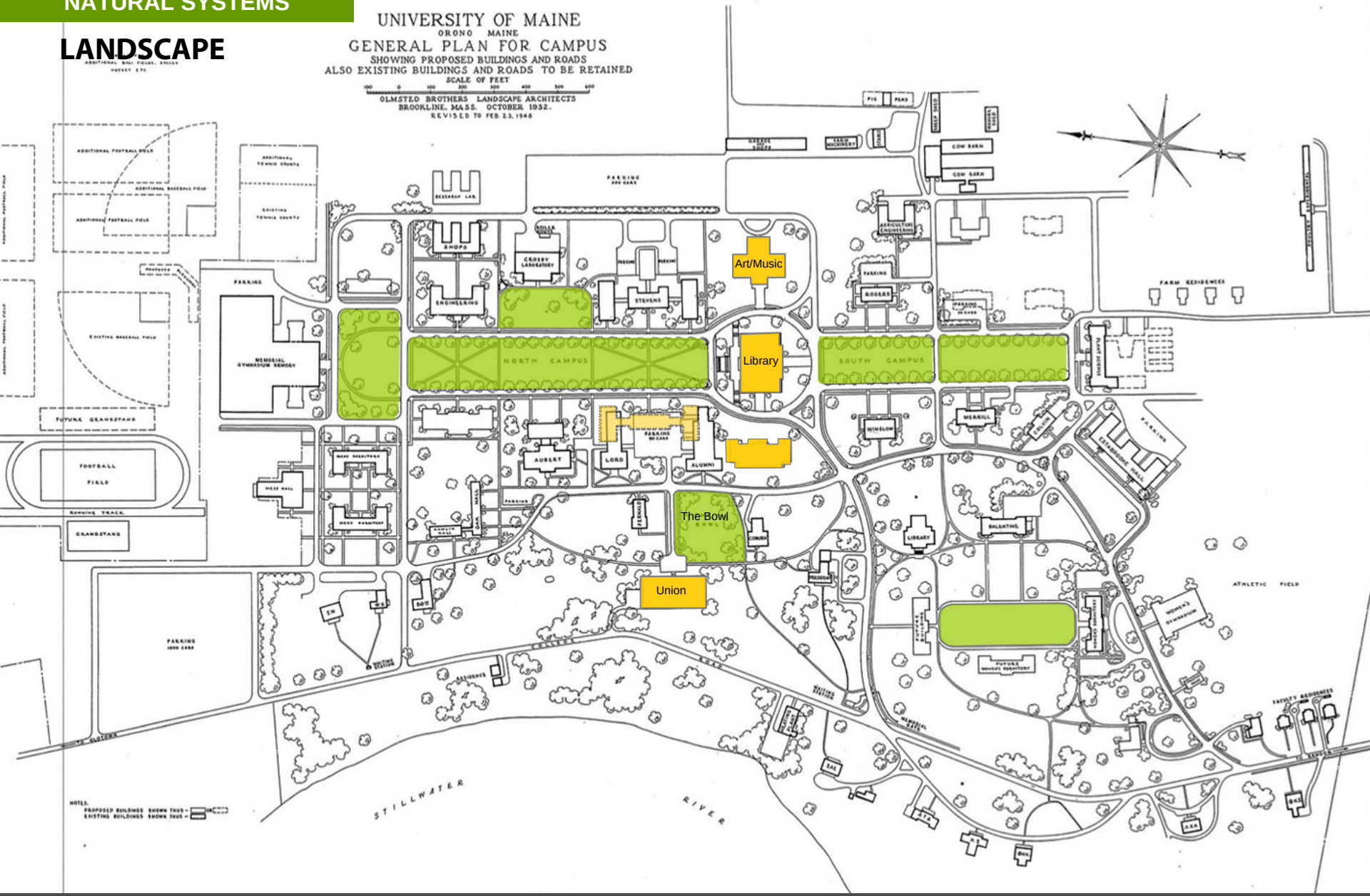


LANDSCAPE



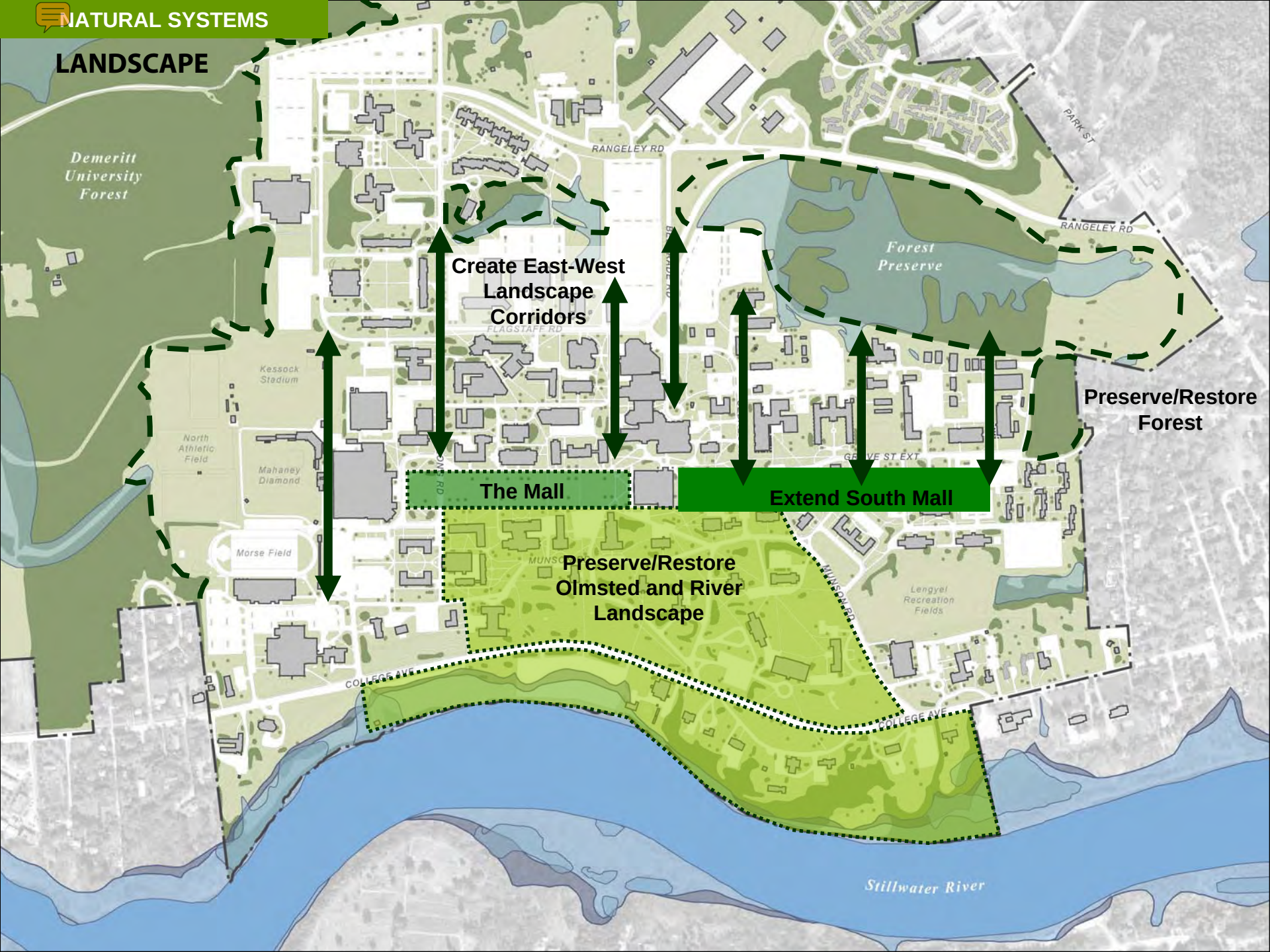
1932 Master Plan – Olmsted Brothers

LANDSCAPE



1948 Master Plan – Olmsted Brothers

LANDSCAPE


Demeritt University Forest
RANGELEY RD
PARK ST
Forest Preserve
Create East-West Landscape Corridors
FLAGSTAFF RD
Kessock Stadium
North Athletic Field
Mahaney Diamond
Morse Field
The Mall
Extend South Mall
Preserve/Restore Forest
Preserve/Restore Olmsted and River Landscape
Lengyel Recreation Fields
COLLEGE AVE
Stillwater River

Access & Circulation Principles

- **Improve pedestrian experience**
- **Remove redundant roads**
- **Consider structured parking**
- **Identify traffic demand management strategies**
- **Improve alternative transportation**
  - Campus shuttle
  - Bicycle routes and storage

ACCESS

REDUNDANT ROADS

Demeritt University Forest

RANGELEY RD

Belgrade Spur

BELGRADE RD

FLAGSTAFF RD

Kessock Stadium

North Athletic Field

Mahaney Diamond

Morse Field

Beddington Strengthen Pedestrian Network

LONG RD

SEBAGO RD

GROVE ST EXT

MUNSON RD

Sebec Road

COLLEGE AVE

Stillwater

Source: Gorrill-Plamer, 2004

Belgrade Spur

Beddington Road

Sebec Road

Problem Intersection

Parking Supply

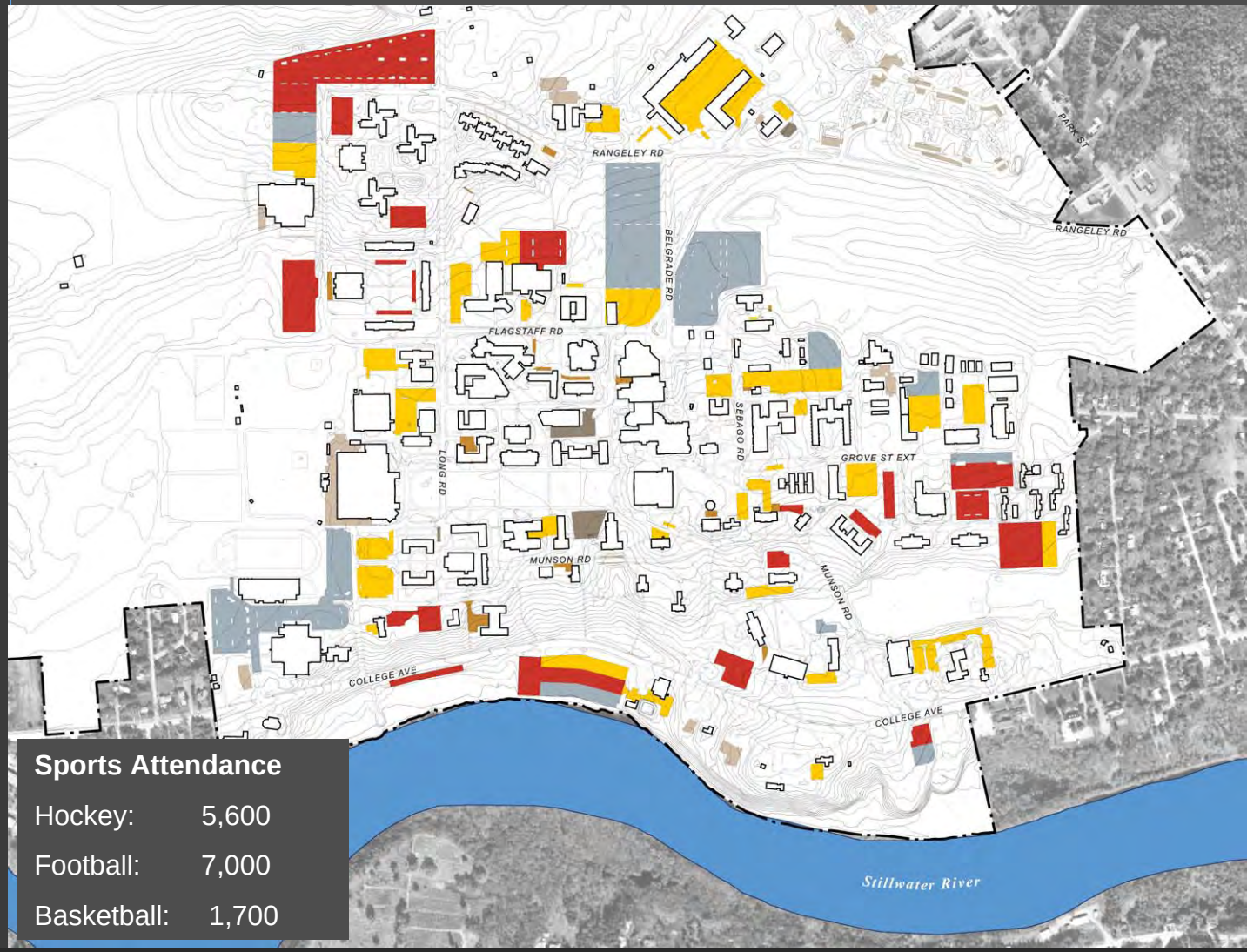
Supply: 6,780

Resident Student	2,250
Commuter Student	2,111
Faculty/Staff	1,699
Visitor	125
Service	82
Other	513

% Buying Permits

Resident Student	72%
Commuter Student*	53%
Faculty/Staff	101%

* counting all full and part-time non-resident students



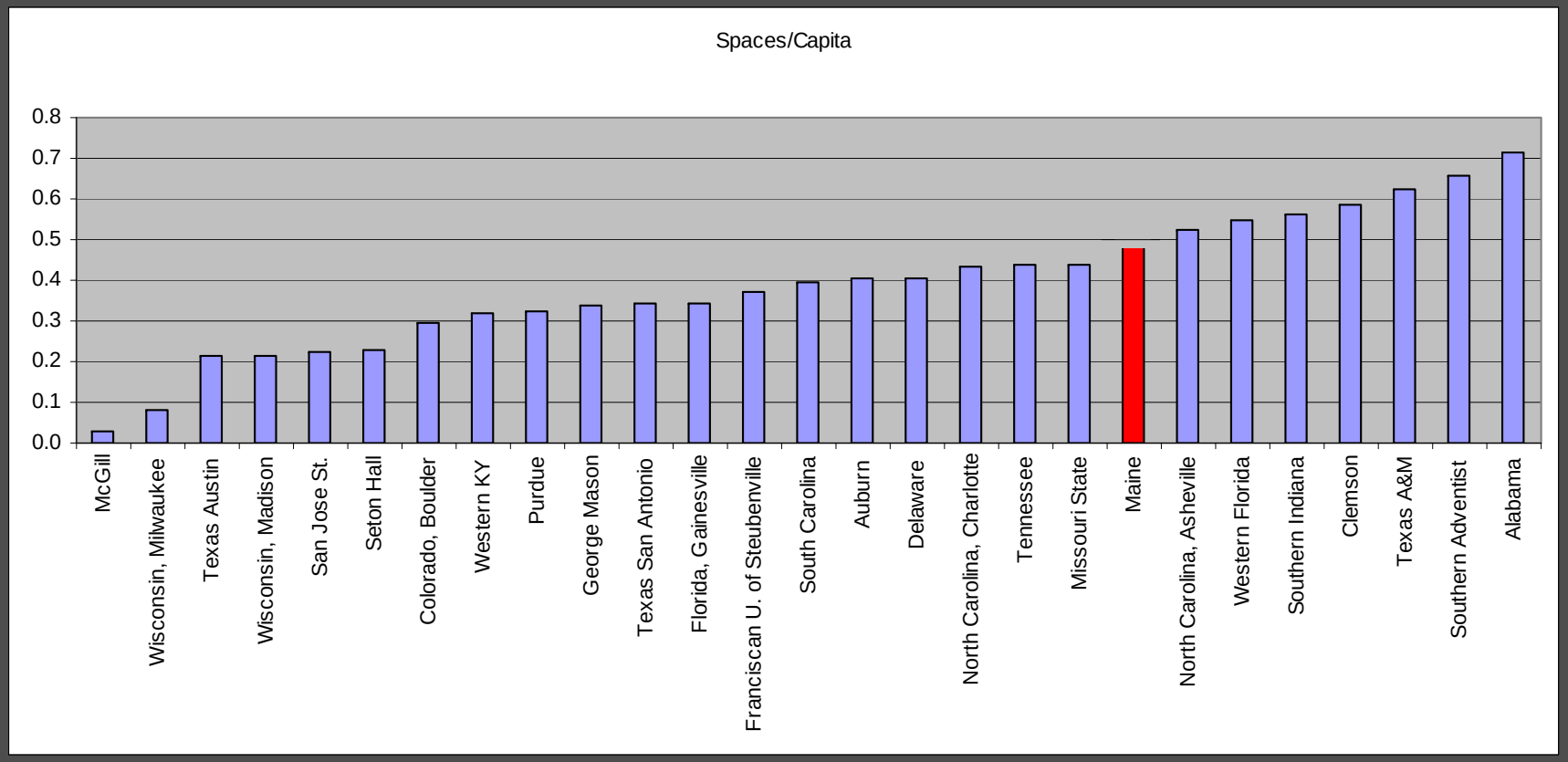
Sports Attendance

Hockey:	5,600
Football:	7,000
Basketball:	1,700

Comparison with other Colleges/ Universities

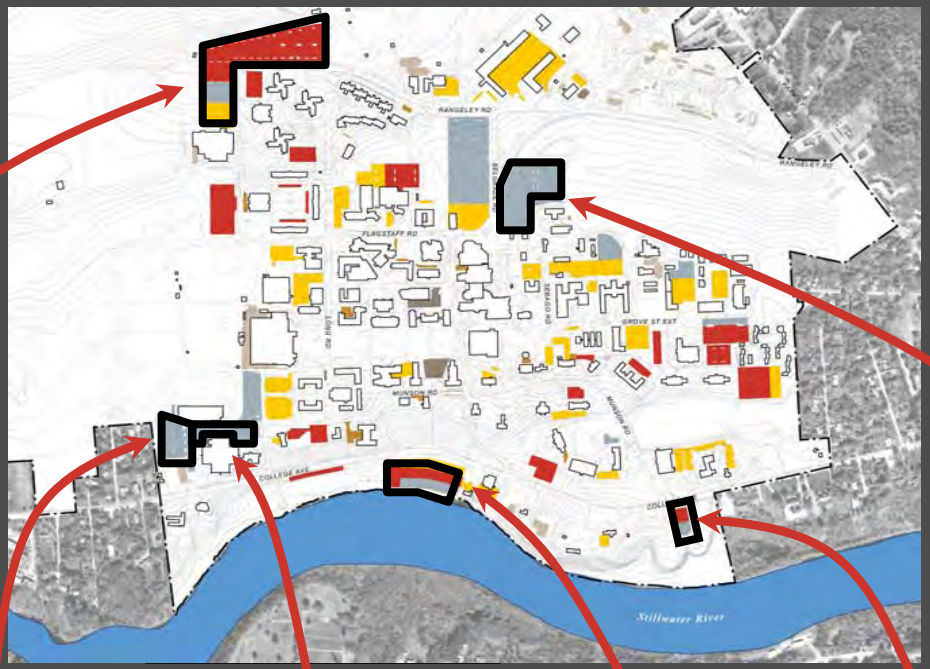
Parking Supply

Students	Fac/Staff	Parking	Spaces /Capita
11,797	2,279	6,780	0.482

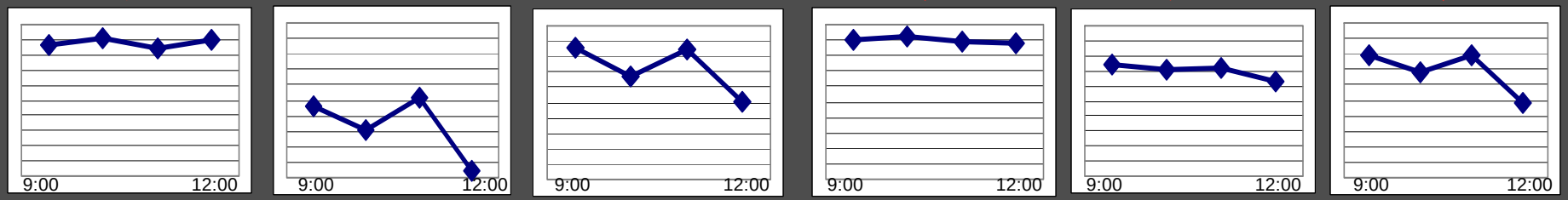


Parking Occupancy

Peak Occupancy – selected lots



Daytime occupancy highest in resident spaces



Hilltop | Satellite | Alfond | Steam Plant | College Ave. South | Belgrade

Ave. % Occupied, October AM

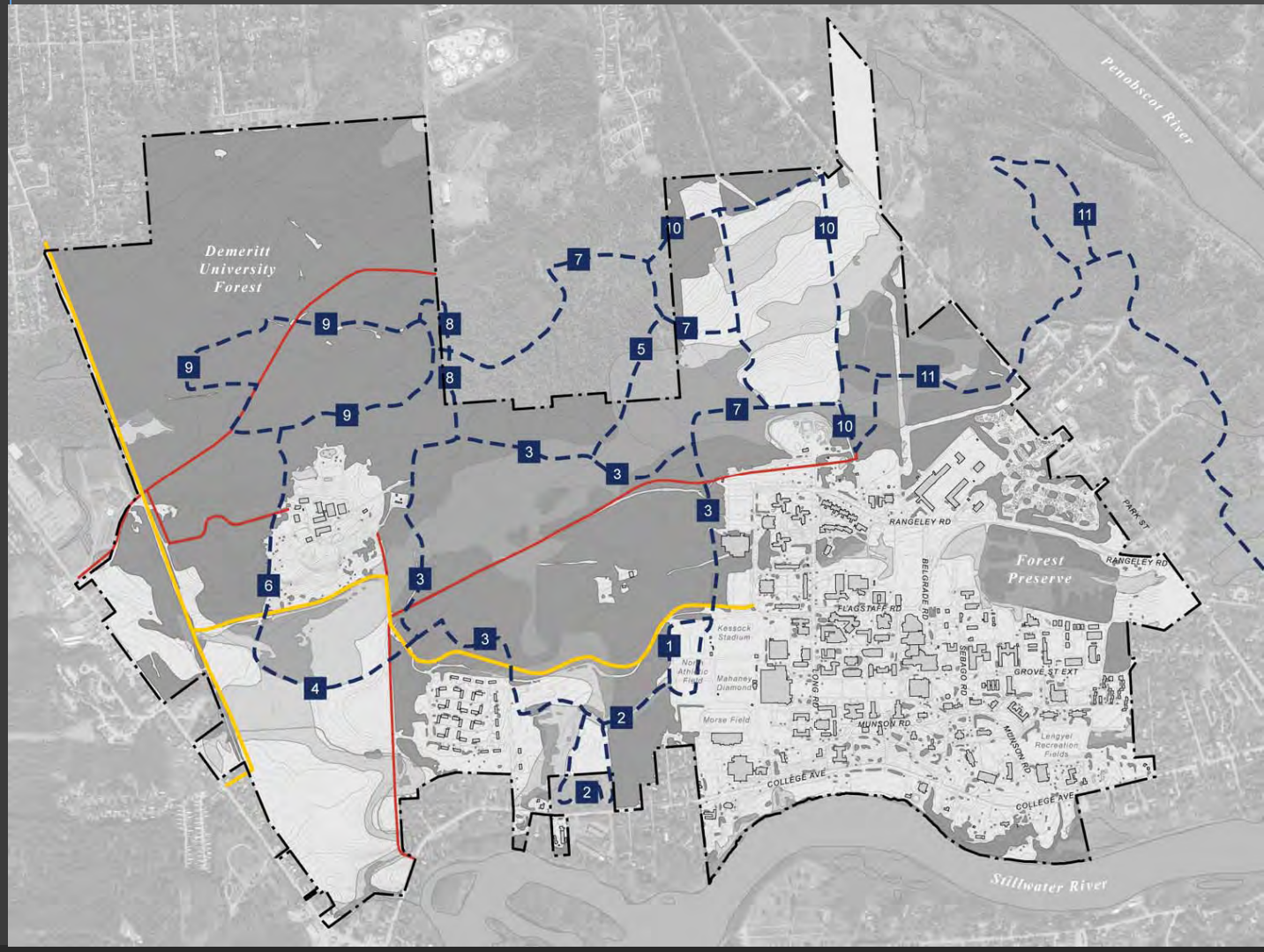
Campus Trails

Trails

- Dirt Road
- Bike Path
- Trail

Trail Guide

1. Half-mile long, groomed loop behind Memorial Gym
2. Short connector to the Otto Farm Loop
3. A longer interior trail with many links to other trails
4. Link to trails 3 & 6
5. Link to trails 3 & 7
6. Link to trails 4 & 9, with some steep sections
7. Outer link to the No. 9 Loop and the Cornfield Loop
8. Connector for trails 9, 7 & 3
9. Loop 9 uses part of the Pinkham road with links to trails 6, 7 & 8
10. The Cornfield Loop is marked with No. 10 along the outer edge; but 10 also links to 7 & 11
11. Trail 11 links the Cornfield Loop to the Orono Land Trust. Be careful crossing Park Street (Rt. 2). The Land Trust section has some steep topography as it dips towards the Penobscot River.



Source: UMaine Recreation Trails www.umaine.edu/campus recreation

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SASAKI

COPLON ASSOCIATES

Energy & Atmosphere Principles

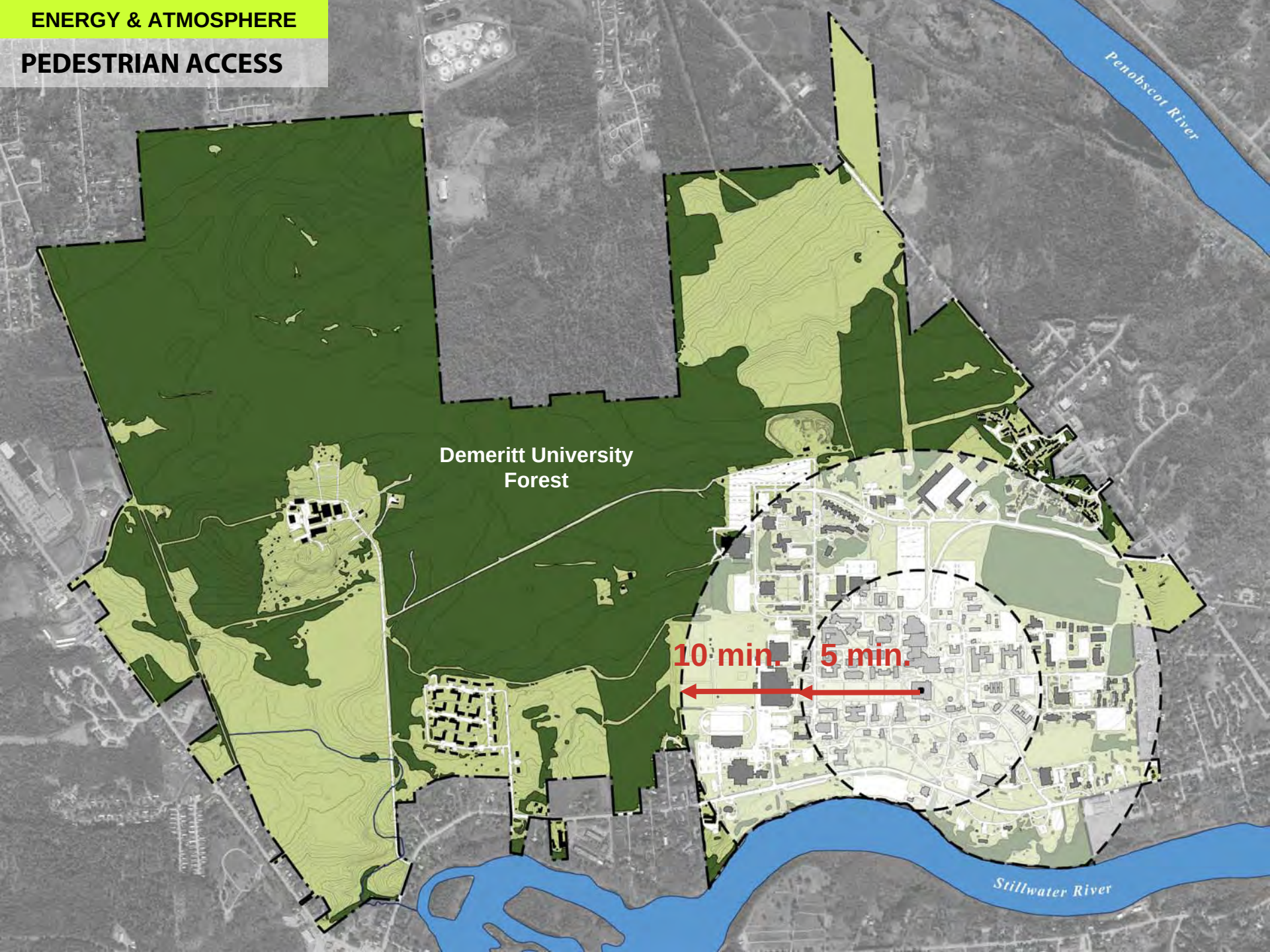
- **Establish & implement climate action plan**
- **Use more efficient, cleaner fuel**
- **Designate forest for carbon sequestration**
- **Reduce transport related emissions**
  - Traffic demand management
  - Alternative transportation
- **Demarcate growth boundary**
  - Promote walkable campus
  - Utilize existing infrastructure
- **Reduce impervious surfaces**
- **Reduce plowing and mowing**

co_2 stored 868.16 tonnes

co_2 annually sequestered 10.78 tonnes

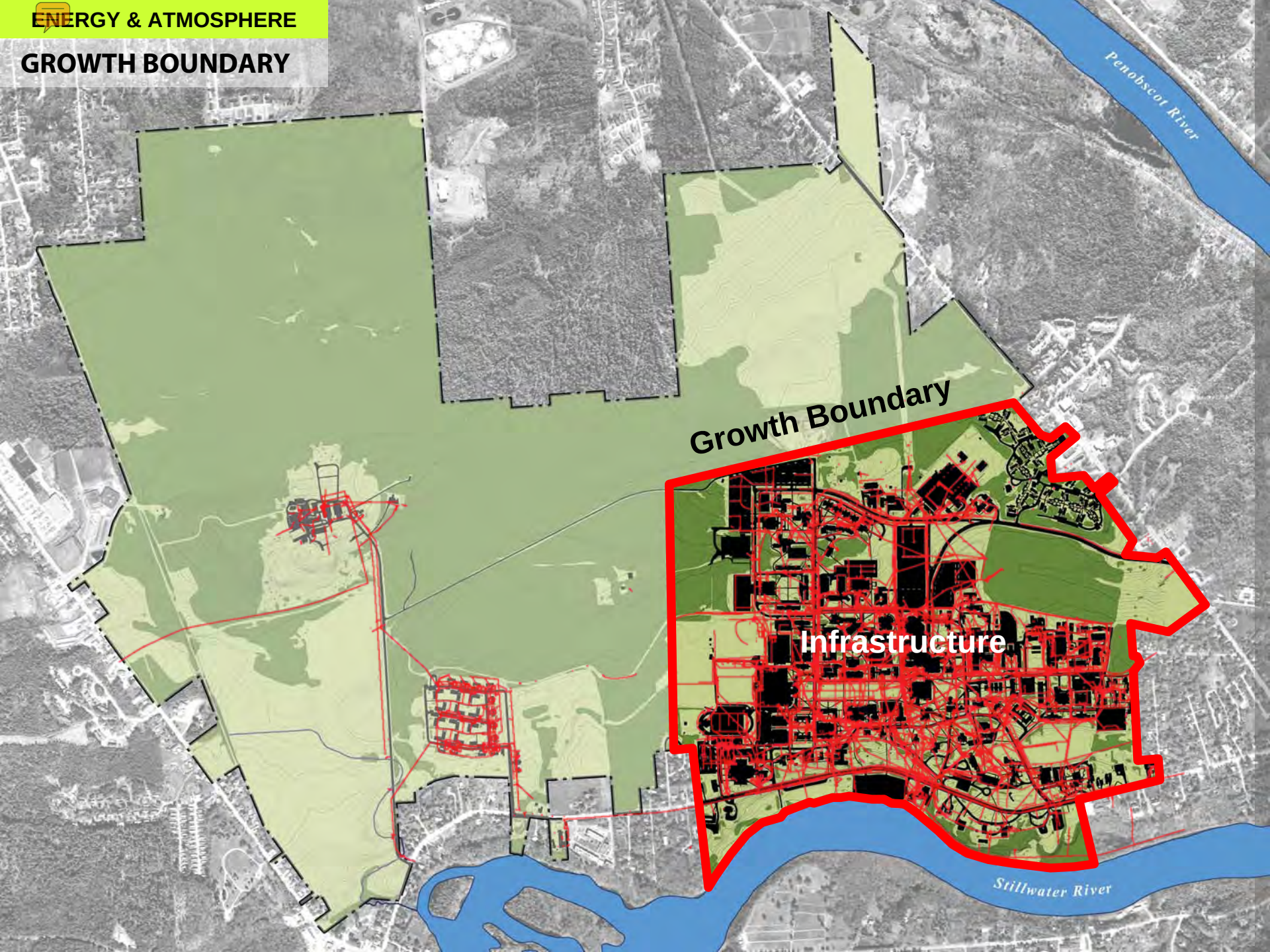
ENERGY & ATMOSPHERE

PEDESTRIAN ACCESS



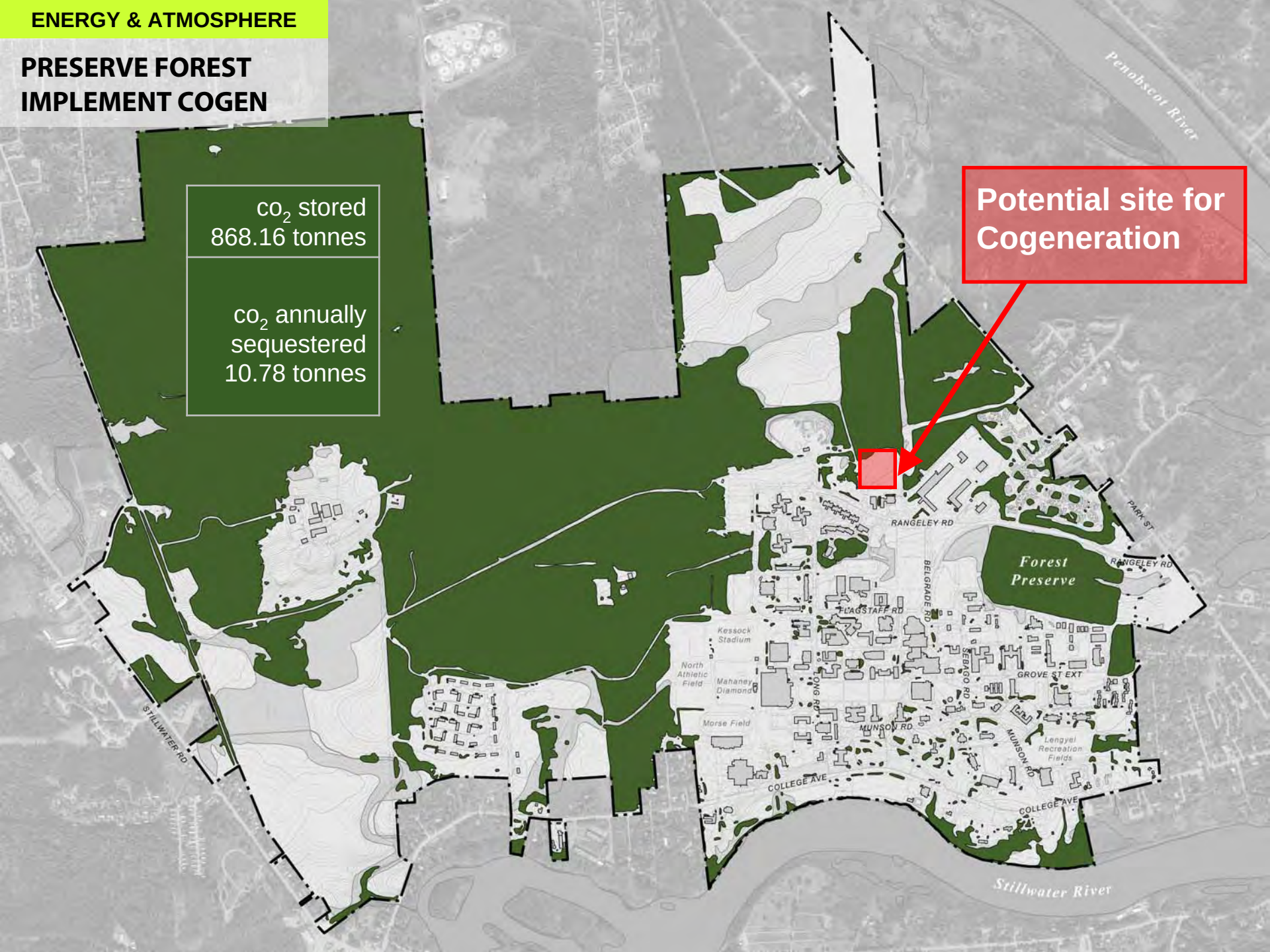
ENERGY & ATMOSPHERE

GROWTH BOUNDARY



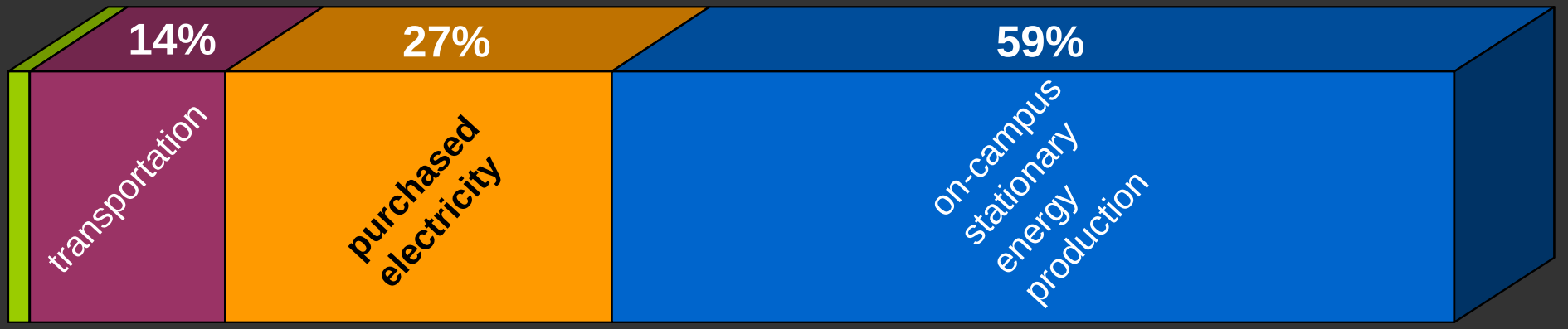
ENERGY & ATMOSPHERE

PRESERVE FOREST
IMPLEMENT COGEN



sequestration

emissions



Source: University of Maine at Orono Utilities Data

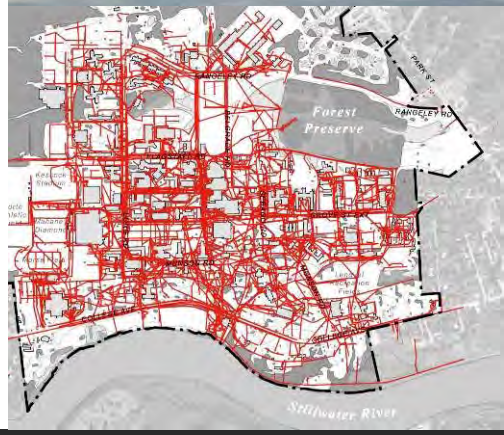
Development Strategy

Development Principles

- **Preserve / Restore important historic buildings**
- **Evaluate and phase out buildings based on:**

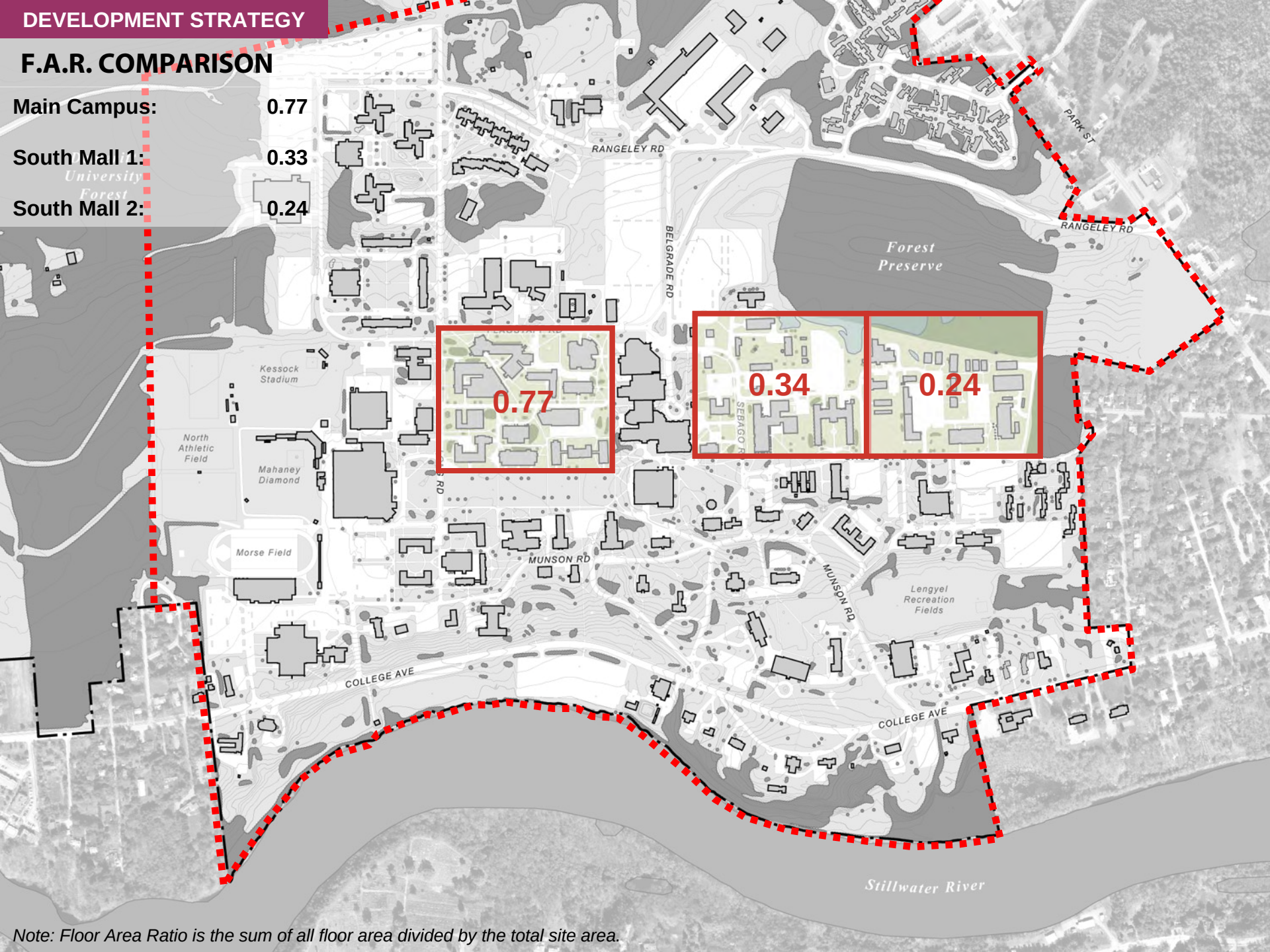
  Contribution to campus character
  Cost to maintain
  Utilization of site to highest potential
  Functionality

- **Infill development / redevelopment**
- **Climate sensitive building design**
- **Compact / Pedestrian development**



F.A.R. COMPARISON

Main Campus:	**0.77**
South Mall 1:	**0.33**
South Mall 2:	**0.24**



Note: Floor Area Ratio is the sum of all floor area divided by the total site area.

OPPORTUNITY SITES

REDEVELOP
- East Annex
- Little Hall
- Machine Tool Lab
- Shibles
- Smith Hall
- York Village

MOVE

INFILL

ADDITION

Development Armature


York Village


Shibles


Little Hall


Demeritt University Forest
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Lengyel Recreation Fields
COLLEGE AVE
COLLEGE AVE
Stillwater River


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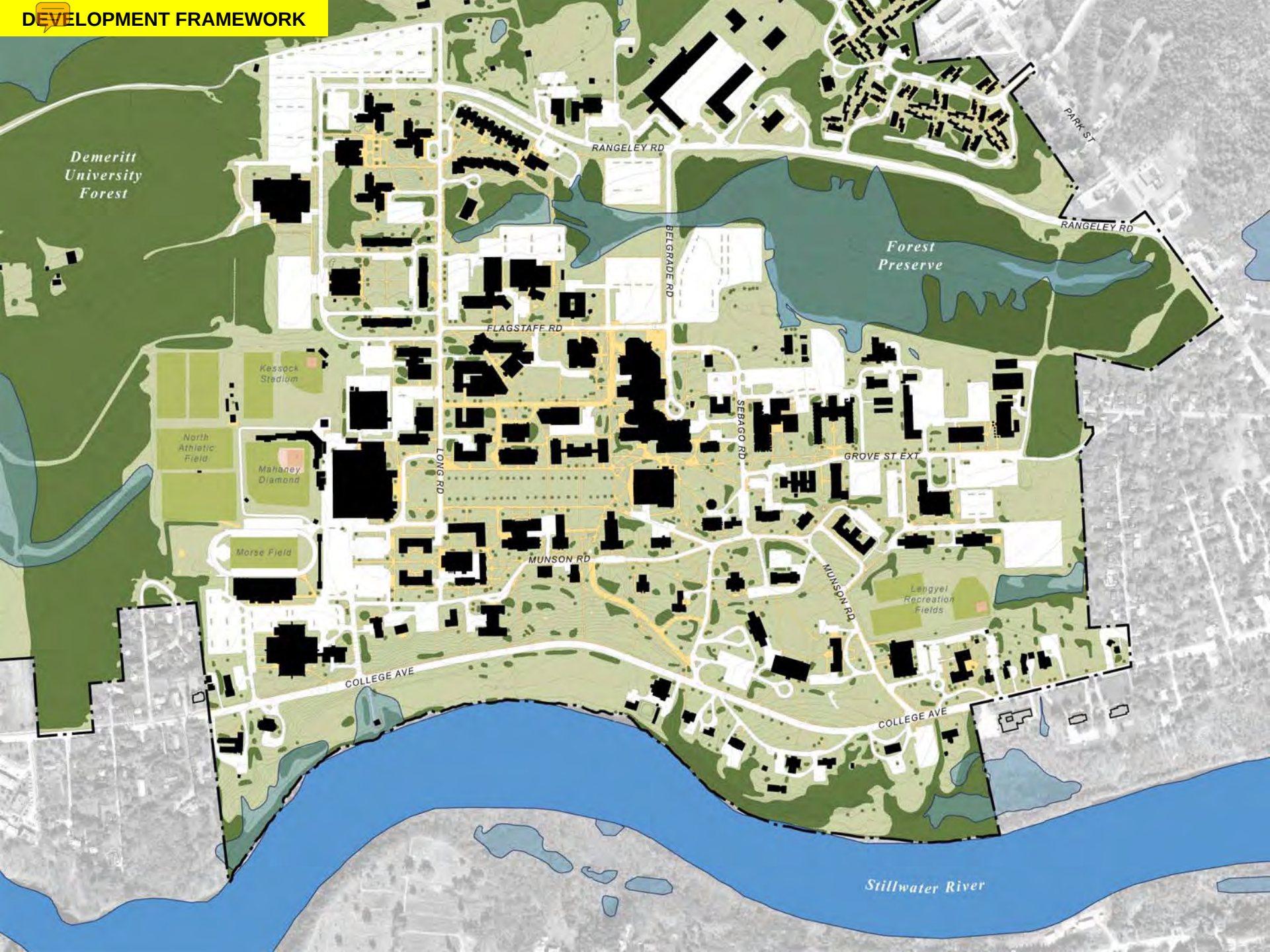
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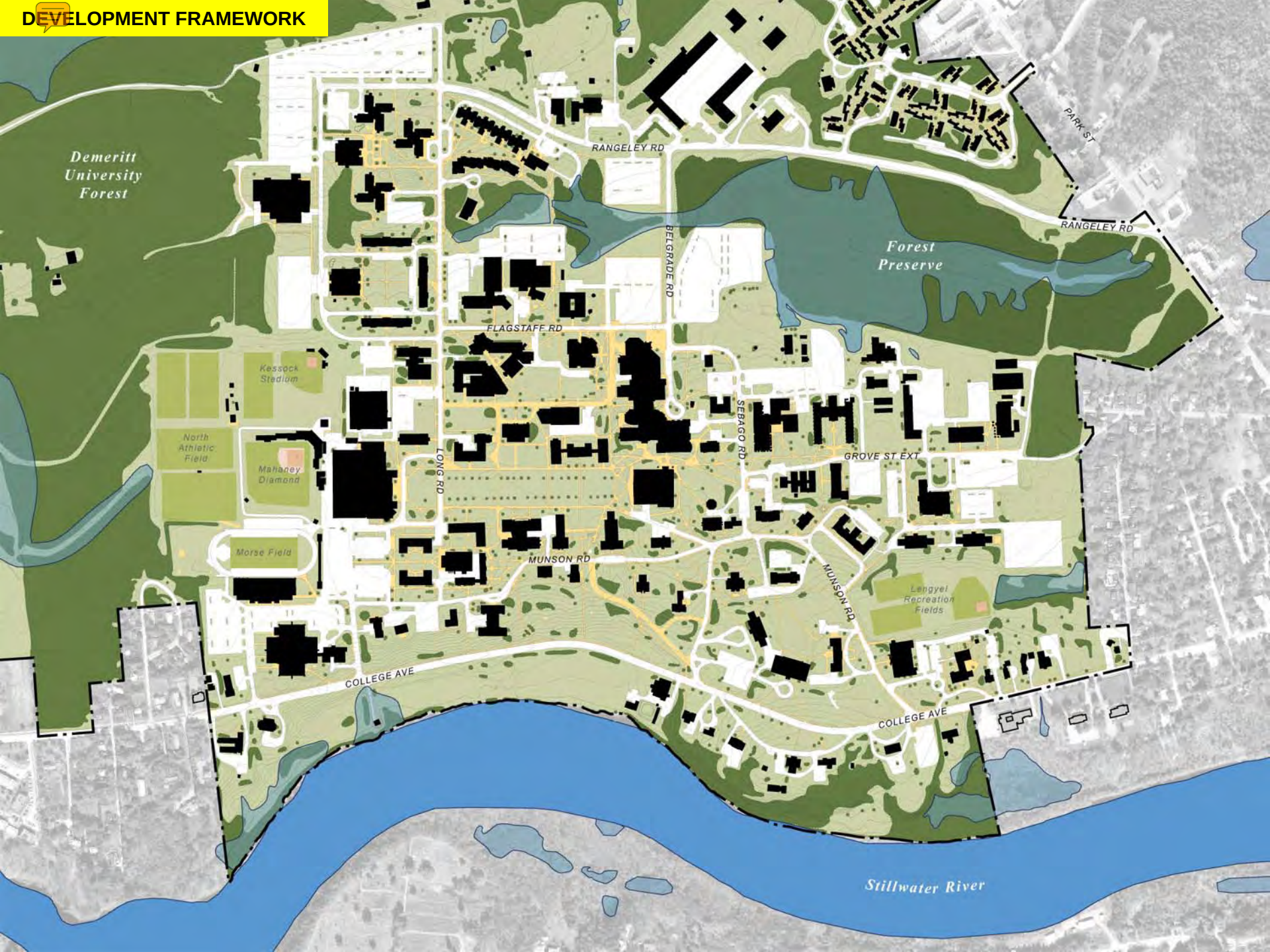
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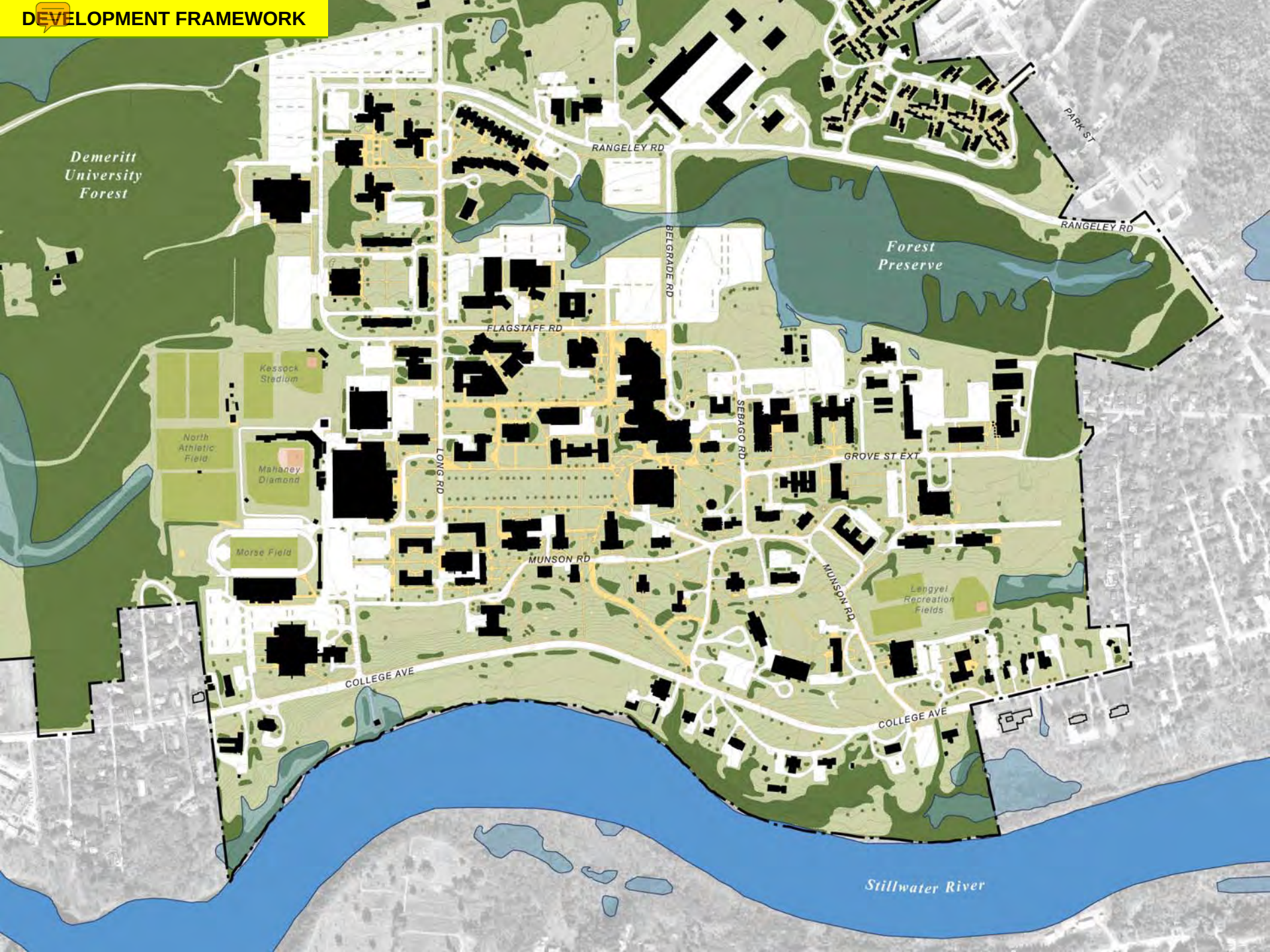
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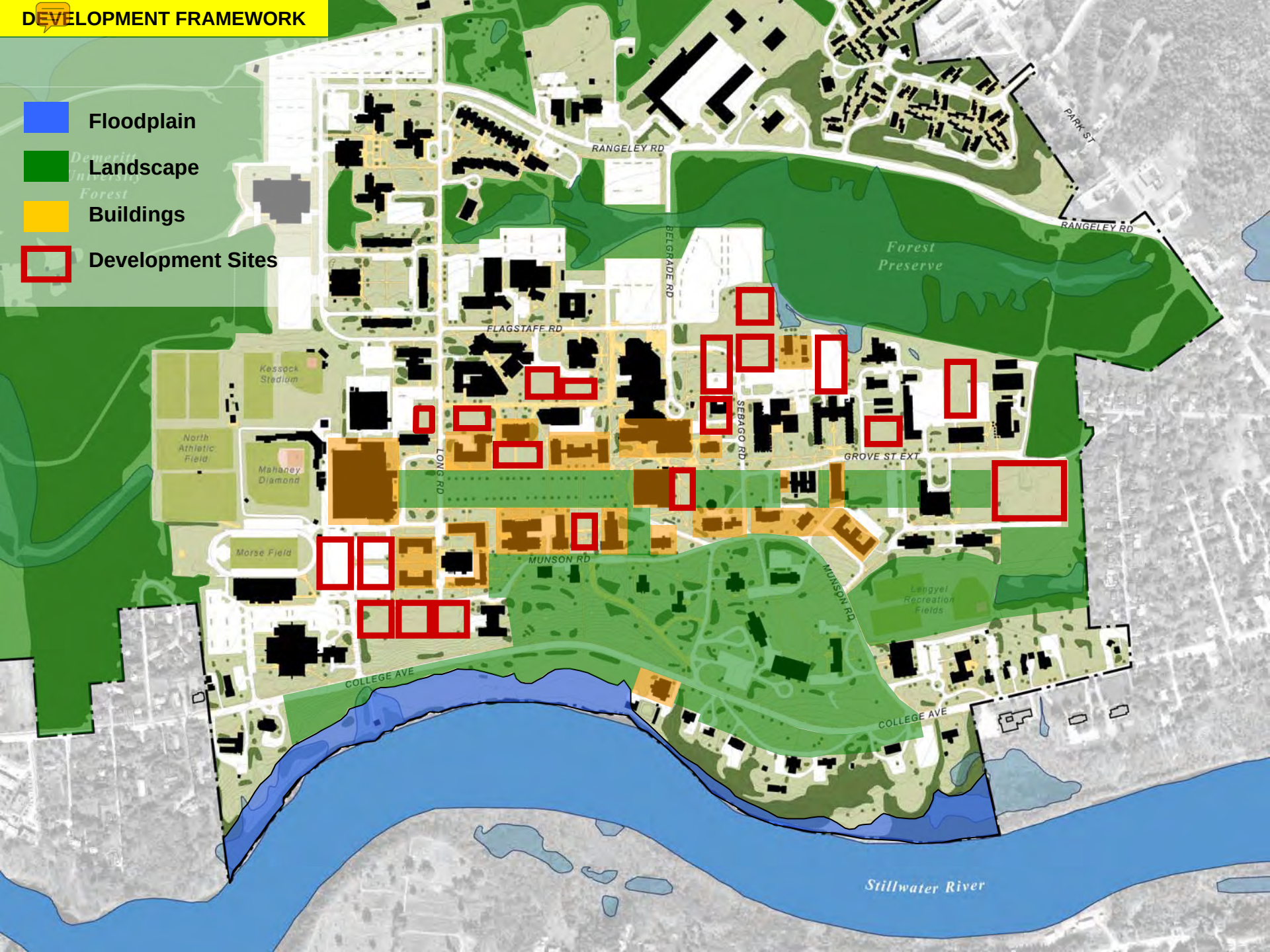
DEVELOPMENT FRAMEWORK
Floodplain
Landscape
Buildings
Development Sites
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PARK ST
RANGELEY RD
Forest Preserve
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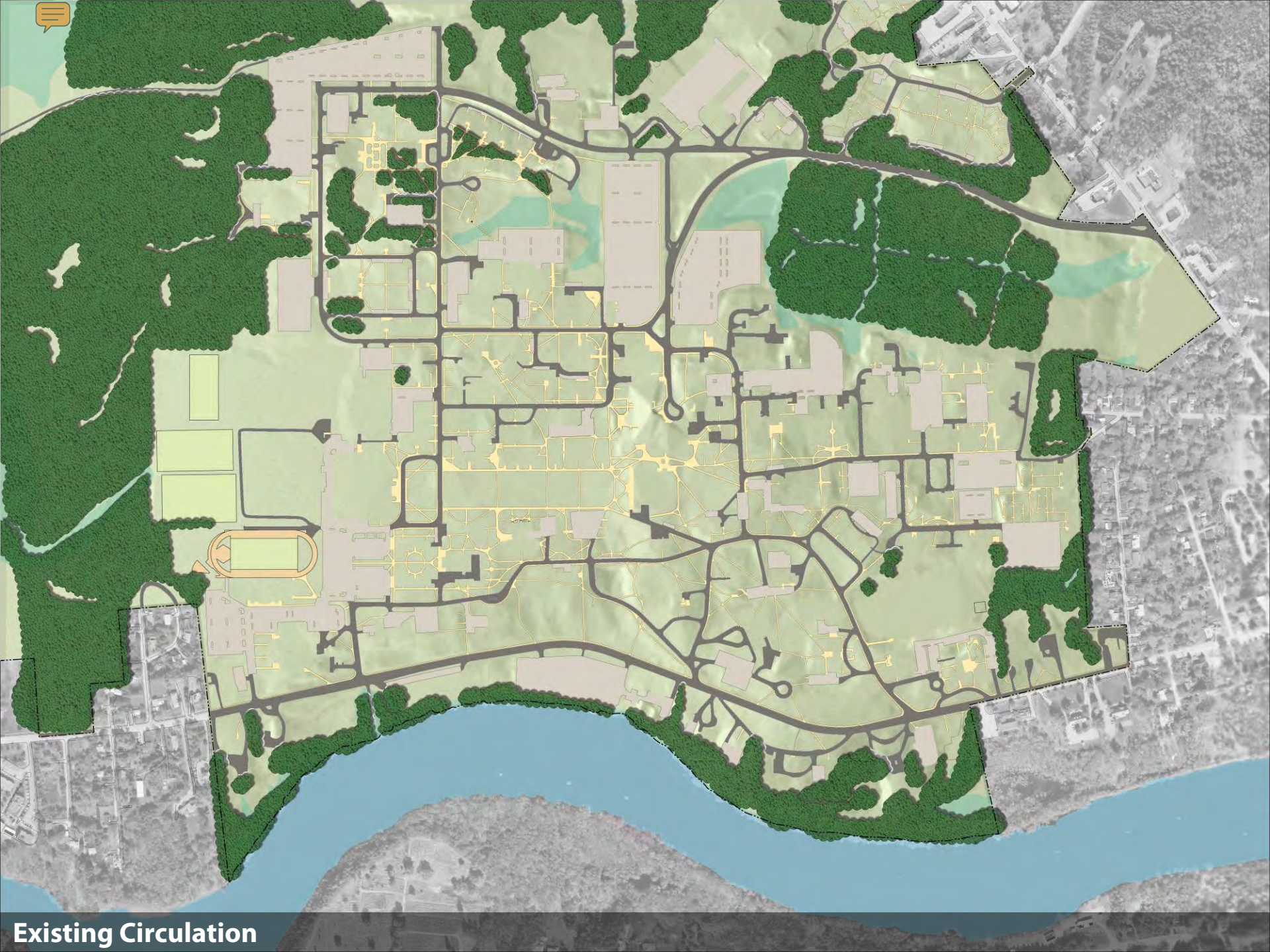
MUNSON RD
MUNSON RD
Lengyel Recreation Fields
COLLEGE AVE
COLLEGE AVE
Stillwater River

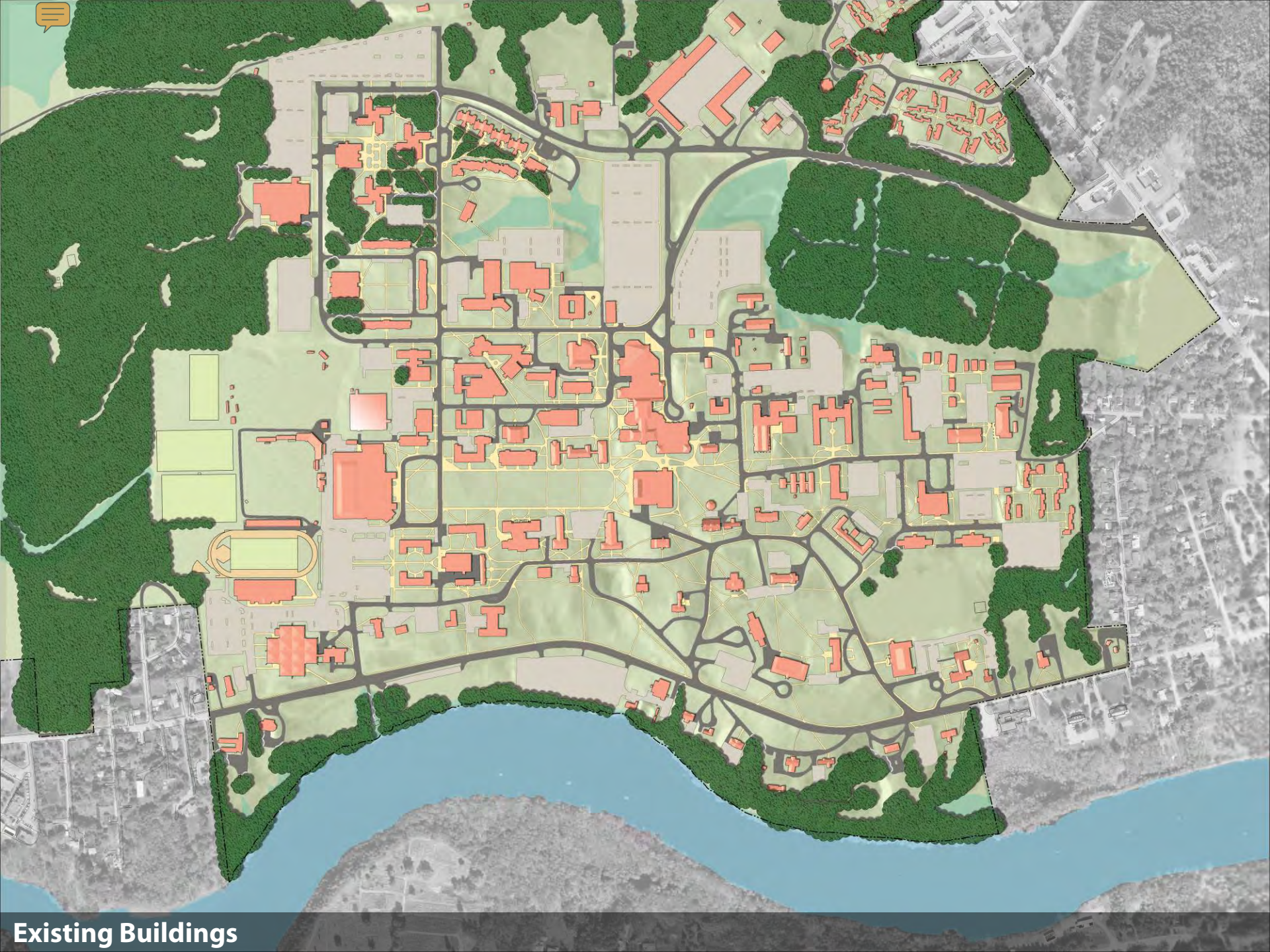
Preliminary Master Plan

Topography

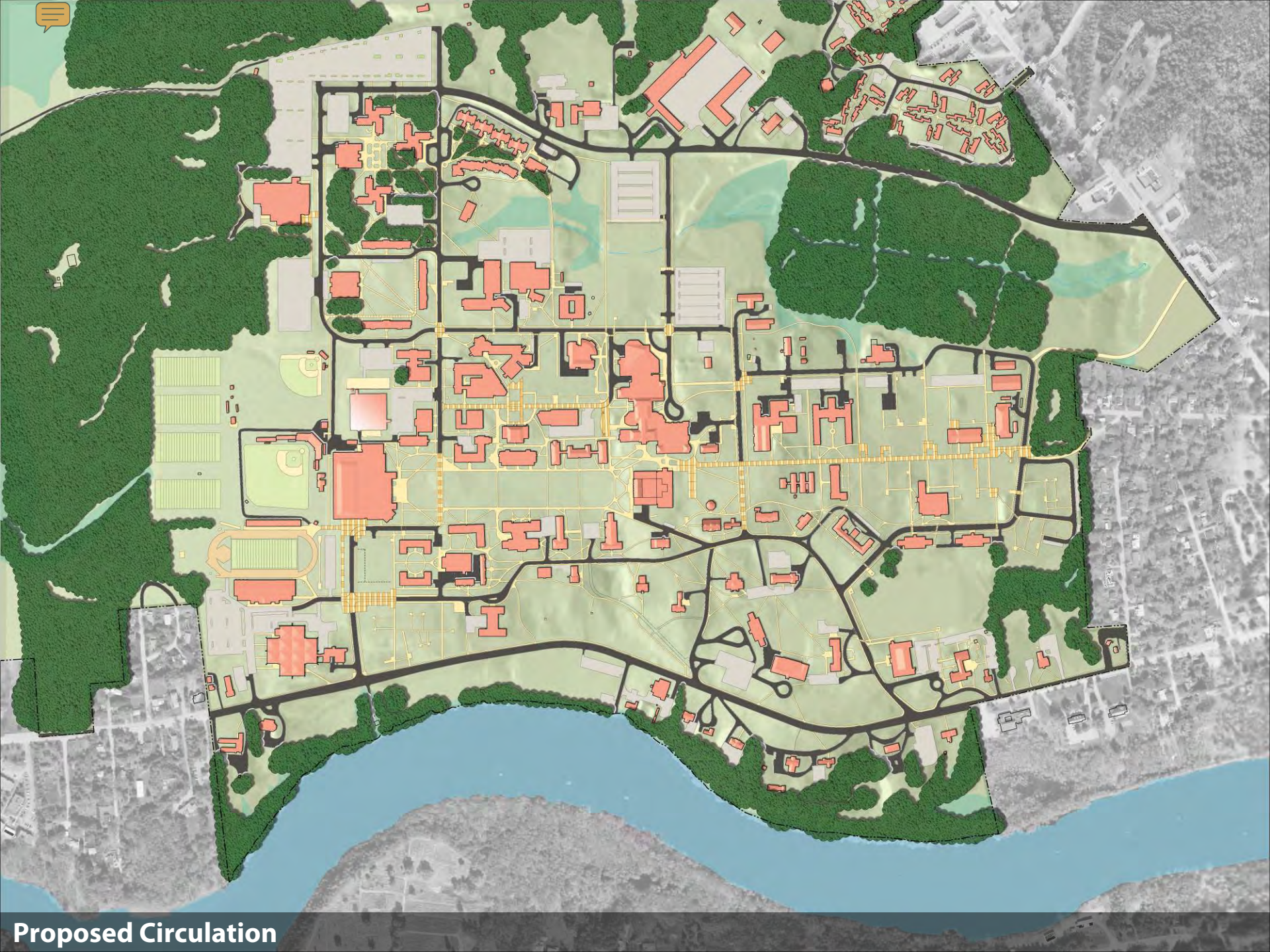
Existing Forest



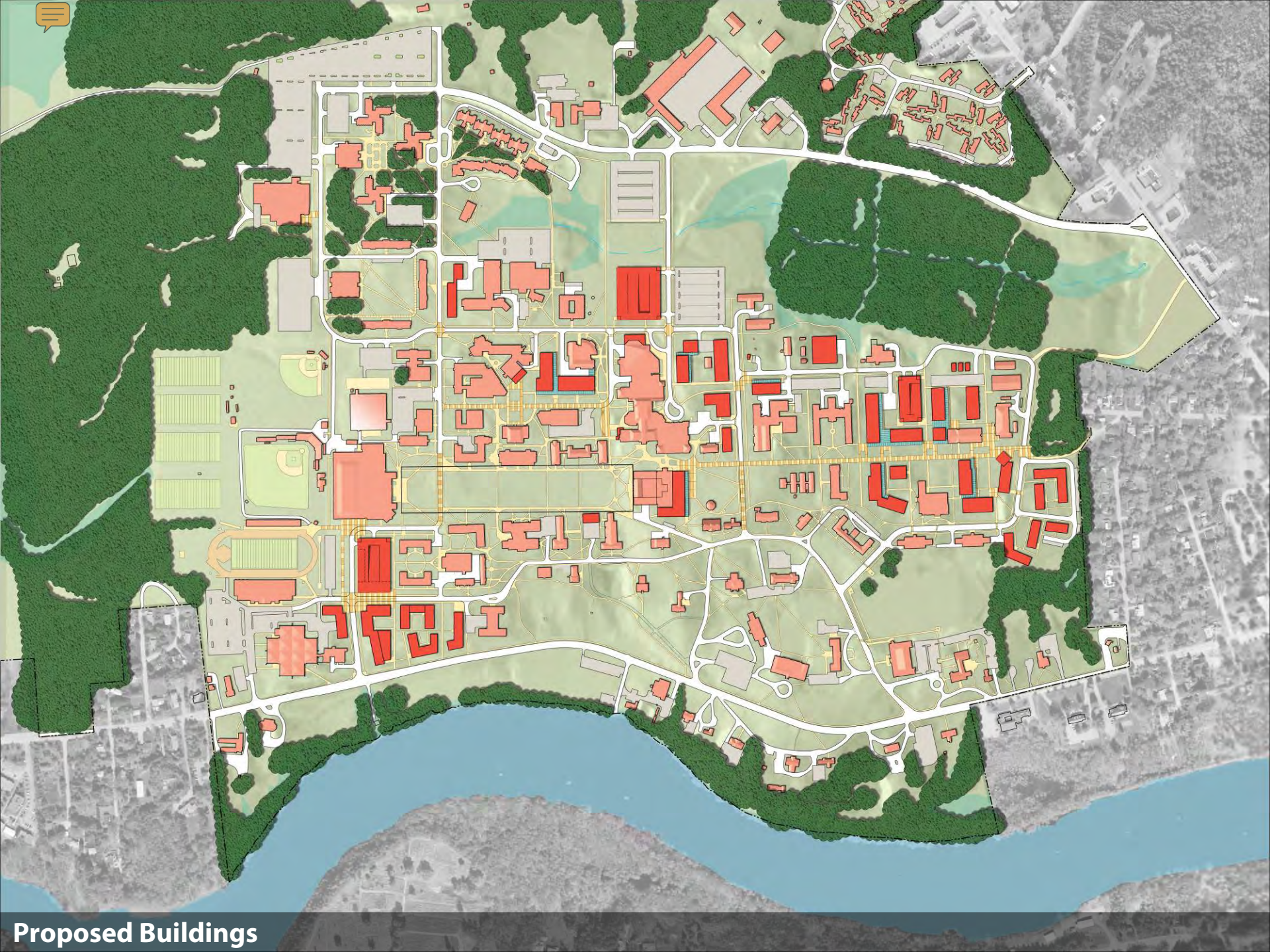
Existing Circulation

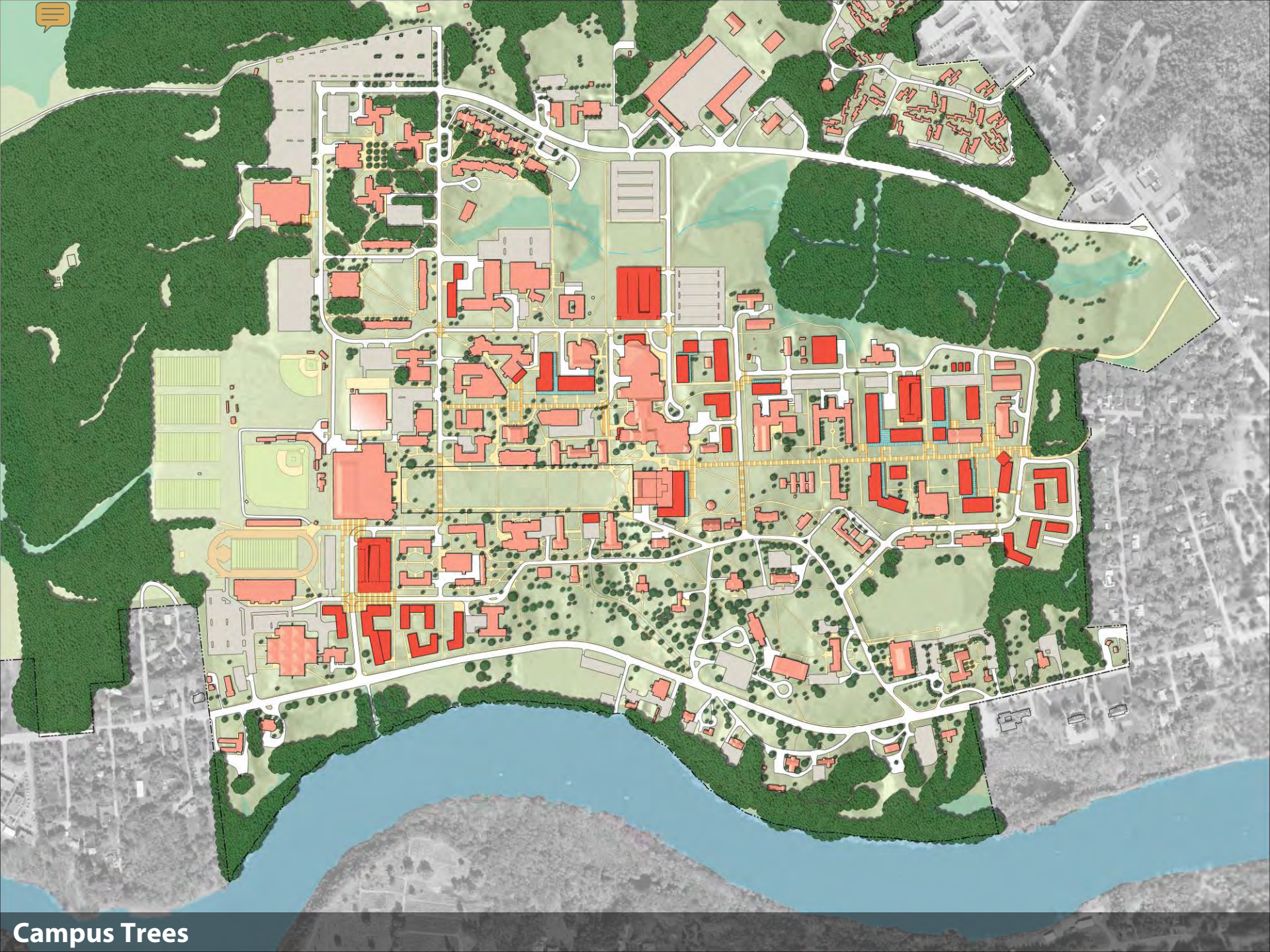


Existing Buildings

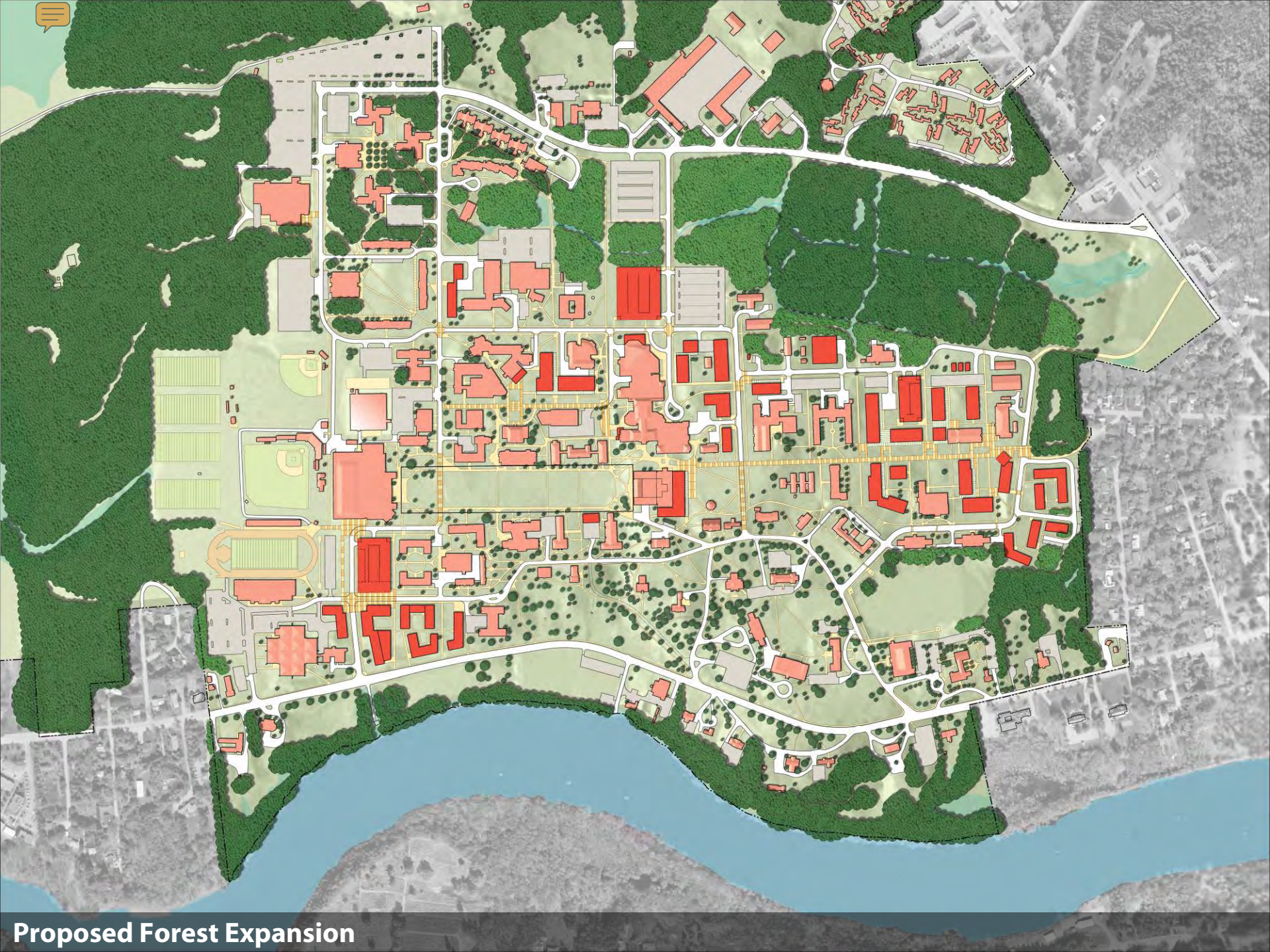


Proposed Circulation

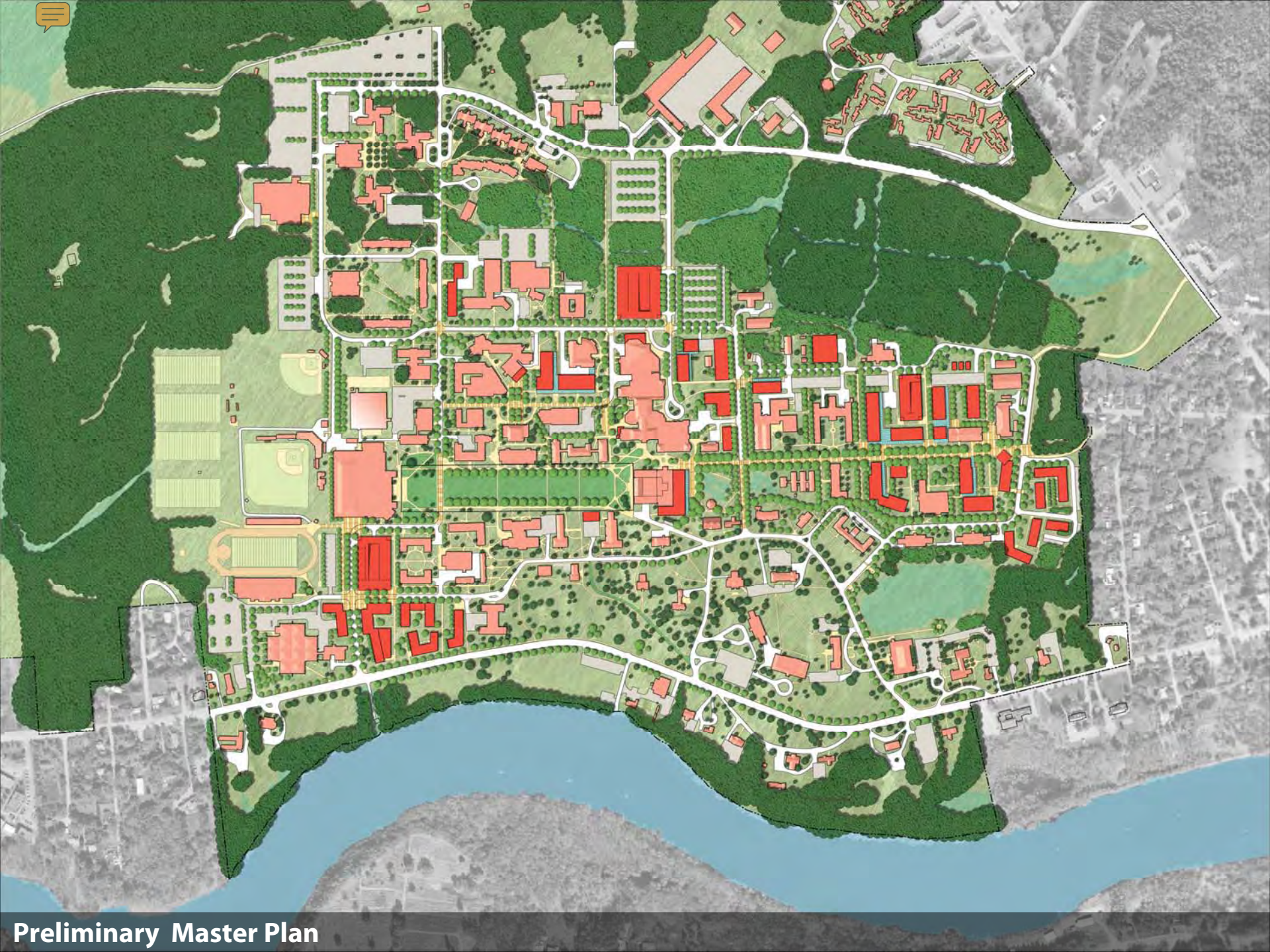

Proposed Buildings



Campus Trees


Proposed Forest Expansion

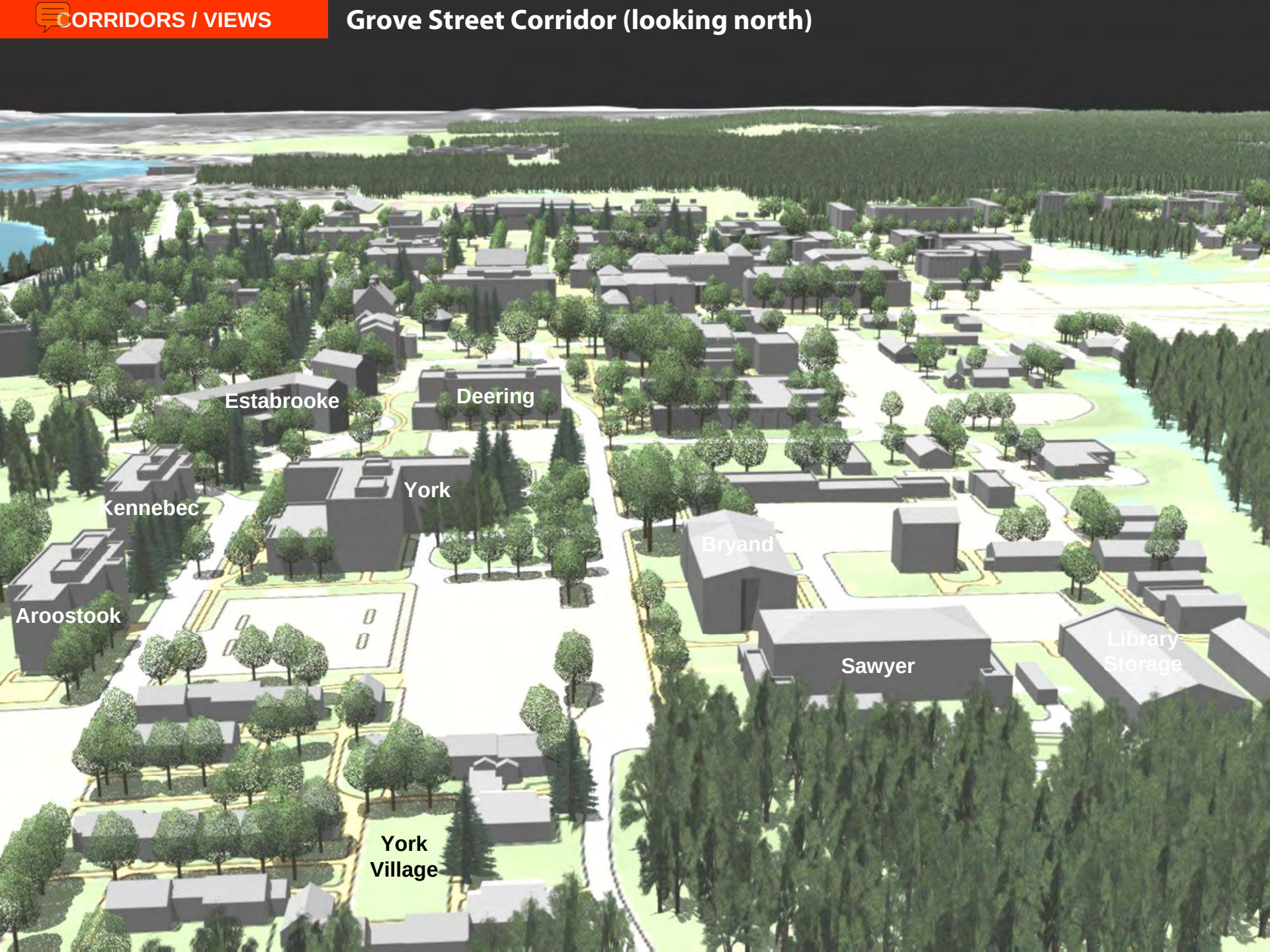
Proposed Campus Trees



Preliminary Master Plan

CORRIDORS / VIEWS

Grove Street Corridor (looking north)



Grove Street Corridor (looking north)

CORRIDORS / VIEWS

Sebago Road Corridor

CORRIDORS / VIEWS

Sebago Road Corridor

CORRIDORS / VIEWS

Existing East / West Forested Corridor

CORRIDORS / VIEWS

Existing East / West Forested Corridor

CORRIDORS / VIEWS

MLK Corridor

CORRIDORS / VIEWS

MLK Corridor

CORRIDORS / VIEWS

Diagonal Corridor

CORRIDORS / VIEWS

Diagonal Corridor

CORRIDORS / VIEWS

Grove Street Corridor (looking south)

CORRIDORS / VIEWS

Grove Street Corridor (looking south)

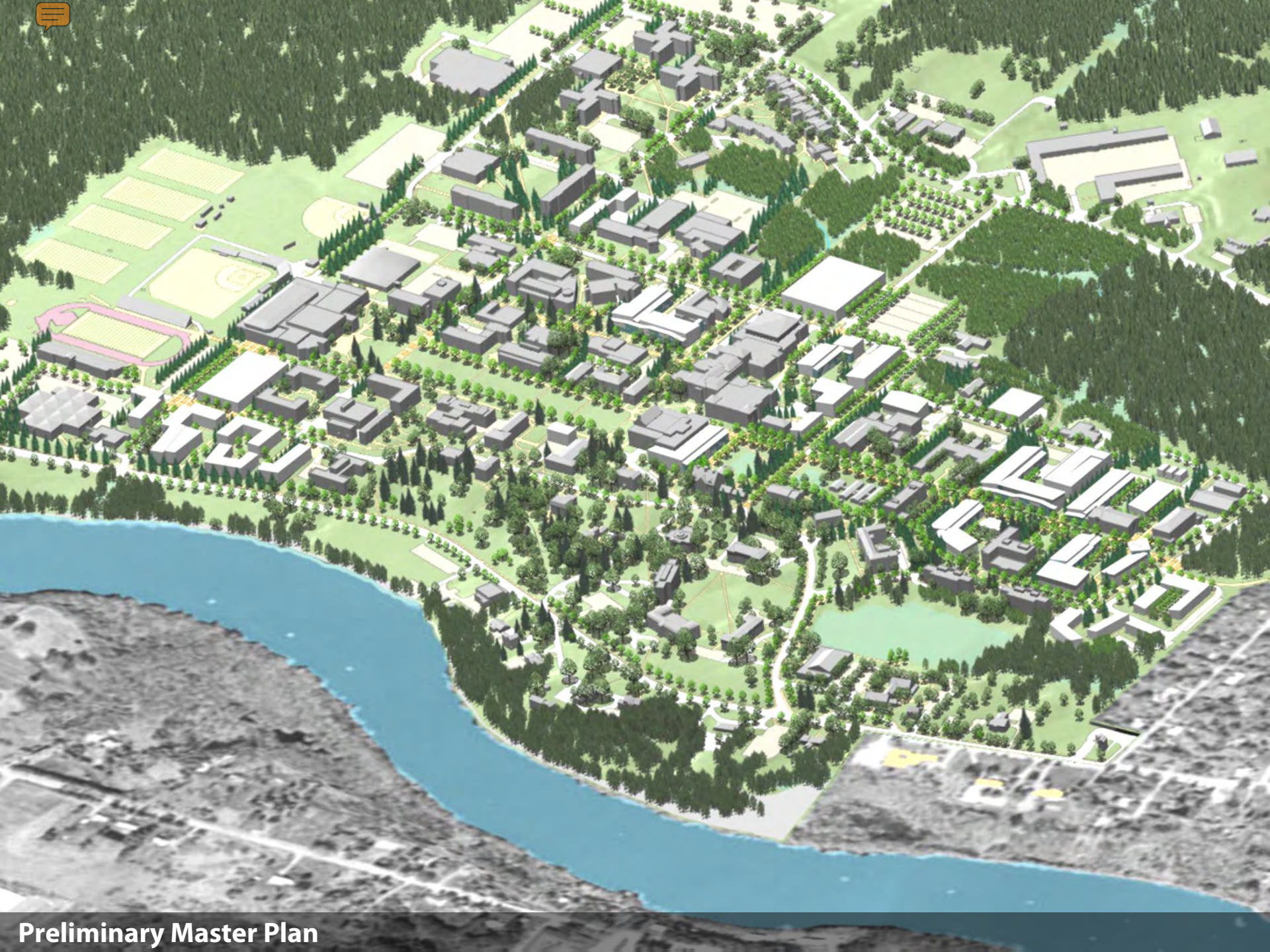
CORRIDORS / VIEWS

Existing East / West Forested Corridor

CORRIDORS / VIEWS

Existing East / West Forested Corridor

Existing Campus Plan



Preliminary Master Plan

Master Plan Components

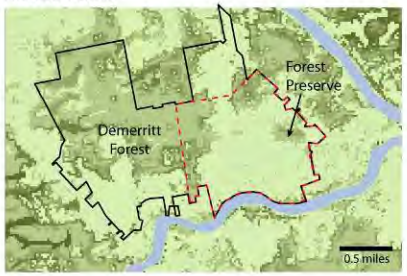
Habitat Network :: existing

Existing Habitat Resources:

- Demerritt Forest
- Forest Preserve
- Stillwater River Frontage
- Wetland areas

References:
University of Maine. College of Forest Resources (1968)
References: "Conserving Wildlife in Maine's Developing Landscape." Maine Audubon Society. (Spring 2008)
Habitat Value Map: FOREST 97. U.S. Fish and Wildlife Service (2003)

Habitat Values



Demerritt Forest :

Spruce 29%
White Pine 27%
Red Maple 18%
Balsom Fir 14%
Hemlock 10%

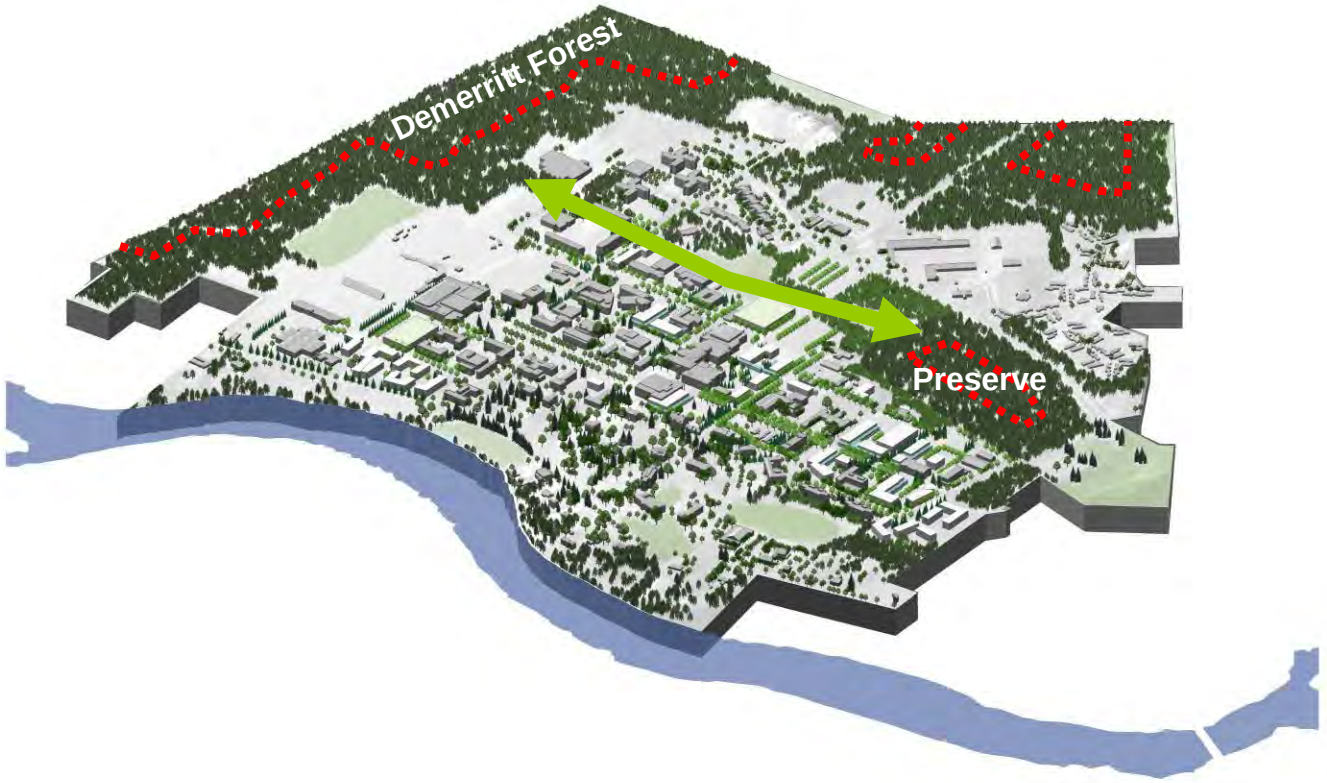
Habitat Network :: proposed

Goals:

- Increase connectivity
- Integrate natural environment with campus environment

Strategies:

- Re-connect the Forest Preserve with Demerritt Forest
- Create corridors that connect the Forest Preserve with the campus
- Increase Forest Cover

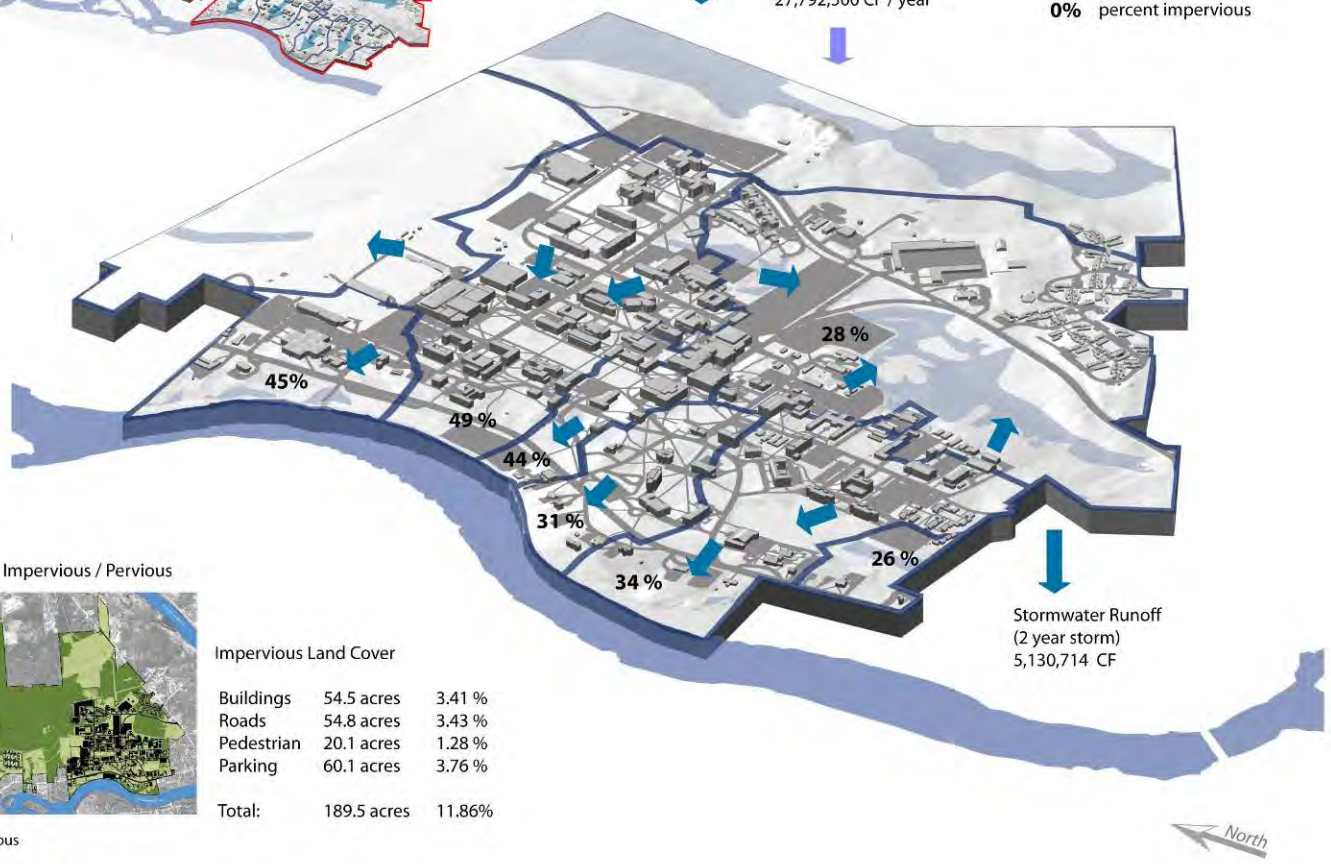


Outcomes:

- **830+ Acres of Forest**
- **Reforestation Corridor**
- **Wetland Extension**
- **Riverfront restoration**

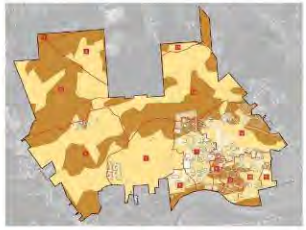
Water Resources :: existing

- 12% impervious surfaces
- 254 acres of wetlands
- High runoff / slow drainage



Sources:
NCRS Interim Soil Survey of Penobscot South County
MEDEP Municipal Separate Storm Sewer System (MS4)
Annual Master

Soils



slow infiltration soil (type C)

high runoff soil (type D)

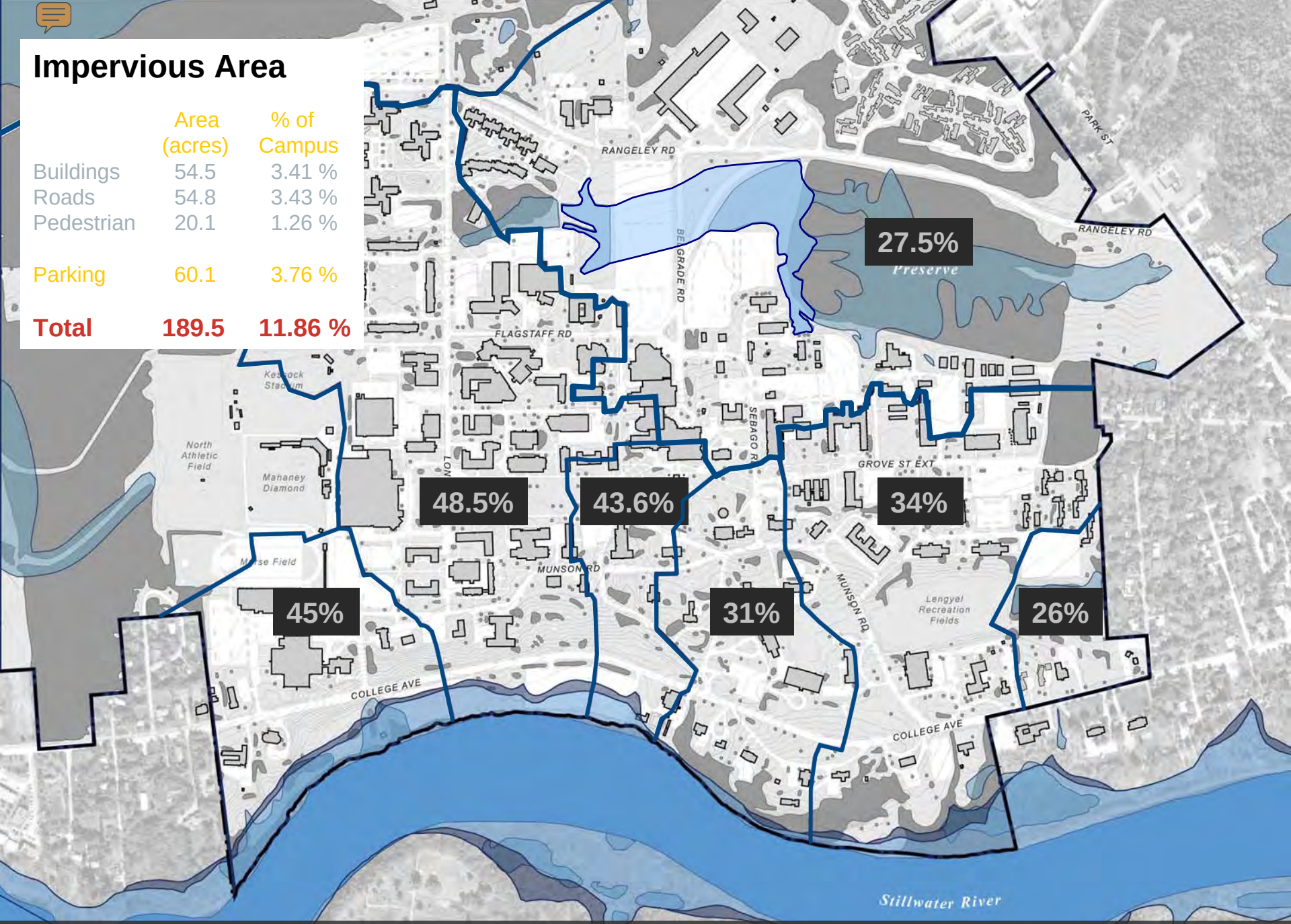
Land Cover: Impervious / Pervious

impervious

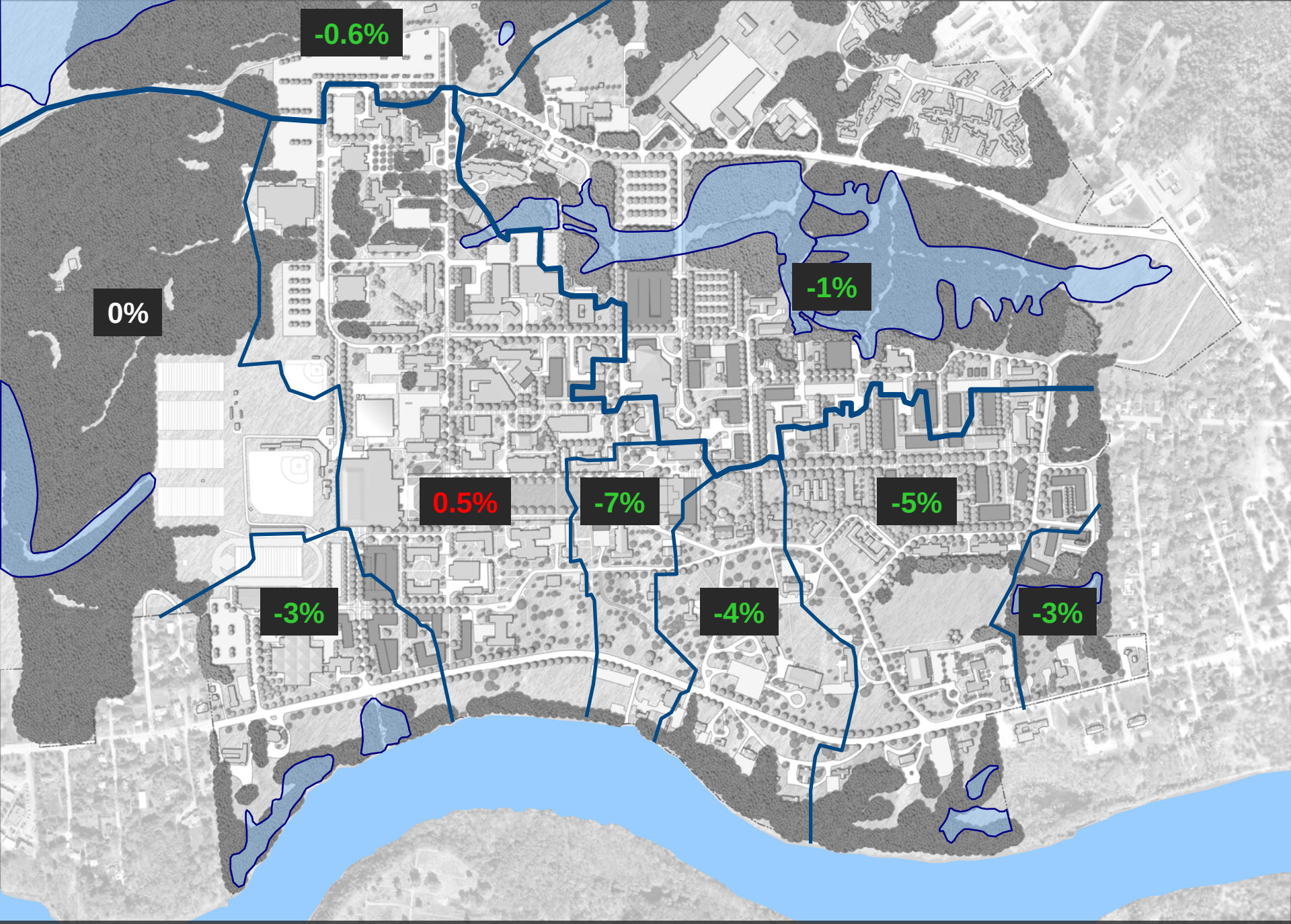
forested / pervious

Impervious Land Cover

Buildings	54.5 acres	3.41 %
Roads	54.8 acres	3.43 %
Pedestrian	20.1 acres	1.28 %
Parking	60.1 acres	3.76 %
Total:	189.5 acres	11.86%

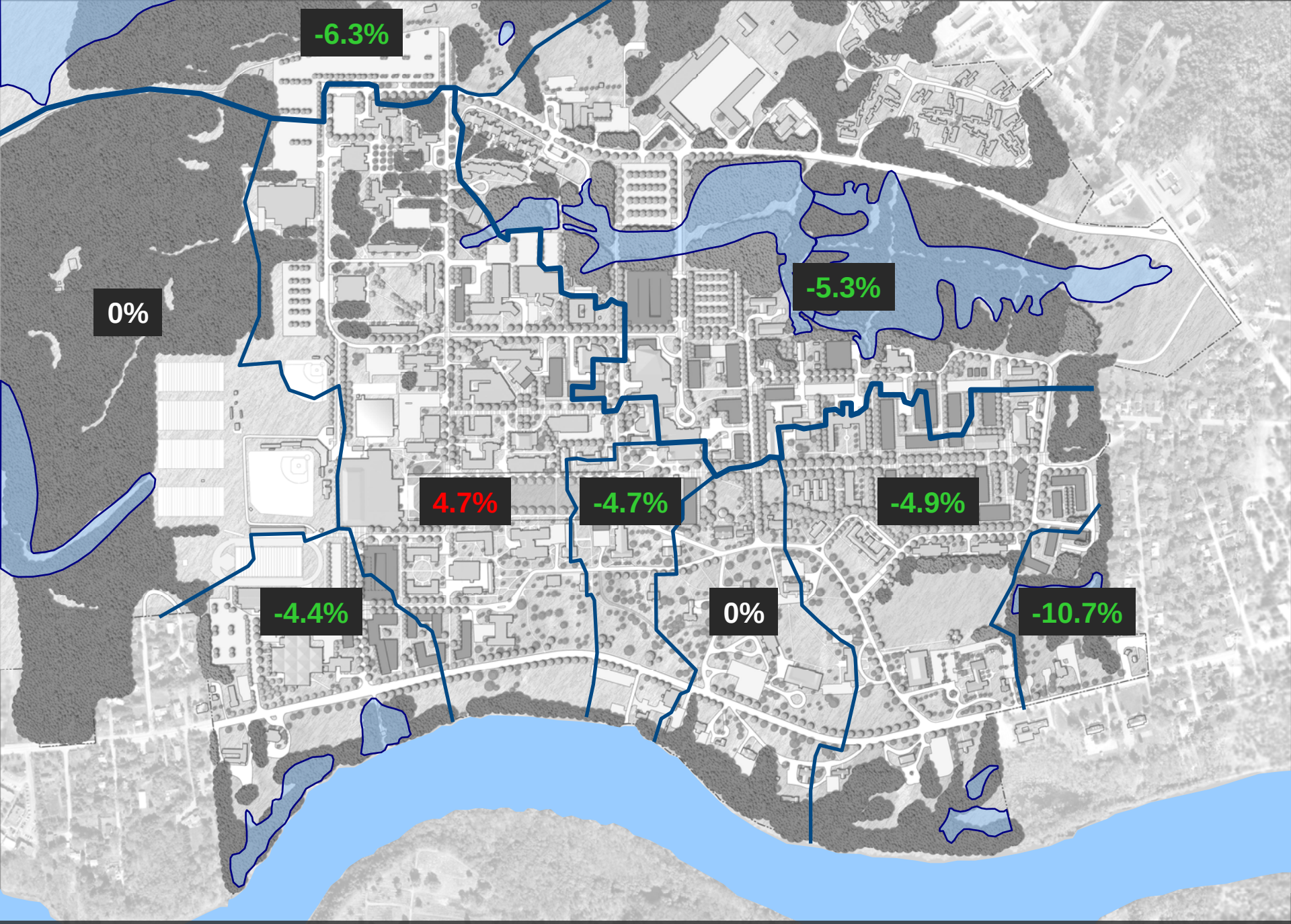


Hydrological Performance – Existing Percent Impervious

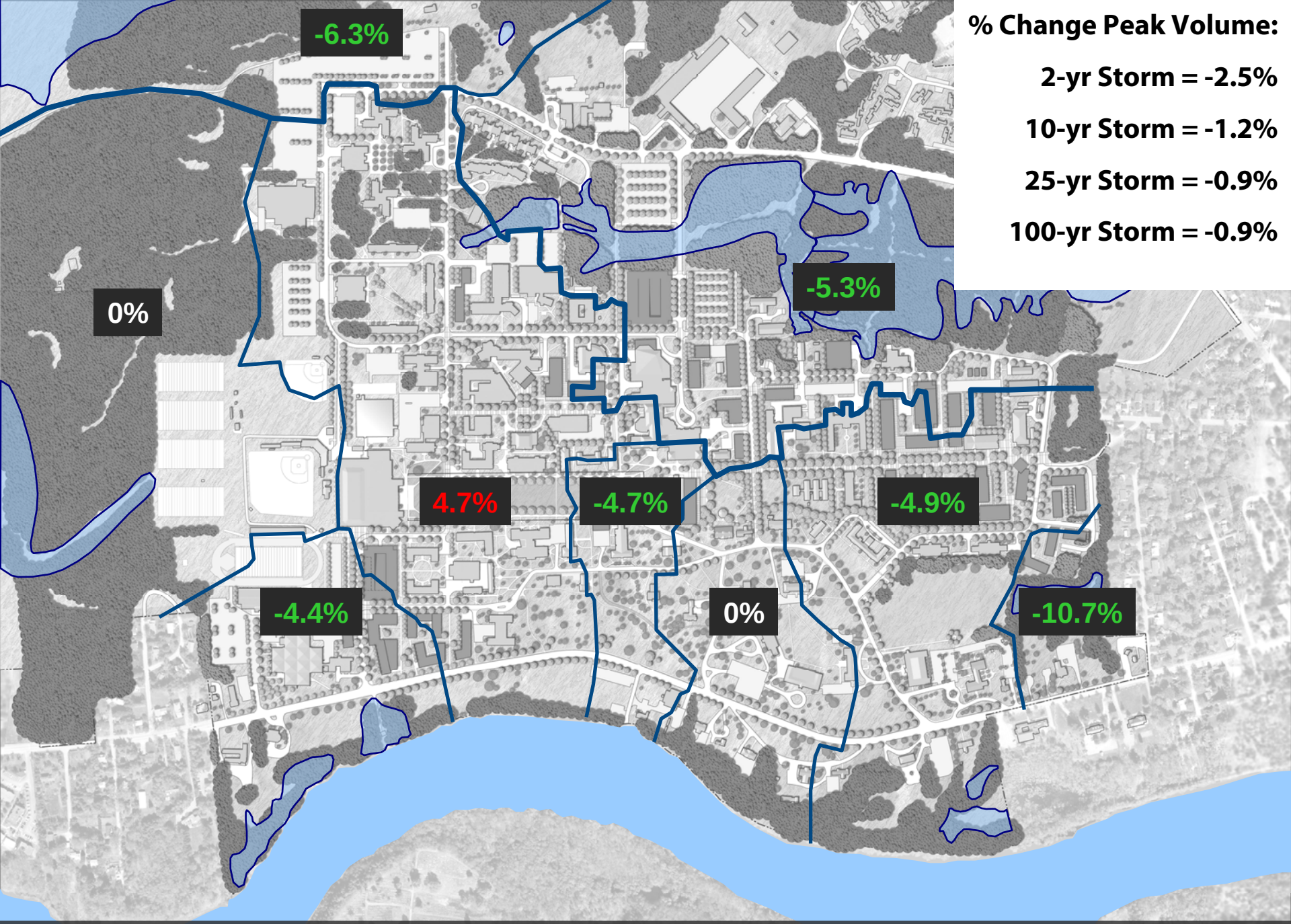


Hydrological Performance – Percent Change Impervious

Poor Good Neutral



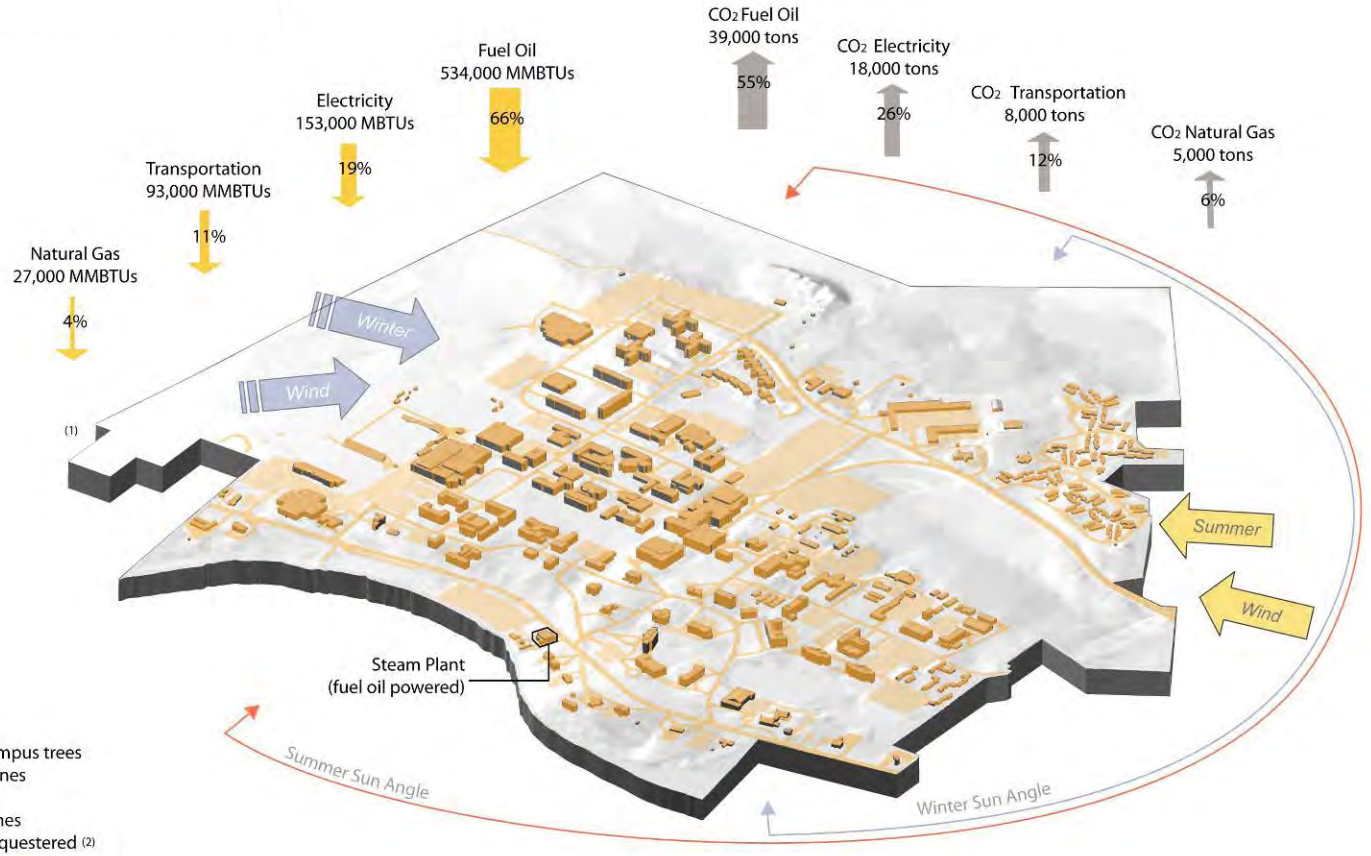
Hydrological Performance – % Change volume of Runoff (cf) Poor Good Neutral


% Change Peak Volume:
2-yr Storm = -2.5%
10-yr Storm = -1.2%
25-yr Storm = -0.9%
100-yr Storm = -0.9%
-6.3%
0%
-5.3%
4.7%
-4.7%
-4.9%
-4.4%
0%
-10.7%
Hydrological Performance – Percent Change Rate of Runoff (cfs)
Poor
Good
Neutral

Atmosphere & Energy Resources :: existing

Steam plant uses fuel oil

30% renewable energy electricity



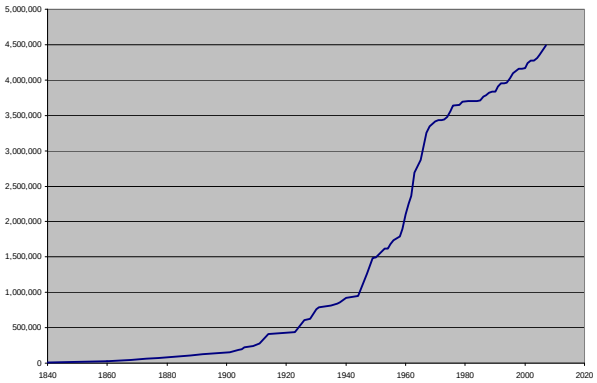
Resources:
(1) Clean Air Cool Planet Carbon Inventory Spreadsheet. University of Maine at Orono, Draft Campus Carbon Calculator.
(2) CityGreen Software, American Forests
(3) Energy Watchdog Utilities Records (energywatchdog.com)

CO_2 stored in campus forests
868.16 tonnes
+
1.78 tonnes
CO_2 annually sequestered (2)

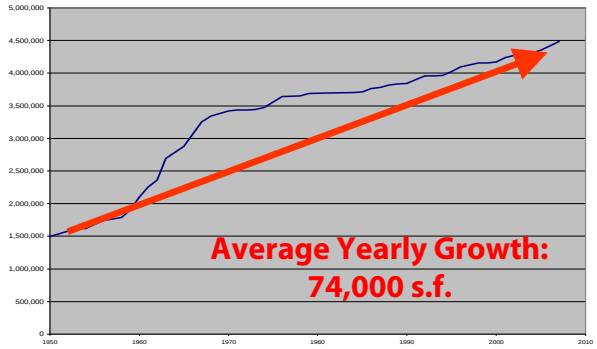
CO_2 stored in campus trees
98.65 tonnes
+
1.23 tonnes
CO_2 annually sequestered (2)

Existing Buildings

Historic Growth



Post-War Growth



Existing Space: 4.3 Million SF

Existing Buildings Considered for Removal

Space:	
Academic	207,000 s.f.
Admin.	25,000 s.f.
Service	7,000 s.f.
Housing	27,000 s.f.
Other	14,000 s.f.
Total	**280,000 s.f.**

Existing and Future Buildings

GSF of Proposed Space:	
Academic	1,173,000 s.f.
Library	128,000 s.f.
Student Services	47,000 s.f.
Housing	208,000 s.f.
Total	**1,492,000 s.f.**
Beds	**640**

Black Bear Village:	
Total	**367,000 s.f.**
Beds	**300**

Grand Total:	**1,923,000 s.f.**
Net Gain	**1,643,000 s.f.**

Growth Horizon: **25 Years**

Parking :: existing

Existing Spaces:	
Faculty/Staff	1,699
Commuter	2,111
Resident	2,250
Other	720
Total	**6,780**

Parking : : proposed

Existing Spaces:	**6,780**

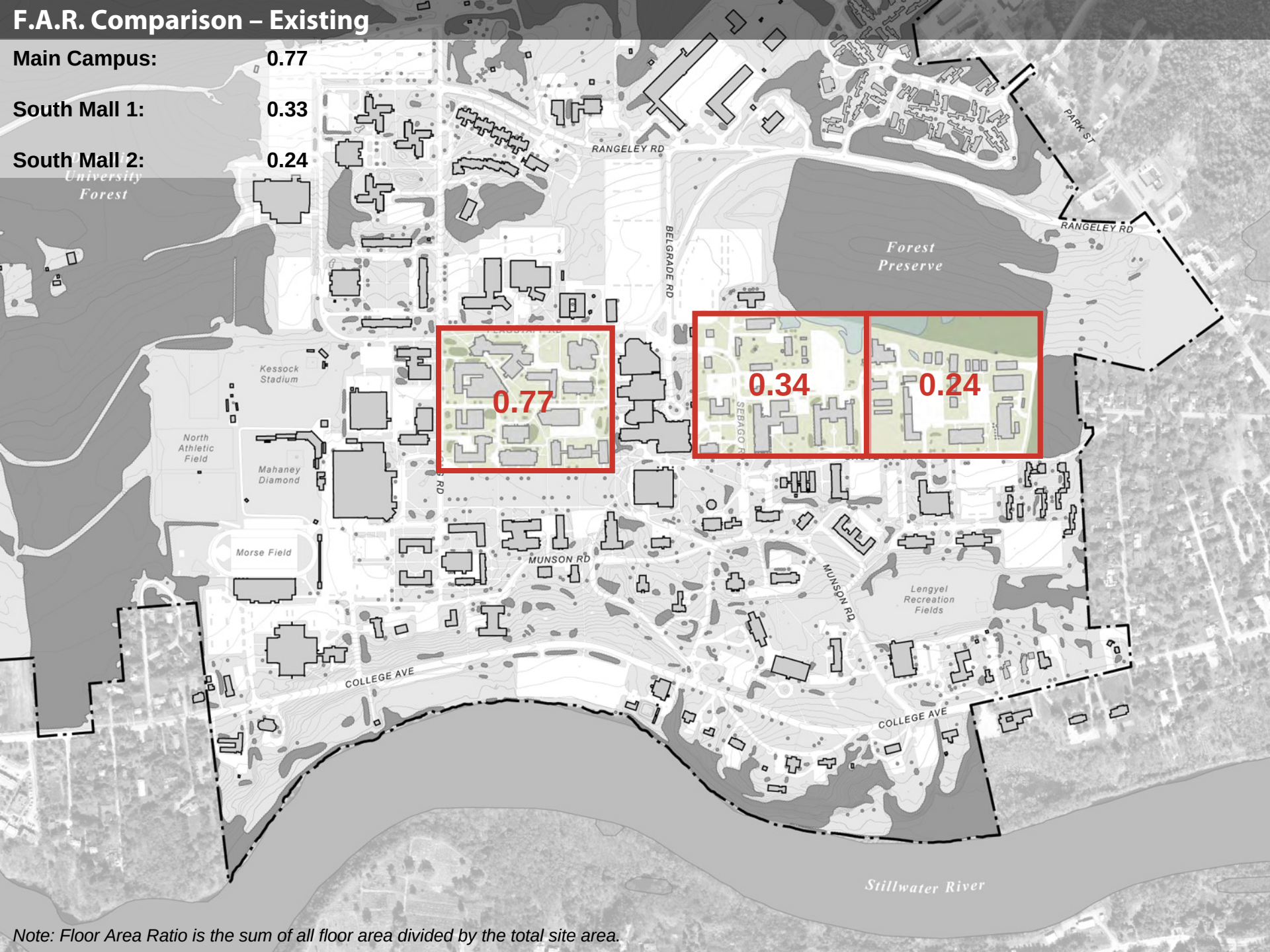
Proposed Spaces:	
Total Proposed	**7,387**
Net Gain	**607**

F.A.R. Comparison – Existing

Main Campus: 0.77

South Mall 1: 0.33

South Mall 2: 0.24

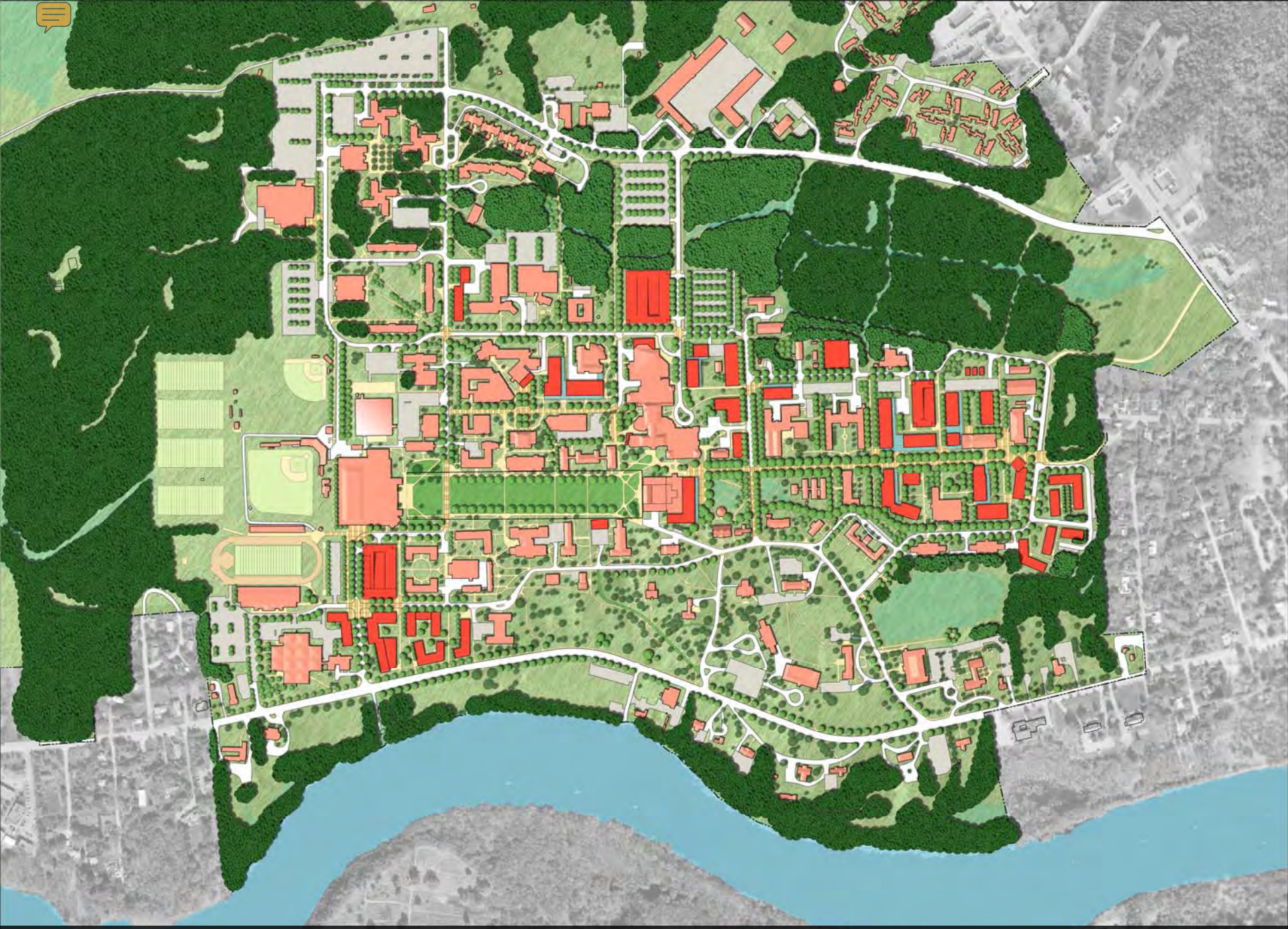


Note: Floor Area Ratio is the sum of all floor area divided by the total site area.

F.A.R. Comparison – Proposed

Main Campus:	**0.77**
South Mall 1:	**0.52**
South Mall 2:	**0.79**

Note: Floor Area Ratio is the sum of all floor area divided by the total site area.



Preliminary Master Plan