

A photograph of a college campus. In the background, there is a large, multi-story stone building with many windows and a small tower on the right side. To the left of this building is a smaller, older stone church with a steep roof and arched windows. A large, leafy tree stands in the center of the image. In the foreground, there is a wide, green lawn and a paved path that leads towards the buildings. The sky is blue with some clouds.

HAVERFORD COLLEGE **CAMPUS** **MASTER PLAN**

Final Report

Venturi, Scott Brown and Associates, Inc.
January 29, 2009



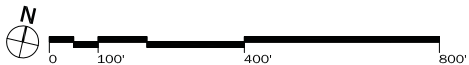
KEY

- HC Buildings
- Road
- Path
- Green Space
- Water
- Trees

SITE PLAN

HAVERFORD COLLEGE
Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.;
Information Source: Google Earth



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I. INTRODUCTION

I. INTRODUCTION

A. PURPOSE OF THE PLAN

“...[W]e’ll remain true to our legacy (and our promise) as we grow and adapt in ways that are informed by who and what we are, and value.”

-- College President Stephen Emerson, February 2008

“The master plan will serve as a living document and decision making tool, providing guidance for the development of the college well into the future. The plan will balance our ambitions for academic and institutional development with our commitment to sustaining the physical beauty of the campus and its buildings. The plan aims to be comprehensive, historically responsive and environmentally proactive and to take into consideration what Haverford College has been in the past, where it is today, and where it sees itself going in the next quarter of a century.”

-- from the Haverford College Master Plan Website

Over the last seven years, the College has completed the Koshland Integrated Natural Science Center and the Gardner Integrated Athletic Center, projects that have transformed aspects of College life and altered patterns of activity and circulation campus-wide. In April 2008, Haverford’s Board of Managers endorsed “A Blueprint for Haverford’s Future,” the Faculty Committee on Academic Enrichment (FCAE)’s recommendations.

It is within this context that the College has chosen to survey a broad picture, to understand this recently augmented campus as an integrated whole and to plan purposefully and strategically for future phases of development.

The plan should support the College’s goals to:

- Support excellence in teaching and research;
- Improve student campus life;
- Strengthen the arts;
- Update the College’s library and research profile.

The plan that follows is intended to be a flexible guide for Haverford’s future, a decision-making tool for now and the foreseeable future.

HAVERFORD COLLEGE STATEMENT OF PURPOSE

Haverford College is committed to providing a liberal arts education in the broadest sense. This education, based on a rich academic curriculum at its core, is distinguished by a commitment to excellence and a concern for individual growth. Haverford has chosen to remain small and to foster close student/faculty relationships to achieve these objectives.

The College’s rigorous academic program is flexible in form and content to meet the needs of individual students, and rests on the assumption that the able students who come here will use their capacities fully. Haverford’s faculty is noted for its strength in both scholarship and teaching, and its members expect to transmit to students their enthusiasm and high standards. The faculty members are teaching at an undergraduate college of arts and sciences by choice and they expect to learn, as well as to teach, in this close relationship with undergraduates.

The full resources of the College, in and out of the classroom, are designed to promote the personal and intellectual growth of students. Through an ambitious program of visiting lecturers and cultural activities, a conscious effort to recruit faculty and students representing diverse backgrounds and perspectives, student self-governance and service programs, an athletic program focused on participation and the scholar-athlete, and through day-to-day living in a residential community,

the College seeks to broaden and enrich each person’s development. Students are asked to give of themselves, even as they draw new strength from others. We seek to foster the pursuit of excellence and a sense of individual and collective responsibility throughout the entire environment.

Haverford strives to be a college in which integrity, honesty, and concern for others are dominant forces. The College does not have as many formal rules or as much formal supervision as most other colleges; rather it offers an opportunity for students to govern their affairs and conduct themselves with respect and concern for others. Each student is expected to adhere to the Honor Code as it is adopted each year by the Students’ Association.

Haverford College, while a non-sectarian institution, has Quaker origins which inform many aspects of the life of the College. They help to make Haverford the special college that it is, where the excellence of its academic program is deepened by its spiritual, moral, and ethical dimensions. These show most clearly in the close relationship among members of the campus community, in the emphasis on integrity, in the interaction of the individual and the community, and in the College’s concern for the uses to which its students put their expanding knowledge.

Fig. 1. Haverford College Statement of Purpose (Source: www.haverford.edu/catalog/purpose)

Faculty Committee on Academic Enrichment

The key elements of our blueprint for excellence are:

To build the sharpest, deepest, and most engaging disciplinary and interdisciplinary curricula.

To strengthen, expand, and model scholarly engagement through the identification of four new dynamic areas of learning:

- *Cross-Cultural and Area Studies*
- *Computational Social and Natural Sciences*
- *Arts, Visual Culture and Performance*
- *Environmental Studies*

To cultivate faculty-student collaboration, creativity, and scholarship at all stages of the Haverford experience through:

- Partnering faculty and students in innovative exploration and critical reflection.
- Improving the freshman and sophomore experience through deeper and more integrated and flexible curriculum.
- Enhancing cumulative skill building and expanding extra-curricular scholarship through symposia, summer research, and internships.
- Providing access to novel and contemporary methodologies that open new areas of learning.
- Adapting the curriculum to fit the needs of an increasingly diverse student body.

B. AREAS OF EMPHASIS

There are four major emphases in the plan:

- improved *student residential space* that includes better social space as well as needed beds;
- improved *student social, activities, and performance and visual arts space*;
- new facilities in *fine arts, music, theater*, exhibitions, collections, as well as digital *media* (film, photography, etc.) that serve to integrate the campus through a *distributed model of arts facilities*;
- improved and increased *classroom, research, and academic* departmental space around the Founders Green core. Office, research space and classrooms to accommodate up to 31 new faculty members are needed.

C. KEY CONCERNS

These specific programmatic concerns are related to broader development questions of access, linkage, growth and conservation, as well as need the College has for:

- Preserving and maintaining its heritage of historic buildings, while updating them to serve the needs of a constantly-evolving institution.
- Creating explicit, *intentional* models of academic life and community that reflect and reinforce the goals of the FCAE recommendations.
- Integrating the arts into everyday campus life.
- Preserving and maintaining a beloved landscape.
- Becoming a significantly more sustainable campus.
- Providing greater degrees of accessibility, especially to those with impaired mobility.
- Supporting community activities – at many different scales, from the scale of an individual department or residence hall floor to campus-wide.
- Meeting the space needs of the current student enrollment in the near term, while preserving flexibility for growth in the long term.

Fig. 2. Excerpt from “A Blueprint for Haverford’s Future,” the Faculty Committee on Academic Enrichment (FCAE)’s recommendations.

D. A FRAMEWORK FOR DEVELOPMENT

The plan describes an overall framework and options for development within that framework. Key aspects of the framework include:

- Preserving and enhancing the character of images central to Haverford’s physical identity – especially Founders Green, the experience of entering the campus along College Lane, and the distant views to the west.
- “Darning and mending” rather than large-scale change at the campus core, including both adaptive reuse of existing buildings and infill construction at key sites.
- Strengthening and extending pedestrian axes to and through the campus core – including a newly defined “College Walk” – to link to new uses outside the core.
- Reinvigorating Founders Green – the campus “forum” – by programming academic activities in existing buildings and new additions at the core.
- Planning for the long-term replacement of Haverford College Apartments (HCA) – but also improving the experience for students who will live there in the interim.
- Conservation of important campus landscapes, vegetation and waterways – including woods, meadows and specimen trees – for beauty and sustainability.

E. PRIMARY COMPONENTS: EARLY INCREMENTS

- ***One or two new residence halls***, to provide improved living and social space in existing dormitories and, potentially, to begin decanting students from HCA. Ideally this development would occur on Orchard Lot, and potentially include some student-centered activity spaces.
- ***Renovation and addition to the Whitehead Campus Center (WCC) to make the building more clearly a student-centered facility – and to dramatically improve the usefulness and appeal of the building.*** Mail service, food service, and bookstore facilities would be maintained. Student organizations, student exhibition space, practice rooms, other student-centered activities would be located in the WCC, creating a night-time hub that includes the Gardner Integrated Athletic Center (GIAC), the WCC and possibly other activity spaces in conjunction with dorms on the Orchard site. Options for the WCC, and for relocating selected uses now in the building, are considered in Section VI.B.3.
- ***A comfortable community space in Ryan Gym, incorporating campus-wide academic resources and social amenities.*** A Culture and Media Center at the Ryan Gym could be created, in conjunction with long terms plans for an enhanced library complex at the Magill Library or alternate site. An addition to Ryan would, like the enhanced WCC, aim for visual transparency and accessibility to students and faculty. It would aim to promote scholarship and teaching in the arts, social sciences and humanities, as well as informal exchange and public access. The Ryan Center for Culture and Media would ideally house the Arts and Humanities Center, Center for Peace and Global Citizenship (CPGC), the Multi-Cultural Center, a digital media center, a screening room, exhibition space, and café. The ***“campus living room”*** would include comfortable furniture, places to read newspapers and have conversations. This space would be for students, faculty and staff.

An alternative would be to include some of these components – including a campus community space – within the walls of the existing Ryan Gym in the near term, to be integrated into a new library complex at Ryan as funding permitted, freeing Magill for academic centers and visual arts collections.

“Test fits” of these alternate programs are included in Section VI.

- ***The renovation of Stokes to provide more academic space, including faculty offices and classrooms.*** Some faculty would be accommodated in Stokes, potentially to make room for Institutional Advancement (IA) expansion in place in the near term. (Long term planning envisions an Alumni/ IA House, freeing Founders for academic use.) Thoughts on this, and on the potential relocation of the Business Office, are described in Section VI.

- ***Arts spaces that support a distributed model of arts facilities.*** This would include fine arts studio space adjacent to existing Marshall Fine Arts, student performance and display spaces in the WCC, and – as funding permitted – a new theater or performing arts center at the southern end of College Walk. The Music Department, including a new recital hall, would be located around Marshall Auditorium or – possibly – integrated into the new performing arts complex. Curated exhibits and a screening room would be integrated into the Culture and Media Center in Ryan or, alternately, in Magill. Options are further described in Section VI.

- ***Additional Faculty housing*** units near the campus perimeter.

- ***Revitalization and improvement of existing classrooms, research and exhibition spaces, faculty/ department office spaces and improvements to existing residence halls.*** This includes upgrades to meet current life safety and accessibility codes and to meet current standards for energy efficiency and comfort.

- ***A new central plant to support existing and proposed facilities.*** A sustainability office could be included within the new building.

- ***As construction replaces existing parking, replacement parking needs to be constructed.*** Options are described in Section V.

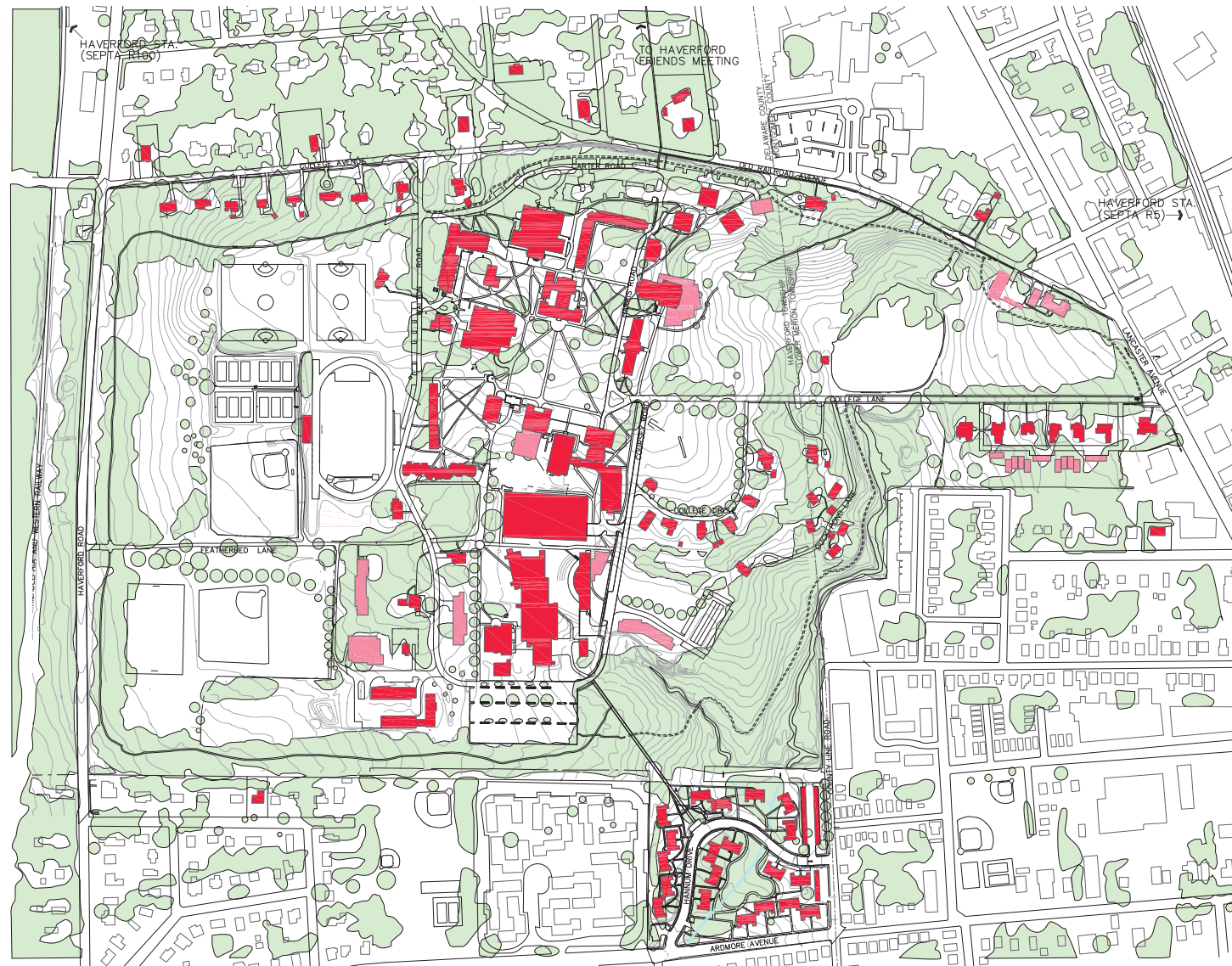


Fig. 3. Early Increment (one scenario)

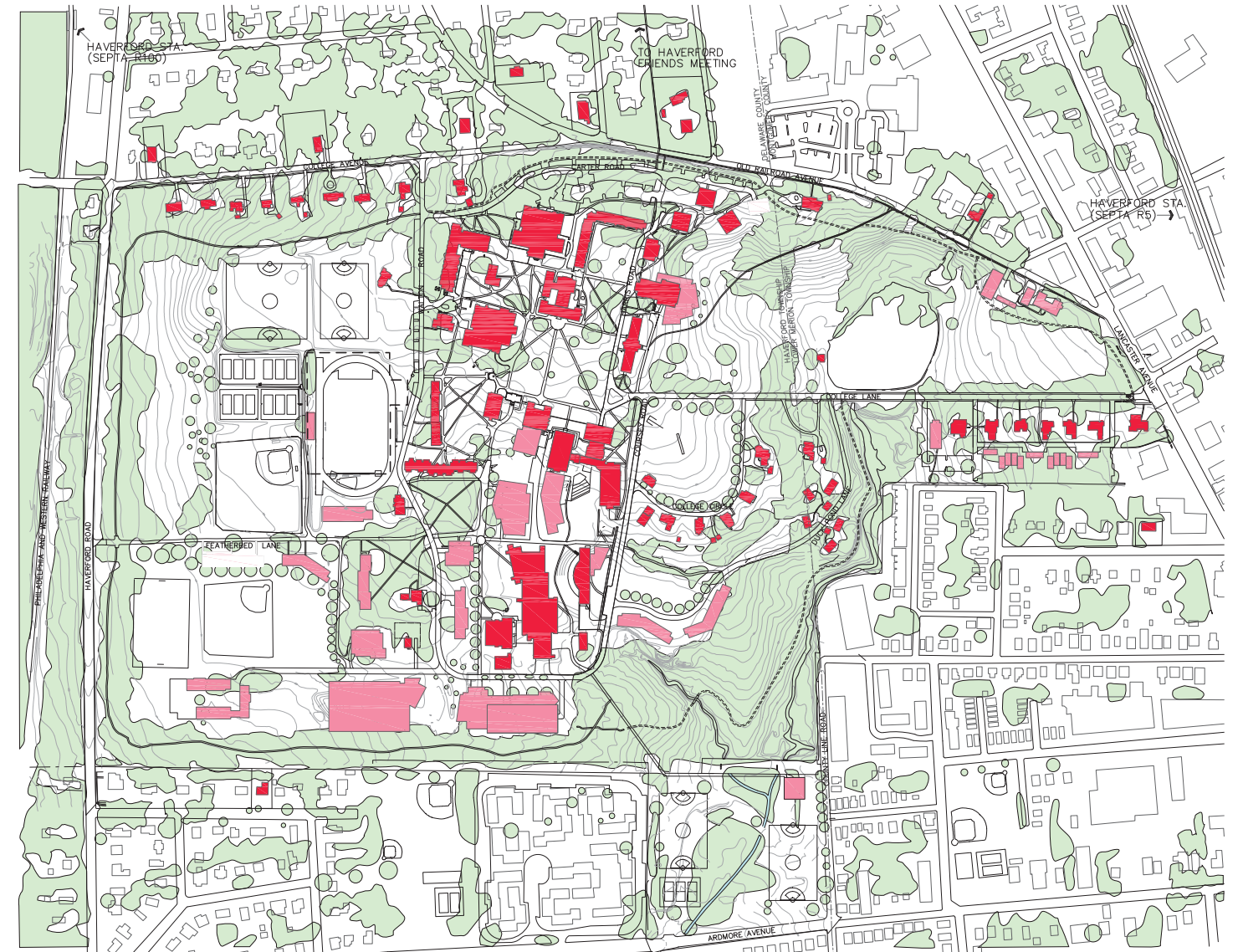


Fig. 4. Longer-term development potential

F. FUTURE INCREMENTS

Future increments include:

- Major renovation or replacement of **Magill Library**, to create a welcoming, navigable environment for 21st-century teaching, learning and scholarship. Several location options are considered in this report.
- **Relocation of the Field House**, to allow better connections and other uses at the geographic center of campus.
- Additional **athletics facilities**, including a natatorium and indoor tennis pavilion.
- Reconfiguring existing space, perhaps with a modest addition, in the **Dining Center** to relieve overcrowding.
- An **Alumni House**, including space for Institutional Advancement, to meet administrative needs and also to bring more academic functions to Founders Hall and other buildings at the campus core.
- **Relocation of students from the Haverford College Apartments**. The housing at HCA does not meet the College's vision of community life at Haverford, and there is a particularly strong sentiment that students should not be living at the perimeter. In the current economic climate, a major shift to additional housing at the core is unlikely

to happen quickly. One long term option for HCA would be to use the area as field space. In the near term, further upgrades/amenities at HCA should be planned.

- Given the importance of the landscape to the campus community and the College's desire to become a more sustainable campus, **structured parking solutions** that preserve the landscape by maintaining or increasing parking capacity without increasing the amount of land devoted to parking should be considered, in tandem with policies with the potential to reduce parking demand.

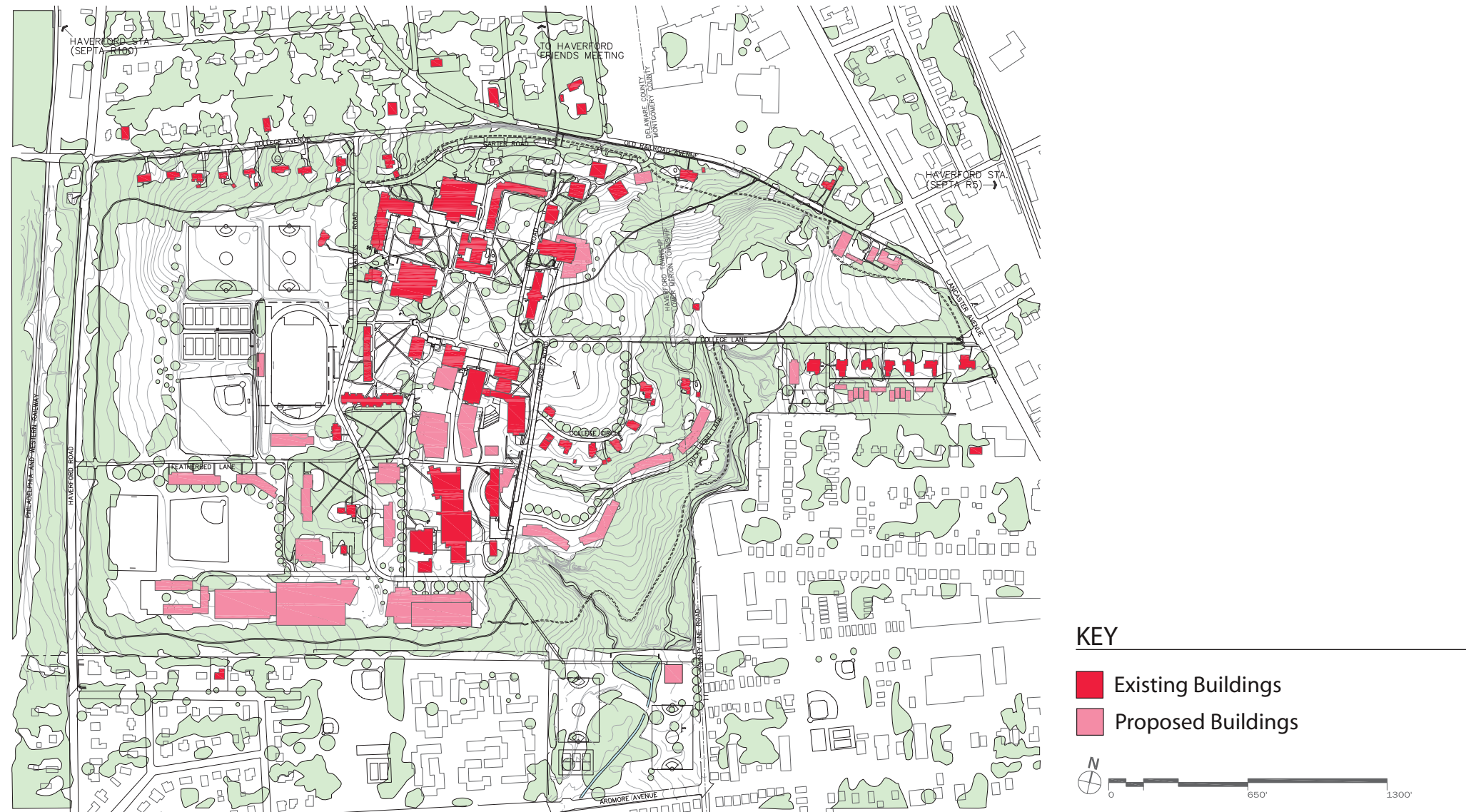


Fig. 5. Longer-term with enrollment growth

G. GROWTH

At present, the College has no plans to significantly increase student enrollment. The plan, however, should leave open the possibility of future growth of the student body to a maximum of 1600 students. Although the campus can physically support that degree of growth – and, indeed, many campuses support far more students on less land – it would require sacrifice of green space and fields or significant acquisition of additional non-residential property.

H. NEXT STEPS

Although we are nearing the end of the planning process, Haverford's work of implementing its vision is just beginning. This document provides a framework for the work ahead.

II. LEARNING FROM HAVERFORD: THE EXISTING CAMPUS

II. LEARNING FROM HAVERFORD: THE EXISTING CAMPUS

A. CAMPUS DEVELOPMENT

Since its beginnings, Haverford has grown from a community of a few dozen members to a College with 1169 students, about 135 faculty members and 380 other staff members.

1. A Brief History

The committee charged with finding a property on which to develop what was to become Haverford College, sought, *“in the first place, a healthy situation – not one which may be so occasionally, but which has acquired a long-established reputation for salubrity – and even the neighborhood free of malaria – may I add, both moral and physical; near enough to the city to admit of easy and daily access; and thirdly, that it must be in the immediate vicinity of a meeting for worship.”*¹

Such a place was found in the Rees Thomas farm in Haverford Township, *“a situation of endless charm and loveliness... possess[ing] in a high degree a simple, quiet, never failing beauty.”*¹

The Haverford campus has changed profoundly since the College’s 1833 inception, yet the most iconic view of the campus remains that of Founders’ Hall on its grassy slope, and the combination of native woods and carefully tended Romantic landscape is still held dear by faculty, staff, students and alumni. The image of Haverford is deeply rooted in this integration of buildings and landscape.

Contemporary views of the College over the course of its history – some perhaps idealized – help trace the history of campus development:

- The founders erected the institution’s first building on the high point of the site, facing south with a porch overlooking the sloping fields. Early images (Fig. 6) show Founders’ Hall against a backdrop of woods – left as a buffer to the surrounding neighborhood – with open lawn and rows of trees in the foreground. From the long porch, one looked south onto *“a farming country with numerous woodlands and orchards as left by the Welsh owners after 150 years of development.”*²

- Planting plan sketches (1834 or 1835, see Fig. 7) by English landscape gardener William Carvill describe the basic elements of the early campus: gardens and a greenhouse on the same orthogonal grid as Founders’ Hall, tree-lined lanes, and groups of trees. A serpentine path wound from a crossroads on axis with the entrance of Founders’ Hall

(roughly in the location of Ryan Gym) south to Featherbed Lane and the farm buildings – including Woodside Cottage – beyond. The sketch indicates the beginnings of present-day paths and lanes – including Harris Road, parallel to the short edge of Founders, and Walton Road, slightly askew. Oval drives at the south and east entrances to Founders’ accommodated turning carriages.

- As shown in an 1878 planting plan (Fig. 8), new buildings – Barclay Hall (Addison Hutton, 1877) and Alumni Hall (1856), the nucleus of the present library – were built on the same grid as Founders’ Hall. (The greenhouse had burned down in 1855.) An irregular path led west to the Observatory.
- Chase Hall (1888) and Whitall Hall (1896, now demolished) were built on the grid established by the earlier buildings; the construction of Ryan Gymnasium (1899) on axis with and facing Founders’ established the southern edge of Founders’ Green. This edge was later reinforced by the construction of the Hall Chemistry Lab (1910), Sharpless Science Hall (1917) and Hilles (1929).
- The first two sections of Lloyd Hall were built in 1899. Roberts Hall (1902) and the Haverford Union (1909) followed, aligned with Barclay. These buildings, with later sections of Lloyd (1913 and 1916), established a loose sort of quadrangle, interlocked with Founders’ Green.



Fig. 6. View of Founders Hall, c. 1835
(Source: Haverford College Archives)

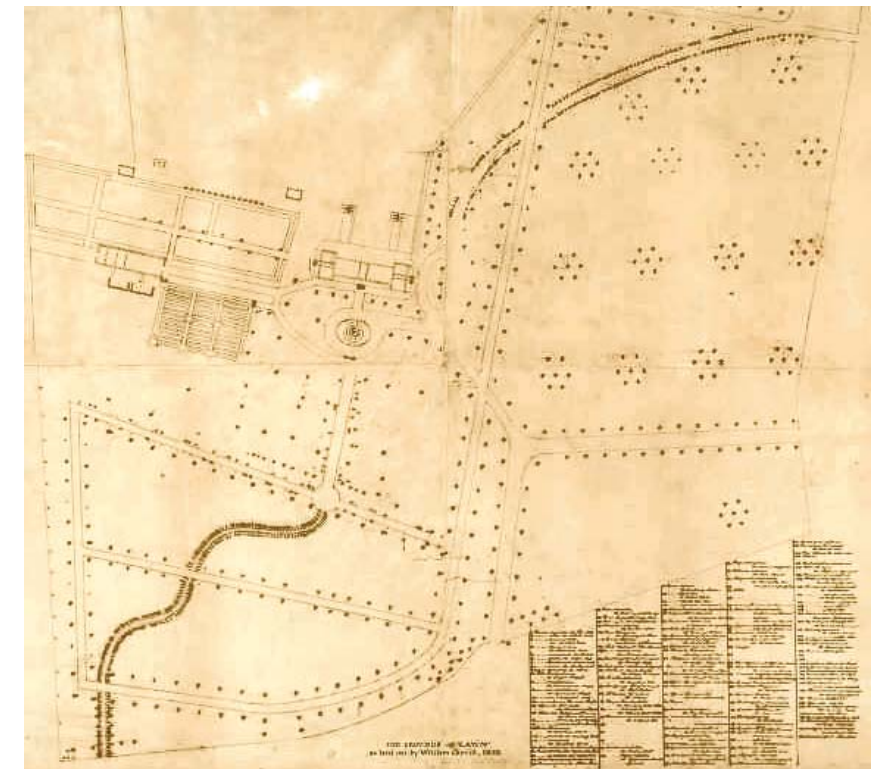


Fig. 7. William Carvill’s Planting Plan of Haverford School, c. 1834-5 (Source: Haverford College Archives)



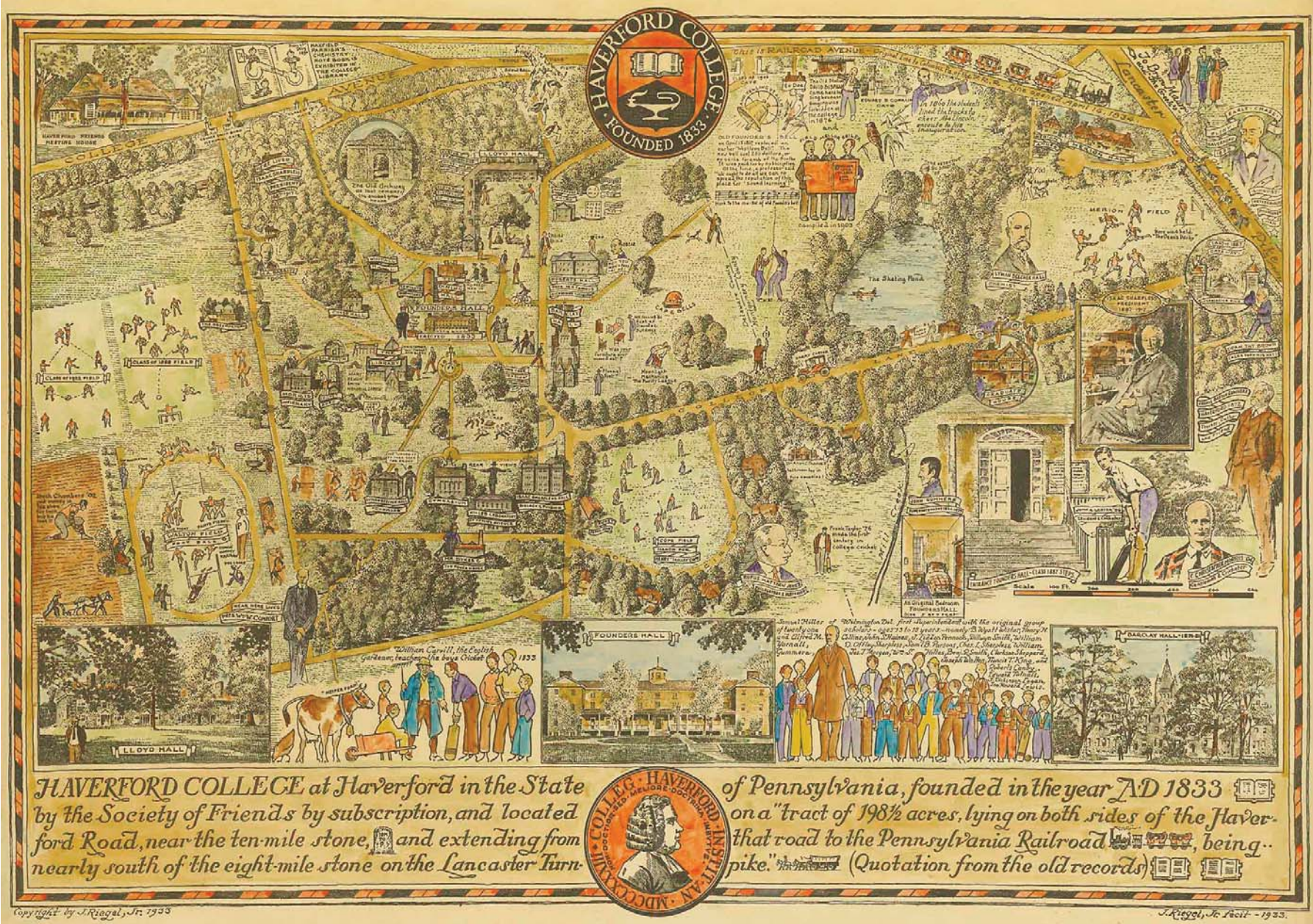
Fig. 8. Planting Plan of the Haverford Lawn, c. 1878
(Source: Haverford College Archives)

¹Rufus Jones, Haverford College: A History and an Interpretation, 1933.

²Isaac Sharpless, *The Story of a Small College*, 1918, p.35.

- Maps from 1900 show the construction of houses along College Avenue, College Lane and College Circle. *“The College now completed arrangements with professors as to dwelling houses. The large and well-planted grounds gave fine sites for such dwelling, which sites were supplied free of rent. The professor built his own house, the plan being approved by the Board, with an agreement that should he leave, the College would purchase his equity at a fair amount...”*³
- In 1903, the old Haverford Grammar School (Furness, Evans and Company, 1885) was converted into a dormitory, and given the name Merion Hall (now known simply as 8-10 Railroad).
- Illustrations of the campus from its centennial in 1933 (Fig. 9) show the gates from Lancaster Turnpike and from College Avenue, and the pedestrian bridge – labeled “the bridge of sighs” – over Railroad Avenue. Carvill’s serpentine path is shown, passing between Hall and Ryan Gym on its way between Woodside and Founders’ Green. By 1933, the playing fields had been developed and the Morris Infirmary (1912) had been constructed, but the area north of Founders’ and Lloyd remained largely wooded. Walton Road, straight and tree-lined, extended to College Avenue, connecting it with Featherbed Lane; an east-west path linked Cope Field with Walton Road and the track beyond. The Power Plant (1906) was located on the far (south) side of this path.

- An aerial photograph from the 1950s, taken from the south, shows the developing campus. The south facades of Hall, Ryan, Hilles and Sharpless faced the “back” of the campus; the Power Plant, now in the midst of the developed campus, was then near its southern edge. A finer, denser, more residential development pattern can be seen in the distance, beyond a buffer of trees and the neighboring Haverford School.
- A drawing of the campus in 1947 (Fig. 11) shows the tennis courts moved west of Walton Field to make way for the construction of Leeds and Gummere. (This drawing, though labeled a map, may be a projected plan; according to other sources, some of the buildings shown – though accurately depicted – had not yet been built.) The construction of Stokes (1963), Gummere (1960-1964) and Leeds (1952-1955) continued the process of developing loosely defined, interlocking greens, and made less direct the connection between campus greens and the playing fields to the west. The Field House and a large parking lot marked the southern edge of the campus core; like Gummere and Leeds, these were oriented to the same grid as Walton Road and the fields, slightly askew from buildings to the north. Some of the woods behind Founders’ Hall had been cleared for a parking lot.
- Aerial photographs from the late 1960s (see fig. 12) show many changes in both the campus and the surrounding area. Lancaster Avenue had become a coarse-grained commercial strip with large expanses of parking, and the surrounding residential neighborhoods (save for the parcel just west of



³ Isaac Sharpless, *The Story of a Small College*, 1918, p.143.

Fig. 9. Haverford College 1933 (Source: Haverford College Archives)



Fig. 10. Aerial view of Haverford College, 1940's (Source: Haverford College Archives)

the Haverford Park Apartments) had become more fully developed. On campus, two of the North Dorms were oriented to the Founders' Hall grid; Comfort was built askew, to accommodate topography. The houses on Duck Pond Lane were picturesquely sited in their sloping topography as well. A large parking lot behind Lloyd occupied the site of the current Dining Center.

- The acquisition of the Haverford Park Apartments in 1978 forestalled the construction of new dormitories, and added the first significant amount of (nearly) contiguous land to the campus in three quarters of a century. (Haverford College became fully co-educational in 1980.)
- Major buildings of the last two decades – the Marshall Fine Arts Center (1987), the Whitehead Campus Center (1993), the Facilities Buildings (1999), the new wing of the Koshland Integrated Natural Sciences Center (2001) and the Gardner Integrated Athletics Center (2005) – have been built on the Walton Road grid, although Walton Road itself has become curvilinear south of Leeds and diverted around Woodside Cottage.

2. *Haverford within the Community*

The maps on pages 12 and 13 illustrate the growth of Haverford College within its surrounding area. They show the subdivision over time of farms and estates to create a largely residential suburban community, with a commercial corridor along Lancaster Avenue.

This development was spurred on, in part, by easy access to the area. At the time of the College's founding, the Philadelphia and Lancaster Turnpike had been in operation for more than three decades, and a rail line ran directly north of the College, along what is now Railroad Avenue. Over time, a new rail line was established on the other side of Lancaster Pike, and the old line was abandoned. The Route 100 rail line (to Norristown and Philadelphia's 69th Street Terminal), along the western edge of College property, became operational around 1909.



Fig. 12. Aerial view of Haverford College, c. 1968 (Source: Haverford College Archives)

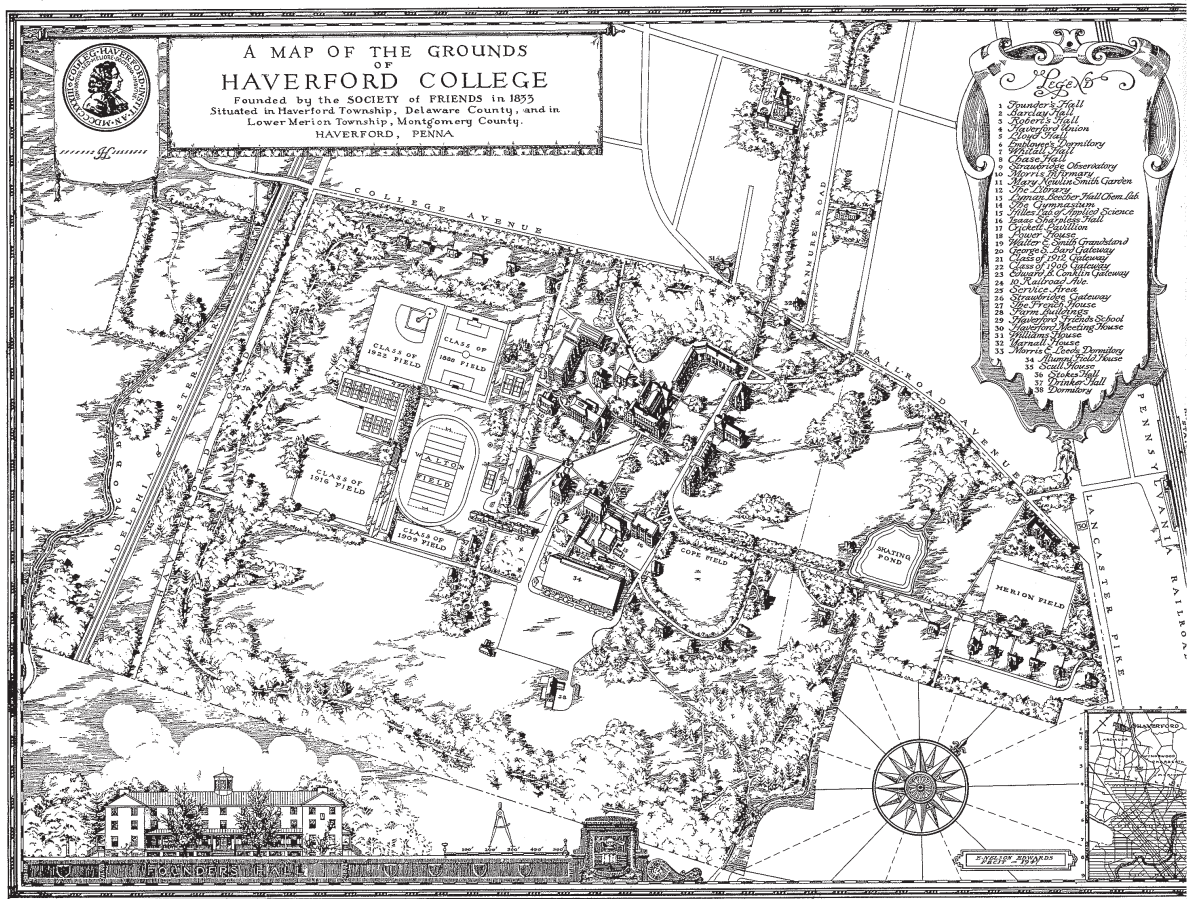


Fig. 11. Haverford College 1947 (Source: Haverford College Archives)

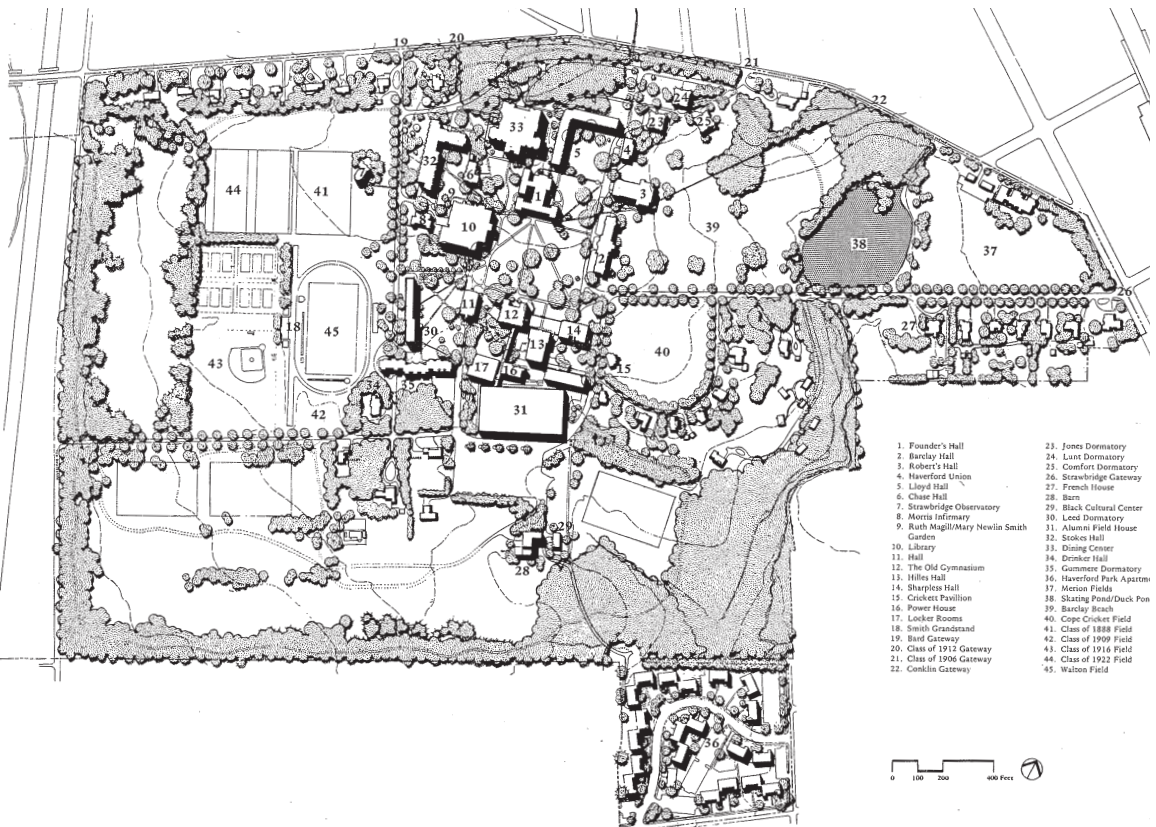
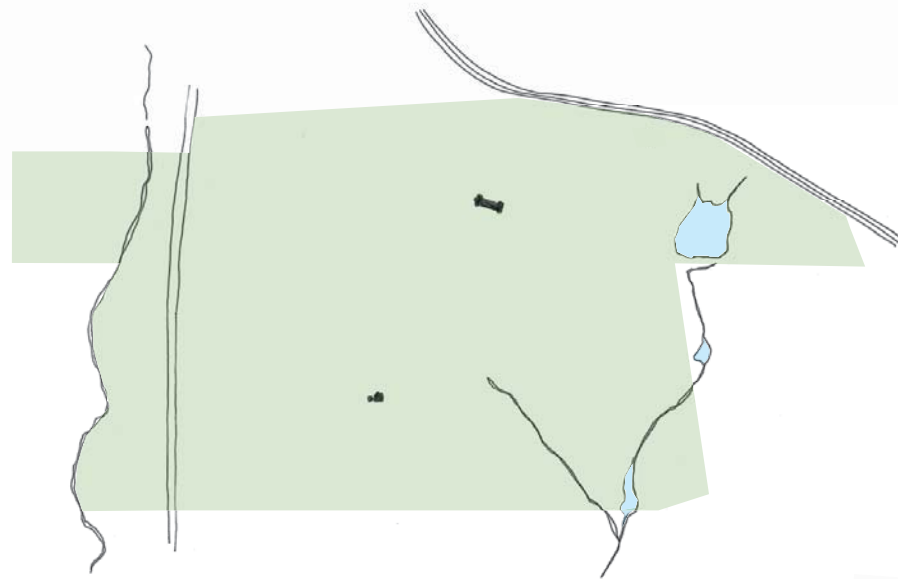
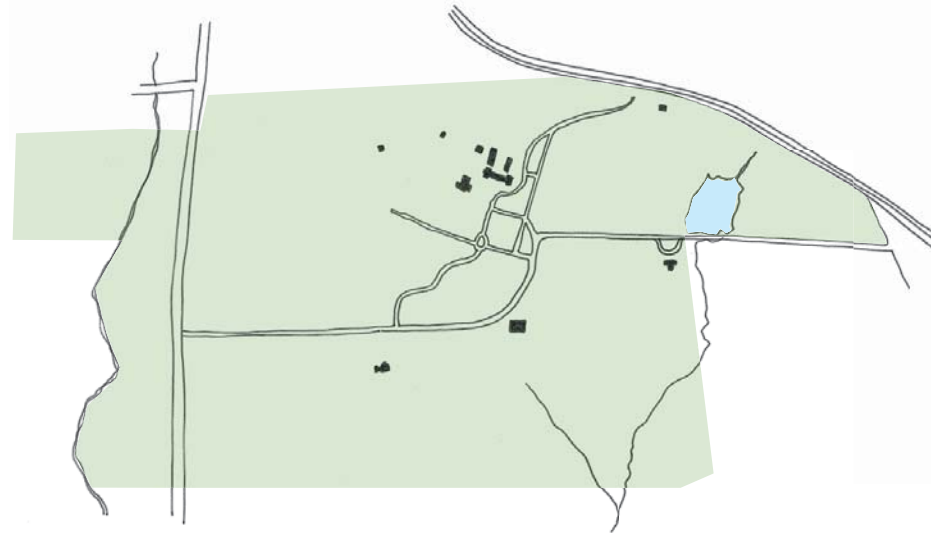


Fig. 13. Haverford College Landscape Plan, WRT, 1983



1833
21 Students



1870
51 Students



1881
68 Students

1830

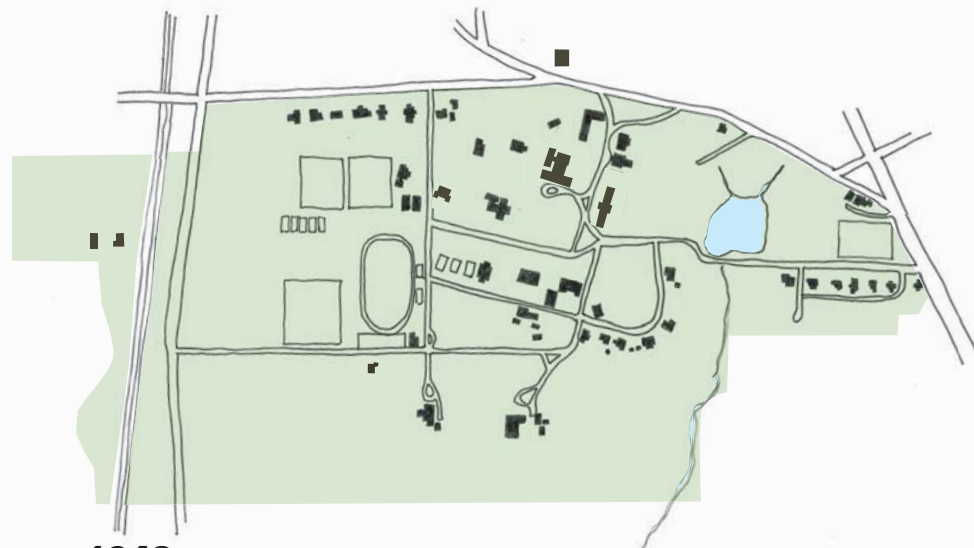
1830: Haverford School Association is formed
1831: A 198 1/2 acre farm site in Haverford is purchased.
1833: William Carvill is selected to design the first campus plan

1855

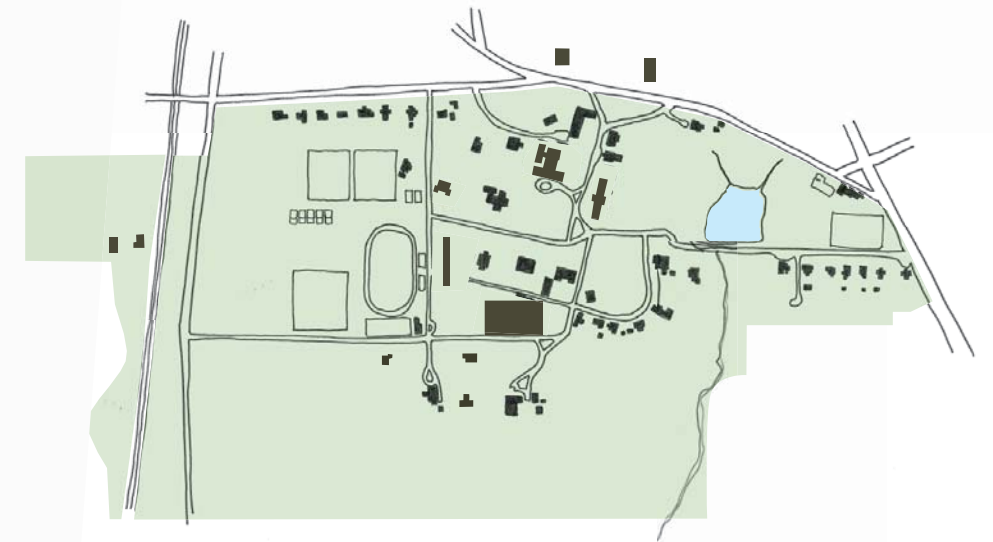
1845: College closes
1848: College reopens

1863: Alumni Hall completed (today's Magill Library)

1877: Barclay Hall completed



1948

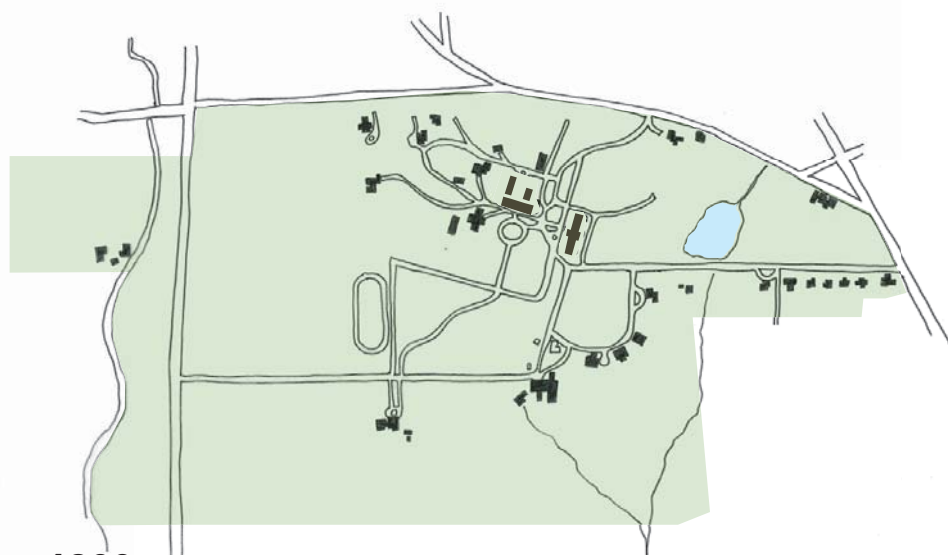


1961

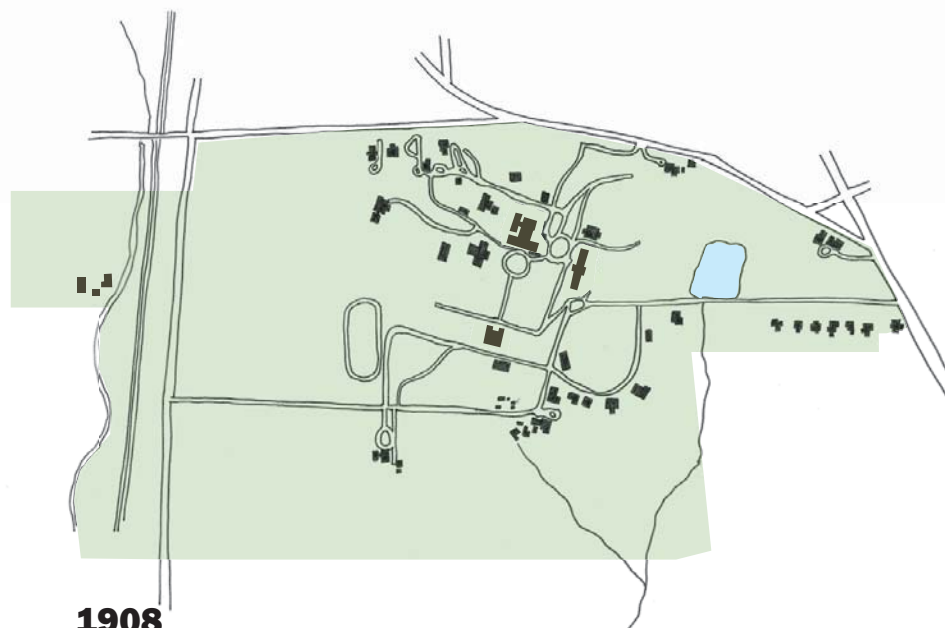
1930

1930: Duck Pond transformed from weedy pool into usable pond
1933: Work is begun on the Nature Trail

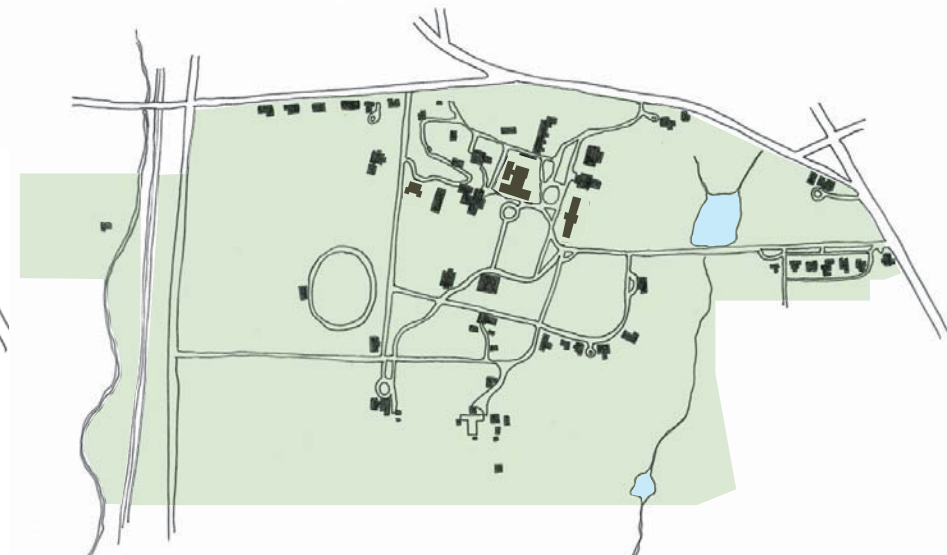
1950



1900
121 Students



1908
160 Students



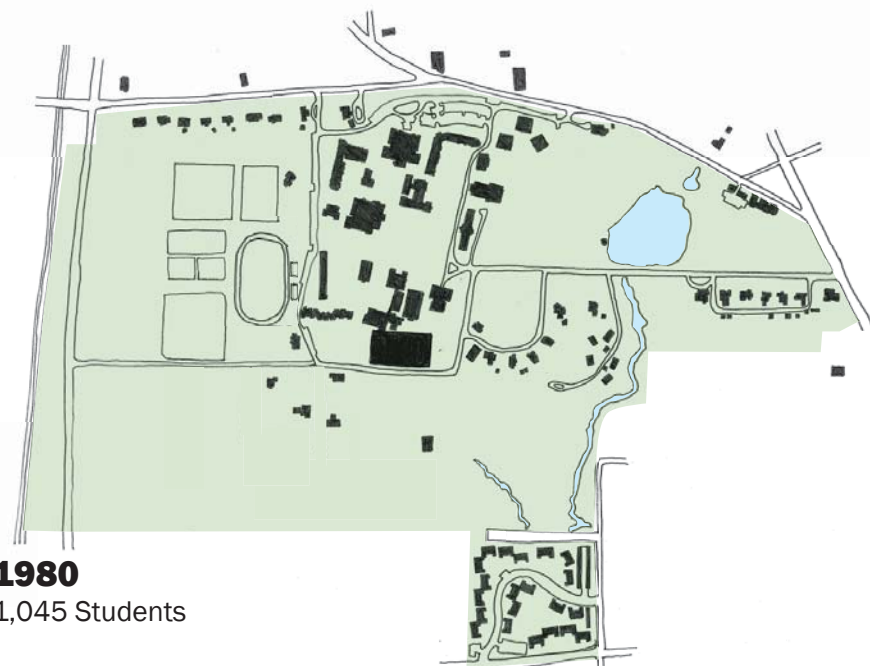
1926

1880

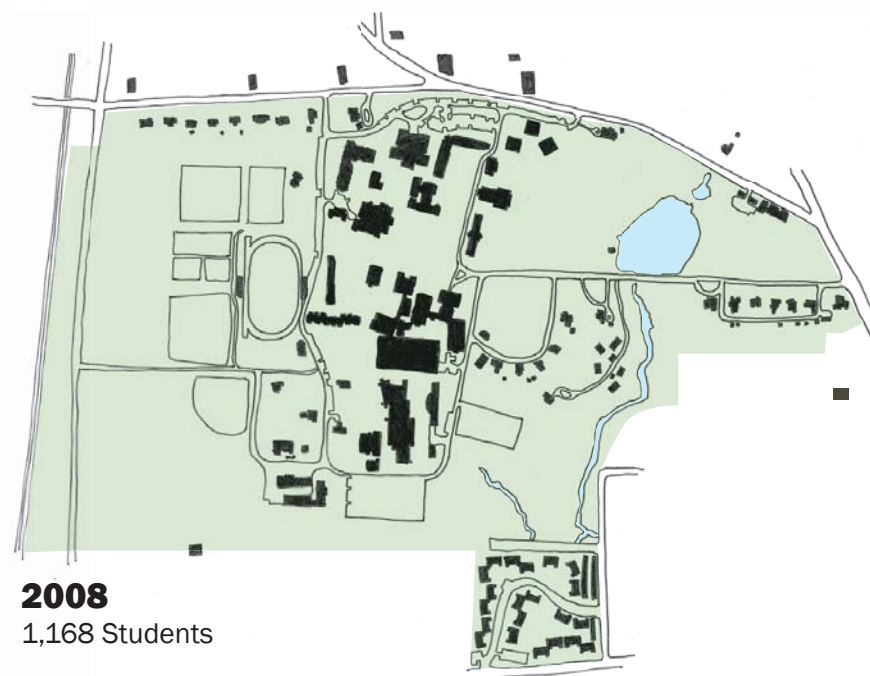
1888: Chase Hall completed

1905

1904: John S. Cope guides campus restoration



1980
1,045 Students



2008
1,168 Students

1970

1968: McGill Library expanded and renovated
1969: Dining Center opens

1990

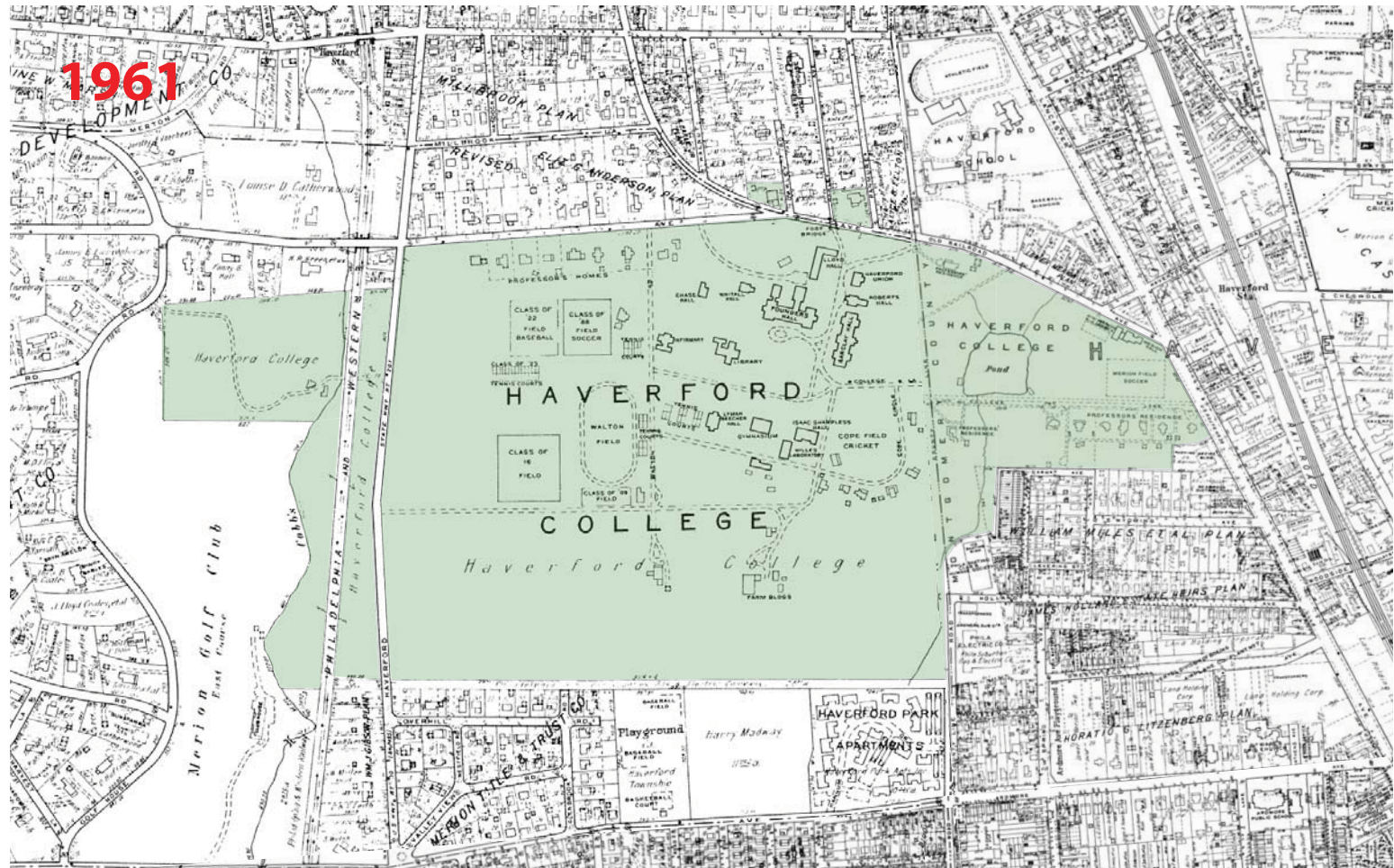
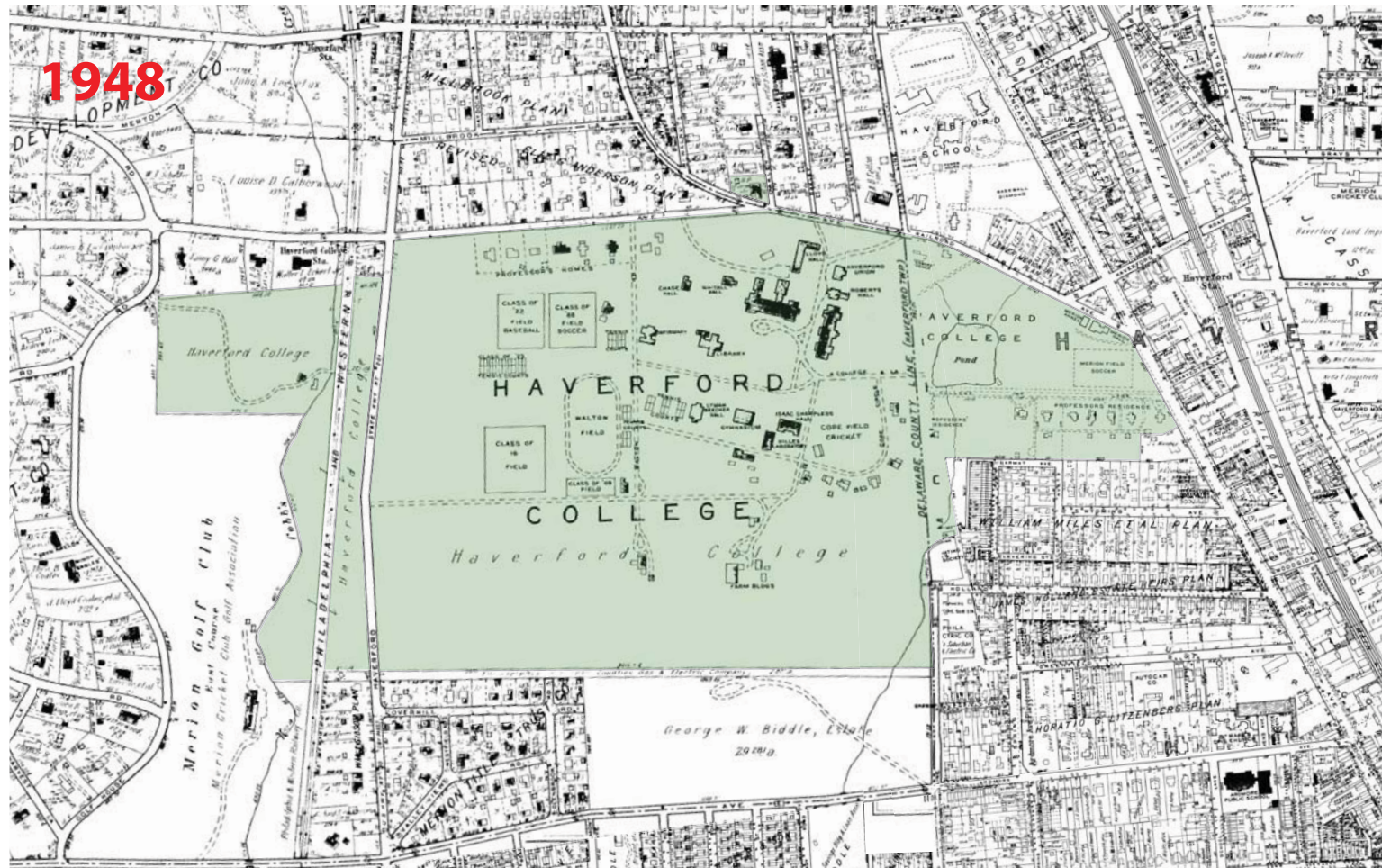
1980: The first co-educational class arrives at Haverford

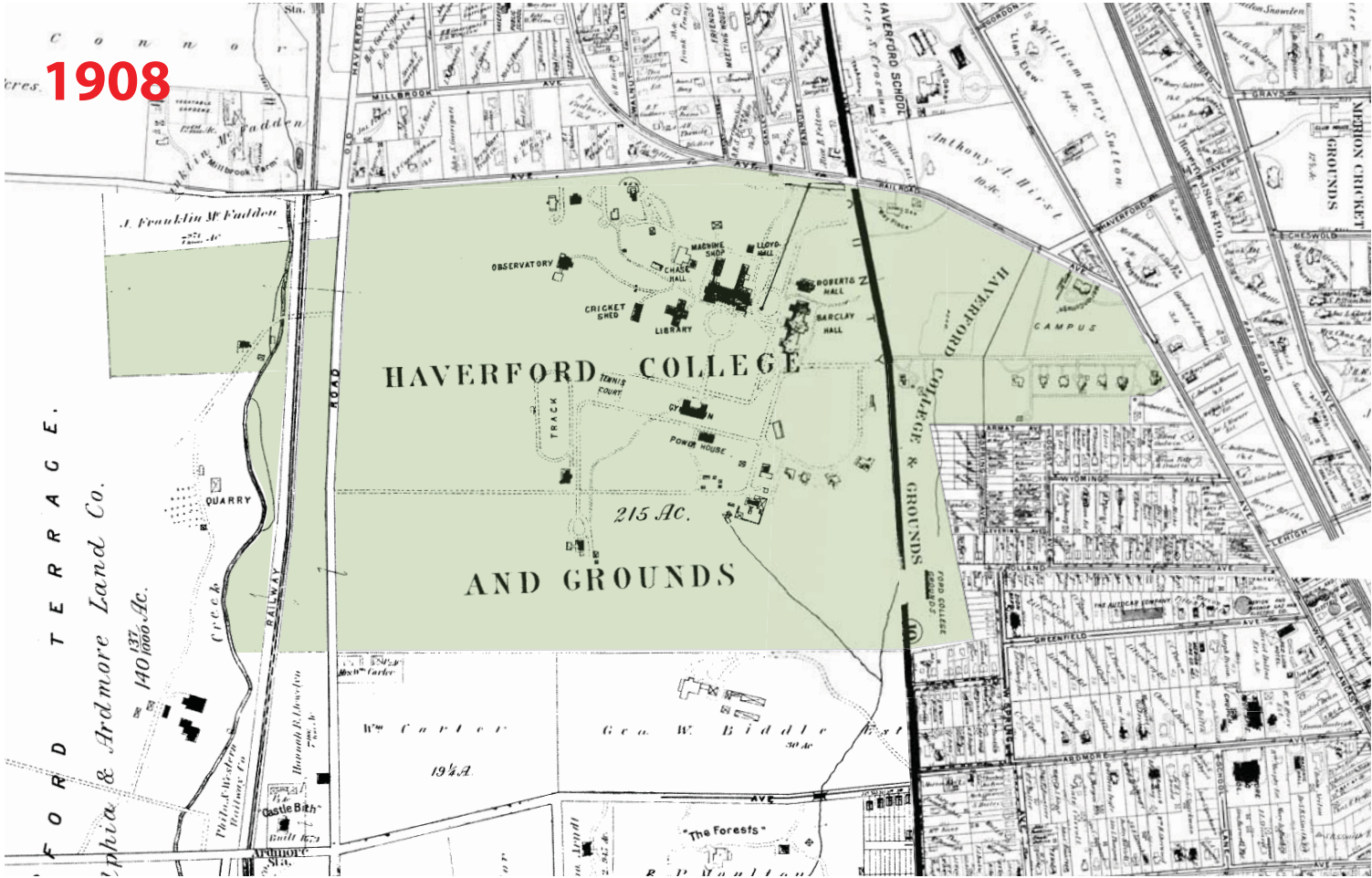
2005: Douglas B Gardner Integrated Athletic Center opens

CAMPUS DEVELOPMENT TIMELINE

HAVERFORD COLLEGE Campus Master Planning

Base Map Source:
Information Source: www.lmls.org; The Spirit and the Intel-
lect: Haverford College, 1833-1983;
Haverford College Facilities Mgt.





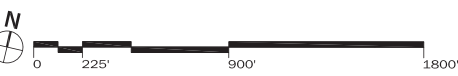
KEY

HC Campus

EVOLUTION OF HAVERFORD AND SURROUNDINGS

HAVERFORD COLLEGE Campus Master Planning

Base Map Source: <http://www.lmIs.org>; Google Earth
Information Source: <http://www.lmIs.org>; Google Earth



B. FIRST IMPRESSIONS

Since beginning our work on the project, we’ve learned the term “Haverbubble.” While no doubt this protected quality derives mostly from the sense of community and scholarship at the College, it is well-supported by the physical campus.

1. Campus approaches and entrances

The core of the campus is almost invisible from the surrounding streets and neighborhoods. Traveling west along Lancaster Avenue, one looks first not for the stone markers or signs (which are easily missed) but for the tops of trees along this commercial stretch of the avenue. To walk or drive down College Lane is an act of decompression, and the lane ends, significantly, not in a grand building but in the rich landscape of Founder’s Green. The asymmetry of the Lane – with beautiful large houses on one side of the tree-lined drive and open fields (and a duck pond!) on the other – saves it from self-importance and sets it apart from most other axial approaches on college campuses.

Upon reaching Founder’s Green, the robust Romantic landscape – with gently sloping topography, verdant lawn and important specimen trees – is complemented by loosely arranged quadrangles of buildings of diverse styles. Here, the domestic scale of the approach buildings gives way to a more institutional scale. Founders Hall – at the top of the hill and the “head” of the quad, albeit asymmetrically – modestly but firmly commands the Green. This Green *feels* – to a visitor, at least – like the center of all things Haverfordian. West of Walton Road, this landscape gives way to playing fields, and the Pinetum beyond.

Like the Lancaster Avenue entrance, the entrance from College Avenue is marked by simple stone gates. Walton Road has been extended beyond its original terminus at Woodside Cottage (and altered to accommodate construction of Gummere) to become part of a loop road around a pedestrian campus core. Passing between the playing fields and the campus core, the road offers views of the fields, the Pinetum and the treetops beyond to the west, and side or rear facades of buildings to the east. Walton feels more casual than College Lane, parallel to and more closely connected to fields than to buildings; it’s also rougher around the edges, lined with parking tucked between large trees.

Most parking is located outside the loop road, on the southern side of campus in large parking areas whose existence helps enable the campus’ lush landscape and pedestrian core. Also outside this loop is the Facilities complex. Unintended consequences of this band of service outside the core, however,

include marking the edge of campus with a sea of parking and increasing the perception of Haverford College Apartments, already an outlier to the campus, as “beyond the edge.”

2. Campus buildings

With faint praise, a 1911 architectural journal noted of Haverford’s campus, “Of all the buildings one can say that they do nothing to spoil the charm of the landscape, and this is high praise as such things go and still more as such things went,” offering modest praise only for Roberts and Lloyd. Founders Hall, the journalist notes, is “not at all noteworthy exteriorly.”⁴

Time has proven otherwise, of course, and the gentle authority of Founders Hall, its sturdy yet mellow materials, and its welcoming front porch are integral to the physical identity of the College. The journalist was right in one regard, however: their settings in the landscape are fundamental to the appeal of Haverford’s buildings. The gently sloping topography and loose arrangements of buildings allow wonderfully incomplete, picturesque views of campus structures and landscapes, and contribute to the Romantic qualities of the campus.

Other campus buildings defer, in their locations and orientations, to the gently imposing Founders Hall. Those in and near the core are a rich mix of textures and types. They include turn-of-the-20th-century domestic buildings, the chapel-like Magill Library, the Victorian Gothic Barclay, the Modern Dining Center and what one writer called “stripped’ Greek Revival” of Lloyd, Union, Roberts, Ryan and Sharpless.⁵ Hilles, designed by the distinguished Philadelphia firm Mellor and Meigs in what’s been called a “French Provincial” style,⁶ seems intriguingly out of place – grandly elegant, with leaded windows and a forecourt rather than the friendlier porches and democratic porticoes of other campus buildings.

The Field House, once near the edge of the developed campus and now near its geographic center, makes problematic the connections between Founders Green and newer development to the south – but at least from the Green it is mostly out of sight. (Can it be viewed, perhaps, as a placeholder for a future increment of growth of the sciences?)

Newer, larger buildings – the Koshland Integrated Natural Sciences Center, the Whitehead Campus Center and the Gardner Integrated Athletics Center – have been built to the south, within an expanded loop road. These buildings appear, in their configurations, to assume the future demolition of the Field House.



Fig. 14. Site characteristics

⁴Montgomery Schuyler, “The Architecture of American Colleges V,” from *The Architectural Record* (1911), p. 203.

⁵Nels Larson, “The Architecture of Haverford College,” from *The Spirit and the Intellect: Haverford College 1833-1983* (Gregory Kannerstein, ed.), 1983, p. 51.

⁶Ibid.

3. Orientation and Axes

Most Haverford College construction follows one of several organizing principles:

- related to the grid of the original Founders' Hall; most buildings at the “upper” campus core are organized this way.
- parallel or perpendicular to Walton Road; for example, the playing fields, the Field House, Gummere, Leeds, and the buildings toward the southern edge of campus.
- related to streets; for example, the houses along College Road, College Lane and College Circle.
- related to topography; for example, Comfort Hall and the Duck Pond Lane houses.

4. Campus Landscape

The campus landscape is a tended arboretum and encompasses – among many other elements – playing fields, academic greens, wooded areas, and a pond. It draws visitors of all ages to the campus to run, walk and play (and feed the ducks!) and contributes immeasurably to the quality of life of the Haverford community.

The photographs on this and the following page illustrate the variety of the Haverford landscape; its qualities and features are further described in the section that follows.



Fig. 15. Haverford buildings



Pinetum



Carvill Arch



Duck Pond



Arboretum



College Lane



Founders Green



Cope Field



College Circle Housing



Nature Trail



Japanese Garden



Barclay Beach

Fig. 16. Haverford landscapes

C. ONE INTERPRETATION OF THE PHYSICAL CAMPUS

Haverford's campus is analogous in some ways to a Roman town or a medieval city. Building facades with few or no active entrances – and little transparency at grade – form walls around much of the perimeter of the campus core. From outside these opaque walls, there are few signs of the life that exists within. A road around the core connects to paths extending outward, through more pastoral landscapes, to the campus extents.

HCA, acquired by the College in 1978, follows its own internal logic and is connected to the perimeter road by pathway.

1. Defining Elements

Defining elements of the Haverford's underlying structure include:

College Lane. College Lane, described in the previous section, is perhaps the most beautiful approach to a college campus in the country.

Founders' Green. If Haverford's campus were a Roman town, Founders Green would be its Forum. If the campus were a medieval city, Founders Green would be its marketplace.

Views to the West. The open, seemingly limitless view to the west from Walton Road is an important aspect of Haverford's campus – a counterpoint to the containment of the campus core.

"Not-quite-quadrangles." Within the core, buildings loosely define a series of open spaces.

2. Development

The idea of the Haverford campus as a series of loosely defined quads is a (relatively) recent one. Founders Hall was built at the crest of a hill, an object in the landscape; later buildings began to give shape to the Green. A road across Founders Green existed until sometime between 1961 and 1980. Up until the 1960s, most buildings beyond Founders Green and Lloyd Green were buildings *in* the landscape – rather than buildings that defined landscaped spaces. (Morris, Ira DeA. Reid, and the Observatory are examples of these earlier buildings that now sit "outside the walls" of the campus core. Chase – once a building set within an open landscape – became a building set within a quadrangle.) Away from the center, others – the houses along College Lane and College Circle – were positioned along paths at edges of large open spaces.

As the academic uses developed beyond Founders Green, additional green spaces were (loosely) defined by new buildings. The "backs" of these new buildings – the sides facing away from Founders Hall – became, perhaps inadvertently, a wall around the campus core. These buildings include Leeds (1955), Stokes (1963), and the Dining Center (1969). The construction of Marshall Fine Arts (1987), the Whitehead Campus Center (whose original main entrance faced west, 1993), the Koshland Integrated Natural Sciences Center (2001) and the Gardner Integrated Athletic Center (2005) continued this pattern southward. Only the southwest corner of the campus core remains apart from this pattern of development.

Later chapters of this report consider extending paths beyond the campus core, and ways of making campus buildings feel more open and welcoming.



Fig. 17. Roman town: Timgad, Algeria
(Source: Google Earth Image)



Fig. 18. Medieval City: Klatovy, Czech Republic
(Source: Google Earth Image)



Fig. 19. Haverford's campus (existing)

D. LANDSCAPE AND NATURAL SYSTEMS

Andropogon Associates

The natural environment – the woods, the pond, the creek, the pastoral sweeping fields with scattered groves of trees is one of the main stays of the sense of place for Haverford’s campus. Understanding how these elements come together to create the setting for the campus is critical to making informed decisions about how to appropriately integrate new development into the campus landscape.

1. *Geology*

- The campus lies on the Wissahickon Formation, a complex of metamorphic schist, gneiss and quartzite. This is a stable bedrock, generally well suited for foundations.
- Bedrock excavation is moderately difficult and will likely add to construction costs where building design intersects shallow bedrock.
- Groundwater flows readily through fissures in the bedrock, and well yields are typically high, so springs and seeps are likely in low-lying areas and slopes.

2. *Hydrology (see page 19)*

- The campus sits in the headwaters of the Cobbs Creek watershed. The campus, through its land-use and land-management decisions, helps set the stage for the health and quality of the creek downstream. In this respect, the College is not an oasis but an influential part of the regional hydrological system.
- Cobbs Creek is classified as an impaired stream: a stream which does not presently fulfill its potential for supporting aquatic life or providing for public use.
- Current issues of concern in the Cobbs Creek watershed include: high variability of water flow, resulting in the deepening and destabilization of stream channels; loss of aquatic habitat; high levels of fecal coliforms; potentially high concentrations of heavy metals.
- The variability in channel flow is a result of development within the watershed, since development typically diverts rainwater to storm sewers and reduces the groundwater recharge that is the basis of stable stream flow. Stewardship initiatives which emphasize infiltration as part of the management of stormwater runoff can help offset this process.
- High fecal coliform levels in stream water are typically the result of combined storm and sanitary sewer outflows, dry weather sewage sources, and waste from pets and wildlife such as geese.

- The campus drains to three tributary creeks within the Cobbs Creek system: a stream that runs through the center of the property (including the pond); a second smaller creek that has its origins in springs below the Whitehead Campus Center and GIAC; and a third, Cobbs Creek, just west of Haverford Road.
- The small west branch of the on-campus creek shows much evidence of irregular, ‘flashy’ flows in the deepening of the creek channel and the steeply eroded cut banks. This is almost certainly an unintended result of campus development, as impervious surfaces increase and groundwater recharge decreases. The upper portion of this creek is buried to the west of Coursey Road, but perennial flow continues to emerge from the pipe outlets at the east side of the roadway. This stream re-enters a pipe at the PECO parking lot.
- The main branch of the on-campus creek (below the pond) has a more variable channel. Portions of the channel are relatively stable, with less recent downward erosion than the smaller tributary creek to the west. Other portions show more lateral erosion of the side banks; the constricted stream corridor allows little room for natural meander movement over time. There are a series of old, low-head dams along this section of the creek which may help to mediate the downward erosion of the channel, but which may also contribute to a decline in water quality. This stream also enters a pipe at the PECO parking lot, and flows underground through the central portion of the Haverford College Apartments site.
- Even though portions of the streams that flow through the campus are buried, the hydrology of the creek still exists below the surface of the landscape. Groundwater still moves to these low points in the landscape (although the water table may have changed as the campus developed), and the creeks still flow in the buried pipes.
- Drainage of runoff on campus is a concern in some areas. In many cases, the soil is unable to fully absorb and infiltrate the rainfall in large storms; in other cases, runoff is concentrated through grading design and then either puddles or begins to erode adjacent slopes.
- The large numbers of geese that congregate on the wide lawns surrounding the pond almost certainly contribute to the fecal coliform problems in Cobbs Creek. This problem is exacerbated by the lack of native vegetation around the banks of the pond, which might otherwise filter runoff flowing off the lawns.

3. *Landform and Physiography (see page 20)*

- Most of the core campus is gently sloping. Steeper slopes are associated with the stream valleys and the open areas

to the west of the pond. Development for both buildings and athletic fields has also created a series of terraces separated by shorter, steeper slopes (see also Fig. 34). While the general topography within the main campus spaces presents few challenges to universal (ADA) access, traversing the steeper grade transitions between campus spaces may create local difficulties.

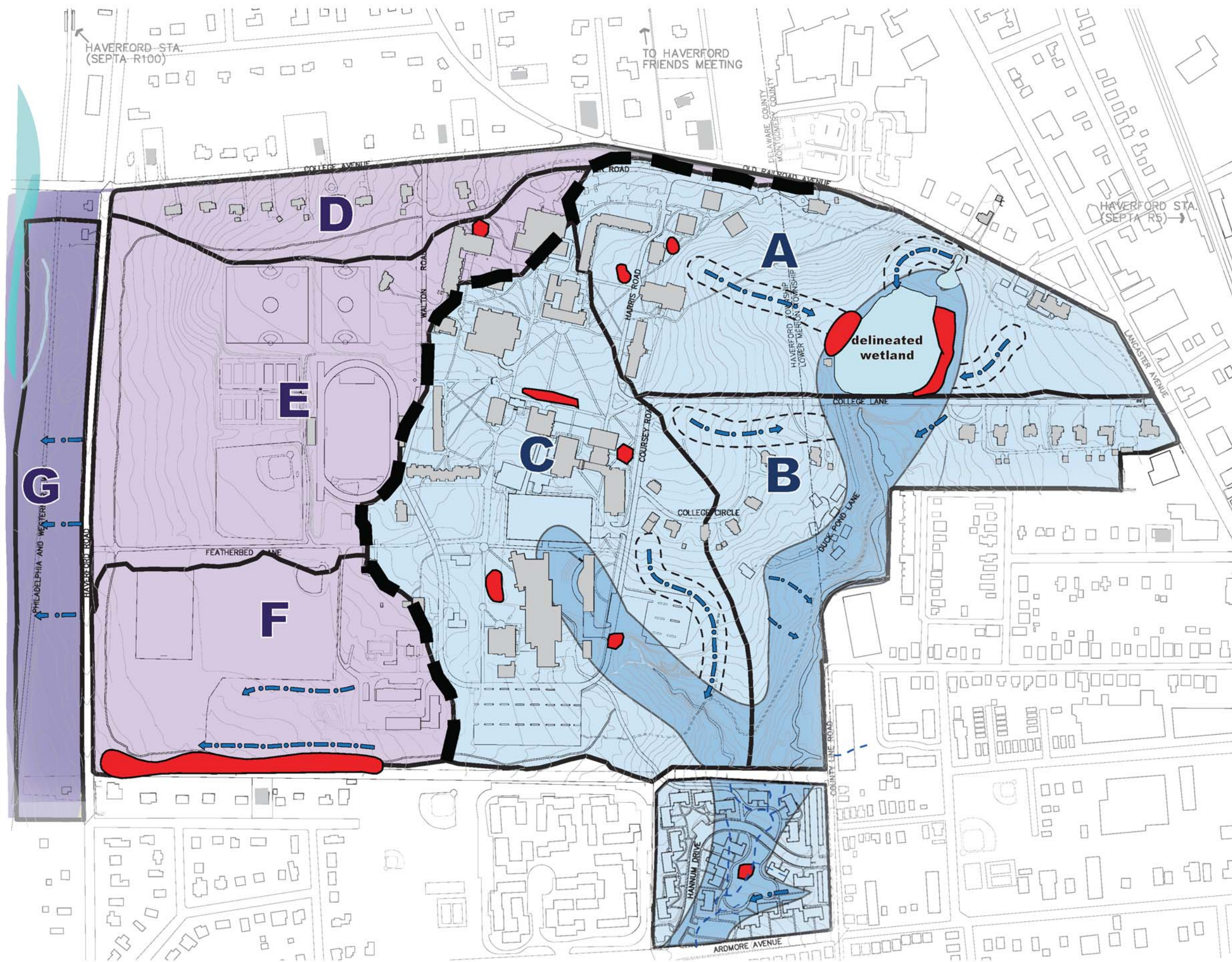
- The highest topographic point on campus is north of the Dining Hall. From this point the land slopes in three directions: east to the pond, south to the minor tributary creek near the Orchard Lot, and west toward Haverford Road. There is a second terrace, or minor promontory, at the east end of Featherbed Lane.
- The most natural, intact topography is associated with the pond and out-flowing stream. The land around the athletic fields and newer athletics buildings has been altered for facility construction. Traces of an older secondary stream valley may be seen in the vicinity of the Gardner Integrated Athletic Center (GIAC).

4. *Soils*

- Soils in the upland portions of the campus are typically very deep and well drained. Some locations along Duck Pond Lane and the west side of the pond may have slower draining soils. Moderate erosion may be present on steep slopes. The stream valleys, floodplains, natural swales and the lower slopes near Haverford Road typically have slower draining or poorly drained soils.

5. *Vegetation (see page 21)*

- The campus has a rich heritage of mature trees, many of which are either state champions (largest individual of its species in the state) or are original to the initial campus design. These trees are a valuable resource – both to the campus as a physical symbol of its history and traditions, and to the larger community, in which trees of this great age (175+ years) are relatively rare. Additionally, for the campus environment, maintaining the *continuity* of the mature trees is important; the time needed to replace these heritage trees, if they were lost as a group, would span many generations of Haverford students. From a larger environmental perspective, our region is on the cusp of significant environmental change, both as a result of climate change and of new introduced pests and diseases. In this context, such old specimens represent an important genetic resource and a heritage that may be increasingly difficult to replace.
- Most significant areas of forest on the campus are associated with the stream corridor. Based on size, shape, and the size and abundance of native tree species, the woods



KEY

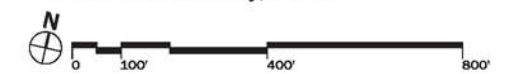
- east draining sub-watersheds - A B C
- east lowlands (based on partially hydric soils & topographic pattern)
- west draining sub-watersheds - D E F G
- west lowlands (based on partially hydric soils & topographic pattern)
- problematic drainage areas (based on interviews and site visit)
- regulatory floodplain
- site dividing ridge
- swales
- existing stream

HYDROLOGY











HAVERFORD COLLEGE

Campus Master Planning
Base Map Source: Haverford College Facilities Management

Information Source: US Geological Survey, 2002; US Fish & Wildlife, 2005; Office of Remote Sensing for Earth Resources, Penn State University, 1996; Haverford and Cobb's Creek Survey, 1949



KEY

-  hilltops & knolls
-  gentle upland slopes (< 5%)
-  moderate upland slopes (8 - 12%)
-  stream valley slopes (8 - 25%)
-  low lands
-  modified topography
-  water
-  ridge line - drainage area boundary
-  swale
-  buried stream

LANDFORM ANALYSIS

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Haverford College Facilities Management

Information Source: US Geological Survey, 2002





KEY







- MF - mature forest
- MF2 - mature forest w/ managed understory
- FF - floodplain forest
- SF - early successional forest
- GR - groves mature forest w/ lawn below
- MD - meadow
- lawn
- water
- nature trail
- alle
- Penn Treaty Elm
- state champion trees
- significant trees
- original 1834 trees

VEGETATION

HAVERFORD COLLEGE
 Campus Master Planning
 Base Map Source: Haverford College Facilities Management
 Information Source: Aerial Photography; Haverford Survey; Haverford College Arboretum Data

0 100' 400' 800'

KEY

-  prevalent view point
-  prevalent viewshed
-  outer view corridor
-  internal landscape rooms
-  natural vegetation boundary
-  porous vegetation boundary

LANDSCAPE VISUAL EXPERIENCE

HAVERFORD COLLEGE

Campus Master Planning
Base Map Source: Haverford College Facilities Management





KEY

- Highest Environmental Value:
wooded stream valley
- High Environmental Value:
upland mature woods
open space adjacent to stream valley
steep slope areas
areas where drainage is concentrated
- Environmental Significance:
heritage trees
significant groves
screens and buffers
- High Visual Significance
- Riparian Corridor

ENVIRONMENTAL STRUCTURE

HAVERFORD COLLEGE Campus Master Planning

Base Map Source: Haverford College Facilities
Management
Information Source:



at the south-east portion of the campus property, along the west branch of the creek, is in the best condition compared to the other campus woods.

- In addition, the largest woods – in this case in the southeast portion of the campus – are most able to provide sheltered, shady, stable growing conditions for woodland wildflowers and other forest plants. This is worth noting if the College wishes to consider interpretive exhibits or other educational outreach programs within the natural areas on campus. Furthermore, larger, more compactly shaped woodlands are generally more stable and viable in terms of their overall health than small sized woodlands, and are less likely to be stressed by invasive exotic plant species and less likely to need intensive management to remain healthy.
- In general, the woods on campus show little regeneration by native species: saplings are either few or absent and the understory is often dominated by non-native species such as Norway Maple, honeysuckle, and multiflora rose. Without the successful development of new young native tree saplings, over time the native forest canopy will decline. In this urbanized context, maintaining healthy woods is not a matter of ‘leaving nature alone’ but of strategic management initiatives aimed at supporting native plant species over the competing invasive exotics. Haverford College Arboretum has implemented a preliminary program for removing Norway Maple in the woods at the north side of the campus, which has been successful in promoting re-establishment of native plants and could be considered for wider implementation.
- Smaller patches of forest create a buffer along the northern edge of campus and the upstream side of the pond. These woods help frame and define the pastoral (picturesque or Reptonian) views from Lancaster Avenue, College Lane, and Barclay Beach. Groves of trees – former forest canopy trees or horticultural plantings – also frame the edges of the campus to the west and south, creating a park-like edge to this portion of the campus. Taken as a whole, the woods that frame the property help create an illusion of separation from adjacent land uses.
- Within the developed campus, smaller pockets of woods and tree groves help visually separate buildings and contribute to the intimate, green character of the campus. For example, the belt of woods near Gummere, Drinker and Woodside gently screens the southern academic buildings from the softball field, helps define both the academic spaces and athletic fields, and contributes to the ‘unfolding’ quality of the campus spaces. The woods along Duck Pond Lane create an attractive backdrop for the residences on College Circle, help define Cope Field, and maintain an intimate setting for the houses on Duck Pond Lane.

6. *Landscape spaces and sequences (see page 22)*

- The campus landscape has a distinctive sequence of unfolding views as one moves through the campus. This spatial dynamic is an important part of the campus landscape experience for both residents and visitors.
- The initial view from Lancaster Avenue, across the lawns and pond, past woods and groves to the distant buildings is highly orchestrated and deliberate. The subsequent views around the loop road typically feature woods, wide open spaces, and smaller residential-scaled buildings on one side (outer side of loop) and larger campus buildings and informal green spaces on the other side (see also Fig. 32 on page 63). Moving around the edge of campus, the view sequence alternately opens (wide/ long pastoral views), and compresses (narrow views where buildings and forest are in close proximity). This is a distinctive pattern that helps define Haverford’s campus and to date the campus development has remained largely faithful to this pattern.
- In the developed core of the campus, a series of greens or loosely defined quadrangles create an informally organized network of open spaces. Spaces between buildings provide intriguing glimpses of the surrounding pastoral landscape and reinforce the impression of an intimate development scale and close connection to green space.
- When considered from the standpoint of landscape experience, two interesting conclusions emerge. First, open spaces along the ring road – such as the South Parking Lot and Orchard Lot – are not peripheral but are actually very prominent sites, since they are highly visible to visitors and also represent the terminus of long views out of the campus internal spaces. Secondly, the internal pockets of woods and small groves of trees are not simply leftover places but often play important roles in screening, defining spaces, and contribute to the pastoral, park-like campus character.
- The juxtaposition of stone campus buildings, sweeping open lawns, picturesque groves and mature forest is part of what gives both charm and drama to the campus landscape. These landscape elements are not isolated but seen in close context.

7. *Environmental Structure Plan (see page 23)*

The environmental structure plan ranks areas of the site in terms of their importance to overall site health, ecological function, and environmental significance. It is intended as a reference to decision-making about appropriate development sites and open space planning.

- The highest value is given to the woods and riparian areas associated with the stream corridors and pond. These areas are important for their hydrological benefits to the watershed, for their habitat value, and for their more sensitive topography (typically steeper slopes). These environmental benefits could be enhanced through landscape management initiatives, but they do have considerable value in their current condition.
- The environmental structure plan puts a high value on upland mature woods (not connected to the stream corridors); open spaces (not woodland) that are associated with the stream corridor by virtue of their topography and/or drainage characteristics, and that could be managed to enhance the quality and value of the stream corridor; other locations where drainage is concentrated; and other significant steep slope areas.
- The diagram indicates other campus areas of significance for the value of the vegetation. This may be related to the heritage value of individual trees, or related to the buffering or screening value of the trees as a whole.
- The environmental structure plan also indicates other landscape spaces of visual significance in terms of the view or open pastoral quality of the campus landscape. These places are noted in yellow.

E. LAND USE AND ACTIVITY PATTERNS

A college campus comprises layer upon layer of complex patterns, some readily apparent, others less discernible. In what follows, we have mapped some of these patterns as they exist on campus today. Principles for the campus’ future development have been derived, in part, from analysis of these patterns.

Land Use. Here we provide analytical land use maps, aggregated and disaggregated by use.

Classroom and Office Concentrations, Residences. By identifying the location and relative size of classrooms, laboratories and studios, one can gain a picture of some of the primary daily activity generators of the College. Comparing these maps of classroom concentrations, dormitories, and faculty and staff offices can give some idea of the Haverford way of life for students and faculty.

Zoning. Zoning limitations on land use and building envelope are diagrammed.



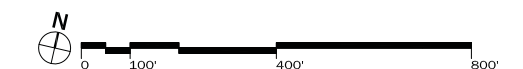
KEY

- Trees
- Road
- Path
- Green Space
- Water
- Academic Building
- Campus Center
- Student Residential
- Faculty Residential
- Facilities / Storage
- Dining
- Athletics / Recreation
- Athletic Fields
- Administration

LAND USE

HAVERFORD COLLEGE Campus Master Planning













Base Map Source: Haverford College Facilities Mgt.
Information Source:



Venturi, Scott Brown and Associates, Inc.

January 29, 2009

KEY

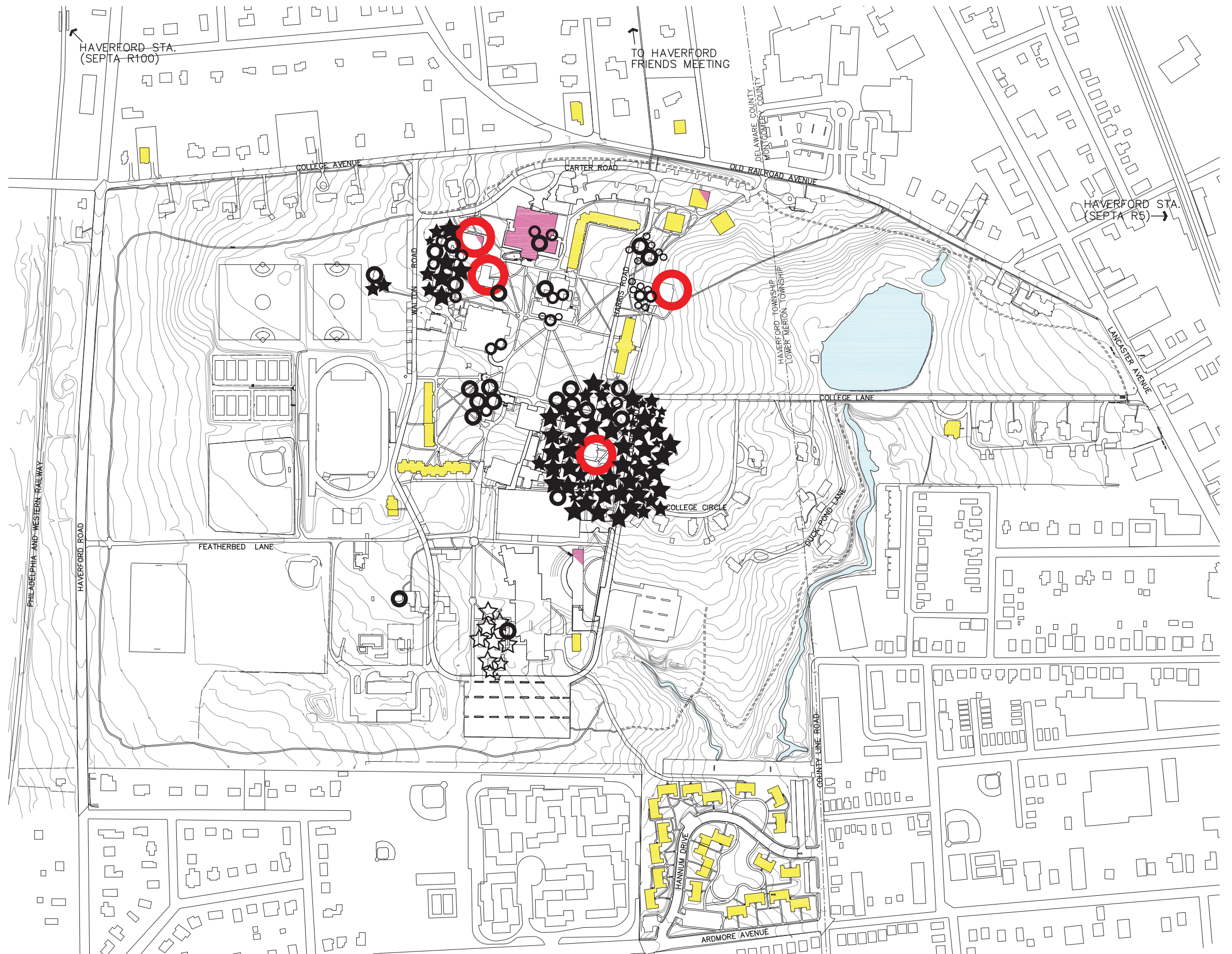
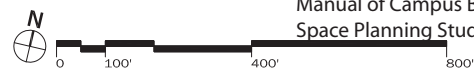
Classroom	Laboratories	Studios	
			401+ SF
			201-400 SF
			0-200 SF
	Auditorium		
	Student Housing		
	Dining		

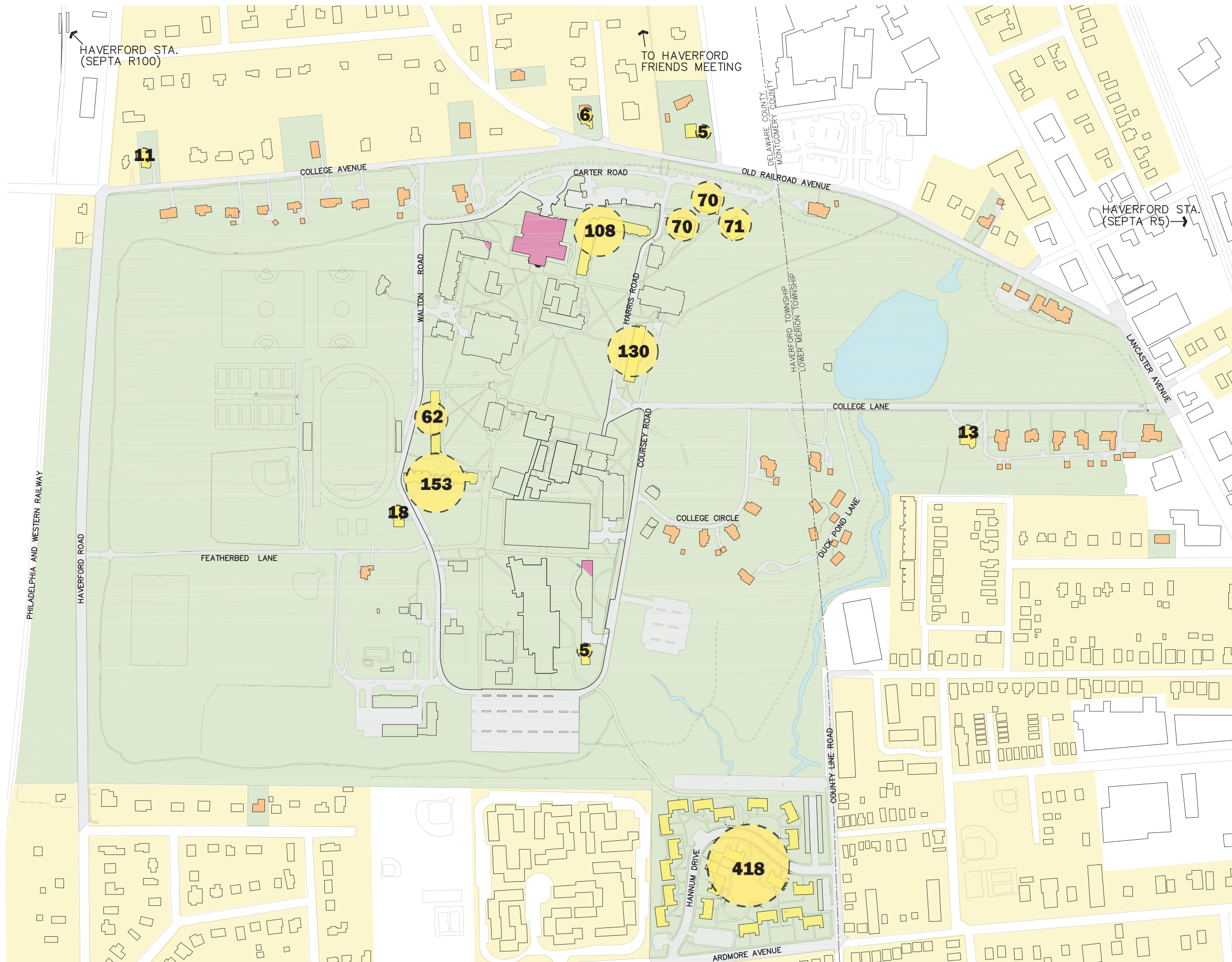
CLASSROOM SPACE

HAVERFORD COLLEGE

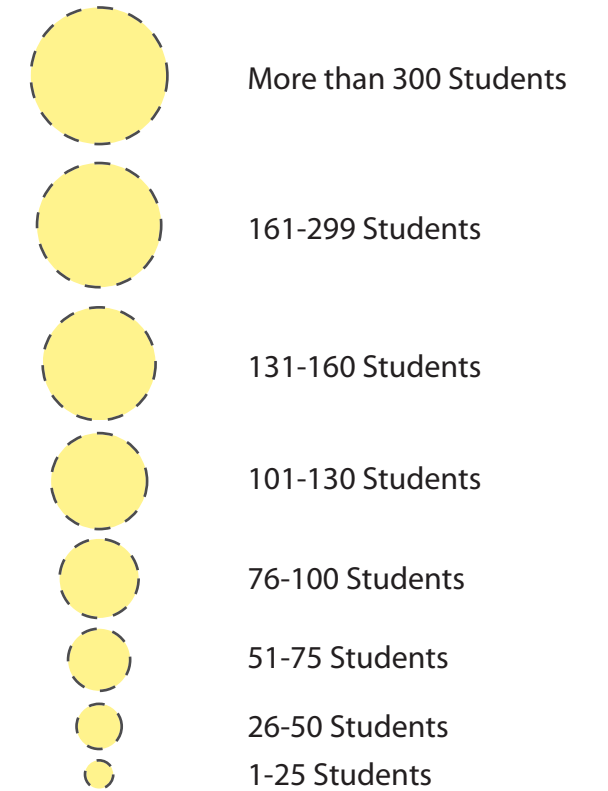
Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source: Room Scheduling Matrix;
Manual of Campus Buildings;
Space Planning Study 1999-2000





KEY



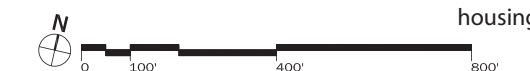
- Student Housing by Capacity
- Dining + Food
- Faculty Housing
- Neighborhood Residential

LAND USE: HOUSING

HAVERFORD COLLEGE

Campus Master Planning

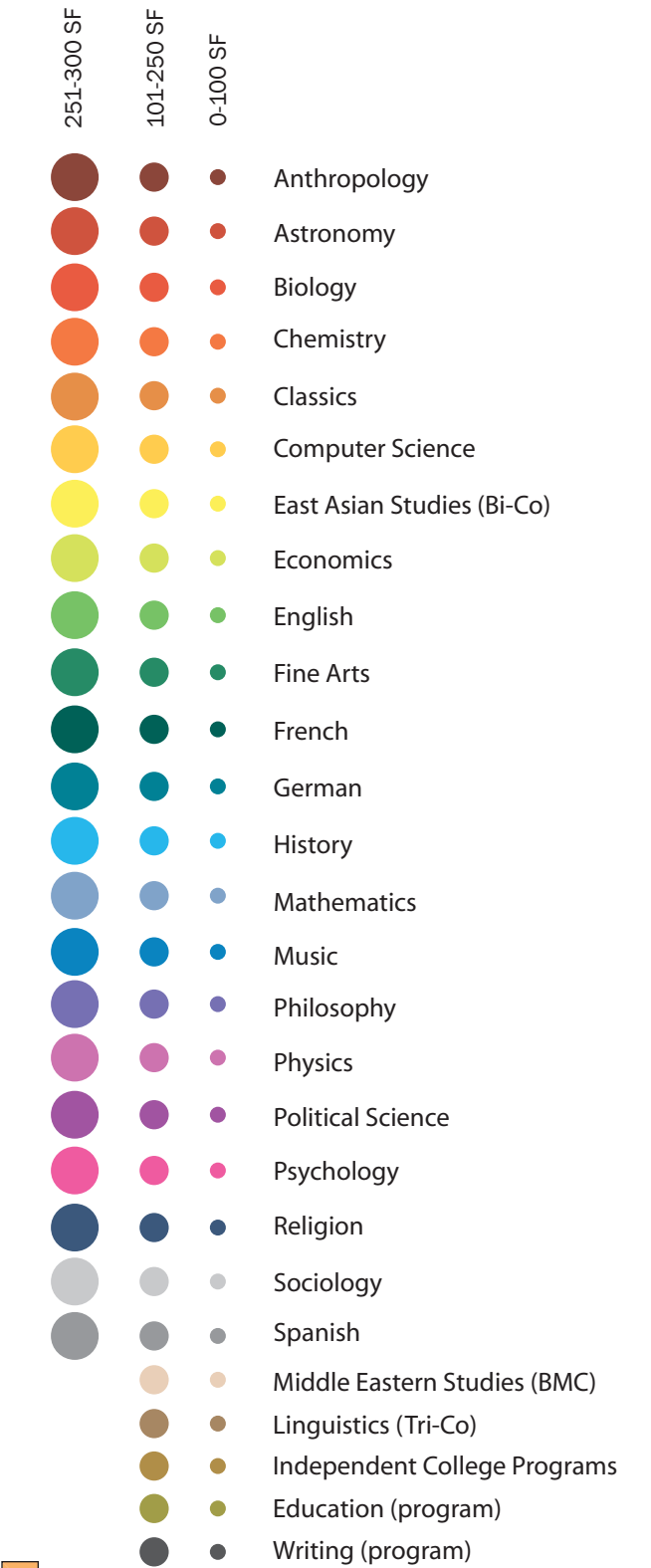
Base Map Source: Haverford College Facilities Mgt.
Information Source: www.haverford.edu/housing/dorms



Venturi, Scott Brown and Associates, Inc.

January 29, 2009

KEY

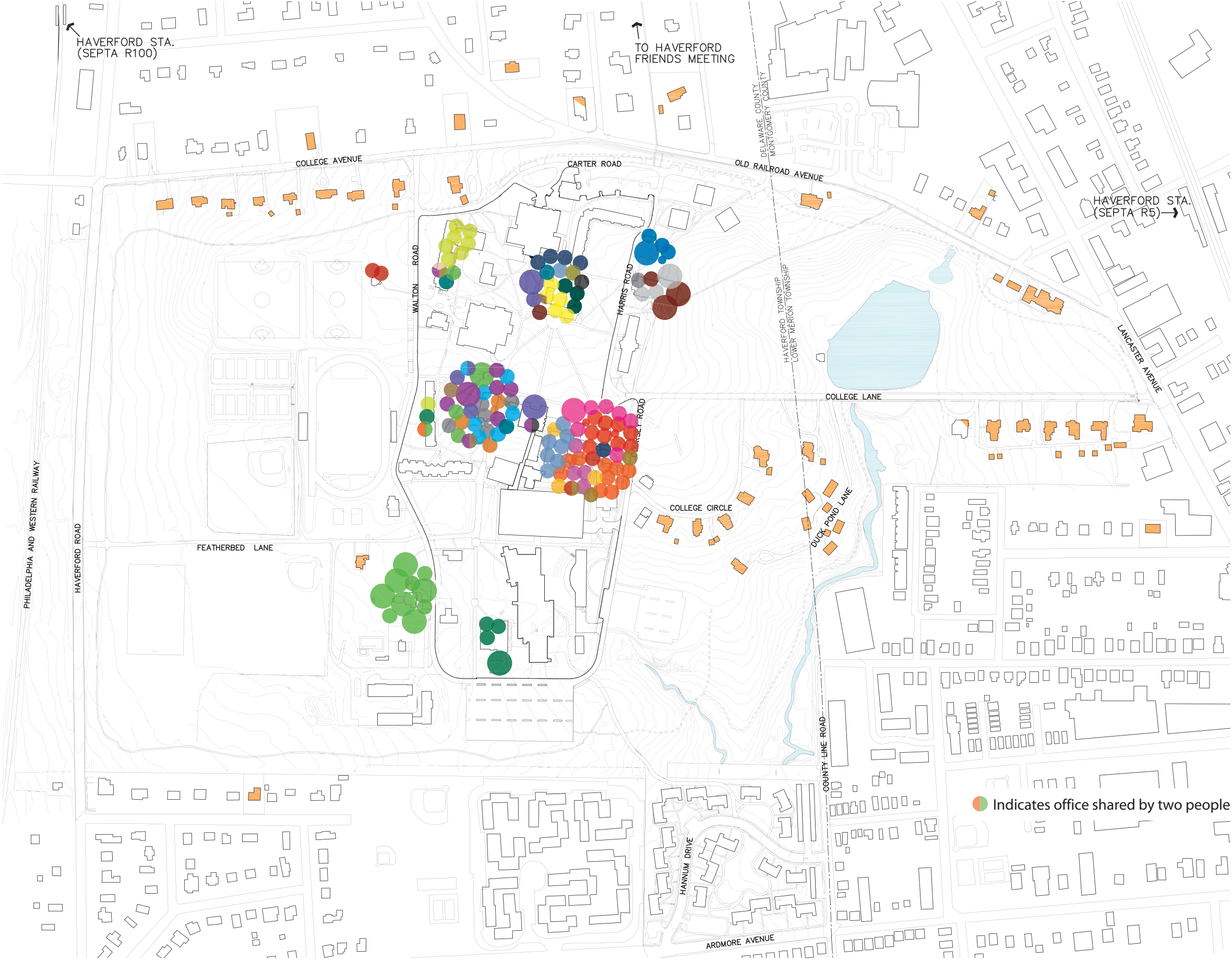
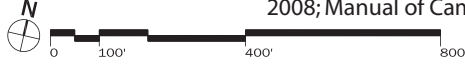


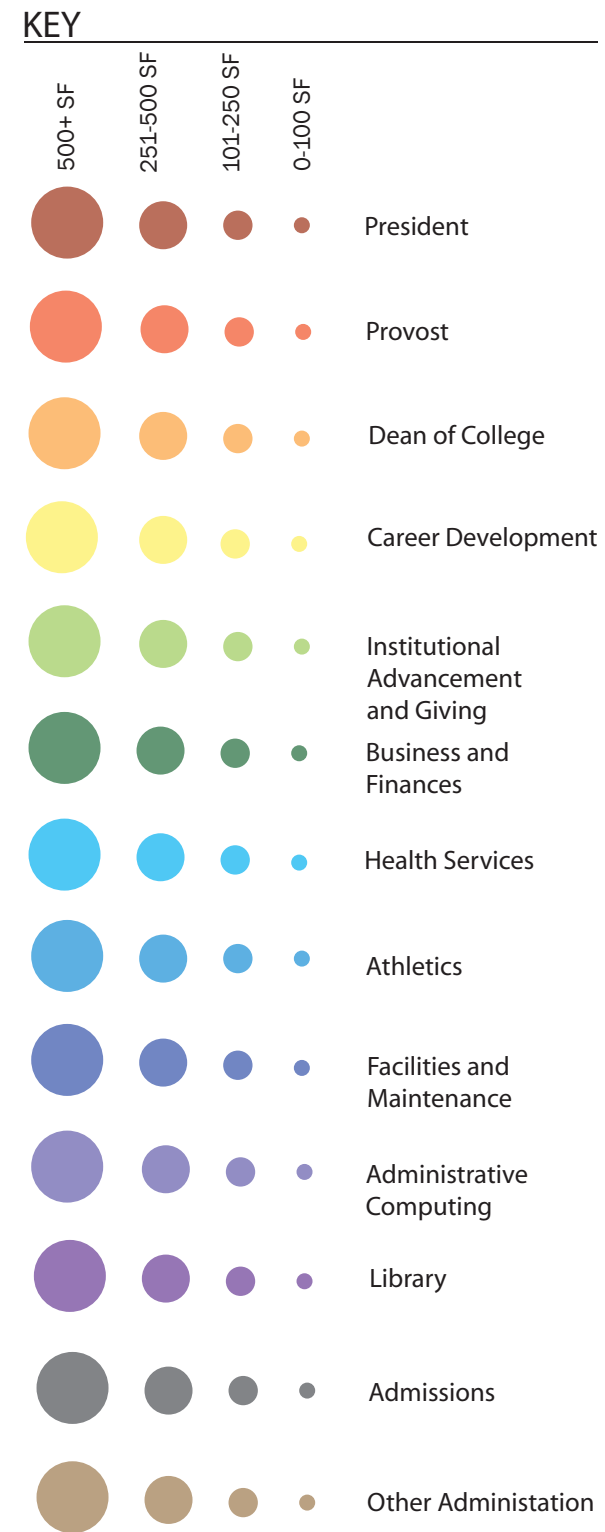
Faculty Housing
FACULTY OFFICES BY DEPARTMENT

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source: Faculty Office Assignments 2007-2008; Manual of Campus Buildings





ADMINISTRATIVE SPACE

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
 Information Source: Campus Planning Studies 1999-2000; Manual of Campus Buildings; Kathy DiJoseph

0 100' 400' 800'



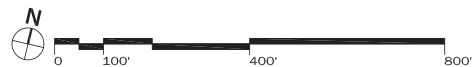
ZONING LIMITATIONS

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.

Information Source:



III. A FRAMEWORK FOR DEVELOPMENT

III. A FRAMEWORK FOR DEVELOPMENT

A. FIRST, AN ANALOGY

As noted in Section II.C., Haverford's campus can be compared to a Roman town or medieval city, with building facades with few or no active entrances – and little transparency at grade – forming walls around much of the perimeter of the campus core.

*If Haverford's campus is a Roman town,
then Founders Green is its Forum.*

*If Haverford's campus is a medieval city,
then Founders Green is its marketplace (of ideas).*

Maintaining and augmenting the primacy of Founders Green in the campus hierarchy of outdoor spaces, even as new greens are created, is critical to supporting the coherence of the physical campus and the sense of the College as *one* place, *one* community.

We recommend thinking of Founders Green as the campus forum, its marketplace, with mission-critical uses in the buildings in and around it.

B. GENERAL ORGANIZING PRINCIPLES

Our recommendations include:

- ***New academic activities in existing buildings in and around Founders Green*** – Haverford's "forum."
- ***Infill and density at the existing core*** where possible, to preserve both the campus' intimate, walkable scale and the long, wide views of its landscape. (These views include those along the approach from Lancaster Avenue and views west across the playing fields.)
- ***Extension of paths to and through the campus core***, to organize growth that cannot be contained within the campus core – analogous, perhaps, to the roads leading out of Roman or medieval towns, which were continuations of those within the city.
- ***Development within the core related to existing campus grids*** – those established by Founders Hall and Walton Road; and ***development outside the core related to pathway edges or topography***.
- ***Greater building transparency, especially at grade*** along campus paths and at additions to the core's "perimeter wall" buildings – to promote a greater sense of connection

between inside and outside, to enliven campus pathways and to invite the campus community to participate in the activities within.

- ***Greater integration of the campus core and HCA by extending the connecting path*** beyond the perimeter road into the core, and by more fully integrating the connecting path into new patterns of development on the HCA site.

C. KEY STRATEGIES

Key components of the evolving framework include:

- Preserving and enhancing the character of images central to Haverford's physical identity – especially Founders Green, the experience of entering the campus along College Lane, and the distant views to the west.
 - Two pedestrian axes – one north-south and the other east-west – that extend beyond the campus core and provide a framework for a campus-wide network of campus spaces and activities.
- New development south of Founders Green, with entrances along a spine – "College Walk" – provide continuity with the campus core and help create a lively campus path with a "critical mass" of activities and users. This tree-lined walk would extend from the Dining Center to the South Parking Lot and possibly beyond, to HCA.
- Residence halls east and west of the core – perhaps along

Featherbed Lane and, possibly, along Duck Pond Lane – would connect via an east-west path bringing students to and through the core.

- Important campus-wide uses near the intersection of these axes. The current Field House site, at the crossroads of campus, would be reserved for such a use, and also for eventual growth of the sciences.
- A more meandering north-south path to the east, connecting Founders Green via a series of landscaped spaces to other important existing and new uses, including a revitalized Whitehead Campus Center. This path would roughly parallel "College Walk;" it would include a terraced green within the KINSC, and the landscaped space between Whitehead Campus Center and the GIAC.
- Reinvigorating Founders Green and the campus core – lovely and symbolic but also perceived by some as "dead" – by providing new academic and campus activities in existing buildings and new additions.
- Planning for the long-term replacement of HCA – with faculty housing at the perimeter and other uses, perhaps senior student housing or playing fields, more closely related to the campus core – but also improving the experience for students who will live there in the interim.
- Conservation of important campus landscapes, vegetation and waterways – including woods, meadows and specimen trees – for beauty and sustainability.

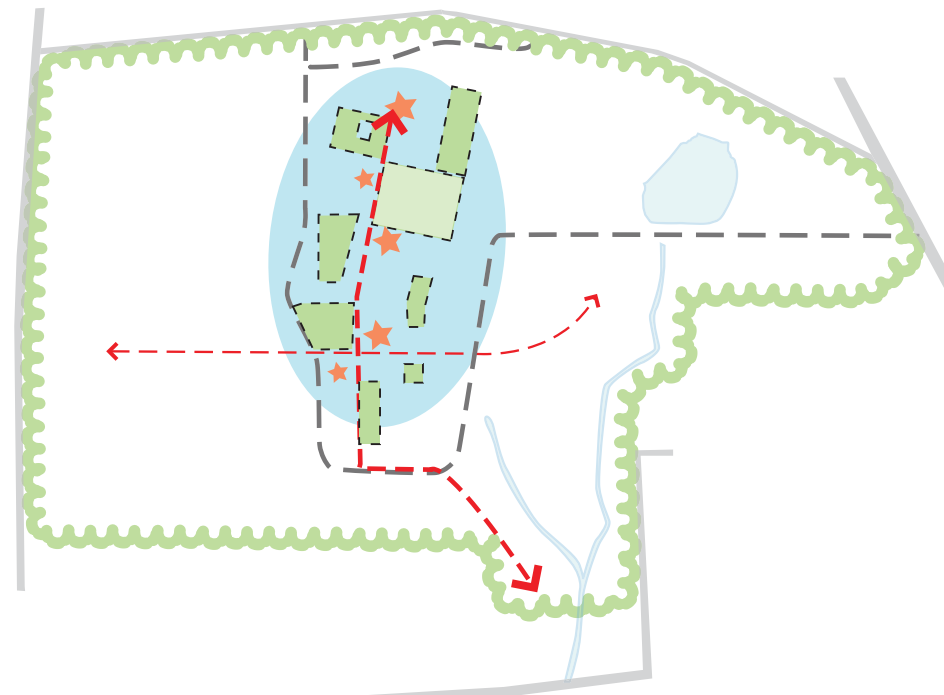


Fig. 20. Proposed Framework Diagram

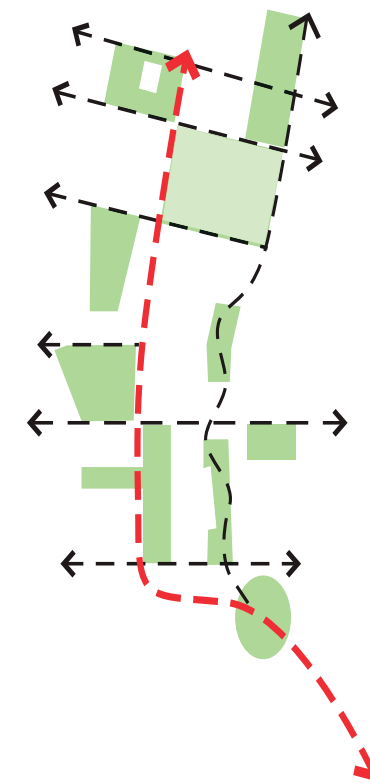


Fig. 21. Proposed Framework Diagram at Campus Core

IV. DEVELOPMENT GUIDELINES

IV. DEVELOPMENT GUIDELINES

A. OVERVIEW

Here, we present preliminary guidelines for locating programs and designing the physical campus within the framework set out in Section III of this report. Further program information is in Section VI.

To understand the flow of public space, from the outside into and through the public areas of private buildings, we’ve used the “Nolli” plan (named after the Italian architect’s famous map of mid-18th century Rome). The map shows delicately rendered entry level plans of each campus building, set on the “macramé” of exterior pedestrian paths.

The “Nolli” plan highlights pedestrian movements across campus and to and through buildings. It shows the “street through the building” and the relationship between public and private both indoors and out. Building entrances and service locations are also shown, in order to communicate more complex relationships.

1. Founders Green

Founders Green is the symbolic heart and center of Haverford’s campus. An important component of the plan is the realignment of the College’s physical campus with its mission by returning more academic uses to buildings in and around the Green.

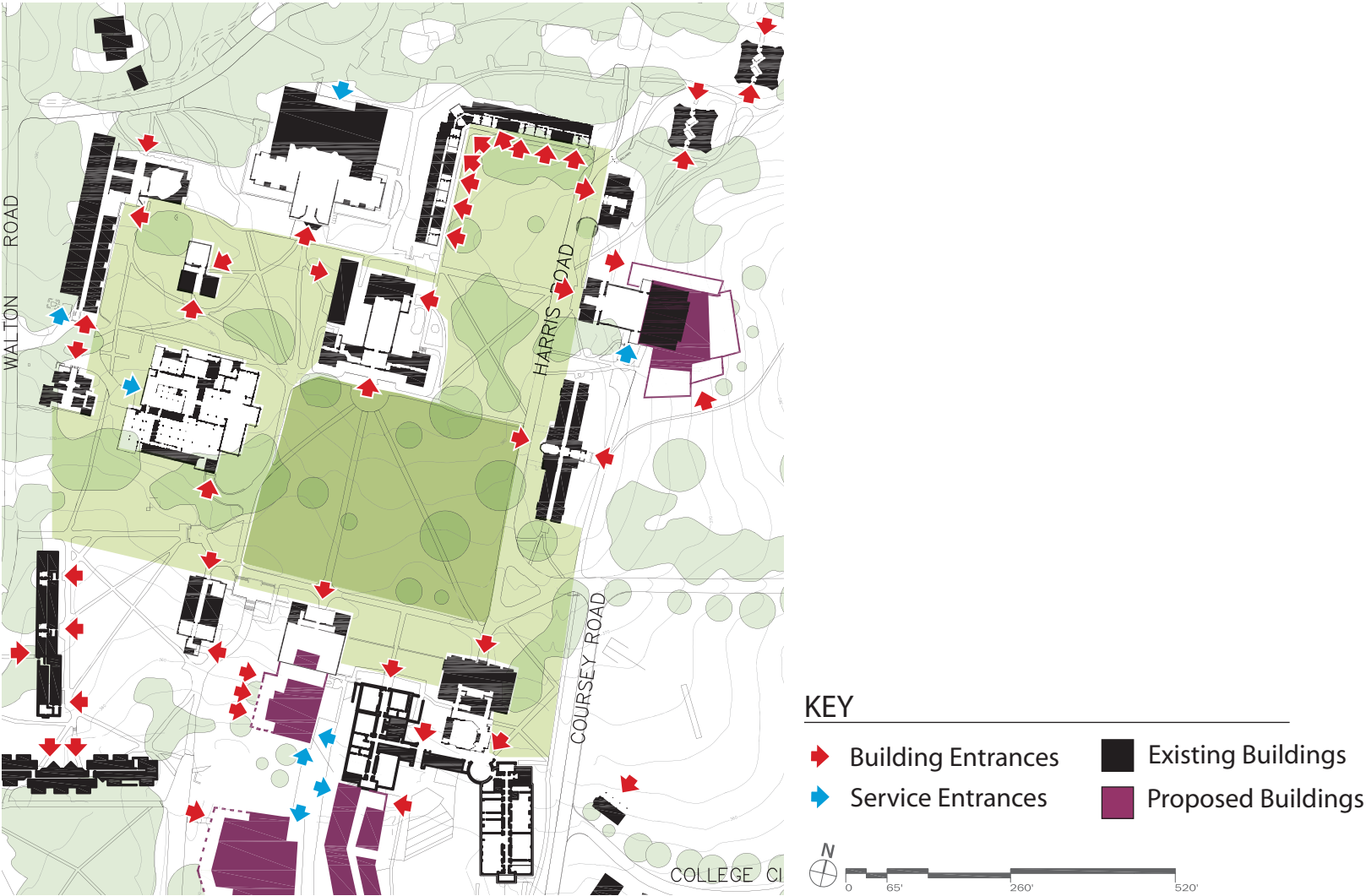


Fig. 22. “Nolli” map of Founders Green



Fig. 23. Founders Green

2. “College Walk”

- The north-south “College Walk” would link the established north precinct of Founders Green with the south precinct, which has the capacity to accommodate much of the campus growth.
- The development of College Walk would help ensure campus precincts are tied together and that the campus does not become segregated as it grows.
- Along the length of College Walk would be a series of buildings and outdoor places located in an alternating pattern along the length of the Walk; a building on one side of the Walk would be balanced with an open space on the other, to help maintain the green character of the campus.
- Significant, shared campus facilities, such as the Center for Culture and Media, dining and library, and symbolic, iconic buildings like Founders Hall and Magill would be distributed along the length of College Walk. Along the Walk could be programmatic “neighborhoods” for themes like the arts or athletics.
- The massing of buildings would follow College Walk, their long sides paralleling the Walk and encouraging movement.
- Founders Green, Gummere Woods, Chase Green, and other outdoor spaces would continue to have unique identities along the Walk.
- College Walk would lead to an important, campus-wide building – a theater and dance center or, possibly, a dining hall.
- Buildings along College Walk should be three (or possibly four) stories tall, with relatively transparent, glazed ground floor facades that connect interior activities and vitality with the exterior Walk.
- Activities that are the most public in nature, or illustrative of the programs that occur within the building, should be located at ground level where views into the building can be highlighted.
- Materials should build on the existing College fabric of natural stone and buff colors, combined with a contemporary curtainwall where openness is desired. The recommendations of the 2004 *Analysis of Historic Exterior Finishes* (Getty report) should be considered for existing buildings, and interpreted for new.
- Where floor plates are relatively deep, roofs should be flat.
- Any roof-mounted mechanical equipment should be located well set back from the building perimeter and surrounded by screening.

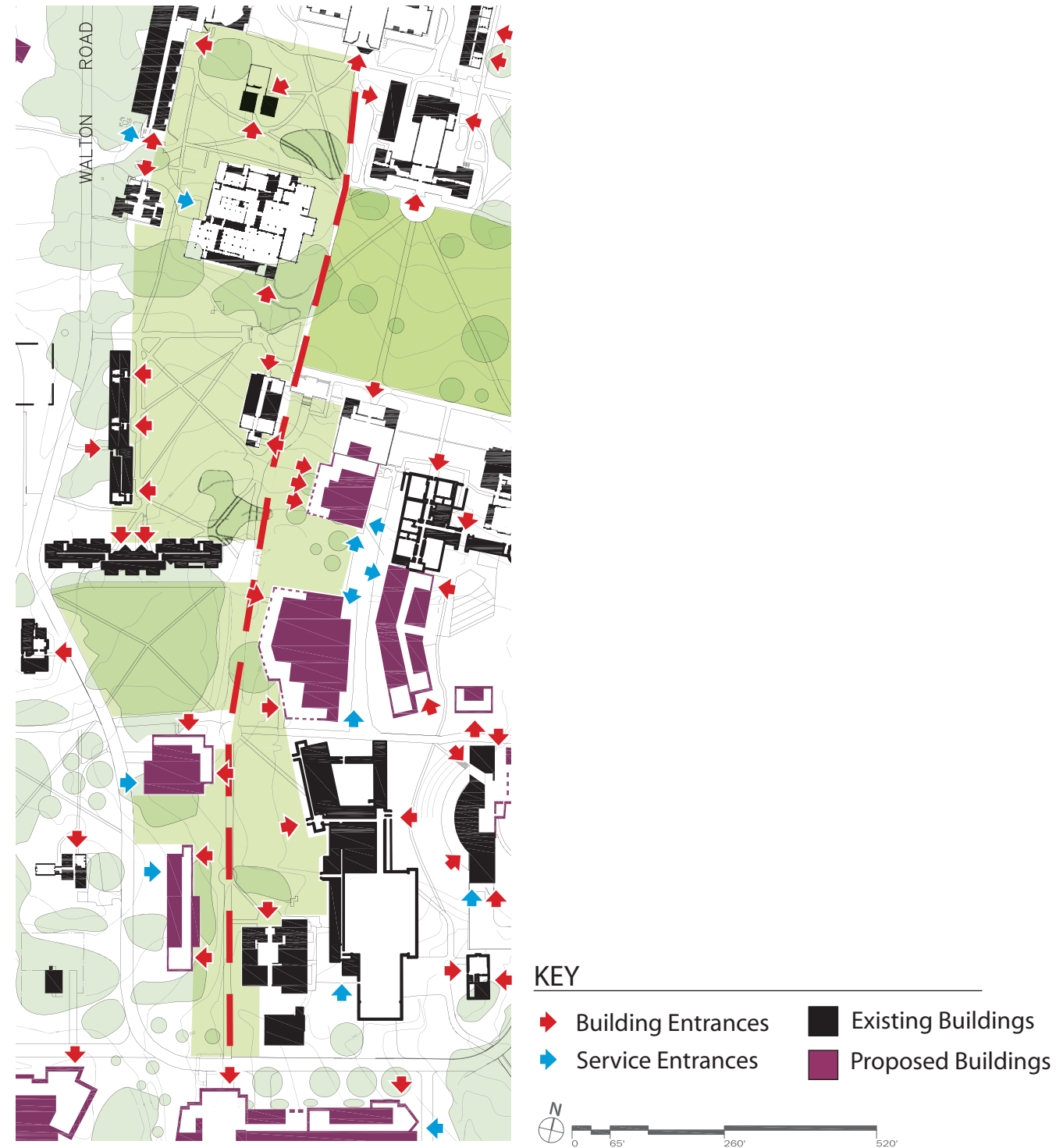
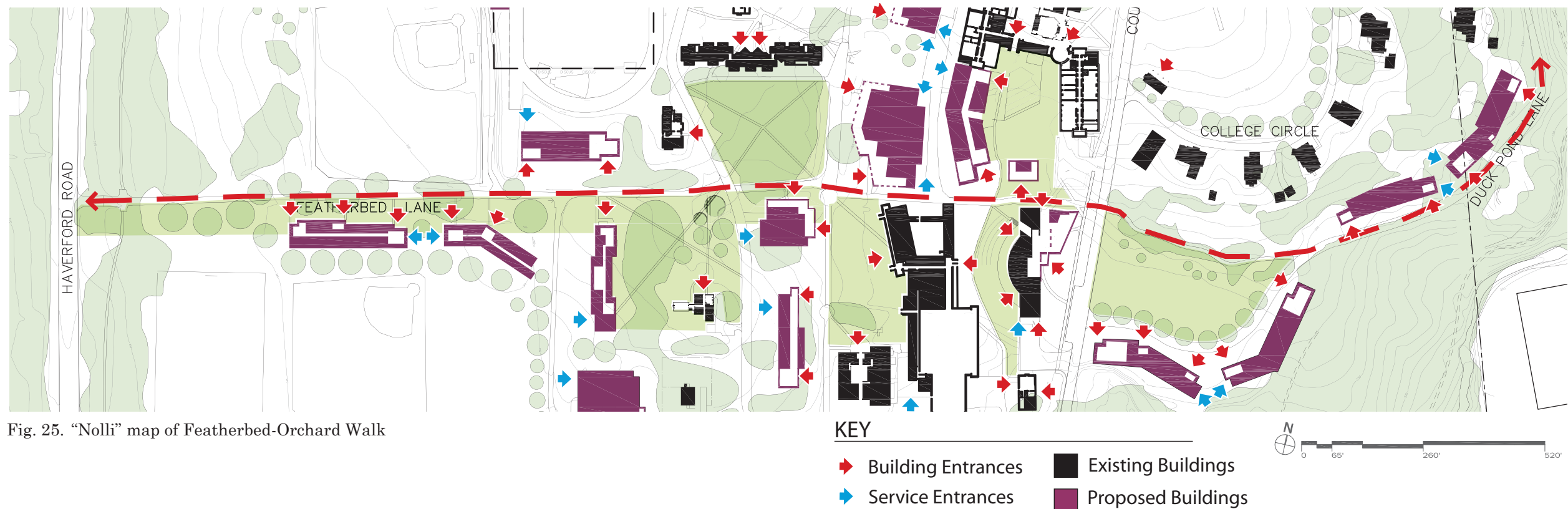


Fig. 24. “Nolli” map of “College Walk”

3. Featherbed-Orchard Walk

- A revitalized and strengthened east-west walk – on which would be located student life and residential facilities – would provide secondary access to academic buildings. This walk would extend from Featherbed Lane to – and through – a new Orchard Green.
- This path would intersect with College Walk at Gummere Woods – which would become an important campus node and meeting place for the College community.
- Featherbed Walk would link student residences located at its ends to the academic core – where shared uses and campus-wide activities are held. Possible uses at or near the intersection with College Walk include dining, library, and student activities. To the east are sites for future expansion of the sciences.
- The west end of Featherbed Walk would contain future student housing and access to the playing fields.
- At the east end of Featherbed Walk, across Coursey Road, would be Orchard Green, a precinct of student housing. Shared student social space would be included, within the student residence hall or in a separate building.

- A revitalized, reprogrammed and expanded Whitehead Campus Center would provide a hub for student-centered night-time activity; it would have an entrance along the Walk.
- Paths leading from parking below Orchard Green and from parking below Walton Field would be connected east and west by Featherbed Walk.
- Within the campus core, east of Walton Road, ends of buildings would, generally, front Featherbed Walk, allowing secondary north-south permeability mid-block to complement the major north-south movement along College Walk.
- New student housing on the campus should be of simple, linear massing, with gable roofs and thin profiles. The linear forms should gesture to tie them to their particular context – for instance, bending at Orchard Green to allow views through the site and integrate the forms into the landscape. Materials should be primarily buff masonry with punched windows, and curtainwall at and near building entrances or common spaces. Sloped roofs should be slate or copper.

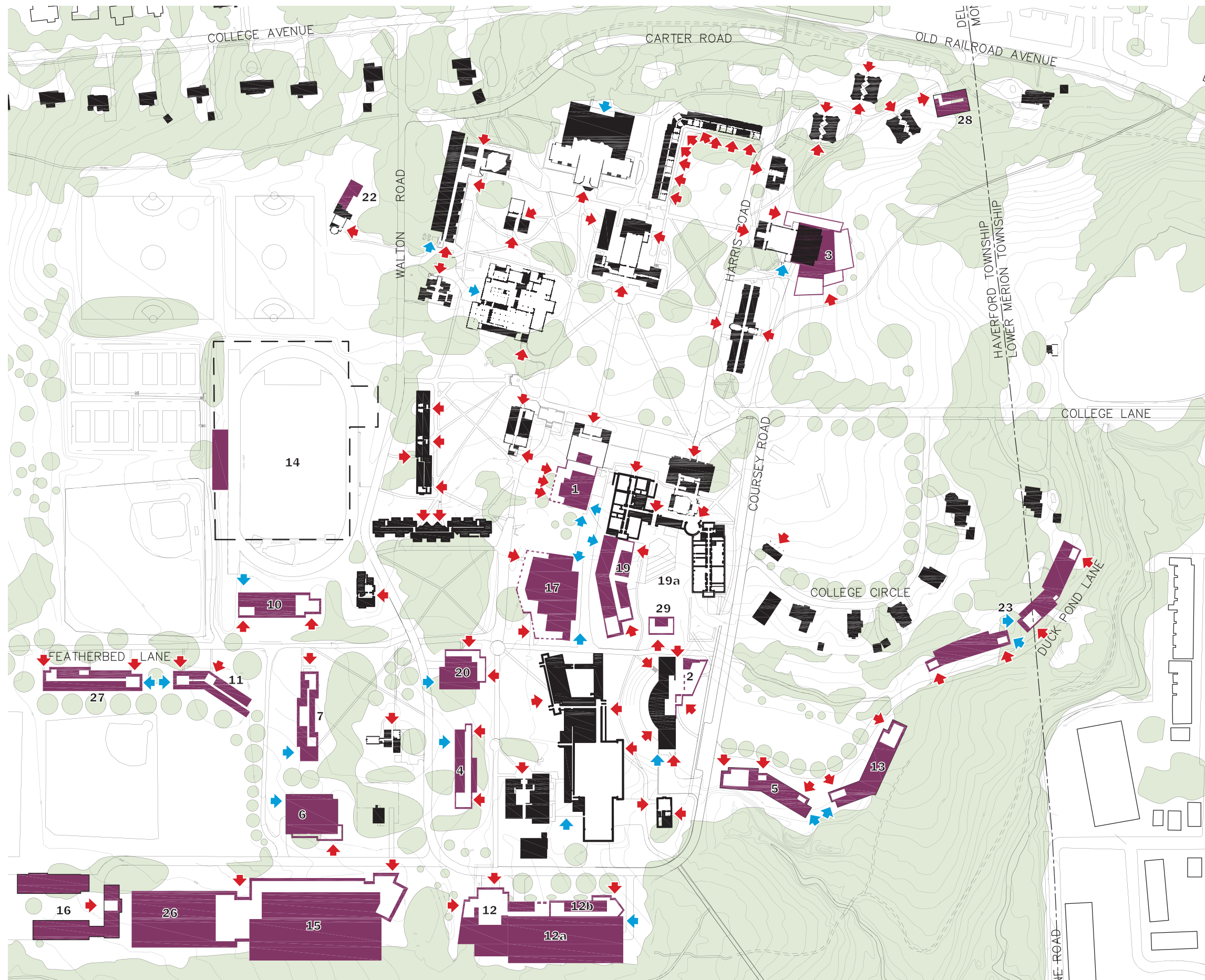


1	Center for Culture and Media Addition to Ryan Gym - 3 levels + basement 38,300 GSF
2	Student Activity Space Addition to Whitehead Campus Center 2 levels + basement 9,000 GSF
3	Music and Addition to Roberts 31,700 GSF
4	Studio Arts Building 2 highbay levels + basement 31,300 GSF
5	Student Residence Hall on Orchard Green 3 levels + basement (about 100 to 110 beds) or 4 levels + basement (about 110 to 130 beds) 44,000 to 52,000 GSF
5a	Surface Parking at Orchard Green (see fig. 26)
6	Central Power Plant (12,000 GSF) - one high-bay floor with Sustainability Program Office (1,500 GSF)
7	Student Residence Hall 3 levels + basement (about 85 to 100 beds) or 4 levels + basement (about 105 to 120 beds) 35,000 to 48,000 GSF
8	Faculty Residences--Old RR Ave (beyond map extents) about 10 apartment units (with zoning exception)
9	Faculty Residences--College La (beyond map extents) about 15 townhouse units (with zoning exception) or 5 single-family units
10	Student Residence Hall North of Featherbed Lane 3 stories + basement (about 85 to 105 beds) or 4 stories + basement (about 110 to 130 beds) about 42,000 to 52,000 GSF
11	Student Residence Hall South of Featherbed Lane 3 levels + basement (about 85 to 100 beds) or 4 levels + basement (about 100 to 120 beds) 33,000 to 48,000 GSF
12	Theater and Dance about 42,650 GSF
12a	Structured Parking 4 levels about 400 spaces
12b	Additional Program - Academic or Administrative (Admissions?) 3 levels + basement
13	Student Residence Hall on Orchard Green 3 levels + basement (about 100 to 110 beds) or 4 levels + basement (about 110 to 130 beds) 44,000 to 52,000 GSF

14	Parking under Walton Field 1 level - about 400 spaces 2 levels - about 800 spaces Alternate: Potential Surface Parking Across Haverford Road
15	Athletic Facility Field House and Tennis Pavilion 2 levels, partially submerged facility with green roof about 131,000 GSF
16	Facilities Management Complex
17	New Academic Building (or Library) on Field House Site 3 levels + basement About 108,000 GSF
18	Alumni House 2-1/2 or 3 levels + basement about 11,000 to 15,000 GSF
19	Academic Building (Science) on Field House Site 3 levels + basement about 70,600 GSF Building elevator connects landscape levels.
19a	Amphitheater
20	Academic, Dining or Gallery on James House Site 2 or 3 levels + basement
21	(Temporary or Permanent HCA Uses)
22	Observatory Addition 1 level + basement 2,500 GSF
23	Student Residence Halls on Duck Pond Lane (2)

or

24	Student Residence Halls on HCA Site (3) (see fig. 28) (Alternate- Fields)
25	Faculty Residences on HCA Site (see fig. 28) (Alternate: Fields)
26	Natatorium
27	Student Residence Hall 3 levels + basement (about 85 to 100 beds) or 4 levels + basement (about 105 to 120 beds) 33,000 to 48,000 GSF
28	Student Residence Hall or Administration near North Dorms 3 to 4 levels + basement, about 18,000 to 22,500 GSF (about 45 to 50 beds)
29	Building South of KINSC For small, specialized use - student related?



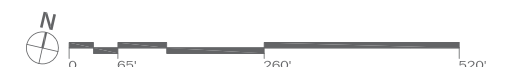
KEY

- ▶ Building Entrances
- ▶ Service Entrances
- Existing Buildings
- Proposed Buildings

CAMPUS CORE SITE CAPACITIES + GUIDELINES

HAVERFORD COLLEGE Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source:



Venturi, Scott Brown and Associates, Inc.

January 29, 2009

B. SITE BY SITE

The plans on the previous pages and the section drawings that follow indicate the approximate massing and capacity of sites under discussion, and give some indication of appropriate uses.

1. *In and Around the Core*

a. “Up Campus”: In and Around Founders Green

Here, buildings would be enlivened by change of use, with the potential for infill additions:

- Ideally and over time, additional spaces in Founders, Chase, Stokes and perhaps Morris Infirmary would be converted to academic use. (See Section VI.)
- Ryan Gym would be converted to The Center for Culture and Media. An important component of this use would be a “campus living room,” which could be entered directly from Founders Green. In fine weather, outdoor seating could be provided on the entry terrace. Alternately, Ryan Gym would be converted to a “headhouse” for a replacement library. (the diagram on page 101 illustrates this option. See Section VI.D.2. for a fuller discussion.)
- Union would be updated for life safety, accessibility and comfort, while retaining its intimate scale and charm. (From its entry pergola to its fireplaces and millwork, it’s one of the most endearing buildings on campus.) The lower and first levels could be used as offices for faculty or the Deans; the large second floor room, overlooking Lloyd Green, could be used as a classroom by day and – perhaps – a student multi-purpose or rehearsal space by night, provided accessibility and egress issues could be resolved in the renovation.
- Roberts would be renovated to improve its use as a campus-wide auditorium and theater space. An addition to the south and east could provide a home for the Music Department, including a new recital hall. A beautifully-crafted curtainwall, allowing views to trees and the pond from the inside – and to arts activities from the outside – could offset the inelegance of the 1987 addition and provide a new, contemporary image for the arts at Haverford.
- Eventually, Magill would be renovated. More detailed feasibility studies, nearer to construction, would be required to determine whether the Library could remain in place as a central component of Founders Green, or if site logistics and the cost of providing interim Library space dictate an alternate site and replacement Library. In either case, the lovely and historic early phases of Magill including Alumni

Hall and the Rufus Jones study should be preserved; later additions could be reused if feasible, or demolished. If demolished, the capacity of the site could be increased; a large and beautiful addition, visible as a backdrop to the historic stone building, could be a welcome contemporary addition to Founders’ Green. Alternate uses include visual arts collections exhibition and storage, special Library collections, or other campus-wide uses. (If the College decides to locate the Library in an addition to Ryan Gym, many of the functions planned for the Center for Culture and Media – including the academic centers and collections spaces – could be located in Magill.)

- The north-south walkway from the Dining Center to Hall would be landscaped and become the north segment of College Walk.

b. Along College Avenue

The College Avenue houses are important elements of their Haverford neighborhood; their domestic scale knits the College into the community and their use as houses provides an important buffer between the College and the residential community.

- Houses 707 through 765, and 794 College Avenue, should remain residential.
- As La Casa’s use as a Spanish-language cultural center is greatly restricted, should the College consider swapping use and identity with on-campus faculty housing?
- 773 and, especially, 791 College Avenue are more closely tied to the identity of the College than are the other houses along the Avenue. They form a kind of welcoming gateway at the Walton Road entrance to the campus. Should their uses change from residential, the more communal “gatehouse” aspect of their locations could be reinforced in the design of the landscape.
- Eventually, 791 College Avenue could be converted to administrative use, to decant administrative functions from academic buildings while keeping them centrally located. The entrance could be reoriented to face Stokes. (This is controversial among members of the Master Plan Steering Committee, and would require additional faculty housing elsewhere. We believe the benefit of this house’s central location would offset any potential awkwardness in office configuration.)
- 773 and 791 College Avenue and 36 Old Railroad are potential locations – among other possibilities – for a new campus guest house. Dumpsters near the west end of 36 Old Railroad should be relocated and/or screened from view.

- Eventually, as new parking structures are constructed – including one under Walton Field – most parking, beyond that required for universal accessibility, could be removed from Carter Road. Carter could become two-way up to Harris Road to allow vehicles to search for parking without having to return to the Walton Road entrance via Old Railroad Avenue; a wider buffer could be made between the road and the Nature Trail.

c. South

- Landscaped greens and buildings would continue to alternate along College Walk as it extended southward from Founders Green. Complementing building on one side of College Walk with open space on the other would help maintain the sense of a verdant campus.
- Care should be taken to preserve an intimate scale along the Walk (even if buildings are large) and to maintain at least some of the large trees on the James and Parker sites. These large trees convey a sense of permanence and *gravitas* that newly planted trees cannot.
- New buildings would be arranged with activity and transparency at grade along the Walk.
- An addition to Ryan would be transparent at grade; along the Walk, the floor could step with the grade, allowing multiple entrances along the Walk. A new, modestly-scaled green would be located where the Locker Building now stands. (Depending on the size of the program eventually built on the Ryan site, a below-grade central power plant could be considered at this location. See Section V.F.6.b.)
- If feasible, the historic portion of the central plant could remain, with new uses – temporarily or, perhaps, permanently. This decision could be left to the future, when a final decision is made about the use of the Ryan addition and more is known about the program and scale of the buildings to replace the Field House.
- The Field House, actively used by College and community constituencies, would remain in place until its site is required by another use with greater need for a central location. At that time, it would require replacement in a less central campus location. Maintaining the building for more of its life cycle is “greener” than replacement, allows funds to be allocated to more urgent uses, and guarantees a placeholder at the very center of campus for future community-wide uses or the eventual expansion of the sciences.
- The eventual demolition of the Field House would allow both a large new campus-wide function at the corner of College Walk and Featherbed-Orchard Walk and long-term

growth potential for the sciences. The space between wings of the expanded science center could be used for a tiered outdoor classroom, amphitheater, garden, or other outdoor space.

- The large trees in Gummere Woods would be maintained – for reasons of sustainability and beauty – but paths through would be created.
- A new Visual Arts studio building would complement uses in Marshall Fine Arts and help create a landscaped “arts green.”
- The Whitehead Campus Center would be reprogrammed to create a more student-centered place. This use would build on the Coop and the Bookstore and the existing level of night-time activity in the Game Room. (See Section VI.B.3.)
- A small but prominent addition on the east side of the Whitehead Campus Center would be largely transparent, to contrast with the closed character of the existing WCC, and could house campus-wide multi-purpose rooms, an intimate dining venue (assuming the existing game room could be used for a kitchen/servery), or a very visible addition to Admissions.
- A new green space, between a new Theater and an Athletics facility would be visible at the end of the College Walk axis; sidewalks would bend and continue toward HCA. The theater would be located at the southern end of the axis, with structured parking behind. A relatively shallow layer of building would screen parking from the campus and provide space for academic departments or administrative functions (Admissions, for example).
- Along the southern edge of campus, but set back somewhat from the nature trail, would be located Facilities Management (relocated to allow more central uses to take its place), new athletics facilities, and – if needed as a short-term option between building on the Orchard or South Lots and building structured parking – surface parking. The largest of the buildings – a potential Field House-Tennis Pavilion – would be located adjacent to a public park, to minimize the visual impact on residential neighbors.

2. Outside the Campus Core

a. College Lane

- The massing of a new addition to Roberts, described above, could create a welcoming background to Barclay Beach and, potentially, help shield undesirable views of Marshall Auditorium from College Lane. A new, contemporary building layer could become an important part of the sequence of views seen upon entering the campus.

- A new infill building along College Lane should match the scale, form, and *perhaps* materials of existing domestic architecture along the facade that faces the street. Massing and form behind the street frontage can change to accommodate larger scales of program and more efficient floorplates. This would be an appropriate site for an Alumni House incorporating Institutional Advancement, Career Services, or other administrative uses that need proximity but not adjacency to the core. This use would require a special exception from Lower Merion Township. (Lower Merion Township does not have any institutionally zoned land, but instead specifically allows for special exceptions for educational institutions including administrative uses.)
- An addition to the Old Railroad Avenue building, for faculty housing. The option shown would eliminate the most recent addition; and should be designed with great sensitivity to the original and historic Furness and Evans building. The addition could, potentially, be oriented toward campus.
- Should there be a need in the future for a College use requiring a public face near Lancaster Avenue, 1 College Avenue – which seems almost like a campus gatehouse in its location and orientation – could be considered a potential location. It could, perhaps, be considered a possible location for a campus guest house. Other large buildings along the Lane could also be considered.
- Additional faculty housing could be developed in the open area behind the College Lane houses. Care should be taken in the design to space and orient the buildings in a way that minimizes the inherent awkwardness in having the fronts of new houses face the backs of old. Lower Merion Township would allow single family detached houses in this location; townhouses, like the ones illustrated, would require a variance.

b. Featherbed Lane

- In the long term, student housing could be provided along Featherbed Lane, following the patterns of linear building along open space established by the houses along College Lane; the row of Barclay-Roberts-Union along Harris Road; and other Haverford College precedents. Athletics fields would be reconfigured and moved south to accommodate this development, resulting in the loss of community gardens and some informal playing fields. Significant growth of the student body, or the relocation of all students from HCA, could trigger the need for this development.
- A new central plant is shown in the approximate location of the faculty pool. The Sustainability Program office, and perhaps the Arboretum office, could be located here. This location could be largely screened by trees from Woodside Cottage.

c. West of Walton Road

Our sketch for this area shows minimal visible change, with westward views from the campus core largely unchanged north of Featherbed Lane. We show:

- A dormitory on the old volleyball court site just south of Walton Field, as described above. Care should be taken to locate and construct the building to preserve a significant tree on the site.
- A parking structure built into the slope under Walton Field. This structure would be open to grade and daylight toward Haverford Road, but would be hidden from the road by the landscape. This would be an expensive option for parking, but would allow parking very close to Founders Green while still preserving views to the west.
- The Astronomy Department has requested we consider a small addition to the Observatory. If built, this addition should respect the historic character of the original building, and should be accomplished with minimal disruption to the landscape.

d. Orchard Green

A zone of student-centered housing would extend across the campus – including a newly revitalized WCC and a student residential precinct across Coursey Road.

- Student housing on the Orchard Lot site would be configured to allow the building to integrate into the landscape and to create a new green space (or, perhaps, to restore an old one).
- Student social spaces could be an important component of the site, in a stand-alone building or integrated into the residential building.
- About 110 existing parking spaces would be displaced by new construction. Ideally, these would be replaced on site. We show a near term option with a parking lot. After a parking structure has been built elsewhere on campus, this lot could provide a site for a second Orchard Green dormitory.
- Eventually, student housing could extend along Duck Pond Lane. The area between the new residences and College Circle housing would be heavily planted, to provide a buffer between student and faculty living. Because it would displace faculty housing, student housing on Duck Pond Lane could be a long-term option, to be considered after additional faculty units have been constructed. In addition, stormwater mitigation in this area could be challenging.
- New buildings should be located only to the west of Duck Pond Lane to avoid the potential flood plain area.

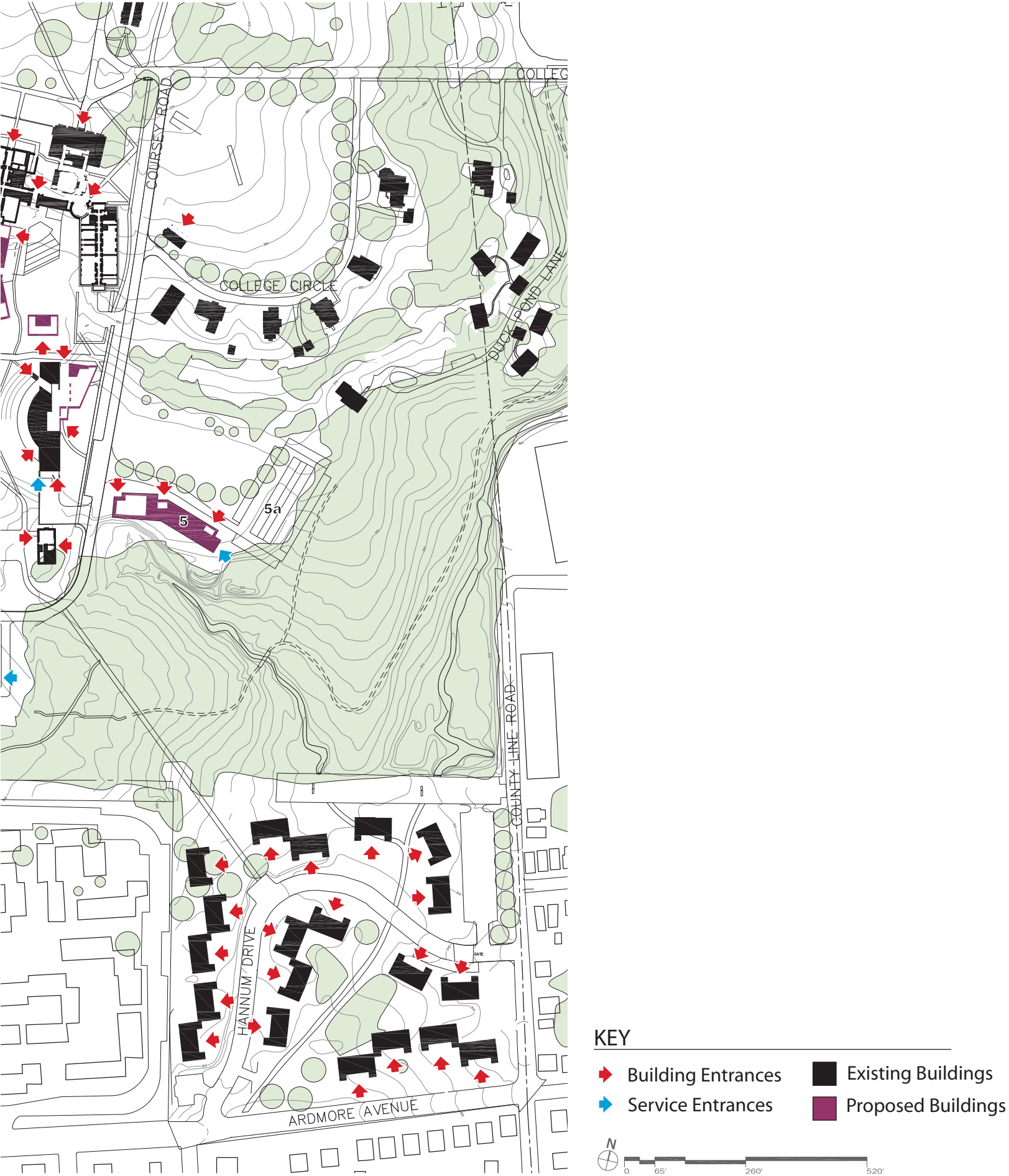


Fig. 26. “Nolli” alternate map of Orchard Green

e. HCA

- In the near term, most student housing at HCA would remain. Landscape and building improvements would be needed to make the experience of living – or even visiting – there more “Haverfordian.” This could include maintaining the complex to the same level as main campus dorms. Ideally, one or two buildings closest to the campus core would be removed in the near term, after construction of a new residence hall on Orchard Green, to allow a more natural path between classes and the apartments.
- In the long term, student housing on part of the HCA site closest to the campus core could be rebuilt, organized along a pathway connection to other campus activities. Some of the stream could be daylighted, and a green buffer of trees and landscape could be planted between student uses and the surrounding area – extending a physical manifestation of the “Haverbubble” onto the HCA site. We believe using this site fairly intensively for student housing – particularly for seniors – makes sense, in part to relieve development pressures elsewhere on the campus. Faculty housing could provide an interface with the community along County Line Road and Ardmore Avenue, with a green buffer between this and student housing.
- We understand, though, that there is a strong desire to remove all student housing from the site and so we show an option with playing fields. The sloping site, bisected by a stream, would need to be significantly re-engineered to accommodate this use.

Any change of use from “garden apartments” at the HCA site would require adjustments to zoning.

f. Across Haverford Road

- The narrow strip of land across Haverford Road provides limited options for development. Its potential for surface parking is discussed in Section V.A.4.

KEY

- | | |
|----------------------|----------------------|
| ◆ Building Entrances | ■ Existing Buildings |
| ◆ Service Entrances | ■ Proposed Buildings |

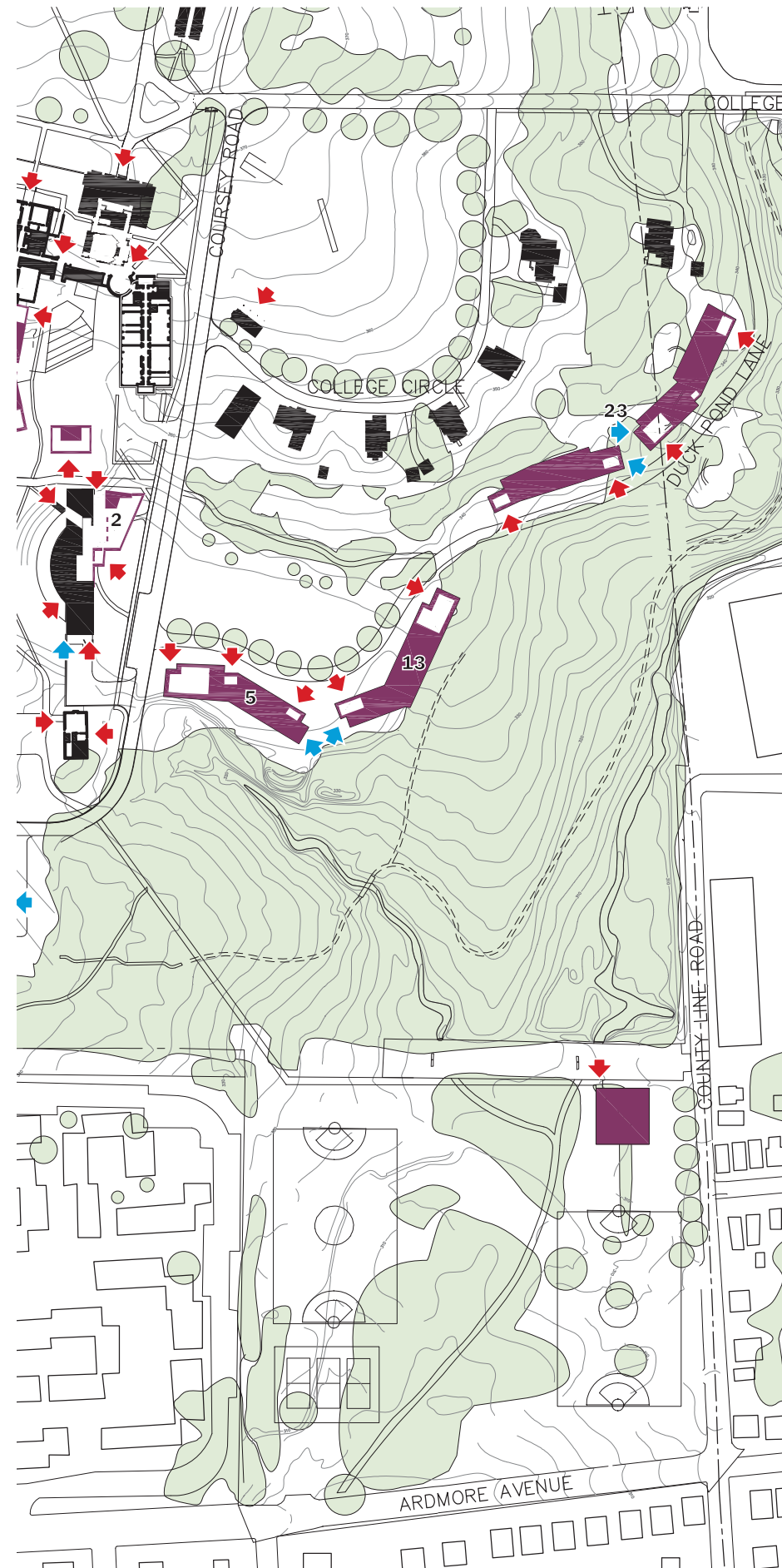
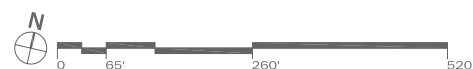


Fig. 27. “Nolli” alternate map of HCA

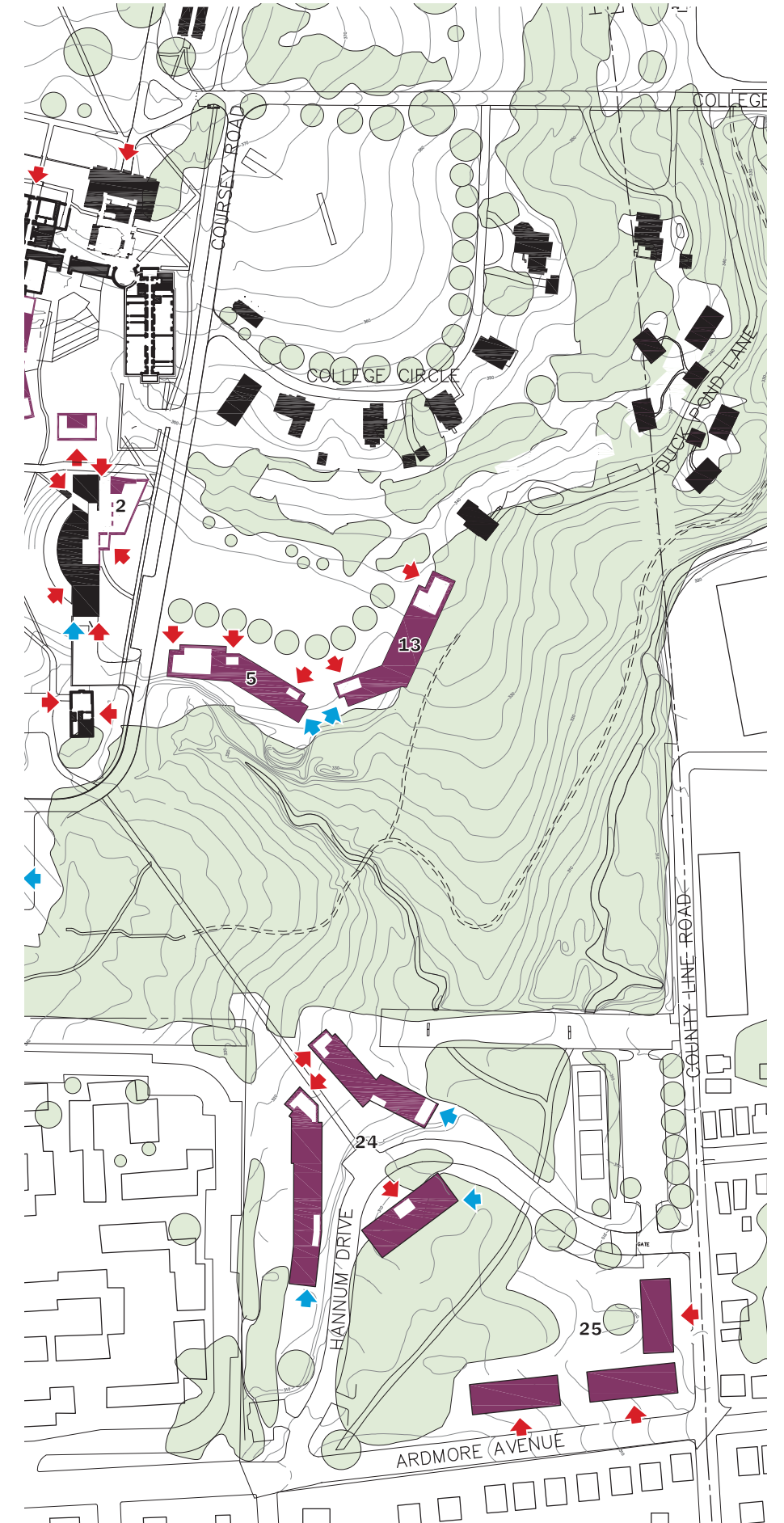
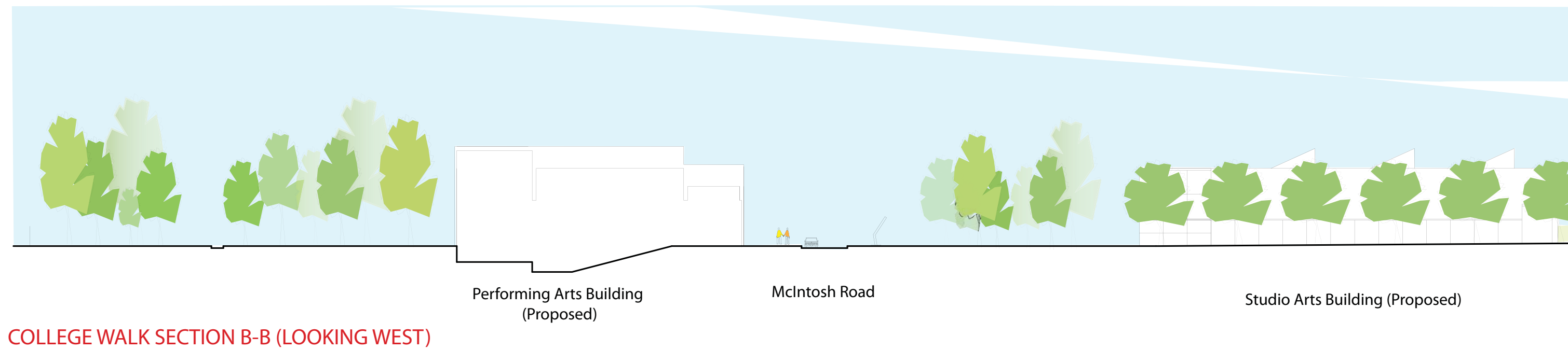
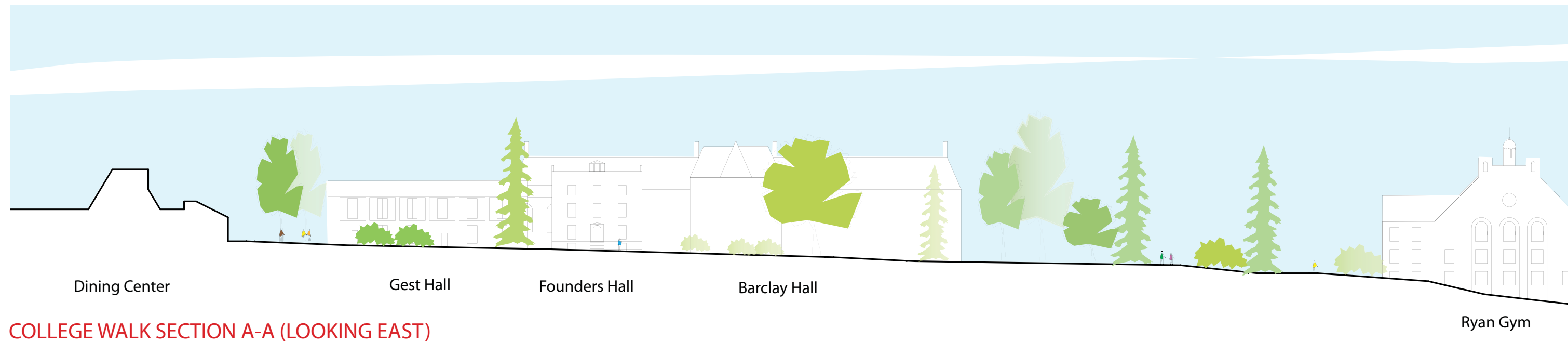
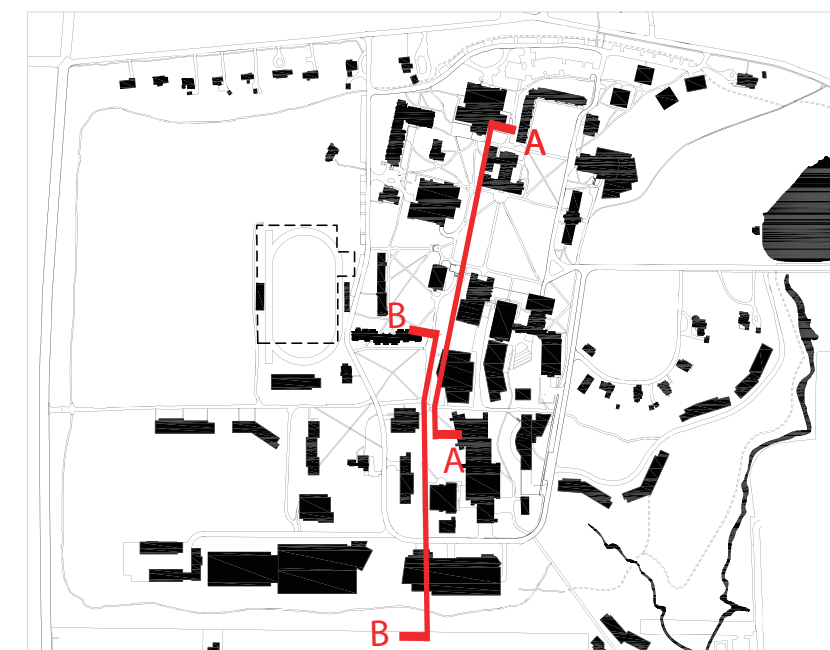
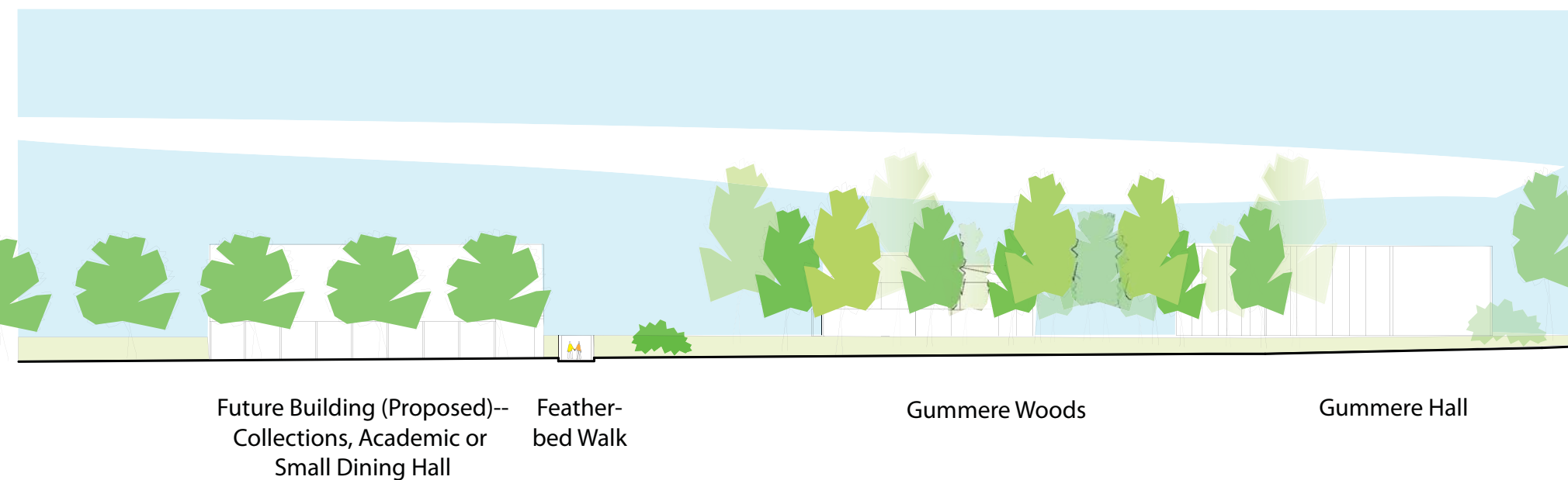
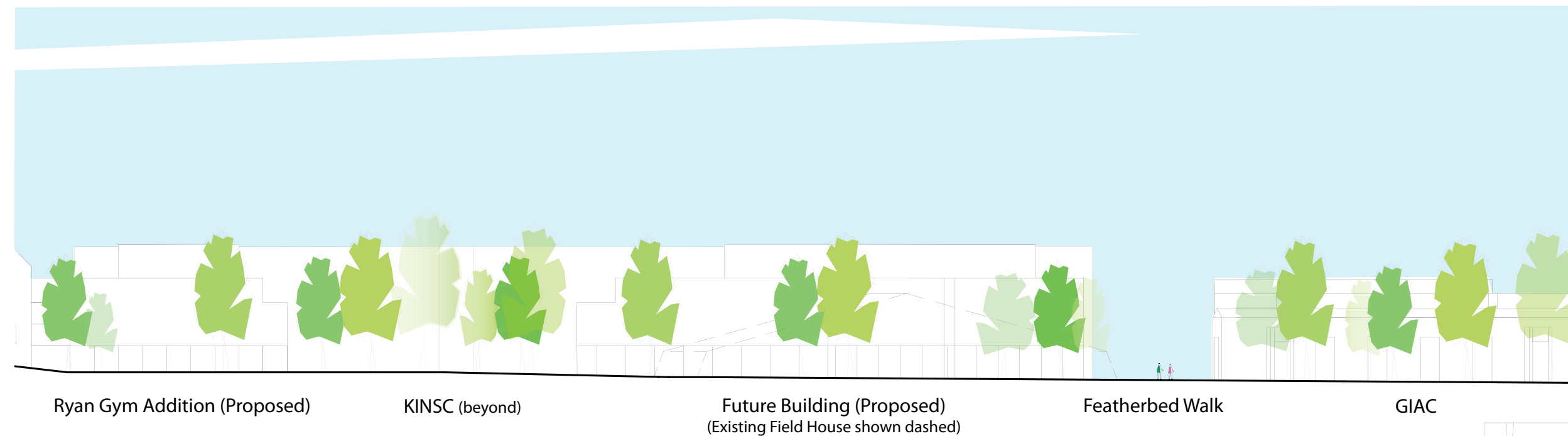


Fig. 28. “Nolli” alternate map of HCA





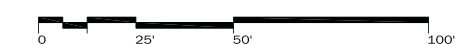
COLLEGE WALK SECTIONS

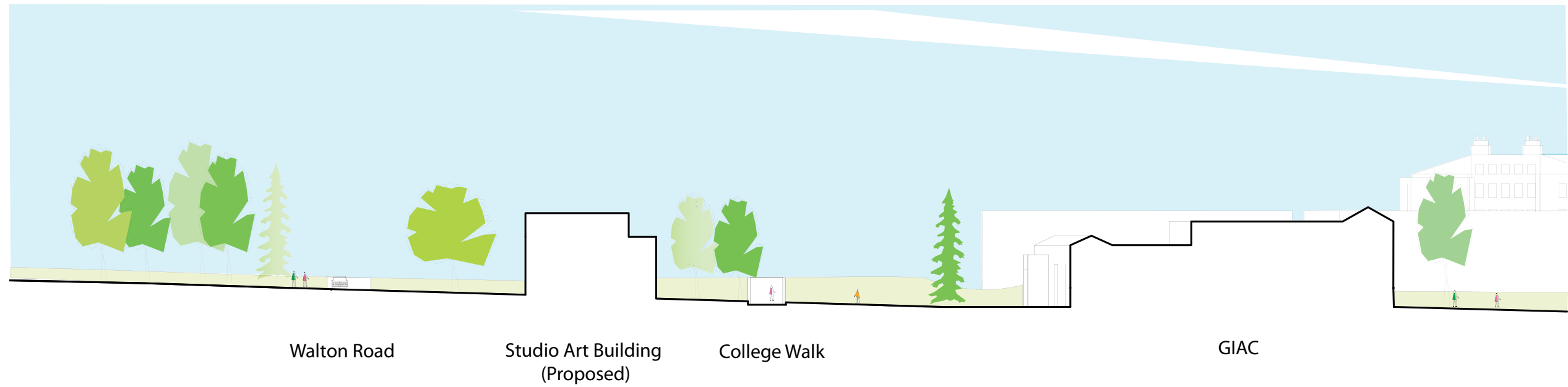
HAVERFORD COLLEGE Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source:

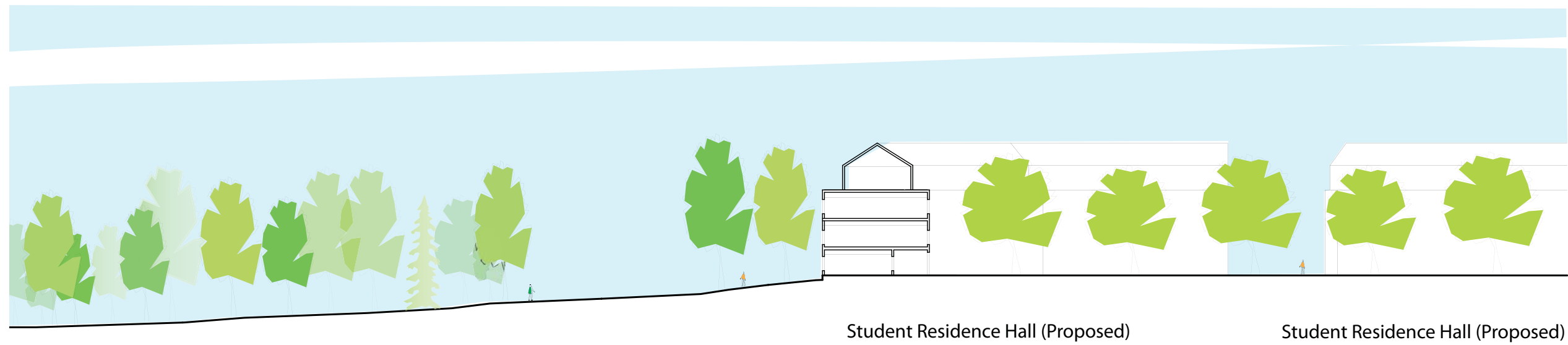
Venturi, Scott Brown and Associates, Inc.

January 29, 2009





FEATHERBED-ORCHARD WALK SECTION A-A (LOOKING NORTH)



FEATHERBED-ORCHARD WALK SECTION B-B (LOOKING SOUTH)

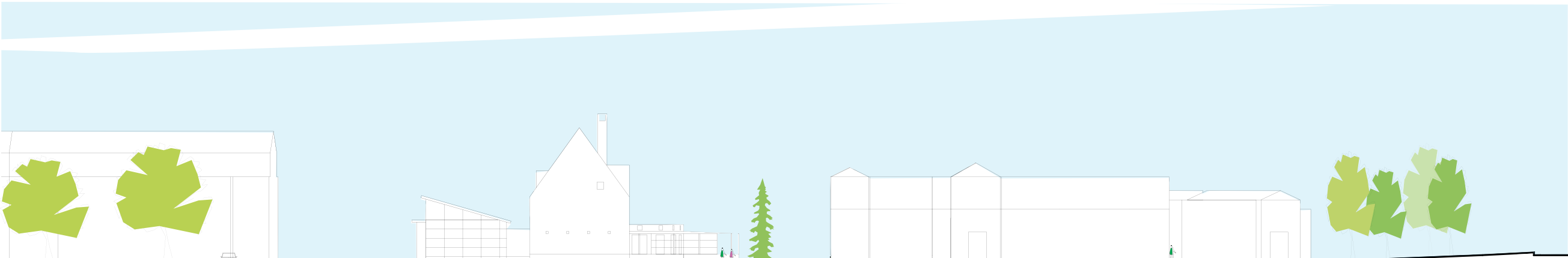


Whitehead Campus Center

Campus Center
Addition (Proposed)

Walton
Road

Student Residence
Hall (Proposed)



Student Residence
Hall (Proposed)

Walton
Road

Campus Center
Addition (Proposed)

Whitehead Campus Center

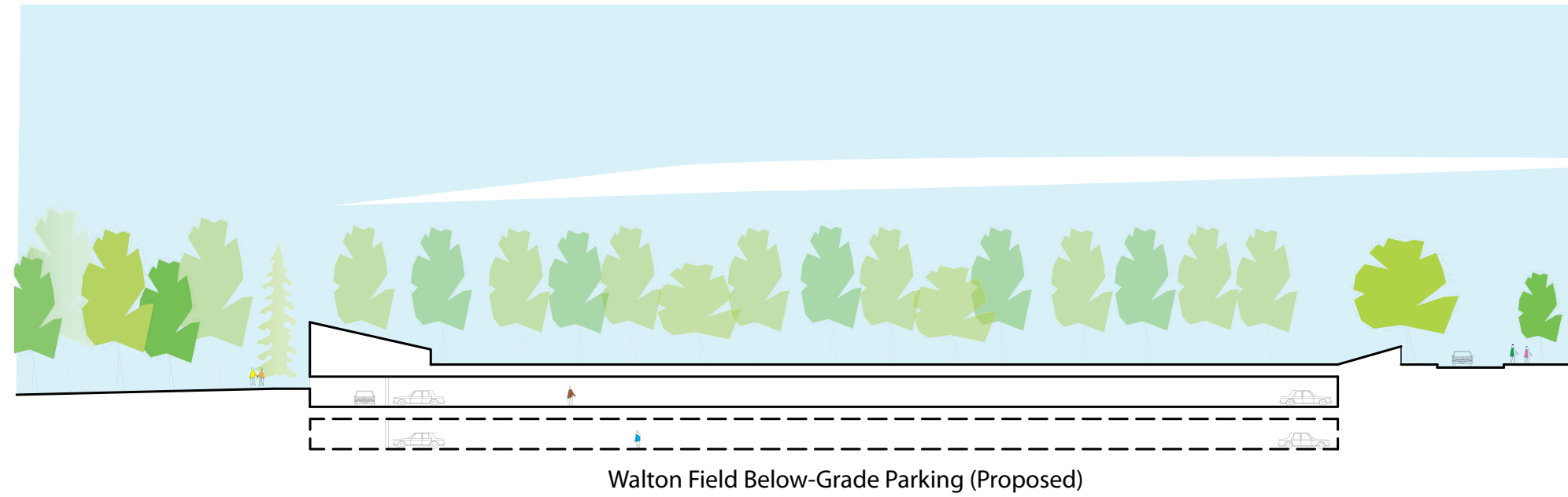
GIAC



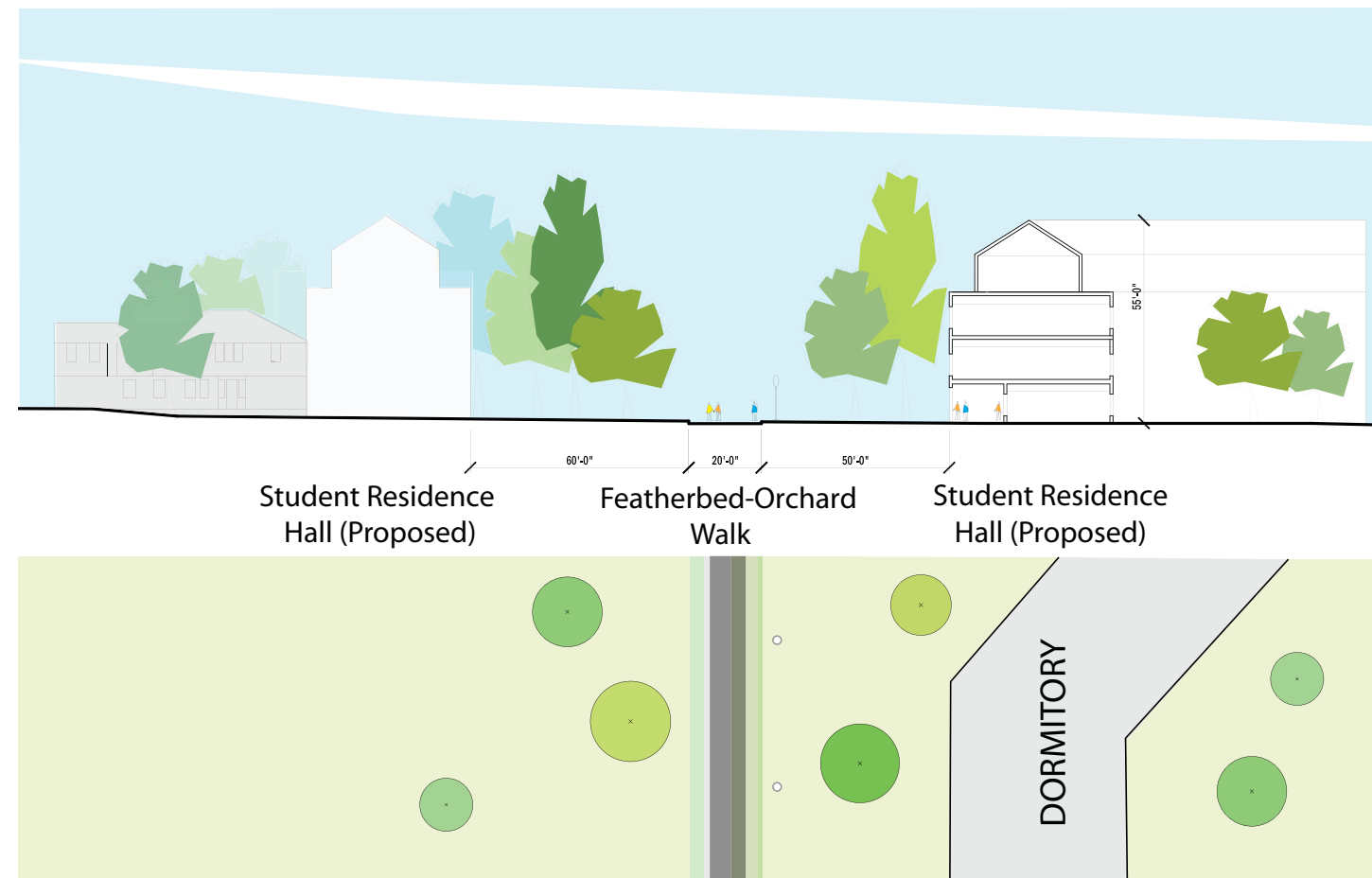
FEATHERBED-ORCHARD
WALK SECTIONS

HAVERFORD COLLEGE
Campus Master Planning

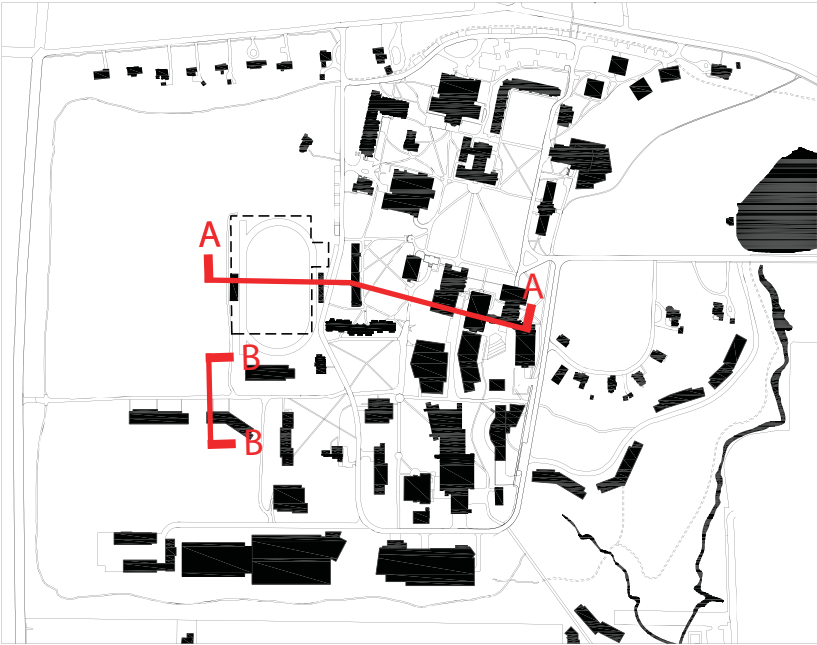
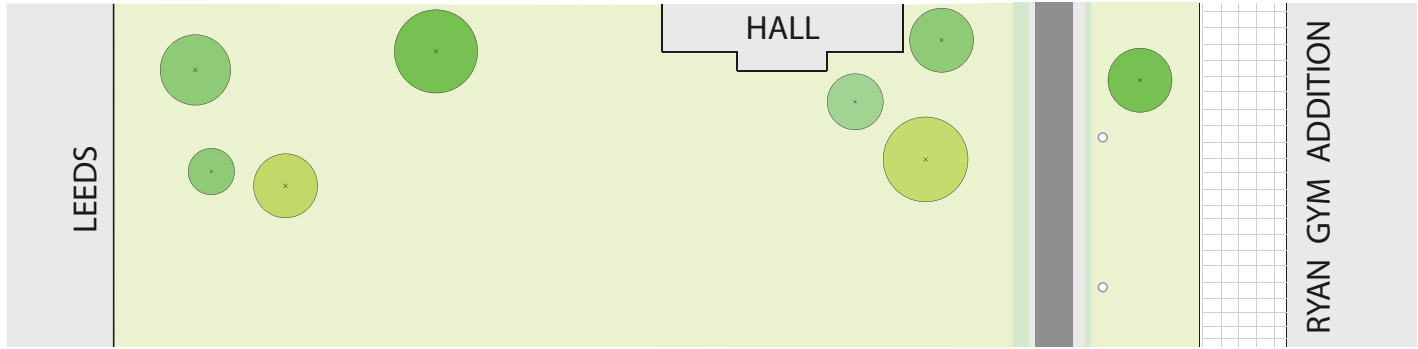
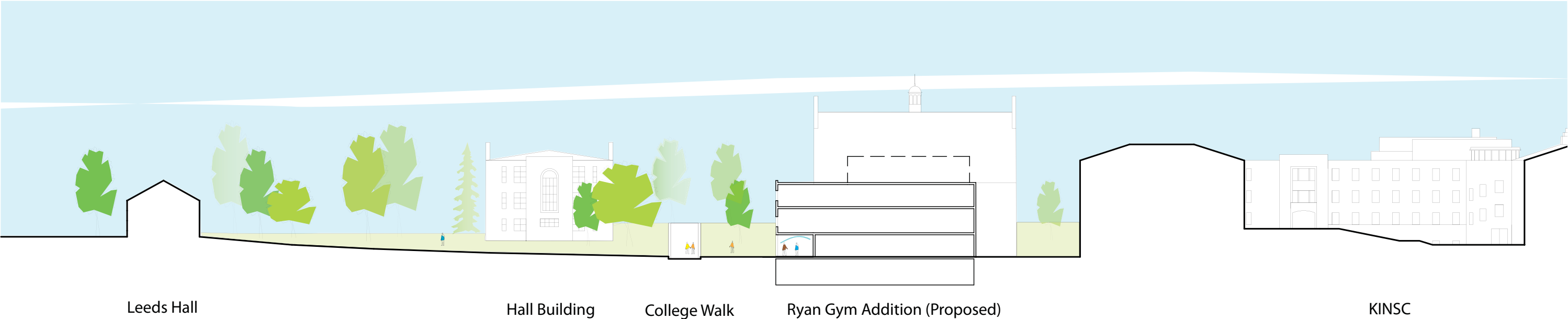
Base Map Source: Haverford College Facilities Mgt.
Information Source:



RYAN GYM-WALTON SECTION A-A (LOOKING NORTH)



FEATHERBED-ORCHARD WALK SECTION B-B (LOOKING EAST)



RYAN GYM-WALTON SECTION FEATHERBED-ORCHARD WALK SECTION

HAVERFORD COLLEGE
Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source:

1	Library Addition to Ryan Gym - 4 levels plus basement 85,000 GSF
12	Theater, Dance and Music about 42,650 GSF
12a	Structured Parking 4 levels about 400 spaces
12b	Additional Program - Academic or Administrative (Admissions?) 3 levels + basement
17	New Academic Building on Field House Site 3 levels + basement About 78,000 GSF
18	Magill Addition 3 levels + basement or 4 levels + basement 85,000 to 103,000 GSF

KEY

- Building Entrances
- Service Entrances
- Existing Buildings
- Proposed Buildings

CAMPUS CORE
SITE CAPACITIES + GUIDELINES
ALTERNATE OPTION
HAVERFORD COLLEGE
Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source:



C. SOME OTHER ALTERNATIVES

The framework of the plan is flexible, to allow changes based on evolving campus circumstances, priorities and relationships.

1. Ryan Gym Option 2: Library

One alternate would relocate the Library from Magill to Ryan Gym and its addition. Here, the Library would remain on Founders Green, while also providing a strong academic presence on College Walk. The programmatic and logistical pros and cons of this approach are described in Section VI.F.

From a design point of view, we believe a large building at this location be well-integrated into the campus, provide that:

- Heights were kept (relatively) modest – three stories – along College Walk and below the eaves at the attachment to Ryan Gym. An additional level could be set back from the Walk and from the existing building.
- Entrances were located along College Walk as well as through the Ryan Gym “head house.” This would need to be worked out through careful planning of library security zones and staffing – but multiple entrances have been accomplished successfully at many other collegiate libraries (for example, at Dartmouth’s Baker-Berry Library and Wellesley’s Clapp Library).

A more detailed library feasibility study – including the alternate sites included in this study – should inform the decision-making process. If the library is to be located at Ryan, the schematic design phase for the renovation should include the entire library building.

The decision should be made before the design of the Ryan renovations.

2. Performing Arts

A second major alternate would be to include the Music Department, including the recital hall, in the new Performing Arts Complex. Pros and cons are described in Section VI.E.

3. Walton Road

Some members of the Steering Committee have expressed a preference for re-routing Walton Road, to include Woodside Cottage within the campus core.

We believe this is unnecessary and unlikely to be worth the expense and disruption; further, it would create additional

conflicts between pedestrian and service vehicles. The near term projects outlined in this document do not require the road to be moved; nor do they eliminate the possibility of moving it at a later date.

In either case, it should be a long-term goal to remove parking from Walton Road.

D. ARCHITECTURAL CHARACTER AND MATERIALS

1. New Construction

The plans, sections and diagrams in this chapter give some idea of the massing of additions to the campus – but what should they *look* like? Haverford’s buildings should look and “feel” like Haverford – with a rich palette of natural materials; wherever feasible, these should be set against a Romantic landscape of mature trees.

One member of the campus community described the “beautiful indigenous materials [and] the simplicity of the structure” of Founders Hall as a point of reference: “Its simplicity and elegance are aesthetic touchstones, and the quality of its materials (built to last for hundreds of years)... reminds us that the place is meant to be perpetual. Such a standard might cause people to think quality, forever-ness, simplicity, and beauty when making decisions about a new building or even a new sign.”

We agree that these qualities – “forever-ness, simplicity, and beauty” – should be integral to the new campus construction. That is not to say, however, that campus buildings should mimic existing buildings or replicate the architecture of an earlier time. The College should encourage its designers to use simple, traditional, durable materials in new ways and, especially, to consider more transparency in its buildings. More transparency could help create stronger connections between inside and outside, and provide interior spaces with daylight and views. Additionally, seeing communal activities from walks and paths could help promote a greater sense of inclusion in the community, an invitation to participate, and a livelier campus atmosphere.

2. Preservation

Haverford College’s heritage of historic buildings is integral to its physical character and identity – central to a visitor’s first impressions and an alum’s lasting affections. The preservation and care of these buildings – which include domestic buildings like those along College Lane as well as more institutional buildings like Founders Hall – is fundamental to the continued beauty and image of the campus. Existing Haverford resources to help guide the College’s stewardship include:

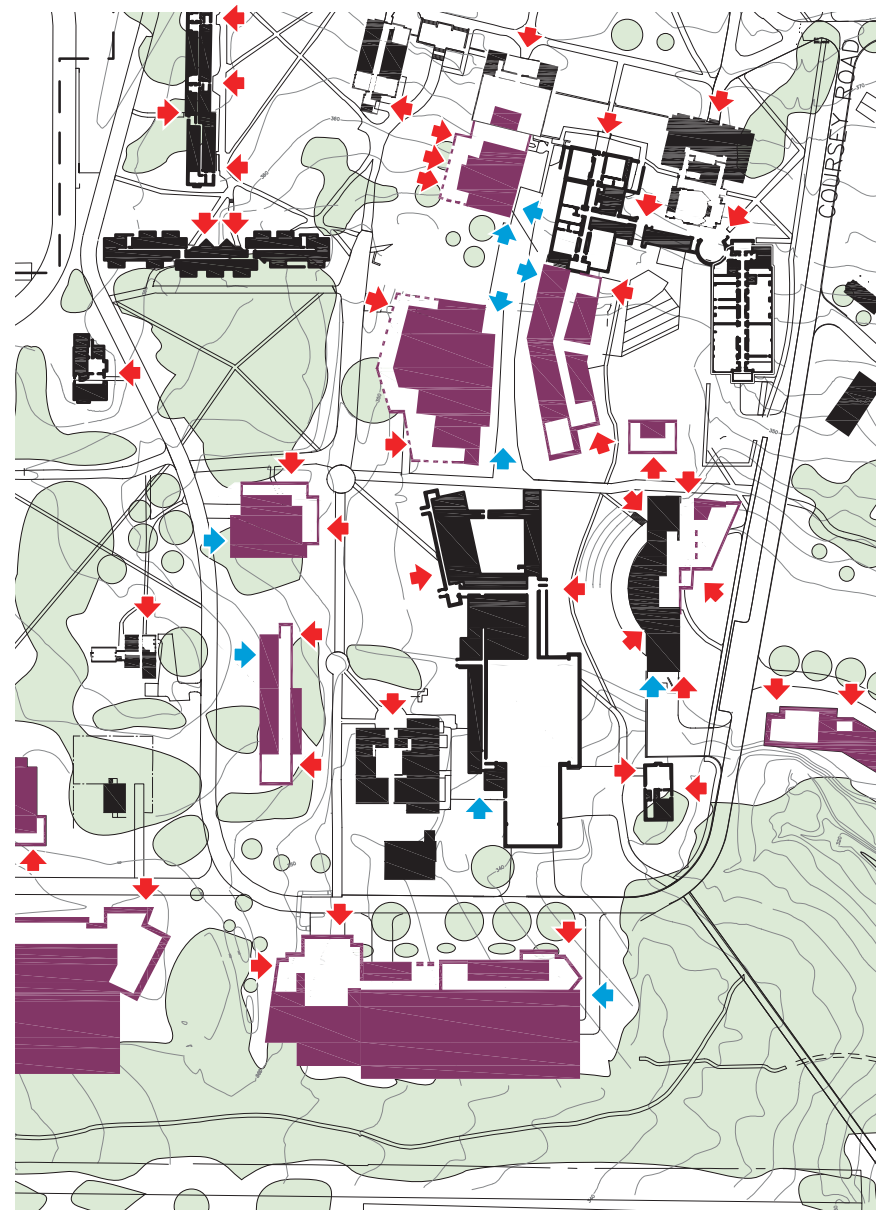


Fig. 29. “Nolli” map with existing configuration of Walton Road

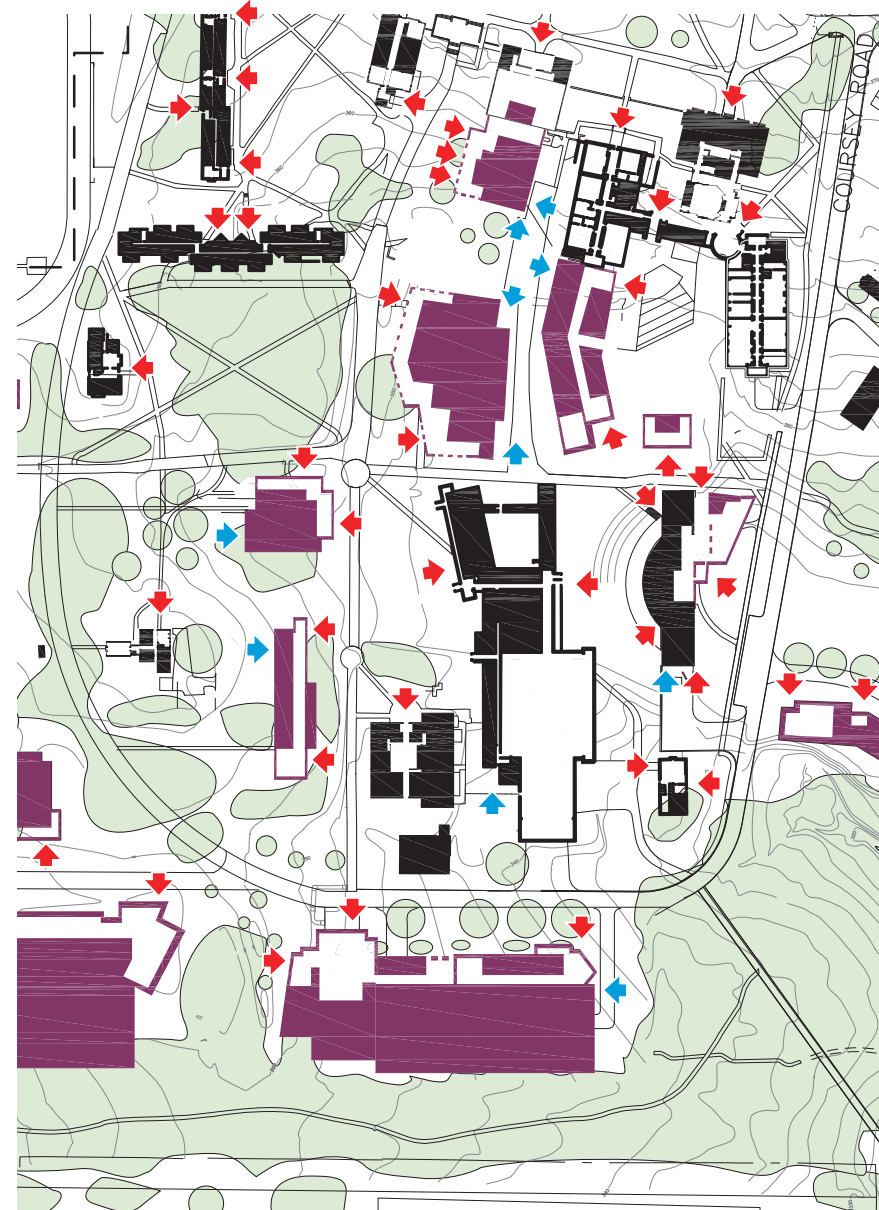


Fig. 30. “Nolli” map with alternate configuration of Walton Road

KEY

- ◆ Building Entrances
- ◆ Service Entrances
- Existing Buildings
- Proposed Buildings



- The 2004 *Analysis of Historic Exterior Finishes Characterization* (Noble Preservation Services, Inc. and CivicVisions, LP) – also known as the “Getty Report,” includes provides a detailed study of the finish materials and colors of campus buildings; these findings should be consulted in any work visible from the exterior.
- The 1999 *Haverford College Resources Campus Survey* (E. Cooperman, D Vitiello) notes some important interior features for preservation in the College’s most significant buildings.

In addition, we strongly recommend following the National Park Service’s *Secretary of the Interior’s Standards for the Treatment of Historic Properties* (www.nps.gov/hps/tps/tax/rhb/stand.htm) as a guide to maintaining, preserving and rehabilitating the campus’ historic buildings.

V. CAMPUS-WIDE SYSTEMS

V. CAMPUS-WIDE SYSTEMS

A. CIRCULATION, TRANSIT AND PARKING

Haverford has some transportation-related advantages over many similarly bucolic institutions. The campus core is compact, and even the most remote parts of campus (including HCA) are no more than a 10 or 15 minute walk from Founders Green. Two rail lines – the SEPTA’s Route 100 and the R5 Regional Rail – are within walking distance of the campus.

The plan’s approach to campus circulation builds on these strengths and includes:

- *Extending connections.* Improving and extending existing campus paths beyond the campus core, and creating new paths related to new buildings or landscapes builds on the existing network of campus walkways.
- *“Darning and mending.”* Small-scale interventions could help improve the pedestrian experience, encourage forms of transportation other than single occupancy vehicle, and make wayfinding easier.
- *Improving accessibility.* Coordinated efforts are needed to improve accessibility in the landscape and within buildings.
- *Parking strategies.* We recommend managing the demand for parking in tandem with identifying locations for additional parking lots and structures as existing parking lots are developed for other purposes.

1. Entrance and Wayfinding

The Lancaster Avenue entrance to the campus is one of the most beautiful approaches to any college campus, but wayfinding can be difficult.

- Consider redesign of the intersection of Coursey Road and College Lane to make the (normally) required left-turn more intuitive.
- Consider replacing speed bumps with speed “humps” or “tables,” which are equally effective in calming traffic, but much easier on cars and bicyclists. The speed tables also provide a raised (level) pedestrian crosswalk and therefore should be located where they would benefit both pedestrian circulation and safe traffic speeds.
- A series of gateways are proposed for the edge of the property, and a secondary set of pedestrian gateways are proposed along the loop road. These gateways could include signage or maps for orientation. (Pedestrian-scaled maps at College entrances would help orient those arriving on foot from transit stops.)

2. Vehicular Circulation

- Consider right-turn only exit from College Lane at certain times of the day; alternately, selectively widen the Lane to allow a left-turn-only exit lane. The latter option would involve removing some trees and rebuilding part of the stone wall; further study would be needed to confirm the need.
- Consider discussing with the Pennsylvania Department of Transportation (PennDOT) and Lower Merion Township the possibility of re-timing Lancaster Avenue traffic signals to the east and west of the College Lane intersection to allow larger gaps in traffic for turning.
- Consider widening Carter Road to make it two-way, removing parking if necessary, allowing drivers to loop back without exiting the campus.
- At the campus exit onto Old Railroad Avenue, provide more obvious signage direction to Lancaster Avenue and Haverford Road.
- Our plans show improvements to Featherbed Lane for emergency and construction access (and, possibly, limited service access), but not as a general entrance to or exit from the campus.

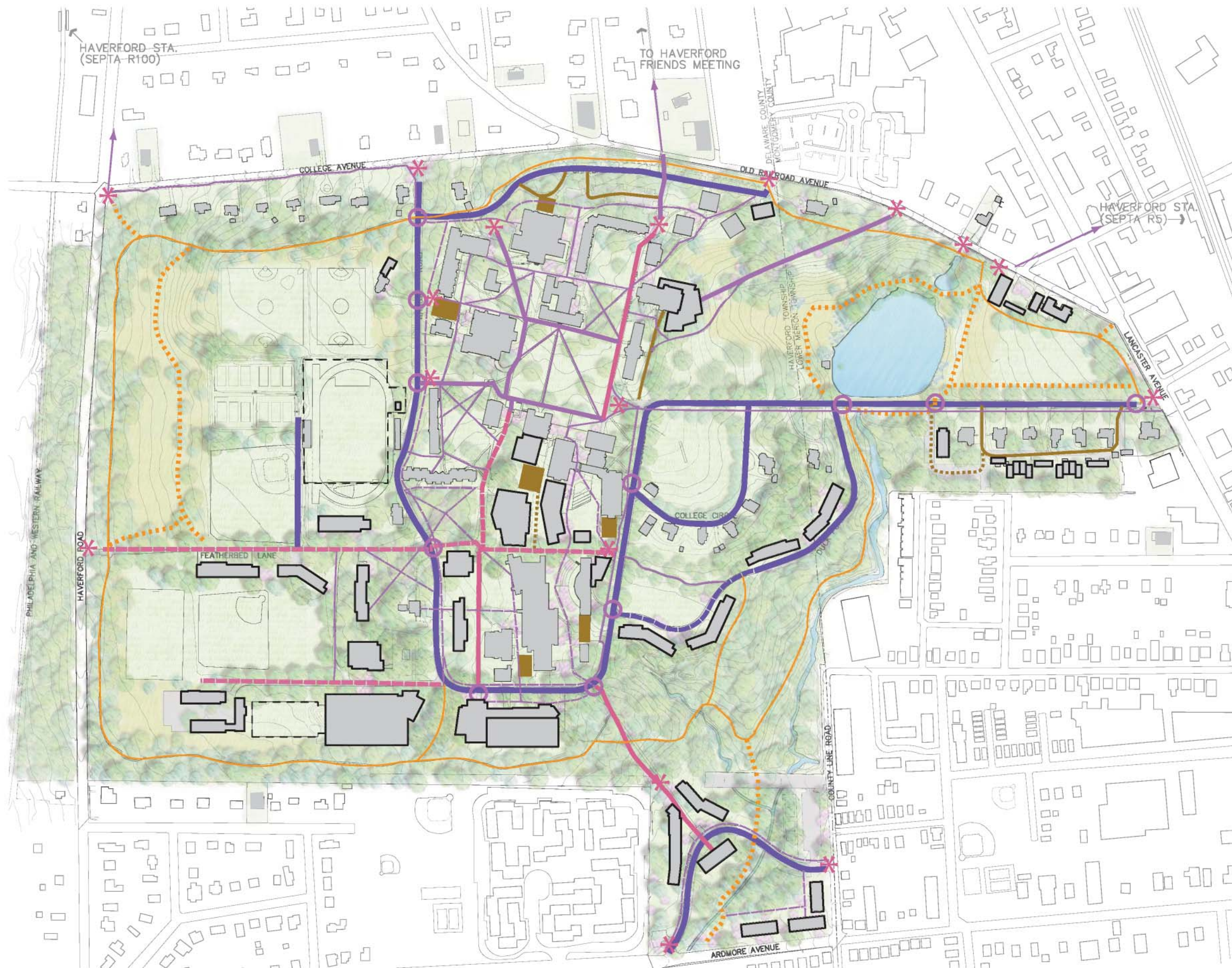
3. *Pedestrian Circulation*

Haverford College is widely acknowledged as a beautiful place for walking. On weekends, visitors stroll the grounds and jog along the nature trail. Walking is the primary mode of travel for the College community, too, and the campus' small size makes travelling on foot easy and pleasant in all but the most inclement weather.

A goal of the plan is to strengthen connections between areas, and to create an accessible, pedestrian-friendly, bicycle-friendly framework for future development. Our plan indicates strengthening two pedestrian axes through the campus core – one north/south and the other east/west – that provide a backbone of a framework of secondary and tertiary paths connecting a campus-wide network of campus spaces and activities:

- Primary pedestrian pathways thread through the length and width of the campus, connecting spaces and helping to orient visitors.
- Some primary pathways are also shared access routes for service and emergency vehicles. Golf carts and other small service vehicles should, to the extent feasible, be kept to the wider paths to avoid conflicts with pedestrians.
- Pedestrian pathways jog or bend slightly so a pedestrian's line of vision terminates at distant open space.
- Diagonal paths in quadrangles are secondary pedestrian pathways.
- Vehicles remain primarily on the existing perimeter road.
- "Table-crossings" combine pedestrian crosswalks with traffic calming.
- A continuous sidewalk on the south side of College Lane, by the extension of the existing sidewalk west along the edge of Cope Field to Coursey Road, could be considered. The sidewalk should make a logical connection to the east-west walk at the south side of Founders Green, in front of Sharpless Hall and Ryan Gym. A similar continuous sidewalk is not proposed for the north side of College Lane, since this is a more informal, romantic, park like setting, and foot traffic appears light enough to be supported by one sidewalk. The existing north-side sidewalk between Lancaster Ave and the Duck Pond should be phased out and either not replaced, or – space permitting – replaced as a discrete landscape walk within the lawn on the opposite side of the street trees. Level crosswalks (speed tables) should connect the southern College Lane sidewalk to the proposed nature trail loop around the pond, and walkway connection to the Haverford R5 train station.

- A continuous pedestrian walkway at the eastern side of Walton Road, could be considered to create a continuous sidewalk around the perimeter of the developed campus, and to discourage pedestrian use of the street. This sidewalk should be set well to the inside of the roadway edge (unlike Coursey Road), to simultaneously maintain the informal, pastoral character of Walton Road, allow for adequate growing space for the mature street trees, and to support a green, park-like setting for the pedestrian walk itself (see proposed roadway section, page 74).
- The Nature Trail loop is connected around the perimeter of the pond, and along the interior (uphill) edge of the Pinetum, to expand the opportunity to explore Haverford's natural setting. Educational and interpretive information could be incorporated along the trail.
- Additional paths could be added to improve connections to the train station and other public transit areas off campus. In particular, sidewalk improvements would greatly improve the pedestrian route between campus and the Route 100 station. The portions of the Nature Trail which are regularly used as a link to the R5 Haverford Station or the Route 100 should have a well-maintained woodchip or aggregate surface; avoid informal foot paths or bare soil.
- Removing parking from Carter Road could be considered to allow two-way traffic and create a wider easement for the Nature Trail. Since the many existing large trees may conflict with creating the needed pavement widths, pavement widening should be minimal. A second option would be to make the central portion of Carter Road a one way loop (return through the Lloyd Hall parking lot), with the eastern leg of Carter Road remaining as one-way out. This option would limit necessary widening to the western third of Carter Road.



KEY

- Vehicular connections
- Pedestrian walkway connections
(proposed walks are dashed)
- Shared Walkway: pedestrian/service/emergency
(proposed sections are dashed)
- Gateway
- Possible Table Crossing locations
- Nature Trail
(proposed sections are dotted)
- Service Laneways and Courts
(proposed sections are dashed)
- Buildings - Proposed
- Buildings - Existing

PROPOSED CAMPUS CIRCULATION HAVERFORD COLLEGE

Campus Master Planning
Base Map Source: Haverford College Facilities
Management



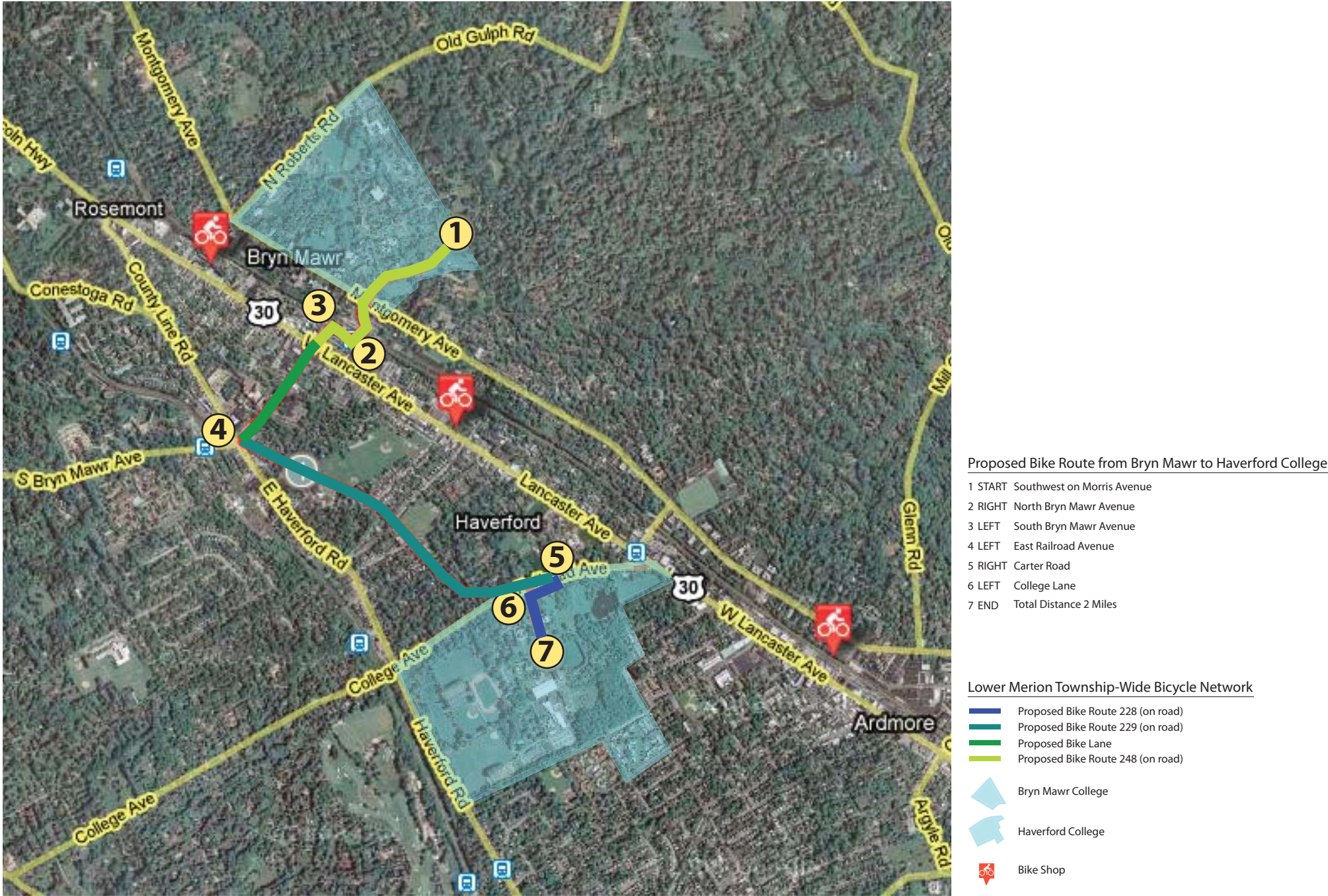
4. Bicycles

Even with relatively short walking distances between campus destinations, bicycles could become a more integral part of the Haverford circulation system.

- Given the relatively small campus population, bicycles could co-exist with pedestrians and vehicles; dedicated bikeways are not necessary.
- Bicycle racks and bicycle shelters should be placed in high population areas – near dining halls, academic buildings with large concentrations of classrooms and near the campus “living room” and student activity areas. Bicycle storage areas could be included in the programming for residence halls and faculty apartments.
- There is a desire among students for a bike path between Bryn Mawr and Haverford, but at present the connecting roads are daunting for all but the most experienced cyclists. “Pinch points” include narrow underpasses below the SEPTA R5 line. In 2004, Lower Merion Township completed a feasibility study for a Township-wide Bicycle and Pedestrian Network, but its recommendations have not yet been implemented. (A map showing a two-mile bicycle route between the two colleges is included is shown to the right. It is based on recommendations in the Township plan.) The College could consider working with Lower Merion Township, Bryn Mawr College and citizens’ groups like the Lower Merion Bike Committee to identify and implement routes between Haverford College, Bryn Mawr, and other student destinations. Once routes have been established, bicycle route maps could be posted or distributed at Bryn Mawr and Haverford College bike racks.
- Shuttle buses (the “Blue Bus” and Tri-Co shuttle) could be outfitted with simple bike racks to allow students to bring bikes between campuses.
- First year students could receive information encouraging them to bring bicycles to campus. A shared bike program has been discussed, but not implemented; it could further increase bicycle use.

5. Parking

In the long term, as existing parking lots are developed for other uses, parking structures should be created to limit the amount of new impervious surface, preserve open space and possibly remove most parking from campus roads.



PROPOSED BIKE ROUTE
HAVERFORD COLLEGE
Campus Master Planning

Base Map Source: www.mymapride.com
Information Source: www.mymapride.com

Near term strategies for parking include:

- Maintaining existing parking lots in early increments of the plan where feasible, to forestall the need for structured parking. Our near term diagrams for student housing on the Orchard lot indicate a location for replacement parking. (The lot shown would replace most of the existing spaces; about another ten spaces would be needed to provide full replacement.)
- As construction displaces existing parking, considering new surface lots at future locations of athletics facilities along the south edge of campus, again to forestall the need for structured parking.
- Pairing new parking with traffic demand management strategies for reducing the number of parking spaces required. (See Section VII.B.2. for some examples.)
- Potential parking on the College-owned properties on the west side of Haverford Road. This would be a far less expensive – but also far less convenient – alternative to a parking structure. These spaces would be about a 10 to 15 minute walk to most campus destinations. An on-demand shuttle service – or rush-hour-only shuttle – could help mitigate this for some staff members. (The cost of this service should be compared to the cost of debt service on a parking structure.) Alternately, student parking could be located here, thereby discouraging students from using automobiles for daily errands or for attending class at Bryn Mawr, Swarthmore or Penn, when transit was available. In any case, pedestrian safety would need to be carefully analyzed and considered. Transportation consultants URS believe that, even with the additional traffic and pedestrians crossing, meeting standard engineering thresholds for an additional signal along Haverford Road (at Featherbed Lane, for example) would be unlikely.

On page 57, we show potential locations for parking. Our long-term options for future development indicate:

- One or more parking structures. Parking under Walton Field would provide a high concentration of parking near the core of campus and north of the South Lot.
- Reducing parking along Walton and Carter Roads to provide a better, more beautiful sense of connections between the campus core and the fields, and to allow Carter Road to be widened to allow a covered shuttle stop and a loop in the road. This would also be an opportunity to create more of a landscape buffer between Carter Road and the Nature Trail.
- A net addition of between about 210 and 610 spaces, assuming that most parking would be removed from Carter and Walton Roads. (The lower number is with one level of

parking below Walton Field; the higher number is with two levels below grade in this location.) By Haverford Township regulations, this amount of parking could support about between 210,000 and 610,000 gross square feet of campus development, as most campus uses fall under the zoning codes “other” category. (Lower Merion regulations are somewhat different, but most of the development shown is in Haverford Township.)

- If parking below Walton Field is not affordable or desirable, an alternate approach would be to maintain parking on Carter Road and create a new surface lot on the west side of Haverford Road. In this case, there would be a net addition of about 170 spaces, enough to support 170,000 gross square feet of campus development.
- Although not specifically mentioned in Haverford Township’s code, some uses – like spectator seating in athletics buildings or audience seating in a theater – could

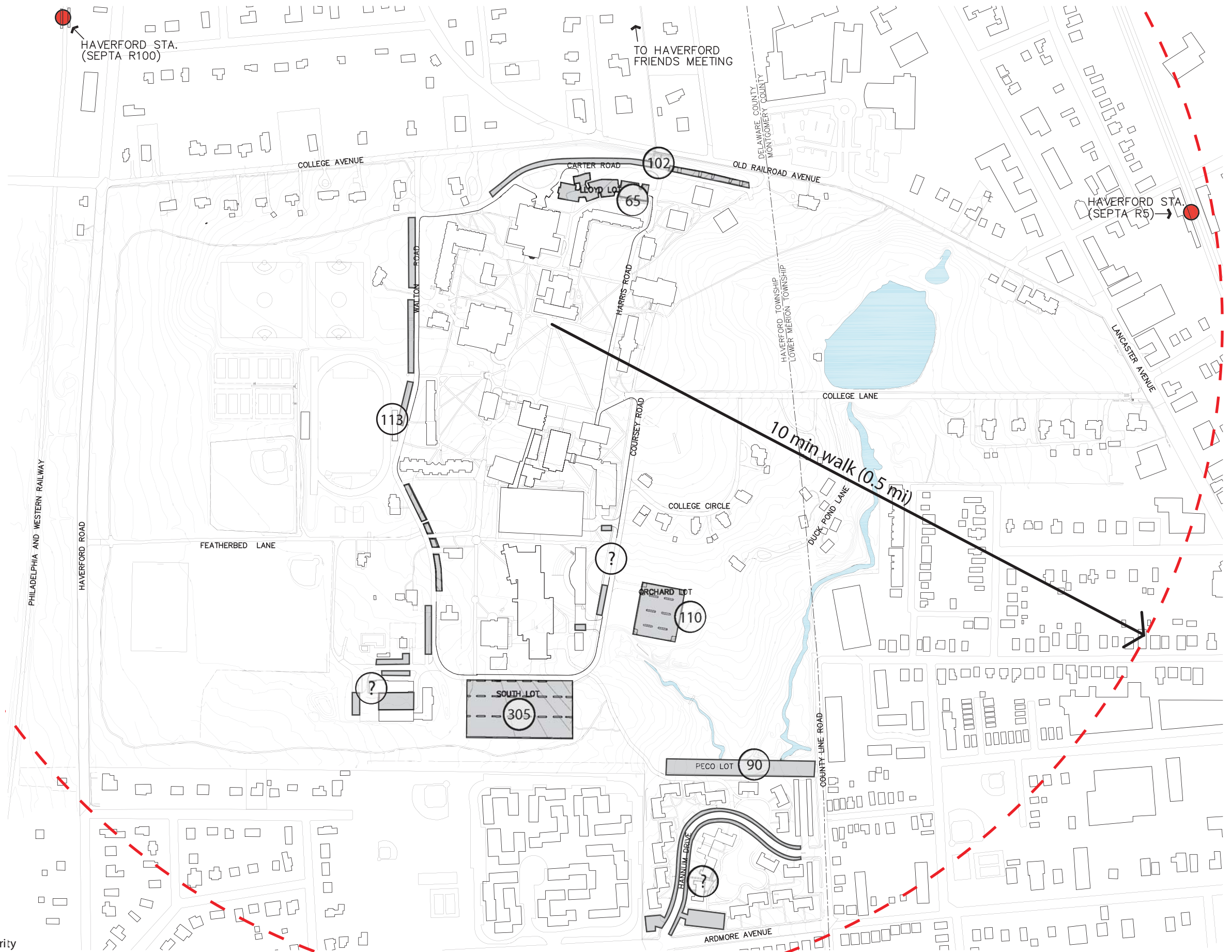
increase the number of spaces required. Likewise, an increased need for parking could be offset by managing demand, or by limiting the number of student parking permits. The amount of new parking required by code could be refined when more is known about the timing of some of the programs of the plan.

6. Transit

The campus is well-served by public transit routes, with SEPTA Route 100 and Route R5 lines within walking distance. Paths and sidewalks should be selectively added to campus to facilitate pedestrian access to transit stops. (See diagram page 59.) These improvements are an important part of a strategy to encourage greater use of alternative transit to campus.

PARKING OPTIONS								
	Approx. Area (GSF)	Construction cost/GSF		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier)	
		Low	High	Low	High		Low	High
Underground Parking at Walton Field for 400 cars								
Underground Garage	140,000	\$110	\$110	\$15,400,000	\$15,400,000	1.25	\$19,250,000	\$19,250,000
Track and Field	140,000	\$25	\$50	\$3,500,000	\$7,000,000	1.25	\$4,375,000	\$8,750,000
Grandstand Building	3,800	\$250	\$300	\$950,000	\$1,140,000	1.25	\$1,187,500	\$1,425,000
Grandstand Seating (#seats)	150	\$200	\$250	\$30,000	\$37,500	1.25	\$37,500	\$46,875
				\$19,880,000	\$23,577,500		\$24,850,000	\$29,471,875
						cost/stall	\$62,125	\$73,680
Underground Parking at Walton Field for 800 cars (2 levels)								
Underground Garage	280,000	\$90	\$90	\$25,200,000	\$25,200,000	1.25	\$31,500,000	\$31,500,000
Track and Field	140,000	\$25	\$50	\$3,500,000	\$7,000,000	1.25	\$4,375,000	\$8,750,000
Grandstand Building	3,800	\$250	\$300	\$950,000	\$1,140,000	1.25	\$1,187,500	\$1,425,000
Grandstand Seating (# seats)	150	\$200	\$250	\$30,000	\$37,500	1.25	\$37,500	\$46,875
				\$29,680,000	\$33,377,500		\$37,100,000	\$41,721,875
						cost/stall	\$46,375	\$52,152
Above-grade Structured Parking for 400 cars								
350 gross square feet/stall	140,000	\$70	\$100	\$9,800,000	\$14,000,000	1.25	\$12,250,000	\$17,500,000
						cost/stall	\$30,625	\$43,750
Surface Parking for 400 cars								
325 gross square feet/stall	130,000	\$10	\$15	\$1,300,000	\$1,950,000	1.25	\$1,625,000	\$2,437,500
						cost/stall	\$4,063	\$6,094

Fig. 31. Parking options and costs

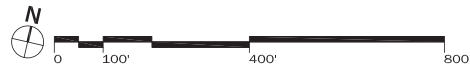


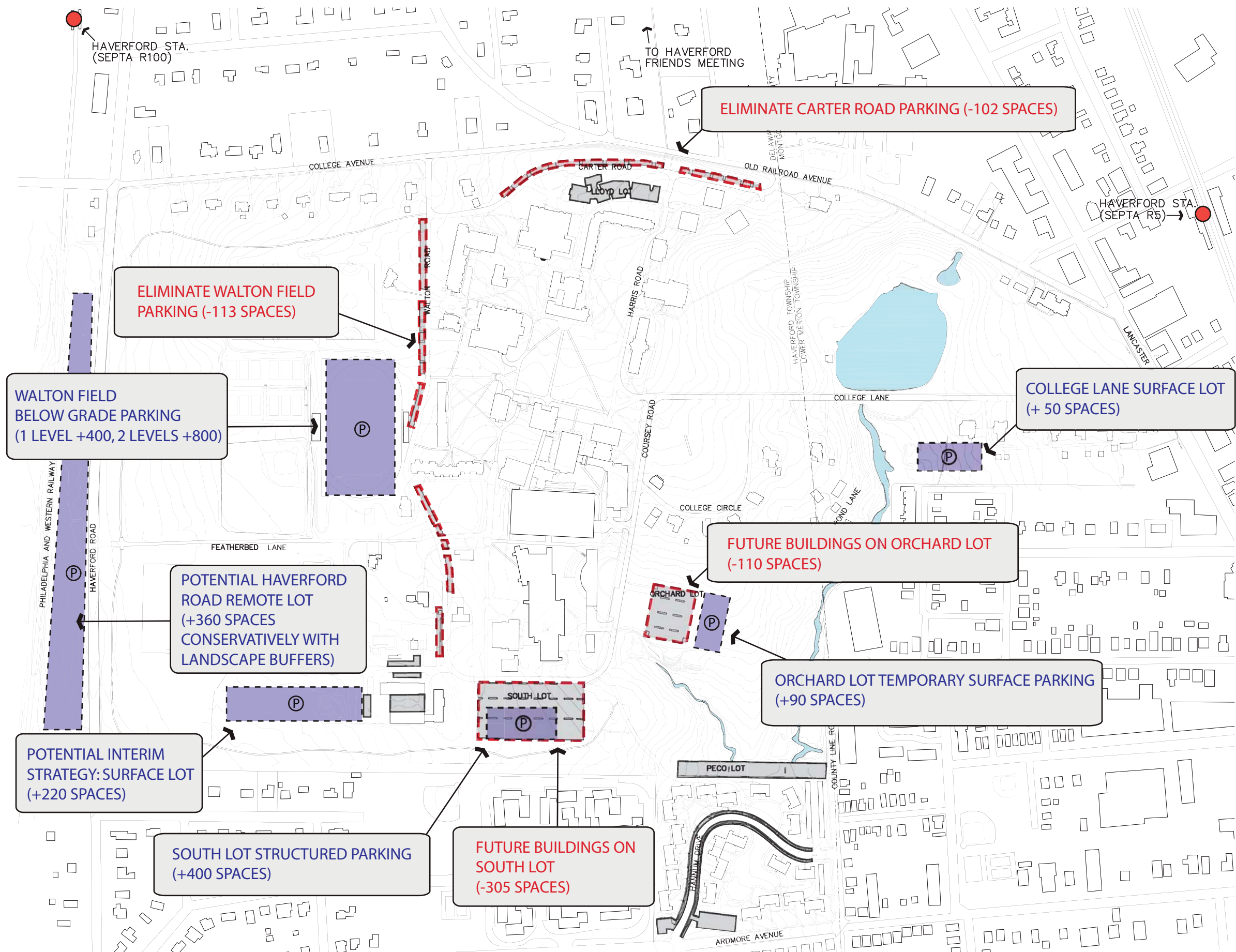
KEY

- Existing Parking
- Number of Spaces
- SEPTA Station

EXISTING PARKING
HAVERFORD COLLEGE
Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source: Haverford College Safety and Security





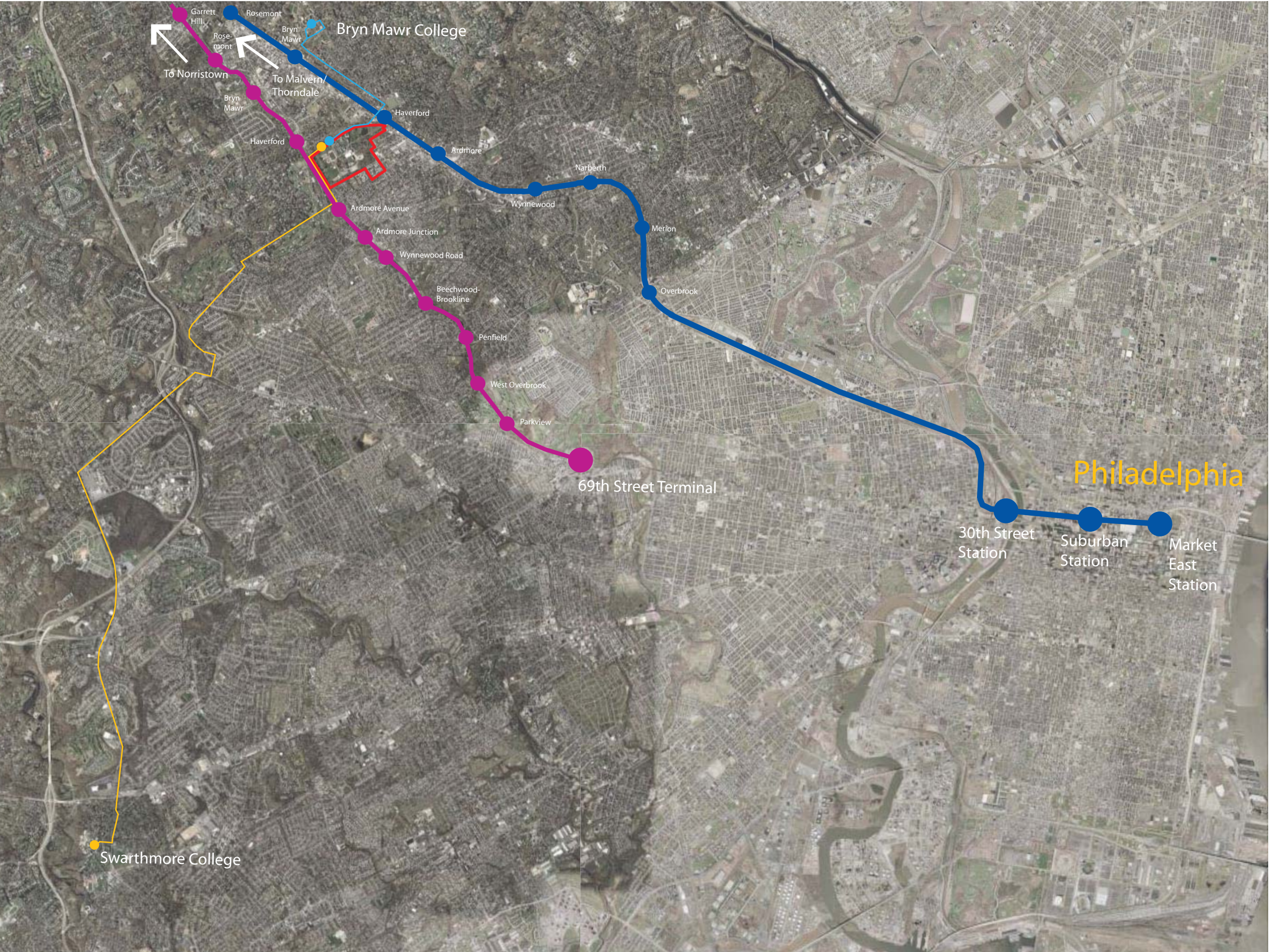
KEY

- Existing Parking
- Omitted Parking
- Added Parking
- SEPTA Station

OPTIONS FOR PARKING
HAVERFORD COLLEGE
 Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
 Information Source: Haverford College Safety and Security





KEY

- SEPTA R5 Regional Rail
- SEPTA Route 100 Light Rail
- Tri-College Shuttle, Haverford to Swarthmore
- Blue Bus, Haverford to Bryn Mawr
- Haverford College

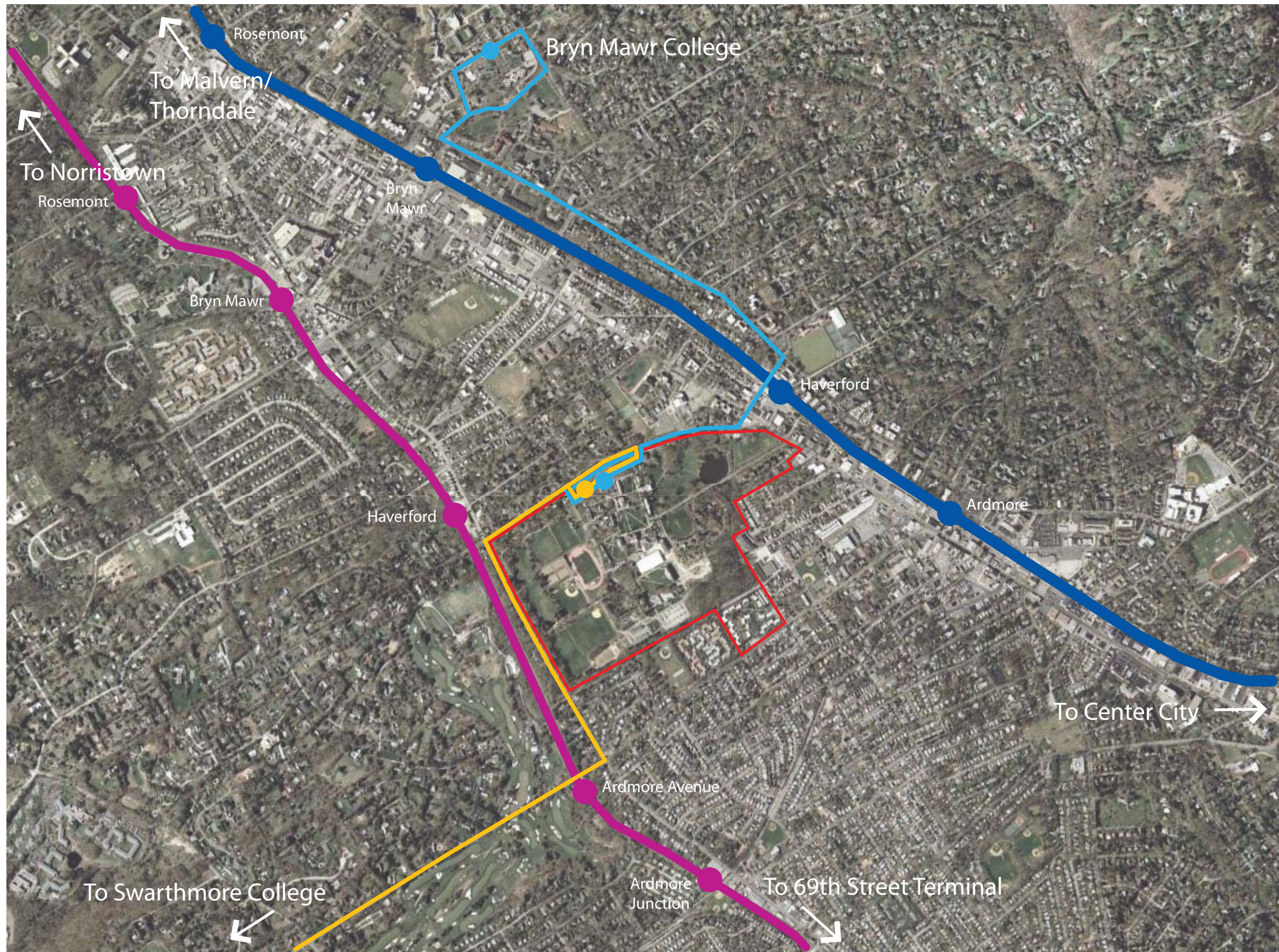
REGIONAL TRANSIT LINKS

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Google Earth
Information Source: SEPTA; Transportation Dept., Bryn Mawr College

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0 0.25mi 1mi 2mi



KEY

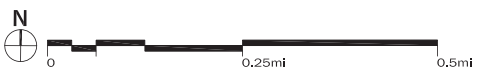
- SEPTA R5 Regional Rail
- SEPTA Route 100 Light Rail
- Tri-College Shuttle, Haverford to Swarthmore
- Blue Bus, Haverford to Bryn Mawr
- Haverford College

LOCAL TRANSIT LINKS

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Google Earth
 Information Source: SEPTA; Transportation Dept., Bryn Mawr Col.



KEY

Potential Path or Sidewalk

Potential Two Way Road

Existing Two Way Road

Proposed Crosswalk

SEPTA Station

POTENTIAL CIRCULATION IMPROVEMENTS

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source:

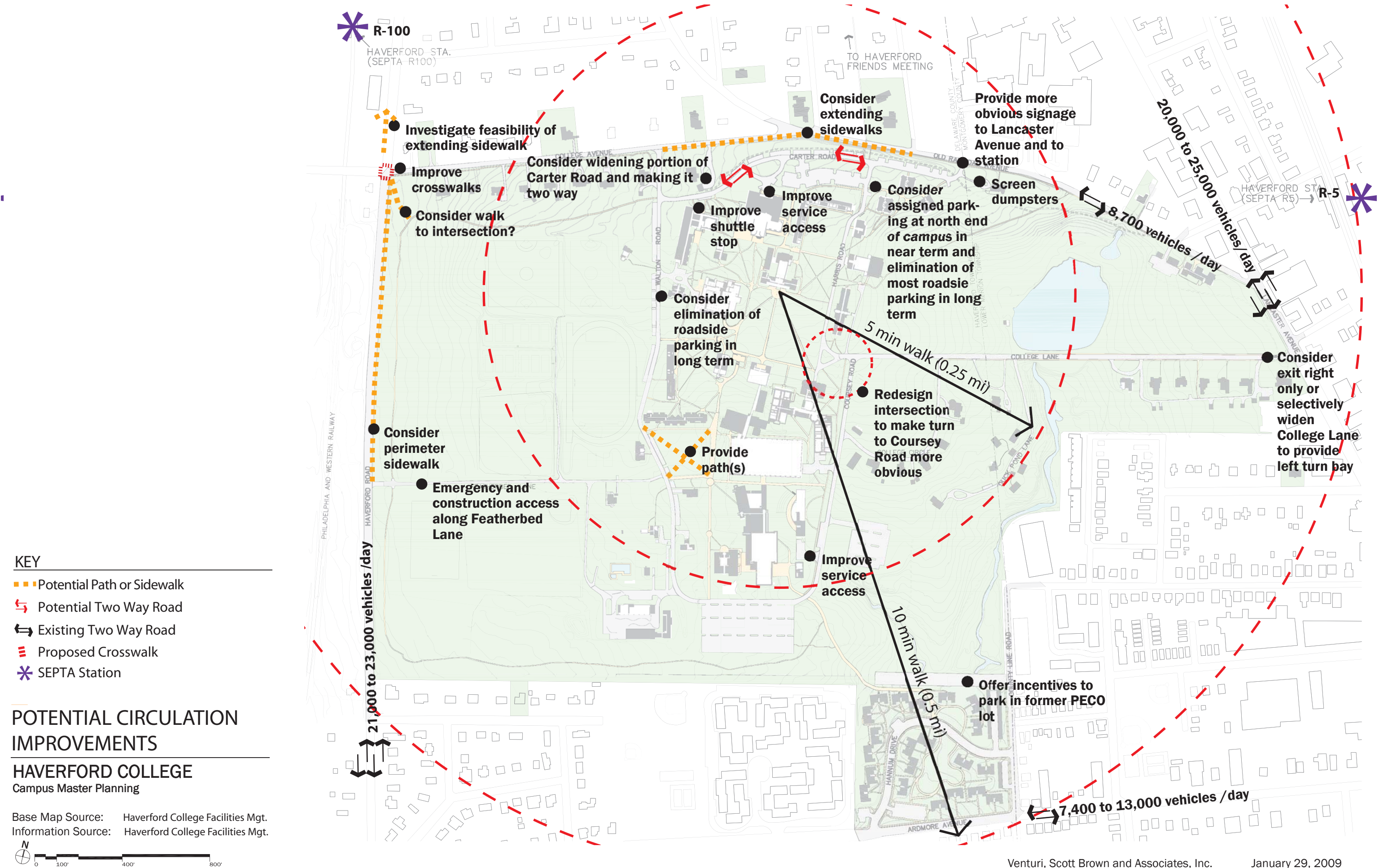
Haverford College Facilities Mgt.

Information Source:

Haverford College Facilities Mgt.

N

0 100' 400' 800'



B. ACCESSIBILITY

An accessible campus is one that accommodates the widest range of potential uses, including people with mobility, visual or auditory impairments or other special needs. It includes not only accessible buildings but also accessible landscapes, transit, communication and information systems.

1. Background

Haverford College, as a private higher education institution, is considered a Title III (Public Accommodation) under the Americans with Disabilities Act (ADA). Beginning on January 26, 1992, all Title III entities were to begin the process of identifying and removing barriers that are considered “readily-achievable.” The United States Department of Justice (DOJ) requires the readily-achievable removal of barriers, even if new, accessible buildings are constructed.

Haverford’s website describes in some detail the accessibility of various buildings on campus, so that visitors and members of the College community know what to expect before arrival on campus.

While a large number of upgrades have been achieved, a number of campus buildings remain inaccessible or only partially accessible. For example:

- Woodside Cottage, home of the English Department, is not accessible.
- Magill Library has some accessible facilities, but persons with mobility issues require help negotiating the steep ramp and heavy front doors.
- Most campus residence halls – including Gummere, the North Dorms, Lloyd, HCA and the power-assisted front door of Roberts – are not accessible.
- Roberts Hall’s Marshall, the largest on-campus auditorium, does not appear to have assistive listening devices.
- There are accessible student dormitory rooms on the first floors of Barclay and Leeds, but additional fully accessible rooms are needed. Department of Justice settlements with academic institutions typically stipulated that a minimum of 3% of available beds be made accessible; in the case of Haverford, over 30 accessible beds, in total, would be needed.
- Alumni Field House is not listed as having accessible toilets.

2. The Exterior Environment

An overall goal is to create a network of accessible routes so that every building that is at least partially accessible is connected to all other at least partially accessible facilities along an accessible route.

The Department of Justice lists as examples of readily achievable barrier removal the following exterior improvements:

- Installing ADA compliant ramps
- Making curb cuts in sidewalks and at entrances
- Widening doors
- Installing offset hinges to widen doorways
- Installing accessible door hardware
- Creating designated accessible parking spaces⁷

Also, when existing buildings are renovated or new facilities are built, not only the building but also the immediate site must be made as barrier-free as possible in accordance with the Americans with Disabilities Act (ADA).

3. The Interior Environment

a. Setting Priorities

Some buildings whose accessibility is of high priority to the College are already well on their way to being accessible. For example, the College has some level of accessibility to buildings in which most classes are held, including older buildings such as Hall and Chase.

Each facility’s use, location, and prominence in campus life should factor into the equation when prioritizing accessibility improvements. Priority should be placed on buildings with the highest use by students, faculty, employees, and visitors.

- Of these, the highest priority buildings for achieving barrier removal are those with highly public functions, particularly those one-of-a-kind structures which serve functions that cannot readily be moved to another venue. Examples include Marshall Auditorium in Roberts Hall and Magill Library.
- Highly used academic buildings should also remain a top priority.
- Next priority should be given to student life issues, such as resident life and access to campus life (i.e. eating and

drinking establishments, sport and fitness facilities). Many of Haverford’s residential buildings are not accessible.

When substantial barrier removal will not be conducted on a particular facility, the reasons for the College’s decision should be clearly documented.

b. Readily Achievable Barrier Removal

According to Title III Section 4 of the ADA, a “readily achievable” barrier removal refers to one that is “easily accomplishable and able to be carried out without much difficulty or expense.” Issues which may affect whether or not barrier removal is readily achievable include the cost of the action in relation to the institution’s financial resources, its number of employees and the number and type of the institution’s other facilities.

Since the College’s resources are not limitless, priorities must also be assessed in terms of which barriers are eliminated first. The Department of Justice makes suggestions—not mandates—on which types of barriers should be addressed first. Top priority is getting all individuals through the door utilizing physical means that are efficient and that respect the dignity of individuals with disabilities. The next priority is providing access to public goods and services, then providing access to restrooms, followed by access to other public facilities.

The Department of Justice lists as examples of readily achievable barrier removal the following:⁸

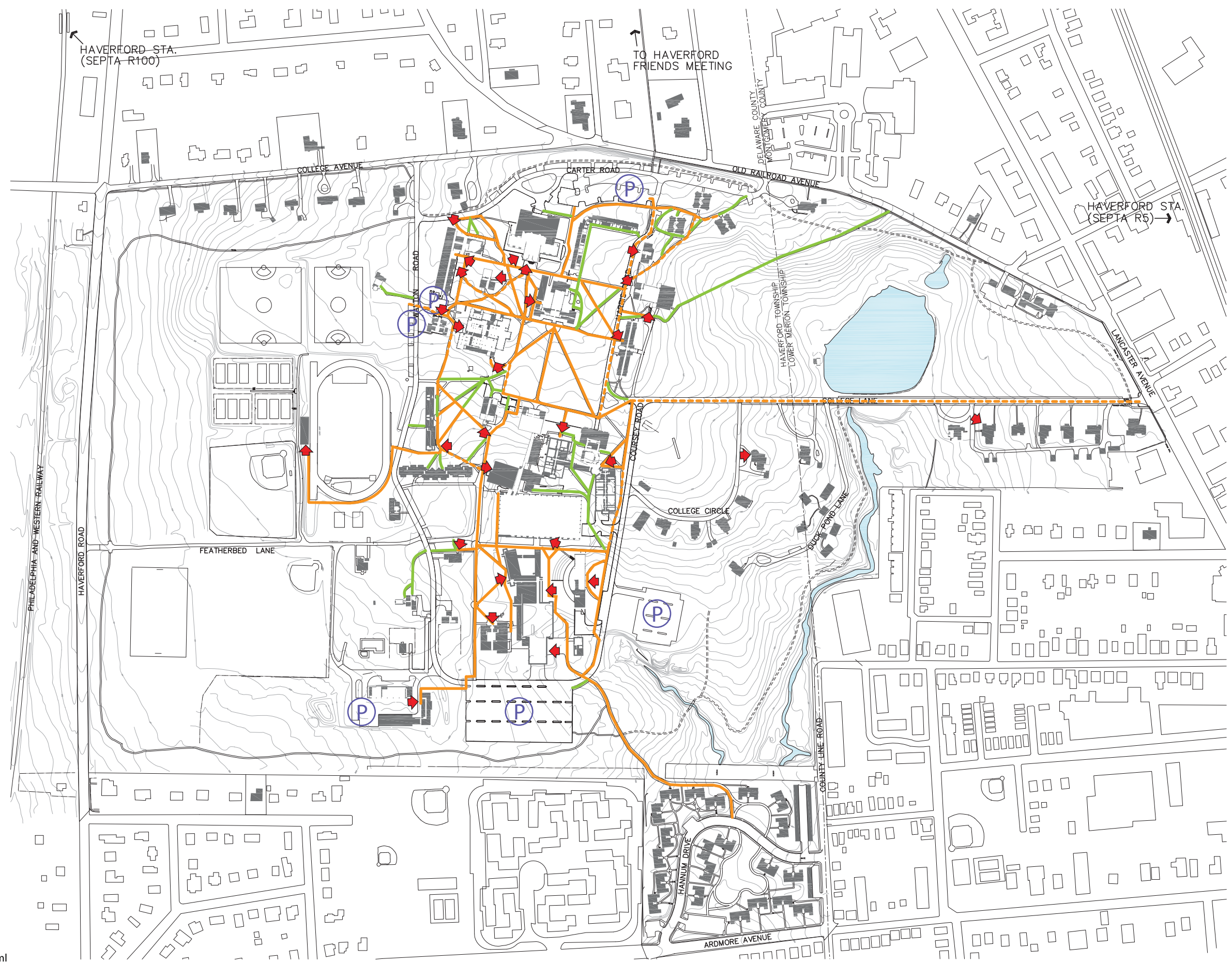
First Priority

- Installing ramps
- Widening doors
- Installing offset hinges to widen doorways
- Eliminating a turnstile or providing an alternative accessible path
- Installing accessible door hardware
- Installing flashing alarm lights

Second Priority

- Removing high pile, low density carpeting
- Rearranging tables, chairs, vending machines, display racks, and other furniture

⁷ <http://www.ada.gov/taman3.html#III-4.4200>
⁸ *ibid*



KEY

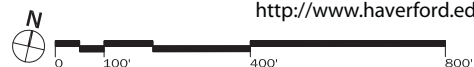
- ◆ Accessible Building Entrance
- Accessible Path
- - - Path Accessible with Difficulty
- P Accessible Parking Location
- Pedestrian Path (Not Accessible)

ACCESSIBILITY

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
 Information Source: Campus Access Guide
<http://www.haverford.edu/ods/mobility.html>



Third Priority

Installing grab bars in toilet stalls
Rearranging toilet partitions to increase maneuvering space
Insulating lavatory pipes under sinks to prevent burns
Installing a raised toilet seat
Installing a full-length bathroom mirror

Fourth Priority

Repositioning shelves
Repositioning telephones
Adding raised markings on elevator control buttons
Installing an accessible paper cup dispenser at an existing inaccessible water fountain

The College should take steps not only to create accessibility for individuals with mobility issues that require the use of a wheelchair, but also to eliminate barriers to individuals with other disabilities. For example, door and faucet hardware should be corrected, as to benefit those individuals with limited hand dexterity; Braille and raised character signage should be installed for those who have vision loss; and visual strobe alarms should be installed for hearing impaired or deaf individuals.

4. System-wide

In addition to ADA-compliant major renovations and new construction, it is strongly recommended that the University establish an **annual budget for readily-achievable barrier removal** throughout the campus.



Fig. 32. Campus patterns, overall landscape

C. LANDSCAPE *Andropogon Associates*

1. *Campus Landscape Framework:*

a. Campus Spatial Patterns

The original Carvill campus was built on a Romantic 'Reptonian' model: buildings grouped on high ground, forming loose quadrangles, surrounded by open fields and woods. The entry drive provided an idealized, picturesque vista of the main buildings, including a pond, groves of trees, and sweeping lawns. Despite the expansion of the campus to the south, this pattern is still largely intact.

The terraced quads are the dominant spatial feature of the historic campus. These loosely-defined quadrangles have some distinctive patterns which help give the campus its intimacy, charm, and sense of greenness. These patterns could be extended to the design of new spaces in the southern part of campus (Fig. 33 and 34).

- Haverford's quadrangles have open corners and open sides, which allow the campus spaces to flow smoothly from one quadrangle to the next;
- Main building entries are typically on the quadrangles;

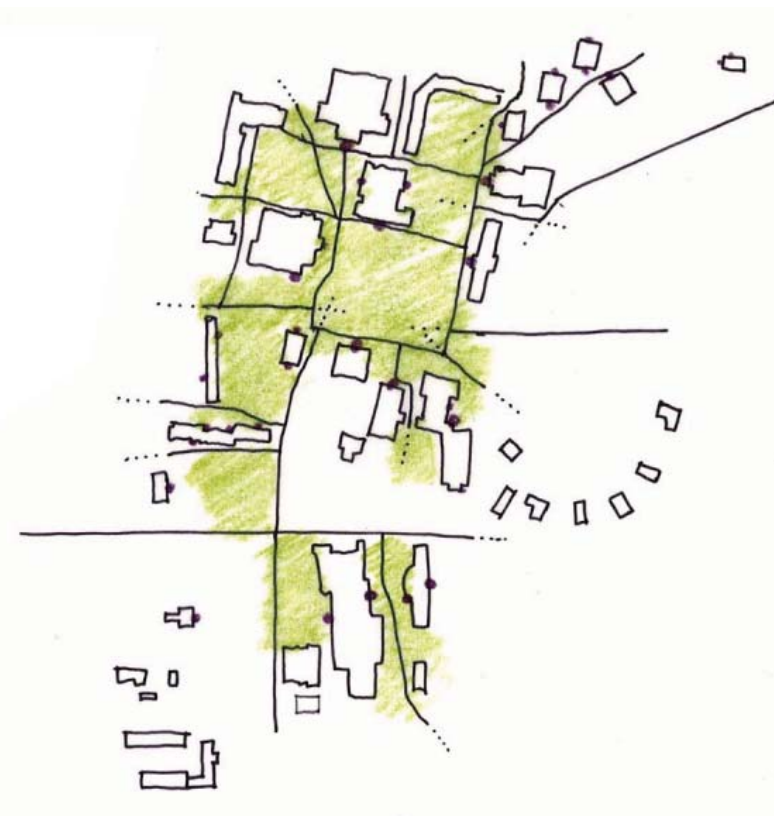


Fig. 33. Landscape spaces

- Walkways typically jog laterally when they enter a quadrangle. These offsets in the paths emphasize the views of the green space and downplay the visual presence of the walkway;
- Walkways provide views out of the campus to the pastoral landscape;
- Quadrangles are terraced. Some of the topographic transitions are significant enough to require stair and ramp combinations.

b. Landscape Framework Plan

The main components of the proposed landscape framework build on and enhance the existing strengths of the campus. The clarity and consistency of these landscape elements create a recognizable pattern which gives the campus its distinctive sense of place.

- *Developed Campus* – terraced quadrangles, or greens, framed by buildings. This zone is primarily within the campus loop road, consistent with the original campus organization. However the robust building program results in the eventual expansion of primary buildings beyond the boundary of the loop road at the southern end of campus.

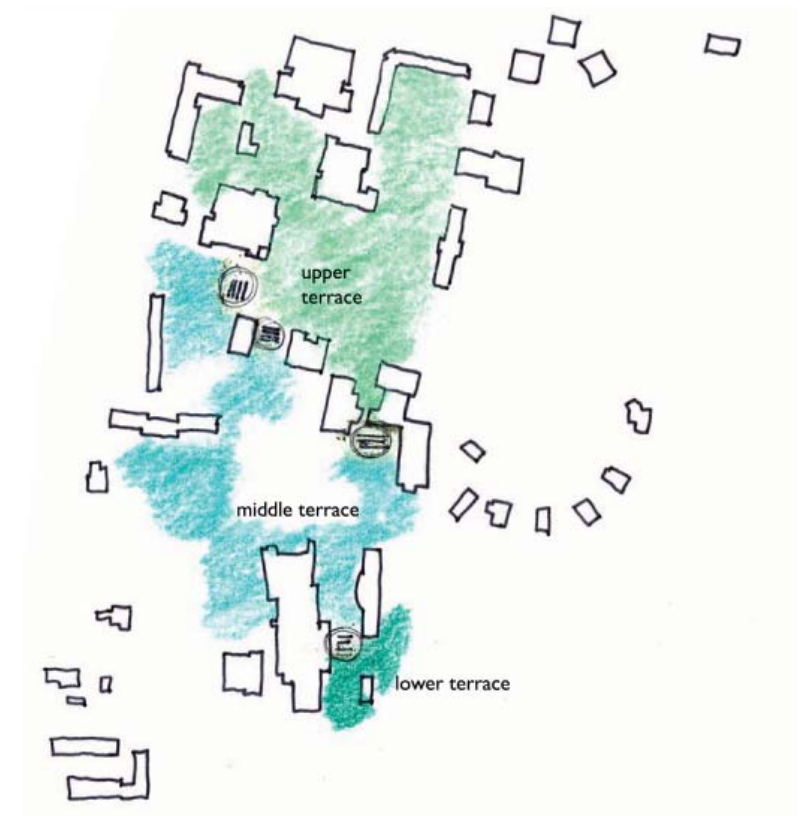


Fig. 34. Landscape terraces

KEY

- Developed Campus
- Primary (Loop) Road
- Secondary Road
- Pastoral Landscape
- Wooded Riparian Corridor
- Riparian Corridor
- Wooded Buffer
- Residential Street
- Operations-Athletics Complex
- Buildings - Proposed
- Buildings - Existing

PROPOSED LANDSCAPE FRAMEWORK HAVERFORD COLLEGE

Campus Master Planning
Base Map Source: Haverford College Facilities Management





KEY

- A** Founder's Green
- B** Duck Pond
- C** Cope Field
- D** Mature Woods + Field Corridor
- E** Haverford College Apartments Site
- F** Pinetum
- G** Barclay Beach
- H** Daylighted Stream & Extended Wood Corridor
- Proposed Vegetation
- Garden Spaces and Flowering Trees (accents)
- Existing Vegetation
- Lawn
- Meadow / Greensward
- Buildings: Early Increments
- Buildings: Longer Term
- Buildings: Enrollment - Growth Enabling Projects

ILLUSTRATIVE PLAN

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Haverford College Facilities Management



KEY

- Internal Greens
- Woodland Quadrangles
- Intimate Garden
- Terraces
- Campus Streetscape
- Pastoral Viewsheds
- Linear Pedestrian Spaces
- Service Courts
- Buildings - Proposed
- Buildings - Existing

PROPOSED CAMPUS SPACES

HAVERFORD COLLEGE

Campus Master Planning
Base Map Source: Haverford College Facilities Management



- *Residential Street* – row of residential houses (or similar scale buildings) on one side of the campus road, with a backdrop of trees. The other side of the campus road is typically open fields. Where campus buildings are proposed along the edges of open spaces outside the loop road, conformance with the ‘residential street’ pattern will help maintain the existing campus identity.
- *Facilities Management-Athletics Complex* – large buildings with enhanced fronts along a tree-lined laneway (for limited vehicles and pedestrians). This is a ‘working’ landscape in the short term, including the current Facilities Management building, new utility plant, community gardens, and (screened) landscape storage. In the longer term, these maintenance related uses would be relocated to make room for new large-scale athletics facilities such as the Field House. The fronts of these buildings could be enhanced with windows, common areas, and offices for community services to enliven the walkway. The allée of trees acts to bring a pedestrian scale to the walkway and to lightly screen distant views of the large building facades from the adjacent open spaces.
- *Pastoral Landscape* - open fields (wide lawns, meadows and athletic fields), framed by woodlands and groves of trees. Ideally, the athletic fields will blend relatively seamlessly with the adjacent open landscape spaces.
- *Wooded Riparian Corridor* – the stream valley and adjacent forest – is the heart of the natural landscape on campus. This corridor is conserved for its environmental benefits, its recreational and educational opportunities, its ability to buffer the campus from adjacent development and create the illusion of a pastoral setting, and its connections to the larger watershed.
- *Wooded Buffers* – these narrow wooded areas enclose the campus open spaces and create an intimate, peaceful setting for the campus.

-- Perimeter Buffers: These buffers play key roles at the campus edges, where they screen adjacent development and become the anchoring element for the Nature Trail.

-- Internal Screening Woods: Other wooded buffers play important roles as a back drop for campus buildings (e.g. along College Circle) and serve to separate different areas of campus (e.g. South Campus from softball fields and proposed peripheral buildings, or North Dorms and north parking lot from the Duck Pond)

2. Illustrative Landscape Plan

This plan is a pictorial representation of the future campus landscape. Proposed buildings are indicated as either initial increment or longer term. The following overlay diagrams – campus spaces, circulation, vegetation, and storm water – highlight various landscape-related aspects of the Master Plan.



Fig. 35. A conceptual diagram of the central, developed campus, illustrating the organization of the quadrangles along the primary pedestrian paths. The campus street forms a linear boundary for the campus core.

3. Campus Spaces

The campus spaces overlay diagram illustrates the following spatial types as key components of the outdoor social setting:

- *Internal Greens* – Historic campus spaces, loosely framed by buildings, with scattered mature trees. The proposed quadrangles in the southern half of campus are organized along either side of the two main pedestrian axes (Figs 36 and 37).

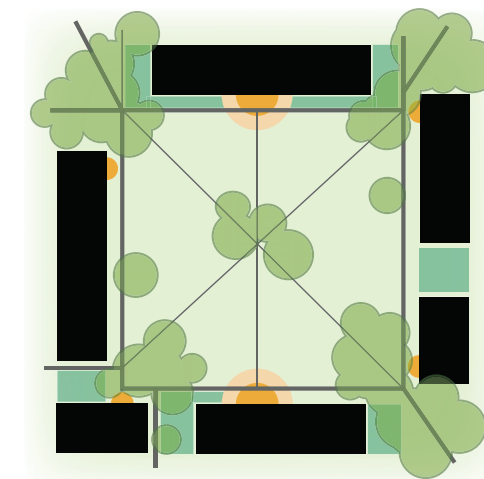


Fig. 36. A simplified representation of a typical quadrangle at Haverford, including open corners, limited paving, groves of trees loosely grouped at the perimeter, and garden spaces located at the gaps between buildings or at recessed portions of building facades.



Fig. 37. Founders and Lloyd Greens at Haverford College

- *Woodland Quadrangles* – These types of quadrangles would be created from small remnant pockets of woodland within Haverford’s campus. Existing mature forest trees are preserved within the space; native woodland shrubs, such as rhododendron, create a peaceful enclosure for a usable central grassy space without completely blocking views to the surrounding buildings; campus walkways should run through the space; the central space may be enhanced with seating, sculpture, native woodland wildflower gardens, etc. The mature trees in these spaces lend a pedestrian scale to the adjacent buildings. The green leafy shade cast by the tree canopy is a cool and comfortable retreat in the summer (Figs 38 and 39).

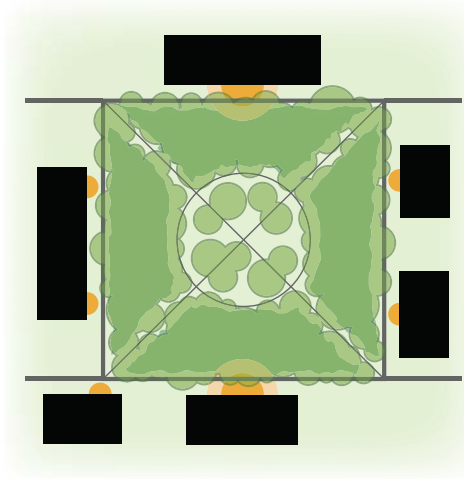


Fig. 38. A simplified representation of a wooded quadrangle, including a grove of mature trees, a central grassy space partially enclosed by peripheral woodland plantings, and criss-crossing pathways.



Fig. 39. Scott Amphitheater at Swarthmore College, one of the inspirational precedents for the wooded quadrangle concept.



Fig. 40. Nature Trail - Before (Source: Andropogon Associates)



Fig. 41. Nature Trail - After (Source: Andropogon Associates)



Fig. 42. Section through Gummere Woods (proposed) (Source: Andropogon Associates)

- *Campus Street* – The main campus roadway is framed by allées of mature trees, typically (at Haverford) with campus buildings on one side and an open vista on the other. At Haverford, the buildings and street are not necessarily parallel, creating varying ‘front yard’ widths and presenting interesting views of the building architecture (Figs. 43 and 44).
- *Pastoral Spaces* – These spaces provide important picturesque vistas at the primary campus entries and within the Pinetum. These spaces play a significant role in creating the tranquil, green landscape image that is a mainstay of the Haverford College identity. Note that the groves of trees that frame these spaces are just as important in defining the views as the open space itself (Fig. 45).
- *Terraces* – While large plaza spaces are not a part of Haverford’s campus, modest terraces are an occasional component of the campus landscape. These relatively discrete spaces reinforce the intimate character of the campus, highlight landscape transitions or vistas, and provide a place for outdoor social interaction. Terraces are small, usually less than 20 feet in any direction, and may be accented with low walls, stone paving, and small artwork. The social life of these spaces could be enhanced with additional seating (Fig. 46).
- *Intimate Garden Spaces* – Small, partially enclosed spaces that accent building entries, sitting nooks, stairs and other landscape transitions. These places offer a setting for quiet reflection, and present a pleasing contrast of scale to the more extensive quadrangle spaces. These spaces are very similar to the terraces in their scale and social intent, but are much more richly planted and have a greater sense of enclosure or partial separation from the larger landscape spaces (Fig 47).
- *Parking and Service Courts* – the Haverford Campus currently places many service areas in small spaces adjacent to the loop road. Where these spaces are most successful, their utilitarian elements are softened by low perimeter walls, and/or central planting islands. These design features give the space the appearance of a small courtyard, which happens to have a utilitarian function. This successful pattern, seen at the Morris Infirmary and at the Gardner Integrated Athletic Center, could be replicated elsewhere on campus, for both service areas and possibly minor parking (3-5 spaces).

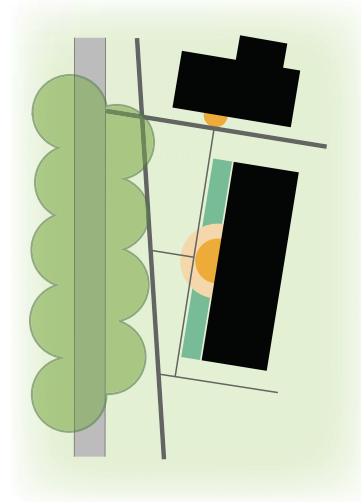


Fig. 43. A simplified representation of a campus street.



Fig. 44. Walton Road at Haverford College



Fig. 45. View of the Duck Pond from Barclay Beach.



Fig. 46. Bluestone terrace at the west edge of Founders Green provides a view of Leeds Hall and the distant sports fields.



Fig. 47. Intimate garden space at the University of Pennsylvania.

4. Vegetation Management

The Vegetation Management Plan illustrates a series of districts (management areas), each with its own priorities and needs. There are, however, some themes: the visible demonstration of landscape stewardship, the ability of vegetation to support a healthy site environment (in particular site hydrology and runoff mitigation), and the diversification of lawns into a wider range of planting types.

Within a sustainable campus, landscape maintenance should emphasize the benefits of preserving and restoring native vegetation, for its role in moderating local climate and air quality, maintaining stable stream flows, removing pollutants from air and water, providing habitat for wildlife and pollinating insects, and contributing to sense of place and human well-being. Haverford College should consider the following recommendations as the basis for sustainability initiatives related to vegetation:

Looking forward, the Arboretum has a potential, important role as a bridge between Facilities and Grounds, the academic community (in particular the Sustainability Director) and the local neighbors. This ‘watchdog’ and interpretive role can help foster a holistic awareness of the campus landscape and promote a unified understanding of stewardship needs and initiatives.

a. Horticultural District

- Continue to plan for the long-term continuity of the large tree cover in the center of the campus [1830s Arboretum collection]. The historic campus is fortunate to have many stately mature trees, which contribute greatly to the peaceful, traditional collegiate setting. Planting new trees in each quadrangle space is important to the continuity of large sized trees through time. The Haverford College Arboretum should continue to consider regionally native species, including those which are not commonly available in the nursery trade (e.g. hickories, walnuts, oaks, chestnut, etc); specimens that are grown from seed and on their own root stock (representing genetic diversity); and the propagation of seedling trees from historic trees on the campus. If not already doing so, coordination between desirable planting sites for new trees from a horticultural / design perspective and requests about establishing memorial trees would be useful.
- Continue to phase out remaining invasive, non-native plants in the campus gardens, and replace with native equivalents. Consider labeling the herbaceous plants and shrubs in the horticultural collection, so that visitors and community members can more easily learn about their favorite plants, and transfer the knowledge to their own

gardens. Consider planting the native species in ‘community groupings’, with regionally-grown plants. Consider hosting educational workshops that promote awareness about common but invasive horticultural species (such as barberry, burning bush and Norway maple) and planting native alternatives.

- Integrate the existing mature trees, including pockets of woodland, as an amenity within the development of the campus. This needs to be considered proactively throughout the planning and design process for capital projects. Haverford College is very fortunate to have a rich legacy of large mature trees and mature woods on their campus. Individual mature trees, when retained near new construction, can help anchor the building in the landscape and blend it gently into the existing campus fabric. Sensitively enhanced, the woodland pockets have many qualities that are desirable for outdoor spaces: shade, stately mature trees, rich soils, reduced wind velocities, potential for screening, and/or potential for pleasant internal tranquil spaces. By capitalizing on both mature specimen trees and on the existing woodlands as key assets within the campus outdoor spaces, Haverford has the opportunity to quickly create many of the beloved qualities of the historic campus within the planned redevelopment sites.
- Require planning for viable horticultural soils within the scope of capital construction projects.

b. Native Woodland Management District

This area comprises the mature woods along the stream corridor and on the steep slopes above the pond.

It is strongly recommended that the College develop a management plan for the native woods on campus, including invasive species control, promoting regeneration on native species, and deer management. It is a relatively recent phenomenon that the urban woodlands that are in the best condition are also those that receive some degree of human intervention: to help control invasive plant species, reduce deer populations to appropriate levels, manage the impacts of recreational use, and foster the regeneration of native species. Unfortunately, in near-urban areas, ‘just leaving woods to be natural’ does not promote healthy native plant communities. Haverford College is implementing a Norway Maple removal program for portions of their woods; this is a commendable effort which benefits the health of the woodland plant community, and which should be considered for wider implementation. Haverford might also consider:

- expanding the program to include other non-native plant removals within the campus woods;

- strategic replanting of native sapling trees;
- a deer enclosure – perhaps presented as a secluded woodland wildflower walk – as an educational comparison to “typical” urban woods.

It is recommended that the Nature Trail be developed as a community outreach / environmental education tool that interprets native plant communities, in addition to its current status as a recreational amenity.

- Consider interpreting a range of native plant communities and habitats on campus, including the riparian area around the pond, the mature upland woods, the wooded wetland (off Duck Pond Lane), the meadow in the Pinetum, and the floodplain along the lower section of the creek.
- Within the mature forest, consider native plant displays appropriate to the woodland setting. Possibilities include woodland wildflowers, native rhododendrons and azaleas, ferns, and wooded wetland display.
- Consider interpretive ‘exhibits’ along the trail, where environmental points of interest and stewardship initiatives are highlighted for community awareness and education.

c. Buffer Enhancement District

This district encompasses the narrow wooded areas that enclose the campus open spaces. These thin groves of trees are very important for their role in screening the campus from adjacent neighbors, providing a backdrop for buildings, and for gently dividing the campus into districts with a more intimate scale. However, their narrowness makes them vulnerable to attrition, and they tend to be overlooked as ‘leftover’ areas. The significance of these buffers needs to be considered in the design of capital projects and in allocating management resources.

d. Pastoral Landscape Districts

- Reduce traditional lawn in favor of a wider range of plant cover types, such as meadow, greensward, and woodland groves. These spaces might be enhanced with a wider diversity of natural vegetation while still maintaining the beloved picturesque qualities and views. Short butterfly meadows, greensward (tall turf with low-growing spring bulbs and wildflowers) and groves could all be considered as a replacement for lawn in selected areas. These vegetation types would help improve the management of storm water runoff and water quality within the pond. Wide swaths of lawn would still be maintained to accommodate outdoor play, informal walks, and other casual use. The Arboretum



KEY

- H Horticultural District
- WM Native Woodland Management District
- Riparian Corridor
- BE Buffer Enhancement District
- M Pastoral Landscape - meadow and greensward
- A Pastoral Landscape - athletics
- ★ Woodland-Themed Displays
- Allees

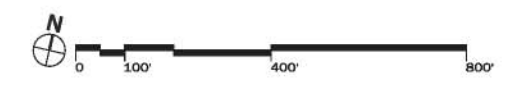
Heritage Trees

- Penn Treaty Elm
- ★ State champion trees
- Significant trees
- Original 1834 trees

- Buildings - Proposed
- Buildings - Existing

**PROPOSED VEGETATION
MANAGEMENT AREAS**

HAVERFORD COLLEGE
Campus Master Planning
Base Map Source: Haverford College Facilities
Management



staff have already proposed replacing lawn around the Duck Pond with a naturalistic planting of mixed native grasses. The Pinetum Meadow has been effective at reducing runoff problems while still allowing for recreational use. Haverford College might consider expanding this approach within the pastoral spaces.

- Consider removing the fence at the pond edge once the riparian buffer meadow has become well established.
- Persevere at implementing a Canada goose management program.
- Replace the spray fountain in the Duck Pond with a more discrete bubbler. Monitor water quality and adjust the bubbler's performance accordingly.

e. Athletic fields

- Incorporate Integrated Pest Management into lawn maintenance, to most effectively and efficiently use needed chemical treatments.
- Continue to locate utilitarian elements discretely, to blend the athletic spaces relatively seamlessly into the larger landscape.
- Consider adding some shade trees in the “interstitial” spaces between fields. These few trees can help enrich views and provide shade for casual spectators.



Fig. 48. Duck Pond, existing (*Source: Andropogon Associates*)



Fig. 49. Duck Pond, proposed (*Source: Andropogon Associates*)

5. Landscape Design Guidelines and Detail Standards

Following are recommendations regarding the landscape design guidelines for campus walkways, curbs, walls and site furniture. The campus currently has many different materials and detail styles. The proposed standard design details are based on a site review of the campus precedents, feedback from campus staff, and a range of considerations, including:

- harmony with existing architecture & building materials
- elegance and discretion: details that are appropriate to the campus setting, without upstaging the overall experience of the spaces and buildings
- durability: consideration of lifecycle costs; ability to age gracefully
- sustainability: local availability; durability; ability to re-use and recycle; energy costs to manufacture (preferably low); high-reflectivity (to reduce heat-island effect)
- maintenance: ability to make changes or repair and still look good when finished
- preferably already existing at Haverford College: overall philosophy of building upon the quality elements that already exist.

Walkways – primary, secondary, and garden paths – porous asphalt (see Figs. 50 and 52).

Asphalt is an economical material that can have a low-key, informal look. A flush edge of cut stone or cobble is essential for durability of the porous asphalt edge and adds elegance to more important walkways. Porous asphalt differs from conventional asphalt in that it contains only coarse-grained aggregate, allowing water to pass through the pavement into an infiltration bed below. This has two advantages: a greater proportion of rainfall soaks into the soil rather than contributing to storm water runoff; and the pavement is less prone to surface puddles, creating more comfortable walking conditions and prolonging the life of the asphalt. An additional advantage of asphalt is that it is relatively economical. However, asphalt is relatively difficult to repair without noticeable patches, and needs to be resurfaced periodically to look its best; this repair interval will likely be longer for porous asphalt than for conventional asphalt. It is recommended that the College budget for periodic resurfacing if asphalt is selected as the primary walkway material.

Where existing asphalt walkways are in good condition, they may be retrofitted to match the campus standard without incurring the cost for replacing the entire walkway. In other cases, existing tree root zones may make replacement of the existing pavement base course undesirable. In these situations, the existing asphalt can be edged with stone

(a gutter may be added if needed) and runoff directed to a nearby rain garden or below-grade infiltration structure. The standard asphalt may be given a new porous surface course for uniformity with newer walkways where appropriate. Concrete walkways may remain and be phased out over time. Brick walkways should be actively replaced as budgets permit.

Where walkways are sloped, or where they traverse sloping terrain, a gutter (see Fig. 51.) will be necessary on the uphill side of the walk to channel storm water flows appropriately. Sloping pavement, even porous pavement, may not absorb water fast enough to prevent the concentration of runoff and a gutter will prevent erosion of the lawn at the paving edge. Additionally, runoff that is carrying sediment should not flow onto porous pavement; a gutter can intercept this water and channel it to a rain garden.

Walkway intersections may be reinforced with cobble paving and/or a low curb to prevent wear at the corners. Where pedestrians are cutting minor corners, a combination of a low profile curb (cobble or bluestone) and planting can encourage people to remain on the pavement (see Fig. 54-a). Where maintenance vehicles require a wider turning radius, the pavement may be widened with stone or cobble edging (see Fig. 54-b). The stones should be laid with reasonably narrow joints. A low cobble or bluestone curb may also be added to reinforce accurate driving habits.

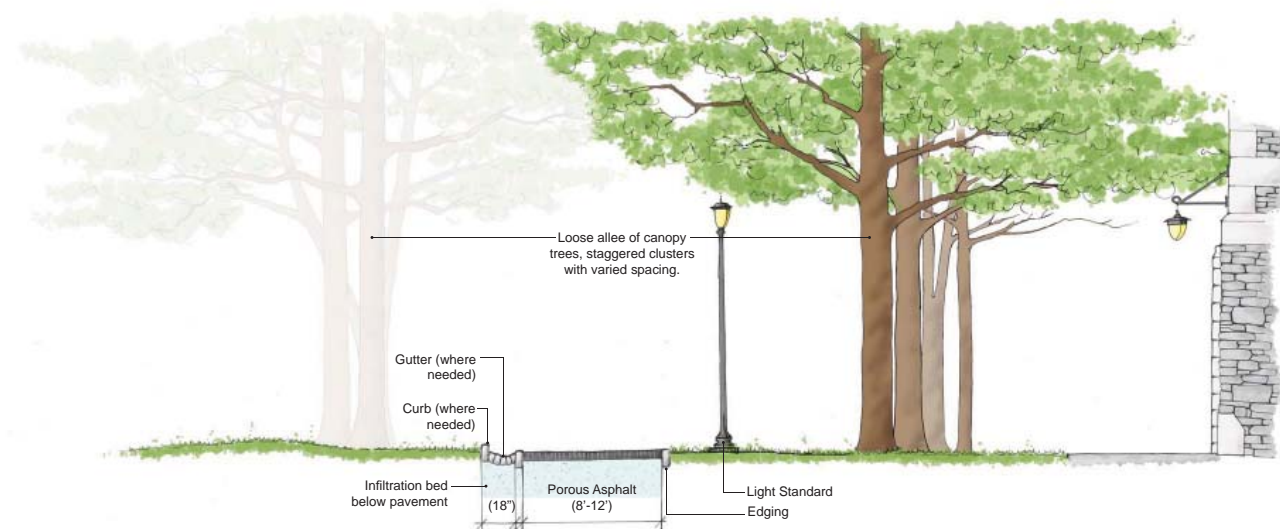


Fig. 50. New walkway construction section

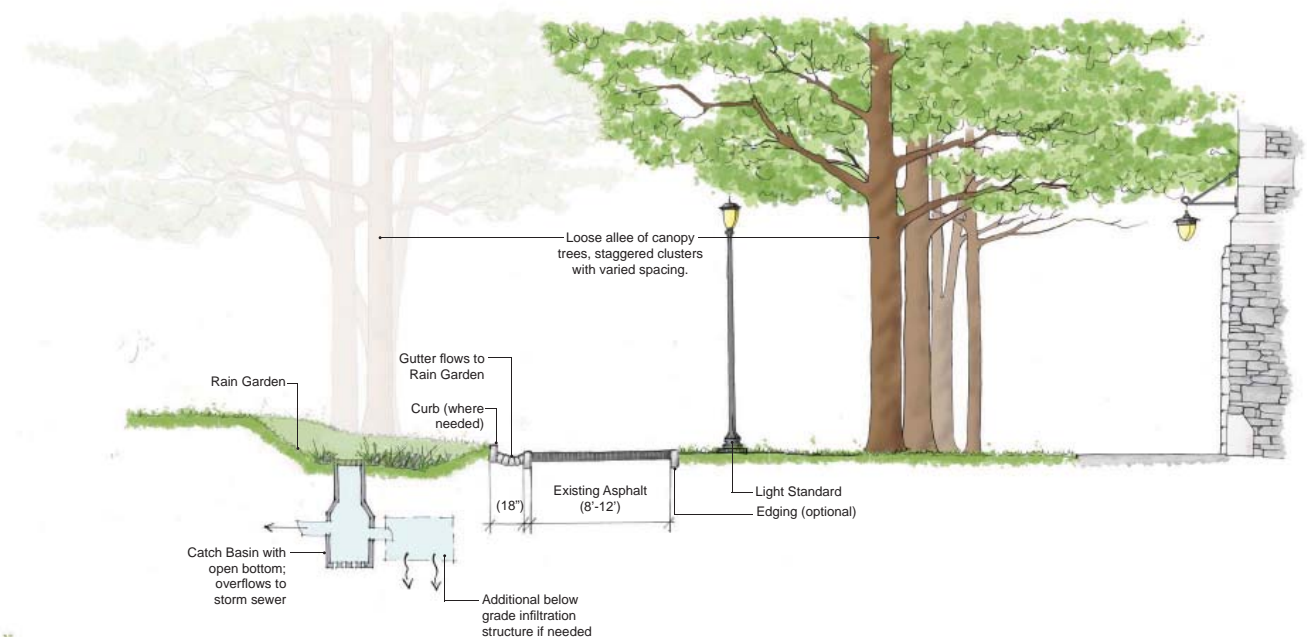


Fig. 51. Retrofit walkway construction section

The walkway design for the campus should aim to be universally accessible. While stairs are part of the historic campus fabric, and in some cases may be desirable on sloping terrain, in general the campus circulation system should be barrier free.

Walkways – accent paving – bluestone or similar natural cut stone (see Fig. 54-c).

Entry thresholds, terraces, and garden areas on the Haverford College campus are typically paved in natural cut stone (bluestone or similar). This material harmonizes well with the existing architecture and is in keeping with the traditional character of the campus. The extent of the paving varies in accordance with the size of the terrace or garden space, with the architectural design of the building entry.

Walkways – incidental paths – bluestone, or similar natural cut stone, very narrow (see Fig. 54-d).

Accommodating the many diverse pedestrian movement patterns, without constructing an excess of walkways, is a challenge for most campuses. Haverford has a good example of how minor but persistent short cuts in the landscape can be addressed with a very narrow path. The minimal width of the paving is relatively discrete, and covers what would otherwise be a worn path in the grass. These incidental paths are supplemental and should not be a replacement for any portion of the main walkway system that serves pedestrian needs.

Shared Laneways for pedestrians and service, and emergency vehicles – Where walkways also need to accommodate fire trucks and occasional service vehicles, a shared pavement design is recommended over parallel separate roadways (see Fig. 52). This is similar to the accommodation for servicing within the existing historic campus. The asphalt paving should be wide enough to support the vehicle wheel base. Stone paving is used to define a pedestrian-only zone at the edge of the laneway. Reinforced turf is proposed to make up the required overall fire-lane width without widening the paving excessively.

Roadways – The typical campus roadway (see Fig. 53) aims to stay in keeping with a low-key, semi-rural landscape setting. Curbs are omitted where possible (consistent with existing Walton Road). Gutters are proposed instead. The concept for storm water management emphasizes infiltration as a means of reducing runoff volumes.

- Porous asphalt / open graded asphalt for new road construction
- Standard asphalt to remain within existing roadways
- Curb-less (where feasible)
- Gutters (where necessary) for storm water conveyance, connected to infiltration structures
- Walkways set in the landscape, well back from the roadway
- Allée of canopy trees, both sides.

Curbs (where necessary) – bluestone, or similar natural stone (see Fig. 54-e).

Many roads on the campus do not presently have continuous curbs. Runoff sheet flows onto existing lawns, where it is filtered and absorbed. Where the runoff volumes are sufficiently small, and the lawns are able to absorb it, dispersing runoff in this manner should be continued. Consideration will need to be given to where overflows from large storm events go; catch basins set in low points of the landscape may catch excessive runoff while still allowing the surrounding lawn to filter and absorb smaller flows.

In other cases, runoff volumes will be concentrated enough that curbs will be necessary to avoid damage to the adjacent landscape and to direct water to where it can be appropriately managed. Curbs may also be added where necessary to protect lawns from wheel damage, such as the edge of parking areas or where vehicles back up frequently. In these locations, stone curbs are recommended. Stone is more durable than concrete, ages more gracefully, and severe damage to limited sections may be replaced with relatively little disruption to the adjacent intact curb.

Gutters (where necessary) – cobble or stone; width will differ between pedestrian walkways and roadway gutters. Stones should be laid with reasonably tight joints. Inlets, where used, should be either curved to match the gutter profile or flat. Vertical curb inlets are visually intrusive at the roadside edge, may present safety hazards for small children,

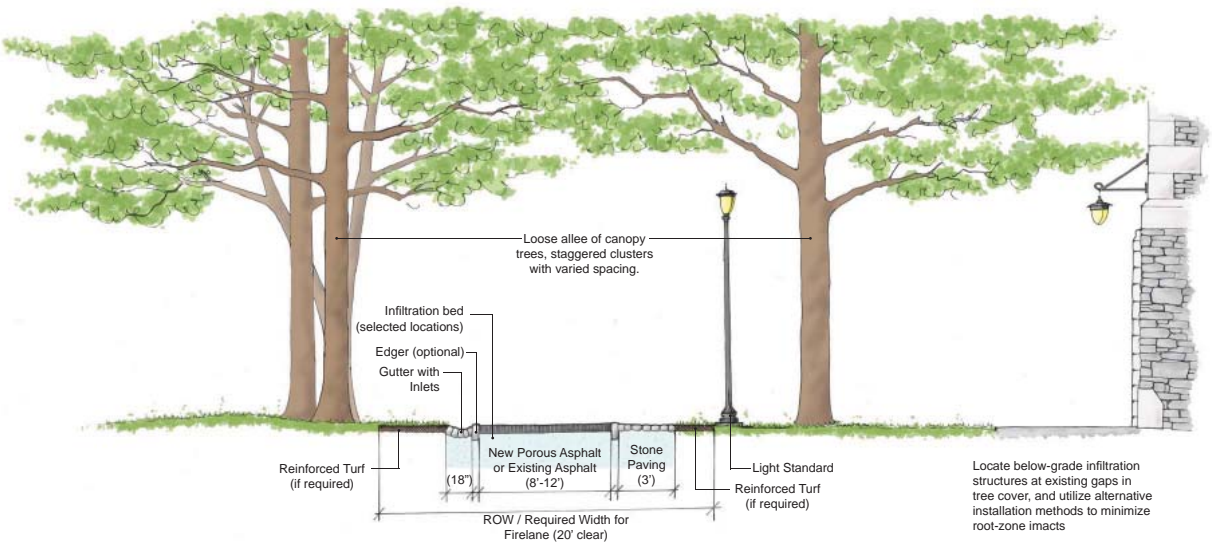


Fig. 52. Shared pedestrian walkway section

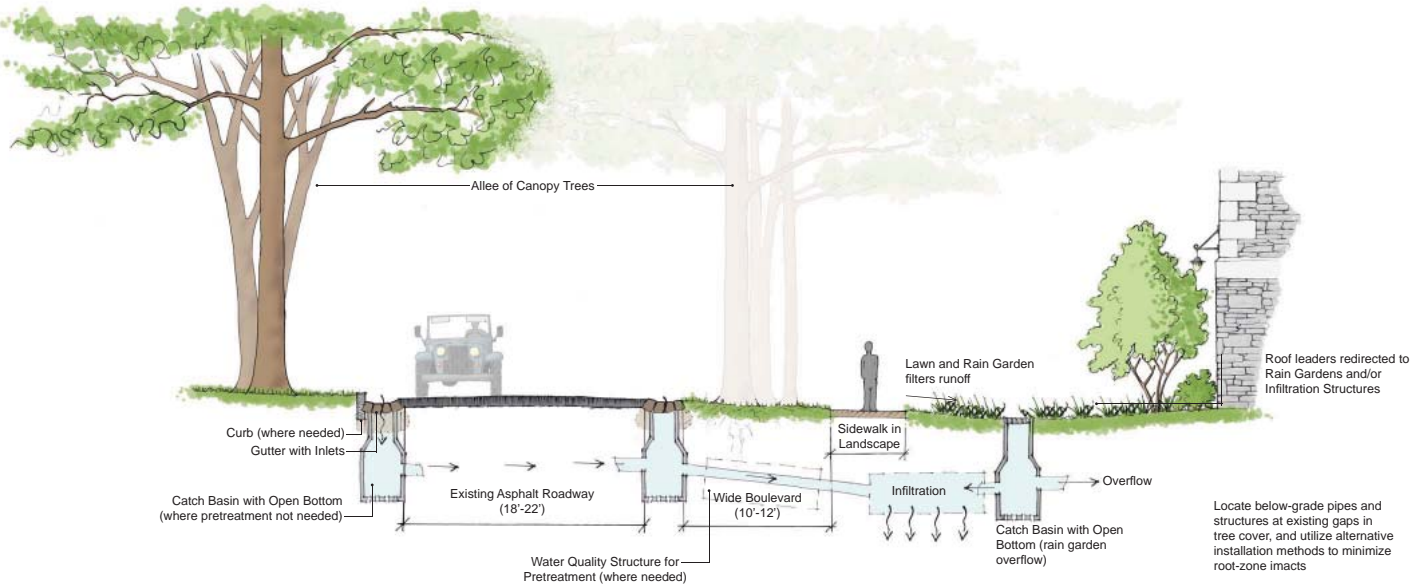


Fig. 53. Roadway section

and should be avoided. A curb may be added to the outside edge of the gutter to increase its water carrying capacity. Therefore wider roadways are likely to have a curb and gutter combination. Narrow roadways may have a gutter only, unless emergency overflow over the edge of the gutter would result in a problem down slope (see Fig. 54-f).

Pedestrian Crossings – raised “speed table” crossings. This style of crossing is wheelchair accessible and also functions as a traffic calming device. The sloped margins of the crossing may be surfaced with cobble for greater visibility (see Fig. 54-g).

Site Walls – Wissahickon schist or similar stone, with split or natural cleft faces. Stone should be either dry laid, or the mortar should be raked back for a natural look (see Fig. 54-h).

Light Fixtures – (see photos, one typical, one historic). Haverford’s current light standard is *Van Buren*, supplied by Spring City Electrical Mfg. Co. with a black paint finish. New lighting should have ‘full cut off’ shielding to prevent upward scatter of light (consistent with the International Dark Sky Association philosophies). Existing lighting should be retrofitted where problems exist, including glare or uneven lighting (abrupt over lit / under lit transitions are a safety concern) (see Fig. 54-i-j).

Benches – The campus standard is the “Windermere” by Country Casual (or similar), wood, 6 foot long. Most benches are straight, but occasional curved benches are used in some special settings.

Litter and Recycling Receptacles – Victor Stanley “Ironsites” unit (or similar), metal, painted black (see Fig. 54-k).

This style of litter receptacle is already in extensive use on campus, is elegant, discrete, and blends with a range of architectural styles.



Examples of Landscape Elements

- a. Cobble curb
- b. Cobbles used to widen path
- c. Stone accent paving
- d. Minor walkway with minimal paving
- e. Stone curb
- f. Stone gutter
- g. “Speed table” crossing
- h. Site wall
- i-j. Light fixtures
- k. Litter and recycling receptacles



Fig. 54. Examples of landscape elements

6. Landscape Project / Development Areas

a. Landscape Project Priorities

In general, landscape projects should be prioritized as follows:

-- Enabling projects deemed critical to facilitate near-term construction (if any). These projects may include storm water enabling / capacity projects for a specific campus area and/or new access for emergency and service vehicles.

-- Projects which enhance healthy site functions for both the campus landscape and the region, in addition to benefiting the campus aesthetic. These projects will likely focus on comprehensive environmental issues such as storm water management, invasive species control, re-establishment of native species. A high visibility, educational, and straightforward project should be undertaken first, to raise awareness of the emerging sustainability initiatives and energize the College community.

-- Projects which resolve minor site problems, in addition to enhancing the look of the campus.

-- Projects which enhance the aesthetics of the campus.

b. Potential Landscape Projects

Following is a list of site and landscape projects that have been proposed during the Master Planning process. These projects are not connected with any specific building project.

c. Potential Capital Projects

- Campus walkway enhancements to accommodate anticipated development in the south end of campus (4 separate project areas). Includes new/retrofitted paving, pavement removal (parking and paving deemed inappropriate), installation of storm water management systems (gutters, inlets, and infiltration structures), new / relocated lighting, tree protection and pruning, tree planting.
- Wooded Quadrangle enhancement (2 separate project areas), including walkways, grading (minor fill only), planting enhancements, tree pruning, selected vegetation removal, installation of site furniture and interpretive signage, installation of sculpture (if desired). Steps will likely be needed at the southeast corner of Gummere Woods.
- Stream channel restoration. This effort would begin with a peer review of the preliminary recommendations of the 2004 Stream Stabilization Study, and then move forward with the necessary documentation to implement the stream channel improvements. Consider including the western stream tributary.

- Flood capacity improvements at the Pond, including possible pond dredging and (if needed) any significant enlargement of the existing floodplain.
- Buffer enhancements. There are several project areas. The most pressing is the southern portion of campus, from the South Parking Lot to Haverford Road. Planting includes additional tall shrubs and trees for screening between the Nature Trail and the property line. Lawn, with the exception of a 4-6 foot mowing strip on either side of the trail, should be removed and replaced with low meadow (seed, supplemented with drifts of plugs near the trail). Interpretive signage is an essential part of promoting public awareness of this effort. Benches and minor trail repair should also be included.
- Storm water management demonstration projects, to address existing drainage problems. This could include
 - disconnecting downspouts from the sewer line and redirecting to rain gardens and / or below grade infiltration structures;
 - adding gutters, curbs (if needed) and inlets where necessary along existing roads and redirecting water to infiltration structures;
 - adding rain gardens and/or infiltration structures in existing low areas where runoff currently collects.
- Lancaster Avenue enhancements, including signage improvements and potential extension of the stone wall south of College Lane in place of the existing hedge.
- Stream daylighting and restoration at HCA

d. Projects Potentially Funded Within Operations Budgets

- Pond and Riparian Buffer enhancements, including minor regarding to enlarge of the floodplain around the pond, establishment of a wide, wet meadow planting buffer around the pond perimeter, replacement of the current spray jet with a bubbler, possible replacement of the existing fence and addition of new loop trail with interpretive signage.
- Wooded Quadrangles: initial establishment, including removal of invasive shrubs, partial understory clearing to create a central space, open up the diagonal pathways, minor planting of saplings (if needed) and low native flowering shrubs, ferns and wildflowers. Additional drifts of flowering native trees such as dogwood could also accent the edges.
- Nature Trail improvements, including adding boardwalks at seasonally wet areas, clearing invasive shrubs within 20 feet of the trail, and adding interpretive signage. Planting of new native species as a supplement to natural regeneration could be done at a small scale on an annual basis.

- Greensward restoration – low meadow establishment in place of manicured lawn in the vicinity of the Pond and woods. This is essentially an expansion of the Pond & Riparian Buffer project, to include the upper swales, steep slopes and low-use lawn areas that are away from paths.
- Invasive Species Management - continued initiatives in the mature campus woods (Native Woodland Management District) and in the successional woods along Duck Pond Lane. Where invasive trees and shrubs are extensive, removal efforts should be coupled with replanting and/or reseeding of native plant cover.
- Minor walkway improvements to address current problems (typically at pathway intersections).
- Removal of wood curbs and replacement with stone wheel stops where needed.

e. Next Steps

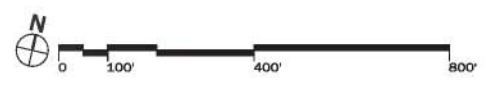
- Comprehensive Storm Water Management planning – comprehensive thinking for SE District and setting of priorities.
- Visible and inspirational initial landscape project to catalyze site sustainability initiatives. Consider improvements to edge of pond.
- Woodland Management Program – comprehensive thinking and setting of priorities.
- Goose Management Program.



- KEY**
- A** campus walkways enhancements
 - B** wooded quadrangle enhancement
 - C** Pond enhancements and (if needed) flood capacity improvements
 - D** buffer enhancements
 - E** storm water management demonstration projects
 - F** Lancaster Avenue enhancements
 - G** nature trail improvements
 - H** woodland & invasive species management
 - I** greensward restoration
 - J** stream channel restoration
 - K** stream daylighting and restoration at HCA
- Buildings: Early Increments
 - Buildings: Longer Term
 - Buildings: Enrollment - Growth Enabling Projects

POTENTIAL LANDSCAPE PROJECTS

HAVERFORD COLLEGE
 Campus Master Planning
 Base Map Source: Haverford College Facilities Management



D. STORMWATER MANAGEMENT
Hunt Engineering and Andropogon Associates

1. Overview

Storm water management for the campus is best considered holistically, in addition to site specific considerations. In general, individual building projects will need to mitigate their own runoff within the vicinity of the new construction. However, an advance evaluation of broader opportunities and potential limitations for the campus as a whole will help the College make the most effective use of its available space and budget. The integration of storm water management strategies into other architectural and site features may provide mutual efficiencies. While we recommend a Comprehensive Storm Water Management Plan for the entire campus, it is also possible to plan for management districts or individual drainage areas.

The overall philosophy of storm water management, regardless of the project, should be based on sustainable principles. Stormwater management within a sustainable campus philosophy emphasizes the restoration of a healthy (natural) site hydrology and supports healthy, stable streams. At the most basic level, this means putting more rainfall back into groundwater and allowing less surface runoff to flow directly into ponds and streams.

- Address stormwater as a resource, harvesting rainwater for reuse within buildings or in the landscape (for example, irrigation).
- Reduce the amount of runoff generated by the campus.
- Maximize infiltration of rainfall to groundwater.
- Improve water quality of runoff.
- Provide detention for the (minimized) site runoff before it reaches the stream or pond.
- Avoid sending runoff straight to the streams without mitigation of rate, volume, and water quality.

2. Existing Conditions

The current system consists of a network of stormwater inlets and connecting storm sewers which outfall into existing drainage channels on site. It is our understanding that a series of underground infiltration beds have been installed at various locations on campus. For example, an underground infiltration bed is present under the Orchard parking lot, and infiltration pits are present along the new storm sewer

located between the Facilities Management complex and the southwest corner of the site. Data on the design and performance of these infiltration structures is not available, but their presence indicates that infiltration in other locations on campus should be feasible. Some of the older buildings also include large dry wells for groundwater recharge, which likely predate the current storm sewers.

The western portion of the site, consisting of predominately athletic fields, contains a limited amount of existing storm sewers which typically outfall onto existing fields. Stormwater then flows over land toward Haverford Road to an eventual outfall near the SEPTA Norristown High Speed Line tracks to the west of the College property. The central and eastern portions of the site are bisected by a network of storm sewers located around the existing buildings and generally draining toward either the Duck Pond or toward streams in the southwestern corner of the campus. This network appears to have been developed as a result of incremental campus building construction rather than as a result of a planned stormwater network.

A detailed evaluation of the existing storm sewer network capacity should be made prior to new development. This evaluation should include existing pipe size, slope and condition. New development may warrant installation of a more systematic network of stormwater distribution rather than connecting to the existing network on an “as needed” basis as previously done.

3. Meeting Regulatory Requirements

a. Summary of Requirements

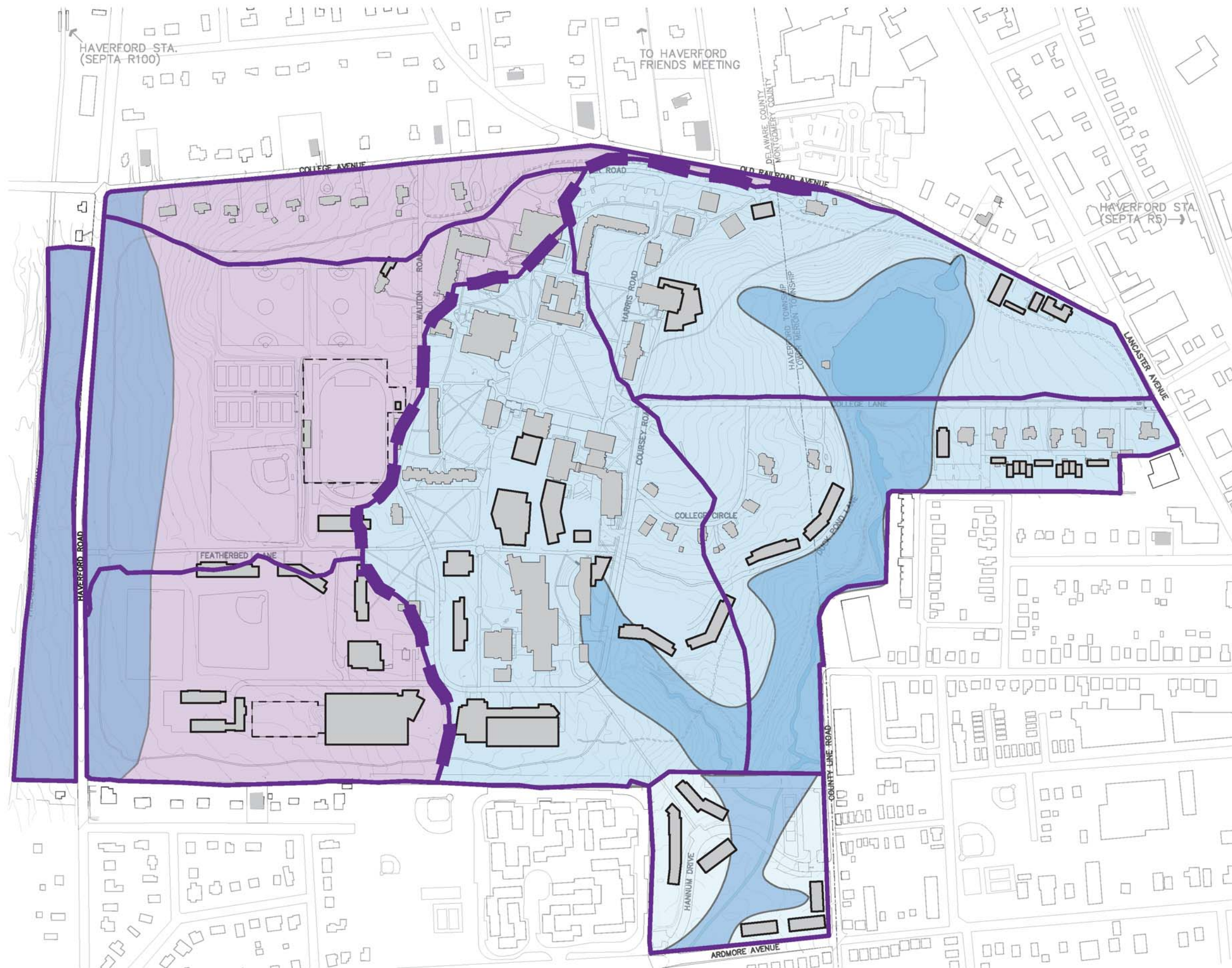
The Haverford College property lies entirely within the Cobbs Creek Watershed, Management District A, which is a designated watershed subject to the Pennsylvania Stormwater Management Act (Act 167). As designated, the Cobbs Creek Watershed is subject to a watershed-wide stormwater management plan developed to control stormwater runoff from new development. Accordingly, water quality, channel protection and flood control requirements will need to be implemented on any development with earth disturbance greater than 5,000 square feet.

Haverford and Lower Merion Township regulations for stormwater management are in accordance with the Pennsylvania Department of Environmental Protection (PA DEP) stormwater management requirements. Accordingly the following criteria must be met to satisfy both local and state regulations:

- Do not increase the post-development total runoff volume for all storms equal to or less than the 2 year / 24 hour storm event.
- Existing non-forested pervious area, such as existing lawns, must be considered meadow (good condition) in the model for calculating maximum allowable runoff. This effectively requires the most conservative evaluation of existing conditions for non-forested pervious areas, consequently resulting in the greatest volume of stormwater to be managed when comparing the proposed development with the existing conditions.
- Twenty percent of existing impervious area, when present, shall be considered meadow (good condition) in the model for existing conditions for redevelopment. This evaluation essentially under-estimates the run-off volume for the existing conditions. By under estimating the existing conditions a greater volume of stormwater needs to be managed when compared to the proposed development.
- New stormwater facilities shall be sized to capture at least the first two inches of runoff from all contributing impervious surfaces.
- At least the first one inch of runoff from new impervious surfaces shall be permanently removed from the runoff flow where feasible. This should be accomplished by use of a network of subsurface infiltration basins and/or rain gardens and by reuse of stormwater in water gardens, cisterns and for irrigation. If removal from the runoff flow is not possible then an exemption must be requested which typically requires utilization of alternate measures to address water quality and volume such as pre-treatment and/or storage to delay peak runoff flow.

The regulatory requirements for stormwater quality improvement include an 85 percent reduction in post-development particulate-associated pollutant load (as represented by total suspended solids), 85 percent reduction in post-development phosphorous loads, and a 50 percent reduction in post-development solute loads (as represented by NO3-N), based on post-development land use. However, a standardized testing and monitoring procedure of these parameters is not currently accepted. Consequently, these requirements are more often viewed as target goals that best management practices are geared toward meeting without a quantifiable reduction result.

Included with Land Development permit approvals, a Post Construction Stormwater Management Plan (PCSM) shall be recorded with the recorder of deeds and implemented. The PCSM should embrace and promote items like green



KEY

- Stormwater Management District
- East-West Drainage Divide
- East-draining areas
- West-draining areas
- Stream corridor and low-lying / wet areas
- Buildings - Proposed
- Buildings - Existing

CAMPUS STORMWATER MANAGEMENT DISTRICTS

HAVERFORD COLLEGE
Campus Master Planning
Base Map Source: Haverford College Facilities
Management



roof design, surface bio-retention area and infiltration. As buildings and other impervious areas are removed and replaced per the Master Plan, each new impervious area will require mitigation for both water quality and water quantity impacts associated with new impervious surfaces. Increasing permeable surfaces should be achieved where possible; however, credit for removal of impervious surfaces and replacement “in-kind” is not expected to be honored.

b. Strategies for Improving Water Quality

Both structural and non-structural measures can be used to promote pollutant reduction from stormwater runoff. Water quality treatment requirements can be met by utilizing expanded vegetated buffer zones at pond and stream edges, planting for shade at water edges; plantings with a tree canopy that shades paved areas; disconnection of impervious run-off from direct flow to storm drains, promotion of paving reduction in favor of pervious cover; minimal piping which promotes inclusion of naturalized swales built directly into the landscaping; and planting trees that conform to the Pennsylvania tree credit guidelines. Stormwater quality may also be improved by controlling geese and duck populations on campus.

c. Strategies for Reducing Run-off Quantity

Requirements for controlling runoff quantity can be met by infiltrating stormwater, capturing and reusing stormwater on site, or providing vegetative systems that promote returning rainfall to the atmosphere. The remaining runoff must be detained and released from the site at a regulated rate to provide peak rate control.

Strategies to reduce run-off include infiltration, green roofs, porous pavement, bio-retention areas or rain gardens, or cisterns for reuse of stormwater. Reuse of stormwater collected in a cistern can be for landscape watering or use in a gray water system for toilet flushing. Additional subsurface storm water detention basins are anticipated to be required to serve as locations for infiltration and peak-flow rate controls. Depending on Master Plan programming, stormwater management could take a number of forms but would likely include a series of smaller infiltration areas built directly at the source of run-off.

By decreasing overall runoff volumes, these initiatives may also generate cost savings through a decrease in installation and maintenance costs associated with conventional storm sewers and detention structures and further promote the health and feel of the Arboretum setting present within the campus.

d. A Strategy for Improving Quality and Quantity

Improvement of stormwater quality and quantity can also be achieved by increasing vegetation growth within large open spaces. Meadows have less runoff and better quality than grass lawn areas; this measure was successful in the Pinetum for significant reduction of runoff overflow onto Haverford Road. Wooded areas are even better. Note that for best success, planting projects such as new meadows should be planned for aesthetics and educational outreach in addition to stormwater function and habitat benefits.

4. Near Term

The storm water management district most affected by new construction in the proposed near term development scheme is the campus core, which drains to the small western tributary of the campus creek that runs below the Whitehead Campus Center and the PECO Lot, connection to the main creek on the HCA site. Comprehensive planning for this district will be particularly beneficial. The density of new buildings may significantly reduce available site space for storm water management. Design strategies that integrate storm water management into other site or building features (e.g. runoff harvesting for reuse, below grade infiltration, green roofs, ornamental rain gardens) would make the most effective use of the open space. In addition, this tributary’s watershed lies entirely within the campus; this situation creates a great opportunity to demonstrate the ability of storm water management initiatives to improve stream conditions within an urban watershed. The effects of a series of storm water Best Management Practices, implemented both as retrofits and as part of new construction, could be seen and assessed in the consequent changes to the condition of the stream. This represents an opportunity for both research and a visible stewardship demonstration.

E. SITE LIGHTING

Haverford’s standard campus pole-mounted lighting fixtures, supplied by Spring City Electric Manufacturing, were mostly installed during the mid-1980s. The luminaires are fitted with 150 Watt high pressure sodium lamps.

Based on the age of existing luminaires, when they need replacing, it would likely be more cost effective to replace them with new, more energy efficient ones. New fixtures could be similar in appearance, but should include cut-off shielding, directing light down, to reduce light pollution and address recommendations of the International Dark-Sky Association.

The College should consider replacing existing fixtures with LED lighting. According to Spring City Electric, LED technology is currently being developed for fixtures similar to those existing at Haverford. Mark Harris from Grenald Waldron Associates cautions that glare is still an issue to be resolved before LED fixtures should be widely used for site lighting. Low wattage metal halide is recommended if the College intends to replace campus lighting in the near term.

We have heard that existing campus lighting levels and warm color are intentionally that way. LEDs tend to emit a cooler light, but the technology to provide warmer color is improving. LEDs are significantly more energy efficient and are expected to last about 20-25 years before needing replacement. This would reduce maintenance costs. If intending to retain the feel of current campus lighting, the College should maintain minimum required lighting levels.

F. CENTRAL PLANT AND UTILITIES

Excerpted from Brinjac Engineering’s reports. The Engineer’s full study is included in a Technical Appendix to this document.

1. Limits to construction

On-campus construction is limited by:

- Electrical service contract limits.
- Existing loop transformer that is at or near capacity.
- Capacity of the existing underground electrical loop and feeders.
- Extent of underground power distribution network. (Existing individual building transformers feed directly from utility power lines entering campus. Although the transformers have available capacity, they are not currently on the power distribution loop, and the existing loop does not have the available capacity to incorporate them.)
- Existing overdutied passive system elements in the manholes.
- Three megawatt limit of existing paralleling switch gear for the stand-by electrical service and generators.
- Central boilers that are nearing both capacity and the end of their expected life cycles.
- Capacity of gas line size serving the existing boiler house site.

Without increasing any electrical contract limits or improving/replacing any systems, the maximum building square area that can be constructed new or as an addition is approximately 40,000 gross square feet. To put this in context, this is approximately equivalent to one 100-bed residence hall.

2. Recommended changes to increase electrical capacity

Changes could be made to electrical system on campus to increase capacity. These changes include:

- Negotiating with PECO to increase the electrical contract limit, which is currently set at 3000 kilowatts, to 4500 kilowatts.
- Adding transformer(s) to the campus underground electrical loop.

- Adding switch gear and separating the existing underground loop into two loops. The current in-earth feeders (#4/0) present a capacity limitation that is recommended to be split into two loop feeders with all new construction placed on the new loop conductors.

- Modifying the existing catenary (overhead) lines. According to PECO, this would be required to accommodate the additional loading and dual service requirement.

- Replacing the overdutied components (deadbreaks, related elbows and junctions) with similar equipment having a 25 kiloamperes (kA) fault current rating. Passive elements of the system installed campus-wide in electrical manholes carrying a 10 kA fault rating are potentially overdutied, according to Brinjac’s review of the 2006 Short Circuit Analysis Study provided by the College. (Brinjac’s review of the data and analysis concluded that there is potentially 14kA available at the equipment, not 9.2kA as indicated in the study.)

- Increasing the capacity of the power factor correction bank to 300kVAR to continue avoiding PECO penalties triggered when the power factor drops below 0.9. (Power factor is the percentage of electricity that’s delivered and used effectively, compared to what is wasted.) Utility information provided by PECO for 24 months (through May 2008), indicates that the power factor was hovering between 0.91 and 0.935 for the majority of the months, and that there were a few months that it was at 0.9. (No penalties were paid because the power factor did not drop below 0.9.)

- Adding generator capacity and paralleling switch gear cubicles and controls or load shedding unnecessary equipment from the system during loss of normal power (stand-by power operation). Load shedding would involve isolating chillers and HVAC equipment from the system during stand-by power operation. This equipment would be automatically by-passed by the electrical system through controls in each building. Once normal power operations resume, the equipment would be brought back on-line manually.

The approximate cost range for new transformers, the PECO improvements, PF capacity increase, and the construction of the new feeder loops would be in an order of magnitude cost of approximately \$2.8 Million.

This cost does not include the following:

- Necessary work required to enable the system to load shed (thus eliminating any overdutied Paralleling Gear and Stand-by Power equipment) including installation of the necessary load shedding switches and circuits in the individual buildings

- Required work in the manholes to the passive system elements
- The cost to increase the campus PECO Contract Limit to approximately 4.5 MVA.

More information is needed to determine the cost of the load shedding and the passive system improvements. We would recommend a budget for the load shedding of \$1.8 Million (this is the estimated cost for a new generator, installation of selective catalytic reducers on the existing generators, and installation of the associated Paralleling Gear). At this time the load shedding cost in each building can not be determined because the specific requirements in the buildings may be different, for the additional required controls (wiring, shunt trips or voltage sensing relays, etc.) to load shed the chillers in the summer and the air handling units (AHUs) in the winter and any other equipment necessary to attain the required load reduction. To determine a cost for load shedding, the following information would be needed:

- Survey of the potential equipment in each building to determine wiring requirements and necessary load shedding modifications to the power supply for each piece of equipment.
- Determination of any equipment that must be replaced because load shedding is not feasible with the equipment.
- Survey power supply configuration at each building to determine necessary modifications to the system.

Haverford College should take the following steps to determine this information:

- Engage a consultant to perform a building by building survey and assessment on the feasibility of load shedding within each building.

Order of magnitude cost for the replacement of the overdutied passive elements can not be quantified at this time as each manhole must be surveyed. Considering that the existing buildings adjacent to each manhole must remain energized during the replacement work process, this makes the work required to complete this task extremely costly.

If these steps to address electrical capacity are taken, the boilers become the limiting factor in new development.

3. *Recommended steps to increase boiler capacity*

Given the age of the College’s existing boilers, the oldest can be expected to last perhaps five years, based on typical life expectancy. However, through routine maintenance and repair in the event of a breakdown, the life of a boiler could be extended. It is our understanding that the College would like to attempt to utilize the existing boilers for another 15 years before replacing them by repairing the boilers when they break down. This is a prudent approach and may ultimately postpone the replacement of the boilers for the allotted time. The College must balance the cost for maintenance and repair with the long-term cost of replacement and the short-term inconvenience from the loss of heat on campus in choosing to keep the existing boilers operational. There is an advantage to prolonging the lives of the existing boilers and using them as redundant boilers.

Replacement of the boilers with newer, more efficient boilers would reduce the carbon footprint by approximately 15 to 25 percent. The larger boilers are more efficient for making steam. The burners used in the newer boilers burn more efficiently.

Ideally, a new central plant with redundant boiler capacity should be constructed before one of the aging boilers fails or temporary boilers will need to be installed. Construction of the new central boiler plant before the loss of any of the boilers is ideal because the cost for the temporary boiler(s) will be an additional cost to the new boiler plant project and because the existing boilers could serve as redundant boiler capacity in the short term.

Another trigger for construction of a new boiler plant is in the event the construction of a new gas line to the existing boiler house becomes necessary to handle increased demand. The existing medium pressure gas line supplying the boiler plant is inadequate to service the increased demand for the proposed campus square footage growth. A new 10 inch diameter medium pressure gas line would be required to service the expanded boiler house at the present location or if the boiler house is relocated. The construction of the gas line is dependent on the placement of the new boiler plant.

In the meantime, there appears to be adequate capacity in the existing boilers to add approximately 80,000 gross square feet. This assessment is based on current mechanical code requirements for new construction and includes recommended redundancy in the system.

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards stipulate that the design temperature for heating in the Philadelphia region be 11° F or 15.8° F depending on the building. Over the last several years the low temperature readings for the Philadelphia region have been approximately 26° F. The Goddard Institute for Space Studies indicated that December 2007 through November 2008 was the ninth warmest year in the period of instrumental measurements. The Facilities Department indicated they only operated two of three boilers during this period.

The International Building Code requirements for building ventilation have significantly changed in the last several years. The older buildings present on the Haverford College Campus do not provide much if any outside ventilation air. The code now stipulates between 25 to 40% outside air for new buildings. Newer buildings have much greater heating load requirements because of the quantity of outside air that is continuously brought into the system; a newer building could require 30 to 100% more heating load than a comparably sized older building.

Haverford College boiler plant currently operates without significant redundancy. During mild winters, the system seems to adequately meet heating needs. However, loss of a boiler during a long cold spell would result in heating problems for the campus. It is generally accepted industry standard to operate with approximately 1/3 boiler capacity redundancy. The Haverford College Facilities Department differs on this assessment and may opt to operate without this recommended redundancy.

As indicated herein, our estimated campus expansion without increasing boiler capacity is approximately 80,000 GSF, provided the following steps are taken (in addition to those described in Section 2 above):

- Combustion efficiency is maintained and the tubes do not leak into the combustion chambers in the current boilers. Continue inspection and necessary maintenance on an annual basis during summer shutdown of the tubes, the combustion chamber, and the water pathways.
- Increase the steam pressure in the tunnels from 42 psig to 65 psig. To increase the steam pressure to 65psig throughout the system and the boilers would require the installation or replacement with higher capacity pressure reducer stations (pressure reducing valves, shut-off valves, bypass piping, etc.) at all of the buildings. It is our understanding that many of the buildings currently have pressure reducer stations. All buildings are required to be surveyed to determine the extent of work.

The replacement or installation of pressure reducers at all buildings is necessary because it is our understanding that , according to the College, the issue with the current central steam plant is the inability to get the necessary steam to the North Campus Dorms. The increased pressure in the system will solve this problem.

More information is needed to determine the cost of increasing the steam pressure, but we would recommend budgeting \$15,000 per building for the pressure reducing stations installation or upgrade. To determine a narrower range of costs, the following information would be needed:

- Survey of each building served by the central plant to determine necessary measures for upgrading the pressure reducing stations.

Haverford College should take the following steps to determine this information:

- Engage a consultant to perform a survey of each building served by the central plant to determine if a pressure reducing station exists, if the capacity at each existing station can be simply increased, and to quantify the extent of work necessary to complete the installation or replacement at each building.

4. *Plant overview*

After considering multiple options, the Master Plan Steering Committee has reached consensus on replacing the existing central heating and power plant and creating zoned chiller plants.

a. Heating and electrical plant

Additional heating capacity is needed to accommodate the growth anticipated by the campus plan. Simply replacing the existing boilers and increasing the capacity of the existing central plant in place was not considered feasible or desirable because:

- The cost to keep the existing plant operational would likely increase due to rising maintenance costs of the boilers and associated equipment; there are potential savings in the energy costs for a more efficient and new central plant.
- The phased cost of constructing portions of the new plant can be included in the construction costs for new buildings or additions in the short term, while the existing plant remains operational.

- The new plant will be less expensive than expansion of the plant in situ.
- The current site offers limited area for expansion. The land at the current location in the campus core is valuable and the visibility of the plant is aesthetically unpleasing in that location.

Options related to siting the plant are described in section 6 below.

b. Cooling

Haverford’s present system of building-by-building cooling is inefficient and redundancy is not feasible without adding redundant cooling towers in multiple locations. In the event a remote chiller fails, there is no system in place, nor is it economically feasible, to offset the loss of one of the remote chillers with a stand-by chiller or chilled water piping from a redundant chiller. However, creating one central chilled water plant for the entire campus was deemed infeasible by the Steering Committee owing to cost and the potential campus-wide ground disturbance (trenching) necessary to install the chilled water loop around the campus core. The recommended system of zoned chilled water plants, distributed throughout campus with each serving more than one building, is more efficient than building-by-building cooling but requires significantly less upfront capital investment than a single central plant. The Steering Committee also agreed that existing dormitories and faculty houses would not have central cooling. New dorms should be designed to minimize the need for air conditioning.

c. A Note on Cogeneration

Creating a cogeneration plant generating electricity cheaper than the College could purchase electricity from the local utility) was considered, but an efficient (economic cost payback) cogeneration plant was determined to be infeasible, primarily because the College’s steam load and waste heat from the electricity generation can not be offset by the chilled water creation in the summer. The potential savings payback in the electricity generation can not be attained because without a central cooling plant with steam absorptive chillers the waste heat and the steam load are not captured. Cogeneration is currently not economically feasible because the College does not have enough need for year-round steam, the utility costs do not make cogeneration feasible, or the ability to capture the waste heat from the electrical generation. In addition, the initial capital expenditure for the system would be high; a central chilled water plant serving all campus buildings would be a pre-condition of a cost-effective

cogeneration plant at Haverford. If the cost of electricity increases significantly in the future, there could be a situation where the cost of the College generating its own electricity would be less expensive using natural gas than purchasing the electricity from PECO.

Although a full-scale cogeneration plant might not be practical at this point, other kinds of cogeneration should be considered, including:

- Heat recovery, to recover engine heat from generators and other equipment and exhaust heat from boiler stacks to be used for heating water or creating low-pressure steam.
- Cogeneration micro-turbine in new natatorium (Blodgett Pool at Harvard, the micro-turbine system heats pool water, domestic water; produces 300,000 kW electricity per year).
- Gas fired turbine/generator sets or micro-turbines in the boiler house to provide flexibility with fluctuating future utility costs.

5. *Central Heating and Electrical Plant*

Years	Campus SF (Heating Load on Central Plant)	Boiler Plant Size	
		Boiler Capacity (Bhp)	Area
Initial Increment	1,104,000 SF	1,450	6,400 SF
Longer Term	1,685,000 SF	2,300	8,000 SF
Enrollment Growth	1,770,000 SF	2,500	8,000 SF

Fig. 55. Central Plant phasing.

A new central plant could be expandable to meet the needs of the campus as it grows.

On whatever site is chosen, at least 8,000 square feet of twenty-foot-high floor space should be available for boiler plant equipment and 4,000 square feet of 14 foot-high floor space for electrical equipment. This area should be accessible – either directly on grade or via areaway – to large pieces of equipment. The boiler plant should have a stack at least 6 feet above any adjacent buildings within 20 feet of the stack, and the boiler plant at full build-out will require approximately 44,000 cfm for ventilation and combustion air, resulting in a total free louver size of approximately 170 SF (typically louvers are 50% cover), or louver opening of 340 SF.

The building should be concrete block construction with steel framing for the roof and concrete slab on grade. An on-grade building could be faced with stone or other finish material. There should be a minimum of two permanent air supply openings in the outer walls of the boiler room. If possible, the openings should be at opposite ends of the boiler room and the bottom of the opening approximately seven feet above the floor. This will promote thorough mixing with the air already in the boiler room, proper cooling of the boilers and tempering of potentially colder outside air prior to the air entering the burner for combustion.

The boiler plant and power plant are relatively quiet. There is some fan noise associated with the boiler plant and minor noise with the switches at the power plant. If the electrical equipment is indoors there is essentially no outside noise.

Approximately 6,400 SF of the building must be constructed in the initial phase with provisions for expansion in later years.

Under the initial increment, three (3) 600 BHP gas-fired steam-generating boilers and a single 400 BHP gas-fired steam-generating boiler are to be installed. The 400 BHP boiler is for summer use. The three 600 BHP boilers provide redundancy for the initial increment and some room for growth into the longer term phase. The College may opt to not install the third 600 BHP boiler or the 400 BHP boiler and eliminate the redundancy or rely upon the existing boilers for redundancy. The postponement of the installation of one 600 BHP boiler or the 400 BHP would be a decision made by the College to reduce initial costs, but this decision could be undone at anytime and the additional boiler added. The fourth 600 BHP gas-fired steam generation boiler should be installed once the heating load on the central plant exceeds 1600 BHP. The four 600 BHP boilers and the 400 BHP boiler would provide the steam for the full build-out with enrollment growth.

There has been discussion with the College about locating the boilers and electrical equipment in either one location or two separate locations.

- The advantages of locating the equipment together include:
- Centralizing the plant reduces cost of equipment, allows for more efficient equipment use, and creates opportunities for redundancy.
 - Capturing waste heat from generators or the use of heat recovery is limited by separating the boiler plant and the power plant.

- Having both plants in the same location minimizes the aesthetic disturbance on campus.
- Preserving a greater opportunity for a future addition of the central chilled water plant and/or possibly cogeneration or other future technologies.

The advantages of locating the equipment in two distinct locations include:

- Dividing the size of the overall 12,000 SF footprint into two areas of 8,000 SF and 4,000 SF would allow placement of equipment in smaller locations.

6. Central Plant: Sites under Consideration

Sites under discussion for the central plant include:

a. Site A – North of Existing Facilities Management Complex

Pro:

- Plant location would not impede future development in the campus core.
- The facility could be featured as an educational tool, perhaps combined with a campus sustainability office.
- This site has sufficient space to accommodate all projected boiler and electrical equipment as well as some unanticipated future expansion.
- This option would have a shorter site disturbance and construction period.
- Relatively clean (no steam lines or other utilities passing through site serving other parts of campus) site with limited utility disturbance.
- The installation of the new 10-inch gas service line from Haverford Avenue to the new site would be shorter than to the Site B location.

Con:

- Faculty pool, and if expanded beyond 12,000 GSF, greenhouses and the pole barn would be displaced.
- Further distance to the campus core and steam loop with electric power and steam.

b. Site B – in an Addition to Ryan Gym

Pro:

- This project could be combined with added academic and community social space, and be located largely underground – limiting the amount of open space disturbed.
- Located at the campus core so connection to the campus steam loop and electrical loops are direct.

Con:

- The Steering Committee is leaning away from a large-footprint addition to Ryan Gymnasium. Without a large-scale addition, much of the plant would need to be under green space, making the necessary elements of the plant – areaways, air intake, service drives and stacks – visible from the south and west of the building.
- Construction phasing would require keeping the existing plant in place until the new facility is ready; this would have an impact on the size and shape of the Ryan addition.
- On the other hand, if – as illustrated as an alternative – the College decides to build a new library at this location, the underground space is likely to be needed for library program uses.
- Depending in the size of the addition, there may not be adequate room to place the electrical plant at the same location necessitating a remote location for the power plant.
- From a campus planning and design perspective, there should be no blank facades or louvers along College Walk. At least along College Walk, the plant should be located entirely underground, requiring large areaways for equipment access and air intake.
- There would be a longer disturbance of the site during construction than with the clean remote site because of the coordination requirements, confined construction site, and existing steam lines crossing the site.
- Future unanticipated expansion would be limited by the footprint of the addition to Ryan. It makes sense either to build the physical space for full build-out now or to build additional space in the basement of an adjacent future building to the south in order to reduce future construction disturbance in the center of campus.
- The location would prohibit the future possibility to add full plant cogeneration because of both space constraints and noise. Heat recovery and small turbines are feasible in this location with the addition of the necessary equipment.

The costs for relocating and operating the electrical plant are similar for both sites, even if the electrical plant is located in a separate area from the boiler plant. The College might choose to reduce construction costs by building an inexpensive enclosure for a separate electrical plant.

7. Phasing

The central plant may be phased in two ways, the equipment and the building. The first involves the equipment placed in the plant. New equipment for just the power or heating requirements can be added incrementally. The electrical power requires two additional switch gears under the entire build-out: the first may be added and once the load nears the capacity, then the second switch gear must be added. The boiler plant expansion must grow in increments of the design boiler size, by adding the 600 BHP boilers as need requires. There is an opportunity for the addition of smaller boilers in the event the life expectancy of the boiler elapses before the next proposed construction.

Ancillary boiler plant equipment and the power equipment can also be added incrementally, but the life expectancy of the specific equipment and the necessary size/capacity should be factored into the phasing.

The second means of phasing involves the construction of the building. It could be designed allowing for the later construction of an addition to accommodate longer term growth. However, constructing the size needed for the entire physical plant building in the first increment would avoid any possible permitting or approval issues with future expansion attempts. Additionally, a relatively small addition would be more expensive to construct.

8. A Related Question

If an administration building is constructed west of Cadbury, it does not make sense for the building to be fed by the central plant because of the long steam line that must be extended to the building. Rather, it is more feasible to heat the building with a remote gas-fired system. Additionally, new faculty housing in the longer term phase should likely be heated with a remote gas-fired system. Geothermal could be considered as an alternative heating system.

9. Recommendation

The planning team recommends that a physical plant building be constructed on Site A, north of the existing Facilities Management complex, in the early increments of development. As the campus footprint grows, this location would enable the College to simply add the necessary equipment and not require the construction of an addition to the building, thus reducing the site disturbance on the campus. This site outside of the campus core also has space for future expansion, if needed.

We understand that the College may prefer to build the plant in an addition to Ryan. We recommend this be considered if:

- It could be accomplished without an above-grade component along College Walk.
- The program of the building into which it would be incorporated could be comfortably accommodated within the above-grade building envelope.

The College must decide on two issues as it moves forward with implementing this plan:

- if the heating plant is to have some redundancy in the event of boiler shut-down. Should the College elect not to provide boiler capacity redundancy in the boiler plant with a non-scheduled boiler shut-down occurring during the heating months, the steam generated may be inadequate to provide the necessary heat for the buildings. At that time the College could either install a temporary boiler or operate with reduced heating.
- If load shedding of AHUs in the winter and chillers in the summer is the desired course of action or if additional stand-by power capacity is to be attained. The decision affects how the College operates during an electrical power outage. Currently, within 30 seconds of an outage, the College is running at full or almost full electrical capacity on stand-by generator power. The College must choose to continue operating in that fashion or convert to the load-shedding program, where the chillers/cooling towers and AHUs at the buildings are not operated during power outages. In either case, stand-by power should be provided to building areas where maintaining precise climate control is essential.

These decisions could be postponed or changed, but each will impact the long-term plan for the College. Both decisions have a monetary budget aspect to consider. The redundancy in the boilers involves additional installed costs for another boiler. The operation of full stand-by power involves cost for new generators and additional paralleling gear.

CENTRAL PLANT OPTIONS UNDER CONSIDERATION - ORDER-OF-MAGNITUDE COST BREAKDOWNS EXCLUDING ESCALATION		
	OPTION 1 - New central plant in remote location Most flexibility and desirable redundancy; can move from center of campus	OPTION 2 - Central boiler plant near existing plant; remote electrical
ELECTRICAL	\$6,200,000 to \$7,200,000	\$6,200,000 to \$7,200,000
STEAM PLANT - EQUIPMENT		
Equipment	\$7,500,000	\$7,500,000
Extending lines for steam and condensate	\$3,000,000	
Upgraded gas line	\$1,000,000	\$1,500,000
Temporary piping and constrained site		\$1,200,000
Building	\$500,000 to \$800,000	\$500,000 to \$1,200,000
Subtotal - Steam plant	\$12,000,000 to \$12,300,000	\$10,700,000 to \$11,400,000
Subtotal - Electrical and Steam Plant - hard costs	\$18,200,000 to \$19,500,000	\$16,900,000 to \$18,600,000
Costs with fees, permitting, contingencies (135%)	\$24,570,000 to \$26,325,000	\$22,815,000 to \$25,110,000
CHILLED WATER (COOLING)- HARD COSTS	\$6,000,000 to \$12,000,000	\$6,000,000 to \$12,000,000
Costs with fees, permitting, contingencies (135%)	\$8,100,000 to \$16,200,000	\$8,100,000 to \$16,200,000
in district plants over time		
TOTAL - HARD COSTS	\$24,200,000 to \$31,500,000	\$22,900,000 to \$30,600,000
ORDER-OF-MAGNITUDE PROJECT COSTS	\$32,670,000 to \$42,525,000	\$30,915,000 to \$41,310,000

Fig. 56. Central plant options under consideration

The initial costs for the central boiler plant include the gas line costs, the temporary costs, the express line costs and would be approximately 75 to 80% of the total cost for the equipment. The longer term costs would be the remaining 20 to 25% of the total costs. The growth expansion square footage increase related to the boiler plant is too small an incremental increase that the expansion does not register. The costs do not reflect the increase in pressure to the system by replacing or installing new pressure reducing stations at \$15,000 per building.

The electrical figures do not include costs for:

- a new generator and paralleling gear or the load shedding work
- improvements to the passive system
- the increase in the PECO Contract limit

COGENERATION OPTIONS	
HEAT RECOVERY	ADDITIONAL COST
Capture “waste” heat generated in steam production to create hot water or low pressure steam	add \$3,000,000 to \$5,000,000 \$4,050,000 to \$6,750,000 with fees, permitting, contingencies

Fig. 57. Cogeneration Options

G. SIGNAGE

Signage on Haverford’s campus should be used to orient visitors (including service vehicles) and, if desired by the College, for educational purposes. It should be simple and purposeful.

A signage system could include the following – some of which exist but are not coordinated:

Vehicular-scaled signs should be considered for:

- The main campus entrances from Lancaster Avenue and College Avenue. Simple identification markers could be perpendicular to the street for legibility.
- Vehicular intersections throughout campus, directing vehicles to visitor parking, major service areas and visitor destinations like Admissions and the Field House. (The sign at the intersection of College Lane and Coursey Road is an example.)
- The campus exit onto Old Railroad, with clear direction to Lancaster Avenue and Haverford Road.
- Signs from Carter Road and College Avenue directing traffic to “left turn onto Lancaster” via Haverford Station Road.
- These should clear and visible – but not dominant. Campus identification signs should be carefully designed – beautiful but not corporate.

Pedestrian-scaled wayfinding graphics could include campus maps at visitor parking, and at pedestrian entrances to campus. These locations would include:

- Near 1 College Lane, for pedestrians entering from Lancaster Avenue;
- At the intersection of Old Railroad Avenue and Fletcher-Silver Walk, for those walking from Haverford Station;
- Near the intersection of Haverford Avenue and College Avenue, for those approaching from the Route 100 line.

Maps should be beautifully rendered, with clear graphics that represent the highest aspirations of the College. They should be legible both from a standing position and from a wheelchair.

Building identification – for example, at buildings that welcome members of the public. Current building signage, although inconsistently used and not particularly beautiful, is understated and mostly inobtrusive. In some cases – for

example, at Stokes – the format of the signs limits the amount of information conveyed, resulting in multiple signs.

- Signage **required by the Americans with Disabilities Act**, including signs indicating accessible parking, accessible passenger drop-off and loading zones, and at accessible building entrances, as well as signs at inaccessible entrances directing visitors to the nearest accessible entrance.
- **Educational and interpretive signs** could be considered for:
 - Locations along the Nature Trail, and at important specimen trees throughout the campus.
 - Sustainability features, as they are implemented.

- Historical markers. Those that exist – for example, at Carvill Arch and at the original Observatory location – add detail and richness to the campus.
- Building history. A member of the campus community suggested simple markers indicating the date and architect of campus buildings; this could help communicate a sense of the institution’s history.

The design and quality of campus signage communicates not only the intended information but also information about the character and quality of the institution. Campus-wide signage should be considered holistically, as a system, while also respecting the variety and individuality of Haverford’s buildings and landscapes.



Fig. 58. Examples of signage at other institutions

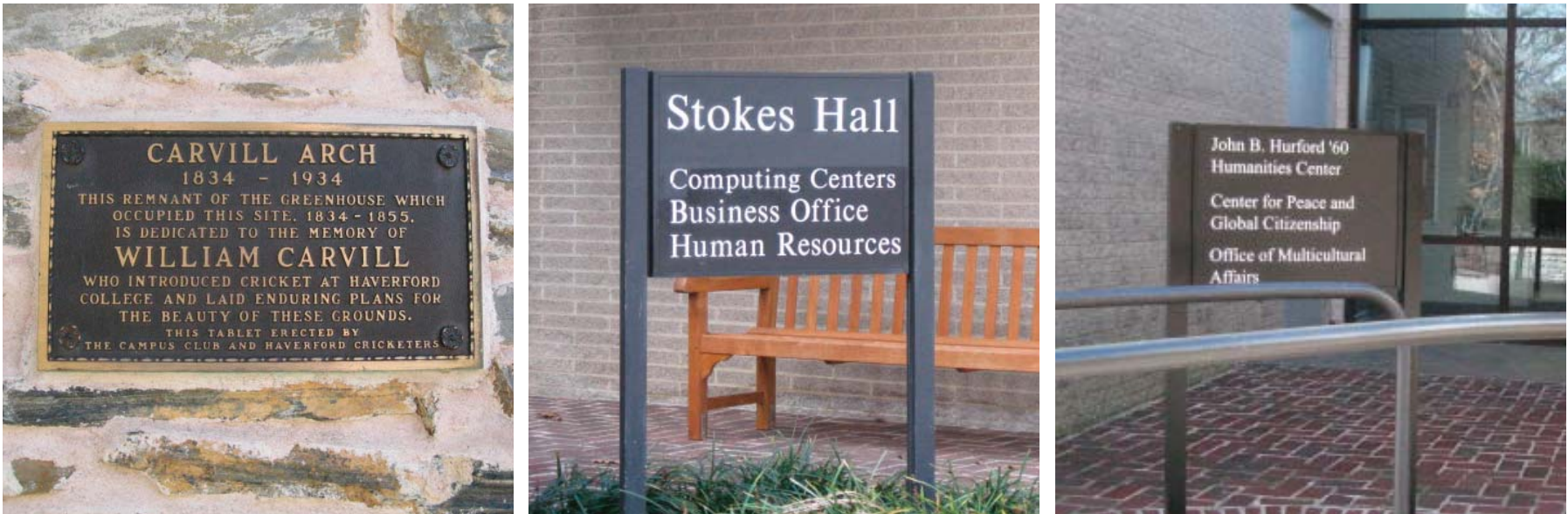


Fig. 59. Examples of current Haverford College signage

VI. BUILDING AND PROGRAMMING NOTES

VI. BUILDING AND PROGRAMMING NOTES

In this section, we provide outline programs for proposed new buildings and consider potential uses for some key existing buildings.

The plan is, by design, flexible enough to accommodate changes in priorities and funding opportunities. We include in this section:

- Two options for Ryan Gym's reuse and addition: the Center for Culture and Media (Ryan Gym Option 1, Section VI.C.) or a replacement for Magill Library (Ryan Gym Option 2, Section VI.D.2.d).
- Two options for the Music Department: in an addition to Roberts Hall, or incorporated into a new performing arts complex at the South Lot (Section VI.F.1.b.).
- Multiple options for the College Library.

A. STUDENT RESIDENCE HALLS

Over time, owing to enrollment growth and the acquisition of HCA, how students live together at Haverford – in what configurations and where – has become less a matter of intention than logistics. The College seeks to restore intentional models of student living to Haverford. From our discussions across campus, it appears this long-term effort should include:

- A variety of housing choices and types, including residence halls, program houses, and apartments.
- Groups of freshmen living together in Customs Groups, in and around the core of campus. Freshmen housing could include a variety of single and double rooms, with Customs Groups clustered around common spaces.
- Upperclassmen housing in and around the core, primarily in single rooms, but with a variety of arrangements available. Student housing modeled on Lloyd – but meeting ADA requirements – would be in keeping with the College's intentions for student life.
- Student housing, if any, at the HCA site reserved primarily for seniors.
- Restoring common space to existing dormitories where it has been eroded by the need for beds.

During the summer, most residence halls are rented to summer programs, and the Haverford College Apartments are rented to Haverford students staying on campus over the summer. The physical campus should continue to support these programs for the foreseeable future.

1. New Buildings

New residence halls are needed in order to restore common spaces in existing dormitories and house fewer students, particularly freshmen, at HCA. About 73 beds would be needed to restore *all* common spaces in Barclay, Comfort, Gummere, Jones, Leeds, and Lunt Halls; restoring even half that number would make a huge improvement in communal life at Haverford. About 418 beds would be needed to replace *all* the beds currently at HCA.

The near term residence hall illustrated on Orchard Green could accommodate about 85 to 105 students in three stories, or 110 to 130 students in four. This assumes a combination of

single and double rooms, with a common space for every 15 to 16 beds (Customs Group). If campus-wide student uses – for example, a small dining room – were included in the program, fewer residents could be accommodated.

As a comparison, one of the newer residence halls at Swarthmore houses 75 students; the newest halls at Middlebury house about between 67 and 84 beds each; and, each of the four newest halls at Amherst house no more than 65 students.

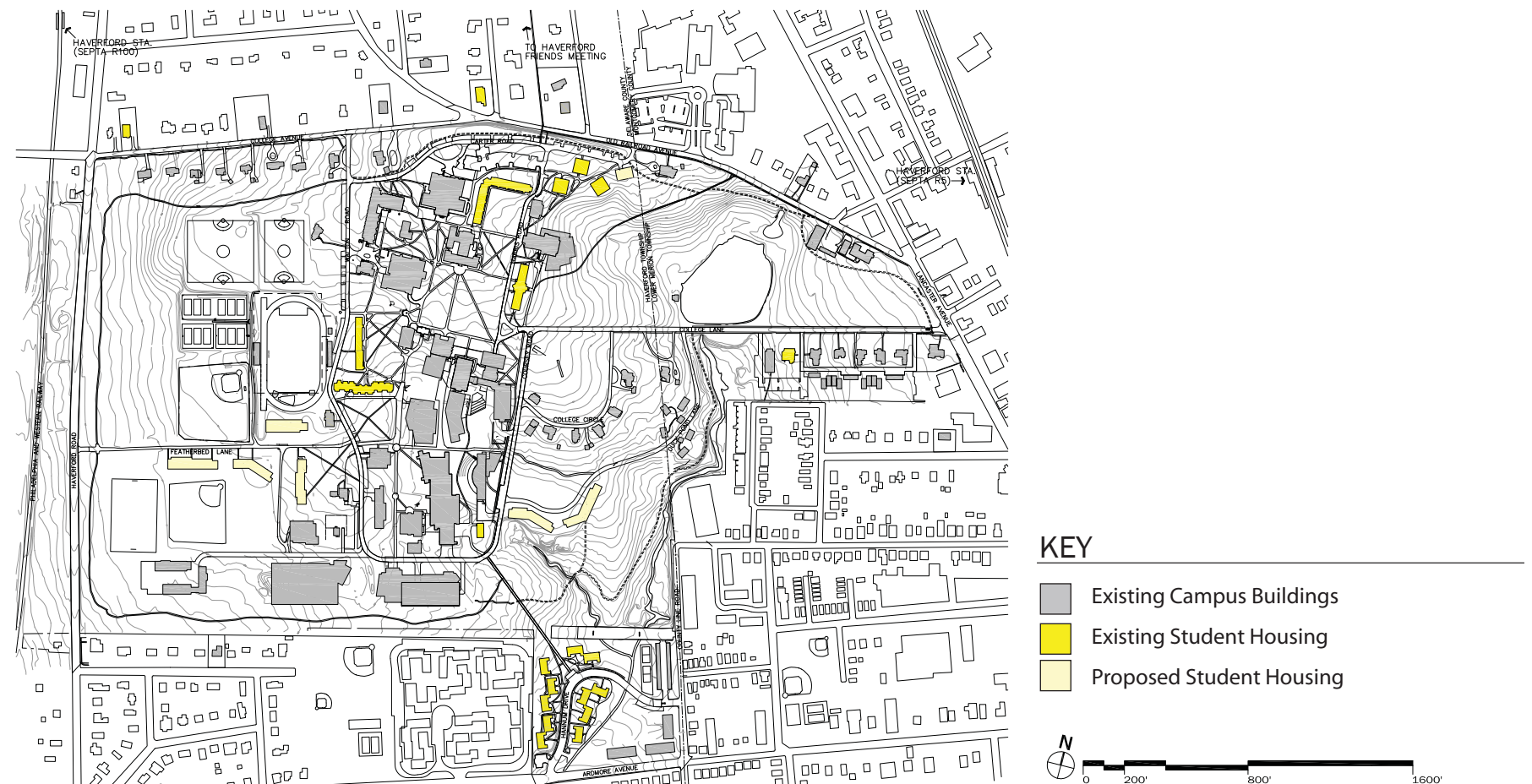


Fig. 60. Potential student housing locations

STUDENT HOUSING - PEER SUMMARY

Amherst

About 81% of first year students live in doubles, 15% live in 2-room doubles, and 4% live in singles (including special rooms). Freshmen residence halls vary in size from 54 to 118 beds, with an average of about 70.

Bowdoin

Most freshmen live in triples. About 19% of upperclassmen live in College houses, 49% live in residence halls and 32% live in College-owned off-campus apartments. About 26% live more than a half mile from the Polar Bear statue at the center of campus. College houses vary in capacity from 22 to 28 beds. Upperclassmen residence halls vary from 12 to 200 beds, with an average of 86 beds. Apartment buildings range from 14 to 199 beds.

Bryn Mawr College

Except for 2 houses, freshmen and upperclassmen live in mixed dorms. Bathrooms in all residence halls are shared. Occupancy of residence halls range from 71 to 163 beds, with an average of 111 beds, although 2 pairs of halls are connected.

Davidson

There are 2 freshmen residence halls, 5 upperclassmen residence halls and 4 mixed upperclassmen and freshmen halls. In addition, there are 6 upperclassmen apartment buildings. Overall, about 42% live in traditional doubles, 5% live in traditional suites, 5% live in traditional singles, and 15% live in apartment-style singles.

Middlebury

Middlebury's residences are organized into 5 residential commons. New halls include La Force (67 single beds), Atwater Hall A (84 beds), and Atwater Hall B (71 beds). The largest residence hall is 250 beds; the smallest campus housing accommodates just 2 students.

Mt. Holyoke

All but 2 small residence halls accommodate a mix of freshmen and upperclassmen. About 52% of students live in traditional doubles; about 35% in singles; 9% in triples or quads; and about 3% in suites or apartments. Average capacity of residence halls is 104 students; the smallest accommodates 12 students, the largest 154.

Pomona

In general, first and second year students live together, and third and fourth students live together. Buildings range in size from 4-person bungalows to one 280-person hall. Excluding the bungalows, the average residence hall size is about 123 beds.

Swarthmore

Capacity of residence halls (excluding houses and off-campus condos) is 97 beds on average, ranging from 22 to 213 students. 17 students live in units in an off-campus condominium building, about a 15 to 20 minute walk to campus. About 18% of students live a 10-minute or more walk from campus. One of Swarthmore's newer dorms, Alice Paul, houses all class years in a mix of singles and doubles (398 gross square feet/bed).

Williams

Freshmen live in 6 residence halls, housing between 66 and 150 students each; average is 101 beds. Upperclassmen live in 4 "neighborhoods," in buildings ranging from 7 to 120 residents (average 48).

STUDENT HOUSING: RECENT PEER RESIDENCE HALLS

Swarthmore College

Alice Paul Hall	Beds	75
	Singles, doubles, 2-story duplex units	
	4 stories	
	Area	29,900 GSF
Construction Cost (2004, excluding soft costs)	\$8.9 Million	
	398 GSF/bed	
	\$301/SF	
	\$119,798/bed	

Amherst College

New freshmen dorms (James and Stearns)	Beds	85 in each of 2 buildings
	Singles, doubles and 2-room doubles	
	4 stories	
	Area	62,000 GSF
Construction cost (2005, excluding soft costs)	\$266/SF	
	365 GSF/bed	
	\$97,058/bed	
Upperclassmen dorms (King and Weiland)	Beds	110 (total) in 2 buildings
	Singles	
	4 and 5 stories	
	Area	59,000 GSF
Construction Cost (2004, excluding soft costs)	\$13.5 Million	
	536 GSF/bed	
	\$229/SF	
	\$122,727/bed	

Middlebury College

Atwater Commons Residence Halls (Hall A and Hall B)	Beds	154 (total) in 2 buildings
	Suites of 3-5 single bedrooms w/living room, kitchen	
	5 stories	
	Area	93,500 GSF
Construction Cost (2004, excluding soft costs)	\$18 Million	
	607 GSF/bed	
	\$192/SF	
	\$116,883/bed	

Fig. 62. Student Housing, Recent Peer Residence Halls

Fig. 61. Student Housing, Peer Summary



Fig. 63. Dorm hallways, lounges and walkways

2. Existing Student Housing

Facilities reviews the condition of student housing every Fall and Spring to identify and correct maintenance issues. Each summer, some student housing is renovated. The College has been systematically adding sprinklers to dormitories; two of the North Dorms and several HCA buildings remain to be completed.

B. STUDENT SPACE

1. The Biddison Hier Report

The vision expressed in the *Conceptual Program for a New Center of Community Life at Haverford: A Student-Centered Campus Development* (Biddison Hier Ltd., March 2007) was one of a “town center’...around which student life at Haverford is organized...geared to academic, co-curricular, social and recreational interests and development needs of students, although it should provide a welcoming environment for all members and visitors to the Haverford community.” The recommended concept included a campus living room; café/coffee house; student organization spaces; academic and co-curricular centers (including the Writing Center and CPGC); group study, meeting rooms and multi-purpose space; a 100-to-150 seat blackbox theater performance space; entertainment spaces including a pub/bar, TV room, game room and unfinished, unfurnished party space; information kiosks, e-mail stations and computing “convenience” center; and support spaces, including student mailboxes, post office, convenience centers (for example, video rental, convenience store, sports rental) and, if possible, the bookstore. The report noted that the area around Ryan Gym would be a “logical location for the Meeting Center,” but also that the “program concepts...are entirely independent of a specific building or specific site.”

2. Discussions

The idea of Ryan Gym becoming a campus living room – a place for the entire Haverford community – was enthusiastically supported by the Steering Committee and many others we talked with. Various options for an addition—from none to rather large – were considered; it became clear that the site could not – and perhaps *should* not – support the combination of academic, co-curricular and recreational uses suggested by the Biddison Hier report.

In open meetings with the campus community, some noted that the Whitehead Campus Center – although much maligned and widely disliked in its current state – was

actively used by some groups of students, particularly at night. According to building staff, the Game Room is particularly well-used, and most meeting room use is for student groups. In addition, the Coop is seen as a positive campus place – albeit invisible from the main building entrance – and the service access, although not ideal, is much better than almost any other location within the campus core. However, the combination of uses within the building – particularly the sleeping rooms, which require a certain level of night-time decorum – inhibits student social activities in the building.

3. Recommended Approach

Our recommended approach is to develop a College-wide living room in Ryan and also to build on the existing Campus Center to make a more dynamic, student-centered place in and around the existing Whitehead Campus Center (WCC).

a. In and around the Campus Living Room

The Campus Living Room in Ryan Gym would be a place for *all* members of the Haverford College community to come together. It would meet many of the needs of the space described in the Biddison Hier report: “[A] primary congregating and hang out spot in the Meeting Center...[with comfortable furnishings that] convey the feeling that they are to be used rather than admired. To accommodate student studying, the space should also include large library-type tables...[and] include semi-private nooks or rooms that provide quiet study opportunities without being totally separated from others in the room...”

The café in Ryan would likewise support the idea of Haverford as one intellectual community by serving students, faculty and staff. From the Biddison Hier report: “The Café should be in a high-profile public space, preferably close to campus living room. Fare should be light food...(Model: Starbucks, Lunt)...”

A combination of arts facilities, academic centers and co-curricular centers – plus a media commons – could be located in an addition to Ryan (see Ryan Gym Option 1, Section VI.C.). Another option would be to incorporate Ryan and its “campus living room” into a new college library on the site (Ryan Gym Option 2, Section VI.D.2.d)

b. In an Expanded and Improved WCC

We recommend expanding and (vastly) improving the Whitehead Campus Center (WCC) for student use by building on some of its existing functions – the Coop, the bookstore, the mailroom; decanting others – the sleeping rooms, the

professionally curated gallery and some administrative offices; and expanding the building and program to include additional student-centered uses.

Although much maligned as a “staircase in search of rooms,” the WCC is in a convenient location, especially for student night-time activities. Housing will remain at HCA, at least in the near term, and the GIAC is an important nighttime locus of student activity. The plan proposes student housing on Orchard Field and, eventually, on Featherbed Lane – with an enlivened Featherbed-Orchard Walk through the core connecting these two new residential precincts. Eventually, after the replacement of Alumni Field House, new campus-wide uses – including, potentially, a library or second dining hall – could be built at the intersection of this east-west route and College Walk. As the implementation of the plan progressed, the WCC site – if not the structure – would become increasingly strategic for locating student activities.

We propose a glassy, transparent addition facing the new Orchard Green, with a secondary entrance from Featherbed-Orchard Walk. (This secondary entrance would require some re-grading and change of level.) Some of the existing building’s stone wall, between columns, would be removed where it meets the addition, for greater visibility and “flow.” (Because the stone wall is a bearing wall – that is, it supports its own weight – structural interventions would be needed.) The building could potentially be arranged to allow after-hours access to the addition only.

One idea of how uses might be arranged in the building is illustrated in the diagrams on this page. It includes:

Grade level. The mail and bookstore would remain in place; the bookstore wall facing the main stair would become more transparent and inviting. The offices below the stairs would be removed, to allow people to flow more seamlessly between the stair hall and the new addition. Perhaps more important in terms of perception of the space, the existing vestibule walls would be removed, allowing a clear view from the mail hall (almost) to the game room. The addition could include a late-night lounge, coffeehouse or rehearsal room – in a light-filled beacon to the campus community.

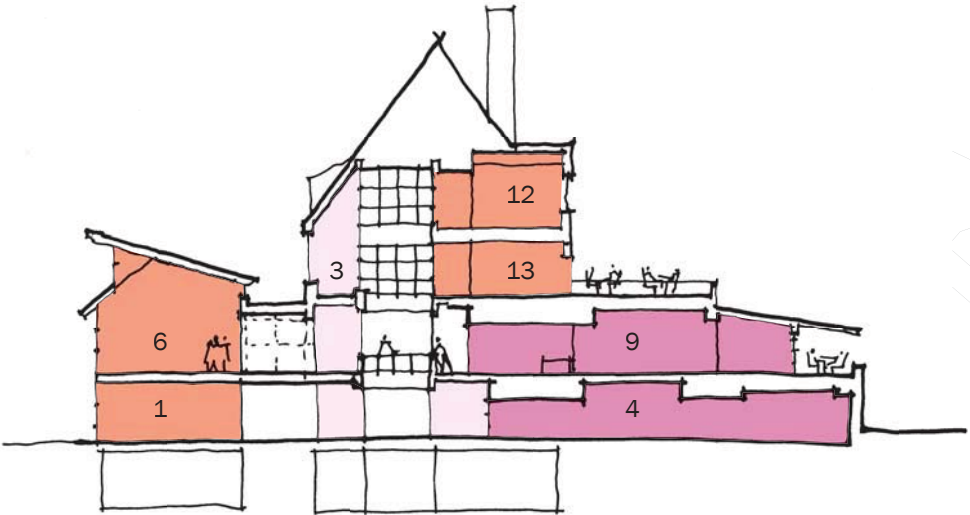
First (Coop) level. The Coop would remain, and would expand into the “Ikea Lounge,” with comfortable, coffeehouse-type furniture; the ability to see into the Coop and to the terrace beyond in one direction – and out through the glazed addition to Orchard Green beyond in the other – would help create a positive, connected sense of place. Small café tables at the stair hall windows could invite people to take their coffee from

the Coop into the atrium. Curated exhibits in the Cantor Fitzgerald Gallery would be moved to the Ryan addition; the space could be used as a student gallery, student performance space, or some combination of the two. The addition could house a large, light-filled multi-purpose room – suitable for use for student rehearsals, meetings or gatherings. Student organizations benefitting from a high degree of visibility – perhaps the campus radio station – could also be located here. For at least the near term, the Admissions office would remain in its current offices on the south ends of the first and second floors, and expand into the south end of the third floor (current sleeping rooms) as well. Ideally, a more direct entrance to Admissions would be provided – perhaps via a reconfigured main stair.

Second level. The north end would be used primarily for campus organizations; the meeting rooms (205 a, b and c) would be combined into one large meeting room or lounge overlooking the terrace. The Student Activities office could also be located here.

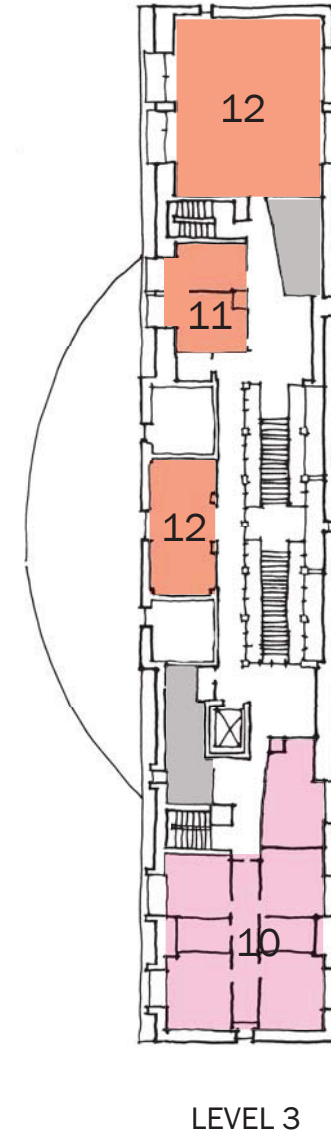
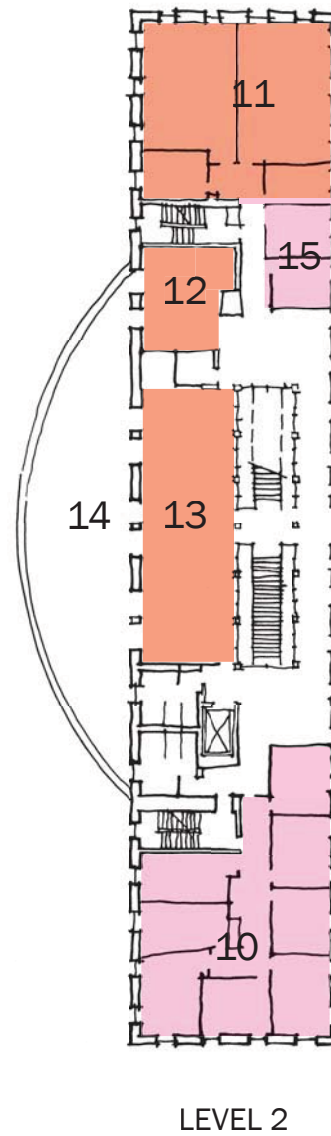
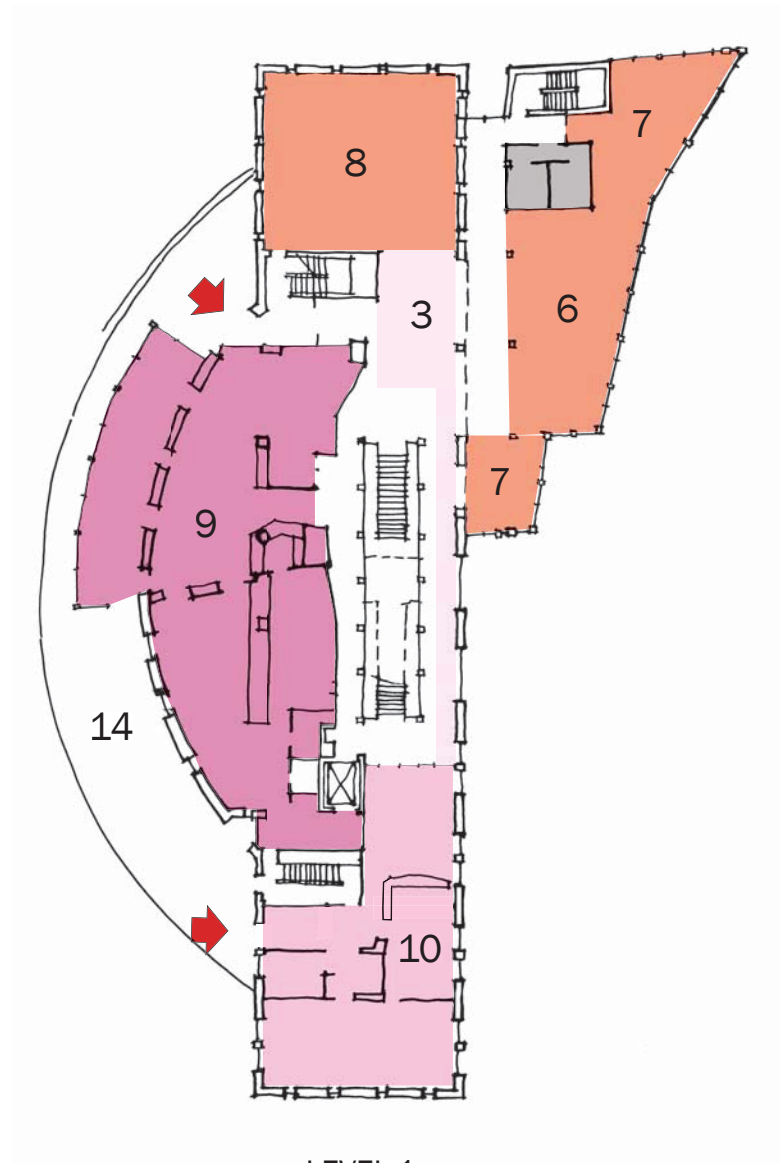
Third level. Here, too, would be student activities offices and meeting rooms.

Construction of the addition could probably be accomplished with very little “downtime” for the existing building; proposed renovations to the existing building are strategic but not extensive and could be phased to minimize disruption. (If more extensive renovation is desired – for example, replacing the main stair – “downtime” would be increased and additional swing space would be required.)



SECTION (Not to same scale)





1. Student multi-purpose or lounge space
2. Game room
3. Hearth/Lounge
4. Bookstore
5. Mail room
- 5a. Student mailboxes
6. Multipurpose or rehearsal room
7. Meeting or rehearsal rooms
8. Student art gallery and/or performance space
9. The Coop
10. Admissions
11. Student organizations
12. Meeting room
13. Meeting room or lounge
14. Terrace
15. Student Activities Offices

KEY

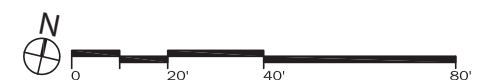
- Campus Center
- Student Center
- Dining and Retail
- Administration
- Facilities / Storage
- Potential entry locations
- Service access

WHITEHEAD CAMPUS CENTER POTENTIAL RENOVATION AND ADDITION

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source:
Information Source:



We believe the addition should:

- be much more transparent than the existing building, but of equally fine materials.
- be two stories above grade, holding its roofline below the eave of the existing building.
- have an entrance between the existing building and the addition, facing the KINSC, on the path from the KINSC breezeway; this could make it more convenient for people just to “pass through” the building, potentially bringing more pedestrians past the Game Room and Bookstore.
- provide additional toilet rooms, if needed by code. The number of existing public toilet fixtures seems modest in proportion to the number of users of the building, particularly at the Coop.

Even in the very near term, before any substantial changes were accomplished, the building could be improved by:

- Encouraging people to take their coffee into the atrium, thereby enlivening the stair.
- Making more use of color, and perhaps graphics, throughout the building.
- Enlivening the entrance to Cantor Fitzgerald with well-lit (and non-photosensitive) displays visible even when the gallery is closed.
- Providing digital displays in the main lobby.
- Hold some scheduled classes in underused meeting rooms, to bring more people to and through the building.

c. Within Residence Halls

The new residence hall proposed for “Orchard Green” would be built in part to decant beds from existing dormitories, allowing social and other communal space to be returned to each building.

d. Other Student Community Spaces

The campus living room and a (vastly) improved WCC could be supplemented by other student-oriented spaces nearby:

- Marshall Auditorium in Roberts Hall could be used for student theater and dance productions; eventually, these activities would take place within a new performing arts complex on the South Lot.
- Student social space could be provided in a new residence

hall on Orchard Green. This space would have a separate entrance and its own toilet facilities, to avoid compromising the security of residents.

- In the longer term, 6 College Circle, now used by Bryn Mawr’s Phebe Anna Thorne School, could be developed into a student-run coffeehouse, similar to the Ronj at Bates College. (This building has also been suggested as a possible location for Admissions, but is far too small.)
- Provided issues of egress and ADA access could be addressed in a renovation, the second floor of Union could be used as a registrar-controlled classroom during the day, and a dance rehearsal space at night after new space is built for the Music department.

e. Displaced uses

The hotel-style rooms in the WCC would be relocated to a large campus house, renovated for the purpose. Possibilities include:

- Cadbury House, if another College house could be identified as the campus quiet residence. The location of Cadbury would be ideal, next to the proposed Alumni House.
- 791 College Avenue, if not used for administrative offices.
- 1 College Lane.

Locations within Lower Merion Township would require zoning approval.



Fig. 64. The Ronj coffeehouse, Bates College
(Source: www.bates.edu)

IEWS THROUGH SPACES



Loker Commons, Harvard University



Fig. 65. Campus center images

COLOR - PATTERN - LIGHTING



TRANSPARENCY & LIGHT AT THE EDGES



C. THE CENTER FOR CULTURE AND MEDIA
(RYAN GYM OPTION 1)

A Culture and Media Center at the Ryan Gym would aim to promote scholarship and teaching in the arts, social sciences and humanities, as well as informal exchange and public access. The Center for Culture and Media would ideally house:

- a “campus living room,” with comfortable furniture, places to read newspapers and have conversations. This space would be for students, faculty and staff.
- the Arts and Humanities Center;
- the Center for Peace and Global Citizenship (CPGC);
- the Multicultural Center;
- a digital media center;
- a screening room;
- exhibition space and collections storage;
- café.

A “test fit” of the program is included on page 95. Entrances are shown from College Walk as well as from Founders’ Green. Active public spaces should be easily visible and accessible from the Walk.

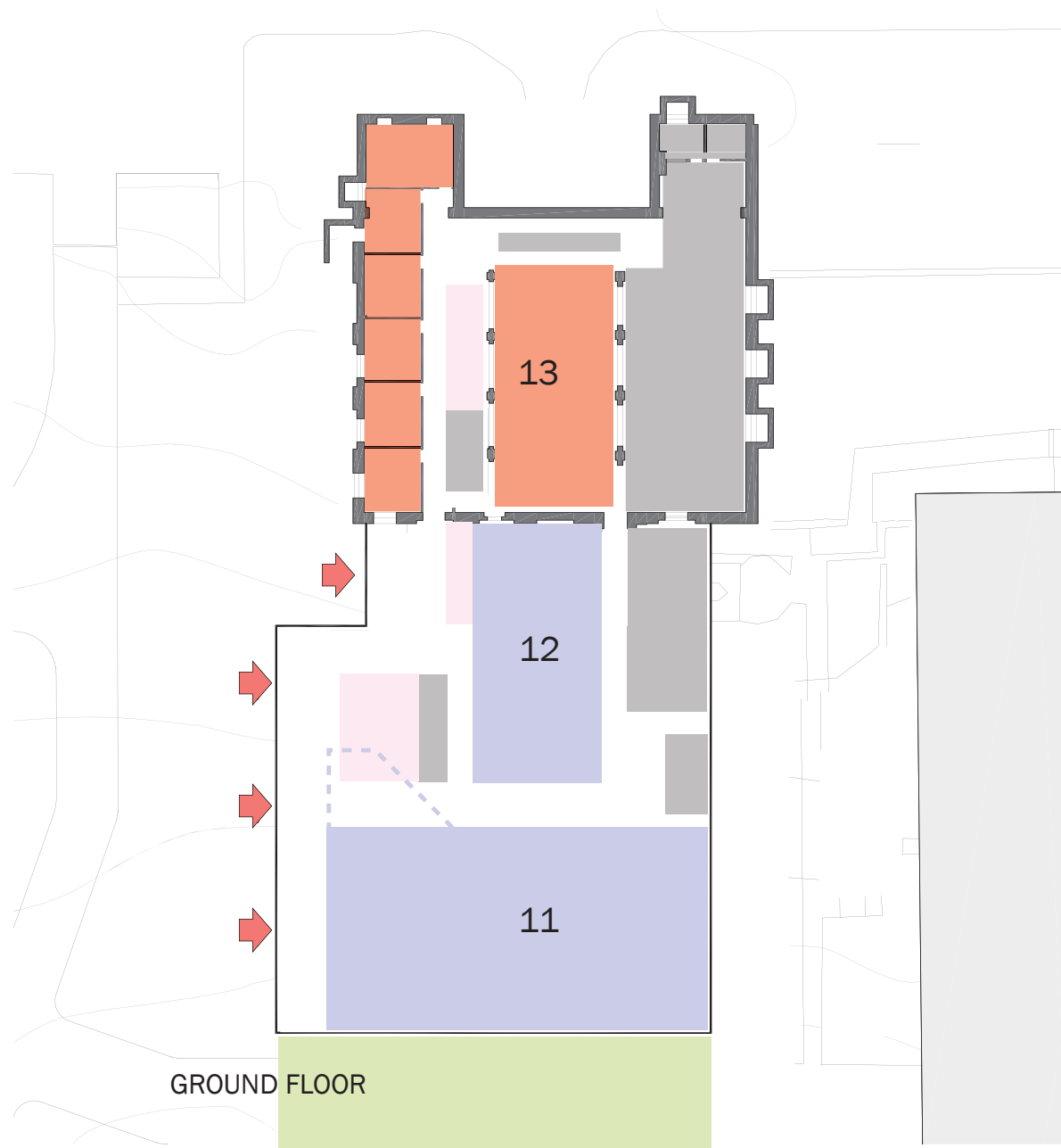
An alternative to this program is discussed in Section VI.D.2.d.

OUTLINE PROGRAM: CENTER FOR CULTURE AND MEDIA IN RYAN GYM		
	Net program area (SF)	Gross area (SF)
Existing and New		
Campus Living Room and Associated Spaces		
Main space	1,800	
Side areas, café spillover and “nooks”	1,000	
Café - 34 seats	1,300	
Meeting Rooms		
4 @ 430 sf	1,720	
Multi-purpose and practice spaces		
Arts and Humanities Center		
Executive Director	225	
Faculty Director	180	
Associate Directors	450	
Mellon Fellows	300	
Visual Studies Post-doc	150	
Environmental Studies Post-doc	150	
Reception	250	
Exhibition Coordinator	225	
Curator	225	
Exhibition Space	500	
Center for Peace and Global Citizenship	1,600	
Faculty Offices? (Could be future Center expansion space)		
8 @ 170 sf	1,360	
Multi-Cultural Center	1,600	
Seminar Room	360	
Conference Room	1,500	
Breakout rooms	900	
3 @ 300 sf		
Digital Media Center	4,000	
Screening Room	1,500	
Exhibit Space (Collections)	3,000	
Replaces 1,667 NSF in Whitehead Campus Center		
Collections Storage and Preparation	3,400	
Including cold storage for photography		
Object Study		
2 @ 400 sf	800	
Total		
	34,995	56,444
	assume 62% net-to-gross (renovated space)	
Existing building to remain (less elevated track)		18,600
New construction		37,844

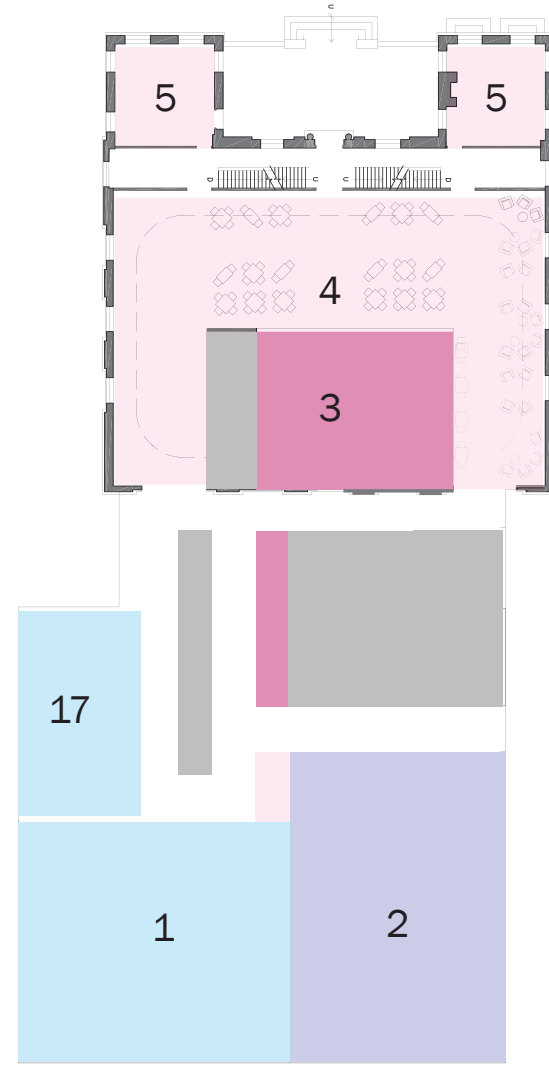
Fig. 66. Outline Program: Center for Culture and Media in Ryan Gym

PEER COMPARISON: ART COLLECTIONS STORAGE
Grinnell College 2,194 SF in 2 locations; ideally, would like 50% more and in one location
Vassar College 6,200 SF
Wesleyan University 1,260 SF in Davison Art Center 3,000 SF planned for new building, never built

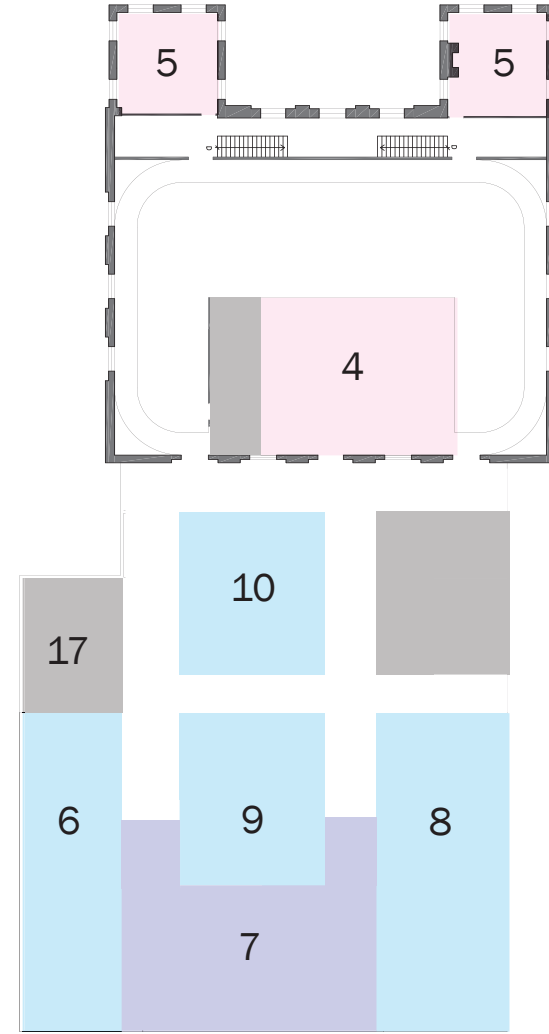
Fig. 67. Peer Comparison: art collections storage



LEVEL 2



LEVEL 3



1. Arts and Humanities Center
2. Exhibition Space
3. Café
4. Campus Living Room
5. Meeting Rooms
6. CPGC
7. Conference Room
8. Multicultural Center
9. Breakout Rooms
10. Seminar Room
11. Digital Media Center/ Information Commons
12. Screening/ Lecture
13. Multi-purpose Room
14. Art Storage
15. Object Study Rooms
16. Mechanical
17. Potential Faculty Offices

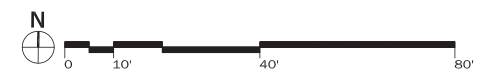
KEY

- Academic and Cultural Centers
- Campus Wide Spaces
- Student Spaces
- Support / To Be Determined
- Central Power Plant
- Cafe
- Administration
- Arts
- Mechanical
- Green Space
- Pedestrian Entrance

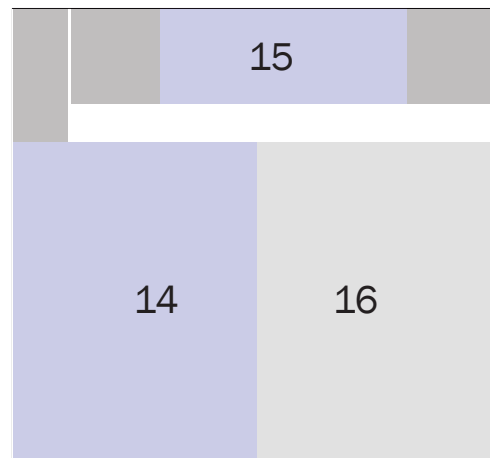
THE CENTER FOR CULTURE AND MEDIA (RYAN GYM OPTION 1)

HAVERFORD COLLEGE Campus Master Planning

Base Map Source:
Information Source:



BASEMENT



Venturi, Scott Brown and Associates, Inc.

January 29, 2009

D. LIBRARY

1. Needs

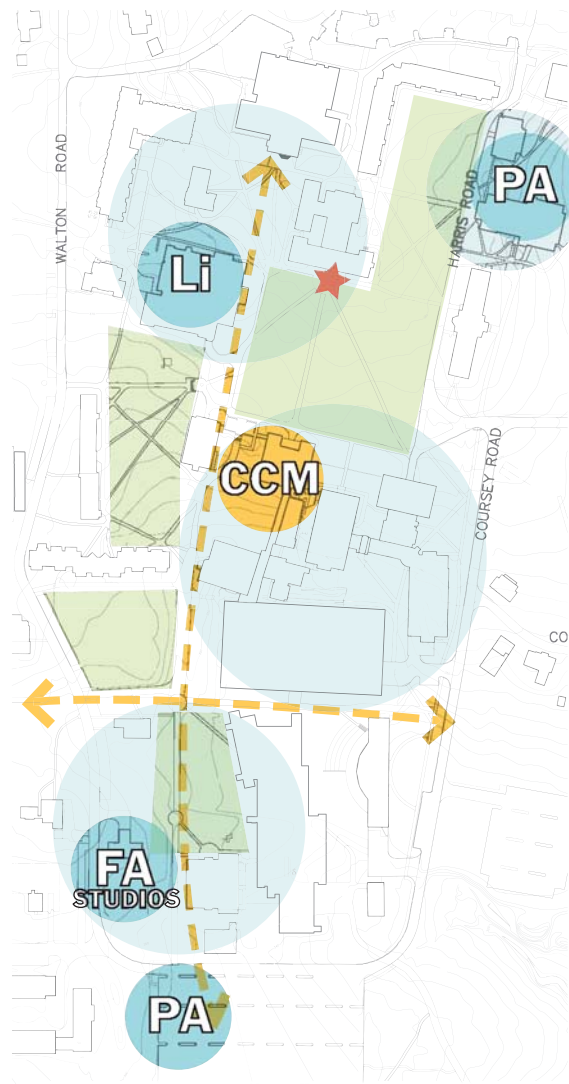
Magill Library has been built in modest increments over time, resulting in a complex, confusing series of spaces. Within the building there are spots of great loveliness – the reference area, for example, or the Philips Wing – but the building is difficult to comprehend and navigate.

The building lacks the kinds of spaces that have become the norm for college libraries: group study rooms, exhibition spaces and a café. More space is needed for individual study and growth of the collections. Climate control systems, particularly humidity control, are not up to the demands of the library – and especially not adequate to protect special collections.

The present Library is 87,614 gross square feet (gsf). Peer comparisons in Fig. 68 range from 102,000 gsf (Swarthmore) to 135,000 gsf (Middlebury). Our diagrams assume a size on the lower end of that scale based on Haverford’s smaller collection and student body (both about half the size of Middlebury’s). A more detailed programming study, including acquisition projections, would be needed to confirm our assumptions.

LIBRARY			
Needed:			
<i>Group meeting and study spaces</i>			
<i>Exhibition spaces</i>			
<i>Individual study space</i>			
<i>Space for growth of collections</i>			
<i>Better space for special collections</i>			
<i>Internet café</i>			
<i>Additional space for special collections, with temperature and humidity controls</i>			
<i>Better climate control</i>			
<i>Better wayfinding</i>			
<i>Better lighting</i>			
Some Peer Comparisons:			
	<i>Number of Volumes</i>	<i>Students (FTE)</i>	<i>Main Library Area (gsf)</i>
Haverford College Main Library - Magill	445,000	1,168	87,614
Swarthmore College Main Library - McCabe	648,000	1,398	102,000
Williams College Main Library - Stetson-Sawyer (to be completed in 2011)	760,000	2,039	125,000 (plus remote storage)
Amherst College Main Library - Frost		1,616	134,000
Middlebury College Library (completed 2004)	over 1,000,000	2,432	135,000

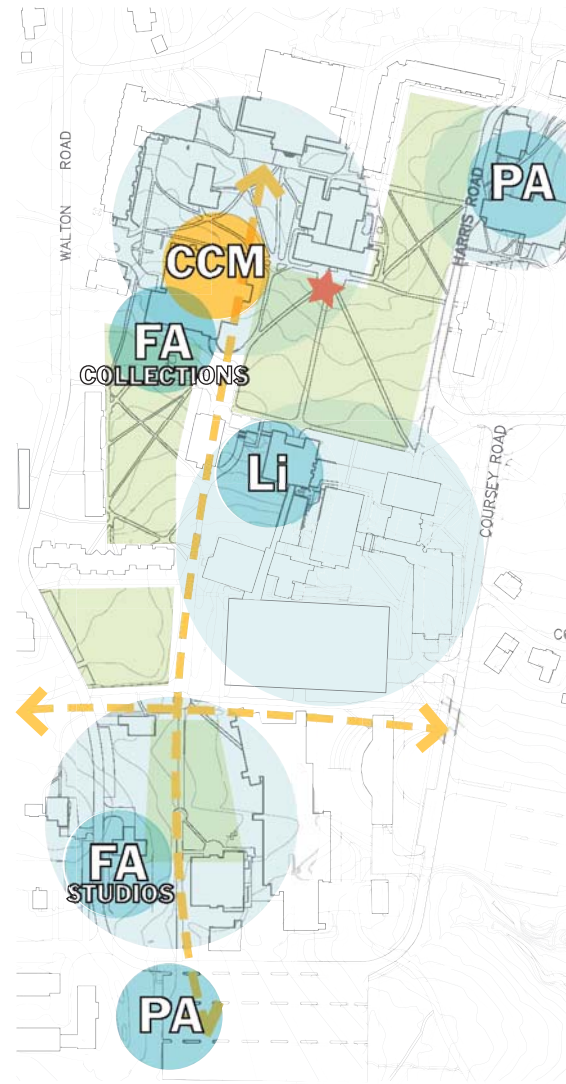
Fig. 68. Program needs and peer comparisons: Library



RENOVATE OR REBUILD LIBRARY AT MAGILL

- Existing envelope constrained (Magill - 87,600 GSF). There is limited room for an addition. If only historic portions of building are maintained, and a new extension built, capacity increases to about 120,000 GSF including four stories plus basement.
- In place phasing of Library or temporary re-location could be complex, disruptive, and expensive.
- Most prominent location on Founders Green nearest Founders Hall.

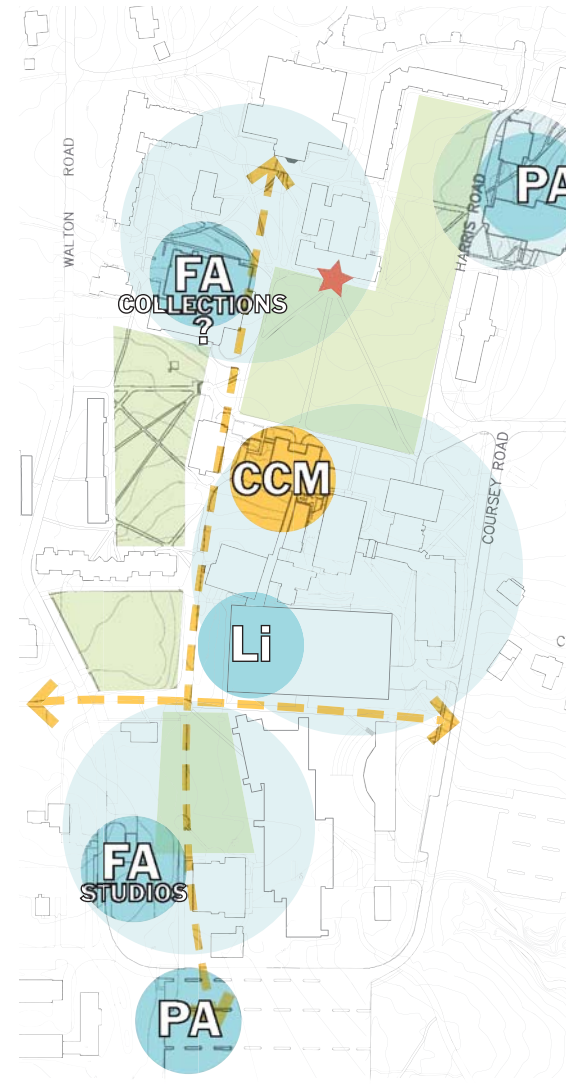
This option makes sense if a new library is not feasible in the near term but cannot wait until the Field House site becomes available; if another program large enough to fully use the Magill site cannot be identified; or, if the significance and prominence of the site is valued more highly than the logistical and cost issues of building in place.



REPLACEMENT LIBRARY AT RYAN

- Constrained Library site (Capacity, including Ryan, about 105,000 GSF)
- New space would be needed elsewhere on campus to accommodate additional office space that would have been provided in the Center for Culture and Media.

This option makes sense if a new library is a greater priority in the near-term than the Center for Culture and Media; and if the logistics and cost of rebuilding at Magill prove insurmountable.



REPLACEMENT LIBRARY AT CAMPUS CROSSROADS

- Least constrained Library site (capacity about 130,000 GSF in four levels plus basement)
- Field house replacement on another site needed before Library project
- Re-use of Magill could not occur until both a new Field House and new Library were constructed.
- Location at crossroads of College Walk and Featherbed Orchard Walk.

This option makes sense if a new Library, with increased capacity, is a long-term priority.

KEY

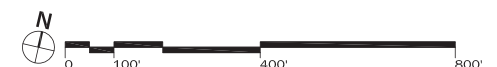
- Academic Core
- CCM Center for Culture and Media
- FA Fine Arts
- Li Library
- PA Performing Arts
- ★ FOUNDERS HALL
- ← ARTERIAL CAMPUS PATHWAY
- ICONIC GREEN

LIBRARY LOCATION OPTIONS

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source:



2. *Alternative Approaches*

Options for a new Haverford College Library include:

a. Renovation of Magill

Pro

- The Library would maintain its presence on Founders Green.
- By retaining most of the existing building, this option could be considered “greener” than full replacement, providing greatly increased capacity.

Con

- Maintaining a working library while undergoing extensive renovations – or creating a temporary library – would be a challenge.
- Area for expansion would be limited, although extensive renovation and selective demolition could result in more efficient use of the site and increased capacity.
- The health of the existing historic trees around Magill – including the climbing tree and the bitternut hickory – could be compromised by extensive construction in the vicinity.

b. Rebuilding on Site

In this option, the most historic parts of the building would be maintained and incorporated on site into a substantially new library building.

Pro

- This option would maintain the Library presence on Founders Green and the charm of the historic building, while also creating a new, 21st-century facility.
- A completely new addition could be both taller and more efficient than the existing hodgepodge of incremental extensions.
- If the addition is high enough, it could be visible from Founders Green – potentially adding a beautiful, contemporary face to this historic place.

Con

- Creating a temporary library would present logistical challenges; the financial challenges and inconvenience would need to be weighed against those of other options.
- Expansion footprint could be limited, although extensive (but selective) demolition and new construction could result in more efficient use of the site and increased capacity.
- The health of the existing historic trees south of Magill – including the climbing tree and the bitternut hickory – could be compromised by extensive construction in the vicinity. Their health and expected longevity should be evaluated and taken into consideration.

c. Replacement Library at Field House Site

A new library could be built at the intersection of College Walk and Featherbed-Orchard Walk.

Pro

- This would be a relatively easy option in terms of library operations; the library would simply move from the old building to the new, causing inconvenience for a matter of weeks not years.
- This is the least constrained of the sites under consideration.
- The existing Magill – particularly its more historic segments – could be used for other campus-wide activities, perhaps an art gallery.
- The new library would be located at an important campus crossroads.

Con

- A replacement for Alumni Field House would be needed before construction could begin, potentially off-setting any advantages of convenience and cost.
- The Library would not retain its presence on Founders Green.
- Another program that uses the Magill site to full capacity has not yet been identified.

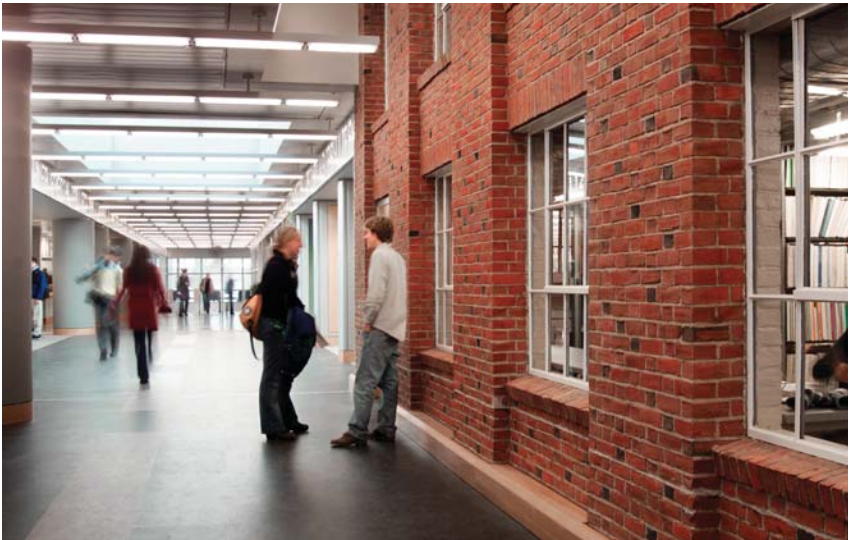
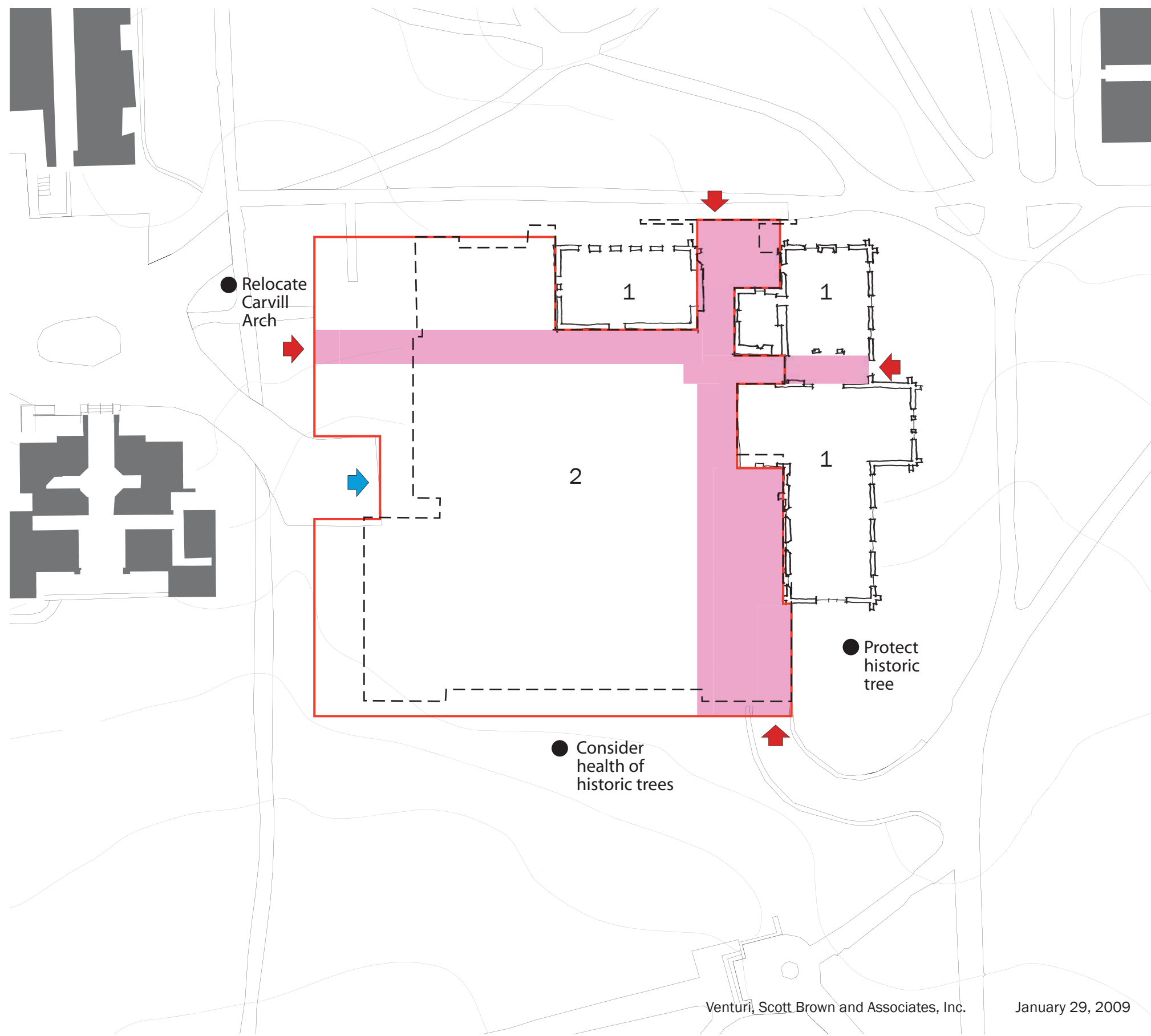


Fig. 69. Example of New and Old at Baker/Berry Library, Dartmouth College



d. Replacement Library Incorporating Ryan Gym
(Ryan Gym Option 2)

In this option, Ryan Gym would provide a “head house” for a new library in an addition to the south. To integrate well into the campus – and to avoid a “dead zone” along College Walk – the building would have entrances along the Walk as well as through Ryan.

Pro

- The Library would remain on Founders’ Green, while also lending a strong academic presence to College Walk.
- This would be accomplished without complicated phasing of Library operations (compared to a complete, phased renovation of Magill); the expense and logistics of a temporary library and off-site storage (compared to creating a new library behind the historic portion of Magill); or the need to wait until a new field house has been constructed.
- With careful planning, it could be possible to renovate Ryan as a “campus living room” with a café, information commons and some display space in the near term, while leaving open the possibility of a major library addition in the longer term.

Con

- The size of the addition needed would be larger than the Steering Committee has, in earlier iterations of the plan, found desirable. (If the height is kept relatively modest at the Walk and against Ryan, a larger building here – set off against the green space on the opposite side of the Walk, behind Hall – could be well-integrated into the campus.)
- Multiple entrances would need to be worked out through careful planning of library security zones and staffing – but has been done successfully elsewhere (for example, at Dartmouth’s Baker-Berry and Wellesley’s Clapp Library).
- If only the first phase – within the existing Ryan envelope – is built in the near term:

-- additional space would be needed on campus to allow growth of the faculty beyond capacity of the Science Library in Stokes. (A new Alumni House, incorporating offices for Institutional Advancement staff, could meet this need.)

-- program elements would be limited. Priorities between desired programmatic functions – including information commons, café, meeting rooms and exhibition space – would need to be decided. Some elements would need to be made smaller than desired, or deferred to later phases of construction.

- The site is somewhat limited in size; a more detailed library programming study would be needed to confirm its adequacy. (The eventual demolition of the Field House could, however, provide long term expansion potential.)
- Another program that uses the Magill site to full capacity has not yet been identified.

3. *A Note on Temporary Facilities*

Of 61,586 total net assignable square feet (NASF) of space at Magill Library:

- approximately 39,700 square feet (64.4%) is devoted to stack space and other collections storage;
- about 8,000 square feet (13%) is study space (including carrels and classrooms);
- about 7,000 square feet (11.5%) is staff and administrative offices;
- and the remaining 11.1% of assignable area is support or other space.

If the Library were to remain in Magill for the long term, and all or part of the building were reconstructed, how much interim space would be needed to house library functions during construction? Where would such space(s) be located?

- One option – if the library were rebuilt *before* a new performing arts space were built on the South Lot – would be to build a temporary library at the southern end of College Walk, on part of the existing parking lot. Temporary replacement parking could be located west of Facilities.
- Another option – if the library were rebuilt *after* the construction of a new field house – would be to locate a temporary library within Alumni Field House.
- If volumes cannot be housed in Magill Library during renovation/ reconstruction, a second interim facility for collection storage will be necessary.

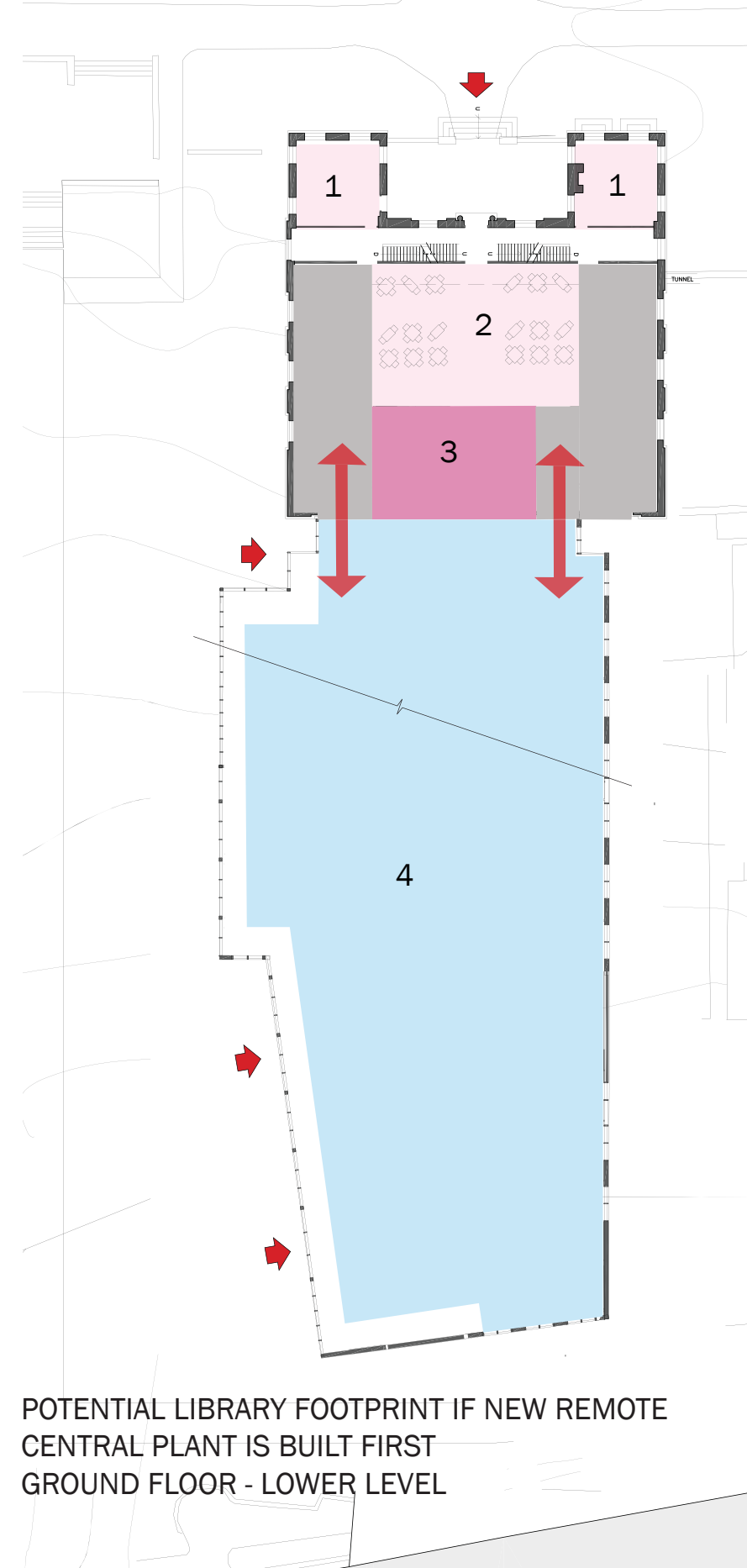
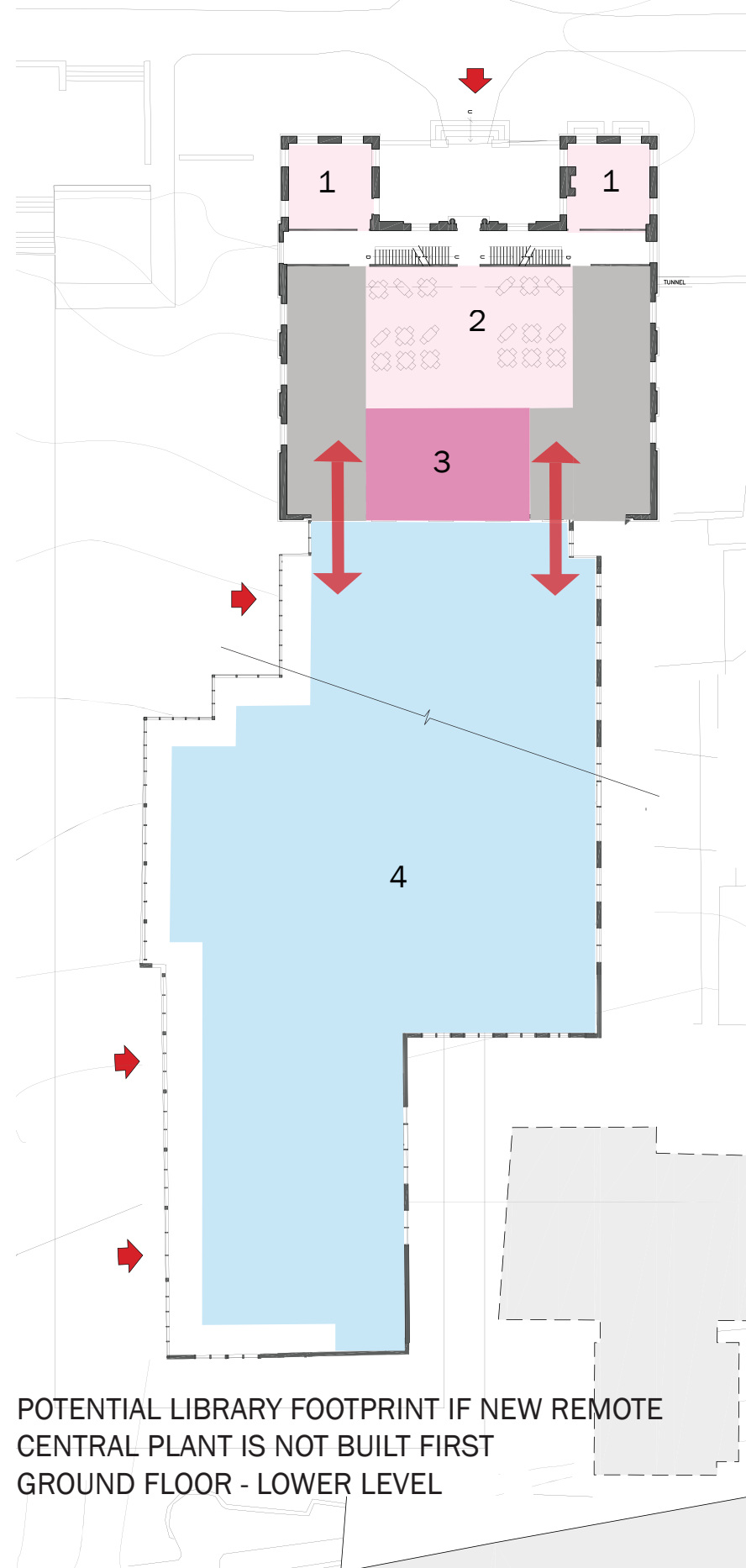
Examples of interim solutions at other institutions include:

- In 2008, Salem State College created a temporary library for 100,000 books, 60 computer workstations, study rooms and a classroom in 20,000 SF; this serves a community of approximately 7,300 undergraduates and 2,500 other students. With a fraction of that student body, Haverford could likely find an acceptable interim library solution in equal or lesser area.

- In 1992, UCLA built the temporary “Towell Library” while its undergraduate Powell Library was renovated. Sited on a main quadrangle and constructed primarily of a polyester fabric membrane over a steel frame, this two-story, 36,000 square foot structure contained book stacks, compact storage, carrels, computer clusters and meeting rooms. About 150,000 volumes were stored in Towell; the remainder were sent to off-site storage. The structure was able to accommodate thermal and sound-proofing requirements for the library and also found later life as a dance studio until demolition in 1998.
- Williams College recently completed its Library Shelving Facility approximately one mile north of its campus; it houses about 900,000 volumes in 10,000 square feet with 30-foot high compact shelving. This is both a near-term solution to a library construction project and a long-term solution for storage of library volumes. With a library collection under 600,000 volumes (not all housed at Magill), Haverford would not need a facility the size of Williams’.

OUTLINE PROGRAM: PHASE I OF FUTURE LIBRARY IN RYAN GYM (Ryan Option 2)		
	Net program area (SF)	Gross area (SF)
Existing and New		
Campus Living Room (future Library entrance)	1,500	
Café - 30 seats	1,170	
Meeting Rooms and Offices		
4 @ 430 sf (existing north rooms at 1st and 2nd levels)	1,720	
Other	1,000	
Digital Media Center	4,000	
Exhibit Space (Collections)	2,000	
Replaces 1,667 NSF in Whitehead Campus Center		
Collections Storage and Preparation	2,000	
Total	13,390	22,317
		assume 60% net-to-gross (renovated space)
Existing building to remain (less elevated track)		18,600
New construction (within existing envelope)		3,717

Fig. 70. Outline Program: Ryan Gym Option 2



1. Meeting Rooms
2. Campus Living Room?
3. Café
4. Library

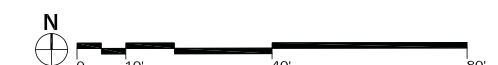
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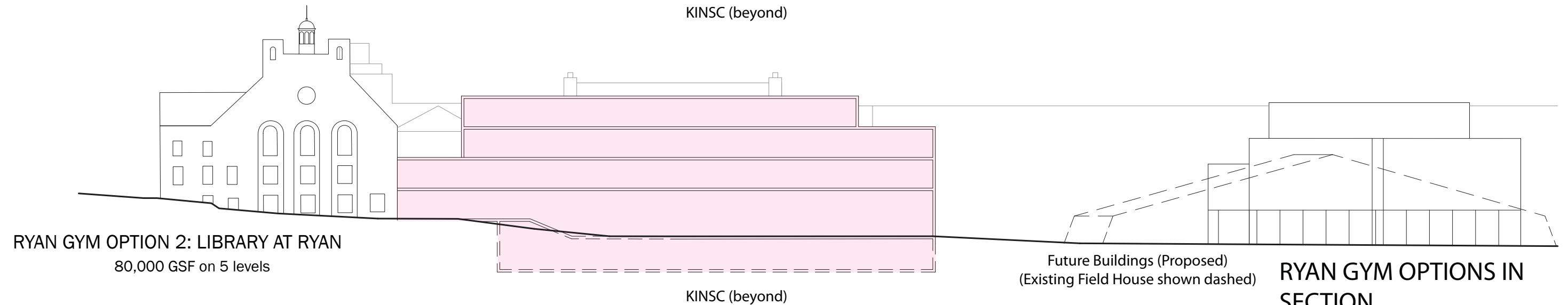
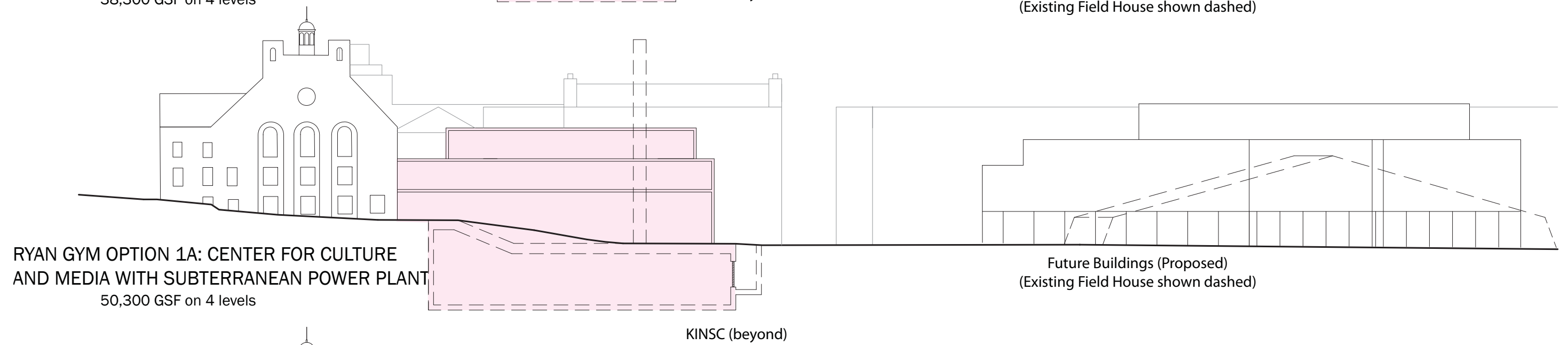
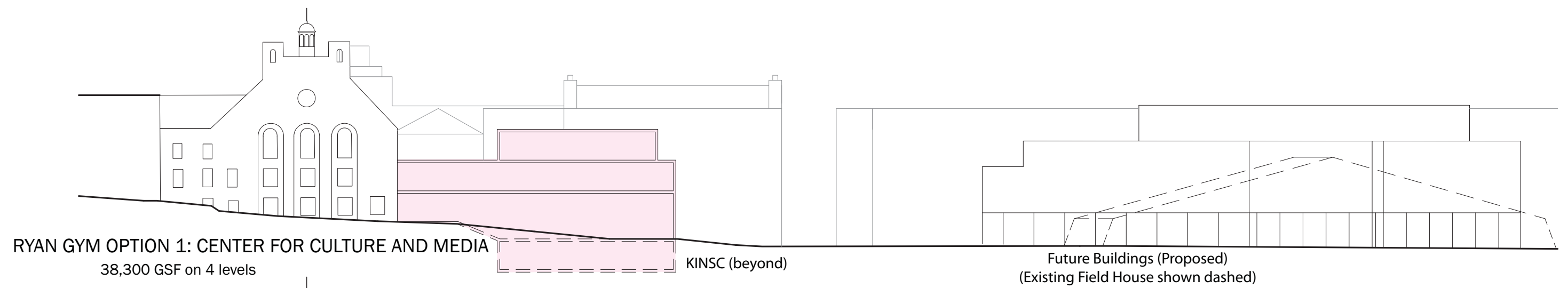
- Academic/Library Spaces
- Campus Wide Spaces
- Café
- Support / To Be Determined
- Pedestrian Entrance
- Connection

LIBRARY LOCATION OPTION: REPLACEMENT LIBRARY INCORPORATING RYAN GYM (RYAN GYM OPTION 2)

HAVERFORD COLLEGE Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source:





RYAN GYM OPTIONS IN SECTION

HAVERFORD COLLEGE
Campus Master Planning

Base Map Source:
Information Source:



4. Next Steps

The combination of a new facility with the charm and location of the historic segments of Magill is very appealing, but creating an interim library would be a large undertaking, perhaps beyond what Haverford could afford or tolerate. The Ryan Gym option combines a location on Founders Green with the logistical simplicity of a replacement library, but capacity is somewhat limited.

We recommend a library feasibility study to study the options in more detail at least several years before the College intends to begin construction of a new library. The true advantages, sustainability and cost of each option – including costs of phasing, off-site storage and temporary accommodations – would require detailed analyses. We recommend that no other building be constructed on the Alumni Field House site until a decision among options has been finalized.

In the nearer term, the College must decide the future of Ryan Gym. If the College decides to pursue the option of a library at Ryan further, we recommend a feasibility/conceptual design/programming study that considers all phases of the project – Ryan and its addition – in greater detail.

- Possible outcomes of the study include a decision to build the library on the Ryan site; a decision to keep the Ryan site as an option, and to build the first phase in such a way that either the library or the Center for Culture and Media could be added; or, a decision to eliminate Ryan as a potential library site.
- Pursuing the project in phases could mean that more of the building services – elevators, fire stairs, toilet rooms – would be located in the original building than would be if the project were completed at one time.
- Connections between buildings require careful consideration; points of connection should be determined with some degree of precision before the first phase of renovation.

We understand that the College has many competing priorities and may be unlikely to undertake a project of the Library's magnitude in the very near term. Smaller scale improvements could help the existing library serve the Haverford community in the interim.

E. FACULTY OFFICES AND CLASSROOMS

1. Faculty Offices

The FCAE report anticipates between 26 and 32 new faculty members. In addition to accommodating new faculty, the College should aim to remove faculty from space in Leeds, a student residence.

Based on an analysis of existing faculty offices and discussions with the Steering Committee, we have assumed, for planning purposes, a faculty office size of about 170 square feet, although some variation should be expected owing to the eccentricities of existing buildings. In addition to office space, there is a need for faculty and student interaction and research – similar to the Math or Physics lounge.

2. Classrooms

a. Existing use

The charts on the pages that follow present Haverford’s use of its classrooms in a graphic format. The same information is presented in different formats, arranging classrooms in order by:

- *Seat utilization* (average percentage of seats filled when room is occupied). One typical rule of thumb used by many institution is that each classroom, on average, should have 60% to 70% of its seats filled during the hours in which it is occupied. Haverford’s small size – and its correspondingly small number of classrooms – makes achieving this rule of thumb difficult. At Haverford, an average of 56% of classroom seats are filled when the room in use.
- *Use* (number of class hours per week). Some institutions set a goal of a certain number of class hours per week of use for each classroom. A typical rule-of-thumb s is that classrooms should be used about 60-70% of scheduled class hours, to allow efficiency but also time for regular cleaning and maintenance as well as for non-class activities. Using this standard and assuming Haverford’s current available class schedule, 42 hours per week, the College’s target for classroom use could be about 25 scheduled class hours per week. At Haverford, the average classroom is used 18.6 hours per week, or about 44% of the available hours.

On page 106, we illustrate classroom use throughout the week.

Observations include:

- At Haverford, medium-sized classrooms are most in demand. Of the ten rooms with the highest use (most class hours per week), all but one hold 25 to 40 students.

- Of the 9 classrooms in which, on average, more than 70% of the seats are filled when the room is occupied, 5 accommodate between 30 and 54 students. Of the ten rooms with the highest use, all are in Stokes, Hall or Gest.
- Although almost a quarter of Haverford’s class sections are for small groups of between one and five students, the demand for small classrooms is not correspondingly high. This may be because such classes are being held in faculty offices or other spaces not scheduled by the registrar.
- The *amount* of space does not seem inadequate – but it appears that the sizes and configurations of rooms do not meet the College’s needs.
- Some spaces appear to be used very few hours per week. Is there some information about their use we are missing – for example, use for classes or meetings scheduled at the departmental level? Or is it that these spaces – Chase Auditorium, Hall 006 and Stokes 102, for example – do not meet the needs of the College?
- Hall 006 is almost exactly the size and shape of Hall 106, albeit a floor lower (but still with windows), but is occupied only about a third as often. More flexible furnishings should be considered to increase its utility.
- There are relatively few classes scheduled for early mornings, on Fridays, or during evening class hours.

FACULTY OFFICES		
In Multiple New or Existing Buildings	Net program area (SF)	Gross area (SF)
Faculty Offices		
32 offices for new faculty		
4 (?) offices to create student work space in Hall		
3 offices to free space in Leeds		
39 faculty offices @ 170 nsf average	6,630	
Administrative Support		
Assume 1 for each 7 faculty		
5 offices @ 120 nsf	600	
Student-Faculty Work Areas		
Assume 80 nsf/faculty office	3,120	
	10,350	15,923
		assume 65% efficiency

Fig. 71. Faculty offices

b. Projected use

The FCAE report indicates that between 26 and 32 new faculty will be added, and also that the teaching load will be reduced from 5 to 4 courses per year (or 5 courses per year with an additional semester on leave every 4th year). Eventually, these will balance each other – but, in the meantime, some additional class time will be added to the schedule.

c. Recommendations

We recommend the College:

- Create rooms – new or from existing space – for 35 to 45 students (about 700 to 900 square feet.) Even one more room at this size, if used 25 hours per week, would relieve much of the pressure for class space. Our plans (Ryan Gym Option 1) show one such space in Stokes in an early increment of development, and several in the longer term. In addition, the College could consider adding a registrar-scheduled classroom to the Studio Arts building program; this would have the added benefit of bringing a wider range of students and faculty into the Arts building.
- Renovate or refurnish unpopular classrooms to better meet the needs of the College. If the existing configurations don’t allow this, consider “swapping” these spaces to other uses. For example: We understand that Chase 101 – though listed as accommodating 33 students – is unpopular because of its L-shaped configuration, necessitated by the location of an elevator shaft. This space should be converted to office or a smaller classroom, and the Registrar’s office – just across the hall, but without the intrusion of an elevator shaft – should be converted to classroom use.
- Consider requiring departments to schedule at least a minimum number of early morning, Friday, or evening classes.
- Consider using one of the meeting rooms in the Whitehead Campus Center for at some scheduled classes, perhaps ten to twelve hours a week. According to data provided by the College, the meeting rooms are infrequently used on weekdays before 4:00 PM, and 205 and 313 are rarely in use at the same time.

We have also heard from the Registrar and various faculty members that the 4:00 PM to 7:00 PM “no class” period restricts classroom scheduling. It seems to us, though, that the College’s philosophy of preventing students’ need to choose between athletics and academics is worthwhile – especially given Haverford’s small size and the extent of student participation in athletics – and, perhaps, part of what makes Haverford, Haverford.

3. *An Approach to Faculty Offices and Classrooms*

Locating faculty offices and related spaces in some combination of Founders, Stokes, Morris and Chase would bring the academic enterprise – and student and faculty activity – to the historic heart of the campus; it would also offer an opportunity to identify space to accommodate the anticipated growth of Institutional Advancement. This approach would require adding administrative offices – either by building new space or adapting non-office space – to replace offices converted to academic use; this could be a longer-term, phased effort.

a. Near term

Renovated Space

Although the Haverford community does not have the same affection for Stokes Hall that it does for historic structures like Founders or Chase, it is one of the more flexible buildings on campus. Its (relatively) large floor plates and regular bays make it well-suited for offices and classrooms. The Science Library is available now for renovation. It could accommodate 10 or 11 faculty members in perimeter offices, with group work space, a classroom, and/or a student research lounge in the skylit space in the center.

Ideally, the Business Office and Human Resources would be located in a nearby building. A small lounge and high technology classrooms visible upon entry to Stokes could be welcoming symbols of academic community.

Some new space on campus would be needed to add faculty beyond those who could be accommodated in the Science Library.

- Including CPGC, the Multi-Cultural Center and the Hurford Humanities Center (or the Center for Arts and Humanities, as proposed by the Arts Study) in an addition to Ryan Gym would free additional space in Stokes for use as faculty offices and classrooms. (If the addition were not built, a new Alumni House could be built in the nearer term to house Institutional Advancement, freeing space in Founders Hall for faculty offices.)
- After new space is developed for the Music Department, Union could be renovated for use by another academic department or by the Deans. A renovated Union could include a beautiful registrar-scheduled classroom on the second floor (provided egress and accessibility issues were addressed). As noted above, the classroom could be used as a student dance rehearsal space at night.

It would be desirable to house academic functions in Founders and Morris, but until new administrative space is built – or until other uses are converted to administrative space – Institutional Advancement will remain in Founders and Health Services will remain in Morris.

New Space

New Music Department space would include space for new faculty; the Fine Arts building would also include faculty offices. In addition, a small concentration of faculty offices could be built in the addition to Ryan, either for the long term or to serve a near-term need while providing placeholders for future growth of the centers (or the establishment of a new center).

b. Longer term

Founders Hall is perhaps the most recognizable symbol of Haverford College. We recommend that, in the long term, Founders Hall be used for faculty offices and seminar rooms, in addition to continued use of the building for the offices of the president, provost and other senior administration.

Chase Hall is small, central and elegant. Its location in the midst of the Green bounded by Magill, Founders and Stokes reinforces its importance. The Deans, on the second floor, are central to the mission of the College, but have outgrown their space. The Registrar, on the first level, plays an important role but does not need to be so geographically central. Options include:

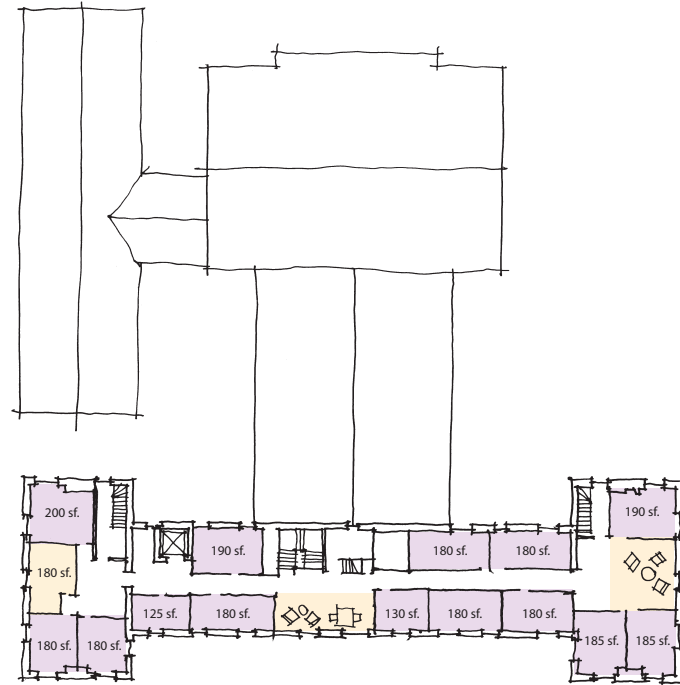
- allowing the Deans to expand into classroom 101, which is unpopular as a classroom owing to its configuration;
- locating the Registrar's office in classroom 101 instead, converting the Registrar's space into a classroom, and providing faculty offices on the second floor, displacing the Deans. In this option, the Deans would be relocated, perhaps to Union.

Morris Infirmary is a delightful building with most of its architectural integrity intact, well-suited but undersized for its use as a health center. A gracious room with stained glass windows and glazed doors lead to the terrace. The examination rooms and offices are beautiful, with large windows and extremely high ceilings. Any reuse of the building should leave these features intact. In the longer term – if, for example, the Health Center and Psychological Services were relocated to a new Wellness Center associated with new Athletics facilities – the building would be suited for a small academic department if faculty were willing to accept some disparity in office size.

New space for academic offices could be incorporated into the design of the new performing arts complex on the South Lot.



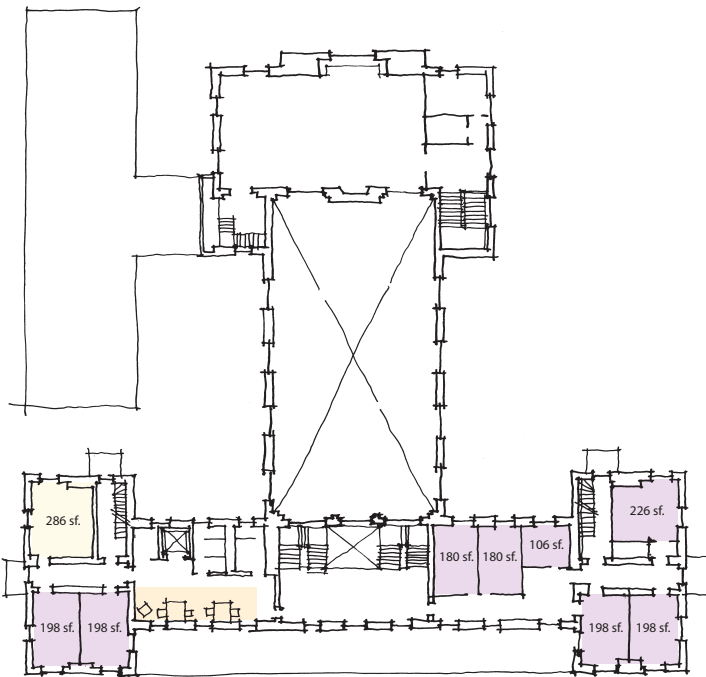
Fig. 73. Second floor Union



THIRD FLOOR

12 faculty offices
2 staff/emerti offices
student work area
shared common space

Displaced
Psychological Services
1,000 net sf
4 or 5 faculty offices
Institutional Advancement
2,452 net sf
Eighth Dimension 220 net sf



SECOND FLOOR

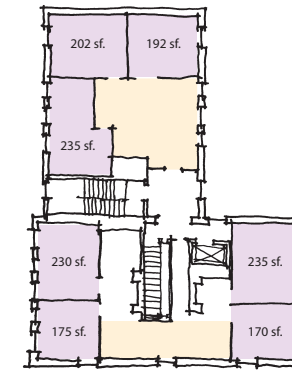
7 faculty offices
1 staff office
1 conference/seminar room
student work area

Displaced
Institutional Advancement
10 private offices
1 shared office
2,204 net sf

FOUNDERS HALL

KEY

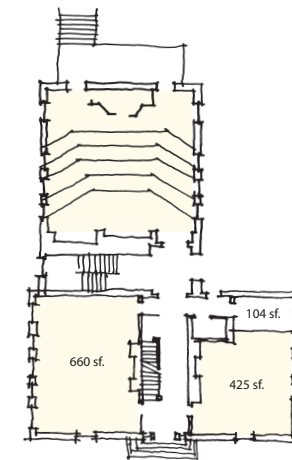
- Lounge/Active Work Area
- Private or Shared Offices
- Open Offices or Shared Work Areas
- Classrooms or Meeting Rooms
- Other Support



SECOND FLOOR

7 offices
Shared work space

Displaced
Deans' Offices 2,244 net sf
(13 individual offices and work-rooms plus support space)

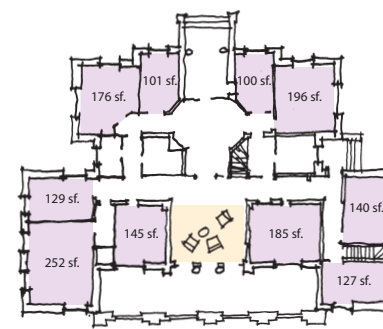


FIRST FLOOR

1 additional classroom

Displaced
Registrar office and
workroom 671 net sf

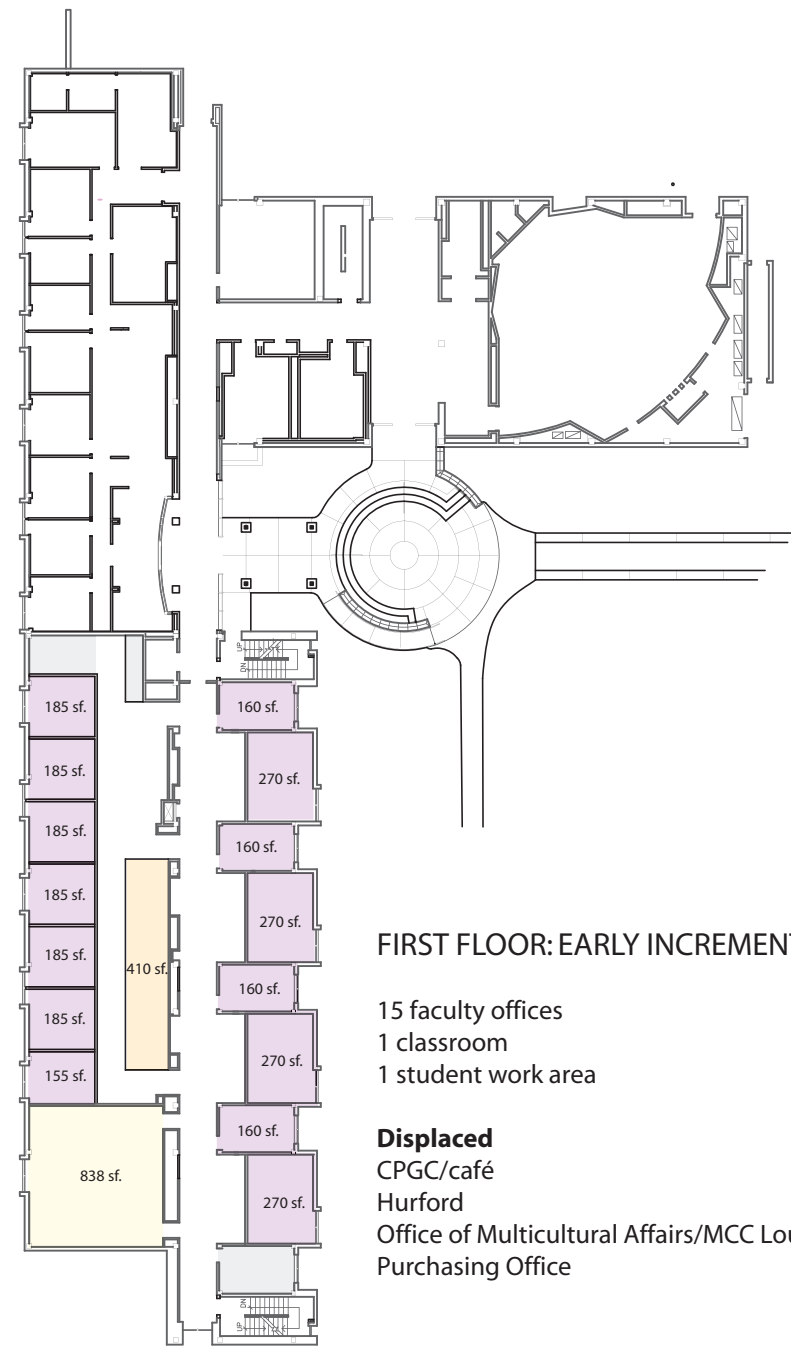
CHASE HALL



MORRIS INFIRMARY

8 faculty offices 125 sf - 250 sf
2 staff offices
Common Space

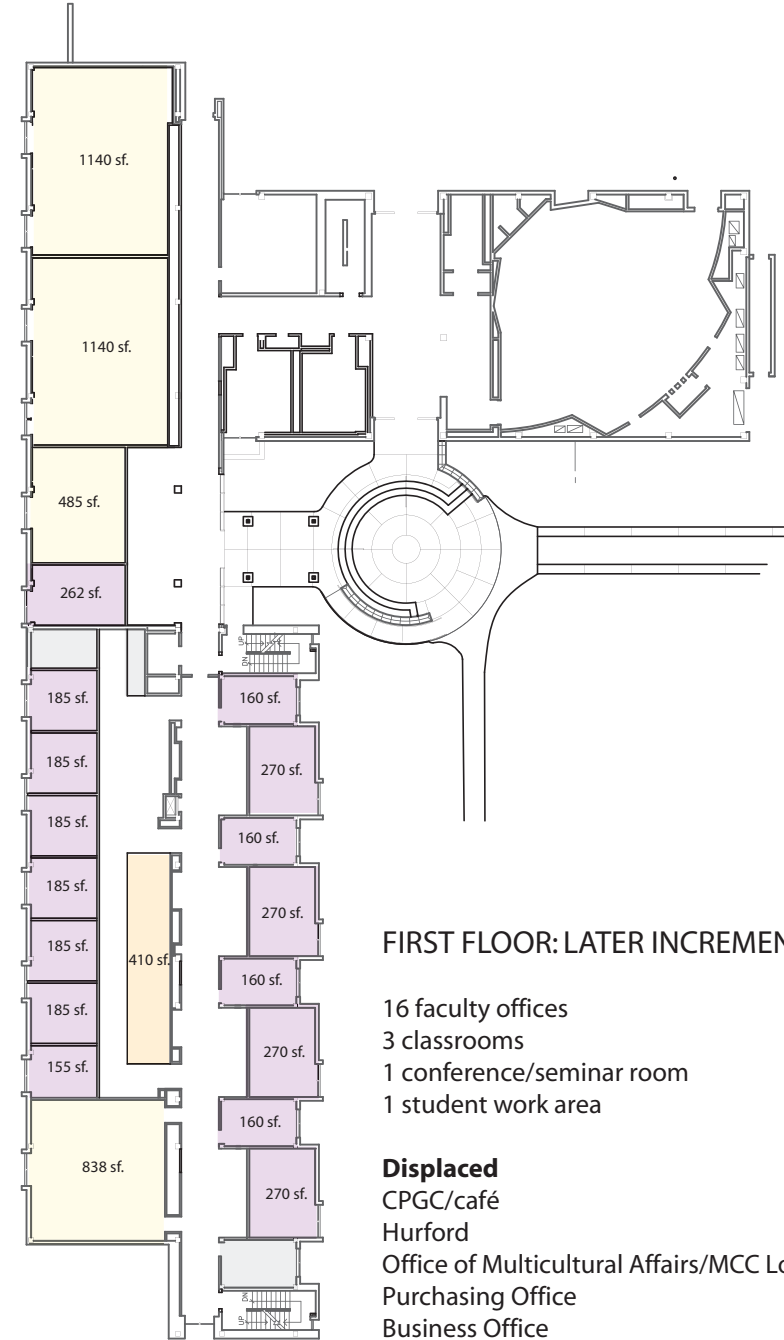
Displaced
Health Center 2915 net sf



FIRST FLOOR: EARLY INCREMENT

15 faculty offices
1 classroom
1 student work area

Displaced
CPGC/café
Hurford
Office of Multicultural Affairs/MCC Lounge
Purchasing Office



FIRST FLOOR: LATER INCREMENTS

16 faculty offices
3 classrooms
1 conference/seminar room
1 student work area

Displaced
CPGC/café
Hurford
Office of Multicultural Affairs/MCC Lounge
Purchasing Office
Business Office



SECOND FLOOR: EARLY INCREMENT

11 offices
1 lounge/active work area

KEY

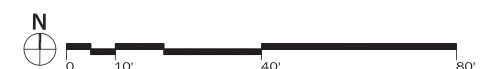
- Lounge/Active Work Area
- Private or Shared Offices
- Classrooms or Meeting Rooms
- Other Support

OPTIONS FOR ACADEMIC SPACE AT THE CAMPUS CORE

HAVERFORD COLLEGE

Campus Master Planning

Base Map Source:
Information Source:



STOKES HALL

CLASSROOMS: EARLY INCREMENTS OPTION 1: CENTER FOR CULTURE AND MEDIA IN RYAN	
Description	Classrooms Added/Deleted
Center for Culture and Media	
Frees Stokes first floor south.	Meeting, multi-purpose rooms and screening rooms
Stokes Hall First Floor South	
Convert Stokes first floor south to classroom, faculty offices, work space.	1 35-to-45 person classroom
Roberts Renovation	
Renovate theater.	(Classroom 007 decanted to allow back-of-house theater space.)
Music Addition	
New construction.	Music-specific classrooms.
Union	
Renovation of Music spaces to registrar-controlled classrooms.	2 20-to-25 person classrooms (001 and 110) 1 49-person classroom and/or student rehearsal (Current Recital Hall; use as assembly space >49 persons could be restricted by code.
Studio Art Building	
	Consider adding registrar-controlled classroom to program.

CLASSROOMS: SELECTED LATER INCREMENTS OPTION 1: CENTER FOR CULTURE AND MEDIA IN RYAN	
Description	Classrooms Added
New Alumni House Building	
Frees space in Founders Hall.	
Founders Hall Ground Floor	
Business/HR move from Stokes. Registrar moves from Chase.	
Stokes First Floor North	
In Business/HR space	2 46-to-50 person classrooms OR 3 35-person classrooms 1 20-person classroom
Chase Hall	
In Registrar Space	1 30-person classroom

Fig. 74. Classrooms: Early and later increments
Option 1: Center for Culture and Media in Ryan

FACULTY OFFICES: EARLY INCREMENTS OPTION 1: CENTER FOR CULTURE AND MEDIA IN RYAN			
Description	Faculty Offices Gained	Faculty Offices Displaced	Net Gain (Loss)
Stokes Hall Second Floor Old Science Library			
Renovate Science Library for faculty offices and work spaces.	10		10
Founders Hall			
IA expands in place.	0	11	(11)
Center for Culture and Media			
Frees Stokes first floor south. Add faculty offices to program?	0 to 8		0 to 8
Stokes Hall First Floor South			
Convert Stokes first floor south to classroom, faculty offices, work space.	15		15
Roberts Renovation			
Renovate theater.		4	(4)
Music Addition			
New construction.	6	0	6
Union			
Renovation. (Some usable space will be lost in renovation owing to life safety and accessibility improvements.)	6	4	2
TOTAL			18 to 26

FACULTY OFFICES: SELECTED LATER INCREMENTS OPTION 1: CENTER FOR CULTURE AND MEDIA IN RYAN			
Description	Faculty Offices Gained	Faculty Offices Displaced	Net Gain (Loss)
New Alumni House Building			
Frees space in Founders Hall.	0		0
Founders Hall Ground Floor			
Business/HR move from Stokes. Registrar moves from Chase.			
Stokes First Floor North			
In Business/HR space	1 (plus classrms)		1
Founders Hall			
Renovate IA spaces on 2nd and 3rd floors to academic use.	19	0	19
Leeds Hall			
Remove faculty offices from residence hall.		4	(4)
Hall Building			
Decant faculty offices to create work space.		5	(5)
TOTAL			11

Fig. 75. Faculty offices: Early and later increments; Option 1: Center for Culture and Media in Ryan

CLASSROOMS: EARLY INCREMENTS OPTION 2: LIBRARY AT RYAN	
Description	Potential Classrooms Added/Deleted
Roberts Renovation	
Renovate theater.	(Classroom 007 decanted to allow back-of-house theater space.)
Music Addition	
New construction.	Music-specific classrooms.
Union	
Renovation of Music spaces to registrar-controlled classrooms.	2 20-to-25 person classrooms (001 and 110) 1 49-person classroom and/or student rehearsal (Current Recital Hall; use as assembly space >49 persons could be restricted by code.
Studio Art Building	Consider adding registrar-controlled classroom to program.
New Alumni House Building	
Frees space in Founders Hall.	
Founders Hall Ground Floor	
Business/HR move from Stokes? Registrar moves from Chase?	
Stokes First Floor North	
In Business/HR space	2 46-to-50 person classrooms OR 3 35-person classrooms 1 20-person classroom
Chase Hall	
In Registrar Space Alternate: Deans expand into first floor classroom space (no net classroom gain)	possibly, 1 30-person classroom

CLASSROOMS: SELECTED LATER INCREMENTS OPTION 2: LIBRARY AT RYAN	
Description	Classrooms Added
Magill	
New screening rooms and classrooms	

Fig. 76. Classrooms: Early and later increments
Option 2: Library at Ryan

FACULTY OFFICES: POTENTIAL EARLY INCREMENTS OPTION 2: LIBRARY AT RYAN			
Description	Faculty Offices Gained	Faculty Offices Displaced	Net Gain (Loss)
Stokes Hall Second Floor Old Science Library			
Renovate Science Library for faculty offices and work spaces.	10		10
New Alumni House Building			
Frees space in Founders Hall.	0		0
Founders Hall Second and Third Floors			
Renovate IA spaces on 2nd and 3rd floors to academic use.	19	0	19
Founders Hall Ground Floor			
Business/HR move from Stokes. Registrar moves from Chase.			
Stokes First Floor North			
In Business/HR space	1 <i>plus classrooms</i>		1
Music Addition			
New construction.	6	0	6
Leeds Hall			
Remove faculty offices from residence hall.		4	(4)
Hall Building			
Decant faculty offices to create work space.		2	(2)
Union			
Renovation (for academic department or deans) (Some usable space will be lost in renovation owing to life safety and accessibility improvements.)	6	4	2
TOTAL			32

FACULTY OFFICES: SELECTED LATER INCREMENTS OPTION 2: LIBRARY AT RYAN			
Description	Faculty Offices Gained	Faculty Offices Displaced	Net Gain (Loss)
Magill - Center for Culture and Media			
Centers and other academic space in Magill Frees up space in Stokes first floor South	(flexible)		(flexible)
Stokes Hall First Floor South			
Convert Stokes first floor south to classroom, faculty offices, work space.	15		15
Hall Building			
Decant faculty offices to create work space.		3	(3)
TOTAL			12

Fig. 77. Faculty offices: Early and later increments
Option 2: Library at Ryan

F. ARTS SPACES

The plan's recommendations for a series of spaces for the visual and performing arts across campus have been informed by the *Haverford College Arts Program and Facilities Planning Report* (WolfBrown, April 2008), and subsequent conversations with the Arts Committee and others. Major components include:

- A new performing arts complex at the southern terminus of College Walk.
- New Music Facilities, perhaps adjacent to Roberts Hall, and renovations to Marshall Auditorium.
- Visual Arts studios near Marshall Fine Arts.
- Spaces within the Center for Culture and Media, including spaces for exhibit, film screening, digital media, and the Center for Arts and Humanities.
- Places throughout the campus for various kinds of student rehearsals, exhibits and performances.

1. Performing Arts

In the near term, Roberts Hall would be renovated and perhaps expanded to meet some of Haverford's needs for performance space.

a. Theater, Musical Theater and Dance

Space is needed for theater, musical theater and dance performances, particularly for student-run performances. The plan includes some degree of investment to improve Roberts Hall, and a new performing arts complex at the southern end of College Walk.

The degree of investment in Roberts Hall could depend, in part, on the timing of the new performing arts building. A major renovation could allow Roberts to house a wide variety of performance types; with a smaller investment, it could complement a new building by continuing to serve as a campus-wide auditorium and a venue for occasional orchestral and large choral performances.

VSBA engaged Charles Cosler of Cosler Theatre Design to visit Roberts Hall and make a preliminary assessment of Marshall Auditorium's potential to accommodate theater and dance, in addition to occasional orchestral performances. It appears the building could be renovated to create such a performance space to meet the current needs of the College. A partial list of recommendations includes:

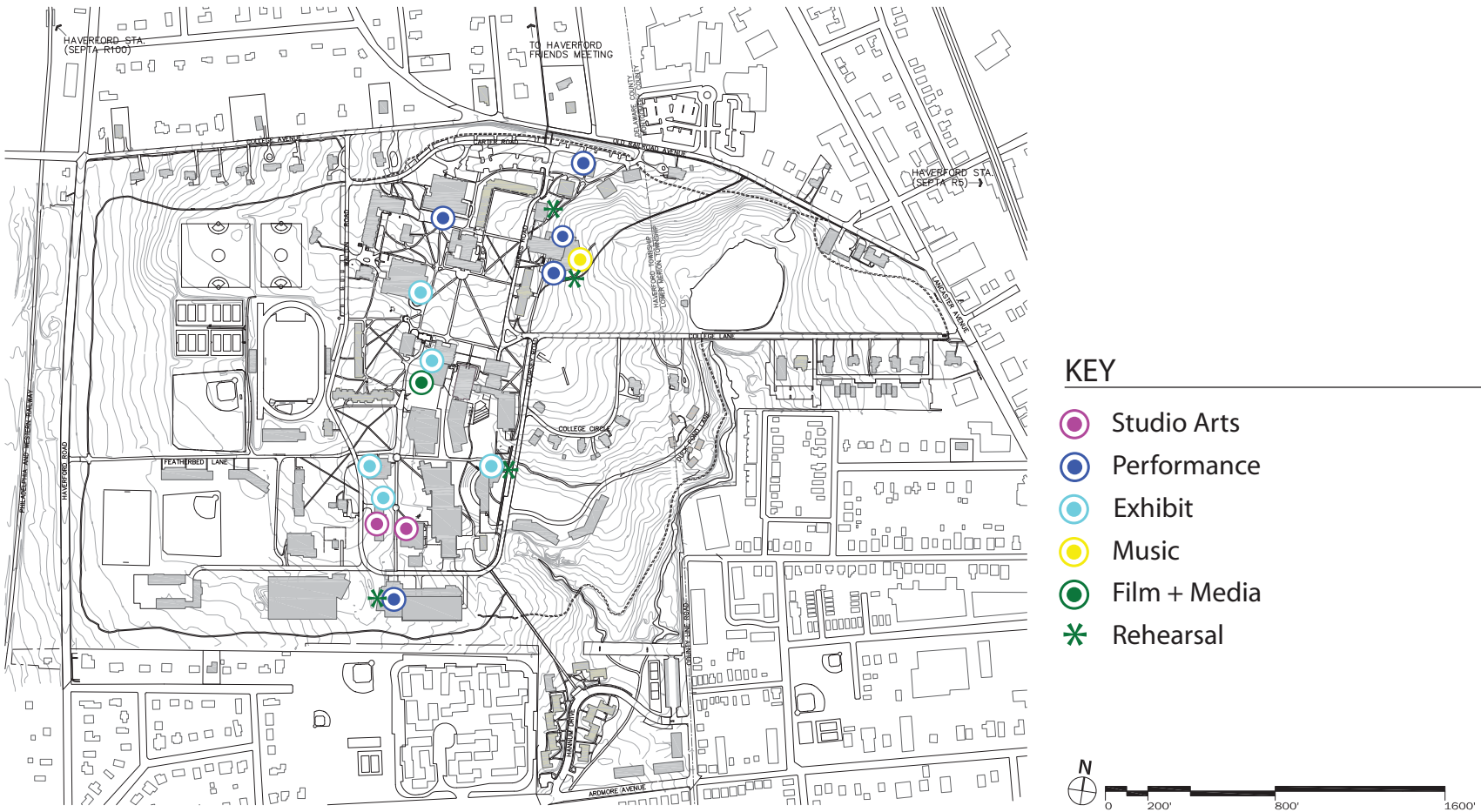


Fig. 78. Potential arts across the campus

- Adding flexibility for drama and music productions by installing a pit lift in the fore-stage area.
- Solving vertical sight-line problems by removal of two rows on each of the side balconies.
- Making the stage house taller.
- New systems, including sound and lighting, throughout.
- Adding new space to the building, and reclaiming existing space for toilet rooms, dressing rooms, green rooms, costume and prop storage and a stage management office.
- Adding an elevator at the side of the building to provide ADA accessibility to all floors.
- Preventing slap-back sound reflections by with acoustical treatments, particularly at the rear walls.

- New seating, perhaps historic reproductions.
- Making the existing scene shop an efficient and safe place to work by fitting it out properly.
- Combining the charm of the historic building with modern, technologically appropriate stagecraft could lead to a wonderful venue for both performers and audience members.
- Rehearsal space could be located in an addition.

More modest investment – including accessibility improvements and new systems – could allow continued use of the building in tandem with new performance spaces on the South Lot. The programming and design of new performance spaces should reflect the College's evolving pedagogical aims and its intentions for the evolution of on-campus theater and dance.

b. Music

Music Department needs include a recital hall, offices, classrooms and practice rooms and a recital hall. Two options exist:

- The Music Department could be located in an addition to Roberts. A new, transparent addition would be visible from College Lane, set in the Romantic landscape, and screening views to the existing rear of Marshall Auditorium. The recital hall stage would be located at the same level as the Marshall stage, to facilitate movement of equipment and instruments, and the lobbies of the two performance spaces could be connected through the addition.
- The Music Department could be located with the other performing arts in a new complex on the South Lot.

THEATER / DANCE		
	Net program area (SF)	Gross area (SF)
New Building		
Theatre		
300 seats	3,600	
Stage	3,500	
Orchestra pit (with lift)	600	
Black box theatre		
100 seats	2,000	
Scene Shop	2,500	
Costume Shop	1,000	
Rehearsal space/practice rooms		
2 @ 2,400 square feet	4,800	
Offices		
4 @ 200	800	
Catering/concessions	400	
Lobby/function area	2,000	
Tickets	150	
Technical booths	500	
Dressing rooms		
2 @ 120	240	
2 @ 550	1,100	
Storage	2,000	
Green Room	400	
TOTAL	25,590	42,650
		60% eff.

Fig. 79. Theater and Dance (Source: WolfBrown’s Arts Program and Facilities Planning Report, Spring 2008; pending confirmation)

Considerations include:

Location of large performances. If the Music Department were located on the South Lot, where would its large, end-of-semester performances be held?

- Holding these in Marshall, as assumed by the WolfBrown study, would require hauling large instruments and pieces of equipment across campus.
- Holding these in the new main stage theater could be problematic; space that is good for theater and dance would not necessarily be good for orchestral or choral performances in terms of acoustics, configuration and audience size.
- The audience size for end-of-term Music Department performances exceeds the capacity of the new theater spaces recommended by the WolfBrown report. The report called Marshall – which is filled to capacity for end-of-term Music Department performances – “too large for audience demand” for on-campus theater and dance productions. Marshall significantly exceeds the size of most Philadelphia area professional theater venues – including Arden (360 in its larger venue), Wilma (296), and Suzanne Roberts (372).
- If, in addition to a recital hall, a large new space were created that met the needs of the Music Department and other users, what would Marshall be used for? Is there enough demand for its use for general lectures and assembly to warrant removing all other functions from it?

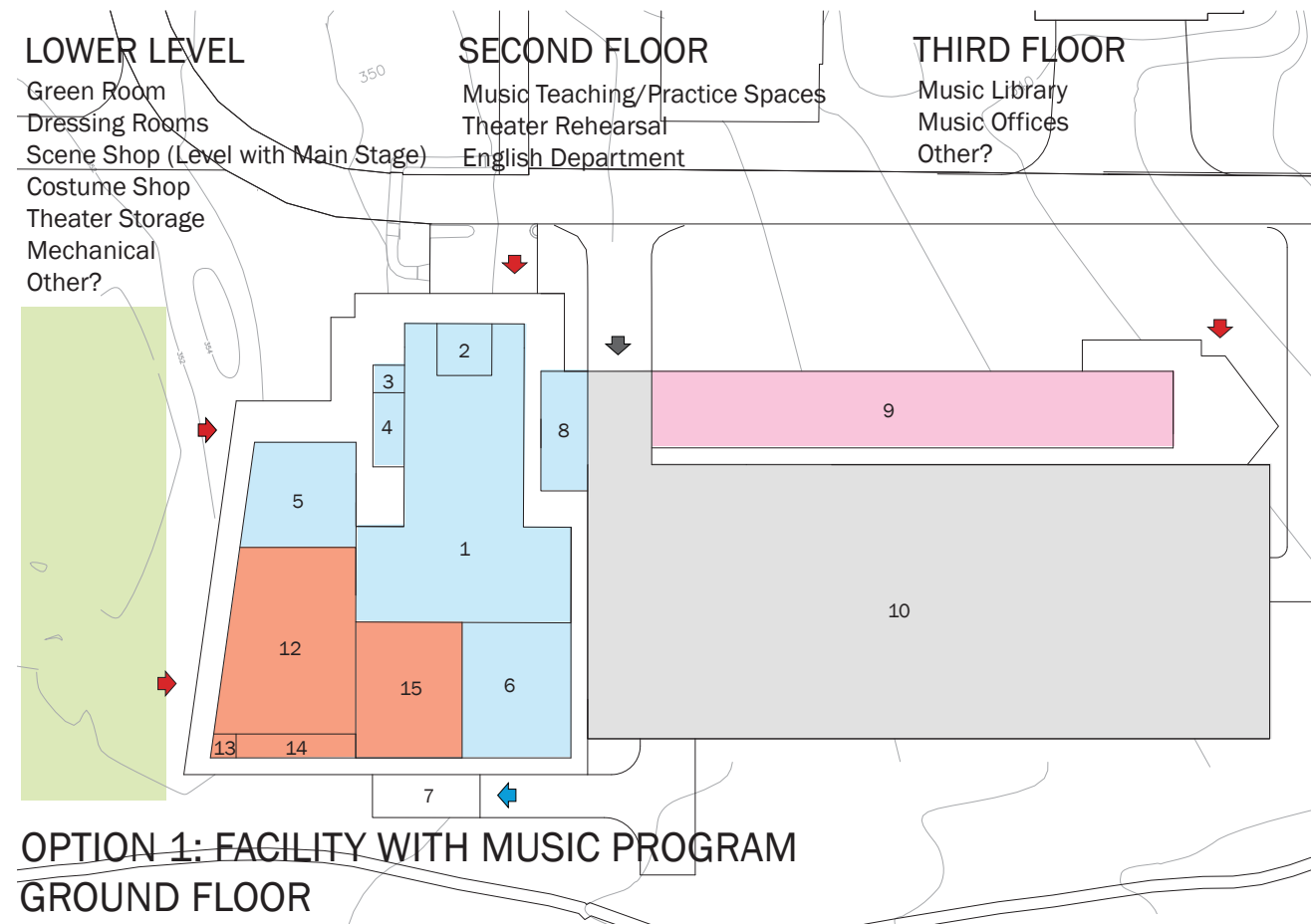
Integration across campus. Among the basic premises of the WolfBrown study was that the various artistic media and departments ought to be distributed rather than sequestered. The model of the Arts and Humanities Center, as described in the study, tries to imagine the ways in which the arts (fine, performing) would find connections in a wide range of disciplines and modes of inquiry. The Music Department envisions as much – or more – of a need to be located near humanities departments than to other performing arts.

2. *Student Performances, Rehearsal and Exhibit Spaces*

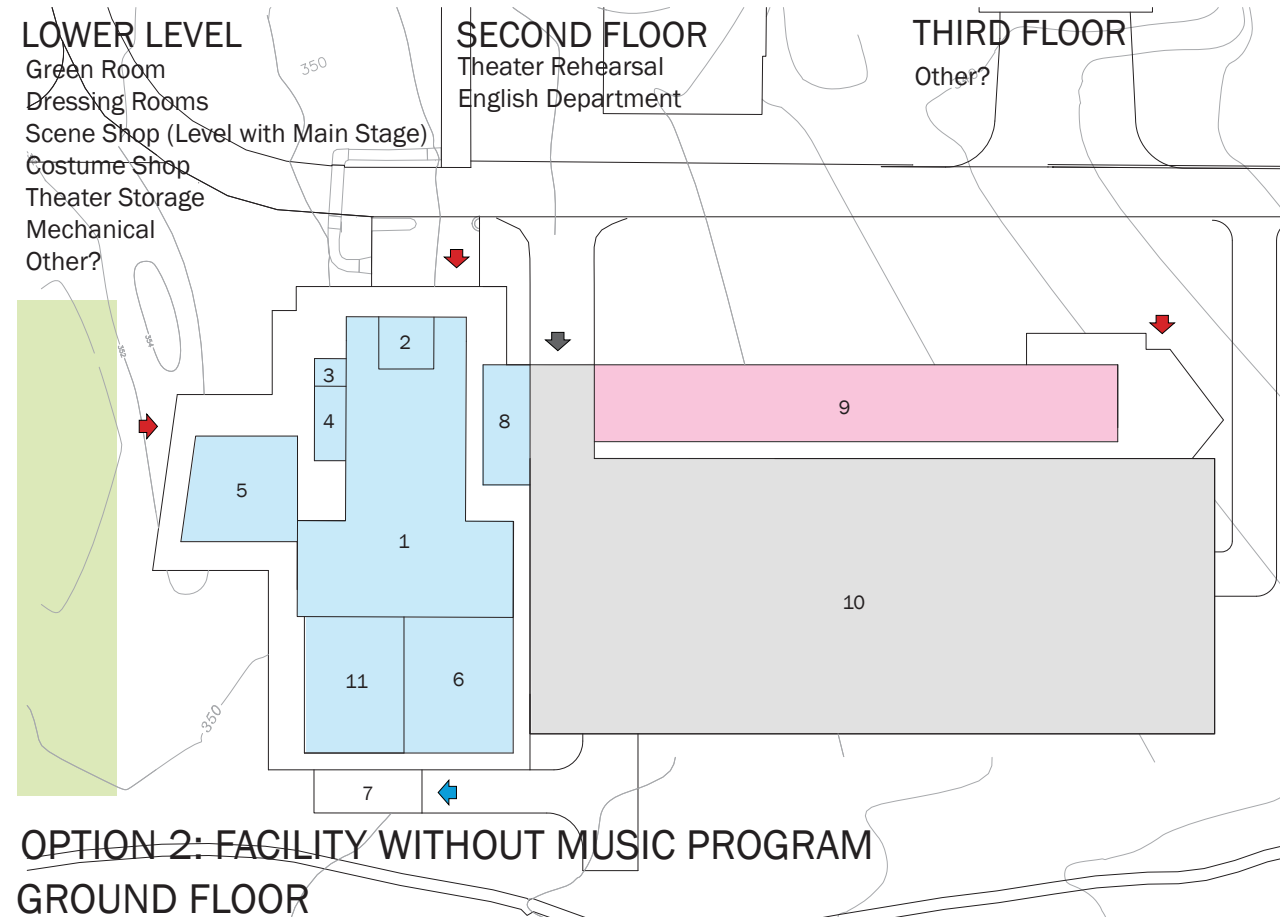
In addition to space in a new performing arts building and in Roberts, smaller-scaled, student-centered places for the arts could be provided in a renovated WCC.

OUTLINE PROGRAM: MUSIC					
	Room	Function	Net Program Area (SF)	Adjacency?	Notes/When used?
Rehearsal and Performance Spaces					
	Marshall stage	Large ensemble concerts		Needs to be connected to instrument storage by hall or elevator. Also to dressing rooms and green room. Marshall also needs modern sound/video recording booth.	Marshall stage space, including wings: 3,500 square feet. Entire hall will need to be upgraded as per Arts Report, with Dressing Rooms/Green Room/ Sound Booth. Note that the new facilities listed below will likely mean less pressure on Marshall, since the only Music Department events to be held there will be the large ensembles—orchestra and chorus.
	Recital Hall	Chamber Recitals by college ensembles and visiting artists. Lecture/Demonstrations. Large music classes. Chamber singers rehearsal. Screenings.	4,200		To seat 250, with flexible seating below an intimate stage. Seats with folding desks? Space estimate based on Swarthmore Lang Stage plus seating. NOTE: New space would relieve pressure on Marshall for theatrical performances and other large campus gatherings.
	Large rehearsal room	choir/orchestra/plus jazz and world music ensemble	2,500		Evening, afternoon rehearsals. These would no longer take place on Marshall stage, thus relieving that space for other activities. Could also be used for Jazz and World Music Ensemble as part of growth of Department. Space estimate based on Marshall Stage minus wings.
	Instrument Storage	for orchestral instruments, jazz instruments, and world music ensemble collection	500	Adjacent to Large Rehearsal room, and linked to Marshall, Recital Hall.	Exact number depends on questions of growth. We can manage current needs for orchestral instruments with various size lockers (stackable), perhaps 50 LINEAR feet (2FT deep), plus space for percussion instruments. But also note need for jazz instruments and possible world music ensemble based on growth of faculty.
	Choral/Orchestral Library			Near Large Rehearsal	Compact shelving OK.
	Lounge/Lobby		400	Outside Recital Hall	It's possible the functions could be combined. But they might also better be distinct spaces.
Library					
	Music Library Reading Room		800	Avoid practice/rehearsal	
	Music Librarian Office		150		
	Music Library Listening		300		Many functions now migrating to desktop stations in any case.
	Music Library Seminar Room		300		Could replace small classroom. Also could be used for group study projects, library instruction. Sem room big enough for 12, with all A/V equipment and piano.
	Music Library Book Stacks		2,700		2,700 square feet is estimate based on current needs of 3000 linear ft @ 75% capacity, plus growth of 30 ft/year for 10 years. Avoid compact shelving.
	Music Library Sound Recording Stacks		250		Compact shelving OK here for CD's.
Offices					
	Electronic Faculty Office		250	Adjacent to studio	
	Faculty offices (6@ 200)		1,200		Includes two new positions under FCAE proposal.
	Music Office		300		Office plus Work Room for copying/production.
	Performance office		200		
	Private teacher/Resident Quartet office		250		Shared office space for adjunct private teachers and resident quartet, with locking files, a desk, central bulletin board, etc.
Practice and Teaching Spaces					
	Practice rooms (7 @100)	Daily individual practice	700		Each with upright piano, mirror.
	Private Teaching Rooms (5 @250)	For private teaching, chamber music, and practicing.	1,250		One dedicated for keyboard instruction room, with two small grand pianos. Remainder with one grand piano each.
	Historic Keyboard Studio		500	Organ possibly used in Recital Hall or Marshall—access door?	For organ, harpsichord, etc. An early music studio, perhaps.
	Electronic Studio	Classroom to support theory labs and digital music courses	500	Near library OK	Five student work stations, plus instructor desk. Related computer and audio production equipment. High quality/large format printing could be elsewhere on campus.
	Classrooms Medium (2 @ 700)		1,400		For classes 12-25, plus piano, boards, stands. Also to be used for chamber music rehearsals and coachings. That is: somewhat larger than 111/114.
	Classroom Large			Assumes large classes are held in the recital hall	For classes >25. OR: Put such classes in Recital Hall.
	TOTAL		18,650	net square feet	VS 18,000 on original Arts Report estimate.
			28,692	gross square feet, assuming 65% efficiency	

Fig. 80. Outline Program: Music (Source: Haverford College Music Department with adjustments)



1. Main Stage for Theater and Dance
2. Technical Booths
3. Ticketing
4. Catering/Concessions
5. Black Box Theater
6. Scene Shop
7. Loading Dock
8. Theater Offices
9. Administrative (Admissions?) and/or Academic Space
10. Parking
11. Theater Rehearsal
12. Recital Hall
13. Choral/Orchestral Library
14. Instrument Storage
15. Music Rehearsal



KEY

- | | |
|--|--|
| Theater Program | ▲ Pedestrian Entrance |
| Music Program | ▲ Vehicle Entrance |
| Parking | ▲ Service Entrance |
| Green Space | |
| Administrative or Academic Space | |

OPTIONS: SOUTH LOT PERFORMING ARTS FACILITY

HAVERFORD COLLEGE Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source: Arts Program and Facilities Planning
Report, WolfBrown, Spring 2008



Venturi, Scott Brown and Associates, Inc.

January 29, 2009

3. Fine Arts Collections

Collections storage and gallery space are included in the near-term program for the Center for Media and Culture. The plan indicates potential locations for a future gallery, should the space in Ryan be outgrown.

Alternately, if the Library is located in and adjacent to Ryan, art collections would be located in a completely re-imagined Magill.

4. Fine Arts Studios

A building near Marshall Fine Arts would house additional fine arts studios, and perhaps a gallery for student art. Including a registrar-scheduled classroom in the building program would help draw students and faculty from across the campus to the new facility.

PEER COMPARISON: FACULTY STUDIOS (VISUAL ARTS)
Middlebury College
Planned New Art Facility
325 SF each
Source: Campus Master Plan 2008: Middlebury College, Michael Dennis & Associates
Haverford College
3 faculty studios: 517 SF (emeritus) to 1124 SF
Bowdoin College
Two models of faculty studios:
On campus 900 SF (in building built in 2001)
Off-campus 1200 SF (in renovated mill in Brunswick)
Source: James Mullen, Director, Visual Arts Program, Bowdoin College
Kenyon College
Studio Art Building under construction
6 faculty studios 209 SF to 220 SF
Source: www.kenyon.edu

Fig. 81. Peer comparison: faculty studios

OUTLINE PROGRAM: FINE ARTS				
	Net program area (SF) from Arts Study	Adjusted net program area (SF)	Gross area (SF)	Notes/basis for adjustment
Drawing Studio 1	2,500	1,600		from 10/1/2008 e-mail from Ying Li
Drawing Studio 2	1,600	1,000		from 10/1/2008 e-mail from Ying Li
Drawing Studio Storage		500		from 10/1/2008 e-mail from Ying Li
Materials Storage		400		from 10/1/2008 e-mail from Ying Li
Printmaking Studio	4,000	2,000		reduced to more closely align with peers
Print Professor's Studio	1,000	900		reduced to more closely align with peers
Print Support Rooms - 4 rooms	2,000	1,000		reduced to more closely align with peers
Faculty Studio(s)	900	900		from Arts Study
Senior Studio to replace parker	2,500	1,600		reduced to net area similar to Parker House; assume 10 students @ 160 nsf
Student Art Storage		200		from Arts Study
Visting Artists/Assistants - 4 @ 800 sf	3,200	3,200		from Arts Study
Faculty Offices - 6 @ 144 sf	876	876		from Arts Study
Photography Instruction	3,363	3,363		from Arts Study
Digital Media Studio	2,000	0		in Center for Culture and Media
Could this be in Center for Culture and Media?				
Community Darkroom	2,600	1,500		reduced; assume this could be in Marshall vacated photography studio space; Arts Study notes this might duplicate Digital Media Studio
Student Exhibit		1,000		added to program
Painting Studio 1	3,100	1,600		from 10/1/2008 e-mail from Ying Li
In Marshall Fine Arts				
Painting Studio 2		1,200		from 10/1/2008 e-mail from Ying Li
In Marshall Fine Arts?				
Painting Storage		500		from 10/1/2008 e-mail from Ying Li
In Marshall Fine Arts?				
Registrar-scheduled Classroom		900		potential addition to program
	29,639	24,239		
Program elements to be located in Marshall				
Painting Studio 1		(1,600)		
Painting Studio 2		(1,200)		
Painting Storage		(500)		
Community Darkroom		(1,500)		
Replace Marshall faculty studio displaced by Painting Studio 2		900		
		20,339	31,291	
			assume	
			65% efficiency	

Fig. 82. Outline Program: Fine Arts (Source: WolfBrown's Arts Program and Facilities Planning Report, Spring 2008; 10/1/2008 e-mail from Ying Li; other modifications as noted)

G. LABORATORY SPACE

The amount of laboratory space at Haverford compares favorably to that of its peers (National Science Foundation, Division of Science Resources Statistics, *Science and Engineering Research Facilities: Fiscal Year 2003 and Fiscal Year: 2004, 2007*), but science facility expansion will almost certainly be needed in the future. The plan illustrates this long-term expansion on the Alumni Field House site.

In the nearer term, the College plans to renovate Sharpless labs.

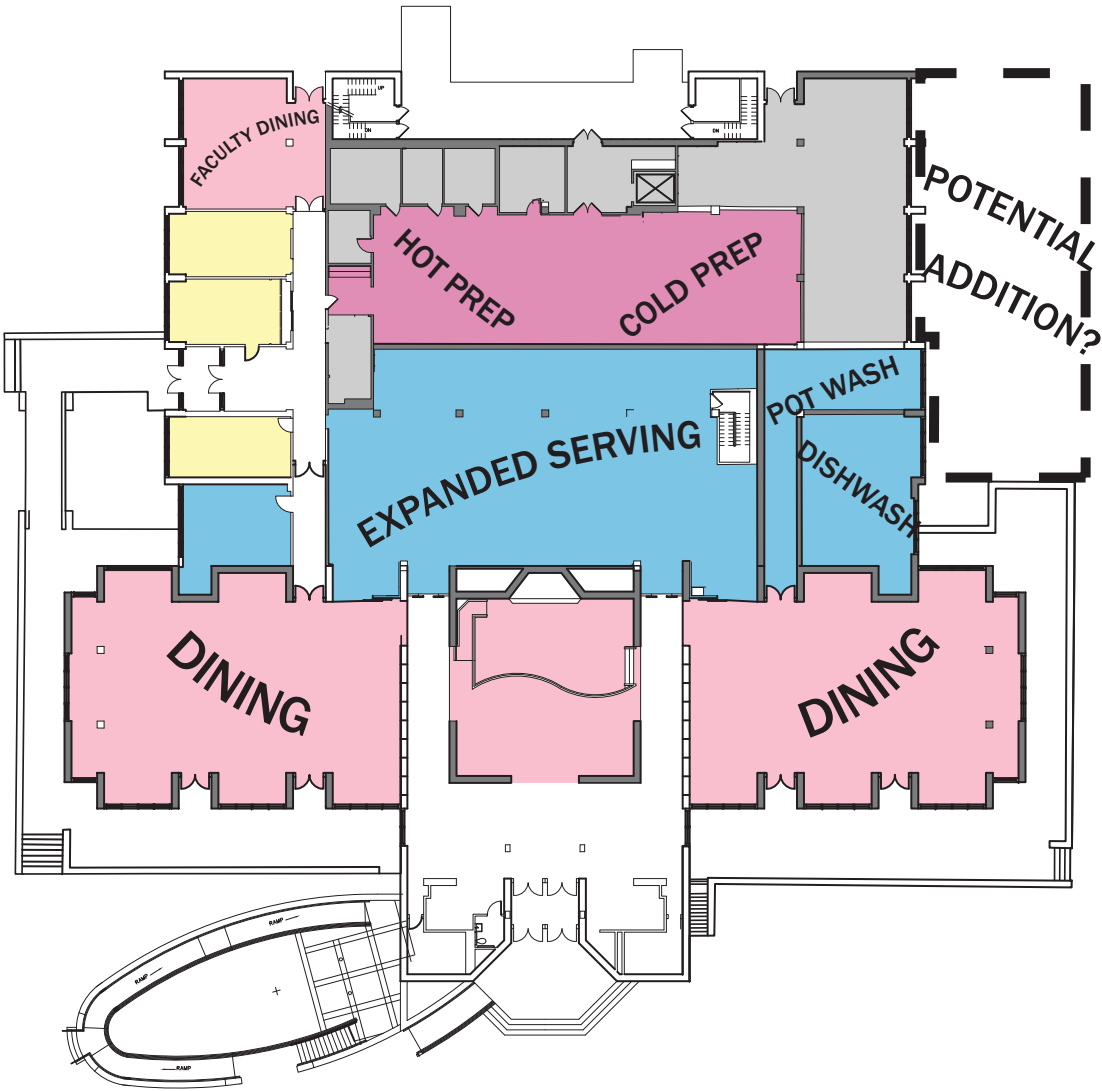
H. DINING CENTER

The Dining Center (DC) is an important hub of student activity; some members of the Haverford community feel strongly that having one main dining hall is a Haverford strength. Food service planning consultants Envisions Strategies helped analyze the existing space:

- The size of the existing Dining Center is adequate for existing peak demand. At present, the size of the servery is the limiting factor in capacity.
- There are “flow issues” related to building entry, flow through the servery, and dish drop-off. The servery configuration is less than optimal (too long and narrow) and, if the building is renovated, should be made deeper in shape.
- For every 100 students added to the meal plan, about 45 seats (about 1755 net square feet, including servery, dining, dishwashing and storage) should be added to campus, in satellite operations accepting the meal plan or in a second dining hall.

Expansion options for the DC are limited; most feasible are options requiring taking over at least some of the “side rooms” – faculty dining or meeting rooms.

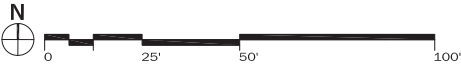
We recommend maintaining a placeholder for a second dining hall, should future expansion of the student body (or a greater percentage of participation in the meal plan) require additional space. This placeholder should be on students’ daily paths, but just as important it should have good service access without major conflicts with pedestrian ways. One good location would be at the intersection of Featherbed-Orchard Walk (for student convenience) and Walton Road (for service access).



KEY

	Food Preparation
	Food Service and Related
	Dining
	Conference
	Facilities / Storage

**PROPOSED
SPACE USE: DINING CENTER**
HAVERFORD COLLEGE
Campus Master Planning
IN PROGRESS
Base Map Source: Haverford College Facilities Mgt.
Information Source:



I. ATHLETICS SPACE

In the long term, replacement of Alumni Field House should include, in addition to a track and infield, indoor tennis courts and additional fencing strips.

A natatorium, with a 50 meter pool, is also desired.

An analysis comparing the number of Haverford’s fields to those of its peers is in a Technical Appendix to this report.

ATHLETICS			
	Net program area (SF)	Gross area (SF)	
Reception and Lobby	3,000		
Indoor Tennis			
4 indoor courts	24,500		
Lockers	7,600		
Spectators*	1,800		
	33,900		
Field House Replacement			
Track and infield	58,200		
Lockers	4,800		
Spectators*	7,500		
	70,500		
Fencing Strips (4)	3,900		
Lockers included above			
Subtotal	111,300	130,941	85% efficiency
Natatorium			
50 meter pool and deck	20,900		
Lockers and auxiliary spaces	7,800		
Spectators (about 1,000)*	6,000		
	34,700	40,824	85% efficiency
Total Athletics Program (nsf)	146,000	171,765	85% efficiency
*Number of spectators to be confirmed. Parking requirements may limit numbers.			

Fig. 83. Outline Program: Athletics

J. ADMINISTRATIVE SPACE

1. Institutional Advancement

Institutional Advancement (IA) has already outgrown its space in Founders Hall and continues to grow. We recommend building a new Alumni House, including Institutional Advancement, not only to allow growth of the department but also (and primarily) to decant activities from Founders Hall, allowing the vacated space to be used for academic activities.

In the nearer term IA could grow in place in Founders; if needed, faculty would move to other space – particularly in Stokes – to accommodate this.

2. Admissions

Admissions is expanding beyond its current space in the WCC, but the location – near the entrance to campus, the Coop, the bookstore and mailroom – is very near ideal. As described in Section VI.B.3.b above, we recommend keeping Admissions in the south segment of the WCC, and expanding into the third floor, at least in the near term.

An alternate location suggested for the department is 6 College Circle (now Bryn Mawr College’s Phebe Anna Thorne School). This house could only accommodate about a third of the Admissions department, and is not easily expandable.

INSTITUTIONAL ADVANCEMENT		
	Net program area (SF)	Gross area (SF)
Private offices		
1 @ 250 nsf	250	
4 @ 180 nsf	720	
23 @ 120 nsf	2,760	
Open Offices		
20 @ 80 nsf	1,600	
Student Work Spaces (Common Space)		
8 @ 50 nsf	400	
Shared Work Space (Assumption)	350	
Conference Room(s) (Assumption)	800	
	6,880	10,585
		assume 65% efficiency

Fig. 84. Outline Program: Institutional Advancement

About three of four College Circle houses would be required to accommodate Admissions.

In the longer term, it could make sense to accommodate Admissions on the South Lot, in “front” of a new parking garage. This development would not occur at least until a new theater were built.

3. Business and Human Resources

Business and Human Resources are in fairly recently renovated space in Stokes. The most frequently mentioned issue with the present space is that employees must walk through the Business Office to reach Human Resources.

Ideally, this area of Stokes would be used for academic purposes, because of its location and generous proportions:

- Almost a quarter of Haverford’s registrar-scheduled classrooms are in Stokes, yet this main building entrance does not seem particularly academic or welcoming.
- Stokes – particularly because of its west column bay size – is one of the very few campus buildings flexible enough to accommodate classrooms of the size most needed by the College.

Although the Steering Committee has determined that making significant investment in multiple College houses to produce less-than-optimal office space is not financially prudent, we continue to believe that converting some housing to other uses – particularly administrative space – could make sense in some situations and should remain “on the table,” particularly when the alternative is building new space.

We recommend considering the following options for relocating Business and Human Resources:

- The lower level of Founders has been suggested as a potential location; this move could only occur after Institutional Advancement moved to new space.
- The building at 791 College Avenue could accommodate about 22 to 25 people, including 11 to 15 in private offices. With renovations, this space could accommodate the Business Office, with Human Resources located on the ground floor. This building could be reoriented to “face” the campus.
- Moving Business and Human Resources to the Science Library – and backfilling the existing first floor space with academic offices – has also been suggested. This would locate faculty nearer the existing Centers.

4. Deans

The Deans are currently located on the second floor of Chase Hall, in tight quarters. Relocating the Student Activities office in a renovated and expanded WCC would relieve the situation only slightly. Other options include:

- Remaining in place and expanding into the first floor of Chase, across the hall from the Registrar’s office. (This assumes the classroom could be replaced with another, in Stokes or elsewhere.)
- Moving to a renovated Union.

5. Storage

Throughout the campus, there are storage needs of various kinds – for supplies, unused furnishings, files. To preserve as much central campus space as possible for activities, we recommend:

- Considering compact shelving for files that must remain on-site.
- Considering off-site storage for records which must be kept but are infrequently accessed.
- Donating or discarding outdated furniture or equipment, with the exception of furnishings with aesthetic or historical value that could be reused.
- Reviewing items in storage, and drafting policies outlining what kinds of items should be stored on-site, what kinds should be moved to off-site storage, and what kinds of items should be donated or discarded.

6. A Note on Converting College Houses to Offices

Code issues to consider in converting housing to offices include:

- Accessibility must be provided to the extent feasible. Any offices frequently visited by the community should be on the ground floor, and accessible from the front door.
- Accessible toilet rooms should be added, including at least one on the ground floor.
- According to the prevailing codes (IBC), buildings more than one story in height converted from private houses to office use (Type R-1 to Type B) must have two means of egress. Simply put, for most of the college houses, adding an exterior stair would be required to use the second and third floors.
- We would recommend adding sprinklers to buildings to improve life safety.

- Because of the lack of accessibility to upper levels, we would not recommend locating departments requiring community access – like the Deans, Career Services, the Health Center or Psych Services – in college houses unless an elevator were added.

SOME OTHER ADMINISTRATIVE OFFICES
Admissions Existing plus More interview rooms (offices) Access to space for large groups (100+ people) Close to FAid, bookstore, mailroom Location close to Financial Aid, Bookstore, Parking and Mailroom
Deans Reception Meeting room Offices Work rooms Location with close and easy access to centers.
Health Services More private areas needed Could be located with Psych Services
Psychological Services Existing (about 1,000 nsf) plus Space for post-doctorate trainees Location adjacent to Eighth Dimension
Career Services Existing plus Office for intern
Human Resources Existing plus Small room for skills tests Near a staff training area More private entry

Fig. 85. Outline Program: Other administrative offices

K. FACULTY HOUSING

1. *Current*

Haverford has more space dedicated to faculty housing per student than many of its peers, and on-campus housing remains an important component of campus life. Faculty lives have changed with the times, however, and relatively few students we met with reported being invited to a faculty member's home.

The College has conducted a faculty survey regarding housing, and is in the process of interpreting findings and preparing a report. New units could be required to:

- Accommodate the increase in faculty.
- Allow existing multi-unit housing – for example, at 8-10 Old Railroad Avenue – to be renovated.
- Offset any decrease in units resulting from the conversion of faculty houses to other uses, including guest rooms and administrative offices. (Our plan recommends converting one or two large houses to these uses.)

Existing units range in size from 750 GSF to 6,700 GSF.

Some faculty with children prefer living in the Lower Merion School District. The Lower Merion property owned by the College is zoned R-4; an exception or variance would be required to built townhouses or other multi-unit structures.

2. *Options*

Many of the houses are very near the campus core. One policy idea elicited by the planning process was to reserve certain houses – for, example, those around College Circle – for faculty committed to holding seminars or other class meetings in their homes.

The plan illustrates several options for additional faculty housing near the campus perimeter:

- Renovating and adding units to 8-10 Railroad Avenue (Lower Merion).
- Townhouses east of the College Lane houses (Lower Merion), requiring zoning exception. Single family detached units could be built without a variance.
- Apartments or townhouses along County Line Road and Ardmore Avenue, at the interface between HCA and the neighboring community (Haverford Township). The property is currently zoned for garden apartments; a change of zoning would be required.

VII. SUSTAINABILITY

VII. SUSTAINABILITY

The Master Plan Steering Committee has reached consensus that the College should “aim to significantly improve [its] sustainability profile.” Broadly speaking, the concept of campus sustainability involves a thoughtful (yet imprecise) measure of resources consumed and wastes emitted, and the consideration of the long-term effects of these on earth’s systems and on human health. Campus sustainability initiatives include a broad range of actions, and encompass:

- Energy use, supply and distribution
- Material supply and disposal
- Food supply
- Water supply and disposal
- Building design and construction, including mechanical systems
- Transportation
- Site and landscape systems: hydrology, soils, vegetation
- Education, research and outreach

In this report section, we outline some common characteristics of institutions widely considered leaders in the field, and list some of Haverford’s ongoing initiatives.

Thereafter, we describe how the fundamental framework of the campus plan could contribute to a more sustainable Haverford; and recommend some additional avenues for consideration as the plan is implemented.

A. CHARACTERISTICS OF SUSTAINABILITY LEADERS

What constitutes institutional leadership in sustainability? *Forbes.com* recently listed ten of “America’s Greenest Colleges;” the Sustainable Endowments Institute grades the 300 schools with the largest endowments in the U.S. and Canada on a variety of factors; and, in the fall, Princeton Review intends to include a green rating in its annual review of colleges and universities. In addition to published information, an institutional self-assessment tool – Sustainability Tracking, Assessment and Rating System (STARS) – is available from the Association for the Advancement of Sustainability in Higher Education (AASHE).

Institutions widely considered to be leaders tend to have at least some common characteristics, for example:

- Institutional commitment at the highest levels. Haverford is one of hundreds of colleges and universities that have signaled their commitment to sustainable efforts by signing the *American College & University Presidents Climate Commitment*.
- Clear, specific, measurable and continually reassessed goals, followed by action. For example, the *American College & University Presidents Climate Commitment* requires signatory institutions to set target dates for achieving climate neutrality and also to set interim targets for goals and actions that will lead to climate neutrality.
- Stewardship of financial as well as environmental resources.
- Commitment of staff and expertise to sustainability initiative.
- Community education and involvement.

B. HAVERFORD: ONGOING EFFORTS

At Haverford College, an Energy Management Plan is in place, and a short term action plan has been produced by the Campus Sustainability Officer. Current sustainability efforts – collected from these documents and from meetings with the Committee for Environmental Responsibility and Arboretum staff – include the following initiatives. (This is not an exhaustive list.)

1. Energy supply and distribution

- Currently, 5% of the campus’ total energy is generated by **wind power**. Students passed a resolution proposing a one-time \$60 tuition increase to purchase 100% wind power.
- Waste oils from all motorized campus vehicles and equipment (including the generator at the Central Heating Plant) are used as a fuel source for a **waste oil heating unit** in the Mechanic’s Shop in the Facilities Building. (The College also offers to recycle waste oil provided by the campus community.) This unit supplements that provided by natural gas heating units.
- A **ground source heat pump (geothermal)** was installed at the President’s house.

2. Material supply and disposal

- The campus currently **recycles** glass/aluminum, tires, paper and cardboard.
- The Arboretum recycles much of its waste, including its waste oil. Wood chips, leaves and organic material are recycled into mulch. Materials from tree trimming operations are recycled into wood chips, fire wood, wood pulp and lumber.
- The College sponsors **annual recycling challenges** in dorms.
- The College specifies, when possible, paper that is at least 30% recycled post-consumer waste.

3. Food supply and waste

- The College buys **local produce** through the White Dog Foundation.
- A contract has been signed to **convert the Dining Center waste oil to biodiesel fuel**.

4. Water supply and disposal

- The College is currently installing a **green roof** on part of Stokes Hall as a pilot project.
- The College has taken some initial steps to **improve water quality** in the pond, in the form of dredging and improved aeration.
- Haverford recently constructed some of the newer parking areas incorporating **pervious pavements**, which reduce runoff.

5. Building design and construction

- The GIAC received a Gold LEED® certification from the U.S. Green Building Council. The College intends all future buildings to be **LEED®-certified** as well.
- There is an annual budget to install **energy-conserving windows**, and to install **attic insulation** and **attic exhaust fans**.

6. Transportation

- The College currently has two **Philly CarShare** spaces.
- The College offers **SEPTA tickets** for purchase at a reduced rate.

7. *Energy use patterns*

- The Energy Management Plan includes a **goal of installing individual utility meters** on all major campus buildings, and a sophisticated energy monitoring system, within the next five years or as funding permits.
- **Building temperatures are set back** during non-occupied and nighttime hours.
- **Energy-conserving lights** replace conventional bulbs on a regular basis.
- The College has submitted its carbon emission footprint analysis, except for the section related to travel, in accordance with the American College and University Presidents Climate Commitment (ACUPCC); the document is available online at www.aashe.org/pcc/reports. Haverford intends to distribute a **travel and commuting survey** to the campus community in the very near future, and to update its carbon footprint document accordingly. The College expects to initiate discussion about its carbon emissions reduction goals in January, and to report its intentions to the ACUPCC in July.

8. *Site and Landscape Systems*

- The College **replaced a portion of the lawn in the Pinetum with low meadow**, which, by absorbing runoff, reduced flooding problems down slope along Haverford Road. (The meadow has since been mowed, and it is unclear whether this measure is still effective.).
- The College has **removed Norway Maples** (an undesirable invasive exotic species) from the woods along Carter Road, which has improved both the health and attractiveness of the woods.
- The College is in the process of **removing invasive non-native horticultural plants** from the ornamental plantings around campus.
- The Arboretum has been including **regional native species** in their new tree plantings, including those which are not commonly available in the nursery trade (including hickories, walnuts, oaks, chestnut). Eighty four percent of new specimens planted between 2005 and 2008 were of this type.

9. *Endowment Policies*

- Haverford College was one of fourteen institutions to receive recognition as an **Endowment Sustainability Leader** in the 2009 College Sustainability Report Card published by the Sustainable Endowments Institute. Recognition was based on endowment transparency, investment priorities and shareholder engagement.

C. THE CAMPUS PLAN: OVERALL FRAMEWORK

The overall organization of the campus plan is rooted in sustainable design principles and recommendations:

- Maintain a ***compact campus core*** and ***minimize expansion into the community*** and “sprawl.”
- Value, maintain and ***update and adapt existing buildings*** where philosophically desirable and programmatically and financially feasible.
- Where new building is necessary, ***build on sites where natural systems have already been disrupted*** and minimize new impervious surfaces.
- ***Maintain and enhance existing important green spaces*** – for example, the Nature Trail, and the landscape along College Lane.
- Build intensively to ***minimize building footprints and maximize open area***.
- Stack parking to ***minimize site area devoted to automobiles and to minimize run-off***.
- Continue to provide faculty ***housing within walking distance*** of campus, reducing automobile use on campus.
- ***Create stormwater initiatives that consider watershed areas holistically***. For example, if building an addition to Union or Roberts, consider stormwater mitigation that includes run-off from the North Dorms as well.
- ***Replace the existing central plant with new, more efficient equipment*** to meet capacity, conserve energy and – by increasing the condensate return rate on steam lines – conserve water.
- ***Encourage transit use*** of the SEPTA R5 and Route 100 commuter lines by making more accessible and amenable paths between the campus and the station and considering the walk from the stations important gateways to Haverford’s campus.
- ***Enhance native vegetation zones*** in select areas of campus to moderate local climate and air quality, maintain stable stream flows, remove pollutants from air and water, provide habitat for wildlife and pollinating insects, and contribute to Haverford’s sense of place and human well-being.

D. SUSTAINABILITY GUIDELINES

Beyond the College’s current efforts and the sustainable principles integral to the framework of the master plan, what guidelines might Haverford incorporate into its implementation of the plan? Near-term, readily-achievable objectives can kick-start a cycle of sustainability action.

1. *Buildings*

Roughly half of U.S. energy use is related to buildings,⁹ and so the way institutions build, heat and cool their buildings – and how much they build – can have a large impact on energy consumption.

- We recommend that the College consider accelerating the implementation of its Energy Management Plan’s goals to ***install individual utility meters on all major campus buildings and invest in a new, web-based energy monitoring system***.

a. Building projects

- ***Consider sustainability when choosing building sites***, and – where feasible – build on already-disturbed sites.

-- Best are infill sites without significant natural resources that have access to existing site services / utilities / infrastructure.

-- Next best are infill sites that affect individual existing trees, where the trees may be large but are not “significant” (as determined by Arboretum) or historic, or sites where significant individual trees can be protected within the site design.

-- Also acceptable are sites that will affect significant or historic trees, where those trees are given a poor longevity prognosis by the Arboretum staff; or sites that affect successional (scrubby) vegetation.

-- Less desirable are sites that affect historic trees; sites that affect small remnant patches of woods; low-lying sites where development would negatively impair site drainage;

-- Undesirable sites include those that contain large areas of mature woods (the better their health, the less desirable; typically larger contiguous areas are more desirable for conservation / environmental value than small, thin, or disconnected areas); wetland sites; flood prone sites; buried stream corridors, very steep slopes.

- Our understanding is that all new buildings will be LEED® certified. ***Consider setting a goal of LEED® Silver or higher certification for all new buildings or major renovations***.

⁹ www.architecture2030.org

- ***Beyond setting the requirement for LEED® certification, consider setting Haverford-specific goals related to particular credits***, including goals that exceed LEED® requirements, for example:

— a targeted number of credits achieved in the “Optimize Energy Performance” category, beyond those required for certification;

-- targets for water use reduction;

-- specific goals for regional materials, recycled content and construction waste recycling.

- Consider the guidelines being developed by the Sustainable Sites Initiative (www.sustainablesites.org) when ***siting new buildings*** and developing landscape. This organization – a partnership including the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center and the United States Botanic Garden – is in the process of developing site and landscape guidelines and a rating system for incorporation into the future evolution of the LEED® Green Building Rating System™. Pilot projects to test the guidelines are expected to be developed between 2010 and 2012, and a reference guide is expected to be published in 2012. In the meantime, the group’s interim document, *Standards & Guidelines: Preliminary Report*,¹⁰ provides a useful point of reference.

- ***Consider designing spaces for multiple uses, to increase intensity of use over the course of a day, week or academic year.*** For example, consider making additional classrooms available for meetings or other uses during non-class hours, and consider using WCC meeting rooms for some daytime classes.

- Where feasible, ***provide some level of personal control over temperature and ventilation.*** Research conducted by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has demonstrated that building occupants are more comfortable across a wider range of temperatures than those who do not.¹¹ At Princeton, the standard for all future dorm renovations and new buildings is to incorporate ***individual thermostats*** in every room, to encourage conservation.

- For projects between 2010 and 2012, ***consider applying as a pilot project*** for the Sustainable Sites Initiative rating system.

- ***Harvest free energy by daylighting buildings.*** (About 25% to 40% of electricity consumed in buildings is used by electric lights.¹²) For example, consider retain the existing skylights in the renovation of the Stokes Science Library.

b. Existing buildings

- ***Consider reuse of existing buildings, and consider the embodied energy in the building when weighing the pros and cons of demolition.*** Buildings can be viewed as repositories of the energy used to create them: the energy used to extract or manufacture materials, transport them to the site, and assemble them. “According to a formula produced for the Advisory Council on Historic Preservation, about 80 billion BTUs of energy are embodied in a typical 50,000-square-foot commercial building. That’s the equivalent of 640,000 gallons of gasoline...”¹³

- ***Consider setting performance targets for energy use reduction in renovated buildings.*** (Most renovated buildings end up using more energy after renovation because of the addition of cooling, elevators and other equipment.)

- Continue ***the College’s lighting replacement program; also consider occupancy sensors.***

- ***Consider a building-by-building audit of the opportunities for energy efficiency, particularly in older buildings.*** Opportunities to improve the energy efficiency of existing buildings could include commissioning and rebalancing existing mechanical equipment; adding aesthetically and historically appropriate storm windows or window replacements in cases where these do not already exist; and adding insulation and weatherstripping.

- Continue ***the College’s lighting replacement program; also consider occupancy sensors.***

- Consider ***requiring environmentally-friendly materials even for minor renovations and improvements.*** Examples include low-VOC paints that meet Green Seal GS-11 standards, and carpet that meets the requirements of the Carpet and Rug Institute’s Green Label program. (The Healthy Building Network – <http://www.healthybuilding.net/> – is one source of information, particularly about materials to avoid.)

- Consider installing ***“Vending Misers”*** on vending machines on campus.

- Consider installing ***low-flow bathroom fixtures*** in toilet and shower facilities, particularly in residences, if the College is not already doing so.

- Consider replacing conventional washing machines with ***energy-saving/water-conserving front-loading washers*** to conserve both water and energy. At Amherst College, this switch is estimated to save about 580,000 gallons of water per year, and a similar initiative at Bowdoin saved the College an estimated 31,356 kWh in electrical energy per year.

2. Transportation

Second only to buildings, transportation is responsible for about 27% of U.S. energy consumption and production of greenhouse gas emissions.¹⁴ Further, reducing the number of cars on campus would decrease the area dedicated to parking and the need for structured parking spaces.

- ***Consider further limiting cars for on-campus residents.*** Swarthmore, for example, limits student parking passes to 110 to 115 per year – less than 10% of the student population.

- ***Consider offering incentives for public transportation, carpooling, or other alternatives to single-person vehicles.*** (For example, at Cornell – which raised parking fees, coordinated its transit system with the city system, and provided free public transit passes – 36% of employees commute by means other than driving alone. Stanford University offers a flexible “Commute Club” that rewards club members – employees and students – with up to \$216 a year for not driving alone. Costs of such programs should be weighed against the cost of providing new parking.)

- ***Consider a shuttle route coordinated with SEPTA arrivals, particularly around peak staff rush hours.***

- ***Consider adding preferred parking for energy-efficient vehicles or carpool vehicles.***

- ***Increase the number of bicycle racks and bicycle shelters on campus, and provide more showering facilities.***

- The *Pedestrian and Bicycle Study* commissioned by Lower Merion Township recommended bike routes, including a two-mile route between Haverford and Bryn Mawr Colleges. ***Consider working with Lower Merion Township, the Lower Merion Bike Coalition and Bryn Mawr College to implement the recommendations of the study and to improve bicycle safety between the institutions.***

Campus transit also offers opportunities for an improved environment:

- Consider ***stronger enforcement of a prohibition on Blue Bus idling*** on campus. The continual presence of idling Blue Buses gives enforcement of this rule the potential to have meaningful consequences for health and the environment in the near-term. Not only does bus idling cause unneeded pollution and wear on engine parts; it has been noted that Blue Bus noise is disruptive in nearby academic spaces, such as Stokes 119 classroom. Better action could permit these existing spaces to be used more efficiently by the community.

¹⁰ http://www.sustainablesites.org/SustainableSitesInitiative_PreliminaryReport_110107.pdf

¹¹ <http://tc21.ashraetcs.org/content.html>

¹² <http://web.mit.edu/newsoffice/2007/energy-daylight-0509.html>

¹³ From a speech by Richard Coe, President of the National Trust for Historic Preservation. <http://www.preservationnation.org/about-us/press-room/speeches/sustainable-stewardship-portland.html>

¹⁴ www.architecture2030.org

- Consider ***greater use of alternative fuel vehicles in the shuttle fleet***. Haverford could consider working with Bryn Mawr College to replace the current diesel-fueled buses with Compressed Natural Gas (CNG) vehicles, expanding upon Bryn Mawr’s existing investments. Lower Merion Township’s school bus fleet, converted entirely to CNG vehicles, is a celebrated national model.
 - Consider ***vehicles that are smaller***, permitting them to make sharp turns on nearby streets as needed. This flexibility could allow shuttles to run modified or expanded routes on or between campuses in the future.
3. *Site and Landscape Systems*
- a. Vegetation
- Environmental stewardship generally emphasizes the benefits of preserving and restoring native vegetation, for its role in moderating local climate and air quality, maintaining stable stream flows, removing pollutants from air and water, providing habitat for wildlife and pollinating insects, and contributing to sense of place and human well-being. Haverford College could consider the following recommendations as the basis for sustainability initiatives related to vegetation:
- ***Continue to plan for the long-term continuity of the large tree cover in the center of the campus*** (1830s Arboretum collection). Within a sustainable philosophy, new tree planting would continue to focus on regional native species, specimens that are grown from seed and on their own root stock (representing genetic diversity); and the propagation of seedling trees from historic trees on the campus.
 - ***Continue to phase out invasive, non-native plants in the campus gardens, and replace with native equivalents.***
 - ***Integrate the existing mature trees, including pockets of woodland, as an amenity within the development of the campus.*** The woodland pockets have many qualities that are desirable for outdoor spaces: shade, stately mature trees, rich soils, reduced wind velocities, potential for screening, and/or potential for pleasant internal tranquil spaces. By capitalizing on both mature specimen trees and on the existing woodlands as key assets within the campus outdoor spaces, Haverford has the opportunity to quickly create many of the beloved qualities of the historic campus within the planned redevelopment sites.
 - ***Develop the Nature Trail as a community outreach / environmental education tool in addition to its current status as a recreational amenity.*** Consider interpretive ‘stations’

along the trail, where habitats, environmental points of interest and stewardship initiatives are highlighted for community awareness and education.

- ***Reduce traditional lawn in favor of a wider range of plant cover types, such as meadow, greensward, and woodland groves.*** The Arboretum staff at Haverford College have already proposed replacing lawn with a naturalistic planting of mixed native grasses, forbs, trees and shrubs along the ‘buffer zones’ around the perimeter of campus and around the Duck Pond. This initiative would benefit storm water management as well.
- ***Develop a management plan for the native woods on campus, including invasive species control, promoting regeneration of native species, and deer management.*** Haverford College is implementing a Norway Maple removal program for portions of their woods. Haverford might also consider expanding the program to include other non-native plant removals; strategic replanting of native sapling trees; and a deer exclosure that fosters native wildflowers as an educational comparison to “typical” urban woods
- ***Consider the role of the Arboretum within a sustainable campus.*** The Arboretum is well-placed to enhance its role as a facilitator of landscape stewardship within a sustainable campus, helping coordinate efforts related to landscape management between Facilities and the and a new Office of Sustainability. The most effective way to build upon the knowledge and expertise of the Arboretum staff, recognizing both the potentials and limits of capacity of their small-scale structure, is worth additional discussion.
- ***Consider the development of a 21st Century Collection for the Arboretum, which is based in sustainability and environmental stewardship as it relates to trees.***

b. Stormwater
Also see Section V.D.

Conventional site drainage systems focus on moving water efficiently off a site. In contrast, sustainable stormwater strategies promote groundwater recharge, slowing and cleaning runoff before it reaches the stream, and the use of rainwater as a potential site resource.

- ***Harvest roof runoff for reuse, either in buildings or in the landscape.*** Minimize or eliminate the use of potable water for irrigation.
- ***Emphasize infiltration of stormwater runoff in both new construction and in site retrofits.*** The original campus buildings infiltrated runoff by directing roof downspouts to dry wells; later construction piped runoff to a storm sewer system which offers efficient conveyance but less opportunity

for runoff reduction. Haverford’s more recent construction is returning to infiltration strategies; for example, some of the newer parking areas incorporate pervious pavements, and drainage problems at the southwest corner of campus were rectified through connecting catch basins to dry wells. Pervious pavements, and similar infiltration-based strategies such as dry wells and plastic modular storage chambers, could be replicated elsewhere on campus.

-- direct downspouts to infiltration structures and/or rain gardens before connecting to conventional storm drains;

-- direct pavement runoff to rain gardens or lawns (if dispersed and small catchment areas) or to water quality storm filters (for roadway pavement) that connect to infiltration structures (for concentrated runoff and large catchment areas);

-- where runoff is not carrying oils or other significant pollutants, consider porous pavements to reduce runoff and increase infiltration.

- ***Promote good water quality for runoff reaching the pond and stream.*** Haverford College has taken some initial steps to improve water quality in the pond, in the form of dredging and improved aeration. The Arboretum has also recommended planting enhancements to campus “buffer zones” that would reduce storm water runoff, filter sediments, and absorb pollutants (Buffer Zone Plan, 2000). This and other subsequent initiatives should consider:

-- In keeping with the proposed Buffer Zone Plan, add a herbaceous riparian fringe around the pond, to help filter goose droppings and lawn fertilizers from lawn runoff. Fecal coliforms and excess nutrients are common pollutants that impair water quality and lead to excess algae growth.

-- Similarly, continue to re-vegetate the grassy swales that flow to the pond. The lower swale west of the pond is already in meadow; this should be extended up slope along the water flow line, and copied at other swales on campus.

-- Implement a goose management program, to reduce the number of geese that routinely congregate on the lawns.

-- Identify and repair or replace leaking septic lines (if any).

-- Develop a plan for removal of underground storage tanks.

- ***Monitor the condition of the tributary stream southeast of the WCC, as a benchmark for incremental stormwater management improvements within the South Campus.*** Haverford’s campus is unusual in that its south campus contains both a small tributary stream and its entire watershed area. Consequently, Haverford College has complete control over land-use decisions that affect the water quality and flow characteristics of the stream. This situation creates a great opportunity to study the ability of stormwater

management initiatives to improve stream conditions within an urban watershed. The effects of a series of stormwater Best Management Practices (BMP's), implemented both as retrofits and as part of new construction, could be seen and assessed in the consequent changes to the condition of the stream. This would make a very interesting comparative scientific study.

- ***Incorporate the goals and recommendations of the Cobb's Creek Watershed Management Plan into on-campus stormwater planning.***
- ***Where feasible, utilize green roofs*** to provide additional permeable surface area thus reducing storm water runoff, to reduce heat island effect, prolonging the service life of roofing materials, and conserving HVAC energy. We understand Haverford is already planning a pilot green roof project.

c. Soils

Sustainable land development and maintenance practices promote the protection and restoration of healthy site soils. Healthy soils, in turn, promote healthy plant development, infiltration, clean water quality, and (through carbon storage) the reduction of greenhouse gasses.¹⁵

- ***Consider including soil protection and restoration measures in the specifications for new construction projects.*** Issues include minimizing erosion and compaction, proper protection and salvaging of on-site topsoil, and restoration of degraded soils.
- ***Consider requiring the use of salvaged on-site topsoil and sustainable soil mixes in construction projects rather than topsoil imported other sites.*** Working effectively with on-site soils is more sustainable than shipping in topsoil from other places. Soil mixes made from recycled mineral subsoils and compost are more effective than manufactured soils (Sustainable Sites Initiative, 2007). Consider requesting a soils scientist have input on the soils specifications.
- Consider implementing an ***Integrated Pest Management Plan*** to make most effective and minimal use of potentially harmful chemicals.

d. Other

- ***Consider the longevity of materials used in the landscape, and how easily they can be repaired or replaced.*** For example, the bluestone curbs used on portions of Haverford College's roads are more durable than concrete and, since they are installed as a series of separate pieces, are more easily repaired if a particular section is damaged.

4. Energy supply and distribution

- ***A new, more efficient central plant could provide opportunities for educating the Haverford community on its energy use.*** For example, large windows could provide visibility to plant operations (if on grade), and digital displays could provide real-time information on energy use.

- ***Some degree of cogeneration could be introduced,*** for example, to recover engine heat and exhaust heat for heating water or creating low pressure steam. This would require some additional upfront capital outlay but not nearly on the level of the entire cogeneration central plant.

- ***Improved controls and larger boilers would increase boiler efficiency.*** For example:

-- the heat input to the boiler could be continually modulated to match the heating load required;

-- the amount of combustion air could be continuously adjusted to achieve high combustion efficiency;

-- flue gas heat could be reclaimed and used to preheat the boiler feed water;

-- combustion air to the burner could be optimized, increasing boiler efficiency.

-- larger boilers require less fuel per unit of output than smaller boilers.

- Upgrades to pumping systems – including right-sized pumps with energy-efficient motors; variable speed drives on pump motors; and changing loop configurations – could save energy.

- ***Although the central utilities and central plant represent the College's biggest opportunity to reduce energy use and emissions, smaller-scale initiatives could be considered in addition.*** These could build on existing Haverford projects – like the photovoltaic panels at the GIAC or the ground source heat pumps at the President's house. Campus initiatives could consider ***renewable energy sources, equipment efficiency and ways of reducing building loads.*** For example:

-- alternative energy sources, such as solar heating and wind energy:

-- low-energy use HVAC system components – for example, heat reclamation devices such as air-to-air heat recovery wheels.

-- improved indoor condition monitoring systems, to monitor space temperature and humidity to ensure that HVAC systems are not over-conditioning a space beyond the required comfort conditions and to monitor space CO2 concentrations to allow for reductions in supplied outside air for energy conservation.

- In addition to a new, more efficient central plant, continue to consider ***alternative energy sources.*** Possibilities include:

-- ***Solar thermal technologies,*** which produce heat energy. Systems can be active or passive and can be used to heat water (especially for pools), for space heating (especially where steam is not available) and even for space cooling. The Solar Rating and Certification Corporation, a non-profit that certifies and provides ratings for collectors and systems, is a good resource. (<http://www.solar-rating.org/>).

-- ***Solar photovoltaics,*** which convert the sun's energy into electricity.

-- ***Biomass*** is the burning of organic matter, such as wood and plants, to produce energy. Systems using biomass typically require large storage areas, and – perhaps most important – a reliable and economical source of fuel. Several organizations in Pennsylvania are actively promoting the development of a state biomass industry; one source of information is the Pennsylvania State University website (<http://www.abe.psu.edu/extension/factsheets/h/H82.pdf>).

-- Using ***wind power*** to generate electricity is viable in areas of the country, but wind resources in the Greater Philadelphia Region have insufficient power and speed to be “commercially viable,” although small-scale demonstration projects might be feasible.¹⁶

Grants – for example, from the Pennsylvania Energy Harvest Grant Program (<http://www.depweb.state.pa.us/energy/cwp/view.asp?a=1374&q=483024>) – could be available to offset the costs of alternative technologies.

- Continue to ***replace and upgrade inefficient equipment.***
- ***Consider district-wide chilled water plants,*** to save energy and reduce maintenance.
- ***Consider a program of replacing site lighting*** with Dark-Sky full cut-off fixtures with LED technology. (See Section V.E.)

¹⁵ Sustainable Sites Initiative, www.sustainablesites.org, 2007.

¹⁶ <http://www.wppsef.org/wind.html>

E. PLAN IMPLEMENTATION: ADDITIONAL CONSIDERATIONS

Additional operational and administrative initiatives could include:

- **Consider creating an administrative structure** to coordinate sustainability efforts campus-wide – including coordinating academic, administrative, and facility efforts.
- Consider **partnerships** with other local institutions, governments or other entities to help achieve shared conservation and stewardship goals. For example, Amherst, Smith and Mount Holyoke colleges hired, initially with the help of a grant from the Mellon Foundation, a single Energy Manager who reports to the Director of Operations at each of the three schools. His responsibilities include identifying and implementing cost-effective ways to reduce fossil fuel and electrical energy consumption.
- **Consider campus-wide informational programs**, encouraging people to turn off lights and equipment and unplug chargers.
- **Consider expanding green cleaning initiatives** to eliminate toxic chemicals by using Green Seal certified cleaning products.

- Consider **real-time, interactive features** for Haverford’s new sustainability website. For example, Oberlin’s website (<http://www.oberlin.edu/dormenergy/>) shows real-time water and energy consumption in dormitories for the past hour, past week and past month. Middlebury College’s website includes a food mapping project, tracing the origins of four typical dining hall meals from farm to plate (http://geography.middlebury.edu/applications/Food_Mapping/).
- **Consider campus-wide informational programs**, encouraging people, for example, to turn off lights and equipment and unplug chargers.
- Continue to **consider connections between the curriculum and the campus**. (For example, on Bryn Mawr’s campus, Morris Woods and the pond are used in various science classes. Could the bi-college agreement extend this relationship to Haverford’s campus?)
- **Consider participation in off-site food composting programs**, if the College is not already doing so.

These initiatives, in tandem with the College’s ongoing efforts and within the framework of the campus master plan, could move Haverford closer to its environmental goals for a significantly more sustainable environment.

VIII. IMPLEMENTATION

VIII. IMPLEMENTATION

A. BEYOND THE PLAN

The Plan describes an overarching strategy for the College’s next stages of development, and identifies further opportunities and capacities for growth beyond that which is currently intended. When Haverford is ready to initiate actions on any of the identified projects, next steps include more detailed programming, pre-design and design studies. This Plan should serve as a guide to the College’s future designers, relating the Haverford’s aspirations, intentions and constraints.

Buildings, landscape and sustainability should be considered holistically and in tandem with the College’s broader mission at all scales and phases of design. We therefore recommend that the Haverford consider including knowledgeable advocates for landscape, building design, sustainability and the College’s strategic mission in planning and programming for construction and renovation projects, and in devising more detailed plans or policies that affect the physical campus.

College constituents instrumental in steering the campus plan could be called upon to advocate for its implementation. This could take many forms, including advising the College’s Property Committee or design review at important milestones of sub-area planning, building or landscape design. The College’s Sustainability Officer, too, should be involved in all aspects of carrying out the plan.

B. NOTES ON PHASING

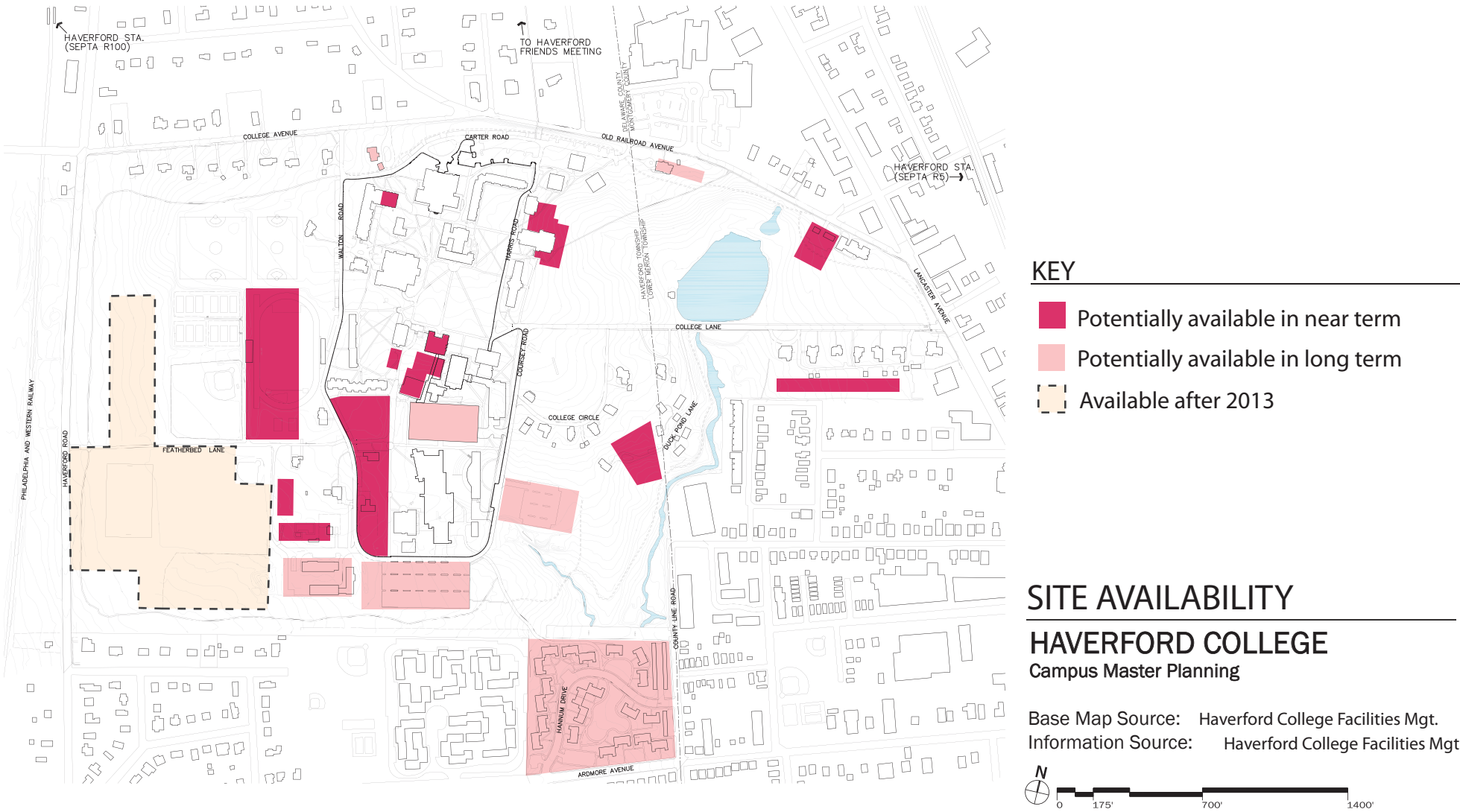
Considerations include:

- A large area of the campus, including sites along Featherbed Lane, will not be available until after the U.S. Open in 2013.
- Only about 40,000 gross square feet could be added to campus before significant upgrades to the electrical system are made. For example, a new Music addition or a new 100-bed residence hall – but not both – could be built before these upgrades are made.
- The existing boilers are near the ends of their life cycles, and a new central plant should be part of the College’s near-term planning. About 80,000 gross square feet could be served by the existing boilers, assuming the recommended electrical upgrades are completed and steam pressure is increased.

- Elimination of existing parking lots could trigger the need for structured parking; therefore, sites that are not already parking may in fact be more economical to develop.
- Construction of anything but garden-style apartments on the HCA site will require zoning relief from Haverford Township. Time for this process should be allocated in the College’s plans.
- The weight assigned to various College priorities will help determine a final implementation plan. For example, if moving students from HCA within the next decade is a priority, about one new residence hall a year could be built to accommodate this.

C. CONCLUSIONS

The planning process has engaged members of the campus community in a self-assessment of the College’s priorities and vision for its physical campus. The recommendations in this report are rooted in this perspective. The plan outlined in this document will help meet the College’s needs for physical space, preserve its most memorable buildings and landscapes, and enhance the beauty and utility of the campus. The plan weaves the College’s past, present and future into a more integrated system of landscape and buildings – one that that is explicitly and intentionally *Haverford*.

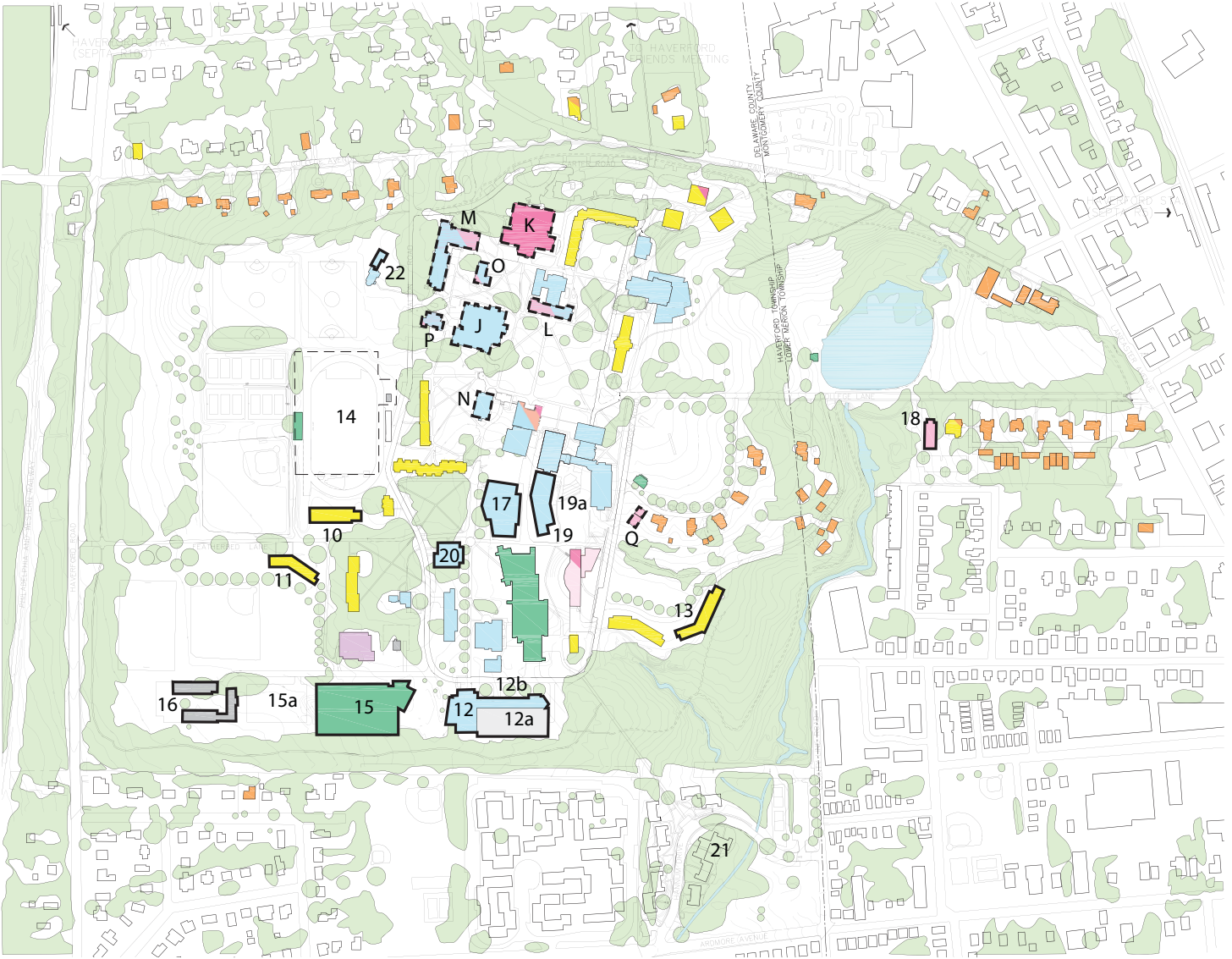




INITIAL INCREMENTS - ONE SCENARIO

New Construction		
1	Center for Culture and Media (Ryan Gym Addition)	38,300 GSF
2	Addition to Whitehead Campus Center	9,000 GSF
3	Addition to Roberts	31,700 GSF
4	Studio Arts Building	31,300 GSF
5	Orchard Green Residence Hall	46,700 GSF
5a	Surface Parking	
6	Central Power Plant	12,000 GSF
6a	Sustainability Program Office	1,500 GSF
7	Student Residence Hall (on Oakley House Site?)	46,700 GSF
8	Faculty Residences on Old Railroad Ave	13,450 GSF
9	Faculty Residences behind College Lane (including garages)	30,000 GSF

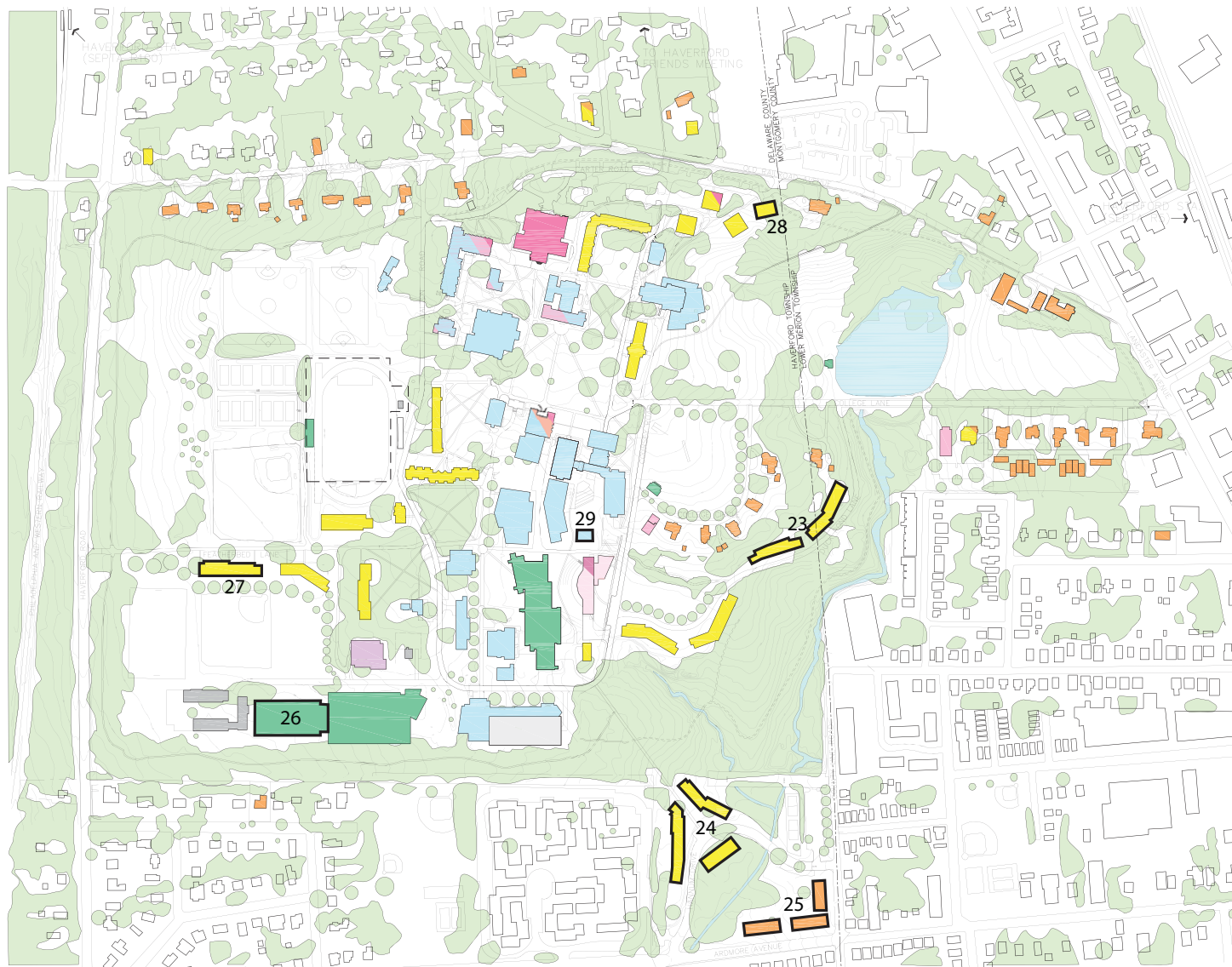
Major Renovations or Changes of Use	
A	Ryan Gym (Campus Living Room)
B	Whitehead Campus Center (Partial)
C	Dance/Theater/Orchestra Renovation of Roberts
D	Union
E	Sharpless Laboratories
F	Stokes Hall (Partial)
G	Founders Hall (Minor Renovation for IA Use)
H	Renovation of 8-10 Old Railroad Avenue



LONGER TERM

New Construction		
10	Student Residence Hall North of Featherbed Lane	46,700 GSF
11	Student Residence Hall South of Featherbed Lane	42,000 GSF
12	Theater	42,650 GSF
12a	Structured Parking	
12b	Additional Program	30,000 GSF
13	Student Residence Hall on Orchard Green	50,400 GSF
14	Parking under Walton Field or Across Haverford Road	
15	New Athletic Facility	130,941 GSF
16	New Facilities Management Complex	21,300 GSF
17	New Academic Building (or Library) on Field House Site	108,000 GSF
18	Alumni House	11,000 GSF
19	Academic Building (Science) on Field House Site	70,560 GSF
19a	Amphitheater	
20	Academic, Dining or Gallery on James House Site	31,000 GSF
21	Temporary or Permanent HCA uses	
22	Observatory Addition	2,500 GSF

Major Renovations or Changes of Use	
J	Magill - Renovation or Partial Replacement
K	Dining Center
L	Founders Hall
M	Stokes Hall (Partial)
N	Hall Building
O	Chase Hall
P	Morris
Q	6 College Lane



LONGER TERM WITH ENROLLMENT GROWTH

New Construction		
23	Duck Pond Lane Student Residence Halls (2)	73,000 GSF
or		
24	HCA Site Student Residence Halls (3) (Alternate: Fields)	115,000 GSF
25	Faculty Residences on HCA site (Alternate: Fields)	59,100 GSF
26	Natatorium	40,800 GSF
27	Featherbed Lane Student Residence Hall	52,000 GSF
28	Student Residence Hall or Administration near North Dorms	20,000 GSF
29	Building South of KINSC	8,500 GSF

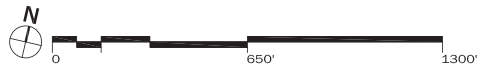
KEY

- Academic Building
- Campus Living Room
- Student Center
- Student Residential
- Faculty Residential
- Facilities / Storage
- Central Power Plant
- Dining
- Athletics / Recreation
- Administration
- New Building
- Renovated Building, With Potential Change of Use

POTENTIAL SCENARIOS OPTION 1

HAVERFORD COLLEGE Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source:

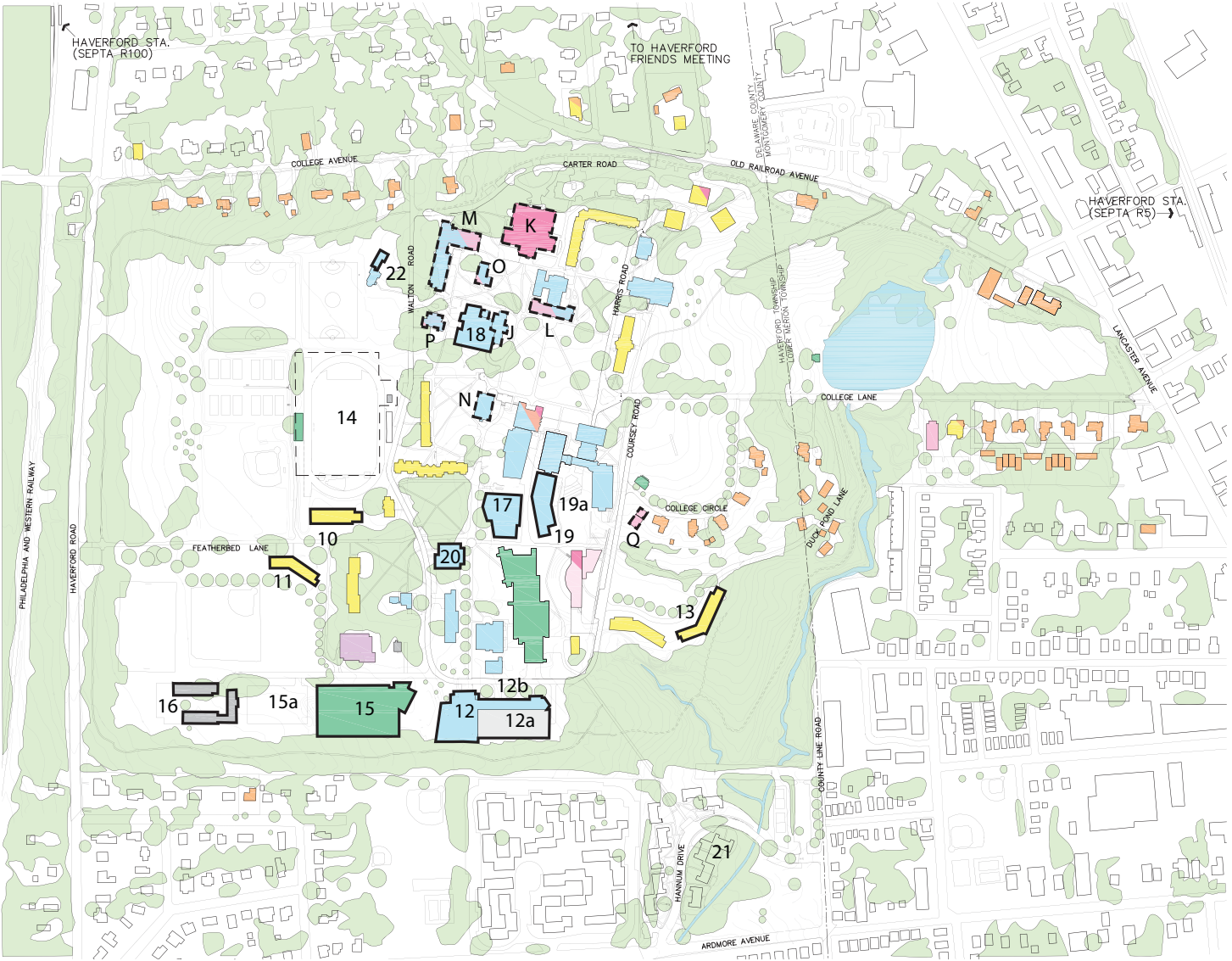




INITIAL INCREMENTS - ONE SCENARIO

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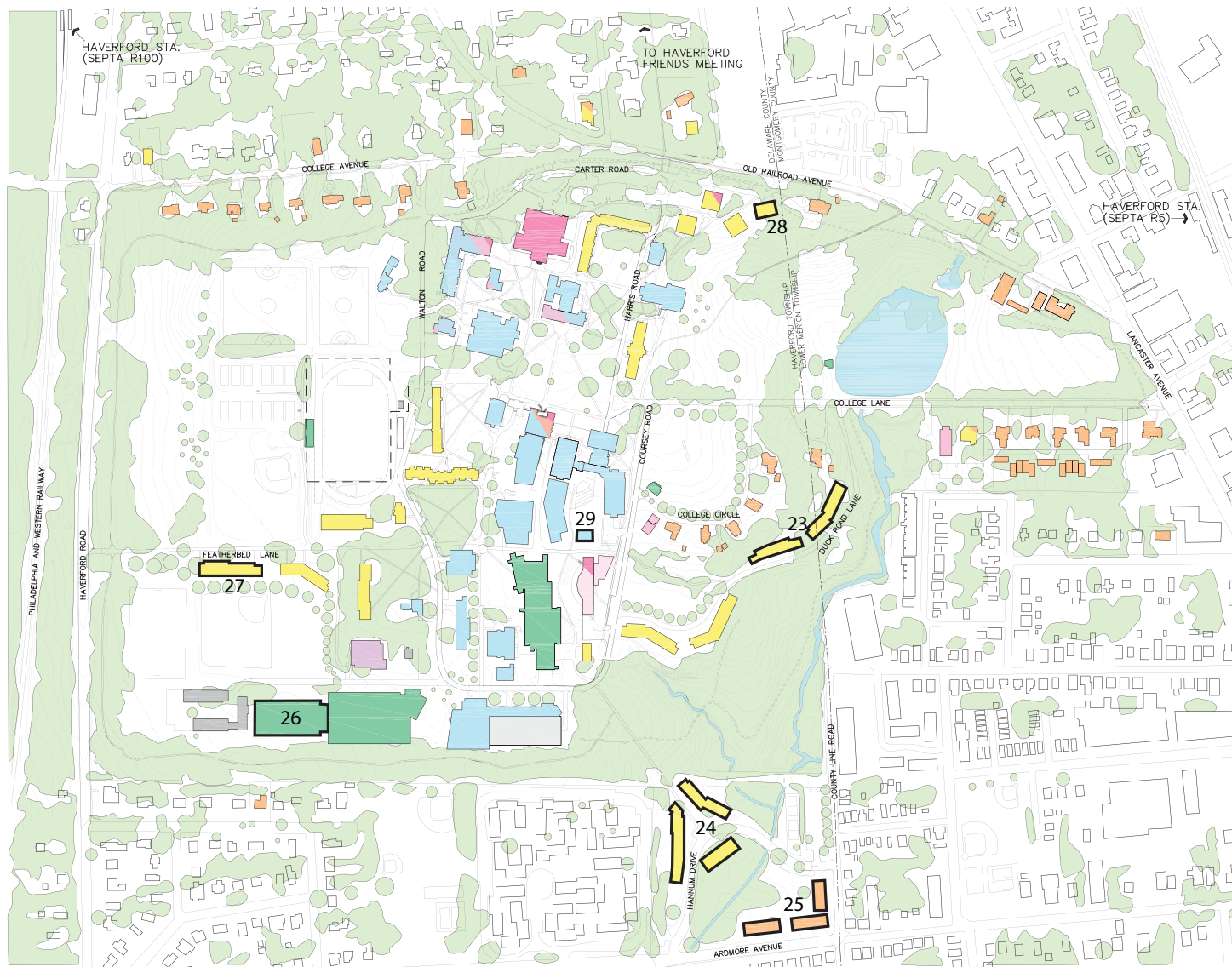
Major Renovations or Changes of Use	
A	Ryan Gym (Campus Living Room)
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LONGER TERM

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18	Magill Addition	11,000 GSF
19	Academic Building (Science) on Field House Site	70,560 GSF
19a	Amphitheater	
20	Academic, Dining or Gallery on James House Site	31,000 GSF
21	Temporary or Permanent HCA uses	
22	Observatory Addition	2,500 GSF

Major Renovations or Changes of Use	
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LONGER TERM WITH ENROLLMENT GROWTH

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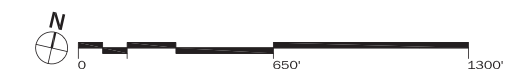
KEY

- Academic Building
- Campus Living Room
- Student Center
- Student Residential
- Faculty Residential
- Facilities / Storage
- Central Power Plant
- Dining
- Athletics / Recreation
- Administration
- New Building
- Renovated Building, With Potential Change of Use

POTENTIAL SCENARIOS OPTION 2

HAVERFORD COLLEGE Campus Master Planning

Base Map Source: Haverford College Facilities Mgt.
Information Source:



APPENDIX I
ORDER-OF-MAGNITUDE COST INFORMATION

EARLY INCREMENT LINKED PROJECTS - RYAN OPTION 1	<i>Appendix I - 2</i>
EARLY INCREMENT LINKED PROJECTS - RYAN OPTION 2	<i>Appendix I - 4</i>
CAMPUS HOUSING	<i>Appendix I - 6</i>
POTENTIAL PROJECTS TO BE PRIORITIZED AND COMPLETED AS FUNDS BECOME AVAILABLE	<i>Appendix I - 10</i>
OPERATING COSTS - ONE POTENTIAL NEAR-TERM SCENARIO	<i>Appendix I - 20</i>

A. COSTS

1. Order-of-Magnitude Costs for Major Capital Projects

We show costs assigned to a list of potential projects. In developing budget estimates for Master Plan projects, International Consultants, Inc. (ICI) typically uses a cost per square foot of building area, which is based on a program projection of required area. The budget numbers used are based on ICI’s in-house database of projects, reference material, our familiarity with the owner’s facilities and the overall level of quality desired. These numbers should be verified or adjusted during the conceptual design/programming phase of each project – especially for renovation projects, where often “the detail wags the dog.”

In this report, construction costs for building projects include fixed furnishings and site improvements in the area immediately around the building; this would include walks, landscaping and utility services near the building. Parking lots and extensive campus landscaping/infrastructure improvements are included as separate projects. Prevailing wages are assumed.

From our discussions at the College, our understanding is that a fairly high level of quality and finish – “*forever-ness, simplicity and beauty*” – is desired, but that containing costs is also important. For this reason, we have worked with ICI to develop a range of costs based on two levels of quality: The lower figures assume simple durable finishes such as brick and punched window facades, membrane roofs, basic interior finishes, and conventional mechanical/electrical systems. The higher figures include some or a mix of materials such as masonry/stone and more curtain walls on the facades, possibly sloped roofs with slate/metal, some interior areas of upgraded finishes and millwork, and a better quality mechanical/electrical system, with the acknowledgment of LEED standards (though not necessarily highly specialized equipment to achieve a high rating). Given Haverford’s existing campus and aspiration, the higher end of the range would appear to be a more appropriate estimation of eventual costs.

“Soft costs” include movable furnishing and equipment, telecommunication wiring and equipment, design team and other fees, permitting, administrative costs and a project contingency. These vary both by institution and by project type. Haverford College Facilities has recommended assigning 30% of hard costs to soft costs for most projects. We recommend the College analyze the soft costs associated with its most recent project, the GIAC, to verify the amount to be budgeted.

We have assigned a higher percentage to soft costs for certain projects, including the library, that would require more complicated moves and phasing.

Haverford College Facilities has indicated it would like to procure a “second opinion” on the order-of-magnitude costs in this report from a cost consultant of the College’s choosing. We welcome their input.

2. Operating Costs

Rough operating costs for newly constructed projects can be budgeted on a per-square-foot basis using industry averages, such as those published by FMLink (BOMA).

In addition to these industry-standard costs, some building types require additional personnel – for example, technical directors for performing arts spaces, pool directors and lifeguards for natatoria, and monitors for art study-storage areas.

3. Costs of Renewing Existing Buildings

In addition to the major capital projects in this plan, the College needs to continuously update, repair and maintain its existing buildings for:

Life safety. For example, the College is continuously adding sprinklers to older buildings, and should continue to do so.

Accessibility. The College is required to address campus accessibility, not only in new buildings but in existing ones as well. Steady, predictable funding should be identified for this purpose – even in lean times. The College’s progress toward universal accessibility must be actively and continuously funded, managed and monitored to meet the goals of the Americans with Disabilities Act (ADA).

Energy efficiency. Updating, maintaining and monitoring existing buildings and equipment for greater energy efficiency are important aspects of sustainability. See Section V. for the College’s ongoing efforts and further recommendations.

Condition, comfort and appearance. These have a direct, everyday impact on the lives of current members of the Haverford community and influence the decision-making of prospective faculty, staff and students.

Classroom technology. For example, Middlebury College budgets \$200,000 per year to upgrade technology in its 84 classrooms.¹

Increasing the College’s current budget for non-capital projects would help meet the aims of the plan, the aspirations of the College, and the expectations of prospective faculty, staff and students.

¹ Michael Dennis & Associates and Andropogon Associates, Middlebury College: Campus Plan 2008, pp. 114-116.

ORDER-OF-MAGNITUDE COSTS: MAJOR LINKED EARLY INCREMENT CAPITAL PROJECTS - RYAN OPTION 1

2008 COSTS NOT INCLUDING ESCALATION

Project	Approx. Area (GSF)	Construction cost/ GSF		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
		Low	High	Low	High		Low	High
Center for Culture and Media in Ryan								
Ryan Gym - Renovation	19,805	\$275	\$375	\$5,446,375	\$7,426,875	1.30	\$7,080,288	\$9,654,938
Demolish Link and Squash Courts	8,300	\$15	\$20	\$124,500	\$166,000	1.25	\$155,625	\$207,500
Additional Space	38,300	\$375	\$425	\$14,362,500	\$16,277,500	1.30	\$18,671,250	\$21,160,750
Stormwater Management				\$25,000	\$75,000	1.30	\$32,500	\$97,500
				\$19,958,375	\$23,945,375		\$25,939,663	\$31,120,688
Whitehead Campus Center Renovation and Addition								
Addition, 2 stories plus basement	9,000	\$400	\$425	\$3,600,000	\$3,825,000	1.30	\$4,680,000	\$4,972,500
Strategic, limited renovations - budget				\$1,500,000	\$2,500,000	1.30	\$1,950,000	\$3,250,000
or				or	or		or	or
More extensive (but not complete) renovations - budget	54,409			\$5,000,000	\$7,000,000	1.30	\$6,500,000	\$9,100,000
Stormwater management				\$25,000	\$45,000	1.30	\$32,500	\$58,500
Conversion of College house to Guest House	5,500	\$175	\$225	\$962,500	\$1,237,500	1.30	\$1,251,250	\$1,608,750
with strategic, limited renovation of WCC				\$6,087,500	\$7,607,500		\$7,913,750	\$9,889,750
or				or	or		or	or
with more extensive WCC renovations				\$9,587,500	\$12,107,500		\$12,463,750	\$15,739,750
Stokes Hall Renovations								
Science Library Space	5,400	\$175	\$250	\$945,000	\$1,350,000	1.30	\$1,228,500	\$1,755,000
First Floor South	6,720	\$100	\$175	\$672,000	\$1,176,000	1.30	\$873,600	\$1,528,800
				\$1,617,000	\$2,526,000		\$2,102,100	\$3,283,800
Infrastructure								
Central Plant - Heating and Electrical building	12,000	\$150	\$225	\$1,800,000	\$2,700,000	1.30	\$2,340,000	\$3,510,000
Sustainability Program Office within Central Plant	1,500	\$150	\$225	\$225,000	\$337,500	1.30	\$292,500	\$438,750
Phase I Central Plant - Heating and Electrical Equipment				\$12,300,000	\$14,700,000	1.30	\$15,990,000	\$19,110,000
Regional Chiller Plants (assume 2 completed in this time frame)				\$2,000,000	\$2,400,000	1.25	\$2,500,000	\$3,000,000
Stormwater management (storage and infiltration beds under fields to be replaced in 2013)				\$400,000	\$700,000	1.30	\$520,000	\$910,000
Landscape beyond that in projects, allowance				\$500,000	\$700,000	1.25	\$625,000	\$875,000
Relocate Faculty Pool				\$75,000	\$85,000	1.25	\$93,750	\$106,250
SUBTOTAL	SUBTOTAL with minor renovations to Roberts and WCC						\$58,316,763	\$72,244,238
							or	or
SUBTOTAL with more extensive renovations to Roberts and WCC							\$62,866,763	\$78,094,238

PROJECT COSTS WITH 4% ANNUAL INFLATION					
Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
\$7,363,499	\$10,041,135	\$7,658,039	\$10,442,780	\$7,964,361	\$10,860,492
\$161,850	\$215,800	\$168,324	\$224,432	\$175,057	\$233,409
\$19,418,100	\$22,007,180	\$20,194,824	\$22,887,467	\$21,002,617	\$23,802,966
\$33,800	\$101,400	\$35,152	\$105,456	\$36,558	\$109,674
\$26,977,249	\$32,365,515	\$28,056,339	\$33,660,136	\$29,178,593	\$35,006,541
\$4,867,200	\$5,171,400	\$5,061,888	\$5,378,256	\$5,264,364	\$5,593,386
\$2,028,000	\$3,380,000	\$2,109,120	\$3,515,200	\$2,193,485	\$3,655,808
or	or	or	or	or	or
\$6,760,000	\$9,464,000	\$7,030,400	\$9,842,560	\$7,311,616	\$10,236,262
\$33,800	\$60,840	\$35,152	\$63,274	\$36,558	\$65,805
\$1,301,300	\$1,673,100	\$1,353,352	\$1,740,024	\$1,407,486	\$1,809,625
\$8,230,300	\$10,285,340	\$8,559,512	\$10,696,754	\$8,901,892	\$11,124,624
\$12,962,300	\$16,369,340	\$13,480,792	\$17,024,114	\$14,020,024	\$17,705,078
\$1,277,640	\$1,825,200	\$1,328,746	\$1,898,208	\$1,381,895	\$1,974,136
\$908,544	\$1,589,952	\$944,886	\$1,653,550	\$982,681	\$1,719,692
\$2,186,184	\$3,415,152	\$2,273,631	\$3,551,758	\$2,364,577	\$3,693,828
\$2,433,600	\$3,650,400	\$2,530,944	\$3,796,416	\$2,632,182	\$3,948,273
\$304,200	\$456,300	\$316,368	\$474,552	\$329,023	\$493,534
\$16,629,600	\$19,874,400	\$17,294,784	\$20,669,376	\$17,986,575	\$21,496,151
\$2,600,000	\$3,120,000	\$2,704,000	\$3,244,800	\$2,812,160	\$3,374,592
\$540,800	\$946,400	\$562,432	\$984,256	\$584,929	\$1,023,626
\$650,000	\$910,000	\$676,000	\$946,400	\$703,040	\$984,256
\$97,500	\$110,500	\$101,400	\$114,920	\$105,456	\$119,517
\$60,649,433	\$75,134,007	\$63,075,410	\$78,139,367	\$65,598,427	\$81,264,942
or	or	or	or	or	or
\$65,381,433	\$81,218,007	\$67,996,690	\$84,466,727	\$70,716,558	\$87,845,396

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
\$8,282,935	\$11,294,911	\$8,614,252	\$11,746,708	\$8,958,822	\$12,216,576	\$9,317,175	\$12,705,239	\$9,689,862	\$13,213,449	\$10,077,457	\$13,741,987	\$10,480,555	\$14,291,666	\$10,899,777	\$14,863,333	\$11,335,768	\$15,457,866
\$182,059	\$242,746	\$189,342	\$252,455	\$196,915	\$262,554	\$204,792	\$273,056	\$212,984	\$283,978	\$221,503	\$295,337	\$230,363	\$307,151	\$239,578	\$319,437	\$249,161	\$332,214
\$21,842,722	\$24,755,085	\$22,716,431	\$25,745,288	\$23,625,088	\$26,775,099	\$24,570,091	\$27,846,103	\$25,552,895	\$28,959,948	\$26,575,011	\$30,118,345	\$27,638,011	\$31,323,079	\$28,743,532	\$32,576,002	\$29,893,273	\$33,879,043
\$38,020	\$114,061	\$39,541	\$118,624	\$41,123	\$123,369	\$42,768	\$128,303	\$44,478	\$133,435	\$46,258	\$138,773	\$48,108	\$144,324	\$50,032	\$150,097	\$52,034	\$156,101
\$30,345,736	\$36,406,803	\$31,559,566	\$37,863,075	\$32,821,948	\$39,377,598	\$34,134,826	\$40,952,702	\$35,500,219	\$42,590,810	\$36,920,228	\$44,294,442	\$38,397,037	\$46,066,220	\$39,932,919	\$47,908,869	\$41,530,235	\$49,825,223
\$5,474,938	\$5,817,122	\$5,693,936	\$6,049,807	\$5,921,693	\$6,291,799	\$6,158,561	\$6,543,471	\$6,404,903	\$6,805,210	\$6,661,099	\$7,077,418	\$6,927,543	\$7,360,515	\$7,204,645	\$7,654,935	\$7,492,831	\$7,961,133
\$2,281,224	\$3,802,040	\$2,372,473	\$3,954,122	\$2,467,372	\$4,112,287	\$2,566,067	\$4,276,778	\$2,668,710	\$4,447,849	\$2,775,458	\$4,625,763	\$2,886,476	\$4,810,794	\$3,001,935	\$5,003,226	\$3,122,013	\$5,203,355
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$7,604,081	\$10,645,713	\$7,908,244	\$11,071,541	\$8,224,574	\$11,514,403	\$8,553,557	\$11,974,979	\$8,895,699	\$12,453,978	\$9,251,527	\$12,952,137	\$9,621,588	\$13,470,223	\$10,006,451	\$14,009,032	\$10,406,709	\$14,569,393
\$38,020	\$68,437	\$39,541	\$71,174	\$41,123	\$74,021	\$42,768	\$76,982	\$44,478	\$80,061	\$46,258	\$83,264	\$48,108	\$86,594	\$50,032	\$90,058	\$52,034	\$93,660
\$1,463,786	\$1,882,010	\$1,522,337	\$1,957,290	\$1,583,230	\$2,035,582	\$1,646,560	\$2,117,005	\$1,712,422	\$2,201,685	\$1,780,919	\$2,289,753	\$1,852,156	\$2,381,343	\$1,926,242	\$2,476,597	\$2,003,292	\$2,575,661
\$9,257,968	\$11,569,609	\$9,628,287	\$12,032,393	\$10,013,418	\$12,513,689	\$10,413,955	\$13,014,236	\$10,830,513	\$13,534,806	\$11,263,734	\$14,076,198	\$11,714,283	\$14,639,246	\$12,182,855	\$15,224,816	\$12,670,169	\$15,833,808
\$14,580,825	\$18,413,281	\$15,164,058	\$19,149,813	\$15,770,620	\$19,915,805	\$16,401,445	\$20,712,437	\$17,057,503	\$21,540,935	\$17,739,803	\$22,402,572	\$18,449,395	\$23,298,675	\$19,187,370	\$24,230,622	\$19,954,865	\$25,199,847
\$1,437,171	\$2,053,102	\$1,494,658	\$2,135,226	\$1,554,444	\$2,220,635	\$1,616,622	\$2,309,460	\$1,681,287	\$2,401,839	\$1,748,539	\$2,497,912	\$1,818,480	\$2,597,829	\$1,891,219	\$2,701,742	\$1,966,868	\$2,809,812
\$1,021,988	\$1,788,480	\$1,062,868	\$1,860,019	\$1,105,383	\$1,934,420	\$1,149,598	\$2,011,797	\$1,195,582	\$2,092,268	\$1,243,405	\$2,175,959	\$1,293,141	\$2,262,997	\$1,344,867	\$2,353,517	\$1,398,662	\$2,447,658
\$2,459,160	\$3,841,582	\$2,557,526	\$3,995,245	\$2,659,827	\$4,155,055	\$2,766,220	\$4,321,257	\$2,876,869	\$4,494,107	\$2,991,944	\$4,673,871	\$3,111,622	\$4,860,826	\$3,236,086	\$5,055,259	\$3,365,530	\$5,257,470
\$2,737,469	\$4,106,204	\$2,846,968	\$4,270,452	\$2,960,847	\$4,441,270	\$3,079,280	\$4,618,921	\$3,202,452	\$4,803,677	\$3,330,550	\$4,995,824	\$3,463,772	\$5,195,657	\$3,602,322	\$5,403,484	\$3,746,415	\$5,619,623
\$342,184	\$513,275	\$355,871	\$533,806	\$370,106	\$555,159	\$384,910	\$577,365	\$400,306	\$600,460	\$416,319	\$624,478	\$432,971	\$649,457	\$450,290	\$675,435	\$468,302	\$702,453
\$18,706,038	\$22,355,997	\$19,454,280	\$23,250,237	\$20,232,451	\$24,180,246	\$21,041,749	\$25,147,456	\$21,883,419	\$26,153,355	\$22,758,756	\$27,199,489	\$23,669,106	\$28,287,468	\$24,615,870	\$29,418,967	\$25,600,505	\$30,595,726
\$2,924,646	\$3,509,576	\$3,041,632	\$3,649,959	\$3,163,298	\$3,795,957	\$3,289,829	\$3,947,795	\$3,421,423	\$4,105,707	\$3,558,280	\$4,269,935	\$3,700,611	\$4,440,733	\$3,848,635	\$4,618,362	\$4,002,581	\$4,803,097
\$608,326	\$1,064,571	\$632,660	\$1,107,154	\$657,966	\$1,151,440	\$684,285	\$1,197,498	\$711,656	\$1,245,398	\$740,122	\$1,295,214	\$769,727	\$1,347,022	\$800,516	\$1,400,903	\$832,537	\$1,456,939
\$731,162	\$1,023,626	\$760,408	\$1,064,571	\$790,824	\$1,107,154	\$822,457	\$1,151,440	\$855,356	\$1,197,498	\$889,570	\$1,245,398	\$925,153	\$1,295,214	\$962,159	\$1,347,022	\$1,000,645	\$1,400,903
\$109,674	\$124,297	\$114,061	\$129,269	\$118,624	\$134,440	\$123,369	\$139,818	\$128,303	\$145,410	\$133,435	\$151,227	\$138,773	\$157,276	\$144,324	\$163,567	\$150,097	\$170,110
\$68,222,364	\$84,515,540	\$70,951,258	\$87,896,161	\$73,789,309	\$91,412,008	\$76,740,881	\$95,068,488	\$79,810,516	\$98,871,228	\$83,002,937	\$102,826,077	\$86,323,054	\$106,939,120	\$89,775,977	\$111,216,684	\$93,367,016	\$115,665,352
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$73,545,220	\$91,359,212	\$76,487,029	\$95,013,581	\$79,546,510	\$98,814,124	\$82,728,371	\$102,766,689	\$86,037,505	\$106,877,356	\$89,479,006	\$111,152,451	\$93,058,166	\$115,598,549	\$96,780,493	\$120,222,491	\$100,651,712	\$125,031,390

ORDER-OF-MAGNITUDE COSTS: MAJOR LINKED EARLY INCREMENT CAPITAL PROJECTS - RYAN OPTION 2

2008 COSTS NOT INCLUDING ESCALATION								
Project	Approx. Area (GSF)	Construction cost/ GSF		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
		Low	High	Low	High		Low	High
Ryan Gym Renovation - for future incorporation into library								
Ryan Gym - Renovation	19,805	\$275	\$375	\$5,446,375	\$7,426,875	1.30	\$7,080,288	\$9,654,938
Demolish Link and Squash Courts	8,300	\$15	\$20	\$124,500	\$166,000	1.25	\$155,625	\$207,500
Additional Space (within Ryan envelope)	3,700	\$375	\$425	\$1,387,500	\$1,572,500	1.30	\$1,803,750	\$2,044,250
Stormwater Management				\$25,000	\$35,000	1.30	\$32,500	\$45,500
				\$6,983,375	\$9,200,375		\$9,072,163	\$11,952,188
New Administrative Building								
Institutional Advancement	11,000	\$275	\$325	\$3,025,000	\$3,575,000	1.30	\$3,932,500	\$4,647,500
Alumni House Functions	1,500	\$275	\$325	\$412,500	\$487,500	1.30	\$536,250	\$633,750
Career Development?	3,000	\$275	\$325	\$825,000	\$975,000	1.30	\$1,072,500	\$1,267,500
Additional surface parking - 50 spaces	16,250	\$10	\$15	\$162,500	\$243,750	1.25	\$203,125	\$304,688
	15,500			\$4,425,000	\$5,281,250		\$5,744,375	\$6,853,438
Founders - Selective Renovation of Vacated Space								
Selected (not complete) Renovation of Space Decanted to Admin.								
Ground Floor West	2,000	\$125	\$200	\$250,000	\$400,000	1.30	\$325,000	\$520,000
Second Floor	5,700	\$125	\$200	\$712,500	\$1,140,000	1.30	\$926,250	\$1,482,000
Third Floor, IA	4,700	\$125	\$200	\$587,500	\$940,000	1.30	\$763,750	\$1,222,000
Third Floor, other than IA	1,200	\$125	\$200	\$150,000	\$240,000	1.30	\$195,000	\$312,000
				\$1,700,000	\$2,720,000		\$2,210,000	\$3,536,000
Whitehead Campus Center Renovation and Addition								
Addition, 2 stories plus basement	9,000	\$400	\$425	\$3,600,000	\$3,825,000	1.30	\$4,680,000	\$4,972,500
Strategic, limited renovations - budget				\$1,500,000	\$2,500,000	1.30	\$1,950,000	\$3,250,000
or				or	or		or	or
More extensive (but not complete) renovations - budget	54,409			\$5,000,000	\$7,000,000	1.30	\$6,500,000	\$9,100,000
Stormwater management				\$25,000	\$45,000	1.30	\$32,500	\$58,500
Conversion of College house to Guest House	5,500	\$175	\$225	\$962,500	\$1,237,500	1.30	\$1,251,250	\$1,608,750
with strategic, limited renovation of WCC				\$6,087,500	\$7,607,500		\$7,913,750	\$9,889,750
or				or	or		or	or
with more extensive WCC renovations				\$9,587,500	\$12,107,500		\$12,463,750	\$15,739,750
Stokes Hall Renovations								
Science Library Space	5,400	\$175	\$250	\$945,000	\$1,350,000	1.30	\$1,228,500	\$1,755,000
				\$945,000	\$1,350,000		\$1,228,500	\$1,755,000
Infrastructure								
Central Plant - Heating and Electrical building	12,000	\$150	\$225	\$1,800,000	\$2,700,000	1.30	\$2,340,000	\$3,510,000
Sustainability Program Office within Central Plant	1,500	\$150	\$225	\$225,000	\$337,500	1.30	\$292,500	\$438,750
Phase I Central Plant - Heating and Electrical Equipment				\$12,300,000	\$14,700,000	1.30	\$15,990,000	\$19,110,000
Regional Chiller Plants (assume 2 completed in this time frame)				\$2,000,000	\$2,400,000	1.25	\$2,500,000	\$3,000,000
Stormwater management (storage and infiltration beds under fields to be replaced in 2013)				\$400,000	\$700,000	1.30	\$520,000	\$910,000
Landscape beyond that in projects, allowance				\$500,000	\$700,000	1.25	\$625,000	\$875,000
Relocate Faculty Pool				\$75,000	\$85,000	1.25	\$93,750	\$106,250
	SUBTOTAL		SUBTOTAL with minor renovations to Roberts and WCC				\$48,497,538	\$61,890,875
							or	or
			SUBTOTAL with more extensive renovations to WCC				\$53,047,538	\$67,740,875

PROJECT COSTS WITH 4% ANNUAL INFLATION					
Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
\$7,363,499	\$10,041,135	\$7,658,039	\$10,442,780	\$7,964,361	\$10,860,492
\$161,850	\$215,800	\$168,324	\$224,432	\$175,057	\$233,409
\$1,875,900	\$2,126,020	\$1,950,936	\$2,211,061	\$2,028,973	\$2,299,503
\$33,800	\$47,320	\$35,152	\$49,213	\$36,558	\$51,181
\$9,435,049	\$12,430,275	\$9,812,451	\$12,927,486	\$10,204,949	\$13,444,585
\$4,089,800	\$4,833,400	\$4,253,392	\$5,026,736	\$4,423,528	\$5,227,805
\$557,700	\$659,100	\$580,008	\$685,464	\$603,208	\$712,883
\$1,115,400	\$1,318,200	\$1,160,016	\$1,370,928	\$1,206,417	\$1,425,765
\$211,250	\$316,875	\$219,700	\$329,550	\$228,488	\$342,732
\$5,974,150	\$7,127,575	\$6,213,116	\$7,412,678	\$6,461,641	\$7,709,185
\$338,000	\$540,800	\$351,520	\$562,432	\$365,581	\$584,929
\$963,300	\$1,541,280	\$1,001,832	\$1,602,931	\$1,041,905	\$1,667,048
\$794,300	\$1,270,880	\$826,072	\$1,321,715	\$859,115	\$1,374,584
\$202,800	\$324,480	\$210,912	\$337,459	\$219,348	\$350,958
\$2,298,400	\$3,677,440	\$2,390,336	\$3,824,538	\$2,485,949	\$3,977,519
\$4,867,200	\$5,171,400	\$5,061,888	\$5,378,256	\$5,264,364	\$5,593,386
\$2,028,000	\$3,380,000	\$2,109,120	\$3,515,200	\$2,193,485	\$3,655,808
or	or	or	or	or	or
\$6,760,000	\$9,464,000	\$7,030,400	\$9,842,560	\$7,311,616	\$10,236,262
\$33,800	\$60,840	\$35,152	\$63,274	\$36,558	\$65,805
\$1,301,300	\$1,673,100	\$1,353,352	\$1,740,024	\$1,407,486	\$1,809,625
\$8,230,300	\$10,285,340	\$8,559,512	\$10,696,754	\$8,901,892	\$11,124,624
or	or	or	or	or	or
\$12,962,300	\$16,369,340	\$13,480,792	\$17,024,114	\$14,020,024	\$17,705,078
\$1,277,640	\$1,825,200	\$1,328,746	\$1,898,208	\$1,381,895	\$1,974,136
\$1,277,640	\$1,825,200	\$1,328,746	\$1,898,208	\$1,381,895	\$1,974,136
\$2,433,600	\$3,650,400	\$2,530,944	\$3,796,416	\$2,632,182	\$3,948,273
\$304,200	\$456,300	\$316,368	\$474,552	\$329,023	\$493,534
\$16,629,600	\$19,874,400	\$17,294,784	\$20,669,376	\$17,986,575	\$21,496,151
\$2,600,000	\$3,120,000	\$2,704,000	\$3,244,800	\$2,812,160	\$3,374,592
\$540,800	\$946,400	\$562,432	\$984,256	\$584,929	\$1,023,626
\$650,000	\$910,000	\$676,000	\$946,400	\$703,040	\$984,256
\$97,500	\$110,500	\$101,400	\$114,920	\$105,456	\$119,517
\$50,437,439	\$64,366,510	\$52,454,937	\$66,941,170	\$54,553,134	\$69,618,817
or	or	or	or	or	or
\$55,169,439	\$70,450,510	\$57,376,217	\$73,268,530	\$59,671,265	\$76,199,272

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
\$8,282,935	\$11,294,911	\$8,614,252	\$11,746,708	\$8,958,822	\$12,216,576	\$9,317,175	\$12,705,239	\$9,689,862	\$13,213,449	\$10,077,457	\$13,741,987	\$10,480,555	\$14,291,666	\$10,899,777	\$14,863,333	\$11,335,768	\$15,457,866
\$182,059	\$242,746	\$189,342	\$252,455	\$196,915	\$262,554	\$204,792	\$273,056	\$212,984	\$283,978	\$221,503	\$295,337	\$230,363	\$307,151	\$239,578	\$319,437	\$249,161	\$332,214
\$2,110,132	\$2,391,483	\$2,194,538	\$2,487,143	\$2,282,319	\$2,586,628	\$2,373,612	\$2,690,094	\$2,468,556	\$2,797,697	\$2,567,299	\$2,909,605	\$2,669,991	\$3,025,989	\$2,776,790	\$3,147,029	\$2,887,862	\$3,272,910
\$38,020	\$53,229	\$39,541	\$55,358	\$41,123	\$57,572	\$42,768	\$59,875	\$44,478	\$62,270	\$46,258	\$64,761	\$48,108	\$67,351	\$50,032	\$70,045	\$52,034	\$72,847
\$10,613,147	\$13,982,369	\$11,037,673	\$14,541,664	\$11,479,180	\$15,123,330	\$11,938,347	\$15,728,263	\$12,415,881	\$16,357,394	\$12,912,516	\$17,011,690	\$13,429,017	\$17,629,157	\$13,966,177	\$18,399,844	\$14,524,824	\$19,135,837
\$4,600,469	\$5,436,918	\$4,784,488	\$5,654,394	\$4,975,867	\$5,880,570	\$5,174,902	\$6,115,793	\$5,381,898	\$6,360,425	\$5,597,174	\$6,614,842	\$5,821,061	\$6,879,435	\$6,053,903	\$7,154,613	\$6,296,059	\$7,440,797
\$627,337	\$741,398	\$652,430	\$771,054	\$678,527	\$801,896	\$705,668	\$833,972	\$733,895	\$867,331	\$763,251	\$902,024	\$793,781	\$938,105	\$825,532	\$975,629	\$858,554	\$1,014,654
\$1,254,673	\$1,482,796	\$1,304,860	\$1,542,108	\$1,357,055	\$1,603,792	\$1,411,337	\$1,667,944	\$1,467,790	\$1,734,661	\$1,526,502	\$1,804,048	\$1,587,562	\$1,876,210	\$1,651,064	\$1,951,258	\$1,717,107	\$2,029,308
\$237,628	\$356,441	\$247,133	\$370,699	\$257,018	\$385,527	\$267,299	\$400,948	\$277,991	\$416,986	\$289,110	\$433,665	\$300,675	\$451,012	\$312,702	\$469,052	\$325,210	\$487,815
\$6,720,106	\$8,017,553	\$6,988,911	\$8,338,255	\$7,268,467	\$8,671,785	\$7,559,206	\$9,018,656	\$7,861,574	\$9,379,402	\$8,176,037	\$9,754,579	\$8,503,078	\$10,144,762	\$8,843,201	\$10,550,552	\$9,196,929	\$10,972,574
\$380,204	\$608,326	\$395,412	\$632,660	\$411,229	\$657,966	\$427,678	\$684,285	\$444,785	\$711,656	\$462,576	\$740,122	\$481,079	\$769,727	\$500,323	\$800,516	\$520,335	\$832,537
\$1,083,581	\$1,733,730	\$1,126,925	\$1,803,080	\$1,172,002	\$1,875,203	\$1,218,882	\$1,950,211	\$1,267,637	\$2,028,219	\$1,318,343	\$2,109,348	\$1,371,076	\$2,193,722	\$1,425,919	\$2,281,471	\$1,482,956	\$2,372,730
\$893,479	\$1,429,567	\$929,219	\$1,486,750	\$966,387	\$1,546,220	\$1,005,043	\$1,608,069	\$1,045,245	\$1,672,391	\$1,087,054	\$1,739,287	\$1,130,537	\$1,808,859	\$1,175,758	\$1,881,213	\$1,222,788	\$1,956,461
\$228,122	\$364,996	\$237,247	\$379,596	\$246,737	\$394,780	\$256,607	\$410,571	\$266,871	\$426,994	\$277,546	\$444,073	\$288,648	\$461,836	\$300,194	\$480,310	\$312,201	\$499,522
\$2,585,387	\$4,136,620	\$2,688,803	\$4,302,085	\$2,796,355	\$4,474,168	\$2,908,209	\$4,653,135	\$3,024,538	\$4,839,260	\$3,145,519	\$5,032,831	\$3,271,340	\$5,234,144	\$3,402,193	\$5,443,510	\$3,538,281	\$5,661,250
\$5,474,938	\$5,817,122	\$5,693,936	\$6,049,807	\$5,921,693	\$6,291,799	\$6,158,561	\$6,543,471	\$6,404,903	\$6,805,210	\$6,661,099	\$7,077,418	\$6,927,543	\$7,360,515	\$7,204,645	\$7,654,935	\$7,492,831	\$7,961,133
\$2,281,224	\$3,802,040	\$2,372,473	\$3,954,122	\$2,467,372	\$4,112,287	\$2,566,067	\$4,276,778	\$2,668,710	\$4,447,849	\$2,775,458	\$4,625,763	\$2,886,476	\$4,810,794	\$3,001,935	\$5,003,226	\$3,122,013	\$5,203,355
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$7,604,081	\$10,645,713	\$7,908,244	\$11,071,541	\$8,224,574	\$11,514,403	\$8,553,557	\$11,974,979	\$8,895,699	\$12,453,978	\$9,251,527	\$12,952,137	\$9,621,588	\$13,470,223	\$10,006,451	\$14,009,032	\$10,406,709	\$14,569,393
\$38,020	\$68,437	\$39,541	\$71,174	\$41,123	\$74,021	\$42,768	\$76,982	\$44,478	\$80,061	\$46,258	\$83,264	\$48,108	\$86,594	\$50,032	\$90,058	\$52,034	\$93,660
\$1,463,786	\$1,882,010	\$1,522,337	\$1,957,290	\$1,583,230	\$2,035,582	\$1,646,560	\$2,117,005	\$1,712,422	\$2,201,685	\$1,780,919	\$2,289,753	\$1,852,156	\$2,381,343	\$1,926,242	\$2,476,597	\$2,003,292	\$2,575,661
\$9,257,968	\$11,569,609	\$9,628,287	\$12,032,393	\$10,013,418	\$12,513,689	\$10,413,955	\$13,014,236	\$10,830,513	\$13,534,806	\$11,263,734	\$14,076,198	\$11,714,283	\$14,639,246	\$12,182,855	\$15,224,816	\$12,670,169	\$15,833,808
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$14,580,825	\$18,413,281	\$15,164,058	\$19,149,813	\$15,770,620	\$19,915,805	\$16,401,445	\$20,712,437	\$17,057,503	\$21,540,935	\$17,739,803	\$22,402,572	\$18,449,395	\$23,298,675	\$19,187,370	\$24,230,622	\$19,954,865	\$25,199,847
\$1,437,171	\$2,053,102	\$1,494,658	\$2,135,226	\$1,554,444	\$2,220,635	\$1,616,622	\$2,309,460	\$1,681,287	\$2,401,839	\$1,748,539	\$2,497,912	\$1,818,480	\$2,597,829	\$1,891,219	\$2,701,742	\$1,966,868	\$2,809,812
\$1,437,171	\$2,053,102	\$1,494,658	\$2,135,226	\$1,554,444	\$2,220,635	\$1,616,622	\$2,309,460	\$1,681,287	\$2,401,839	\$1,748,539	\$2,497,912	\$1,818,480	\$2,597,829	\$1,891,219	\$2,701,742	\$1,966,868	\$2,809,812
\$2,737,469	\$4,106,204	\$2,846,968	\$4,270,452	\$2,960,847	\$4,441,270	\$3,079,280	\$4,618,921	\$3,202,452	\$4,803,677	\$3,330,550	\$4,995,824	\$3,463,772	\$5,195,657	\$3,602,322	\$5,403,484	\$3,746,415	\$5,619,623
\$342,184	\$513,275	\$355,871	\$533,806	\$370,106	\$555,159	\$384,910	\$577,365	\$400,306	\$600,460	\$416,319	\$624,478	\$432,971	\$649,457	\$450,290	\$675,435	\$468,302	\$702,453
\$18,706,038	\$22,355,997	\$19,454,280	\$23,250,237	\$20,232,451	\$24,180,246	\$21,041,749	\$25,147,456	\$21,883,419	\$26,153,355	\$22,758,756	\$27,199,489	\$23,669,106	\$28,287,468	\$24,615,870	\$29,418,967	\$25,600,505	\$30,595,726
\$2,924,646	\$3,509,576	\$3,041,632	\$3,649,959	\$3,163,298	\$3,795,957	\$3,289,829	\$3,947,795	\$3,421,423	\$4,105,707	\$3,558,280	\$4,269,935	\$3,700,611	\$4,440,733	\$3,848,635	\$4,618,362	\$4,002,581	\$4,803,097
\$608,326	\$1,064,571	\$632,660	\$1,107,154	\$657,966	\$1,151,440	\$684,285	\$1,197,498	\$711,656	\$1,245,398	\$740,122	\$1,295,214	\$769,727	\$1,347,022	\$800,516	\$1,400,903	\$832,537	\$1,456,939
\$731,162	\$1,023,626	\$760,408	\$1,064,571	\$790,824	\$1,107,154	\$822,457	\$1,151,440	\$855,356	\$1,197,498	\$889,570	\$1,245,398	\$925,153	\$1,295,214	\$962,159	\$1,347,022	\$1,000,645	\$1,400,903
\$109,674	\$124,297	\$114,061	\$129,269	\$118,624	\$134,440	\$123,369	\$139,818	\$128,303	\$145,410	\$133,435	\$151,227	\$138,773	\$157,276	\$144,324	\$163,567	\$150,097	\$170,110
\$56,735,259	\$72,403,570	\$59,004,670	\$75,299,713	\$61,364,857	\$78,311,701	\$63,819,451	\$81,444,169	\$66,372,229	\$84,701,936	\$69,027,118	\$88,090,013	\$71,788,203	\$91,613,614	\$74,659,731	\$95,278,159	\$77,646,120	\$99,089,285
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$62,058,116	\$79,247,242	\$64,540,440	\$82,417,132	\$67,122,058	\$85,713,817	\$69,806,940	\$89,142,370	\$72,599,218	\$92,708,065	\$75,503,187	\$96,416,388	\$78,523,314	\$100,273,043	\$81,664,247	\$104,283,965	\$84,930,817	\$108,455,323

ORDER-OF-MAGNITUDE COSTS: CAMPUS HOUSING

COSTS BEFORE ESCALATION								
Project	Approx. Area (GSF)	Construction cost/ GSF		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
		Low	High	Low	High		Low	High
ORCHARD GREEN RESIDENCE HALLS								
Orchard Green Residence Hall 1								
3 stories + basement, 100 to 110 beds	44,800	\$275	\$375	\$12,320,000	\$16,800,000	1.30	\$16,016,000	\$21,840,000
or				or	or		or	or
4 stories + basement, about 110-130 beds	52,000	\$275	\$375	\$14,300,000	\$19,500,000	1.30	\$18,590,000	\$25,350,000
Demolish Existing Parking Lot	35,000							
New Green	35,000	\$5	\$10	\$175,000	\$350,000	1.25	\$218,750	\$437,500
Stormwater management				\$25,000	\$100,000	1.25	\$31,250	\$125,000
New Parking Lot (about 100 cars)*	32,000	\$10	\$15	\$320,000	\$480,000	1.30	\$416,000	\$624,000
110 beds in 3 stories above grade				\$12,840,000	\$17,730,000		\$16,682,000	\$23,026,500
or				or	or		or	or
about 110 to 130 beds in 4 stories above grade				\$14,820,000	\$20,430,000		\$19,256,000	\$26,536,500
Orchard Green Residence Hall 2								
New Student Residence on Orchard Lot								
3 stories + basement, 100 to 110 beds	44,800	\$275	\$375	\$12,320,000	\$16,800,000	1.30	\$16,016,000	\$21,840,000
or				or	or		or	or
4 stories + basement, about 110-130 beds	52,000	\$275	\$375	\$14,300,000	\$19,500,000	1.30	\$18,590,000	\$25,350,000
Demolish Replacement Parking Lot	35,000							
Stormwater management				\$25,000	\$100,000	1.25	\$31,250	\$125,000
New Parking Lot west of Facilities (about 100 cars)*	32,000	\$10	\$15	\$320,000	\$480,000	1.30	\$416,000	\$624,000
110 beds in 3 stories above grade				\$12,665,000	\$17,380,000		\$16,463,250	\$22,589,000
or				or	or		or	or
about 110 to 130 beds in 4 stories above grade				\$14,645,000	\$20,080,000		\$19,037,250	\$26,099,000
*unless preceded by parking structure.								
FEATHERBED LANE RESIDENCE HALLS								
First Featherbed Residence Hall (Oakley?)								
3 stories + basement, 100 beds	41,000	\$275	\$375	\$11,275,000	\$15,375,000	1.30	\$14,657,500	\$19,987,500
or				or	or		or	or
4 (3-1/2) stories + basement, about 115 beds	46,700	\$275	\$375	\$12,842,500	\$17,512,500	1.30	\$16,695,250	\$22,766,250
Featherbed Lane (Shared Pedestrian Walkway)				\$500,000	\$525,000	1.20	\$600,000	\$761,250
Demolish Oakley?	2,100	\$15	\$20	\$31,500	\$42,000	1.30	\$40,950	\$54,600
Stormwater management				\$25,000	\$45,000	1.25	\$31,250	\$56,250
3 stories + basement, 100 beds				\$11,831,500	\$15,987,000		\$15,329,700	\$20,859,600
or				or	or		or	or
4 (3-1/2) stories + basement, about 115 beds				\$13,399,000	\$18,124,500		\$17,367,450	\$23,638,350
Each Additional Featherbed Residence Hall								
3 stories + basement, 100 beds	41,000	\$275	\$375	\$11,275,000	\$15,375,000	1.30	\$14,657,500	\$19,987,500
or				or	or		or	or
4 (3-1/2) stories + basement, about 115 beds	46,700	\$275	\$375	\$12,842,500	\$17,512,500	1.20	\$15,411,000	\$21,015,000
Stormwater management				\$25,000	\$45,000	1.25	\$31,250	\$56,250
3 stories + basement, 100 beds				\$11,300,000	\$15,420,000		\$14,688,750	\$20,043,750
or				or	or		or	or
4 (3-1/2) stories + basement, about 115 beds				\$12,867,500	\$17,557,500		\$15,442,250	\$21,071,250
Additional Residence Halls								
Beds needed to replace HCA (400 beds at 400 gsf/bed)	167,200	\$275	\$375	\$45,980,000	\$62,700,000	1.30	\$59,774,000	\$81,510,000
HCA Demolition - 21 buildings, including some sitework	222,894	\$15	\$18	\$3,343,410	\$4,012,092	1.25	\$4,179,263	\$5,015,115

PROJECT COSTS WITH 4% ANNUAL INFLATION					
Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
\$16,656,640	\$22,713,600	\$17,322,906	\$23,622,144	\$18,015,822	\$24,567,030
or	or	or	or	or	or
\$19,333,600	\$26,364,000	\$20,106,944	\$27,418,560	\$20,911,222	\$28,515,302
\$227,500	\$455,000	\$236,600	\$473,200	\$246,064	\$492,128
\$32,500	\$130,000	\$33,800	\$135,200	\$35,152	\$140,608
\$432,640	\$648,960	\$449,946	\$674,918	\$467,943	\$701,915
\$17,349,280	\$23,947,560	\$18,043,251	\$24,905,462	\$18,764,981	\$25,901,681
\$20,026,240	\$27,597,960	\$20,827,290	\$28,701,878	\$21,660,381	\$29,849,954
\$16,656,640	\$22,713,600	\$17,322,906	\$23,622,144	\$18,015,822	\$24,567,030
or	or	or	or	or	or
\$19,333,600	\$26,364,000	\$20,106,944	\$27,418,560	\$20,911,222	\$28,515,302
\$32,500	\$130,000	\$33,800	\$135,200	\$35,152	\$140,608
\$432,640	\$648,960	\$449,946	\$674,918	\$467,943	\$701,915
\$17,121,780	\$23,492,560	\$17,806,651	\$24,432,262	\$18,518,917	\$25,409,553
\$19,798,740	\$27,142,960	\$20,590,690	\$28,228,678	\$21,414,317	\$29,357,826
\$15,243,800	\$20,787,000	\$15,853,552	\$21,618,480	\$16,487,694	\$22,483,219
or	or	or	or	or	or
\$17,363,060	\$23,676,900	\$18,057,582	\$24,623,976	\$18,779,886	\$25,608,935
\$624,000	\$791,700	\$648,960	\$823,368	\$674,918	\$856,303
\$42,588	\$56,784	\$44,292	\$59,055	\$46,063	\$61,418
\$32,500	\$58,500	\$33,800	\$60,840	\$35,152	\$63,274
\$15,942,888	\$21,693,984	\$16,580,604	\$22,561,743	\$17,243,828	\$23,464,213
or	or	or	or	or	or
\$18,062,148	\$24,583,884	\$18,784,634	\$25,567,239	\$19,536,019	\$26,589,929
\$15,243,800	\$20,787,000	\$15,853,552	\$21,618,480	\$16,487,694	\$22,483,219
or	or	or	or	or	or
\$16,027,440	\$21,855,600	\$16,668,538	\$22,729,824	\$17,335,279	\$23,639,017
\$32,500	\$58,500	\$33,800	\$60,840	\$35,152	\$63,274
\$15,276,300	\$20,845,500	\$15,887,352	\$21,679,320	\$16,522,846	\$22,546,493
or	or	or	or	or	or
\$16,059,940	\$21,914,100	\$16,702,338	\$22,790,664	\$17,370,431	\$23,702,291
\$62,164,960	\$84,770,400	\$64,651,558	\$88,161,216	\$67,237,621	\$91,687,665
\$4,346,433	\$5,215,720	\$4,520,290	\$5,424,348	\$4,701,102	\$5,641,322

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
\$18,736,455	\$25,549,711	\$19,485,913	\$26,571,699	\$20,265,349	\$27,634,567	\$21,075,963	\$28,739,950	\$21,919,002	\$29,889,548	\$22,795,762	\$31,085,130	\$23,707,592	\$32,328,535	\$24,655,896	\$33,621,677	\$25,642,132	\$34,966,544
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$21,747,671	\$29,655,914	\$22,617,577	\$30,842,151	\$23,522,281	\$32,075,837	\$24,463,172	\$33,358,871	\$25,441,699	\$34,693,225	\$26,459,367	\$36,080,954	\$27,517,741	\$37,524,193	\$28,618,451	\$39,025,160	\$29,763,189	\$40,586,167
\$255,907	\$511,813	\$266,143	\$532,286	\$276,789	\$553,577	\$287,860	\$575,720	\$299,374	\$598,749	\$311,349	\$622,699	\$323,803	\$647,607	\$336,756	\$673,511	\$350,226	\$700,452
\$36,558	\$146,232	\$38,020	\$152,082	\$39,541	\$158,165	\$41,123	\$164,491	\$42,768	\$171,071	\$44,478	\$177,914	\$46,258	\$185,031	\$48,108	\$192,432	\$50,032	\$200,129
\$486,661	\$729,992	\$506,128	\$759,191	\$526,373	\$789,559	\$547,428	\$821,141	\$569,325	\$853,987	\$592,098	\$888,147	\$615,782	\$923,672	\$640,413	\$960,619	\$666,029	\$999,044
\$19,515,580	\$26,937,748	\$20,296,204	\$28,015,258	\$21,108,052	\$29,135,868	\$21,952,374	\$30,301,303	\$22,830,469	\$31,513,355	\$23,743,688	\$32,773,889	\$24,693,435	\$34,084,845	\$25,681,173	\$35,448,239	\$26,708,419	\$36,866,168
																	\$0
\$22,526,796	\$31,043,952	\$23,427,868	\$32,285,710	\$24,364,983	\$33,577,138	\$25,339,582	\$34,920,224	\$26,353,166	\$36,317,033	\$27,407,292	\$37,769,714	\$28,503,584	\$39,280,502	\$29,643,727	\$40,851,723	\$30,829,476	\$42,485,791
\$18,736,455	\$25,549,711	\$19,485,913	\$26,571,699	\$20,265,349	\$27,634,567	\$21,075,963	\$28,739,950	\$21,919,002	\$29,889,548	\$22,795,762	\$31,085,130	\$23,707,592	\$32,328,535	\$24,655,896	\$33,621,677	\$25,642,132	\$34,966,544
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$21,747,671	\$29,655,914	\$22,617,577	\$30,842,151	\$23,522,281	\$32,075,837	\$24,463,172	\$33,358,871	\$25,441,699	\$34,693,225	\$26,459,367	\$36,080,954	\$27,517,741	\$37,524,193	\$28,618,451	\$39,025,160	\$29,763,189	\$40,586,167
\$36,558	\$146,232	\$38,020	\$152,082	\$39,541	\$158,165	\$41,123	\$164,491	\$42,768	\$171,071	\$44,478	\$177,914	\$46,258	\$185,031	\$48,108	\$192,432	\$50,032	\$200,129
\$486,661	\$729,992	\$506,128	\$759,191	\$526,373	\$789,559	\$547,428	\$821,141	\$569,325	\$853,987	\$592,098	\$888,147	\$615,782	\$923,672	\$640,413	\$960,619	\$666,029	\$999,044
\$19,259,674	\$26,425,935	\$20,030,061	\$27,482,972	\$20,831,263	\$28,582,291	\$21,664,514	\$29,725,583	\$22,531,094	\$30,914,606	\$23,432,338	\$32,151,191	\$24,369,632	\$33,437,238	\$25,344,417	\$34,774,728	\$26,358,194	\$36,165,717
\$22,270,890	\$30,532,139	\$23,161,725	\$31,753,424	\$24,088,194	\$33,023,561	\$25,051,722	\$34,344,504	\$26,053,791	\$35,718,284	\$27,095,943	\$37,147,015	\$28,179,781	\$38,632,896	\$29,306,972	\$40,178,211	\$30,479,251	\$41,785,340
\$17,147,202	\$23,382,548	\$17,833,090	\$24,317,850	\$18,546,414	\$25,290,564	\$19,288,270	\$26,302,186	\$20,059,801	\$27,354,274	\$20,862,193	\$28,448,445	\$21,696,681	\$29,586,383	\$22,564,548	\$30,769,838	\$23,467,130	\$32,000,631
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$19,531,081	\$26,633,292	\$20,312,324	\$27,698,624	\$21,124,817	\$28,806,569	\$21,969,810	\$29,958,832	\$22,848,602	\$31,157,185	\$23,762,547	\$32,403,473	\$24,713,048	\$33,699,611	\$25,701,570	\$35,047,596	\$26,729,633	\$36,449,500
\$701,915	\$890,555	\$729,992	\$926,177	\$759,191	\$963,224	\$789,559	\$1,001,753	\$821,141	\$1,041,823	\$853,987	\$1,083,496	\$888,147	\$1,126,836	\$923,672	\$1,171,909	\$960,619	\$1,218,786
\$47,906	\$63,874	\$49,822	\$66,429	\$51,815	\$69,086	\$53,887	\$71,850	\$56,043	\$74,724	\$58,285	\$77,713	\$60,616	\$80,821	\$63,041	\$84,054	\$65,562	\$87,416
\$36,558	\$65,805	\$38,020	\$68,437	\$39,541	\$71,174	\$41,123	\$74,021	\$42,768	\$76,982	\$44,478	\$80,061	\$46,258	\$83,264	\$48,108	\$86,594	\$50,032	\$90,058
\$17,933,581	\$24,402,782	\$18,650,924	\$25,378,893	\$19,396,961	\$26,394,049	\$20,172,839	\$27,449,811	\$20,979,753	\$28,547,803	\$21,818,943	\$29,689,715	\$22,691,701	\$30,877,304	\$23,599,369	\$32,112,396	\$24,543,344	\$33,396,892
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$20,317,460	\$27,653,526	\$21,130,158	\$28,759,667	\$21,975,365	\$29,910,054	\$22,854,379	\$31,106,456	\$23,768,555	\$32,350,714	\$24,719,297	\$33,644,743	\$25,708,069	\$34,990,532	\$26,736,391	\$36,390,154	\$27,805,847	\$37,845,760
\$17,147,202	\$23,382,548	\$17,833,090	\$24,317,850	\$18,546,414	\$25,290,564	\$19,288,270	\$26,302,186	\$20,059,801	\$27,354,274	\$20,862,193	\$28,448,445	\$21,696,681	\$29,586,383	\$22,564,548	\$30,769,838	\$23,467,130	\$32,000,631
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$18,028,690	\$24,584,578	\$18,749,838	\$25,567,961	\$19,499,831	\$26,590,679	\$20,279,825	\$27,654,306	\$21,091,018	\$28,760,479	\$21,934,658	\$29,910,898	\$22,812,045	\$31,107,334	\$23,724,526	\$32,351,627	\$24,673,508	\$33,645,692
\$36,558	\$65,805	\$38,020	\$68,437	\$39,541	\$71,174	\$41,123	\$74,021	\$42,768	\$76,982	\$44,478	\$80,061	\$46,258	\$83,264	\$48,108	\$86,594	\$50,032	\$90,058
\$17,183,760	\$23,448,353	\$17,871,110	\$24,386,287	\$18,585,955	\$25,361,738	\$19,329,393	\$26,376,208	\$20,102,569	\$27,431,256	\$20,906,671	\$28,528,506	\$21,742,938	\$29,669,646	\$22,612,656	\$30,856,432	\$23,517,162	\$32,090,690
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$18,065,248	\$24,650,382	\$18,787,858	\$25,636,397	\$19,539,373	\$26,661,853	\$20,320,948	\$27,728,328	\$21,133,785	\$28,837,461	\$21,979,137	\$29,990,959	\$22,858,302	\$31,190,597	\$23,772,634	\$32,438,221	\$24,723,540	\$33,735,750
\$69,927,126	\$95,355,171	\$72,724,211	\$99,169,378	\$75,633,179	\$103,136,153	\$78,658,506	\$107,261,599	\$81,804,846	\$111,552,063	\$85,077,040	\$116,014,146	\$88,480,122	\$120,654,712	\$92,019,327	\$125,480,900	\$95,700,100	\$130,500,136
\$4,889,146	\$5,866,975	\$5,084,712	\$6,101,654	\$5,288,100	\$6,345,720	\$5,499,624	\$6,599,549	\$5,719,609	\$6,863,531	\$5,948,394	\$7,138,072	\$6,186,329	\$7,423,595	\$6,433,783	\$7,720,539	\$6,691,134	\$8,029,361

ORDER-OF-MAGNITUDE COSTS: CAMPUS HOUSING - CON'T

COSTS BEFORE ESCALATION								
Project	Approx. Area (GSF)	Construction cost/ GSF		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
		Low	High	Low	High		Low	High
FACULTY HOUSING								
Renovation of 8-10 Old Railroad	20,290	\$175	\$250	\$3,550,750	\$5,072,500	1.30	\$4,615,975	\$6,594,250
New construction at 8-10 Old Railroad (about 10 1300 sf units)	13,450	\$300	\$400	\$4,035,000	\$5,380,000	1.30	\$5,245,500	\$6,994,000
New construction behind College Lane (about 15 1300 sf units)	20,000	\$300	\$400	\$6,000,000	\$8,000,000	1.30	\$7,800,000	\$10,400,000

PROJECT COSTS WITH 4% ANNUAL INFLATION					
Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
\$4,800,614	\$6,858,020	\$4,992,639	\$7,132,341	\$5,192,344	\$7,417,634
\$5,455,320	\$7,273,760	\$5,673,533	\$7,564,710	\$5,900,474	\$7,867,299
\$8,112,000	\$10,816,000	\$8,436,480	\$11,248,640	\$8,773,939	\$11,698,586

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
\$5,400,038	\$7,714,340	\$5,616,039	\$8,022,913	\$5,840,681	\$8,343,830	\$6,074,308	\$8,677,583	\$6,317,281	\$9,024,686	\$6,569,972	\$9,385,674	\$6,832,771	\$9,761,101	\$7,106,081	\$10,151,545	\$7,390,325	\$10,557,607
\$6,136,493	\$8,181,991	\$6,381,953	\$8,509,270	\$6,637,231	\$8,849,641	\$6,902,720	\$9,203,627	\$7,178,829	\$9,571,772	\$7,465,982	\$9,954,643	\$7,764,621	\$10,352,829	\$8,075,206	\$10,766,942	\$8,398,215	\$11,197,619
\$9,124,897	\$12,166,529	\$9,489,893	\$12,653,190	\$9,869,488	\$13,159,318	\$10,264,268	\$13,685,691	\$10,674,839	\$14,233,118	\$11,101,832	\$14,802,443	\$11,545,905	\$15,394,541	\$12,007,742	\$16,010,322	\$12,488,051	\$16,650,735

POTENTIAL CAPITAL PROJECTS TO BE PRIORITIZED AND COMPLETED AS FUNDS BECOME AVAILABLE

LATE 2008 COSTS NOT INCLUDING ESCALATION

Project	Approx. Area (GSF, u.o.n.)	Construction cost/ GSF (u.o.n)		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
		Low	High	Low	High		Low	High
LIBRARY OPTIONS								
Options assume library of about 105,000 GSF.								
Site capacities vary, and program assumptions require confirmation.								
See full report for pros and cons of sites under consideration.								
Magill Renovation and Addition								
Renovation	86,700	\$300	\$375	\$26,010,000	\$32,512,500	1.30	\$33,813,000	\$42,266,250
New Construction	19,000	\$375	\$425	\$7,125,000	\$8,075,000	1.30	\$9,262,500	\$10,497,500
Temporary Library (if Library occurs before new Field House)	20,000	\$120	\$140	\$2,400,000	\$2,800,000	1.20	\$2,880,000	\$3,360,000
Temporary Parking (assuming temp library on parking lot)	30,000	\$5	\$10	\$150,000	\$300,000	1.20	\$180,000	\$360,000
Move to temporary library*								
150,000 volumes				\$75,000	\$75,000	1.05	\$78,750	\$78,750
Move 375 double-sided shelving units				\$22,500	\$22,500	1.05	\$23,625	\$23,625
Off-site storage (non-paged; paged would be higher)*								
Box 300,000 volumes				\$24,999	\$24,999	1.05	\$26,249	\$26,249
Move to off-site storage				\$150,000	\$150,000	1.05	\$157,500	\$157,500
Off-site storage rental	24 months			\$180,000	\$180,000	1.05	\$189,000	\$189,000
Move to completed library - 450,000 volumes*				\$225,000	\$225,000	1.05	\$236,250	\$236,250
Magill Renovation and Addition				\$36,362,499	\$44,364,999		\$46,846,874	\$57,195,124
Magill On-site Replacement								
Demolition	66,350	\$12	\$15	\$796,200	\$995,250	1.30	\$1,035,060	\$1,293,825
Renovation of Historic Building	21,250	\$300	\$375	\$6,375,000	\$7,968,750	1.30	\$8,287,500	\$10,359,375
New Construction	85,000	\$375	\$425	\$31,875,000	\$36,125,000	1.30	\$41,437,500	\$46,962,500
Temporary Library (if Library occurs before new Field House)	20,000	\$120	\$140	\$2,400,000	\$2,800,000	1.20	\$2,880,000	\$3,360,000
Temporary Parking (assuming temp library on parking lot)	30,000	\$5	\$10	\$150,000	\$300,000	1.20	\$180,000	\$360,000
Move to temporary library*								
150,000 volumes				\$75,000	\$75,000	1.05	\$78,750	\$78,750
Move 375 double-sided shelving units				\$22,500	\$22,500	1.05	\$23,625	\$23,625
Off-site storage (non-paged; paged would be higher)*								
Box 300,000 volumes				\$24,999	\$24,999	1.05	\$26,249	\$26,249
Move to off-site storage				\$150,000	\$150,000	1.00	\$150,000	\$150,000
Off-site storage rental	24 months			\$180,000	\$180,000	1.00	\$180,000	\$180,000
Move to completed library - 450,000 volumes*				\$225,000	\$225,000	1.05	\$236,250	\$236,250
Magill On-site Replacement				\$42,273,699	\$48,866,499		\$54,514,934	\$63,030,574
Replacement Library on New Site								
(assumes Field House Relocation)								
Construction	105,000	\$300	\$375	\$31,500,000	\$39,375,000	1.30	\$40,950,000	\$51,187,500
Moving costs (450,000 volumes in one move)*				\$225,000	\$225,000	1.05	\$236,250	\$236,250
Replacement Library on New Site				\$31,725,000	\$39,600,000		\$41,186,250	\$51,423,750

PROJECT COSTS WITH 4% ANNUAL INFLATION

Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
\$35,165,520	\$43,956,900	\$36,572,141	\$45,715,176	\$38,035,026	\$47,543,783
\$9,633,000	\$10,917,400	\$10,018,320	\$11,354,096	\$10,419,053	\$11,808,260
\$2,995,200	\$3,494,400	\$3,115,008	\$3,634,176	\$3,239,608	\$3,779,543
\$187,200	\$374,400	\$194,688	\$389,376	\$202,476	\$404,951
\$81,900	\$81,900	\$85,176	\$85,176	\$88,583	\$88,583
\$24,570	\$24,570	\$25,553	\$25,553	\$26,575	\$26,575
\$27,299	\$27,299	\$28,391	\$28,391	\$29,526	\$29,526
\$163,800	\$163,800	\$170,352	\$170,352	\$177,166	\$177,166
\$196,560	\$196,560	\$204,422	\$204,422	\$212,599	\$212,599
\$245,700	\$245,700	\$255,528	\$255,528	\$265,749	\$265,749
\$48,720,749	\$59,482,929	\$50,669,579	\$61,862,246	\$52,696,362	\$64,336,736
\$1,076,462	\$1,345,578	\$1,119,521	\$1,399,401	\$1,164,302	\$1,455,377
\$8,619,000	\$10,773,750	\$8,963,760	\$11,204,700	\$9,322,310	\$11,652,888
\$43,095,000	\$48,841,000	\$44,818,800	\$50,794,640	\$46,611,552	\$52,826,426
\$2,995,200	\$3,494,400	\$3,115,008	\$3,634,176	\$3,239,608	\$3,779,543
\$187,200	\$374,400	\$194,688	\$389,376	\$202,476	\$404,951
\$0	\$0	\$0	\$0	\$0	\$0
\$81,900	\$81,900	\$85,176	\$85,176	\$88,583	\$88,583
\$24,570	\$24,570	\$25,553	\$25,553	\$26,575	\$26,575
\$27,299	\$27,299	\$28,391	\$28,391	\$29,526	\$29,526
\$156,000	\$156,000	\$162,240	\$162,240	\$168,730	\$168,730
\$187,200	\$187,200	\$194,688	\$194,688	\$202,476	\$202,476
\$245,700	\$245,700	\$255,528	\$255,528	\$265,749	\$265,749
\$56,695,531	\$65,551,797	\$58,963,353	\$68,173,869	\$61,321,887	\$70,900,824
\$42,588,000	\$53,235,000	\$44,291,520	\$55,364,400	\$46,063,181	\$57,578,976
\$245,700	\$245,700	\$255,528	\$255,528	\$265,749	\$265,749
\$42,833,700	\$53,480,700	\$44,547,048	\$55,619,928	\$46,328,930	\$57,844,725

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
\$39,556,427	\$49,445,534	\$41,138,685	\$51,423,356	\$42,784,232	\$53,480,290	\$44,495,601	\$55,619,502	\$46,275,425	\$57,844,282	\$48,126,442	\$60,158,053	\$50,051,500	\$62,564,375	\$52,053,560	\$65,066,950	\$54,135,702	\$67,669,628
\$10,835,815	\$12,280,590	\$11,269,248	\$12,771,814	\$11,720,017	\$13,282,686	\$12,188,818	\$13,813,994	\$12,676,371	\$14,366,554	\$13,183,426	\$14,941,216	\$13,710,763	\$15,538,864	\$14,259,193	\$16,160,419	\$14,829,561	\$16,806,836
\$3,369,193	\$3,930,725	\$3,503,960	\$4,087,954	\$3,644,119	\$4,251,472	\$3,789,884	\$4,421,531	\$3,941,479	\$4,598,392	\$4,099,138	\$4,782,328	\$4,263,104	\$4,973,621	\$4,433,628	\$5,172,566	\$4,610,973	\$5,379,468
\$210,575	\$421,149	\$218,998	\$437,995	\$227,757	\$455,515	\$236,868	\$473,735	\$246,342	\$492,685	\$256,196	\$512,392	\$266,444	\$532,888	\$277,102	\$554,203	\$288,186	\$576,372
\$92,126	\$92,126	\$95,811	\$95,811	\$99,644	\$99,644	\$103,630	\$103,630	\$107,775	\$107,775	\$112,086	\$112,086	\$116,569	\$116,569	\$121,232	\$121,232	\$126,081	\$126,081
\$27,638	\$27,638	\$28,743	\$28,743	\$29,893	\$29,893	\$31,089	\$31,089	\$32,332	\$32,332	\$33,626	\$33,626	\$34,971	\$34,971	\$36,370	\$36,370	\$37,824	\$37,824
\$30,708	\$30,708	\$31,936	\$31,936	\$33,213	\$33,213	\$34,542	\$34,542	\$35,924	\$35,924	\$37,360	\$37,360	\$38,855	\$38,855	\$40,409	\$40,409	\$42,025	\$42,025
\$184,253	\$184,253	\$191,623	\$191,623	\$199,288	\$199,288	\$207,259	\$207,259	\$215,550	\$215,550	\$224,172	\$224,172	\$233,138	\$233,138	\$242,464	\$242,464	\$252,163	\$252,163
\$221,103	\$221,103	\$229,947	\$229,947	\$239,145	\$239,145	\$248,711	\$248,711	\$258,660	\$258,660	\$269,006	\$269,006	\$279,766	\$279,766	\$290,957	\$290,957	\$302,595	\$302,595
\$276,379	\$276,379	\$287,434	\$287,434	\$298,932	\$298,932	\$310,889	\$310,889	\$323,324	\$323,324	\$336,257	\$336,257	\$349,708	\$349,708	\$363,696	\$363,696	\$378,244	\$378,244
\$54,804,216	\$66,910,205	\$56,996,385	\$69,586,614	\$59,276,241	\$72,370,078	\$61,647,290	\$75,264,881	\$64,113,182	\$78,275,476	\$66,677,709	\$81,406,496	\$69,344,817	\$84,662,755	\$72,118,610	\$88,049,266	\$75,003,355	\$91,571,236
\$1,210,874	\$1,513,592	\$1,259,309	\$1,574,136	\$1,309,681	\$1,637,101	\$1,362,068	\$1,702,585	\$1,416,551	\$1,770,689	\$1,473,213	\$1,841,516	\$1,532,142	\$1,915,177	\$1,593,427	\$1,991,784	\$1,657,164	\$2,071,456
\$9,695,203	\$12,119,004	\$10,083,011	\$12,603,764	\$10,486,331	\$13,107,914	\$10,905,785	\$13,632,231	\$11,342,016	\$14,177,520	\$11,795,697	\$14,744,621	\$12,267,525	\$15,334,406	\$12,758,225	\$15,947,782	\$13,268,555	\$16,585,693
\$48,476,014	\$54,939,483	\$50,415,055	\$57,137,062	\$52,431,657	\$59,422,544	\$54,528,923	\$61,799,446	\$56,710,080	\$64,271,424	\$58,978,483	\$66,842,281	\$61,337,623	\$69,515,972	\$63,791,127	\$72,296,611	\$66,342,773	\$75,188,476
\$3,369,193	\$3,930,725	\$3,503,960	\$4,087,954	\$3,644,119	\$4,251,472	\$3,789,884	\$4,421,531	\$3,941,479	\$4,598,392	\$4,099,138	\$4,782,328	\$4,263,104	\$4,973,621	\$4,433,628	\$5,172,566	\$4,610,973	\$5,379,468
\$210,575	\$421,149	\$218,998	\$437,995	\$227,757	\$455,515	\$236,868	\$473,735	\$246,342	\$492,685	\$256,196	\$512,392	\$266,444	\$532,888	\$277,102	\$554,203	\$288,186	\$576,372
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
\$92,126	\$92,126	\$95,811	\$95,811	\$99,644	\$99,644	\$103,630	\$103,630	\$107,775	\$107,775	\$112,086	\$112,086	\$116,569	\$116,569	\$121,232	\$121,232	\$126,081	\$126,081
\$27,638	\$27,638	\$28,743	\$28,743	\$29,893	\$29,893	\$31,089	\$31,089	\$32,332	\$32,332	\$33,626	\$33,626	\$34,971	\$34,971	\$36,370	\$36,370	\$37,824	\$37,824
\$30,708	\$30,708	\$31,936	\$31,936	\$33,213	\$33,213	\$34,542	\$34,542	\$35,924	\$35,924	\$37,360	\$37,360	\$38,855	\$38,855	\$40,409	\$40,409	\$42,025	\$42,025
\$175,479	\$175,479	\$182,498	\$182,498	\$189,798	\$189,798	\$197,390	\$197,390	\$205,285	\$205,285	\$213,497	\$213,497	\$222,037	\$222,037	\$230,918	\$230,918	\$240,155	\$240,155
\$210,575	\$210,575	\$218,998	\$218,998	\$227,757	\$227,757	\$236,868	\$236,868	\$246,342	\$246,342	\$256,196	\$256,196	\$266,444	\$266,444	\$277,102	\$277,102	\$288,186	\$288,186
\$276,379	\$276,379	\$287,434	\$287,434	\$298,932	\$298,932	\$310,889	\$310,889	\$323,324	\$323,324	\$336,257	\$336,257	\$349,708	\$349,708	\$363,696	\$363,696	\$378,244	\$378,244
\$63,774,762	\$73,736,856	\$66,325,753	\$76,686,331	\$68,978,783	\$79,753,784	\$71,737,934	\$82,943,935	\$74,607,451	\$86,261,693	\$77,591,749	\$89,712,160	\$80,695,419	\$93,300,647	\$83,923,236	\$97,032,673	\$87,280,166	\$100,913,980
\$47,905,708	\$59,882,135	\$49,821,936	\$62,277,420	\$51,814,814	\$64,768,517	\$53,887,406	\$67,359,258	\$56,042,903	\$70,053,628	\$58,284,619	\$72,855,773	\$60,616,003	\$75,770,004	\$63,040,644	\$78,800,805	\$65,562,269	\$81,952,837
\$276,379	\$276,379	\$287,434	\$287,434	\$298,932	\$298,932	\$310,889	\$310,889	\$323,324	\$323,324	\$336,257	\$336,257	\$349,708	\$349,708	\$363,696	\$363,696	\$378,244	\$378,244
\$48,182,087	\$60,158,514	\$50,109,371	\$62,564,855	\$52,113,745	\$65,067,449	\$54,198,295	\$67,670,147	\$56,366,227	\$70,376,953	\$58,620,876	\$73,192,031	\$60,965,711	\$76,119,712	\$63,404,340	\$79,164,501	\$65,940,513	\$82,331,081

POTENTIAL CAPITAL PROJECTS TO BE PRIORITIZED AND COMPLETED AS FUNDS BECOME AVAILABLE - CON'T

LATE 2008 COSTS NOT INCLUDING ESCALATION

Project		Approx. Area (GSF, u.o.n.)	Construction cost/ GSF (u.o.n)		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
			Low	High	Low	High		Low	High
LIBRARY OPTIONS (CON'T)									
	Replacement Library at Ryan								
	Ryan Gym - Renovation	19,805	\$275	\$375	\$5,446,375	\$7,426,875	1.30	\$7,080,288	\$9,654,938
	Demolish Link and Squash Courts	8,300	\$15	\$20	\$124,500	\$166,000	1.25	\$155,625	\$207,500
	Additional Space (within Ryan envelope)	3,700	\$375	\$425	\$1,387,500	\$1,572,500	1.30	\$1,803,750	\$2,044,250
	Subtotal, Within Ryan envelope				\$6,958,375	\$9,165,375		\$9,039,663	\$11,906,688
	Addition	85,000	\$300	\$375	\$25,500,000	\$31,875,000	1.30	\$33,150,000	\$41,437,500
	Stormwater Management				\$50,000	\$75,000	1.30	\$65,000	\$97,500
	Moving costs - 450,000 volumes*				\$225,000	\$225,000	1.05	\$236,250	\$236,250
	Subtotal, Addition				\$25,775,000	\$32,175,000		\$33,386,250	\$41,673,750
	Replacement Library at Ryan, Existing and New				\$32,733,375	\$41,340,375		\$42,425,913	\$53,580,438
*Moving and storage unit cost information from Overton & Associates.									
RENOVATIONS AND ADDITIONS IN AND AROUND ROBERTS									
	Roberts - Complete Renovation	30,837	\$325	\$400	\$10,022,025	\$12,334,800	1.30	\$13,028,633	\$16,035,240
	or				or	or		or	or
	Roberts - Minor Improvements only				\$1,500,000	\$2,000,000	1.30	\$1,950,000	\$2,600,000
	Union - Complete Renovation	11,000	\$275	\$375	\$3,025,000	\$4,125,000	1.30	\$3,932,500	\$5,362,500
	Addition to Roberts - Music	28,000	\$450	\$550	\$12,600,000	\$15,400,000	1.30	\$16,380,000	\$20,020,000
	Addition to Roberts - Dance and Theater Rehearsal (optional)	3,700	\$350	\$400	\$1,295,000	\$1,480,000	1.30	\$1,683,500	\$1,924,000
	Stormwater Management (including area)				\$100,000	\$300,000	1.25	\$125,000	\$375,000
	complete renovation of Roberts; music/dance/theater rehearsal in addition including Union				\$27,042,025	\$33,639,800		\$35,149,633	\$43,716,740
	or				or	or		or	or
	with minor renovation of Roberts; no dance/theater rehearsal; including Union				\$17,225,000	\$21,825,000		\$22,387,500	\$28,357,500
NEW THEATER AND DANCE COMPLEX ON SOUTH LOT									
	Theater and Dance	42,650	\$450	\$550	\$19,192,500	\$23,457,500	1.30	\$24,950,250	\$30,494,750
	(program and size to be verified)								
	Stormwater Management				\$300,000	\$400,000	1.25	\$375,000	\$500,000
	Theater and Dance only				\$19,492,500	\$23,857,500		\$25,325,250	\$30,994,750
	Music Department (alternative to Roberts Addition)	28,000	\$450	\$550	\$12,600,000	\$15,400,000	1.30	\$16,380,000	\$20,020,000
	Theater, Dance and Music (total, excluding parking)	70,650			\$32,092,500	\$39,257,500		\$41,705,250	\$51,014,750

PROJECT COSTS WITH 4% ANNUAL INFLATION

Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
\$7,363,499	\$10,041,135	\$7,658,039	\$10,442,780	\$7,964,361	\$10,860,492
\$161,850	\$215,800	\$168,324	\$224,432	\$175,057	\$233,409
\$1,875,900	\$2,126,020	\$1,950,936	\$2,211,061	\$2,028,973	\$2,299,503
\$9,401,249	\$12,382,955	\$9,777,299	\$12,878,273	\$10,168,391	\$13,393,404
\$34,476,000	\$43,095,000	\$35,855,040	\$44,818,800	\$37,289,242	\$46,611,552
\$67,600	\$101,400	\$70,304	\$105,456	\$73,116	\$109,674
\$245,700	\$245,700	\$255,528	\$255,528	\$265,749	\$265,749
\$34,721,700	\$43,340,700	\$36,110,568	\$45,074,328	\$37,554,991	\$46,877,301
\$44,122,949	\$55,723,655	\$45,887,867	\$57,952,601	\$47,723,382	\$60,270,705
\$13,549,778	\$16,676,650	\$14,091,769	\$17,343,716	\$14,655,440	\$18,037,464
<i>or</i>	<i>or</i>	<i>or</i>	<i>or</i>	<i>or</i>	<i>or</i>
\$2,028,000	\$2,704,000	\$2,109,120	\$2,812,160	\$2,193,485	\$2,924,646
\$4,089,800	\$5,577,000	\$4,253,392	\$5,800,080	\$4,423,528	\$6,032,083
\$17,035,200	\$20,820,800	\$17,716,608	\$21,653,632	\$18,425,272	\$22,519,777
\$1,750,840	\$2,000,960	\$1,820,874	\$2,080,998	\$1,893,709	\$2,164,238
\$130,000	\$390,000	\$135,200	\$405,600	\$140,608	\$421,824
\$36,555,618	\$45,465,410	\$38,017,843	\$47,284,026	\$39,538,556	\$49,175,387
\$23,283,000	\$29,491,800	\$24,214,320	\$30,671,472	\$25,182,893	\$31,898,331
\$25,948,260	\$31,714,540	\$26,986,190	\$32,983,122	\$28,065,638	\$34,302,446
\$390,000	\$520,000	\$405,600	\$540,800	\$421,824	\$562,432
\$26,338,260	\$32,234,540	\$27,391,790	\$33,523,922	\$28,487,462	\$34,864,878
\$17,035,200	\$20,820,800	\$17,716,608	\$21,653,632	\$18,425,272	\$22,519,777
\$43,373,460	\$53,055,340	\$45,108,398	\$55,177,554	\$46,912,734	\$57,384,656

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
\$8,282,935	\$11,294,911	\$8,614,252	\$11,746,708	\$8,958,822	\$12,216,576	\$9,317,175	\$12,705,239	\$9,689,862	\$13,213,449	\$10,077,457	\$13,741,987	\$10,480,555	\$14,291,666	\$10,899,777	\$14,863,333	\$11,335,768	\$15,457,866
\$182,059	\$242,746	\$189,342	\$252,455	\$196,915	\$262,554	\$204,792	\$273,056	\$212,984	\$283,978	\$221,503	\$295,337	\$230,363	\$307,151	\$239,578	\$319,437	\$249,161	\$332,214
\$2,110,132	\$2,391,483	\$2,194,538	\$2,487,143	\$2,282,319	\$2,586,628	\$2,373,612	\$2,690,094	\$2,468,556	\$2,797,697	\$2,567,299	\$2,909,605	\$2,669,991	\$3,025,989	\$2,776,790	\$3,147,029	\$2,887,862	\$3,272,910
\$10,575,127	\$13,929,140	\$10,998,132	\$14,486,306	\$11,438,057	\$15,065,758	\$11,895,579	\$15,668,388	\$12,371,402	\$16,295,124	\$12,866,258	\$16,946,929	\$13,380,909	\$17,624,806	\$13,916,145	\$18,329,798	\$14,472,791	\$19,062,990
\$38,780,811	\$48,476,014	\$40,332,044	\$50,415,055	\$41,945,325	\$52,431,657	\$43,623,138	\$54,528,923	\$45,368,064	\$56,710,080	\$47,182,787	\$58,978,483	\$49,070,098	\$61,337,623	\$51,032,902	\$63,791,127	\$53,074,218	\$66,342,773
\$76,041	\$114,061	\$79,082	\$118,624	\$82,246	\$123,369	\$85,536	\$128,303	\$88,957	\$133,435	\$92,515	\$138,773	\$96,216	\$144,324	\$100,065	\$150,097	\$104,067	\$156,101
\$276,379	\$276,379	\$287,434	\$287,434	\$298,932	\$298,932	\$310,889	\$310,889	\$323,324	\$323,324	\$336,257	\$336,257	\$349,708	\$349,708	\$363,696	\$363,696	\$378,244	\$378,244
\$39,057,190	\$48,752,393	\$40,619,478	\$50,702,489	\$42,244,257	\$52,730,588	\$43,934,027	\$54,839,812	\$45,691,388	\$57,033,404	\$47,519,044	\$59,314,741	\$49,419,806	\$61,687,330	\$51,396,598	\$64,154,823	\$53,452,462	\$66,721,016
\$49,632,317	\$62,681,533	\$51,617,610	\$65,188,795	\$53,682,314	\$67,796,347	\$55,829,607	\$70,508,200	\$58,062,791	\$73,328,528	\$60,385,302	\$76,261,670	\$62,800,715	\$79,312,136	\$65,312,743	\$82,484,622	\$67,925,253	\$85,784,007
\$15,241,657	\$18,758,963	\$15,851,324	\$19,509,321	\$16,485,376	\$20,289,694	\$17,144,792	\$21,101,282	\$17,830,583	\$21,945,333	\$18,543,807	\$22,823,147	\$19,285,559	\$23,736,072	\$20,056,981	\$24,685,515	\$20,859,260	\$25,672,936
or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
\$2,281,224	\$3,041,632	\$2,372,473	\$3,163,298	\$2,467,372	\$3,289,829	\$2,566,067	\$3,421,423	\$2,668,710	\$3,558,280	\$2,775,458	\$3,700,611	\$2,886,476	\$3,848,635	\$3,001,935	\$4,002,581	\$3,122,013	\$4,162,684
\$4,600,469	\$6,273,367	\$4,784,488	\$6,524,301	\$4,975,867	\$6,785,273	\$5,174,902	\$7,056,684	\$5,381,898	\$7,338,952	\$5,597,174	\$7,632,510	\$5,821,061	\$7,937,810	\$6,053,903	\$8,255,322	\$6,296,059	\$8,585,535
\$19,162,283	\$23,420,568	\$19,928,775	\$24,357,391	\$20,725,926	\$25,331,687	\$21,554,963	\$26,344,954	\$22,417,161	\$27,398,752	\$23,313,847	\$28,494,702	\$24,246,401	\$29,634,491	\$25,216,257	\$30,819,870	\$26,224,908	\$32,052,665
\$1,969,457	\$2,250,808	\$2,048,235	\$2,340,840	\$2,130,165	\$2,434,474	\$2,215,371	\$2,531,853	\$2,303,986	\$2,633,127	\$2,396,145	\$2,738,452	\$2,491,991	\$2,847,990	\$2,591,671	\$2,961,910	\$2,695,338	\$3,080,386
\$146,232	\$438,697	\$152,082	\$456,245	\$158,165	\$474,495	\$164,491	\$493,474	\$171,071	\$513,213	\$177,914	\$533,742	\$185,031	\$555,092	\$192,432	\$577,295	\$200,129	\$600,387
\$41,120,098	\$51,142,403	\$42,764,902	\$53,188,099	\$44,475,498	\$55,315,623	\$46,254,518	\$57,528,247	\$48,104,699	\$59,829,377	\$50,028,887	\$62,222,552	\$52,030,043	\$64,711,455	\$54,111,244	\$67,299,913	\$56,275,694	\$69,991,909
\$26,190,209	\$33,174,264	\$27,237,817	\$34,501,235	\$28,327,330	\$35,881,284	\$29,460,423	\$37,316,535	\$30,638,840	\$38,809,197	\$31,864,393	\$40,361,565	\$33,138,969	\$41,976,027	\$34,464,528	\$43,655,068	\$35,843,109	\$45,401,271
\$29,188,264	\$35,674,544	\$30,355,794	\$37,101,526	\$31,570,026	\$38,585,587	\$32,832,827	\$40,129,011	\$34,146,140	\$41,734,171	\$35,511,986	\$43,403,538	\$36,932,465	\$45,139,679	\$38,409,764	\$46,945,267	\$39,946,154	\$48,823,077
\$438,697	\$584,929	\$456,245	\$608,326	\$474,495	\$632,660	\$493,474	\$657,966	\$513,213	\$684,285	\$533,742	\$711,656	\$555,092	\$740,122	\$577,295	\$769,727	\$600,387	\$800,516
\$29,626,960	\$36,259,474	\$30,812,039	\$37,709,853	\$32,044,520	\$39,218,247	\$33,326,301	\$40,786,977	\$34,659,353	\$42,418,456	\$36,045,727	\$44,115,194	\$37,487,557	\$45,879,802	\$38,987,059	\$47,714,994	\$40,546,541	\$49,623,593
\$19,162,283	\$23,420,568	\$19,928,775	\$24,357,391	\$20,725,926	\$25,331,687	\$21,554,963	\$26,344,954	\$22,417,161	\$27,398,752	\$23,313,847	\$28,494,702	\$24,246,401	\$29,634,491	\$25,216,257	\$30,819,870	\$26,224,908	\$32,052,665
\$48,789,244	\$59,680,042	\$50,740,813	\$62,067,244	\$52,770,446	\$64,549,933	\$54,881,264	\$67,131,931	\$57,076,514	\$69,817,208	\$59,359,575	\$72,609,896	\$61,733,958	\$75,514,292	\$64,203,316	\$78,534,864	\$66,771,449	\$81,676,258

POTENTIAL CAPITAL PROJECTS TO BE PRIORITIZED AND COMPLETED AS FUNDS BECOME AVAILABLE - CON'T

LATE 2008 COSTS NOT INCLUDING ESCALATION

Project		Approx. Area (GSF, u.o.n.)	Construction cost/ GSF (u.o.n)		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
			Low	High	Low	High		Low	High
FINE ARTS BUILDING									
	Parker House demolished	1,800	\$15	\$20	\$27,000	\$36,000	1.25	\$60,750	\$81,000
	Studios and academic space	31,300	\$300	\$375	\$9,390,000	\$11,737,500	1.30	\$12,207,000	\$15,258,750
					\$9,417,000	\$11,773,500		\$12,267,750	\$15,339,750
SHARPLESS LABORATORY RENOVATION									
	(without escalation)							\$6,443,900	\$8,257,000
FIELD HOUSE AND TENNIS PAVILION									
	New Field House/Tennis Pavilion, 2 levels	131,000	\$200	\$275	\$26,200,000	\$36,025,000	1.30	\$34,060,000	\$46,832,500
	Field House demolition	58,605	\$15	\$20	\$879,075	\$1,172,100	1.30	\$1,142,798	\$1,523,730
	Athletic Lane Service Road (lin. Ft.)	1,100	\$300	\$375	\$330,000	\$412,500	1.25	\$412,500	\$515,625
	Demolish Physical Plant Building	20,177	\$15	\$18	\$302,655	\$363,186	1.25	\$378,319	\$453,983
	New Physical Plant Building	25,000	\$250	\$300	\$6,250,000	\$7,500,000	1.30	\$8,125,000	\$9,750,000
					\$33,961,730	\$45,472,786		\$44,118,616	\$59,075,838
NATATORIUM									
	(Service road included in Field House above.)	41,000	\$225	\$300	\$9,225,000	\$12,300,000	1.30	\$11,992,500	\$15,990,000
CHASE									
	Selected Renovation of Space Decanted to Ryan								
	First Floor Southwest (Registrar)	700	\$175	\$250	\$122,500	\$175,000	1.30	\$159,250	\$227,500
	or								
	Complete Renovation	11,000	\$200	\$300	\$2,200,000	\$3,300,000	1.30	\$2,860,000	\$4,290,000
MORRIS									
	Complete Renovation	7,300	\$200	\$300	\$1,460,000	\$2,190,000	1.30	\$1,898,000	\$2,847,000
	Health Services (including Psychological Services) - within new Athletics/Wellness complex?	6,000	\$275	\$325	\$1,650,000	\$1,950,000	1.30	\$2,145,000	\$2,535,000
HALL BUILDING RENOVATION									
	Hall - Renovation	17,133	\$275	\$375	\$4,711,575	\$6,424,875	1.30	\$6,125,048	\$8,352,338
OBSERVATORY ADDITION									
		2,000	\$350	\$375	\$700,000	\$750,000	1.30	\$910,000	\$975,000
791 COLLEGE AVENUE									
	Renovation to Offices - Business Office	5,420	\$150	\$225	\$813,000	\$1,219,500	1.30	\$1,056,900	\$1,585,350

PROJECT COSTS WITH 4% ANNUAL INFLATION					
Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
\$63,180	\$84,240	\$65,707	\$87,610	\$68,335	\$91,114
\$12,695,280	\$15,869,100	\$13,203,091	\$16,503,864	\$13,731,215	\$17,164,019
\$12,758,460	\$15,953,340	\$13,268,798	\$16,591,474	\$13,799,550	\$17,255,133
\$6,701,656	\$8,587,280	\$6,969,722	\$8,930,771	\$7,248,511	\$9,288,002
\$35,422,400	\$48,705,800	\$36,839,296	\$50,654,032	\$38,312,868	\$52,680,193
\$1,188,509	\$1,584,679	\$1,236,050	\$1,648,066	\$1,285,492	\$1,713,989
\$429,000	\$536,250	\$446,160	\$557,700	\$464,006	\$580,008
\$393,452	\$472,142	\$409,190	\$491,027	\$425,557	\$510,669
\$8,450,000	\$10,140,000	\$8,788,000	\$10,545,600	\$9,139,520	\$10,967,424
\$45,883,361	\$61,438,871	\$47,718,695	\$63,896,426	\$49,627,443	\$66,452,283
\$12,472,200	\$16,629,600	\$12,971,088	\$17,294,784	\$13,489,932	\$17,986,575
\$165,620	\$236,600	\$172,245	\$246,064	\$179,135	\$255,907
\$2,974,400	\$4,461,600	\$3,093,376	\$4,640,064	\$3,217,111	\$4,825,667
\$1,973,920	\$2,960,880	\$2,052,877	\$3,079,315	\$2,134,992	\$3,202,488
\$2,230,800	\$2,636,400	\$2,320,032	\$2,741,856	\$2,412,833	\$2,851,530
\$6,370,049	\$8,686,431	\$6,624,851	\$9,033,888	\$6,889,845	\$9,395,244
\$946,400	\$1,014,000	\$984,256	\$1,054,560	\$1,023,626	\$1,096,742
\$1,099,176	\$1,648,764	\$1,143,143	\$1,714,715	\$1,188,869	\$1,783,303

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
\$71,069	\$94,759	\$73,912	\$98,549	\$76,868	\$102,491	\$79,943	\$106,590	\$83,141	\$110,854	\$86,466	\$115,288	\$89,925	\$119,900	\$93,522	\$124,696	\$97,263	\$129,684
\$14,280,463	\$17,850,579	\$14,851,682	\$18,564,602	\$15,445,749	\$19,307,187	\$16,063,579	\$20,079,474	\$16,706,122	\$20,882,653	\$17,374,367	\$21,717,959	\$18,069,342	\$22,586,677	\$18,792,116	\$23,490,145	\$19,543,800	\$24,429,750
\$14,351,532	\$17,945,338	\$14,925,594	\$18,663,151	\$15,522,617	\$19,409,677	\$16,143,522	\$20,186,065	\$16,789,263	\$20,993,507	\$17,460,833	\$21,833,247	\$18,159,267	\$22,706,577	\$18,885,637	\$23,614,840	\$19,641,063	\$24,559,434
\$7,538,452	\$9,659,522	\$7,839,990	\$10,045,903	\$8,153,589	\$10,447,739	\$8,479,733	\$10,865,649	\$8,818,922	\$11,300,275	\$9,171,679	\$11,752,286	\$9,538,546	\$12,222,377	\$9,920,088	\$12,711,272	\$10,316,892	\$13,219,723
\$39,845,383	\$54,787,401	\$41,439,198	\$56,978,897	\$43,096,766	\$59,258,053	\$44,820,636	\$61,628,375	\$46,613,462	\$64,093,510	\$48,478,000	\$66,657,250	\$50,417,120	\$69,323,540	\$52,433,805	\$72,096,482	\$54,531,157	\$74,980,341
\$1,336,911	\$1,782,549	\$1,390,388	\$1,853,851	\$1,446,003	\$1,928,005	\$1,503,844	\$2,005,125	\$1,563,997	\$2,085,330	\$1,626,557	\$2,168,743	\$1,691,619	\$2,255,493	\$1,759,284	\$2,345,712	\$1,829,656	\$2,439,541
\$482,567	\$603,208	\$501,869	\$627,337	\$521,944	\$652,430	\$542,822	\$678,527	\$564,535	\$705,668	\$587,116	\$733,895	\$610,601	\$763,251	\$635,025	\$793,781	\$660,426	\$825,532
\$442,579	\$531,095	\$460,283	\$552,339	\$478,694	\$574,433	\$497,842	\$597,410	\$517,755	\$621,306	\$538,466	\$646,159	\$560,004	\$672,005	\$582,404	\$698,885	\$605,701	\$726,841
\$9,505,101	\$11,406,121	\$9,885,305	\$11,862,366	\$10,280,717	\$12,336,860	\$10,691,946	\$12,830,335	\$11,119,624	\$13,343,548	\$11,564,408	\$13,877,290	\$12,026,985	\$14,432,382	\$12,508,064	\$15,009,677	\$13,008,387	\$15,610,064
\$51,612,541	\$69,110,374	\$53,677,043	\$71,874,789	\$55,824,124	\$74,749,781	\$58,057,089	\$77,739,772	\$60,379,373	\$80,849,363	\$62,794,548	\$84,083,337	\$65,306,330	\$87,446,671	\$67,918,583	\$90,944,538	\$70,635,326	\$94,582,319
\$14,029,529	\$18,706,038	\$14,590,710	\$19,454,280	\$15,174,338	\$20,232,451	\$15,781,312	\$21,041,749	\$16,412,564	\$21,883,419	\$17,069,067	\$22,758,756	\$17,751,830	\$23,669,106	\$18,461,903	\$24,615,870	\$19,200,379	\$25,600,505
\$186,300	\$266,143	\$193,752	\$276,789	\$201,502	\$287,860	\$209,562	\$299,374	\$217,945	\$311,349	\$226,662	\$323,803	\$235,729	\$336,756	\$245,158	\$350,226	\$254,964	\$364,235
\$3,345,795	\$5,018,693	\$3,479,627	\$5,219,441	\$3,618,812	\$5,428,219	\$3,763,565	\$5,645,347	\$3,914,107	\$5,871,161	\$4,070,672	\$6,106,008	\$4,233,499	\$6,350,248	\$4,402,839	\$6,604,258	\$4,578,952	\$6,868,428
\$2,220,392	\$3,330,587	\$2,309,207	\$3,463,811	\$2,401,575	\$3,602,363	\$2,497,639	\$3,746,458	\$2,597,544	\$3,896,316	\$2,701,446	\$4,052,169	\$2,809,504	\$4,214,255	\$2,921,884	\$4,382,826	\$3,038,759	\$4,558,139
\$2,509,347	\$2,965,591	\$2,609,720	\$3,084,215	\$2,714,109	\$3,207,584	\$2,822,674	\$3,335,887	\$2,935,581	\$3,469,323	\$3,053,004	\$3,608,095	\$3,175,124	\$3,752,419	\$3,302,129	\$3,902,516	\$3,434,214	\$4,058,617
\$7,165,439	\$9,771,054	\$7,452,057	\$10,161,896	\$7,750,139	\$10,568,371	\$8,060,145	\$10,991,106	\$8,382,550	\$11,430,751	\$8,717,852	\$11,887,981	\$9,066,567	\$12,363,500	\$9,429,229	\$12,858,040	\$9,806,398	\$13,372,361
\$1,064,571	\$1,140,612	\$1,107,154	\$1,186,237	\$1,151,440	\$1,233,686	\$1,197,498	\$1,283,033	\$1,245,398	\$1,334,355	\$1,295,214	\$1,387,729	\$1,347,022	\$1,443,238	\$1,400,903	\$1,500,968	\$1,456,939	\$1,561,006
\$1,236,424	\$1,854,635	\$1,285,880	\$1,928,821	\$1,337,316	\$2,005,974	\$1,390,808	\$2,086,212	\$1,446,441	\$2,169,661	\$1,504,298	\$2,256,447	\$1,564,470	\$2,346,705	\$1,627,049	\$2,440,573	\$1,692,131	\$2,538,196

POTENTIAL CAPITAL PROJECTS TO BE PRIORITIZED AND COMPLETED AS FUNDS BECOME AVAILABLE - CON'T

LATE 2008 COSTS NOT INCLUDING ESCALATION

Project		Approx. Area (GSF, u.o.n.)	Construction cost/ GSF (u.o.n)		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
			Low	High	Low	High		Low	High
Dining Center Renovation									
	Dining Center complete renovation (incl. kitchen)	56,867	\$350	\$450	\$19,903,450	\$25,590,150	1.30	\$25,874,485	\$33,267,195
	Potential Additional Dining Space	4,800	\$250	\$350	\$1,200,000	\$1,680,000	1.30	\$1,560,000	\$2,184,000
	Renovation and addition				\$21,103,450	\$27,270,150		\$27,434,485	\$35,451,195
	or								
	Renovation of servery area only	10,800	\$500	\$800	\$5,400,000	\$8,640,000	1.30	\$7,020,000	\$11,232,000
INFRASTRUCTURE									
Site lighting replacement project (approx. 230 poles)					\$1,380,000	\$1,955,000	1.25	\$1,725,000	\$2,443,750
Parking									
Underground Parking at Walton Field for 400 cars									
	Underground Garage	140,000	\$110	\$110	\$15,400,000	\$15,400,000	1.25	\$19,250,000	\$19,250,000
	Track and Field	140,000	\$25	\$50	\$3,500,000	\$7,000,000	1.25	\$4,375,000	\$8,750,000
	Grandstand Building	3,800	\$250	\$300	\$950,000	\$1,140,000	1.25	\$1,187,500	\$1,425,000
	Grandstand Seating (#seats)	150	\$200	\$250	\$30,000	\$37,500	1.25	\$37,500	\$46,875
					\$19,880,000	\$23,577,500		\$24,850,000	\$29,471,875
	OR						cost/stall	\$62,125	\$73,680
Underground Parking at Walton Field for 800 cars (2 levels)									
	Underground Garage	280,000	\$90	\$90	\$25,200,000	\$25,200,000	1.25	\$31,500,000	\$31,500,000
	Track and Field	140,000	\$25	\$50	\$3,500,000	\$7,000,000	1.25	\$4,375,000	\$8,750,000
	Grandstand Building	3,800	\$250	\$300	\$950,000	\$1,140,000	1.25	\$1,187,500	\$1,425,000
	Grandstand Seating (# seats)	150	\$200	\$250	\$30,000	\$37,500	1.25	\$37,500	\$46,875
					\$29,680,000	\$33,377,500		\$37,100,000	\$41,721,875
							cost/stall	\$46,375	\$52,152
	Above-grade Structured Parking for 400 cars								
	350 gross square feet/stall	140,000	\$70	\$100	\$9,800,000	\$14,000,000	1.25	\$12,250,000	\$17,500,000
							cost/stall	\$30,625	\$43,750
	Surface Parking for 400 cars								
	325 gross square feet/stall	130,000	\$10	\$15	\$1,300,000	\$1,950,000	1.25	\$1,625,000	\$2,437,500
							cost/stall	\$4,063	\$6,094

PROJECT COSTS WITH 4% ANNUAL INFLATION

Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
\$26,909,464	\$34,597,883	\$27,985,843	\$35,981,798	\$29,105,277	\$37,421,070
\$1,622,400	\$2,271,360	\$1,687,296	\$2,362,214	\$1,754,788	\$2,456,703
\$28,531,864	\$36,869,243	\$29,673,139	\$38,344,013	\$30,860,065	\$39,877,773
\$7,300,800	\$11,681,280	\$7,592,832	\$12,148,531	\$7,896,545	\$12,634,472
\$1,794,000	\$2,541,500	\$1,865,760	\$2,643,160	\$1,940,390	\$2,748,886
\$20,020,000	\$20,020,000	\$20,820,800	\$20,820,800	\$21,653,632	\$21,653,632
\$4,550,000	\$9,100,000	\$4,732,000	\$9,464,000	\$4,921,280	\$9,842,560
\$1,235,000	\$1,482,000	\$1,284,400	\$1,541,280	\$1,335,776	\$1,602,931
\$39,000	\$48,750	\$40,560	\$50,700	\$42,182	\$52,728
\$25,844,000	\$30,650,750	\$26,877,760	\$31,876,780	\$27,952,870	\$33,151,851
\$64,610	\$76,627	\$67,194	\$79,692	\$69,882	\$82,880
\$32,760,000	\$32,760,000	\$34,070,400	\$34,070,400	\$35,433,216	\$35,433,216
\$4,550,000	\$9,100,000	\$4,732,000	\$9,464,000	\$4,921,280	\$9,842,560
\$1,235,000	\$1,482,000	\$1,284,400	\$1,541,280	\$1,335,776	\$1,602,931
\$39,000	\$48,750	\$40,560	\$50,700	\$42,182	\$52,728
\$38,584,000	\$43,390,750	\$40,127,360	\$45,126,380	\$41,732,454	\$46,931,435
\$48,230	\$54,238	\$50,159	\$56,408	\$52,166	\$58,664
\$12,740,000	\$18,200,000	\$13,249,600	\$18,928,000	\$13,779,584	\$19,685,120
\$31,850	\$45,500	\$33,124	\$47,320	\$34,449	\$49,213
\$1,690,000	\$2,535,000	\$1,757,600	\$2,636,400	\$1,827,904	\$2,741,856
\$4,225	\$6,338	\$4,394	\$6,591	\$4,570	\$6,855

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
\$30,269,488	\$38,917,913	\$31,480,267	\$40,474,629	\$32,739,478	\$42,093,615	\$34,049,057	\$43,777,359	\$35,411,019	\$45,528,453	\$36,827,460	\$47,349,592	\$38,300,559	\$49,243,575	\$39,832,581	\$51,213,318	\$41,425,884	\$53,261,851
\$1,824,979	\$2,554,971	\$1,897,979	\$2,657,170	\$1,973,898	\$2,763,457	\$2,052,854	\$2,873,995	\$2,134,968	\$2,988,955	\$2,220,366	\$3,108,513	\$2,309,181	\$3,232,854	\$2,401,548	\$3,362,168	\$2,497,610	\$3,496,654
\$32,094,467	\$41,472,884	\$33,378,246	\$43,131,799	\$34,713,376	\$44,857,071	\$36,101,911	\$46,651,354	\$37,545,987	\$48,517,408	\$39,047,827	\$50,458,105	\$40,609,740	\$52,476,429	\$42,234,129	\$54,575,486	\$43,923,494	\$56,758,505
\$8,212,407	\$13,139,851	\$8,540,903	\$13,665,445	\$8,882,540	\$14,212,063	\$9,237,841	\$14,780,546	\$9,607,355	\$15,371,768	\$9,991,649	\$15,986,638	\$10,391,315	\$16,626,104	\$10,806,967	\$17,291,148	\$11,239,246	\$17,982,794
\$2,018,006	\$2,858,842	\$2,098,726	\$2,973,196	\$2,182,675	\$3,092,123	\$2,269,982	\$3,215,808	\$2,360,782	\$3,344,441	\$2,455,213	\$3,478,218	\$2,553,421	\$3,617,347	\$2,655,558	\$3,762,041	\$2,761,781	\$3,912,522
\$22,519,777	\$22,519,777	\$23,420,568	\$23,420,568	\$24,357,391	\$24,357,391	\$25,331,687	\$25,331,687	\$26,344,954	\$26,344,954	\$27,398,752	\$27,398,752	\$28,494,702	\$28,494,702	\$29,634,491	\$29,634,491	\$30,819,870	\$30,819,870
\$5,118,131	\$10,236,262	\$5,322,856	\$10,645,713	\$5,535,771	\$11,071,541	\$5,757,202	\$11,514,403	\$5,987,490	\$11,974,979	\$6,226,989	\$12,453,978	\$6,476,069	\$12,952,137	\$6,735,111	\$13,470,223	\$7,004,516	\$14,009,032
\$1,389,207	\$1,667,048	\$1,444,775	\$1,733,730	\$1,502,566	\$1,803,080	\$1,562,669	\$1,875,203	\$1,625,176	\$1,950,211	\$1,690,183	\$2,028,219	\$1,757,790	\$2,109,348	\$1,828,102	\$2,193,722	\$1,901,226	\$2,281,471
\$43,870	\$54,837	\$45,624	\$57,031	\$47,449	\$59,312	\$49,347	\$61,684	\$51,321	\$64,152	\$53,374	\$66,718	\$55,509	\$69,386	\$57,730	\$72,162	\$60,039	\$75,048
\$29,070,985	\$34,477,925	\$30,233,825	\$35,857,042	\$31,443,178	\$37,291,324	\$32,700,905	\$38,782,977	\$34,008,941	\$40,334,296	\$35,369,299	\$41,947,668	\$36,784,070	\$43,625,575	\$38,255,433	\$45,370,598	\$39,785,651	\$47,185,421
\$72,677	\$86,195	\$75,585	\$89,643	\$78,608	\$93,228	\$81,752	\$96,957	\$85,022	\$100,836	\$88,423	\$104,869	\$91,960	\$109,064	\$95,639	\$113,426	\$99,464	\$117,964
\$36,850,545	\$36,850,545	\$38,324,566	\$38,324,566	\$39,857,549	\$39,857,549	\$41,451,851	\$41,451,851	\$43,109,925	\$43,109,925	\$44,834,322	\$44,834,322	\$46,627,695	\$46,627,695	\$48,492,803	\$48,492,803	\$50,432,515	\$50,432,515
\$5,118,131	\$10,236,262	\$5,322,856	\$10,645,713	\$5,535,771	\$11,071,541	\$5,757,202	\$11,514,403	\$5,987,490	\$11,974,979	\$6,226,989	\$12,453,978	\$6,476,069	\$12,952,137	\$6,735,111	\$13,470,223	\$7,004,516	\$14,009,032
\$1,389,207	\$1,667,048	\$1,444,775	\$1,733,730	\$1,502,566	\$1,803,080	\$1,562,669	\$1,875,203	\$1,625,176	\$1,950,211	\$1,690,183	\$2,028,219	\$1,757,790	\$2,109,348	\$1,828,102	\$2,193,722	\$1,901,226	\$2,281,471
\$43,870	\$54,837	\$45,624	\$57,031	\$47,449	\$59,312	\$49,347	\$61,684	\$51,321	\$64,152	\$53,374	\$66,718	\$55,509	\$69,386	\$57,730	\$72,162	\$60,039	\$75,048
\$43,401,753	\$48,808,693	\$45,137,823	\$50,761,040	\$46,943,336	\$52,791,482	\$48,821,069	\$54,903,141	\$50,773,912	\$57,099,267	\$52,804,868	\$59,383,238	\$54,917,063	\$61,758,567	\$57,113,745	\$64,228,910	\$59,398,295	\$66,798,066
\$54,252	\$61,011	\$56,422	\$63,451	\$58,679	\$65,989	\$61,026	\$68,629	\$63,467	\$71,374	\$66,006	\$74,229	\$68,646	\$77,198	\$71,392	\$80,286	\$74,248	\$83,498
\$14,330,767	\$20,472,525	\$14,903,998	\$21,291,426	\$15,500,158	\$22,143,083	\$16,120,164	\$23,028,806	\$16,764,971	\$23,949,958	\$17,435,570	\$24,907,957	\$18,132,992	\$25,904,275	\$18,858,312	\$26,940,446	\$19,612,645	\$28,018,064
\$35,827	\$51,181	\$37,260	\$53,229	\$38,750	\$55,358	\$40,300	\$57,572	\$41,912	\$59,875	\$43,589	\$62,270	\$45,332	\$64,761	\$47,146	\$67,351	\$49,032	\$70,045
\$1,901,020	\$2,851,530	\$1,977,061	\$2,965,591	\$2,056,143	\$3,084,215	\$2,138,389	\$3,207,584	\$2,223,925	\$3,335,887	\$2,312,882	\$3,469,323	\$2,405,397	\$3,608,095	\$2,501,613	\$3,752,419	\$2,601,677	\$3,902,516
\$4,753	\$7,129	\$4,943	\$7,414	\$5,140	\$7,711	\$5,346	\$8,019	\$5,560	\$8,340	\$5,782	\$8,673	\$6,013	\$9,020	\$6,254	\$9,381	\$6,504	\$9,756

POTENTIAL CAPITAL PROJECTS TO BE PRIORITIZED AND COMPLETED AS FUNDS BECOME AVAILABLE - CON'T

LATE 2008 COSTS NOT INCLUDING ESCALATION									
Project		Approx. Area (GSF, u.o.n.)	Construction cost/ GSF (u.o.n)		Construction Cost (Range)		Project Cost Multiplier	Project Cost (Construction Cost X multiplier) Current Dollars	
			Low	High	Low	High		Low	High
LANDSCAPE - IDENTIFIED PROJECTS									
Costs assume all contractor labor.									
Letters refer to Landscape Projects Diagram.									
A	Campus Walkway Enhancements								
	Based on Shared Pedestrian Walkway Diagrams, 50' wide section including landscape.								
	College Walk - North of Featherbed	500	LF	\$595		\$297,500	1.20		\$357,000
	College Walk -South of Featherbed	450	LF	\$595		\$267,750	1.20		\$321,300
	Featherbed - West of Gummere - in Residence Hall costs	850	LF	\$595		\$505,750	1.20		\$606,900
	Featherbed - East of Gummere	750	LF	\$595		\$446,250	1.20		\$535,500
B	Wooded Quadrangle Enhancements								
	Gummere Woods Quadrangle	1.15 acre	\$289,000	\$354,605	\$332,350	\$407,796	1.20	\$398,820	\$489,355
	Woodside Quadrangle	1 acre	\$289,000	\$354,605	\$289,000	\$354,605	1.20	\$346,800	\$425,526
per acre									
C	Pond Enhancements								
	Pond Dredging, Enlarge Flood Plain	5.5 acres				\$109,000	1.20		\$130,800
	Pond Buffer Enhancements (30 feet wide)	7,667 sq. yds.				\$203,000	1.20		\$243,600
D/G	Buffer Enhancements / Nature Trail								
	Cost per acre					\$160,591	1.20		\$192,709
	South Edge Buffer	7.23 acres				\$1,161,073	1.20		\$1,393,288
E	Storm Water Management Demonstration Projects								
	Walton Road								
	Based on Typical Campus Roadway Diagrams, 70' wide section including landscape.								
		950	LF	\$868		\$824,600	1.20		\$989,520
	Small/Limited Areas - Dry Wells, Small Beds	3	EA	\$26,450		\$79,350	1.20		\$95,220
	3 Locations								
	Large Area - Underground Infiltration Area					\$496,000	1.20		\$595,200
	Near North Dorms/Carter Road								
F	Landscape Improvements along Lancaster Avenue				\$172,000	\$383,500	1.20	\$206,400	\$460,200
	Landscape and signage; higher figure includes more extensive signage and extending stone wall.								
CAMPUS-WIDE EXTERIOR SIGNAGE PROGRAM									
(Budget, based on programs at other, similar-sized institutions.)					\$300,000	\$400,000	1.30	\$390,000	\$520,000

PROJECT COSTS WITH 4% ANNUAL INFLATION					
Costs 12/2009		Costs 12/2010		Costs 12/2011	
Low	High	Low	High	Low	High
	\$371,280		\$386,131		\$401,576
	\$334,152		\$347,518		\$361,419
	\$631,176		\$656,423		\$682,680
	\$556,920		\$579,197		\$602,365
\$414,773	\$508,929	\$431,364	\$529,286	\$448,618	\$550,458
\$360,672	\$442,547	\$375,099	\$460,249	\$390,103	\$478,659
	\$136,032		\$141,473		\$147,132
	\$253,344		\$263,478		\$274,017
	\$200,418		\$208,434		\$216,772
	\$1,449,019		\$1,506,980		\$1,567,259
	\$1,029,101		\$1,070,265		\$1,113,075
	\$99,029		\$102,990		\$107,110
	\$619,008		\$643,768		\$669,519
\$214,656	\$478,608	\$223,242	\$497,752	\$232,172	\$517,662
\$405,600	\$540,800	\$421,824	\$562,432	\$438,697	\$584,929

Costs 12/2012		Costs 12/2013		Costs 12/2014		Costs 12/2015		Costs 12/2016		Costs 12/2017		Costs 12/2018		Costs 12/2019		Costs 12/2020	
Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
	\$417,640		\$434,345		\$451,719		\$469,788		\$488,579		\$508,122		\$528,447		\$549,585		\$571,569
	\$375,876		\$390,911		\$406,547		\$422,809		\$439,721		\$457,310		\$475,602		\$494,627		\$514,412
	\$709,987		\$738,387		\$767,922		\$798,639		\$830,585		\$863,808		\$898,360		\$934,295		\$971,666
	\$626,459		\$651,518		\$677,578		\$704,681		\$732,869		\$762,183		\$792,671		\$824,378		\$857,353
\$466,563	\$572,476	\$485,226	\$595,375	\$504,635	\$619,190	\$524,820	\$643,958	\$545,813	\$669,716	\$567,645	\$696,505	\$590,351	\$724,365	\$613,965	\$753,339	\$638,524	\$783,473
\$405,707	\$497,805	\$421,935	\$517,717	\$438,813	\$538,426	\$456,365	\$559,963	\$474,620	\$582,362	\$493,605	\$605,656	\$513,349	\$629,882	\$533,883	\$655,078	\$555,238	\$681,281
	\$153,017		\$159,138		\$165,504		\$172,124		\$179,009		\$186,169		\$193,616		\$201,361		\$209,415
	\$284,978		\$296,377		\$308,232		\$320,561		\$333,383		\$346,719		\$360,588		\$375,011		\$390,011
	\$225,443		\$234,460		\$243,839		\$253,592		\$263,736		\$274,285		\$285,257		\$296,667		\$308,534
	\$1,629,949		\$1,695,147		\$1,762,953		\$1,833,471		\$1,906,810		\$1,983,083		\$2,062,406		\$2,144,902		\$2,230,698
	\$1,157,598		\$1,203,902		\$1,252,058		\$1,302,141		\$1,354,226		\$1,408,396		\$1,464,731		\$1,523,321		\$1,584,253
	\$111,394		\$115,850		\$120,484		\$125,303		\$130,315		\$135,528		\$140,949		\$146,587		\$152,450
	\$696,300		\$724,152		\$753,118		\$783,243		\$814,572		\$847,155		\$881,041		\$916,283		\$952,934
\$241,459	\$538,369	\$251,117	\$559,904	\$261,162	\$582,300	\$271,608	\$605,592	\$282,473	\$629,815	\$293,772	\$655,008	\$305,522	\$681,208	\$317,743	\$708,457	\$330,453	\$736,795
\$456,245	\$608,326	\$474,495	\$632,660	\$493,474	\$657,966	\$513,213	\$684,285	\$533,742	\$711,656	\$555,092	\$740,122	\$577,295	\$769,727	\$600,387	\$800,516	\$624,403	\$832,537

POTENTIAL EARLY INCREMENTS PROJECTS
ROUGH ESTIMATE OF ANNUAL OPERATING COSTS

Benchmark numbers from FMLink (BOMA International) includes Utilities, Custodial, Maintenance, Environmental Health and Safety (\$6.27/SF).
Figures do not include building management staff or insurance.

Project		Approx. Area (GSF)	Rough estimate of annual costs	Notes
Ryan Center for Culture and Media				
	Ryan Gym - Renovation	19,805		Some increase in existing costs; efficient systems could help mitigate this. Cost does not include cost of building management or technical support staff.
	Demolish Link and Squash Courts	8,300	(\$52,041)	
	Additional Space	38,300	\$240,141	
Whitehead Campus Center Renovation and Addition				
	Addition, 2 stories plus basement	9,000	\$56,430	
	Strategic, limited renovations			
	Conversion of College house to Guest House	5,500	\$34,485	Plus cost of hospitality staff.
Performing Arts				
	Roberts - Renovation	30,837		Some increase in existing owing to updated systems; efficient systems could help mitigate this. Cost does not include cost of technical theater staff.
	Union - Complete Renovation	11,000		Some increase in existing owing to updated systems; efficient systems could help mitigate this.
	Addition to Roberts - Music	28,000	\$175,560	
Fine Arts Building				
	Parker House demolished	1,800	(\$11,286)	
	Studios and academic space	31,300	\$196,251	
Sharpless Laboratory Renovation				
Stokes Hall Renovations				
	Science Library Space	5,400		Costs will increase owing to occupancy of existing space.
	First Floor South	6,720		Similar costs to existing.
Orchard Green Residence Hall				
	New Student Residence on Orchard Lot			
	3 stories + basement, 100 to 110 beds	44,800		
	OR			
	4 stories + basement, up to 135 beds	46,700	\$292,809	
Infrastructure				
	Central Plant - Heating and Electrical building (if not accounted for in other projects)	12,000		Greater boiler efficiency should decrease energy costs. Amount depends on equipment selection and system design.
	Sustainability Program Office within Central Plan	1,500	\$9,405	Plus cost of program staff.
HCA Demolition				
	HCA Demolition - 1 building closest to campus	5,307	(\$33,275)	
ADDITIONAL RESIDENTIAL PROJECTS				
Oakley or Other Featherbed Residence Hall				
	3 stories + basement, 100 beds	41,000		
	OR			
	4 (3-1/2) stories + basement, about 115 beds	46,700	\$292,809	
			\$1,201,288	