ESF

State University of New York
College of Environmental Science and Forestry

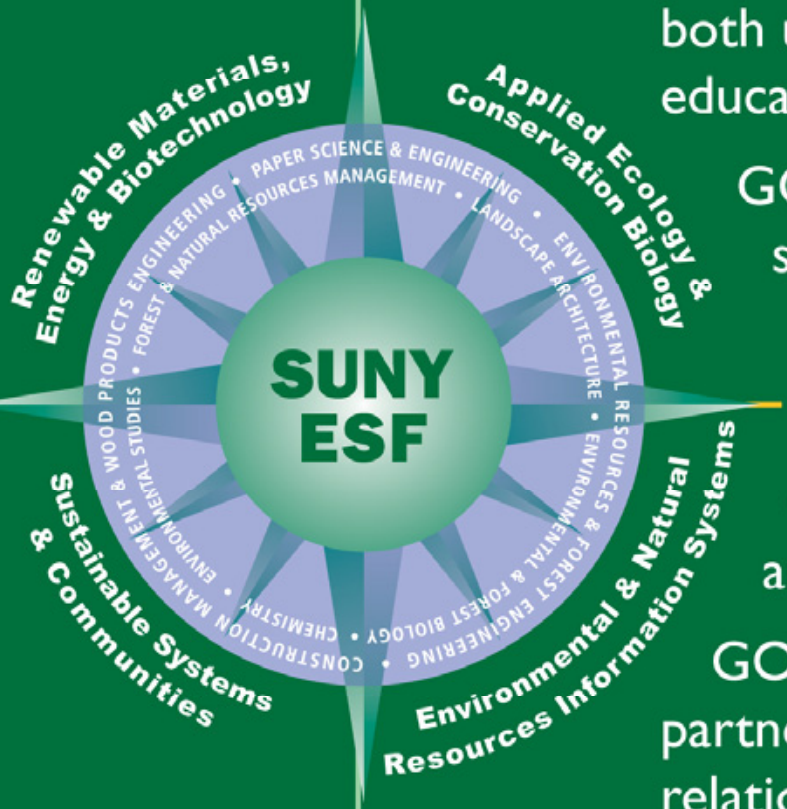
Sustaining the Green

April 2009

Aerial photo from Google Earth

ESF

Vision 2020



GOAL 1: Enrich academic excellence in both undergraduate and graduate education

GOAL 2: Provide an outstanding student experience

GOAL 3: Be the "go-to" institution with a strong and visible reputation

GOAL 4: Become financially secure and independent

GOAL 5: Strategically build and enhance partnerships and collaborative relationships

GOAL 6: Respond to the needs of society

GOAL 7: Invest in ESF's human resources and physical infrastructure

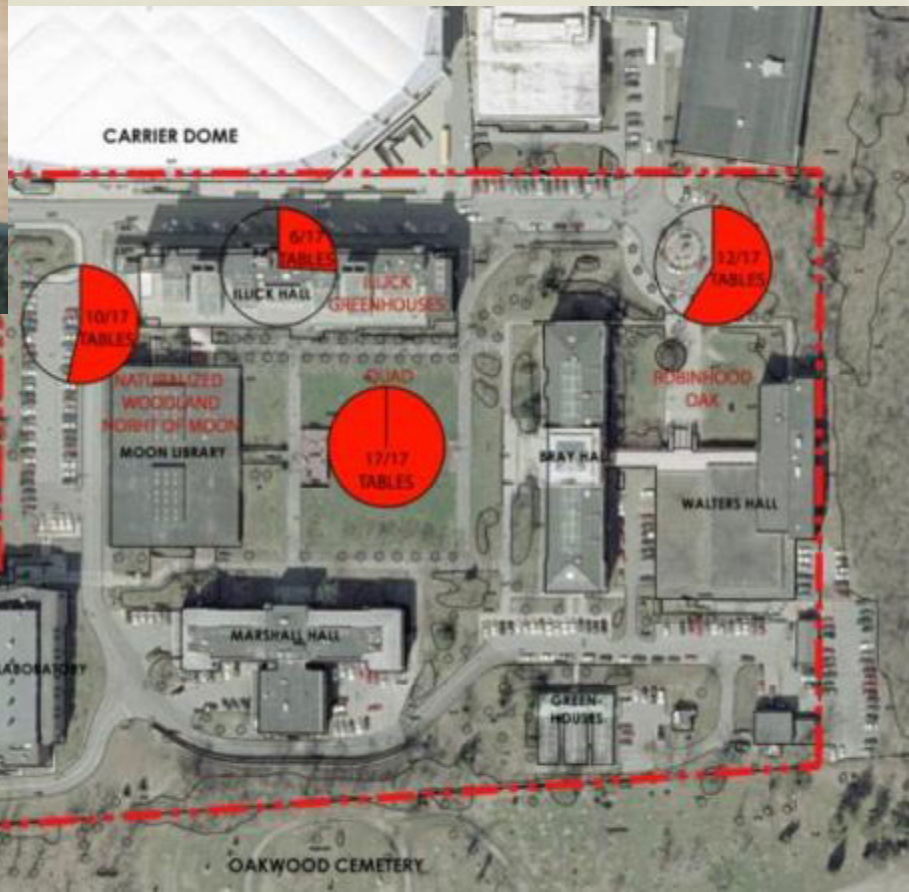
ESF

Sustaining the Green

Planning Vision:
The SUNY-ESF campus will have a strong identity that expresses our commitment to the vision and mission of the institution. The campus will demonstrate and promote environmental stewardship, support our academic endeavors, and provide a setting in which students, faculty, staff, visitors and our neighbors can come together as a community


2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Vision 2020 Started
Vision 2020 Adopted
Campus Master Plan Steering Committee formed
Steering Committee/LA Department begin Campus master plan studies
Signing of American College and University President's Commitment to Climate Change
Campus wide workshops and stakeholder interviews
Draft Campus Master Plan presented to Steering Committee in August
King & King begins Combined Program Study
King & King completes Combined Program Study
RFQ released for Gateway Building team
ESF Board of Trustees Approval of Program Study
Begin Sustainability Master Plan
Architerra begins Gateway Building Design
Finalization of Sustaining the Green
Planned Gateway Building Completion

Campus Workshops



Sacred Spaces

Campus Workshops

Identified Areas for Improvement

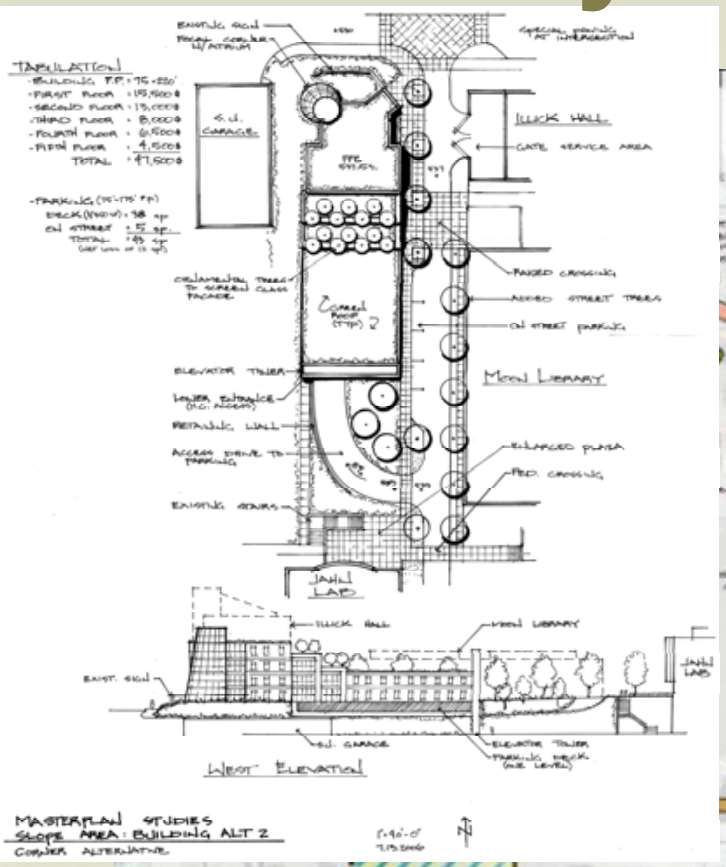
- Social Space (60 Responses)
  - Provide variety of spaces to gather
- Circulation (59 Responses)
  - Vehicular and pedestrian throughout campus
- Vegetation (41 Responses)
  - Too much grass, improve designed plantings
  - Remove invasives
- Improve Entry Sequence (31 Responses)
  - Especially from Irving Ave. through the circle
- Create Identity Separate from S.U. (28 Responses)
- Improve Accessibility (15 responses)

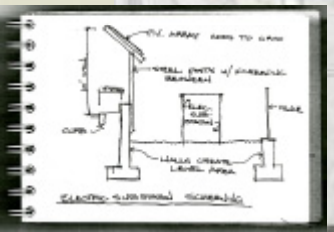
Campus Workshops

Reflecting the Values of the Institution

- Energy Use
  - Alternative transportation
  - Green energy
- Campus Layout and Landscape
  - Better design (all aspects)
- Facilities
  - Student Center and Student Housing
  - Display student work
- Reveal the Campus Mission
  - Model innovative technology on campus
  - Highlight research
  - Signage
  - Native plantings and interpretive landscapes

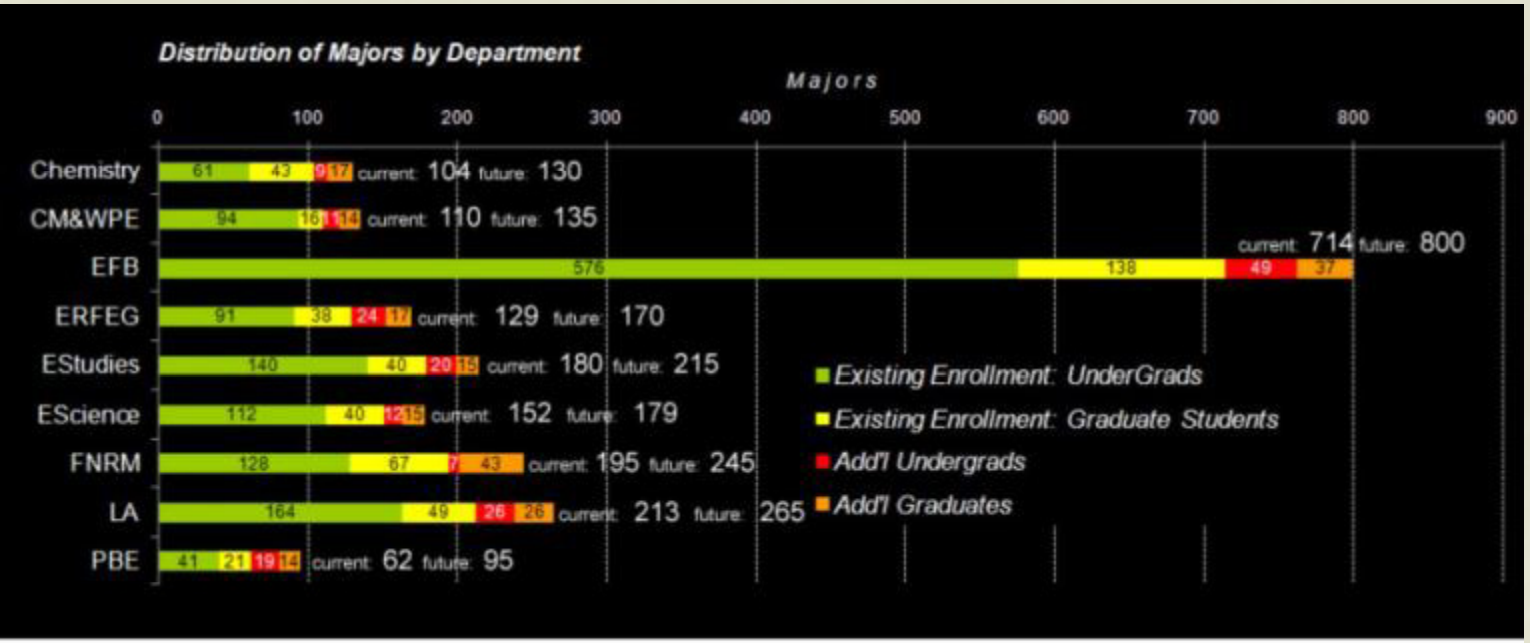
Preliminary Studies



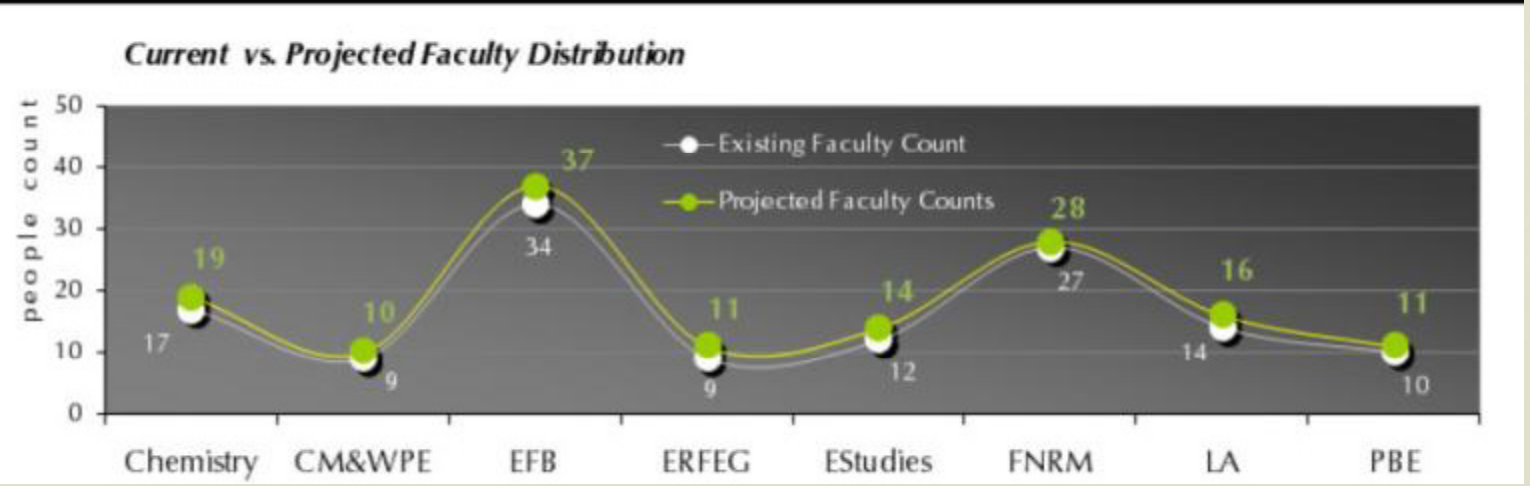


Combined Program Study

How much is ESF projected to grow by 2020?



2,241 Students
(+375)



146 Faculty
(+14)

Information provided by King & King Assoc.

Combined Program Study

How much space do we need?

Information provided by King & King Assoc.

‘Right-Size’ and Update Classroom Space
(+3,000 NSF)

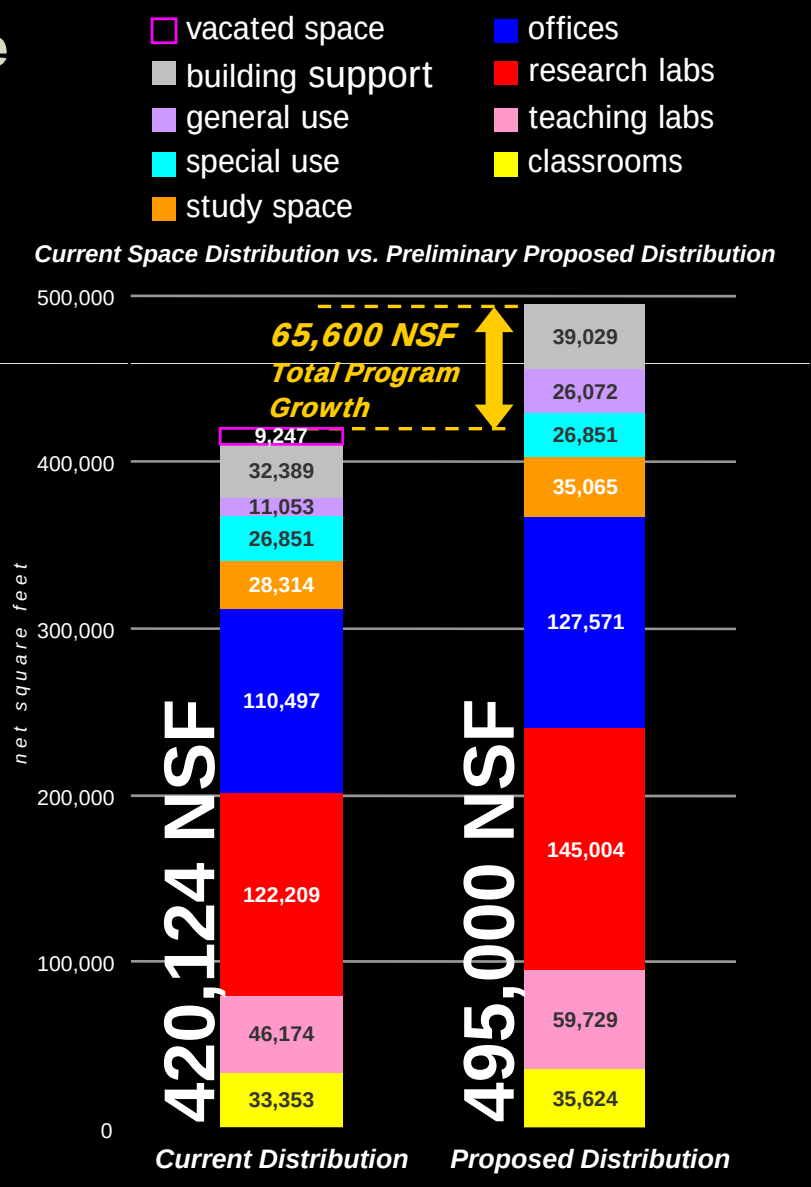
Teaching Lab Expansion
(+13,600 NSF)

Research Lab Expansion
(+21,000 NSF)

Expand Office Space
(+10,000 NSF)

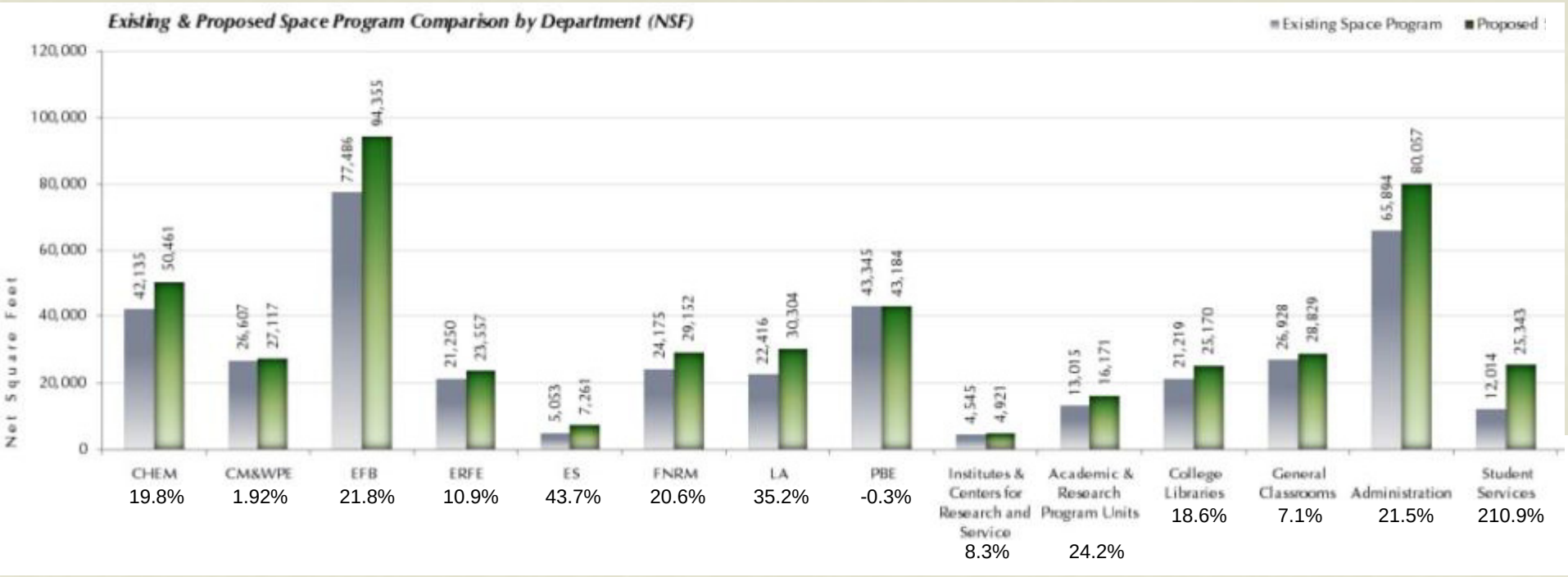
Add Study / Collaborative Space
(+6,700 NSF)

Add Lounge / Dining Space
(+15,000 NSF)



Combined Program Study

How much space do we need?



Information provided by King & King Assoc.

Combined Program Study

Where is this space?

Concept graphics provided by King & King Assoc.

- Proposed Buildings

Gateway Building and Moon Student Center

Academic Research Building

- Existing Buildings
  - Rehab and Update Existing Buildings
  - Increase space utilization to 65% (Currently ~50%)
  - Increase seat utilization to 75% (Currently ~48%)
  - Building Expansions

Becoming More Sustainable

- Campus energy use per square foot is below average for the SUNY system, but it has grown since 1989-90, this compares with SUNY goal of a 37% reduction by 2010.

Greenhouse Gas (CO2)	
Electric	4,506 tons
Steam	3,847 tons
Natural Gas	690 tons
Propane	318 tons
Fuel Oil	539 tons
Transportation	1,057 tons
Total	**10,948 tons**

Existing Initiatives

Conservation, Green Roof and Utilizing Wastes

Existing Initiatives

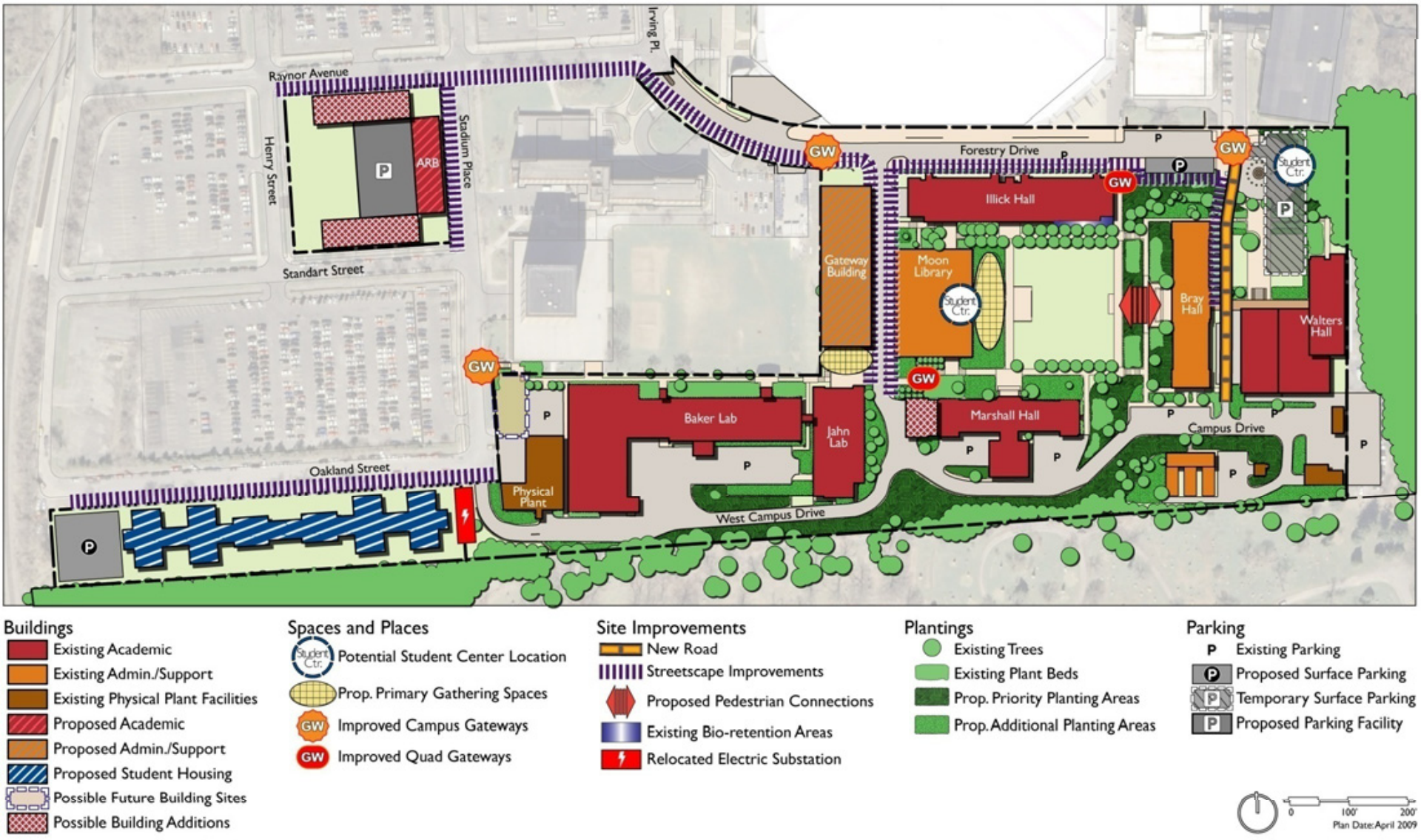
Deploying New Technologies

ESF

Sustaining the Green

The Structure for our Educational Mission

The Future Framework



New Campus Buildings

"Green" Buildings

Imogene Powers Johnson Center _Cornell University

Lewis Center for Environmental Studies_Oberlin College

- Potential Strategies
  - LEED+ Buildings
  - State of the Art Facilities
  - Student Housing
  - All buildings with energy focus

- Mandated by Executive Order 111
- Campus Goal of LEED Gold

Gateway Building – LEED Platinum+

- Building Program
  - Conference/Event Spaces (300+ seats)
  - Exhibition/Gallery Spaces
  - Roosevelt Collection Display
  - Admissions Offices
  - Outreach Offices
  - Café/Snack Bar
  - Bookstore/College Merchandise
  - University Police Office
  - Centralized power and heating unit

Concept graphic provided by Architerra Inc.

Anticipated Completion: 2011/2012

Academic Research Building (ARB)

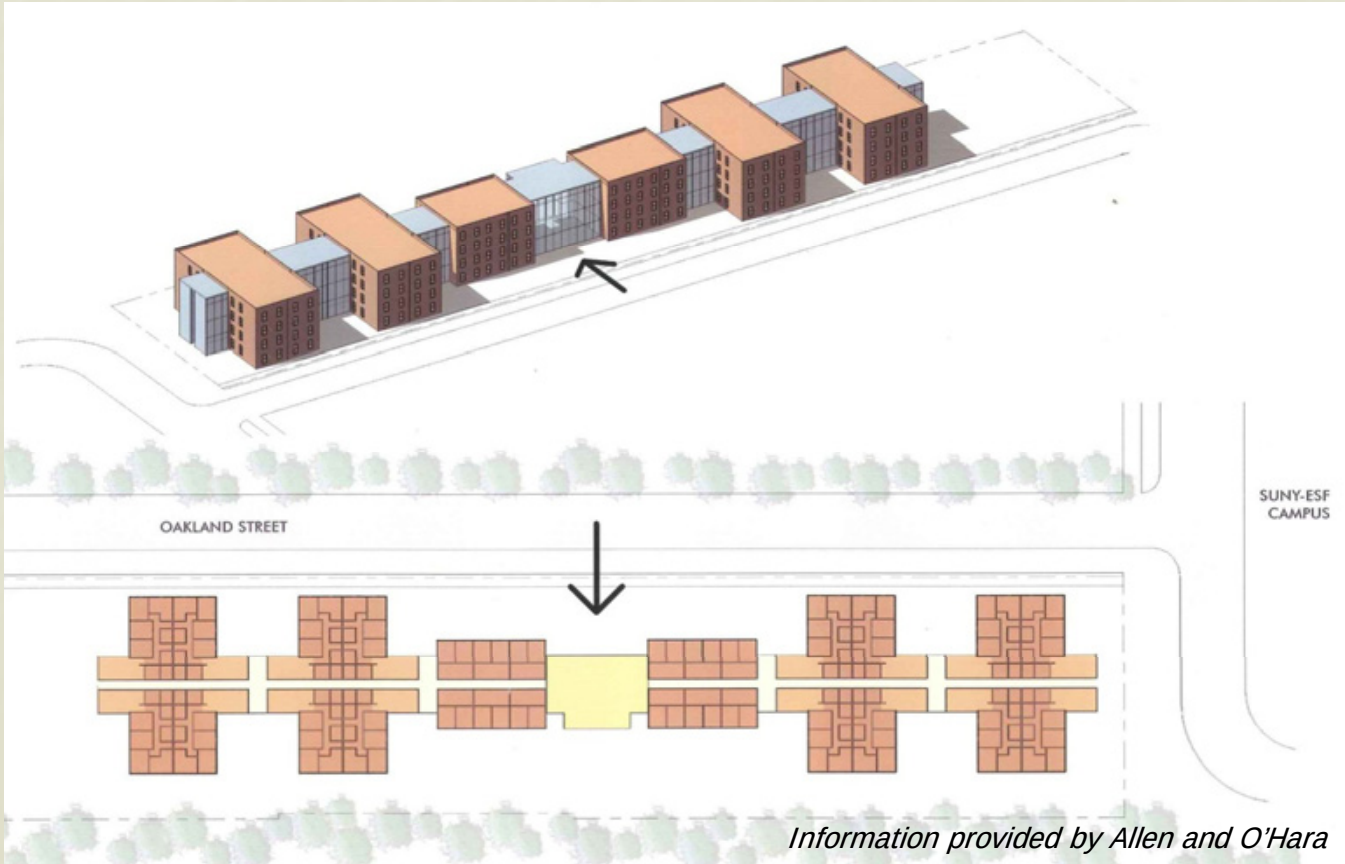
Concept graphics provided by King & King Assoc.

- Building Program
  - EFB Administrative/Faculty Offices
  - Graduate student offices
  - Dry/Wet Research Labs
    - (180+/- NSF per researcher)
  - Greenhouses
  - Study/Collaborative Space
  - Insect Museum, Mycological Collection and Vascular Plant Herbarium Display
  - Parking Facility
    - (240+/- spaces)

Anticipated Completion: 2014

Student Housing

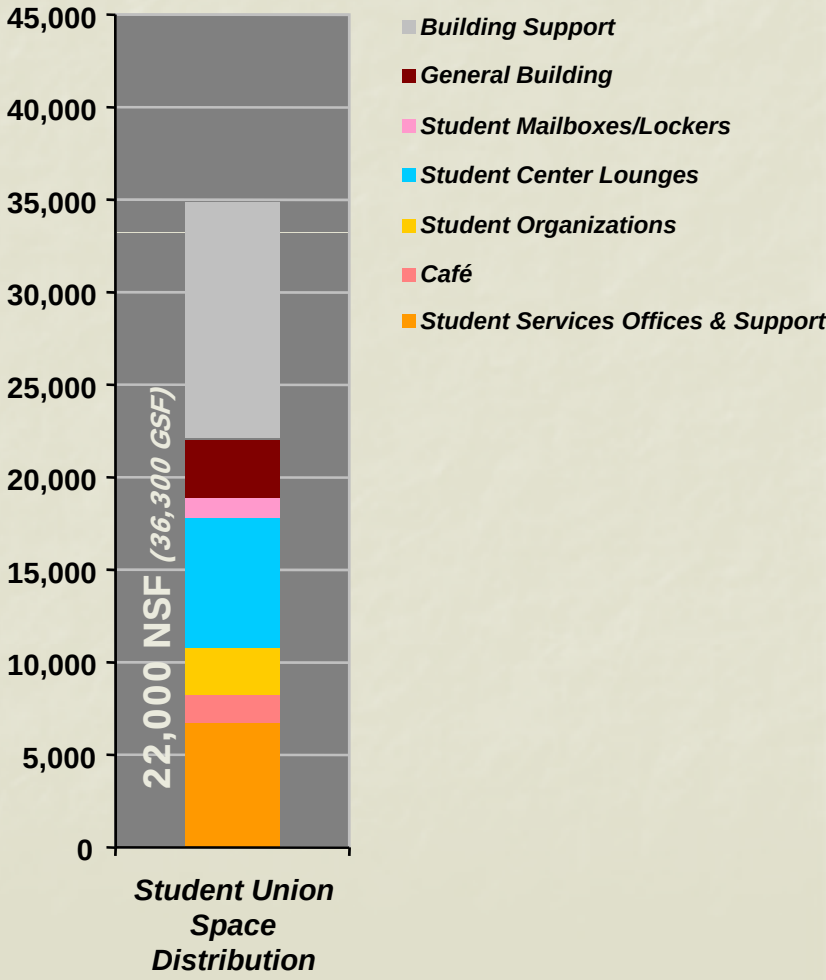
- 400+/- beds
  - Freshman: 280 to 300 in shared rooms
  - Upperclassmen (single bedrooms in suites/apartments)
- Minimum LEED Silver rating for the project.
  - Sustainable heating and cooling
  - Insulation, natural daylighting
  - Material recycling
- Common spaces
- Interior bike storage
- Minimal parking



Information provided by Allen and O'Hara

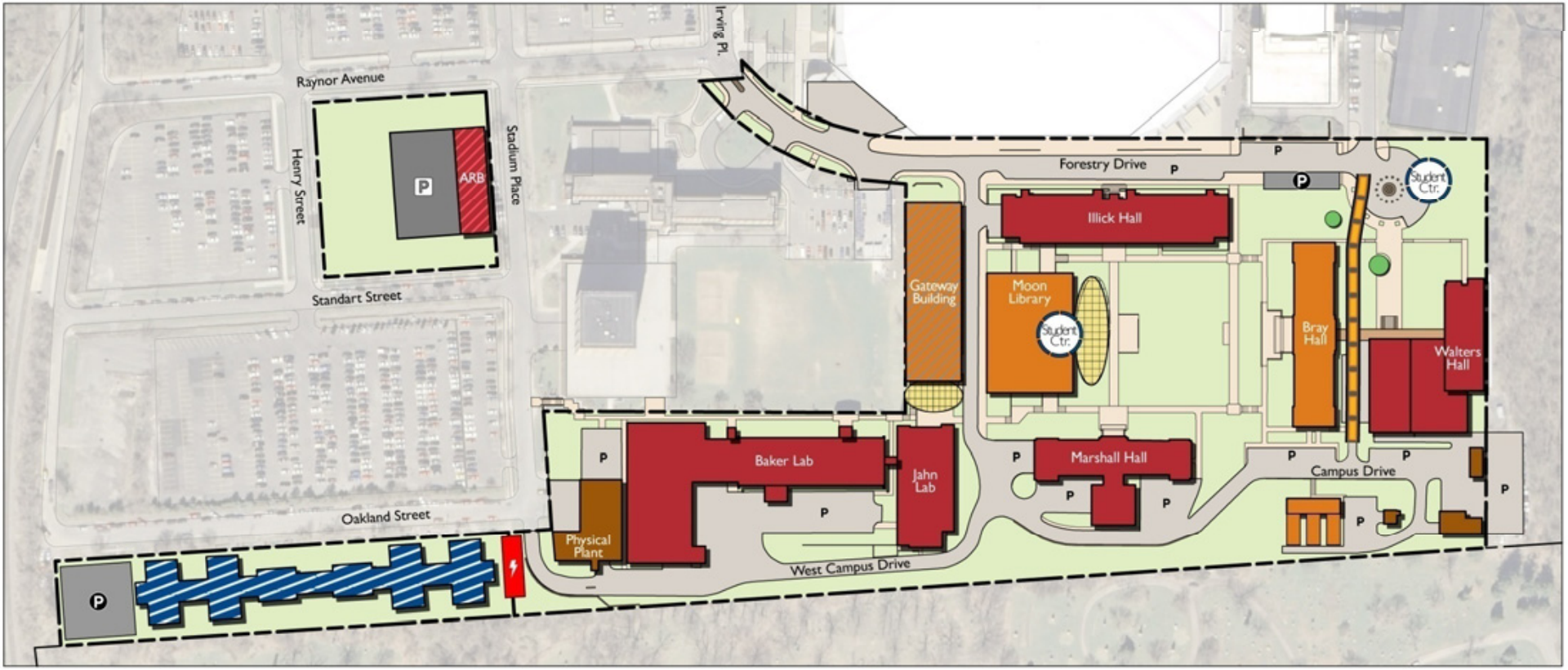
Student Center

- Preliminary Building Program
  - Student Services Offices and Support
  - Café/Dining Service
  - Student Organizations (Clubs, Yearbook, Newspaper, etc.)
  - Lounges
  - Mailboxes/Lockers



Information provided by King & King Assoc.

Student Center



Existing Campus Buildings

Update and Modernize

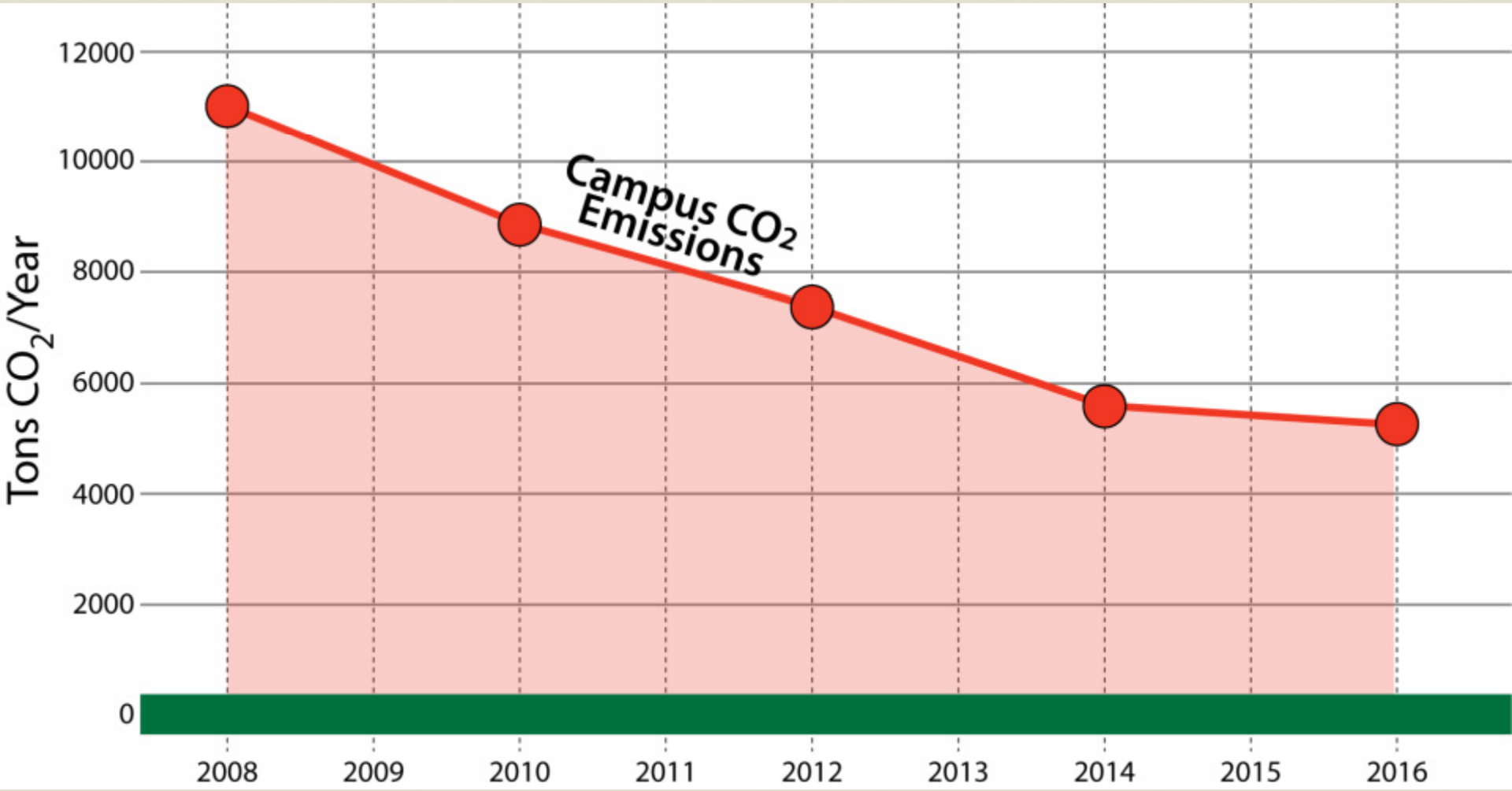
- Potential Strategies
  - Improved energy systems
  - Increased space utilization
- Preliminary Rehab Schedule
  - Illick, Phase 1: 2014-2016
  - Illick, Phase 2: 2016-2018
  - Moon: 2018-2020
  - Old Greenhouses: 2019
  - Marshall: 2020-2021
  - Bray: 2021-2022
  - Walters, major: 2022-2024

ESF

Sustaining the Green

More Sustainable Energy Use

Planned 50 % CO_2 Emission Reduction



Energy: Conservation and Efficiency

- Goal is to reduce purchased Electricity and Steam by 30% through energy conservation and efficiency.
  - Phase 1: Behavioral changes: goal 10% reduction in 2009.
    - Adjust temperature settings (new policy) and campaign to reduce energy use.
    - Reduce energy use, turn off computers, lights, etc...
    - Enhanced sustainability web presence.
    - Your ideas?

Energy: Conservation and Efficiency

- Phase 2: Implement NYPA energy audit 2009.
  - Key energy conservation measures:
    - Jahn Lab heat recovery system
    - Variable speed drives on big motors
    - Test occupancy sensors on Bray
    - Steam trap replacement in Marshall
    - Wood pellet heating to replace oil at AEC
    - 60 kW of PV to enhance teaching and demonstration.
  - Annual Savings: $324,000
  - Cost $ 3.4 million

Energy: Conservation and Efficiency

- Phase 3 Additional energy savings:
  - Lighting efficiency/controls
  - Additional NYPA Energy Audits – Marshall, Bray, Walters, Ranger School and other ESF Facilities.
  - Evaluate improvements to heating systems.
  - Evaluate investment in more efficient electronics – virtual servers, flat panel screens, other.
  - Develop performance contract in 2010-11 RFQ/RFP to augment NYPA efforts and develop guaranteed savings for additional and efficiency and demand response measures.

Gateway Building: Energy Showcase

- Goal: New “zero net energy” showcase building for campus.
- Design includes biomass combined heat and power, PV, green roof, passive solar and rain gardens.

Concept graphic provided by Architerra Inc.

Energy: Photovoltaic & Wind

- **Moon Library Photovoltaic Project** – Install 50 kW photovoltaic array on Moon Library roof to provide a significant visual display opportunity and double campus PV.
- **Adirondack Photovoltaic Project** – Install 50 kW total photovoltaic arrays to demonstrate solar electric power in visible remote Adirondack settings (AEC and Ranger School).
- **Urban Wind Project** – Install 5 vertical turbines (50 kW total capacity) on Illick Hall to demonstrate building based urban wind systems.

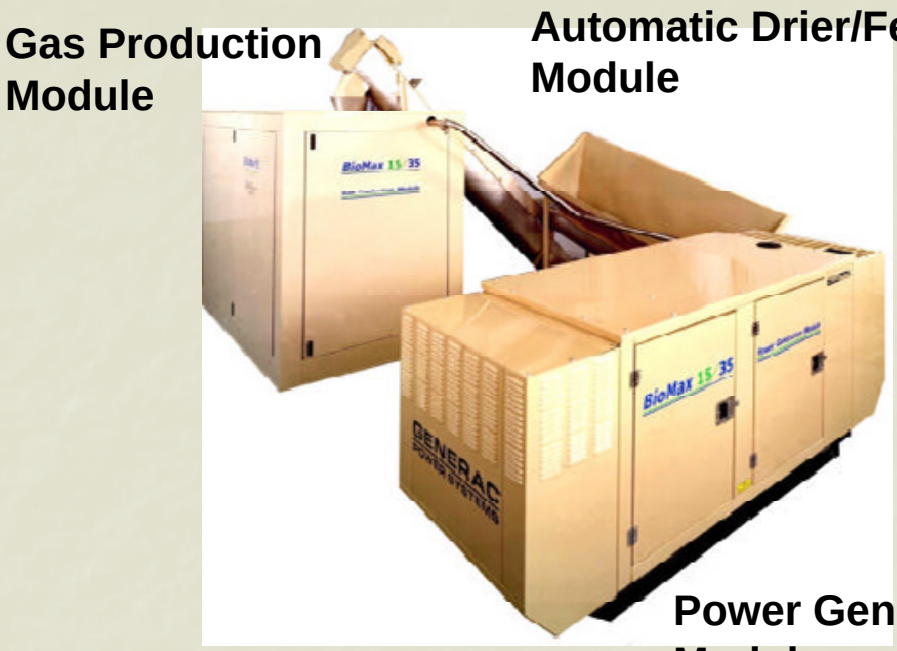
Energy: Pilot Pellet Plant

- **Biomass Pellet Plant and Infrastructure** – develop a pilot scale pellet plant.
  - First the plant will provide much needed pilot scale research and testing of pellets made from various biomass fuels (wood, grasses, agricultural products, and combinations).
  - Next the plant will allow a community scale demonstration of locally produced biomass as an energy source.

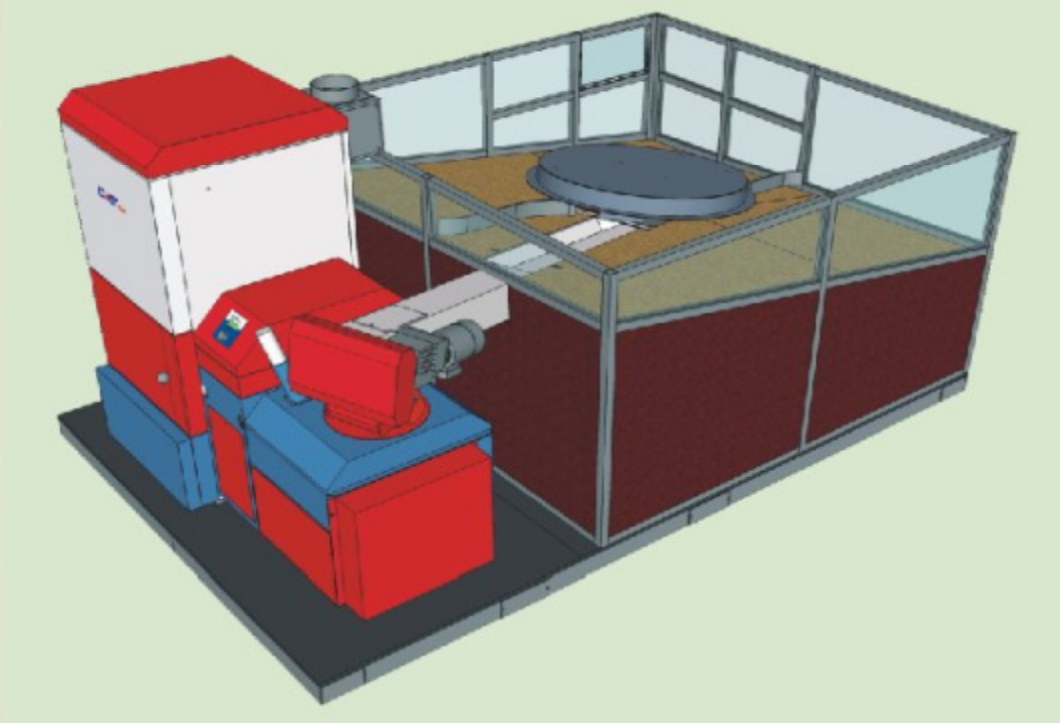
Energy: Combined Heat and Power

- **Biomass Combined Heat and Power Demonstrations** – Traditional electric generation is approximately 35% efficient. CHP systems have the potential to double that efficiency.

- **Fuel Cell/Combined Heat and Power System** –Implement 400 kW Fuel Cell/CHP.



Energy: Efficient Wood Heat



- **Biomass and Efficiency Adirondack Campuses and Heiberg Forest** – The focus will be to significantly reduce energy use through aggressive conservation projects, and to generate at least 50 percent of the remaining energy requirements with New York grown woody biomass.

Transportation and Commuting

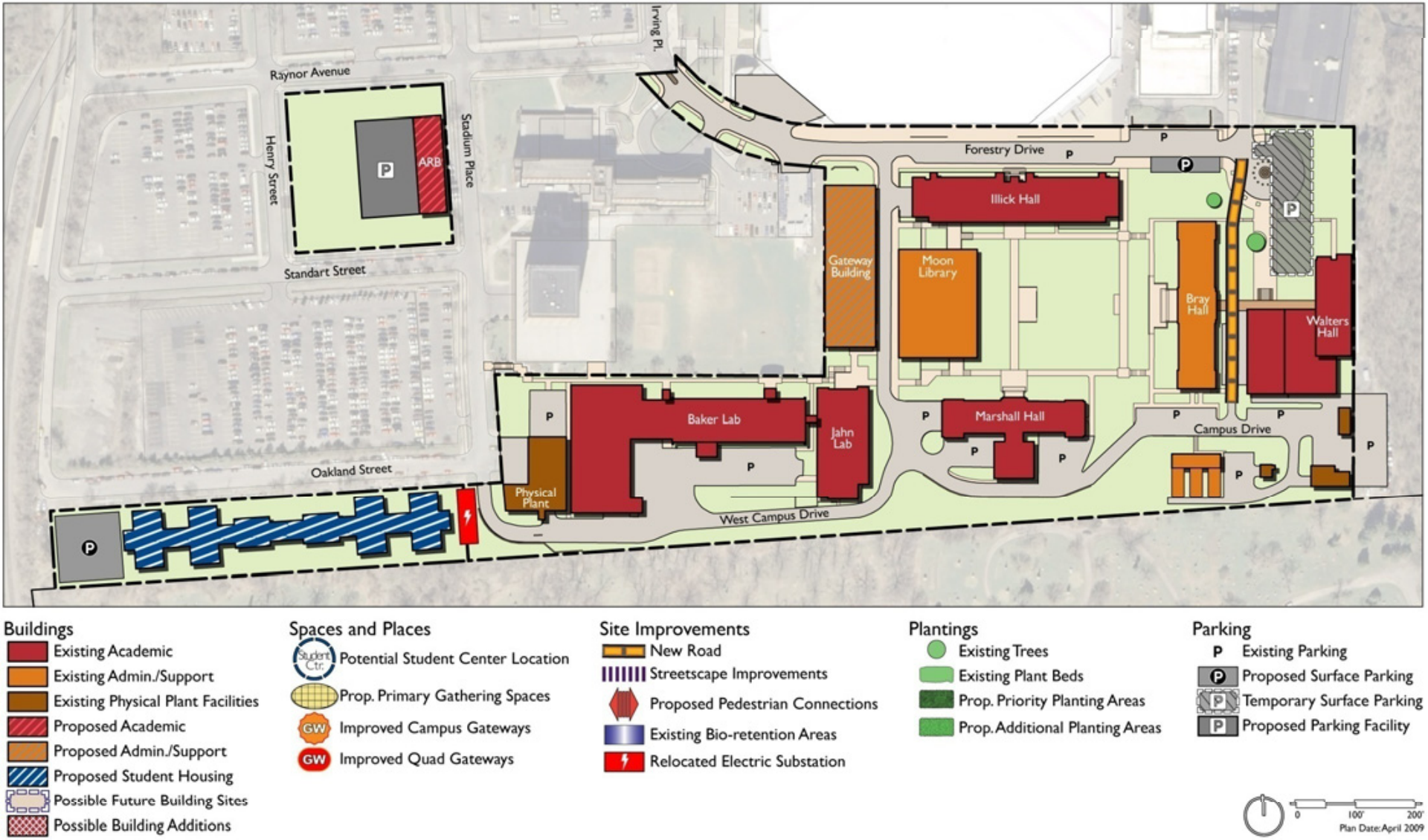
Balance all Modes of Transportation

- Transportation Demand Management Strategies (TDM)
- Hybrid and alternative fuel vehicles
- Green Energy Cooperative
- 10% reduction in travel (plane & car) emissions by 2010
- Develop bike sharing program
- Increase bike parking facilities
- CuseCar car sharing program

CuseCar

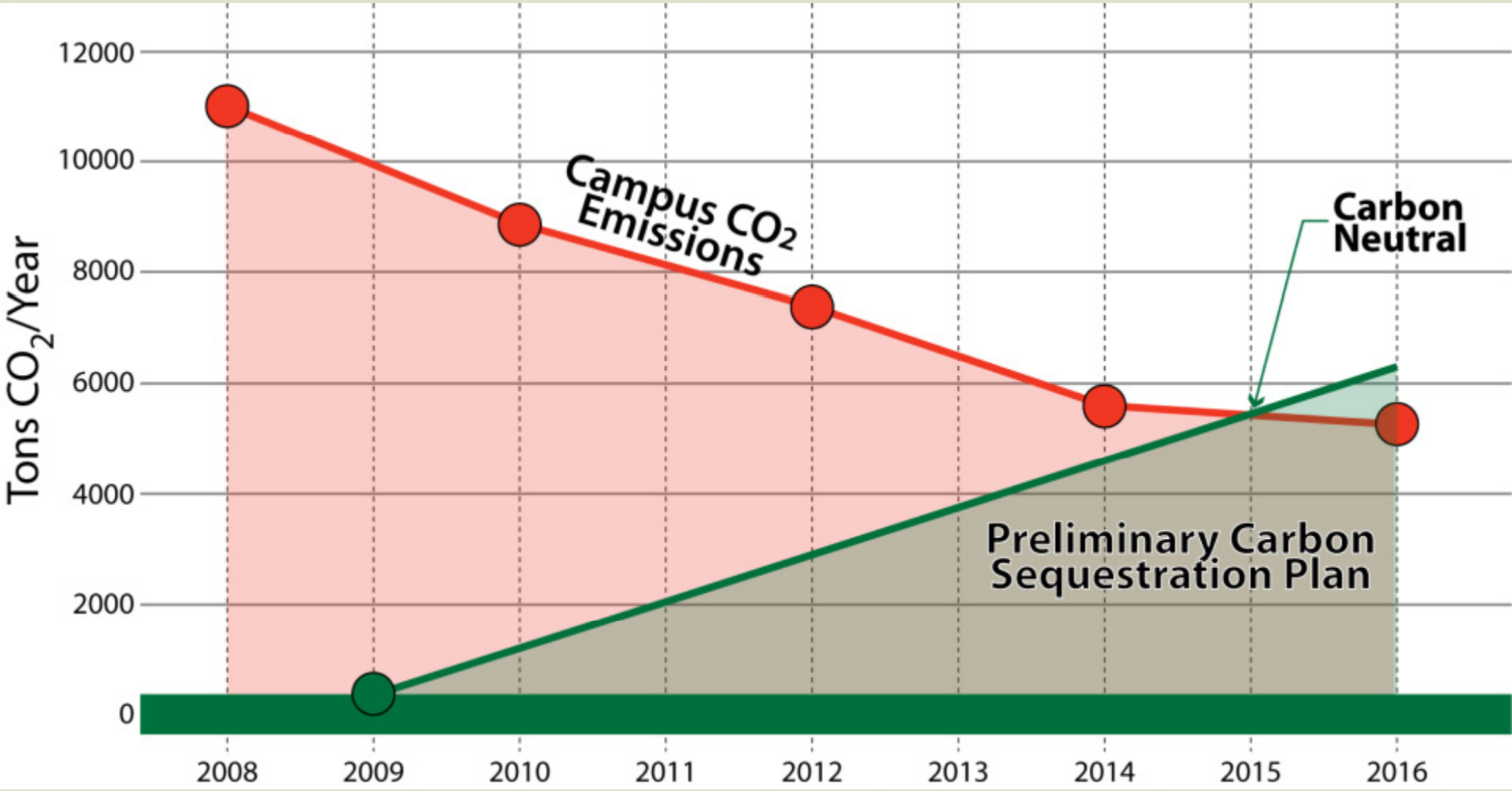
Go Green – Car Share!

Parking



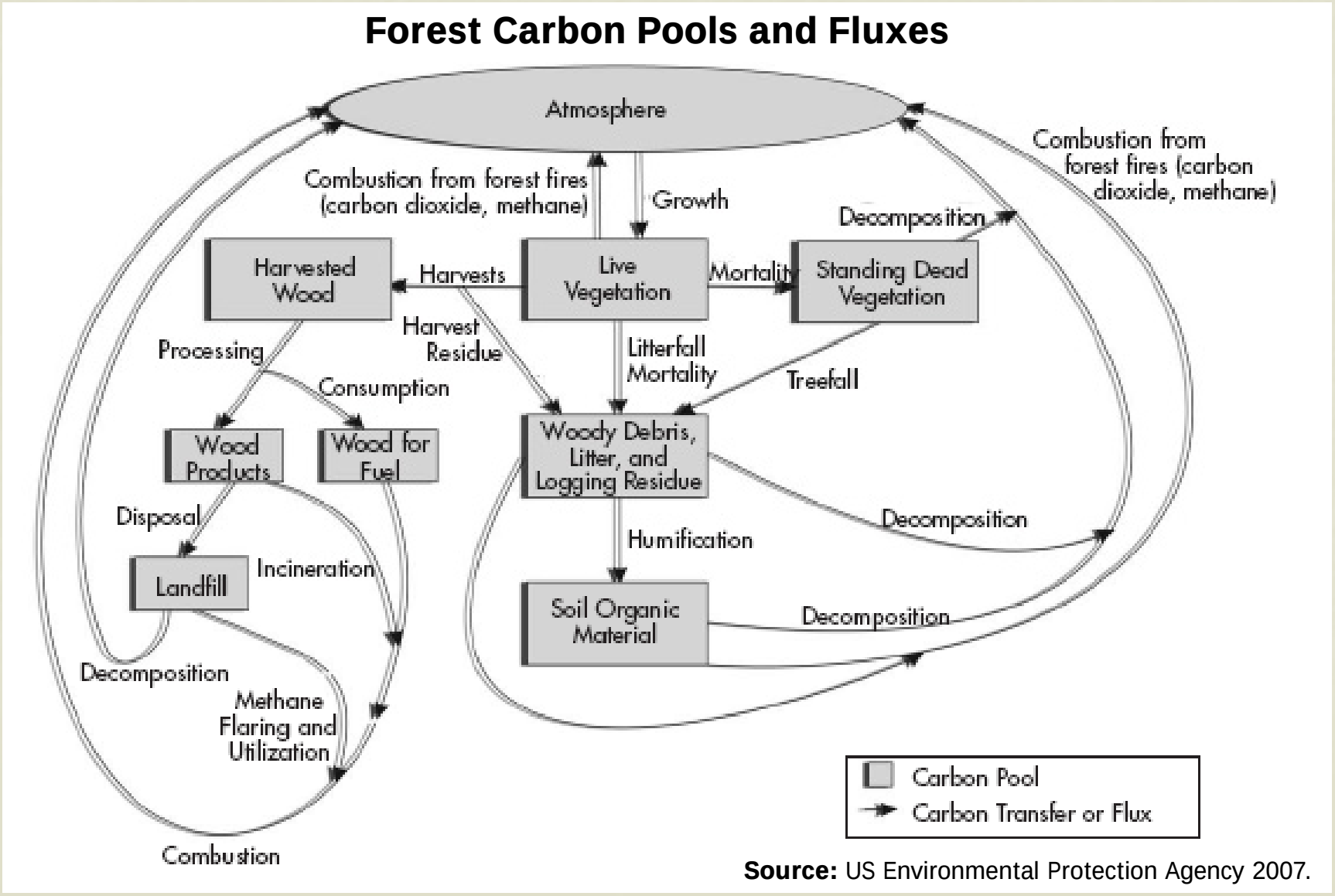
- De-emphasize vehicles on campus
- Balance vehicles, pedestrians, and bikes

Carbon Sequestration



Carbon Sequestration

ESF forest properties can *absorb* and *store* carbon



Source: US Environmental Protection Agency 2007.

Carbon Sequestration

But how do you sequester more carbon here?

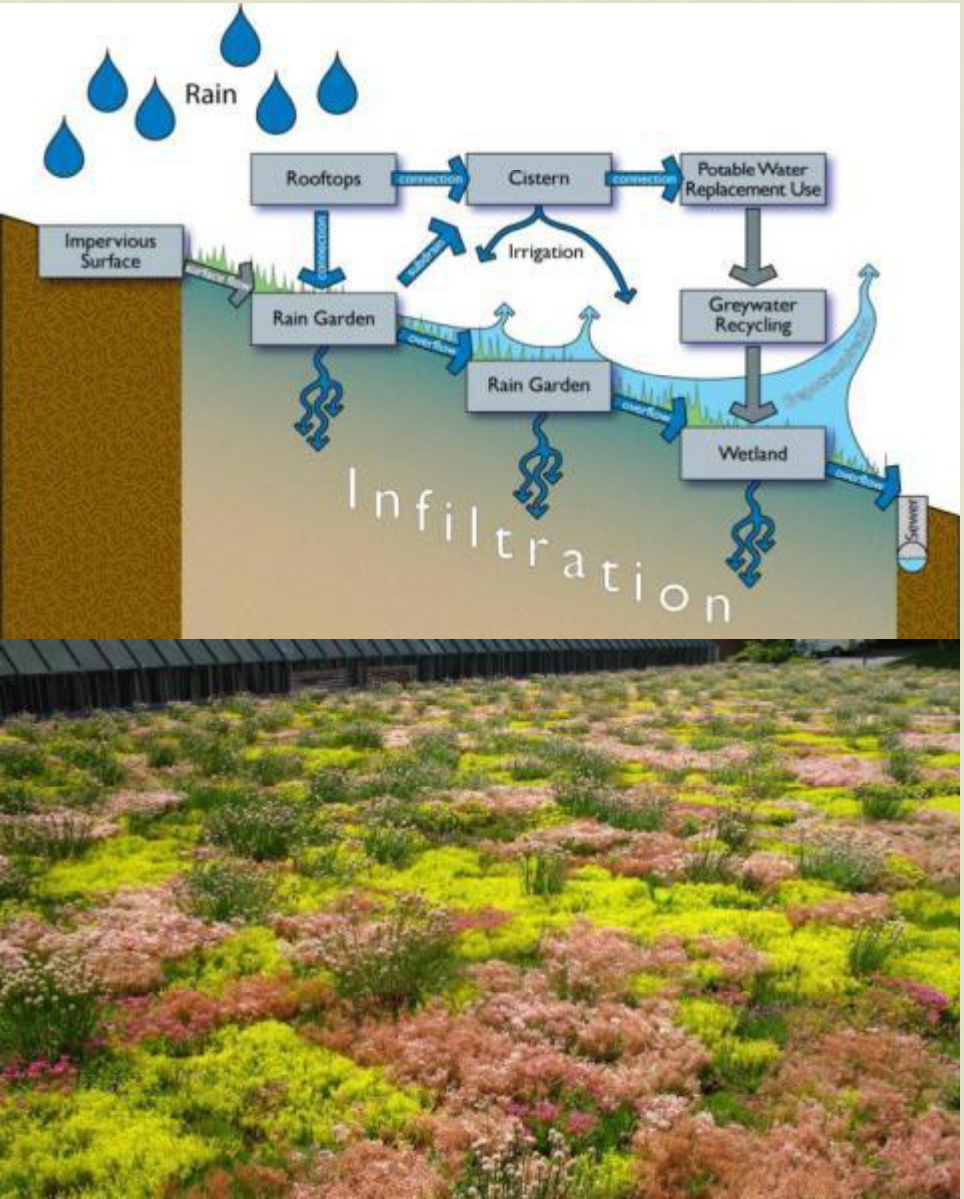
ESF

Sustaining the Green

Changing the Campus Grounds to Live What we Teach

Campus Grounds

Address Stormwater Runoff



- Potential Strategies
  - Convert existing buildings to green roofs where structurally feasible
  - Implement bioretention facilities
  - Implement water harvesting facilities (cisterns)
  - New buildings and major renovations to consider light/greywater recycling
  - Reduce pavement widths to minimize impervious surfaces
- Help city of Syracuse address its CSO issue
- Minimize reliance on traditional infrastructure

Water Management

Reduce Dependence on Municipal Water

- Reduced water use and waste water produced
- Strategies are under development

Skaneateles Lake

Aerial photo from Live Search Maps

Campus Grounds

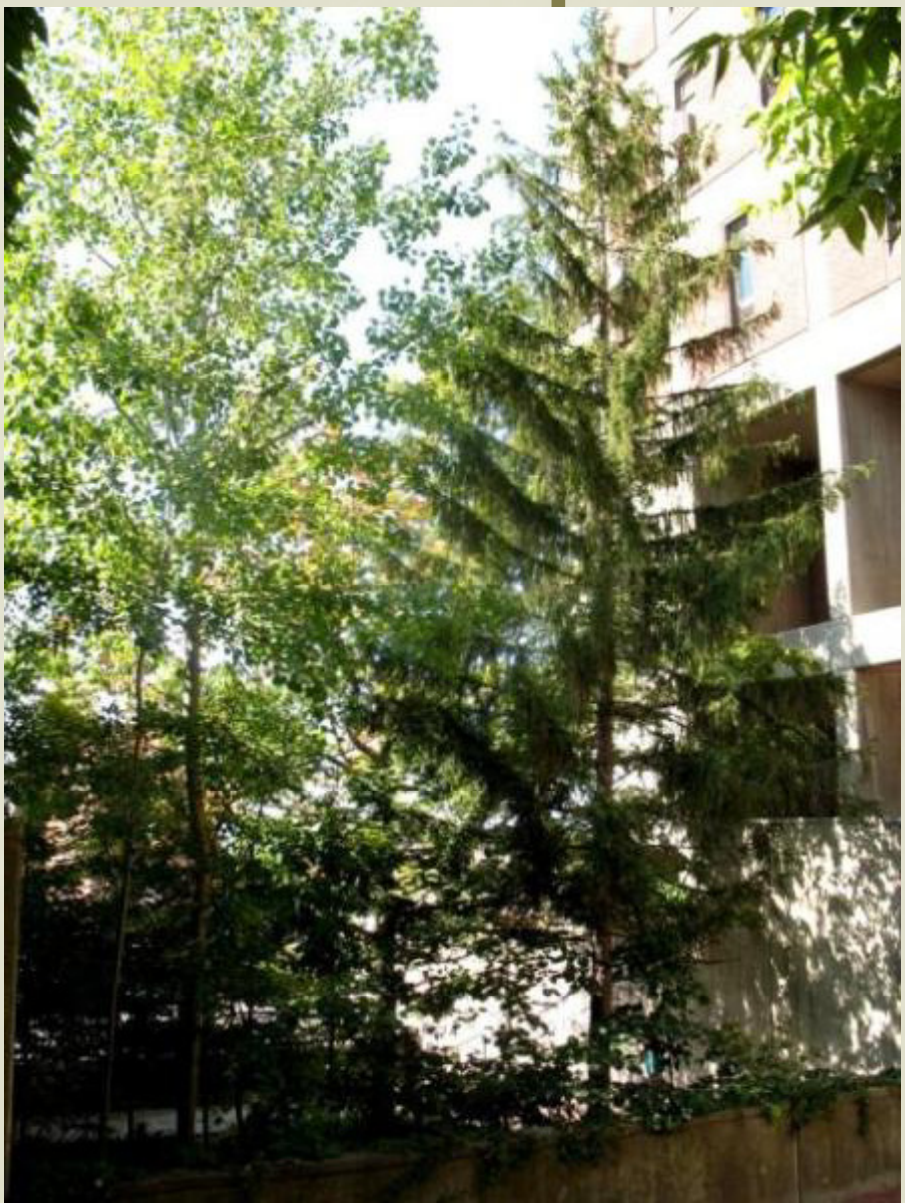
Reduce Turfgrass Areas by 2010

- Potential Strategies
  - Convert to native and non-aggressive exotic plantings
  - Implement other sustainable initiatives

- Reduce energy/maintenance costs by 10%
- Focus on steeply sloped areas and unused spaces

Campus Grounds

Green Campus Distinction



- Potential Strategies
  - Plantings, lots of plantings
  - Convert to native and non-aggressive exotic plantings
  - Remove invasive species
  - Convert turfgrass areas

- Reduce percentage of campus area dedicated to parking and other impervious surfaces
- Support teaching needs for all departments
- Create unique campus aesthetic identify
- Alleviate urban heat island
- Promote urban forestry

Campus Grounds

Create a Landscape That Teaches

Create willow demonstration plot by 2009

- Meet department teaching needs
- Provide research demonstration
- Reduce (not eliminate) bus and van fuel use for field trips
- Minimize turfgrass area
- Address stormwater and planting goals

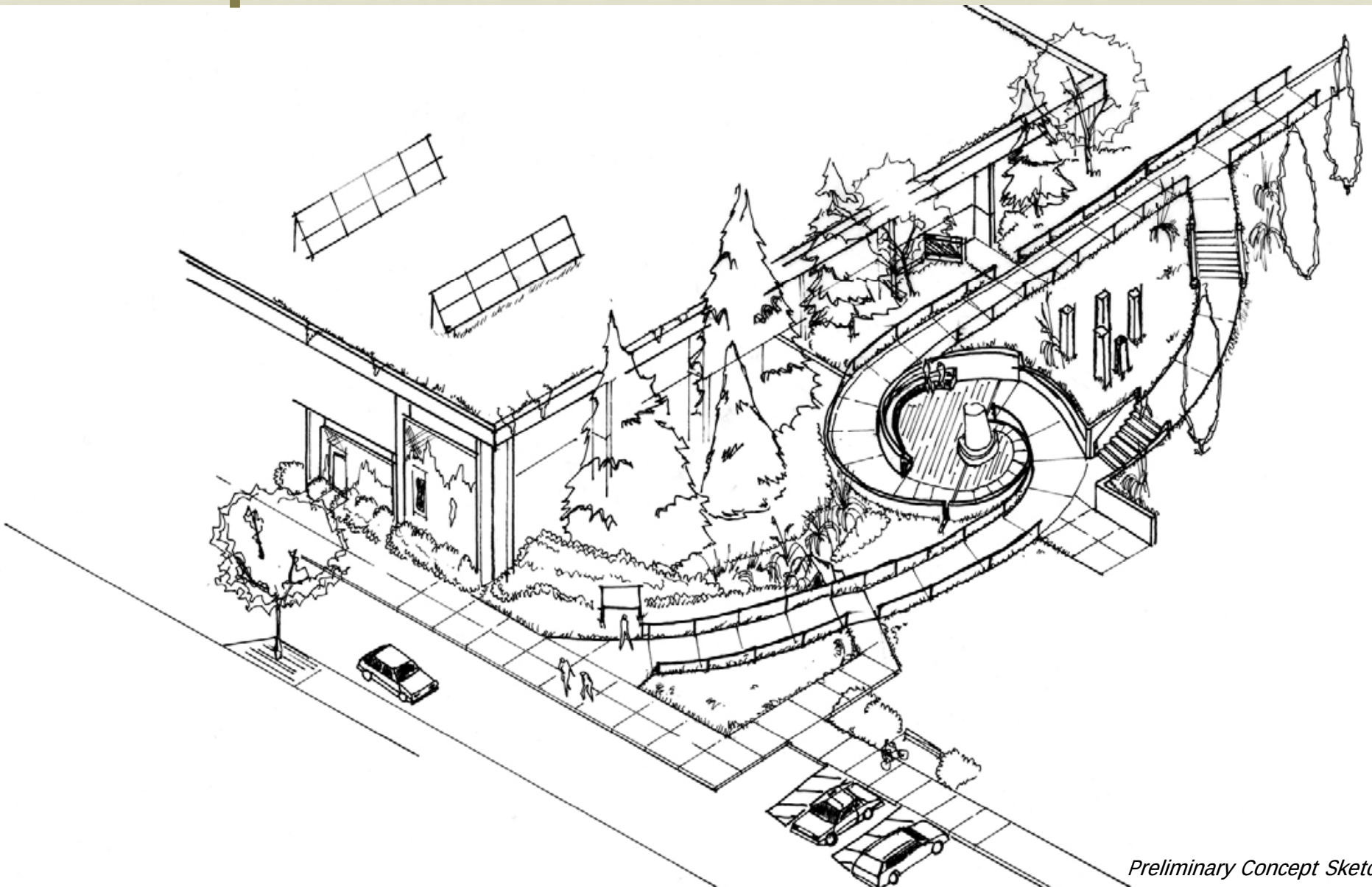
Improved Streetscapes

Balance all Modes of Transportation

Preliminary Concept Sketch

Improved Accessibility

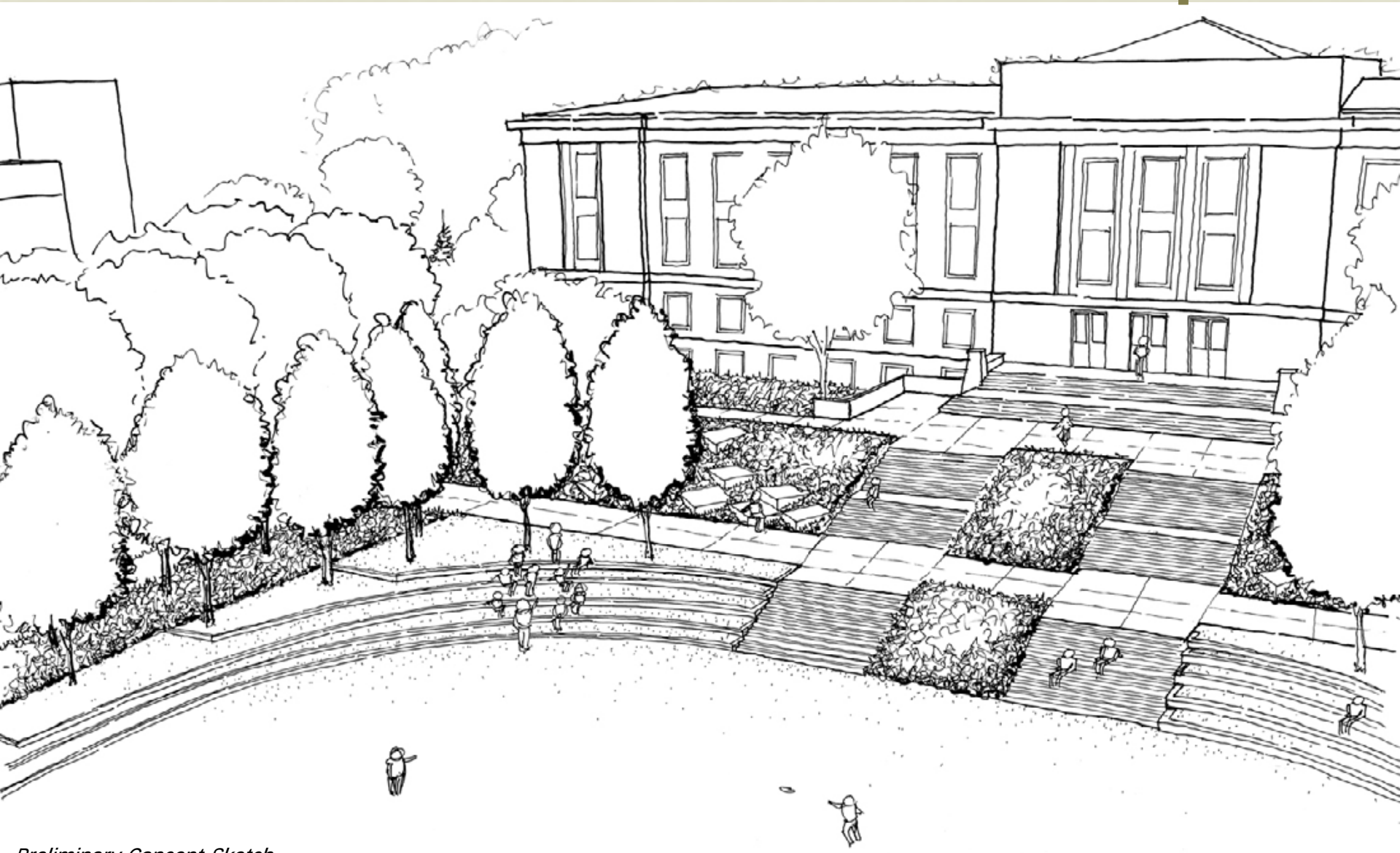
Campus-wide Pedestrian Circulation



Preliminary Concept Sketch

Campus Open Spaces

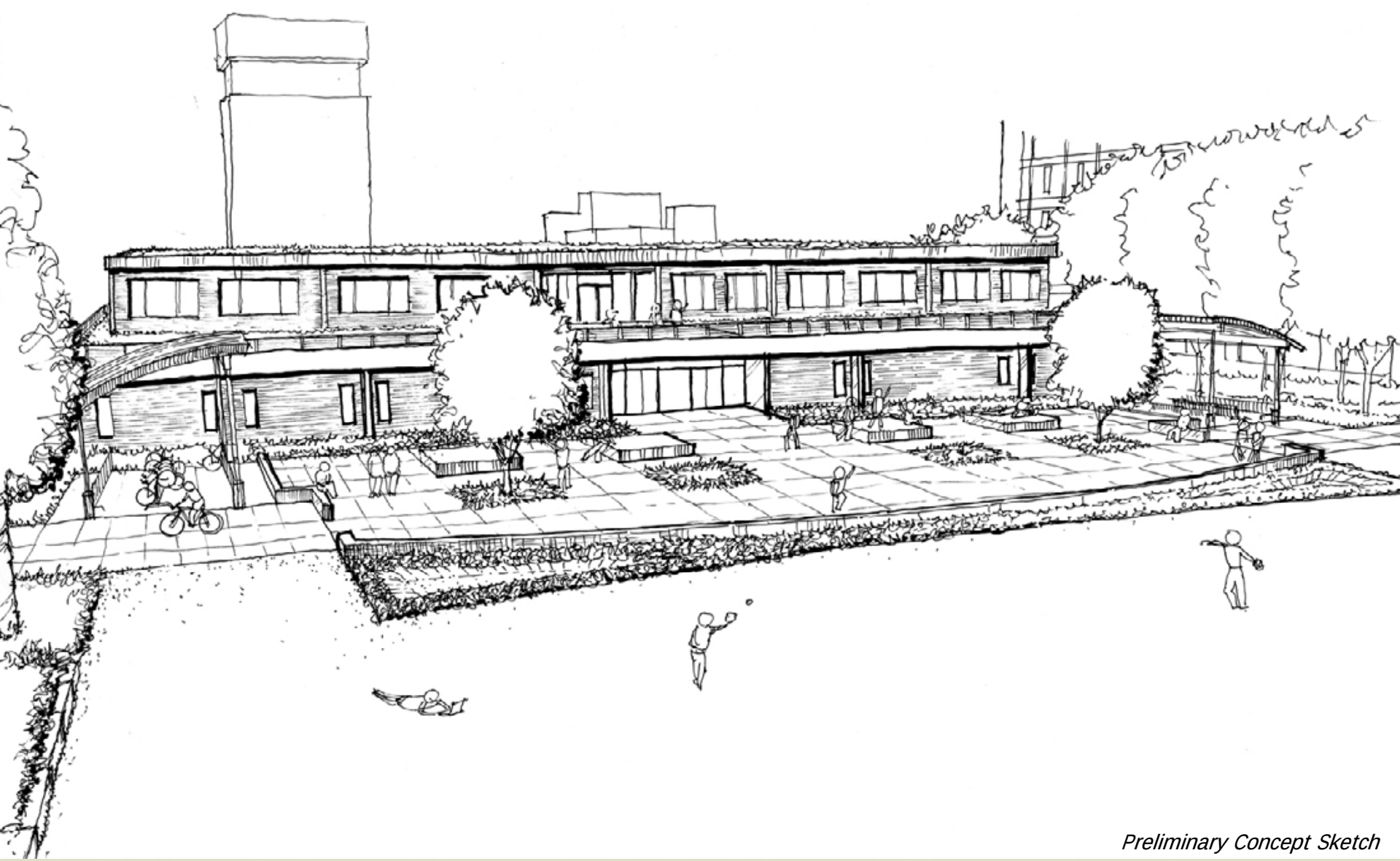
Provide Functional and Beautiful Spaces



Preliminary Concept Sketch

Campus Open Spaces

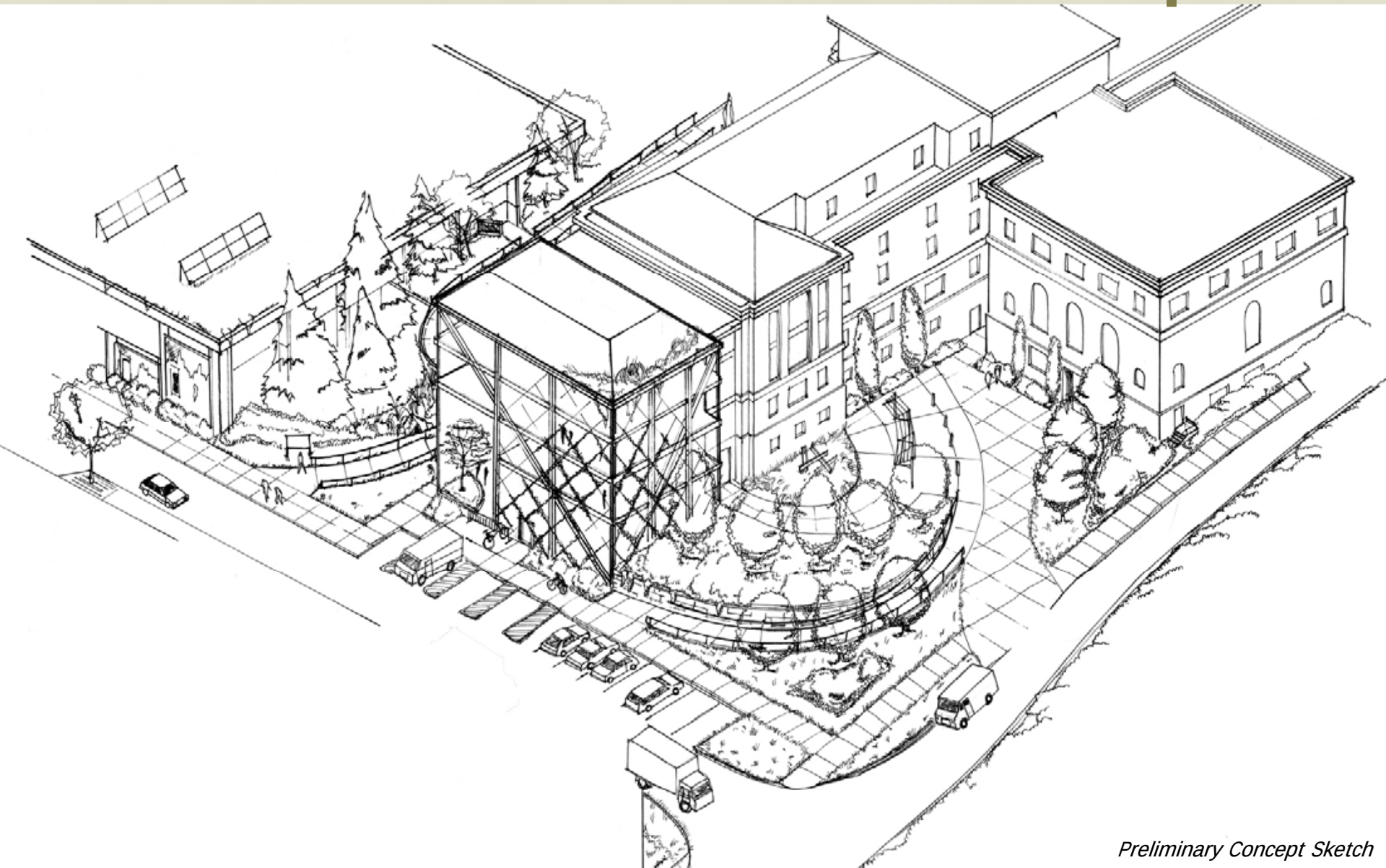
Provide Functional and Beautiful Spaces



Preliminary Concept Sketch

Campus Open Spaces

Provide Functional and Beautiful Spaces



Preliminary Concept Sketch

Campus Grounds

Change Maintenance Practices

- Preliminary Ideas
  - Reduce mown area
  - Use of litterfall as mulch
  - Reduce or eliminate pesticide use through IPM or organic maint. program
  - Utilize student service courses for plant bed maintenance
  - Reduce trips to off-campus storage by increasing on campus facilities
  - Convert to alternative fuel machines
  - Reduce snow removal to key areas only
  - Training to reduce/direct winter salt use
- Practices more in keeping with a college dedicated to the environment
- Minimize resource expenditures (labor and fuel)

Campus Operations

Food

- Potential Strategies
  - Buy local
  - Grow our own (Food in the Landscape)

Oberlin College Apple, Peach and Plum Orchard

- Minimize energy expended on food

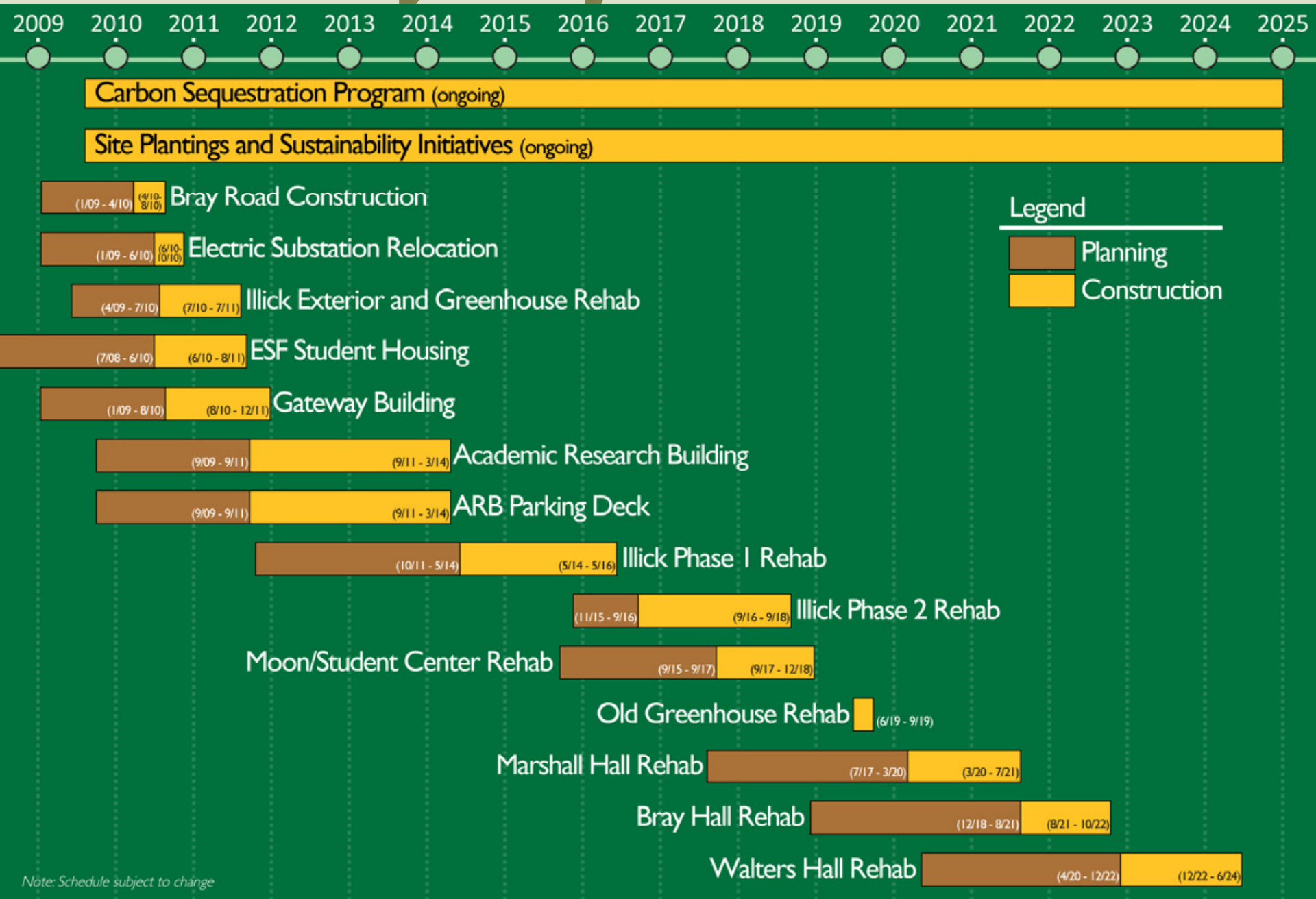
Campus Operations

Composting / Recycling

- Potential Strategies
  - Implement strategies to reduce consumption and waste
  - Expand paper recycling
  - Expand food waste composting

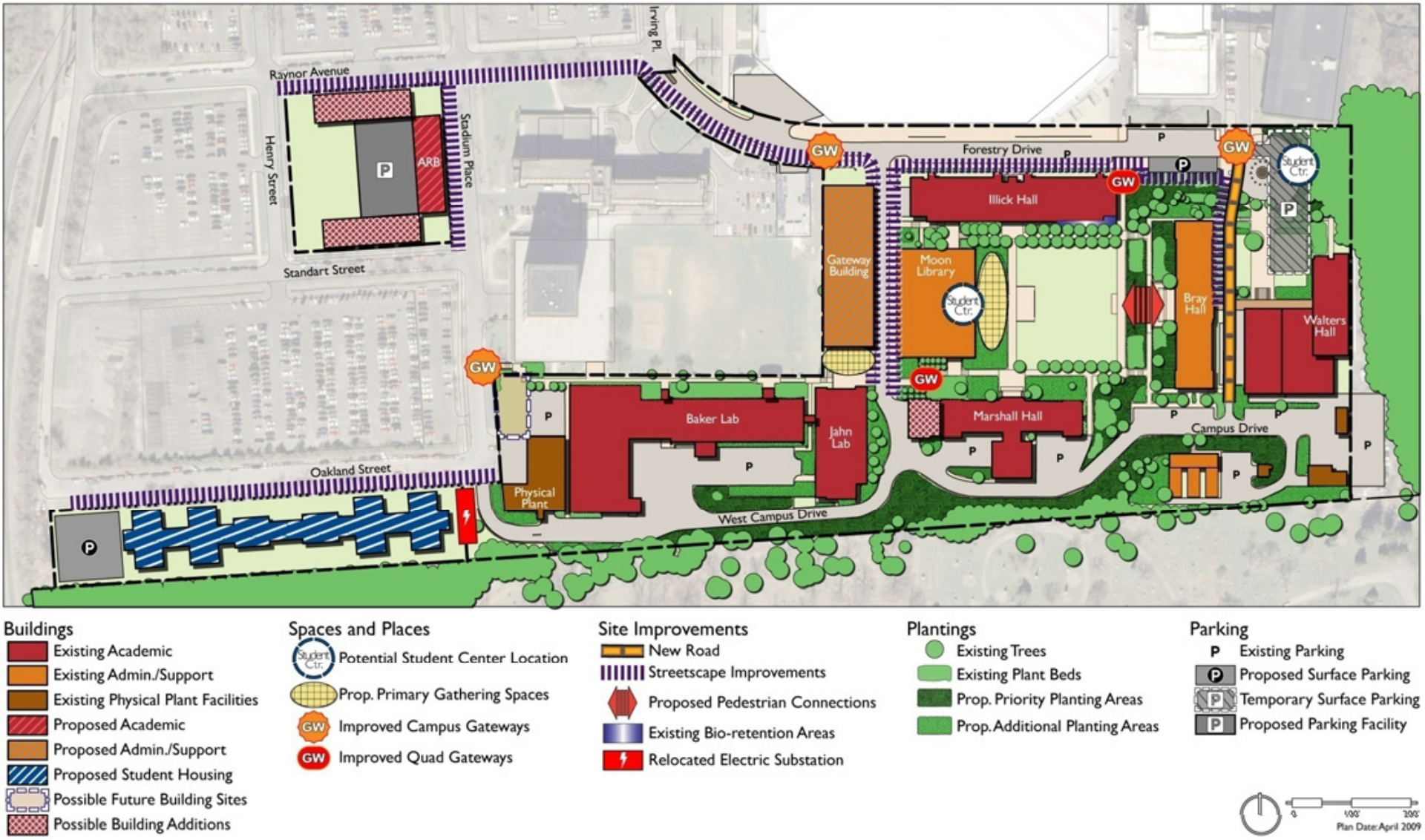
- Minimize the waste stream
- Facilitate soil nutrient replacement

Preliminary Project Timeline



Q/A

www.esf.edu/sustainability/



For grounds/open space comments: trtoland@esf.edu

For energy systems comments: mkellehe@esf.edu