CAMPUS MASTER PLAN

JUNE 6, 2016

OAKLAND UNIVERSITY™

To all in the campus community,

With the benefit of your valued collaboration and contributions over the last year, Oakland University has worked with Hanbury Evans Wright Vlattas + Company to complete the updated Campus Master Plan now before you. This document will guide future campus development to help meet our vision, objectives and goals over the next 10 years and beyond.

As we look to maintain and enhance the outstanding academic, research, community engagement and campus life programs we have in place, we can rely on the Campus Master Plan to support healthy growth through building, re-purposing, new facility locations, strategic infrastructure enhancement, land use and more.

The Plan will also help to inspire the creation of new places, spaces and connections that contribute to more invigorating, distinctive and vibrant University living and learning environments. It has been crafted to honor and preserve the rich heritage of the institution and the Meadow Brook Estate, as well as flexibly adapt to the changing needs and conditions of the University.

We know that breathtaking facilities, cutting-edge technology, and remarkable work and learning space amenities are not enough to advance a pre-eminent University. Rather it is an ambitious, accomplished and dedicated community of scholars, learners and facilitators that does so. It is our hope that by providing the former, our accomplished, ambitious and dedicated campus community will be further inspired and supported to achieve excellence in all of its endeavors.

Best regards,

George W. Hynd

President

acknowledgements

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contents

1 INTRODUCTION

The 2016 Oakland University Campus Master Plan is a bold, long-term vision designed to support the aspirations of OU's strategic vision.

The University's strategic vision reinforces and extends the existing campus structure to anticipate growth in a compact, connected and organized manner. Through renovation, re-purposing and new construction, implementation of the Plan will: provide more teaching facilities, support growth of the University's research enterprise, create a more residential campus and promote community engagement.

The first objective of the Plan is to immediately meet institutional needs with clearly identified project locations. Second, it identifies near-term building and open space opportunities that will enhance existing campus strengths. Third, it also creates a flexible framework for long-term potential growth.

The Plan document is intended to guide sustainable campus growth to promote a cohesive campus character and identity, steward the heritage of Oakland University and celebrate the campus' unique sense of place.

master plan process

OVERVIEW

Beginning in September 2015, the approximately ten month planning process engaged the campus community in an open dialogue regarding the future of the OU campus. The scope of the planning effort focused on the Academic portion of the core campus, but also makes recommendations for other contiguous campus holdings as well as the Macomb location. While the preservation and stewardship of the historic district surrounding Meadow Brook Hall is implicit in the 2016 Campus Master Plan, specific initiatives and actions for that property will be addressed in a separate study.

The Plan addresses current and future space needs based on an 11% enrollment increase projected by the year 2025 to reach a total student headcount of 23,000 and staff headcount of 2,800.

The process to develop the plan was guided by the Campus Master Plan Steering Committee which encouraged broad participation and input. During the 10-month process the planning team met with virtually every campus constituent group and the City's of Rochester Hills, Auburn Hills and Oakland County. Six on-campus workshops included student, faculty and staff open houses, meetings with academic department heads and student life and athletics leadership, as well as consistent input from President Hynd, the Board of Trustees and senior administration. The plan was presented to the University's Board of Trustees for approval on June 6, 2016.

Presentation to Student Congress

Meeting with Senior Administration

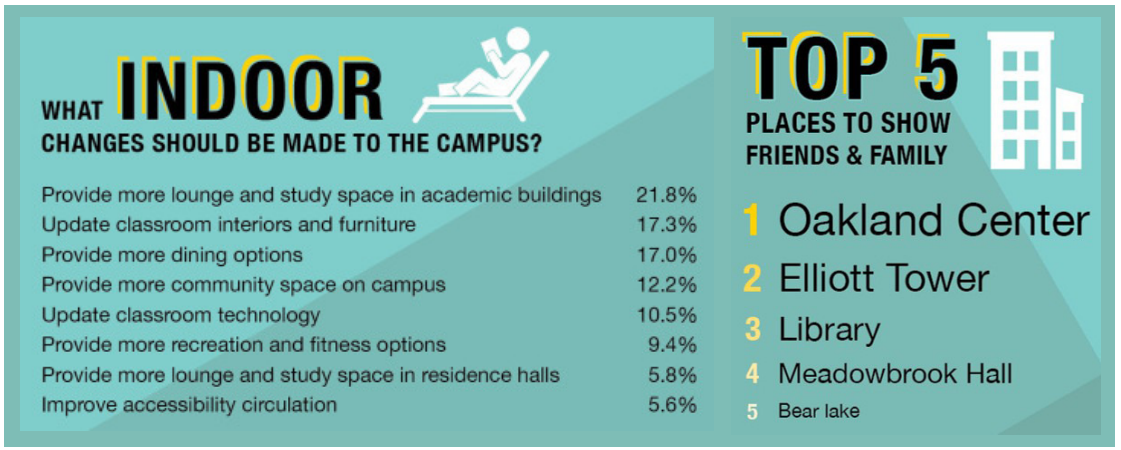


Figure 1.1, Key Student Survey Responses

AN OPEN AND INCLUSIVE PROCESS

The intensive ten-month planning period included:

- Over 75 meetings incorporating sessions with the Master Plan Committee, Board of Trustees, President's Cabinet, University Senate, alumni, students, multiple municipal and county representatives
- 6 on-campus workshops
- A detailed Utilization and Space Needs Analysis
- Campus tours
- Open forums
- On-line survey with nearly 2,000 respondents
- Visit to the Macomb location
- Incorporation of on-going projects already in planning or design
- An integrated team of consultants with expertise in the disciplines of land use planning, landscape, parking and transportation, civil engineering and utilities infrastructure

The Master plan process utilized the following 5 phases.

Data Collection

This phase established an understanding of existing conditions, assets, issues, program needs and aspirations; as well as the OU mission, vision and strategic plan.

Analysis + Options

Analysis of needs, strategic vision and physical opportunities generated multiple land use concepts. Concepts for campus systems such as open space, circulation and infrastructure were also generated.

Concept Refinement

The preferred concept was tested with stakeholder review and refined by developing strategies for program accommodation and synergistic adjacencies, leveraging physical opportunities, creating a connected open space network and campus edge/ gateway identity.

Integration + Documentation

Natural and man-made campus systems were coordinated to reinforce the overall land use strategy and campus framework. The final plan, computer model and graphics were created to illustrate proposed projects and implementation strategies.

Publication + Presentation

Documentation of the process and final recommendations are the basis of this report. The Campus Master Plan was presented to various OU constituents and approved by the University Senate and Board of Trustees.

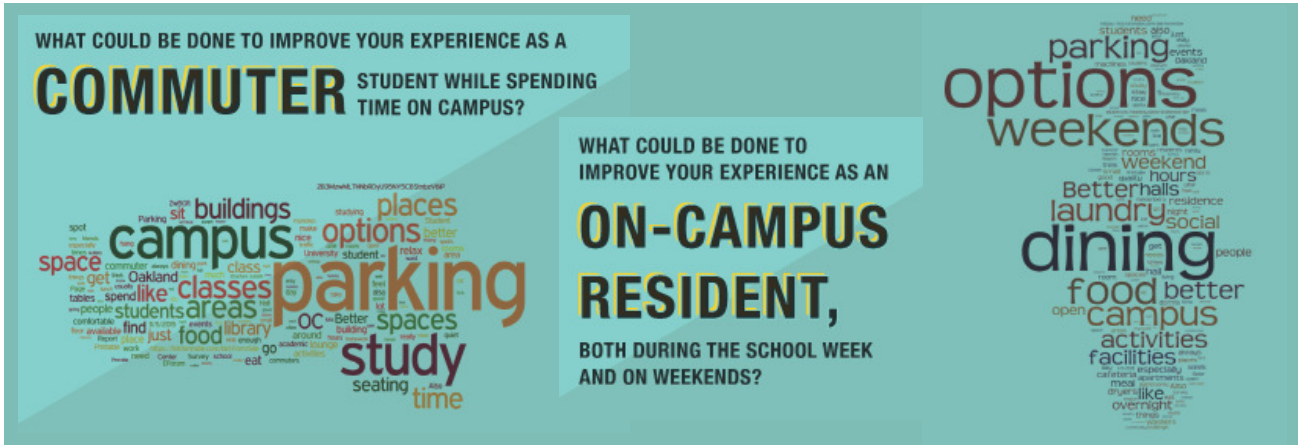


Figure 1.2, Student Survey Response Word Clouds

Public Forums in the Oakland Center

strategic vision alignment

Through initiatives from its Strategic Plan and the implementation of this Master Plan, Oakland University seeks to be the leading metropolitan institution in the state of Michigan and a national model for student centered learning and engagement.

Within the fiscal climate of reduced state funding for higher education, institutional growth in teaching and learning facilities at OU has not kept pace with steady increases in enrollment. Current conditions reflect a nearly 500,000 assignable square foot (ASF) deficit based on state guidelines and informal benchmarking of similar institutions. While several new state-of-the-art facilities have recently been constructed on campus, multiple existing facilities are in dire need of upgrades to systems infrastructure and building modernization. Existing classroom utilization is so high that the addition of course offerings would be nearly impossible without new facilities.

Campus initiatives to increase enrollment, grow academic programs and create more active-learning teaching environments. Campus life initiatives include creating a more robust living/learning environment with new residence halls and student life facilities to improve recruitment, retention and overall student success.

In parallel, growth in interdisciplinary research and creative innovation is an aspiration for the near-term. In particular, alignment between strong academic programs and regional industry could be leveraged to create research opportunities on campus. Greater community engagement through such partnerships as well as through the arts, athletics and outreach programs are also important strategic goals.

Future total space needs to support these various initiatives, based on the projected enrollment increase, grows in 10 years to nearly 1.2 million ASF of new space need.

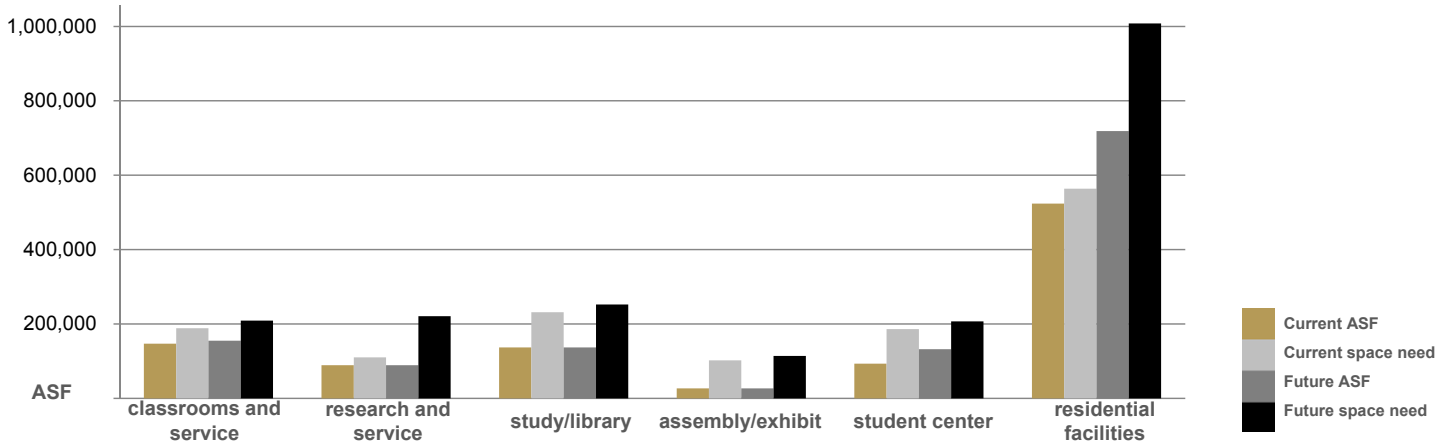


Figure 1.3, Space Needs Assessment Summary Chart

master plan goals

VIBRANT CAMPUS LIFE

Foster ***student success*** through a robust ***teaching, learning and living*** environment and comprehensive ***student services***.

OUTSTANDING PROGRAMS

Be recognized as a ***strong research and scholarly environment*** focused on ***creative endeavors*** and on the ***discovery, dissemination and utilization of knowledge***.

COMPELLING PHYSICAL PRESENCE

Become a ***leader in serving the needs and aspirations of our communities and region*** through expanded community relationships, institutional reputation and visibility and engagement.

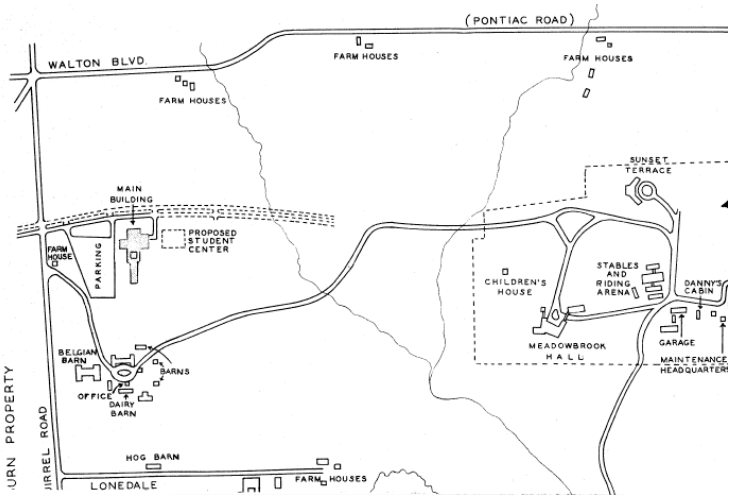
campus context and analysis

HISTORY AND EVOLUTION

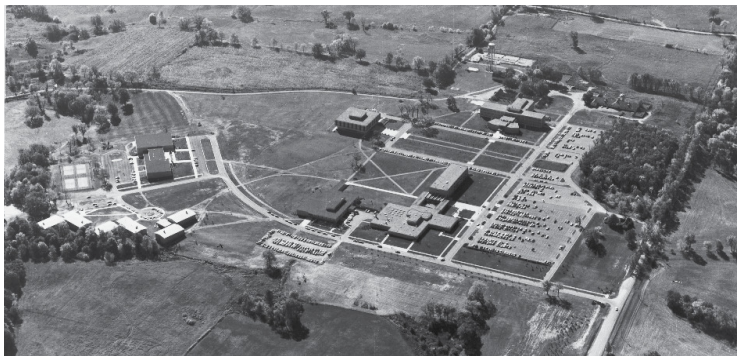
The university was established in 1957 through a generous donation from founders Alfred and Matilda Dodge Wilson. They contributed their historic Meadow Brook Estate and $2 million to Michigan State University to establish a satellite school, named Michigan State University – Oakland. The campus opened in 1959 with 570 students and three buildings. In 1963, it became known as Oakland University and in 1970, the state granted the university autonomy from Michigan State and appointed its first board of trustees. While the university grew steadily over the next two decades, the mid-1990's began a period of increased growth; OU's enrollment has grown nearly 50 percent, to over 20,000 students today. The resident student population has continued to grow to 2,700 students (13% of total student population). There are more than 50 major buildings on campus. The Oakland University William Beaumont School of Medicine opened in 2011 with an initial class of 50 students, the school is one of only a handful new medical schools to be founded in the U.S. in the past 25 years.

Meadow Brook Hall and its expansive grounds and gardens today serve as a historic museum attraction for national and international tourists as well as a cultural center for campus groups and a unique location for significant community events. The university has set up the building as a self-supporting enterprise, with the capacity to generate its full revenue needs through facility rental, tourism, special events, merchandise sales and fund raising. Meadow Brook Amphitheatre, which opened in 1964 and seats 7,700 continues to be a valuable campus cultural amenity for various types of performances. The Katke-Cousins Golf Course, opened in 1977 and the R&S Sharf Golf Course, opened in 2000 utilize the south and southwest portions of the OU property.

A 162 acre faculty subdivision and four historic Greek Houses (former Meadow Brook Farm caretakers' residences) are situated across Adams Road from campus.



Historic Campus Development Map of Campus Properties



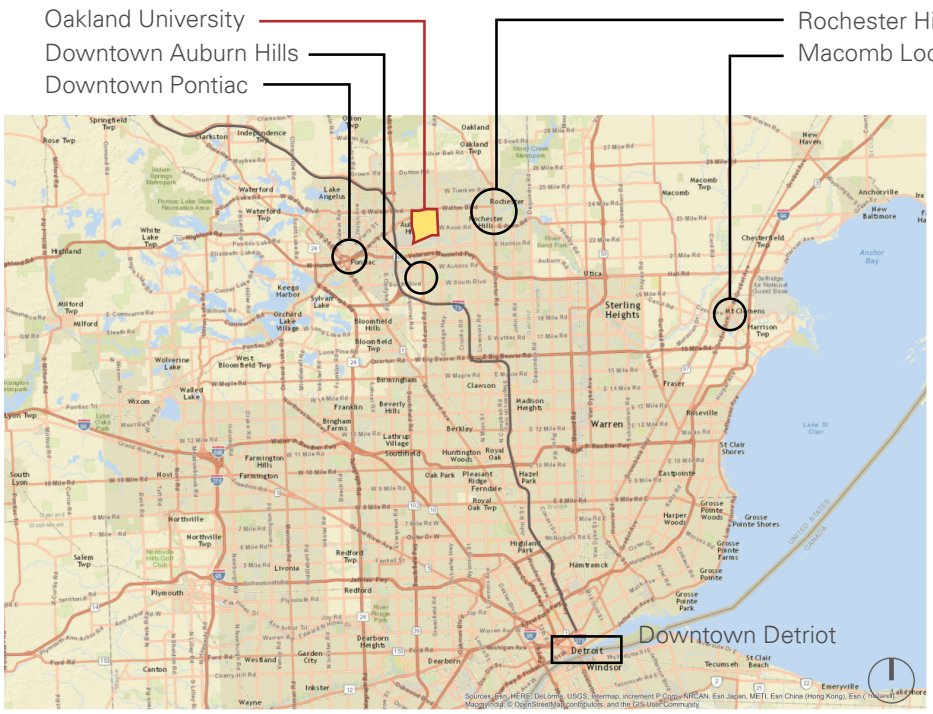
Historical Aerial Photos Showing Early Construction

CAMPUS CONTEXT IN DETROIT

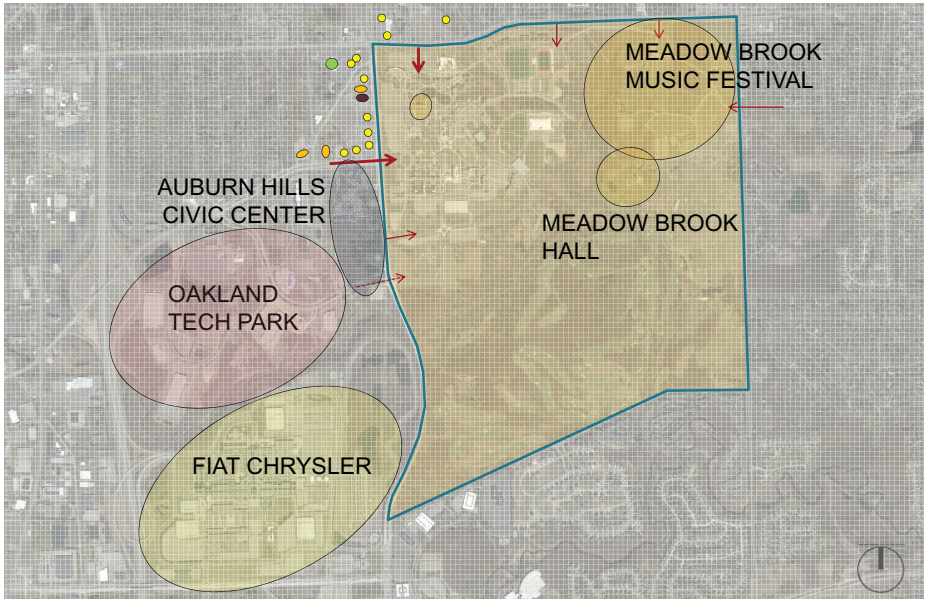
Oakland University's 1,443-acre campus is located 30 miles north of downtown Detroit in the cities of Auburn Hills and Rochester Hills, Michigan. The institution also shares a relationship with the city of Rochester several miles east of campus. It is the only major research university in Oakland County, from which the school derives its name and it serves much of the Metro Detroit region. As shown in the map below, the campus is adjacent to the Auburn Hills Civic Center and Oakland Technology Park. The North American headquarters of Fiat Chrysler Automobiles is just south and west of campus. Located in the heart of Oakland County's Automation Alley and Medical Main Street, the University has forged hundreds of partnerships with hospitals, Fortune 500 companies, cities, government agencies and educational institutions.

Access from I-75 on University Drive is convenient and campus is well served by arterial roads that create the north and west boundaries.

Oakland University also has a presence in Macomb County with locations in Clinton Township at the Macomb University Center and in Mt. Clemens at the Anton/Frankel Center.



Regional Context Map



Campus Context Map

EXISTING LAND USE PLAN

The existing campus land use reflects typical institutional growth over time. A compact core houses a mix of academic and student support functions, which represents the legacy of the early campus. Larger areas of single use then developed outside of the core campus as enrollment and academic programs grew.

Academic functions (red) have largely been contained within the core campus with recent expansion to the North when the Human Health Building was built. This arrangement, within a ten-minute walking circle, as shown in Figure 1.3, enhances the pedestrian environment enabling students to comfortably walk from class to class within class change time.

Much of the northern portion of campus is dedicated to Student Housing (blue).

Athletics and student recreation facilities (darker greens) are located in two areas - the upper fields and the lower fields. The O'Rena and RAC are connected facilities that house both athletics and student recreation uses respectively.

Student Life, Student Support and Administrative functions (light blue and orange) are embeded in the core campus.

Meadow Brook Estate to the East is categorized as an outreach function (orange) and includes two 18-hole golf courses, much of the natural land assets, the president's home at Sunset Terrace, OU INC business accelerator, Meadow Brook Amphitheatre and historic Meadow Brook Hall.

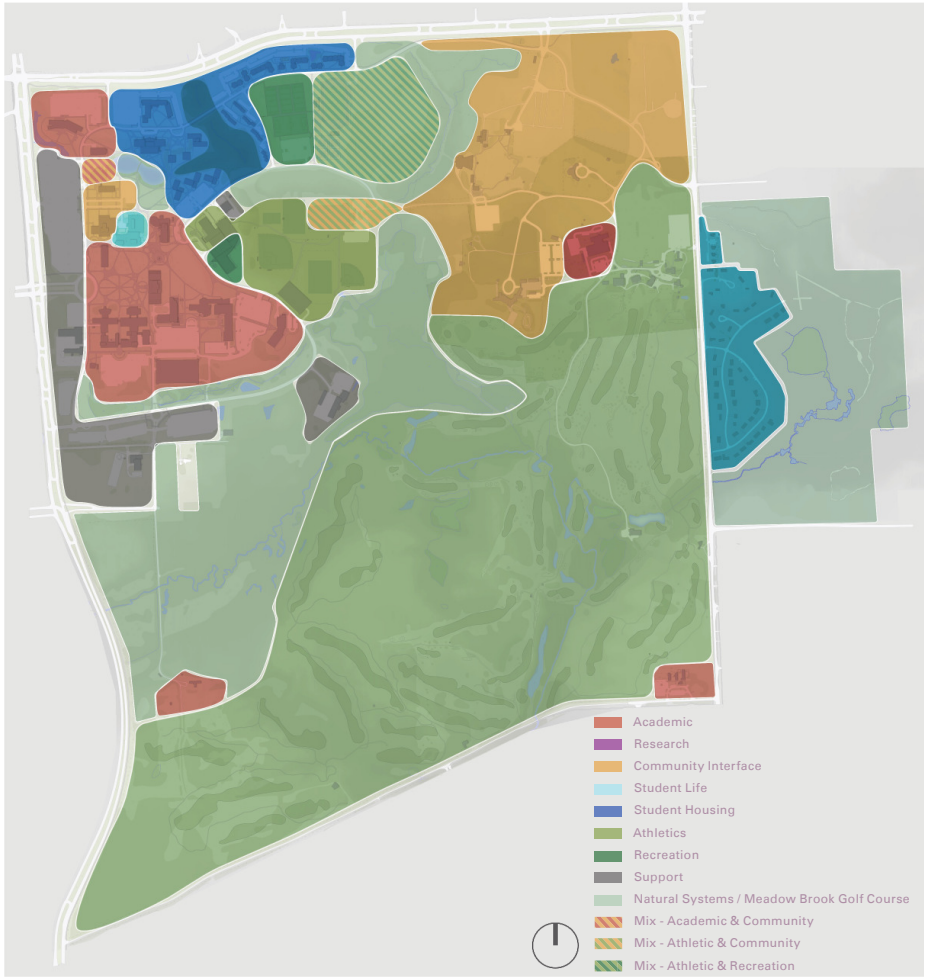


Figure 1.3, Existing Land Use Plan

Physical campus conditions, built patterns and natural systems were initially mapped and documented to generate an understanding of the existing campus and its historical growth. Existing use and circulation patterns have an important impact on growth strategies for the campus. The majority of campus buildings are located within a ten-minute walk from one another, which creates a pleasantly pedestrian oriented campus. All campus housing is located within that 10 minute walk of the core. New facilities, sited as infill projects where possible in and around the core, will keep the campus compact and easily walkable.

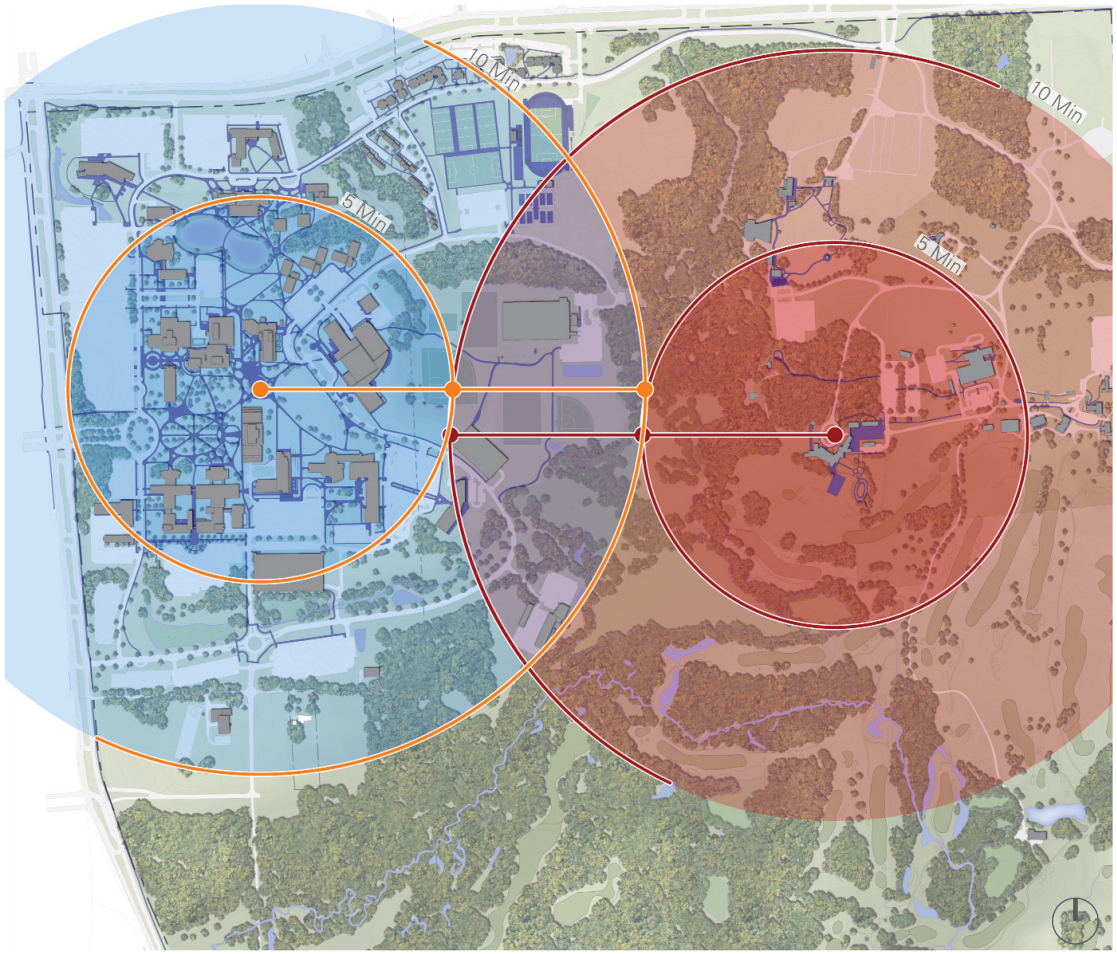


Figure 1.4, Five and Ten Minute Walking Circles

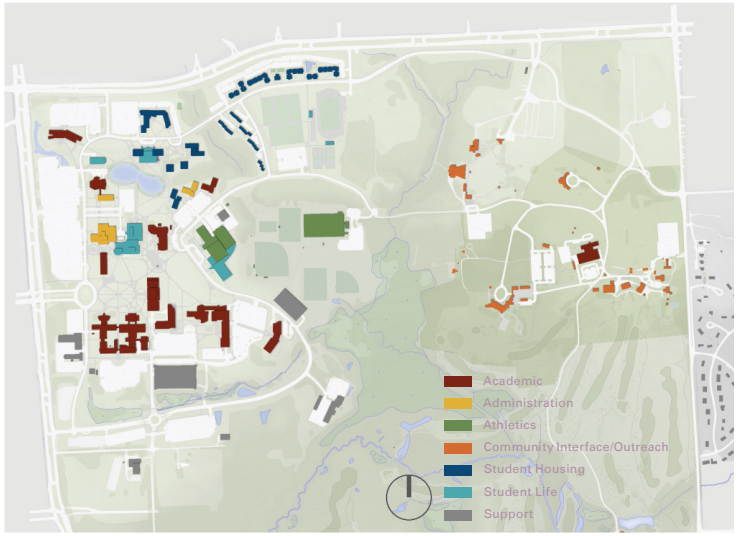


Figure 1.5, Building Use

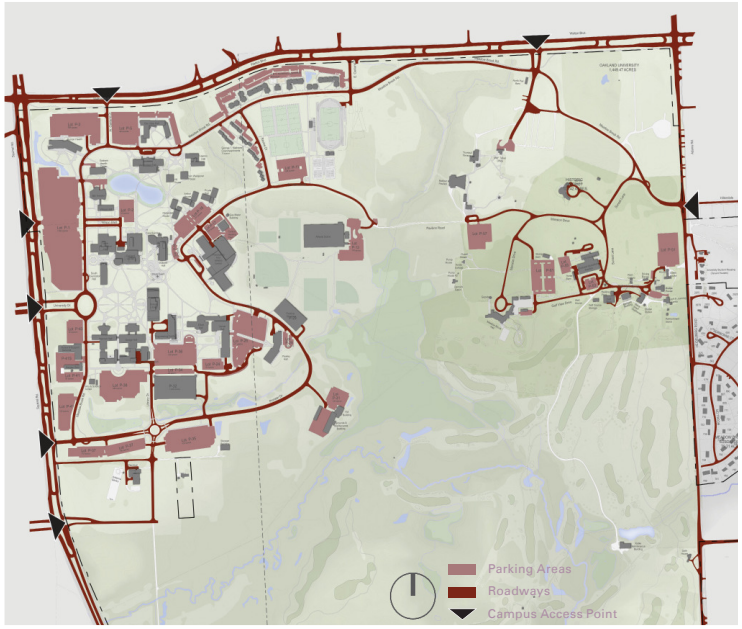


Figure 1.6, Vehicular Circulation

TOPOGRAPHY

The campus has a rolling topography and historically the development has occurred on the higher ground (orange and red). The majority of the campus acreage is land that is outside the core campus and is either part of low wetlands (green) that are undevelopable, the Meadow Brook Historic District, the 36-hole golf course or on slopes that are not suitable for construction.

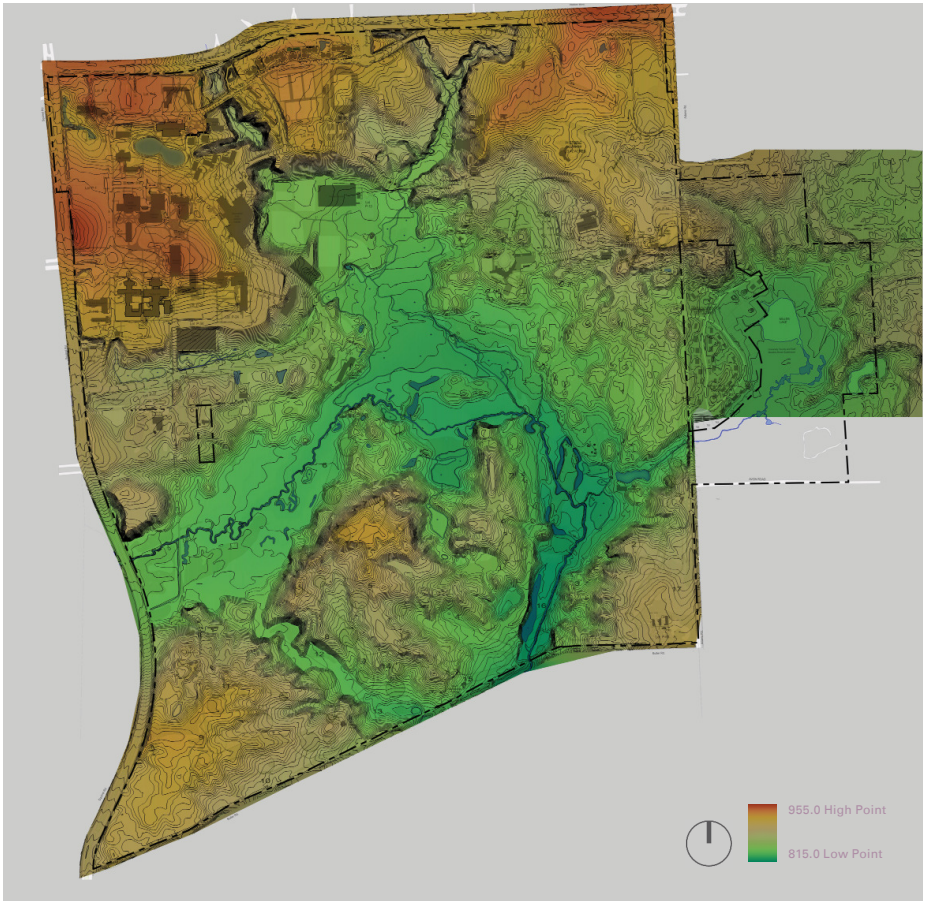


Figure 1.7, Campus Terrain Gradient Map

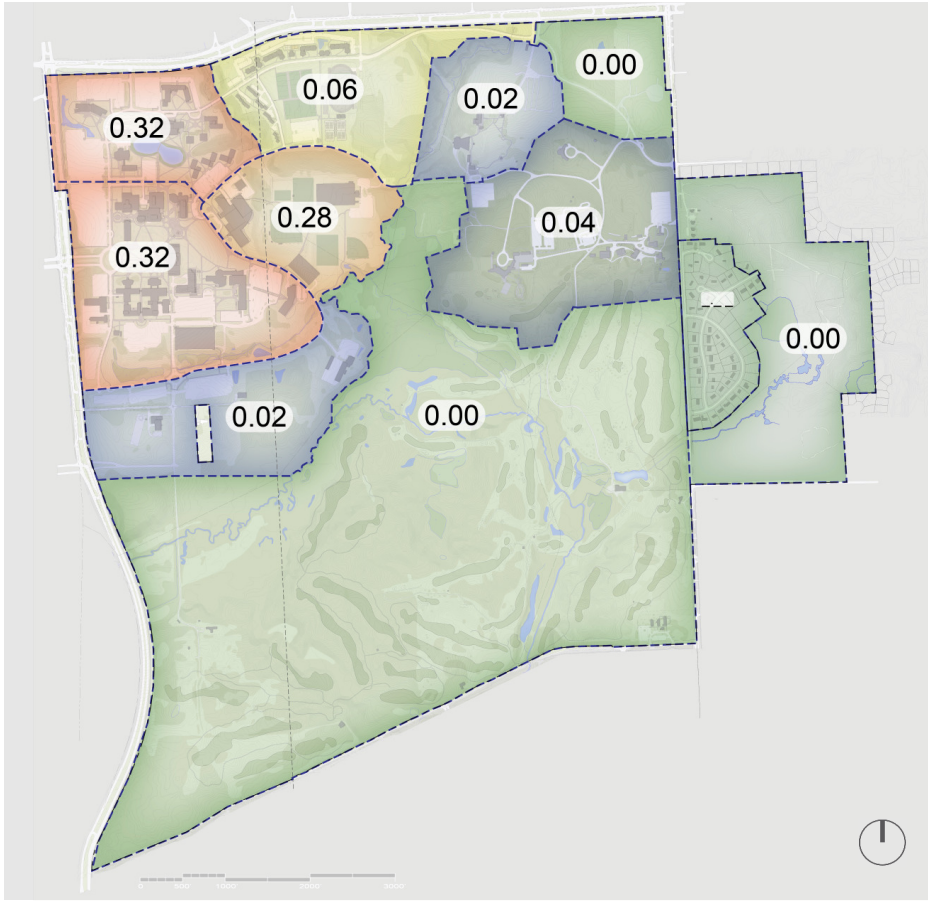


Figure 1.8, Floor Area Ratio

FLOOR AREA RATIO (FAR)

As a result, the highest intensity of FAR coverage occurs in the northwest portion of University owned property. However, this ratio of coverage is relatively low and allows for ample opportunity to develop sites within the academic core without harming the positive pedestrian qualities of the existing campus fabric.

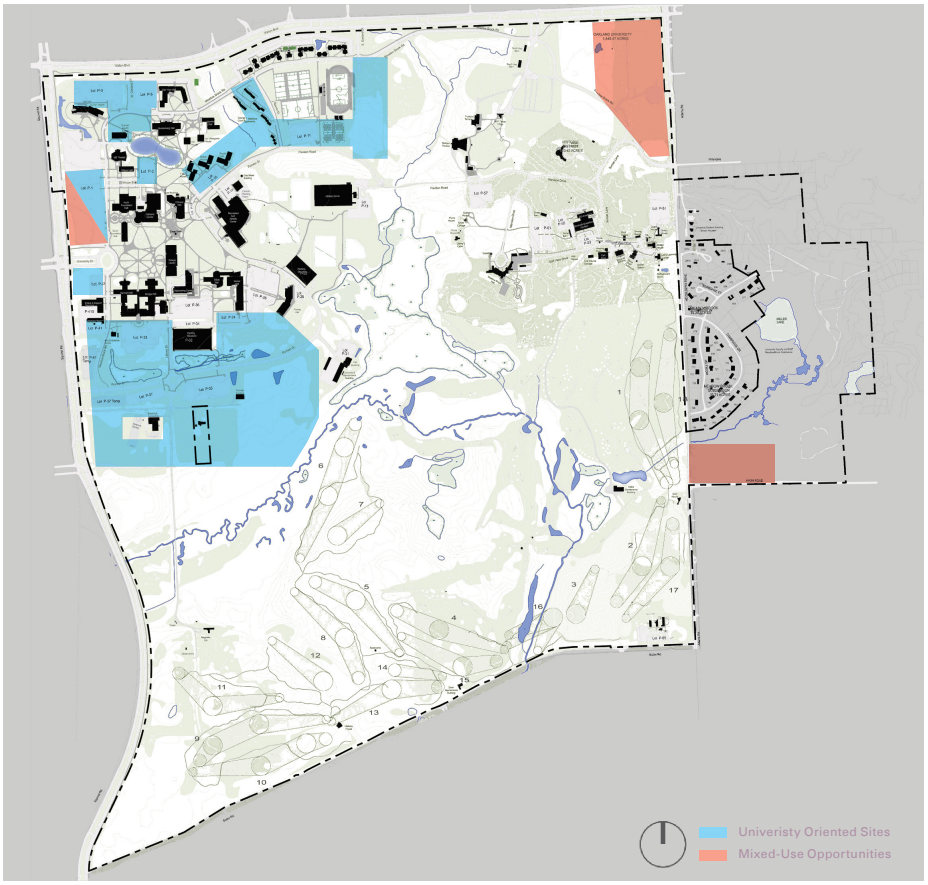


Figure 1.9, Development Opportunities and Areas of Future Consideration

Figure 1.10, Potential Demolition

1	Graham Health Center	4	Campus Police and Support Services
2	Matthews Court Apartments	5	Arts and Science Annex
3	Anibal, Pryale & Fitzgerald House	6	Magnetic Lab

DEVELOPMENT SITES AND POTENTIAL BUILDING DEMOLITION

Early in the planning process, the plan identified sites that should be considered for development to support both the University's academic mission and Strategic Plan goal for increased community outreach.

Due to various factors, several buildings were identified for potential demolition to occur either in the near-term and long-term in order to implement the Master Plan.

DISCOVERY PHASE INSIGHTS AND DESIRED PLANNING OUTCOMES

To align with Strategic Plan Goal 1, the following outcomes were identified:

- Classroom deficit is significant. Need to enhance the utilization & quality of campus buildings
- Create indoor gathering spaces that lead to 'productive collisions' – both scheduled and casual in building lobbies, along hallways and in other spaces
- Increase GSF/student - currently ranked last out of 15 Michigan Universities
- Merge learning & social opportunities
- Enhance exterior spaces in-between buildings
- Enhance outdoor dining opportunities
- Provide housing and transportation for international students
- Increase walkability between parts of campus
- Enhance the dynamics between buildings on campus
- Provide large and medium-sized scheduled group meeting rooms
- Create a "get out of the car" culture

To align with Strategic Plan Goal 2, the following outcomes were identified:

- Provide spaces that allow for interdisciplinary research
- Increase quantity of faculty research labs and student research labs
- Establish departmental growth targets and chart enrollment history

To align with Strategic Plan Goal 3, the following outcomes were identified:

- Provide a comprehensive space utilization plan for campus
- Be a one-stop link between the University's branding and the community in order to promote campus resources
- Intentionally plan for off-campus users to use space on campus that enhance relationships and produce measurable outcomes
- Link the Meadow Brook Estate side of campus better to the core campus
- Attract the community to athletic events on campus
- Become a greater academic resource for the community
- Create more incubator-type spaces on campus
- Make the performing arts and athletic facilities easier to access for the general public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2 UTILIZATION & SPACE NEEDS ANALYSIS SUMMARY

Space needs analysis for the purpose of master planning is a process that estimates space amounts likely to be needed by various units of an institution at current and projected enrollment, staffing and activity levels.

utilization and space needs summary

The purpose of this chapter is to document the Utilization and Space Needs Analysis which was a part of the development of the Oakland University Campus Master Plan by Hanbury Evans Wright Vlattas + Company. The findings from the Utilization and Space Needs Analysis provide data for the development of the Master Plan.

PROCESS

Initial information and data were requested on enrollment, courses, staffing and facilities. The University provided current and projected 10-year enrollment levels, the Fall 2014 course file, two files listing faculty and staff personnel, a list of campus buildings and a facilities file with information on rooms in academic buildings.

Meetings were held on campus October 6 through 9, 2015, with the Vice Presidents, Deans and others to discuss specific needs of the individual colleges, schools and major administrative divisions. A second visit to the campus in November 2015 provided an opportunity to present results of the Utilization and Space Needs Analysis for review and comment.

STRATEGIC PLANNING

The Oakland University Strategic Plan identifies three Strategic Goals. These goals are used as the foundation of the analysis of campus facilities and the development of the Master Plan.

Goal #1: Foster student success through a robust teaching and learning environment and comprehensive student services.

Goal #2: Be recognized as a strong research and scholarly environment focused on creative endeavors and on the discovery, dissemination and utilization of knowledge.

Goal #3: Become a leader in serving the needs and aspirations of our communities and region through expanded community relationships, institutional reputation and visibility and engagement.

ANALYSIS AND PROJECTIONS

The following describes this report's parameters for establishing space needs in the future.

- The Fall 2015 student headcount used for this analysis is 20,711 students. The breakdown is 17,161 undergraduate students and 3,550 graduate students.
- The Fall 2015 full-time equivalent (FTE) student enrollment used is 17,500 FTE.
- The enrollment projection used for this analysis is to reach an enrollment of 23,000 students in the next ten years. The projected student FTE used is 19,450.
- Several new facilities are currently being planned on campus, and as a result, the built space on campus was increased for the future projections to take into account the new facilities planned. The built space for the future analysis included additional student housing on the southern part of campus, an addition to the Oakland Center and an expansion of Elliott Hall. Other new projects are being discussed but have not been included as future space since none of the other planned facilities have been both approved and funded.
- The goal of the Master Plan is to provide direction and clarity for future campus development. It should be noted that this analysis has been performed at a master plan level in assignable square feet (ASF). This analysis has not been performed at a program level to provide numbers and types of rooms to meet the requirements of the projections. The space needs analysis findings should be viewed as tools and information for decision making and planning and not as entitlements to space for individual schools or as a defined plan to correct unmet present and future space needs.
- All space in this analysis is projected in assignable square feet (ASF) which is defined as the usable space contained within classrooms, laboratories, offices, etc. It does not include circulation and building service space, nor does it include the thickness of walls or structural components like building columns.

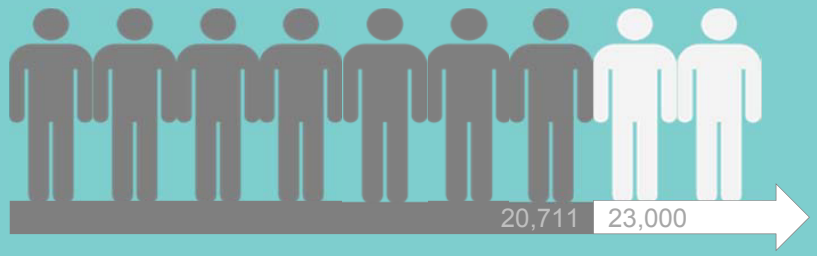
KEY FINDINGS

The data and information provided to Hanbury Evans was used to document the utilization of classrooms and class laboratories and to analyze the space needed on campus at the current time and at a projected enrollment level for the future.

The following graphic outlines the key findings.

- The Enrollment Projection depicts the future anticipated growth of OU used for the development of the Master Plan.
- The Time of Day Classroom Use illustrates the average percentage of classrooms in use at different times of day.
- The Weekly Seat Hours shows utilization at OU compared to peer averages and the average that the consultant would expect to see.
- The bar chart compares the current built space on campus with the space needed to serve the current student population and the projected space needed when enrollment increases.

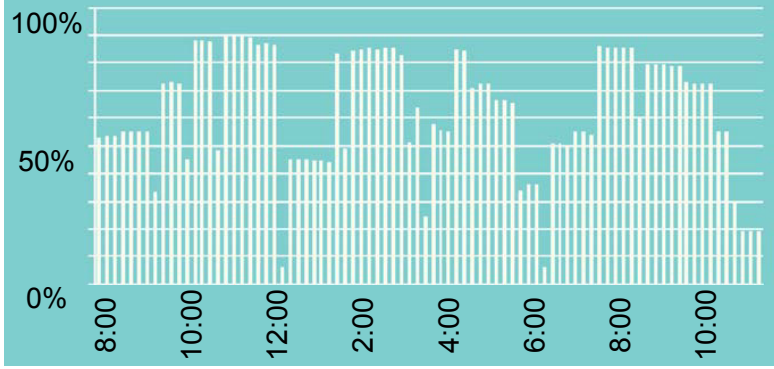
ENROLLMENT PROJECTION



11% *growth by 2025*

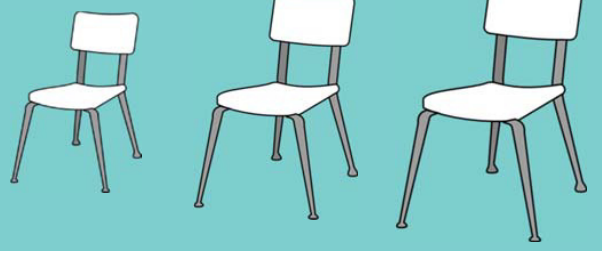
TIME OF DAY CLASSROOM USE

(Mon-Thurs Avg)



WEEKLY SEAT HOURS

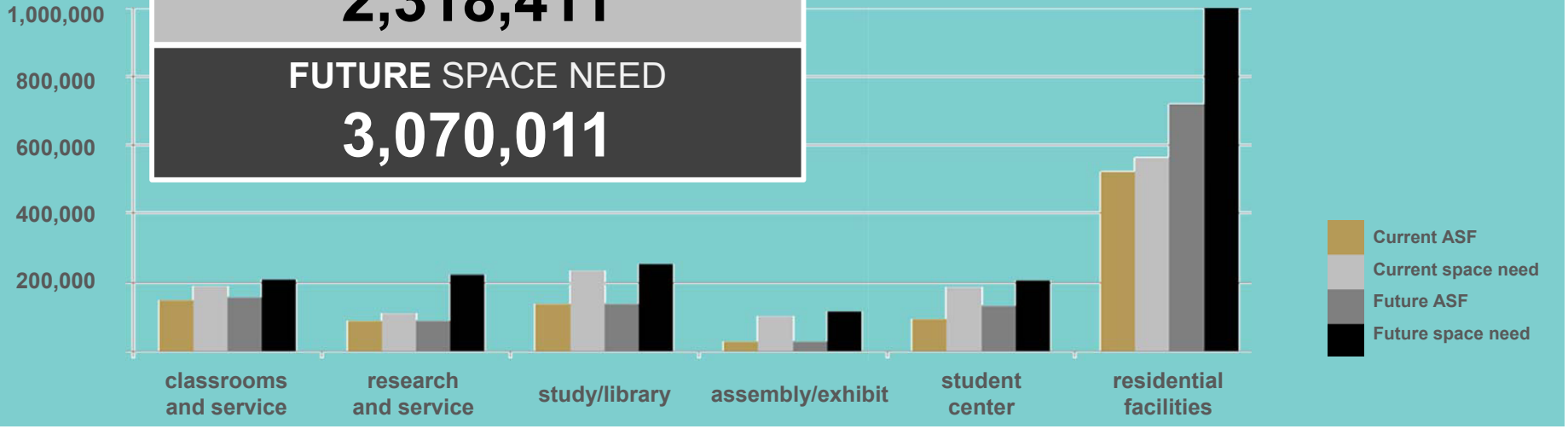
Benchmark	HEWV Expectation	Oakland
16.7 wk / hrs	22 wk / hrs	24.4 wk / hrs



CURRENT ASF
1,885,925

CURRENT SPACE NEED
2,318,411

FUTURE SPACE NEED
3,070,011



Classroom and Class Laboratory Utilization

Classrooms and class laboratories were studied to show the level of use. The factors illustrated in the utilization study included the average hours per week of scheduled instructional use for each room, the average hours of scheduled use for each student seat, the percentage of student stations or seats filled when the rooms are scheduled, and the average square feet allocated to the student stations in the rooms.

Classroom Utilization

In the Fall 2014, the 124 classrooms analyzed on the Oakland University campus averaged 47 hours of scheduled use per week, with 53% of the student stations filled when classrooms were in use. The classrooms average 18 assignable square feet (ASF) per student station. The average for weekly seat hours of use was 24.4 hours.

Benchmark data averaging the utilization finding from over a dozen public universities for which the consultant has previously done studies showed the average scheduled hours per week to average 29 weekly room hours (WRH). The average for weekly seat hours is 16.7 weekly seat hours. The benchmark average for percentage of seats occupied is 63%. The average of the benchmarked universities for classrooms is 20 ASF per student station.

From the consultant's experience, the expectation for average weekly room hours for similar institutions is in the range of 30 to 35 hours per week. The expectation for weekly seat hours is between 20 and 24. A common expected average for the percentage of seats filled is 65% to 70%. The expected average size of the student stations in classrooms is 18 to 22 ASF.

The average room hours per week of scheduled use for classrooms during the Fall term 2014 at Oakland University is considerably above the benchmarked average and significantly above the range that the consultant would expect to see. The average weekly seat hours at Oakland University is also above the benchmark average and above the consultant's expected range.

The average percentage of classroom seats occupied when classes are scheduled at Oakland University is below both the benchmark average and the range the consultant would expect to see. The space per student station at OU is below the benchmark average and also below the consultant's expected range.

When the utilization findings were summarized by building, the classrooms located in Varner Hall showed the highest average hours per week of scheduled use. The three classrooms in Varner Hall averaged 57 hours per week of use.

When the utilization findings are summarized by college and school, the centralized classrooms assigned to the Registrar under Academic Affairs showed the highest average hours per week of scheduled use. The 112 centrally scheduled classrooms averaged 50 hours per week of use.

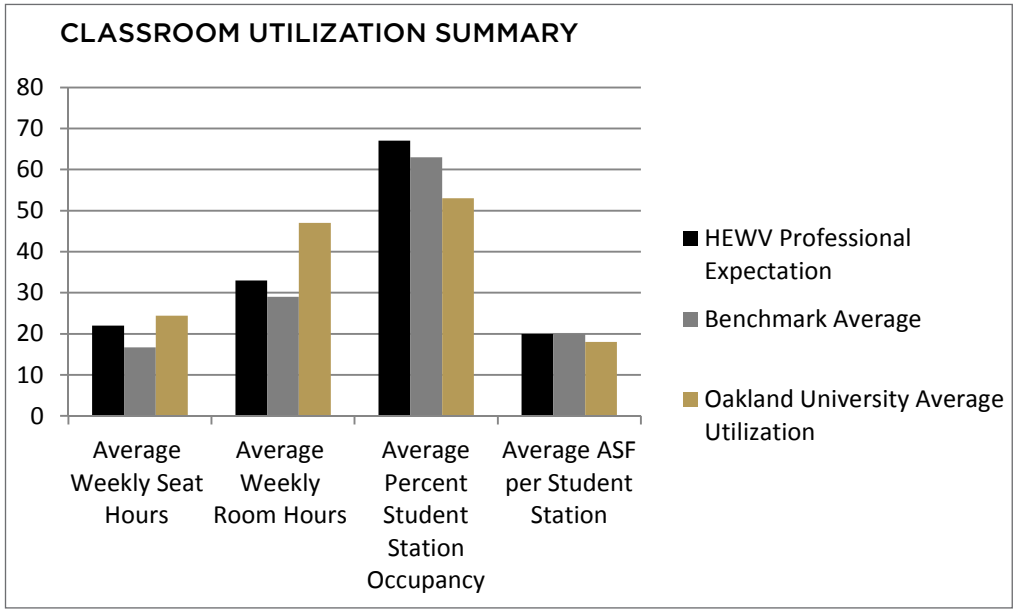
Classroom utilization findings compiled by classroom capacity showed the 36 classrooms in the group with 48 student stations averaged 52 weekly room hours of use.

A review of classroom use by day and time of day showed the classrooms on campus were most heavily used on Tuesday and Thursday in the early afternoon when over ninety percent of the classrooms on campus are in use. Over ninety percent of classrooms are also in use on Tuesday mornings and Tuesday evenings.

CLASSROOM UTILIZATION SUMMARY

	HEWV Professional Expectation	Benchmark Average	Oakland University Average Utilization
Average Weekly Seat Hours	22	16.7	24.4
Average Weekly Room Hours	33	29	47
Average Student Station Occupancy	67%	63%	53%
Average ASF per Student Station	20	20	18

Note: Used middle of HEWV expected range



Class Laboratory Utilization

The 78 class laboratories analyzed for the Fall 2014 term at Oakland University averaged 23 weekly room hours resulting in the average of 17.1 weekly seat hours of use. When laboratories were in use, the student station occupancy averaged 72%. The average ASF per student station at Oakland University is 41 ASF per student station.

The benchmark averages for class laboratories is 17 weekly room hours, 11.6 weekly seat hours, 69% occupancy and 46 ASF per student station.

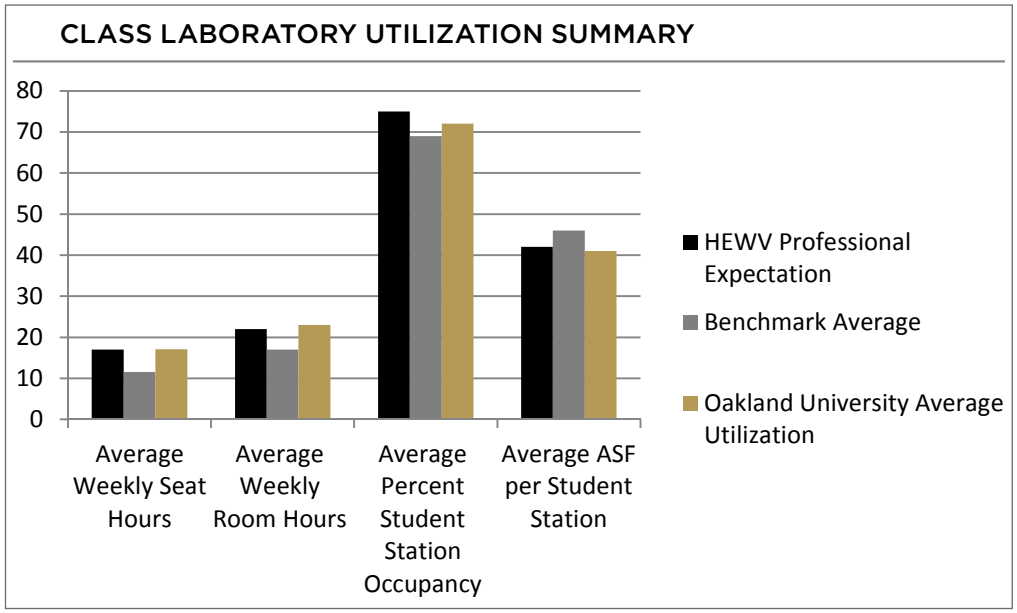
The consultant would expect to see the average for weekly room hours to be 20 to 24 hours per week of scheduled use with 70% to 80% of the student stations filled. The expectation for average seat hours is 14 to 20 weekly seat hours and the expected ASF per station is between 40 to 45 ASF per station.

The average room hours per week of scheduled use of class laboratories, the average percentage of student station occupancy, the average weekly seat hours, and the average station size at Oakland University are all within the range the consultant would expect to see at an institution of the size and mission of Oakland University. The average room hours per week of scheduled use of class laboratories, the average percentage of student station occupancy, and the average weekly seat hours at Oakland University are all above the benchmark averages. The average station size at Oakland University is below the benchmark average station size.

CLASS LABORATORY UTILIZATION SUMMARY

	HEWV Professional Expectation	Benchmark Average	Oakland University Average Utilization
Average Weekly Seat Hours	17	11.6	17.1
Average Weekly Room Hours	22	17	23
Average Student Station Occupancy	75%	69%	72%
Average ASF per Student Station	42	46	41

Note: Used middle of HEWV expected range




Fisherbrand

Space Needs Analysis

The space needs analysis assists in determining the magnitude of space needed for the current level of campus enrollment and activity. The analysis also includes a projection of space needs for the future planning horizon. To calculate the space needs, the consultant applied commonly used standards, experience with state and system guidelines and informal benchmarking of similar institutions.

The space needs analysis calculated the space requirements looking at the findings both for the campus as a whole and at a school level for each of the academic colleges and schools and for major administrative divisions as seen on the following two tables.

Space Analysis by Space Category

Results of the campus-wide space needs analysis showed the campus currently needs an additional 490,000 ASF using the Fall 2015 enrollment of 20,711 students.

The space category with the greatest space need at the current time is Study/Library space. The Student Center and Assembly & Exhibit categories also show a significant need for additional space.

Findings from the analysis using projected future enrollment levels show a campus-wide need for nearly 906,000 ASF when enrollment reaches 23,000 students. Nearly 230,000 ASF of the projected future year space need is in the Residential Facilities category. The Research & Service, Study/Library, and Assembly & Exhibit space categories show significant need for additional space in the future. The Student Center space also shows a projected need.

The inactive space and the Golf Course, Meadow Brook Hall, Meadow Brook Theatre, and Meadow Brook Festival have been shown at the bottom of the space needs analysis table. These spaces have not been calculated in the overall space needs analysis. Space data for the Anton Frankel Center and other off-campus delivery sites was not provided for this study, thus these facilities were not included in this analysis. While this data was not incorporated, it is the consultant's understanding that there is potential to expand offerings at off-campus locations if the University believes it would align with its strategic objectives.

SPACE NEEDS ANALYSIS

Oakland University

Campuswide - Space Category

	2015				Projection 2025			
	Student Headcount = 20,711		Staff Headcount = 2,500		Student Headcount = 23,000		Staff Headcount = 2,800	
Space Use Category	Current ASF	Calculated Space Requirement	ASF Difference	Percent Difference	Future Built ASF	Calculated Future Space Requirement	ASF Difference	Percent Difference
Classrooms and Service	147,301	188,607	(41,306)	(28%)	155,301 *	209,334	(54,033)	(35%)
Class Laboratories and Service	132,204	166,842	(34,638)	(26%)	146,904 *	187,626	(40,722)	(28%)
Open Laboratories and Service	49,645	53,500	(3,855)	(8%)	49,645	59,400	(9,755)	(20%)
Research and Service	89,329	110,500	(21,171)	(24%)	89,329	221,000	(131,671)	(147%)
Office and Service	301,252	345,160	(43,908)	(15%)	309,652 *	377,369	(67,717)	(22%)
Study/Library	137,041	231,670	(94,629)	(69%)	137,041	252,500	(115,459)	(84%)
Recreation	84,227	102,500	(18,273)	(22%)	84,227	112,250	(28,023)	(33%)
Athletics	156,248	175,000	(18,752)	(12%)	156,248	200,000	(43,752)	(28%)
Special Use	12,839	17,500	(4,661)	(36%)	12,839	19,450	(6,611)	(51%)
Assembly & Exhibit	27,084	102,450	(75,366)	(278%)	27,084	114,150	(87,066)	(321%)
Student Center	93,373	186,400	(93,027)	(100%)	132,373 **	207,000	(74,627)	(56%)
General Use	18,482	19,000	(518)	(3%)	29,382 *	40,400	(11,018)	(37%)
Support	52,301	52,500	(199)	(0%)	52,301	58,350	(6,049)	(12%)
Health Care	2,936	3,000	(64)	(2%)	2,936	3,000	(64)	(2%)
Residential Facilities	523,774	563,782	(40,008)	(8%)	718,774 ***	948,182	(229,408)	(32%)
TOTAL	**1,828,036**	**2,318,411**	**(490,375)**	**(27%)**	**2,104,036**	**3,010,011**	**(905,975)**	**(43%)**
Inactive	26,555				26,555			
Golf Course	25,399				25,399			
Meadow Brook Hall	74,510				74,510			
Meadow Brook Festival	20,427				20,427			
Meadow Brook Theatre	10,998				10,998			
	1,985,925				2,261,925			

Space Analysis by School, College and Major Administrative Division

In addition to showing the findings by space category, the space needs analysis was summarized for each of the academic colleges, schools and major administrative divisions.

The results of the space needs analysis show the units under the Student Affairs, the College of Arts and Sciences and Academic Affairs have the greatest need for space at the current time. The space need for the Academic Affairs reflects the need for Library space and the need for Student Affairs space reflects the need for Student Center and Residential Facilities space.

The projected space needs analysis using the 23,000 student enrollment level shows Student Affairs will continue to have space needs as will the College of Arts and Sciences and Academic Affairs.

The summary of space needs for each of the schools shows a space total without classroom space. The space guidelines generated by the courses are applied to courses in the school that offers the course, while the space may be summarized under a different school or division. Even when classes are held in classrooms assigned to the individual schools, the courses do not necessarily match the classroom space assigned to the school. Therefore, for a master plan analysis, classroom space is best viewed on a campus-wide basis rather than at the school level. This is particularly true of campuses, like Oakland University, where the majority of classrooms are centrally scheduled. Current findings show a need for 41,000 ASF of classroom space and a projected future need of 54,000 ASF of classroom space.

SPACE NEEDS ANALYSIS

Oakland University

Campuswide - Colleges and Administrative Divisions

	2015				Projection 2025			
	Student Headcount = 20,711		Staff Headcount = 2,500		Student Headcount = 23,000		Staff Headcount = 2,800	
School/College/Administrative Unit	Current ASF	Calculated Space Requirement	ASF Difference	Percent Difference	Future Built ASF	Calculated Future Space Requirement	ASF Difference	Percent Difference
Classrooms & Service	147,301	188,607	(41,306)	(28%)	155,301	209,334	(54,033)	(35%)
College of Arts & Sciences	232,121	353,606	(121,485)	(52%)	232,121	432,244	(200,123)	(86%)
School of Business Administration	24,260	34,746	(10,486)	(43%)	58,260	54,215	4,045	7%
School of Education & Human Services	55,718	73,783	(18,065)	(32%)	55,718	82,253	(26,535)	(48%)
School of Engineering & Computer Science	92,612	95,274	(2,662)	(3%)	92,612	134,196	(41,584)	(45%)
School of Health Sciences	37,031	45,846	(8,815)	(24%)	37,031	53,537	(16,506)	(45%)
School of Medicine	28,907	33,540	(4,633)	(16%)	28,907	53,644	(24,737)	(86%)
School of Nursing	24,869	30,037	(5,168)	(21%)	24,869	32,878	(8,009)	(32%)
Honors College	1,133	3,135	(2,002)	(177%)	1,133	3,182	(2,049)	(181%)
Graduate Study & Lifelong Learning	2,397	3,815	(1,418)	(59%)	2,397	4,210	(1,813)	(76%)
Eye Research Institute	11,247	12,185	(938)	(8%)	11,247	17,363	(6,116)	(54%)
Office of the President	170,134	194,187	(24,053)	(14%)	170,134	220,470	(50,336)	(30%)
Development, Alumni & Community Engagement	7,185	9,890	(2,705)	(38%)	7,185	10,214	(3,029)	(42%)
Communications & Marketing	4,258	7,025	(2,767)	(65%)	4,258	7,974	(3,716)	(87%)
Academic Affairs	177,985	277,090	(99,105)	(56%)	177,985	312,212	(134,227)	(75%)
Research Administration	1,937	2,880	(943)	(49%)	1,937	5,480	(3,543)	(183%)
Student Affairs	734,488	879,685	(145,197)	(20%)	968,488	1,296,646	(328,158)	(34%)
Finance & Administration	74,453	73,080	1,373	2%	74,453	79,959	(5,506)	(7%)
TOTAL	**1,828,036**	**2,318,411**	**(490,375)**	**(27%)**	**2,104,036**	**3,010,011**	**(905,975)**	**(43%)**

Oakland
UNIVERSITY
30
30
106
106

3 THE MASTER PLAN

The Master Plan proposes new and renovated facilities to support year 2025 enrollment projections and to comprehensively address program aspirations, organization and space needs - both quantitative and qualitative. Proposed recommendations are for near-term implementation of current and planned capital projects and as well as for long-term strategic growth initiatives. Proposed buildings are sited to complement existing land use zones and enhance the campus framework of open space, circulation and infrastructure. Most importantly, recommendations are designed to initiate physical transformation of the OU campus to better reflect its mission and vision.

master plan overview

PLANNING CONCEPTS

The Plan proposes specific facility and infrastructure recommendations for current capital, near- and long-term, projects. Beyond siting specific capital projects, the intent of the plan is to create a framework for coherent long-term growth that is both visionary in concept and flexible in implementation.

OAKLAND UNIVERSITY CAMPUS

The 1,443 acre former estate of Matilda Dodge Wilson consists of a unique blend of resources and amenities. Meadow Brook Hall and the surrounding Historic District form the iconographic original context of the property. Meadow Brook Amphitheater and the Katke-Cousins and R&S Sharf golf courses extend the open bucolic feel of the east side of campus. A natural hydrological system and woodlands form much of the center and southwest portion of campus. The main academic and residential district is on the west side of the property. It is characterized by a mix of well-formed and lovely open spaces such as Library Mall and functional nondescript spaces such as Parking Lot 1. Library Mall presents the quintessential collegiate image at the core campus gateway, while P-1 presents a utilitarian identity that does not reflect the dynamic intellectual community that is OU.

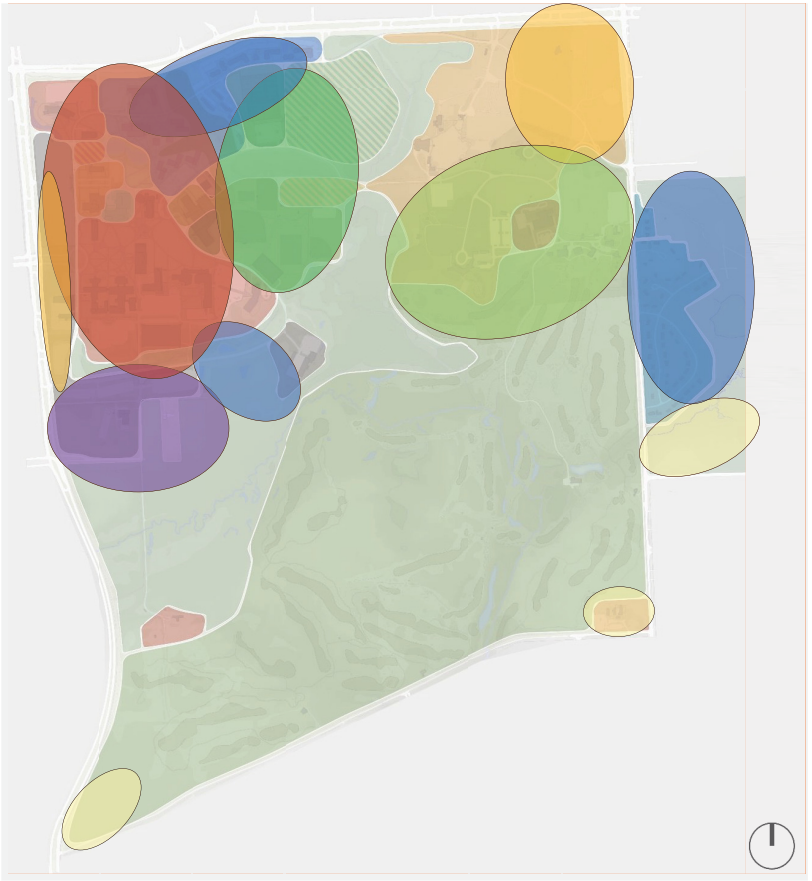


Figure 3.1, Conceptual Future Land Use Plan

- Academic District
- Innovation District
- Housing Villages
- Athletics District
- Mixed-Use Development
- Development Zones
- Historic District

LAND USE PLAN

The Plan defines place and program-based opportunities to promote the concept of "one campus, multiple overlapping districts."

Reinforce and Grow the Academic Core

A relatively compact Academic District will see significant new facilities through the infill of under-utilized areas. This concept will allow for needed growth while reinforcing the pedestrian-oriented nature of campus. Most new academic facilities will be within a five minute walk of the Elliott Tower at the center of campus. This approach to reinforcing the core allows complementary and overlapping districts to develop around it, as well as the opportunity to leverage other property for revenue generating enterprises.

Steward the Character of the Historic Campus

Meadow Brook Hall and its environs should remain the centerpiece of the Oakland Campus as its origin and cultural heart.

Expand the Living and Learning Environment

The existing North Residential Village will see renovations and upgrades to create a greater sense of community. A new South Housing Village, ultimately encompassing approximately 2,000 beds will substantially transform the area southeast of the academic core and expand the living and learning environment.

Plan for Entrepreneurial Innovation Partnerships

As the academic core is strengthened through higher density, the area south of Pioneer Drive is developed as an Innovation District to connect the academy and industry through research partnerships on campus.

Create an Inviting Community Presence

Mixed-use developments along Squirrel Road and at the northeast corner of campus will transform the campus identity to the surrounding community. It will bring revenue generating, welcoming social and cultural enhancements to campus, further embedding OU in the community.

Unite Athletics and Recreation

Plan recommendations utilize multiple strategies to connect the Upper and Lower Fields for a unified and better-served district.

Land Bank of Potential Development Zones

Other University properties not immediately needed or in use for mission critical activities should remain as currently used until a new need or opportunity arises. Sale of OU property is discouraged.

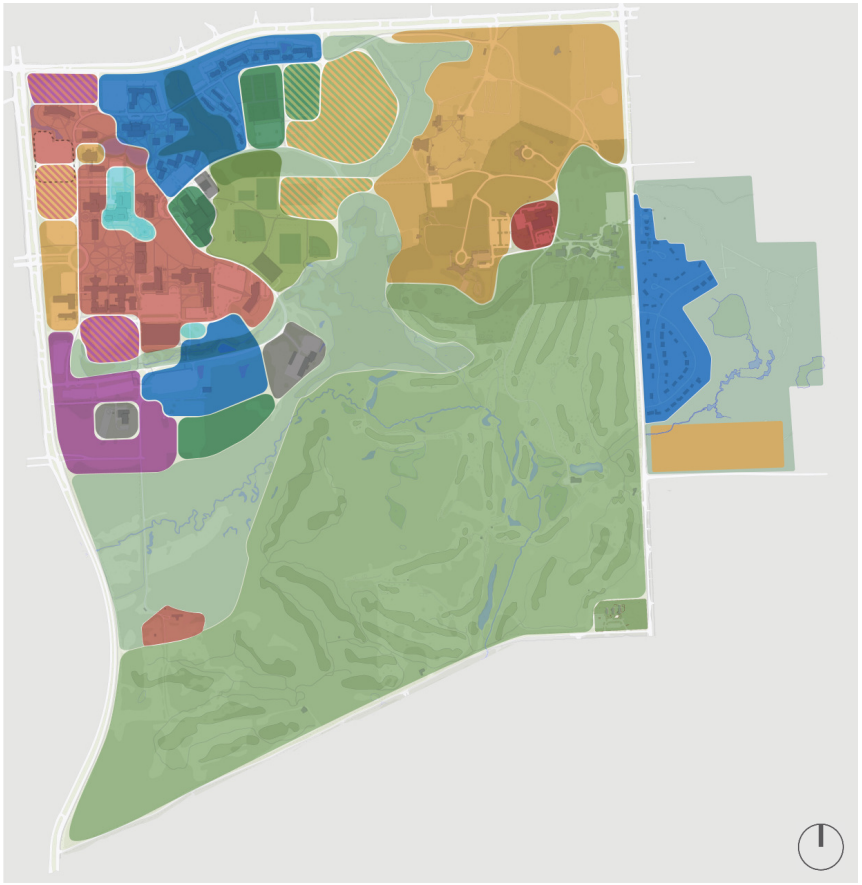


Figure 3.2, Future Land Use Plan

- Academic
- Research
- Community Interface
- Student Life
- Student Housing
- Athletics
- Recreation
- Support
- Natural Systems / Meadow Brook Golf Course
- Mix - Academic & Research
- Mix - Academic & Community
- Mix - Athletic & Community
- Mix - Athletic & Recreation

FRAMEWORK PLAN

Individual proposed projects will provide new and renovated program space to help reconcile space needs. Through integrated planning, larger framework concepts will inspire the stewardship of resources, functional adjacencies and place-making on campus. The Framework Plan lays out the basic structure for future campus growth and allows for flexibility in its implementation. Elements of the Framework Plan are graphically depicted on the next page and listed below:

- Focuses campus academic and student life growth within the existing loop road to maximize land resources and leverage other parcels for potential revenue producing partnerships
- Enhances the vibrant core campus by expanding the student center, increasing dining choices and adding collaborative study spaces
- Recommends ways to implement academic department growth aspirations and increase the number of overall classrooms
- Expands the residential character of campus with a new South Campus Housing Village with approximately 2,000 new beds
- Re-envisions the University Drive Gateway and community engagement along Squirrel Road
- Strengthens the Open Space Network; creating more usable outdoor spaces and better connections across campus
- Creates a new Research District designed to attract industry partnerships
- Proposes a new southern and eastern campus loop road to reduce congestion and pedestrian conflicts
- Addresses parking capacity issues through strategic placement of new parking facilities as well as through policy initiatives
- Enhances the campus infrastructure capacity to align with growth projections and functional needs through sustainable measures
- Develops an implementation strategy for new campus projects
- Develops design guidelines for future building and campus improvements

PROGRAM	PLACE
Parking	Pedestrian Oriented, Stewardship of land
Housing	Residential Campus, Build Community
Student Center/Dining	Vibrant Campus Life, Student Success
Classrooms	Active, Smart, Flexible
Meeting/Study Space	Flexible, Multi-Use, Engage Community
Research	Interdisciplinary, Entrepreneurial

Quantitative Needs | Qualitative Goals

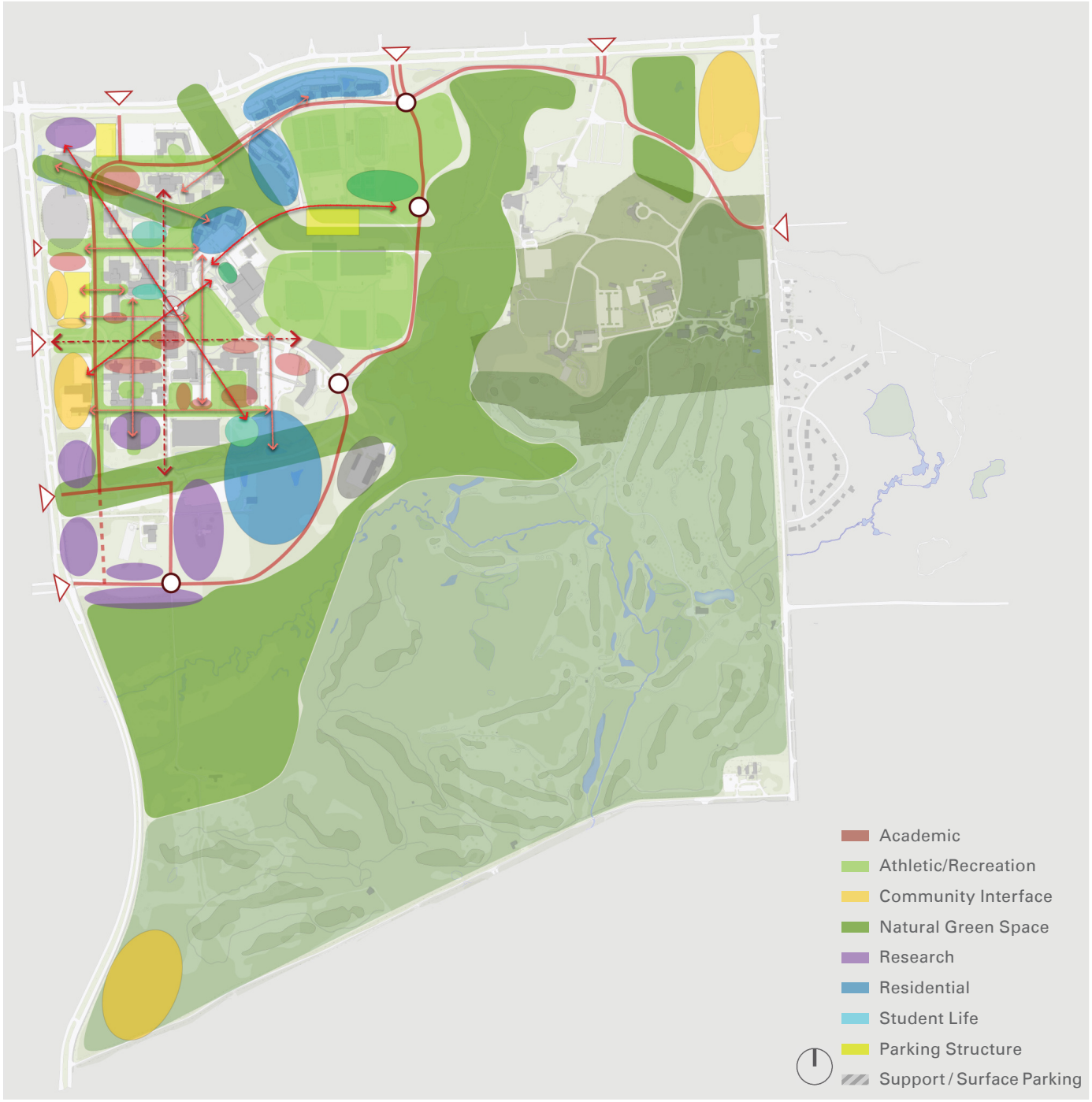


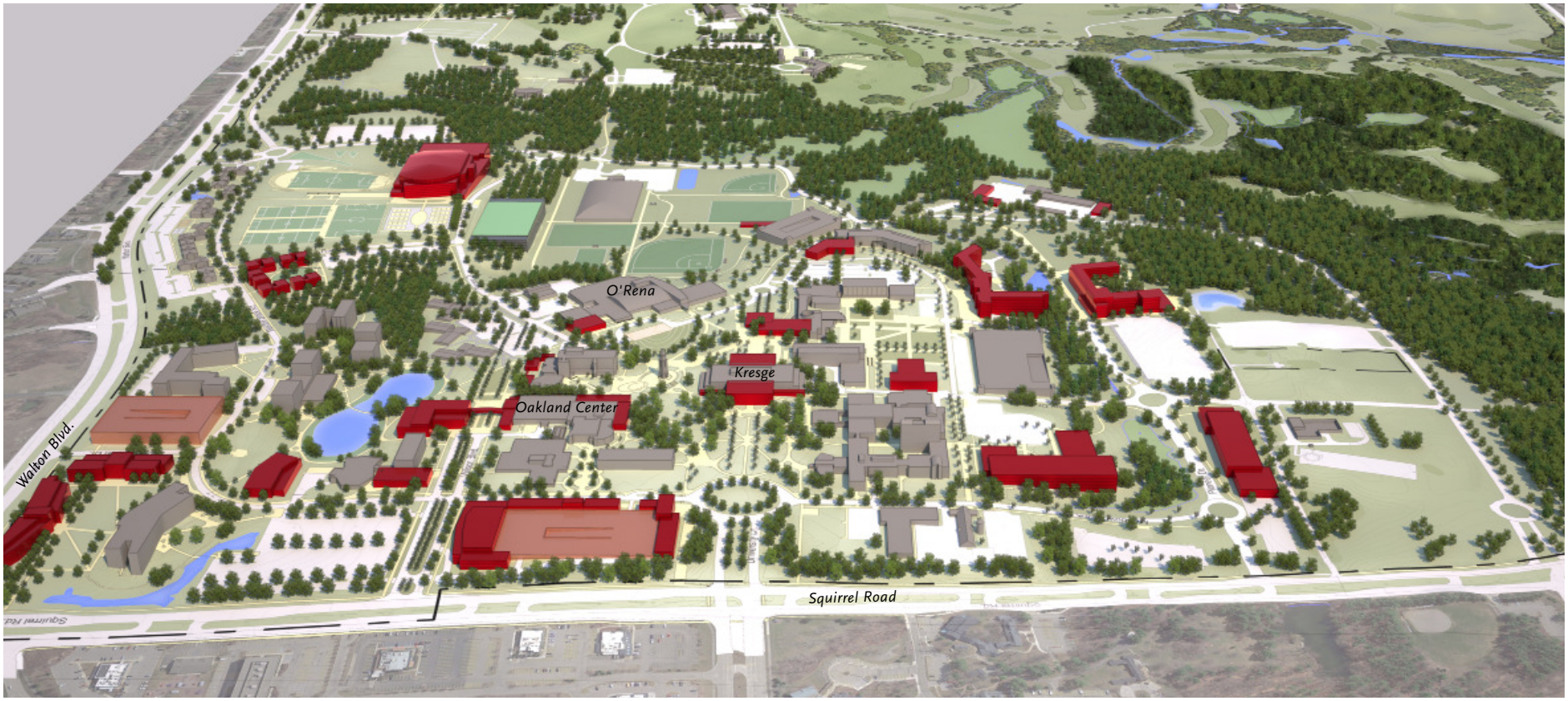
Figure 3.3, Framework Plan

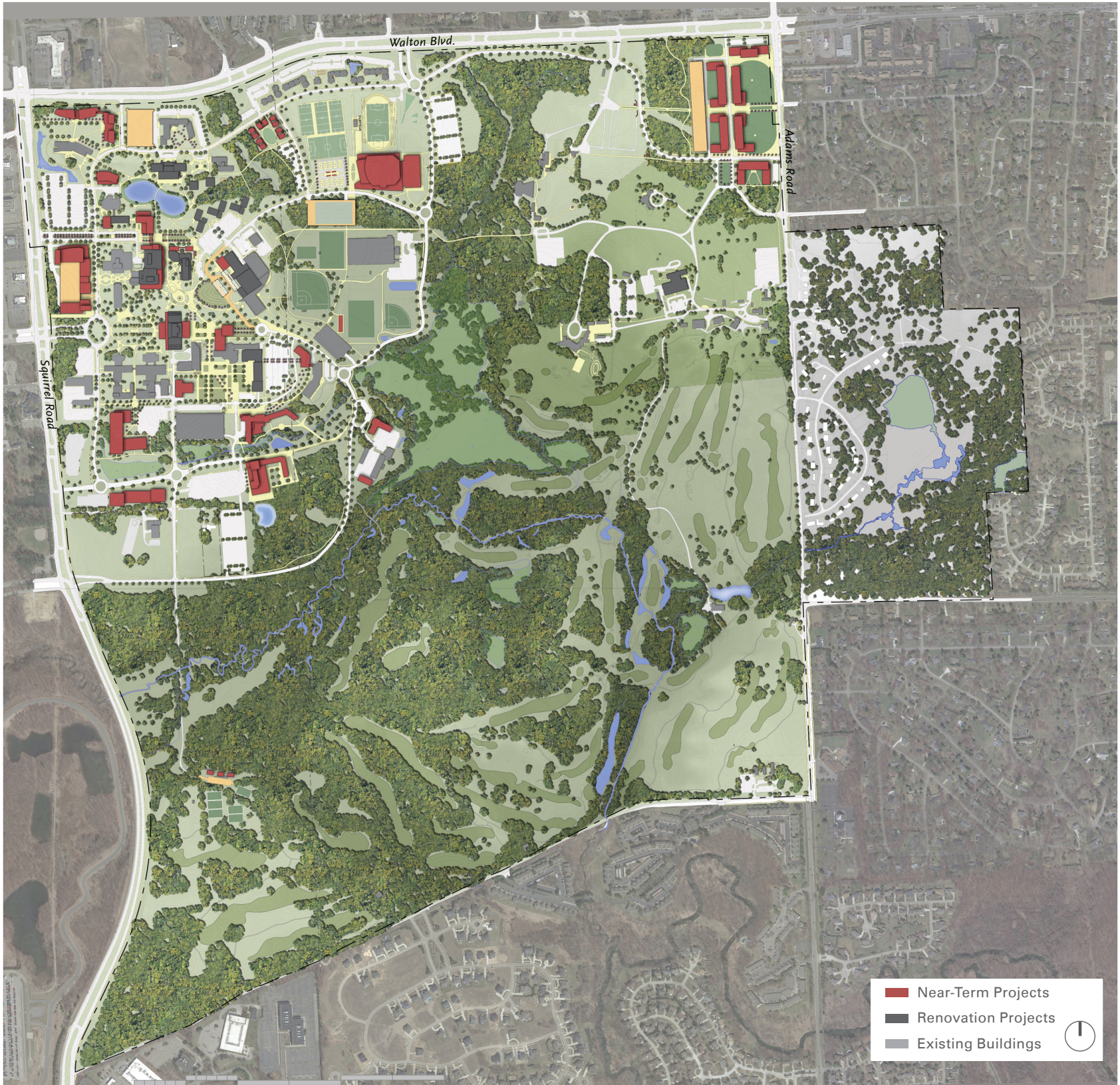
near-term plan

SUMMARY

Near-Term projects include current Capital Projects and subsequent projects that will position OU to fulfill its strategic vision for enrollment growth to 23,000 students. This plan provides new and renovated teaching spaces, expanded research capability, more on-campus student residences and student life amenities. In order to build flexibility into the plan, more projects are shown in this phase than are likely to be realized. Fortuitous events may occur and change the immediate needs of the institution. Within the context of this near-term period, implementation logistics may dictate that some projects happen before others.

The Near-Term Plan transforms the Academic District with infill projects and an extended and connected open space network. A proposed mixed-use development on P1 along with continued growth at the northwest corner will change OU's identity along Squirrel Road and Walton Boulevard. The Convocation Center will create increased activity on campus and in the community. The corner of Walton and Adams Road provides a great opportunity for revenue generating development, potentially through a public private partnership. Research facilities begin to populate the overlap between the Academic and Innovation Districts.




Walton Blvd.
Adams Road
Squirrel Road
Near-Term Projects
Renovation Projects
Existing Buildings

NEAR-TERM PLAN APPROXIMATE TOTAL GSF:

New	2,270,000
Renovation	720,000
Student Housing	±1,400 beds
Mixed Use (# 36)	620,000

ID	PROGRAM	LEVELS	GSF NEW	GSF RENO
1	Industry-University Collaborative Research Building	2-3	85,000	
2	Environmental Science Facility			
3	South Dining Hall			
4	South Housing – Phase 1	5-7	262,000	
5	South Housing – Phase 2	5-6	262,000	
6	South Student Center and Recreation Center	1-2	86,700	
7	Facilities Management – Skilled Trades Addition	1	20,000	
8	Central Receiving and Support Services	1-2	25,000	
9	Integrated BioMedical Research - Phase 1	2-3	150,000	
10	Multi-Disciplinary Building	2	42,600	
11	Kresge Library – Addition and Renovation	3-4	88,000	164,500
12	School of Business - Elliott Hall Addition	3	50,000	
13	College of Arts & Sciences (CAS) – Varner Renovation	2-5		123,000
14	School of Education - Pawley Hall Addition	2.5	47,012	
15	Lower Fields Support Building	1	6,000	
16	Student Recreation Expansion – RAC Renovation	1		70,000
17	Athletics – Lepley Renovation/Addition	1	10,000	9,000
18	CAS – O'Dowd Renovation (Med School Vacate)	0		26,000

ID	PROGRAM	LEVELS	GSF NEW	GSF RENO
19	Oakland Center Addition and Renovation	1-2	50,000	25,000
20	Welcome/Alumni/Outreach Center	2	40,000	
21	Parking Structure, 1,176 spaces	5		
22	CAS – New Concert Hall and Academic Space	2	241,000	
23	CAS – Wilson Hall Renovation & Addition	2	20,000	40,000
24	Multi-Disciplinary Building	3-4	103,000	
25	Anibal, Fitzgerald & Pryale Renovation	2		41,097
26	Parking Structure, 1,840 spaces	5		
27	Convocation Center/Athletics/Community Interface	1-2	200,000	
28	Matthews Replacement Housing	2-3	90,000	
29	Hill Hall and Van Wagoner Hall Renovation	6-8		102,000
30	Vandenberg Hall Renovation	7		118,300
31	Social Sciences New Building	2-3	85,300	
32	School of Medicine	5	168,500	
33	Health Professions Research Building	4-5	123,750	
34	Parking Structure, 1,150 spaces	4	0	
35	Meadow Brook Museum - Former Incubator Space	1	20,000	
36	Mixed Use Development	3-4	618,000	

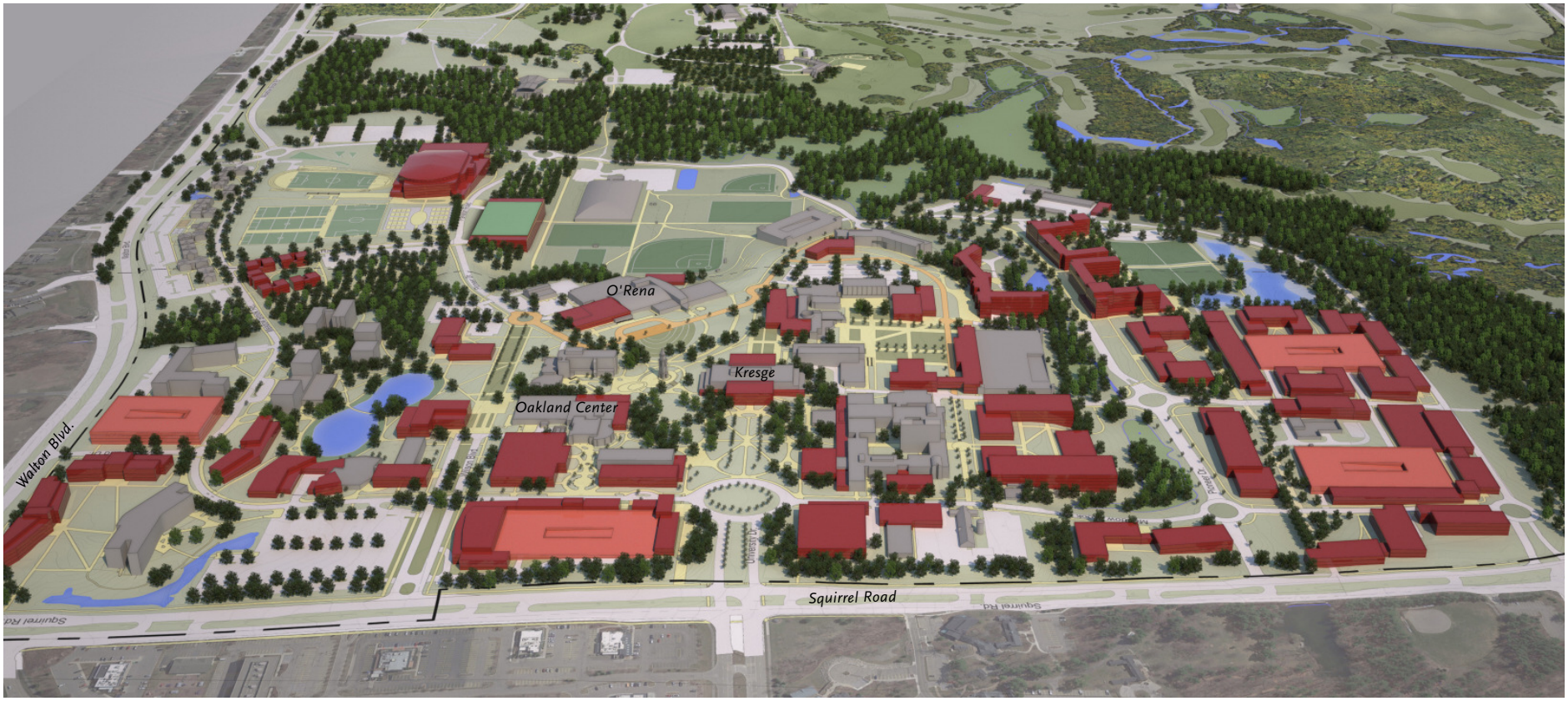
Figure 3.4, Near-Term Plan

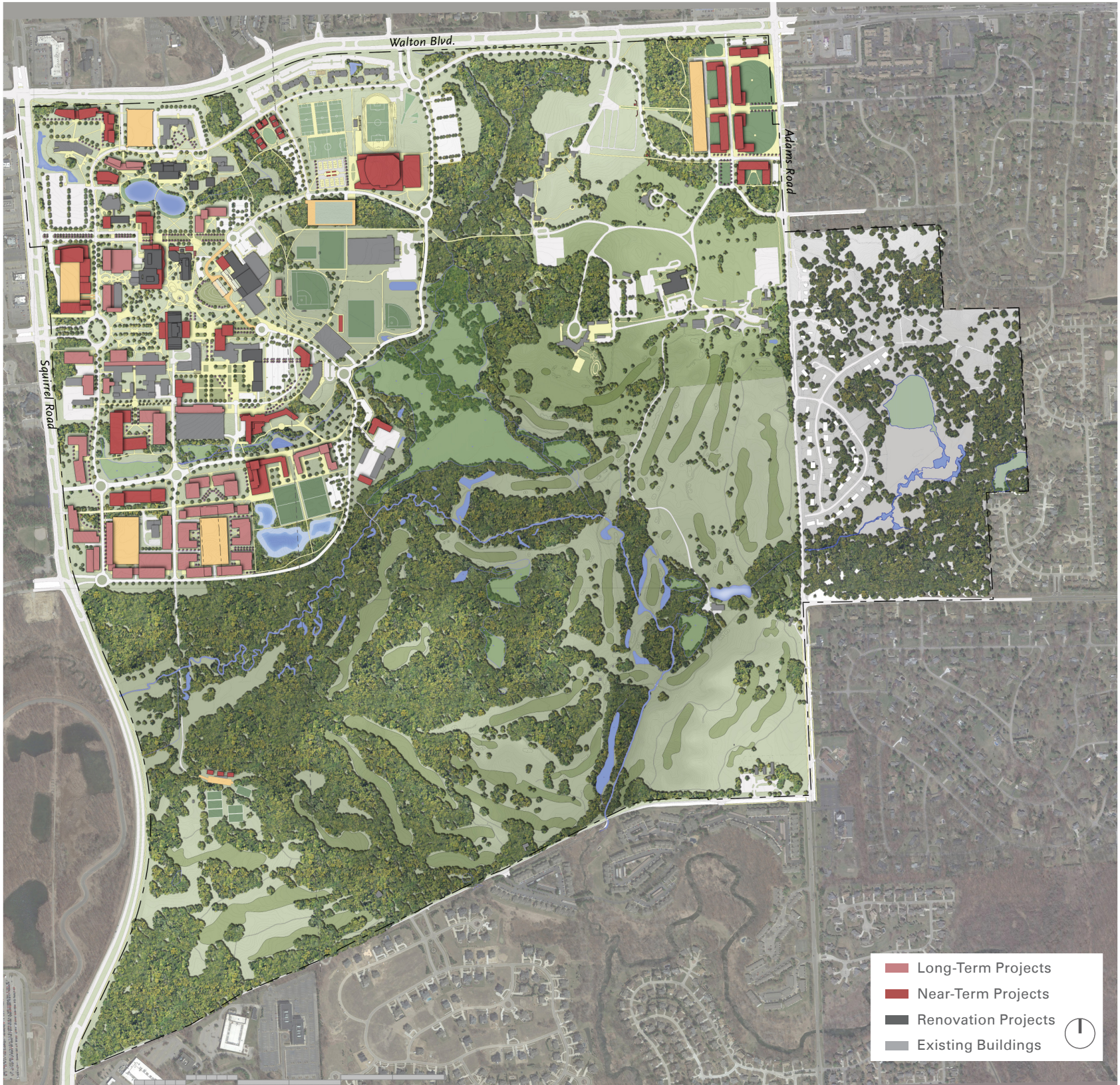
long-term plan

SUMMARY

The Long-Term Vision Plan continues to build on the campus framework and approximates what would conceivably be the carrying capacity of this part of campus. Infill within the Academic District continues to provide future teaching, student life, administration and outreach facilities. The "Main Street" concept for Meadow Brook Road is developed and provides pedestrian friendly connection from the Health Professions Research Building on the north to the Innovation District on the south. Potential buildout in the Innovation District would yield a great deal of potential partnership space and research growth. New research buildings continue to redefine the OU image along Squirrel Road. The southernmost campus gateway connects across Squirrel Road into the Oakland Technology Park.

The South Housing Village and open space is also completed in this phase.




Walton Blvd.
Adams Road
Squirrel Road
Long-Term Projects
Near-Term Projects
Renovation Projects
Existing Buildings

LONG-TERM PLAN APPROXIMATE TOTAL GSF:

Academic:	500,000
Research:	1,800,000
Student Housing:	±600 beds

ID	PROGRAM	LEVELS	GSF NEW
1	Research Cluster	3	679,500
2	Research Cluster	3	455,400
3	Research Cluster	3	222,000
4	Research	3	212,100
5	Recreation Fields - South Housing		
6	South Housing – Phase 3	5-6	262,000
7	General Purpose Classroom	2	67,400
8	Integrated Biomedical Research - Phase 2	3	150,000
9	Research Building	3	134,400
10	Police Department - Addition	1	19,700
11	Hannah Hall - Addition West	3	33,000
12	Outreach Building	1	30,000
13	Hannah / Dodge Hall - Addition North	1	42,000
14	South Foundation - Addition	2-3	65,000
15	North Foundation - New Building	2-3	133,000
16	Lower Fields Support Building	1	9,600
17	General Purpose Classroom	2-3	34,160
18	General Purpose Classroom	2-3	28,500

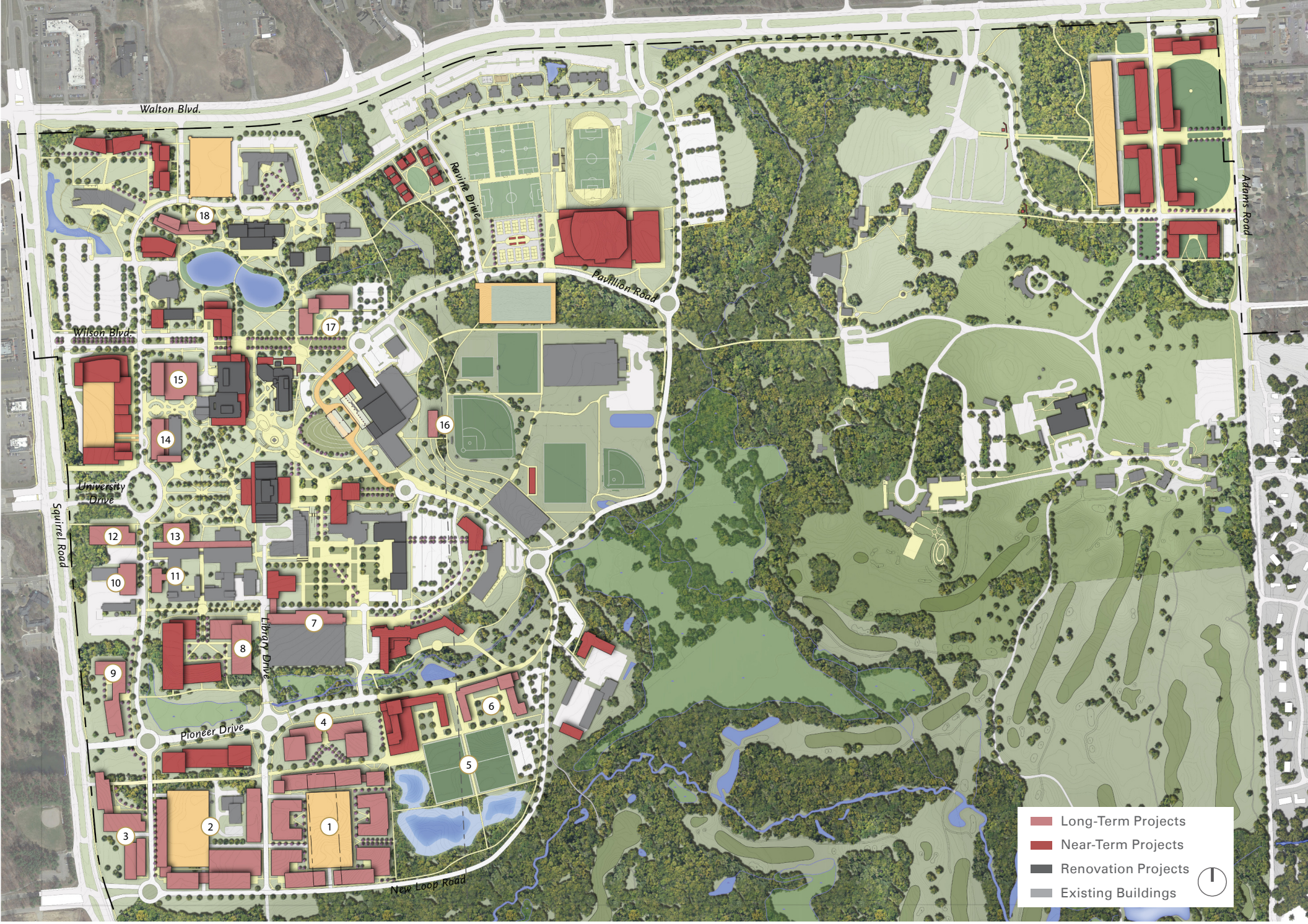


Figure 3.6, Long-Term Vision Plan

master plan focus areas

DISTRICTS

The Master Plan program depicted on the previous pages is shown relative to near and long-term implementation. Projects have also been carefully sited to reinforce six existing and future campus districts:*

Academic District

The Academic District will continue as the core of the OU campus and in key locations, face outward to engage the larger community. It provides the primary identity for Oakland University.

Residential Villages - North & South

The South Housing Village is sited in a "quieter" location and is convenient to academics, research and future student recreation facilities.

The North Housing Village will be enhanced with pedestrian emphasis along Meadow Brook Road from Vandenberg Hall to the Nicholson Apartments.

Athletics & Recreation District

The Athletics and Recreation District will unite the upper and lower fields with a new Convocation Center at its heart and via a parking deck and a new loop road on the east. It also is connected to the nearby academic core and the residential villages.

Innovation District

The Innovation District, where academics and research are brought together, is well located adjacent to academics, along Squirrel Road for easy access and identity and directly across from the Oakland Technology Park.

Mixed Use District at Northeast Corner

A proposed Mixed Use District leverages university land holdings well suited for revenue generation to enhance the cultural amenities around Meadow Brook Hall. It also links with existing community shopping and restaurants.

Through campus infill growth, the identity and life of each existing district will become stronger by siting complementary facilities. Each district is also designed with spatial qualities to strengthen its sense of place. In new districts, first phase projects are sited within a larger framework to be built out over time. Districts are not intended to be solely single use, but to create a critical mass of like activity in order to strengthen overall efficiency and experience. Each district may contain elements of other uses. Boundaries are deliberately loosely defined and overlapping.

Where district overlap occurs, the opportunities for synergistic, collaborative and interdisciplinary projects are greatest. These types of projects will act as connectors between districts by bringing diverse groups together. For example, a new South Dining Hall will provide a connection between the Academic District's south side and the new housing. Similarly, a satellite student union and recreation center in phase 2 of the South Housing Village will provide a nearby social outlet for the Innovation District. The RAC is already a connector building between the Academic District and Athletics. A new building south of Bear Lake and north of the Oakland Center is another opportunity for multi-disciplinary collaboration space or student support functions.

Districts are designed to reinforce Plan goals for vibrant campus life, outstanding programs and a compelling physical presence. Enhanced connections between districts will better knit the internal campus fabric into a seamless whole. Outwardly facing intellectual and cultural assets will catalyze partnerships with local governments, communities and businesses.

*The Meadow Brook Farm historic district and the faculty subdivision are clearly other campus districts. This study does not recommend changes to these areas.


Walton Blvd.
RESIDENTIAL VILLAGE NORTH
MIXED-USE DISTRICT
ATHLETICS & RECREATION DISTRICT
ACADEMIC DISTRICT
Adams Road
Squirrel Road
RESIDENTIAL VILLAGE SOUTH
INNOVATION DISTRICT

ACADEMIC DISTRICT

The elements proposed within the Academic District Plan seek to reinforce Master Plan Goals:

» Vibrant Campus Life
» Outstanding Programs
» Compelling Physical Presence

The University Drive gateway and Library Mall at the core campus is the symbolic center of the University. The addition to the OC on the building's south side and to the Library on the west side will reinforce this as the center of activity on campus as well. Other Academic District open spaces like the amphitheater on the east side of the Library, the Health Professions quad and the new quad west of Varner Hall will strengthen the civic quality of campus. Meadow Brook Road will eventually connect from the Health Professions to the south campus gateway in the Innovation District providing the opportunity for a continuous "Main Street" to campus.

Other Proposed Features within the Academic District are:

- New and enhanced east-west and north-south pedestrian circulation network
- Naturalized recreational trail and park adjacent to stormwater drainage feature along Pioneer Drive
- Enhanced identity for the southern ridge the of Academic District along Pioneer Drive
- Potential for parking under the quad west of Varner Hall
- Buildings #3 and #25 partially designated for multi-disciplinary collaboration spaces for Centers of Excellence
- Bear Lake improvements potentially include: plaza adjacent to Vandenberg Hall for outdoor dining, hillside seating around the lake and extend a pier over the lake
- Increased parking capacity on the north side of the district

1. **Integrated Biomedical Research Phase 1 & 2 (P-38)**
   150,000 SF/phase, contains Academic functions serving the campus context
2. **General Purpose Classroom (P-34)**
   67,400 SF
3. **Multi-Disciplinary Building (P-36) and Adjoining Quad**
   42,600 SF
4. **South Dining Hall & South Housing – Phase 1**
   Dining and Classroom serving the broader campus context - Underway
5. **Pawley Hall**
   47,000 SF School of Education Addition
6. **College of Arts and Sciences (CAS) – Varner Hall Renovation**
   123,000 SF for Art & Art History
7. **Elliott Hall School of Business**
   50,000 SF School of Business Addition - Underway
8. **Hannah Hall**
   33,000 SF Addition
9. **Police Department – Addition**
   19,700 SF
10. **Outreach Building (P-43)**
    30,000 SF
11. **Hannah / Dodge Hall - Addition North**
    42,000 SF
12. **Kresge Library & East Plaza**
    88,000 SF Addition and 164,500 SF Renovation
13. **Welcome Center & Alumni / Outreach**
    40,000 SF as a part of P-1 Mixed-Use project
14. **Parking Structure (P-1)**
    1,176 spaces @ 70,500 SF/level, 5 levels
15. **CAS – New Concert Hall & Music, Theatre and Dance**
    241,000 SF as a part of P-1 Mixed-Use project
16. **South Foundation Hall**
    65, 000 SF Addition

17 **North Foundation**
New Building, 133,000 SF

18 **Oakland Center**
Addition and Renovation - Underway

19 **CAS – O'Dowd Renovation**
± 26,000 SF after School of Medicine vacates space

20 **Amphitheatre and Pavilion**
Campus beautification project adjacent Elliott Tower

21 **Student Recreation Expansion**
RAC Renovation

22 **Lepley**
Athletics, Lepley Renovation - Underway

23 **Anibal, Fitzgerald & Pryale**
Renovation in Near-Term

General Purpose Classroom
34,160 SF, Anibal, Fitzgerald & Pryale replacement in Long-Term

24 **Pedestrian Mall**
Extension of Wilson Boulevard

25 **Multi-Disciplinary Building (P-2)**
103,000 SF, Swing Space

26 **CAS – Wilson Hall**
Addition and Renovation

27 **Social Sciences Building**
85,300 SF, New Building on Graham Health site

28 **General Purpose Classroom**
28,500 SF, New Building Adjacent to Bear Lake

29 **Health Professions Research Building**
123,750 SF

30 **School of Medicine**
168,500 SF

31 **Parking Structure (P-5)**
1,152 spaces @ 86,400 SF/level, 4 levels

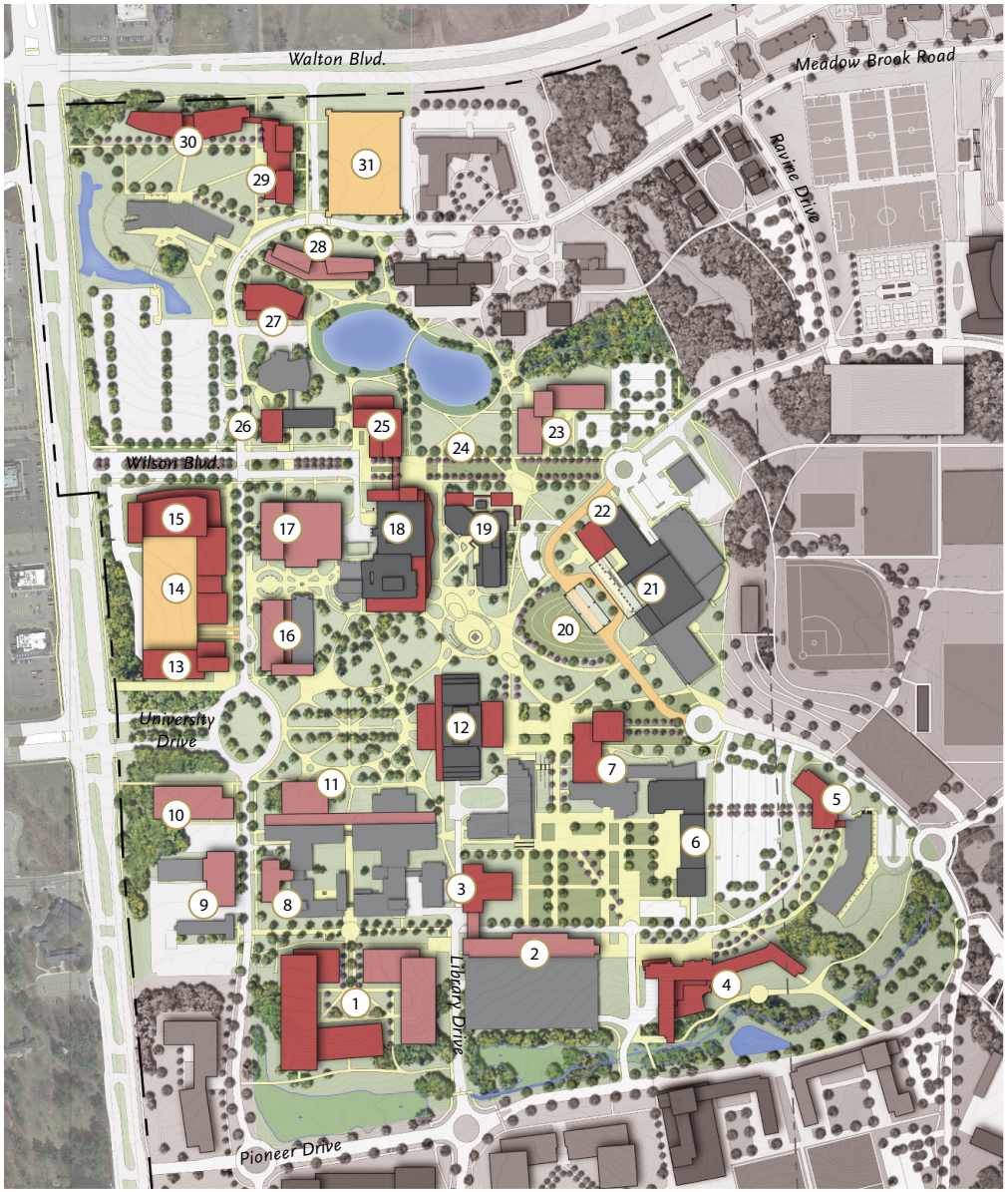
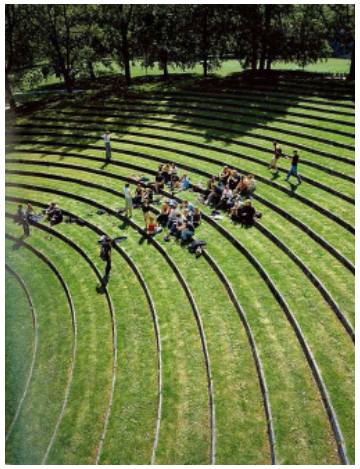


Figure 3.7, Near & Long-Term Plan - Academic District

Academic District Plan Features: Extending the Campus Fabric

The rendering on the following page portrays campus development on the east side of Kresge Library. Most prominently depicted is a new addition and entry to the Library from the east. An accessible path connects from the drop-off circle in the left of the view, to the entry plaza through "Library Mall East." The new School of Business expansion fronts this new space and provides sweeping views to a new amphitheater and iconic Elliott Tower. The amphitheater creates a new place on campus for cultural events and everyday socializing. It connects the Recreation Center and O'rena, Elliott Tower, Library and School of Business into a cohesive campus structure. Pioneer Drive is depicted closed to daily traffic, but would be accessible on game days or for other events and potentially at night.



Amphitheatre Photo © C.F. MØLLER

View of existing area where campus fabric will be extended

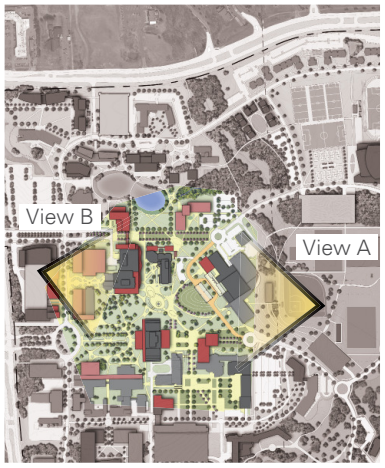
View from Engineering Building toward Elliott Tower

View from Pioneer Drive toward Engineering Building

View A - New Development East of Kresge Library; Positioned over the O'Rena Looking West

View B - 3-D Rendering looking East towards RAC

View toward front door of the RAC

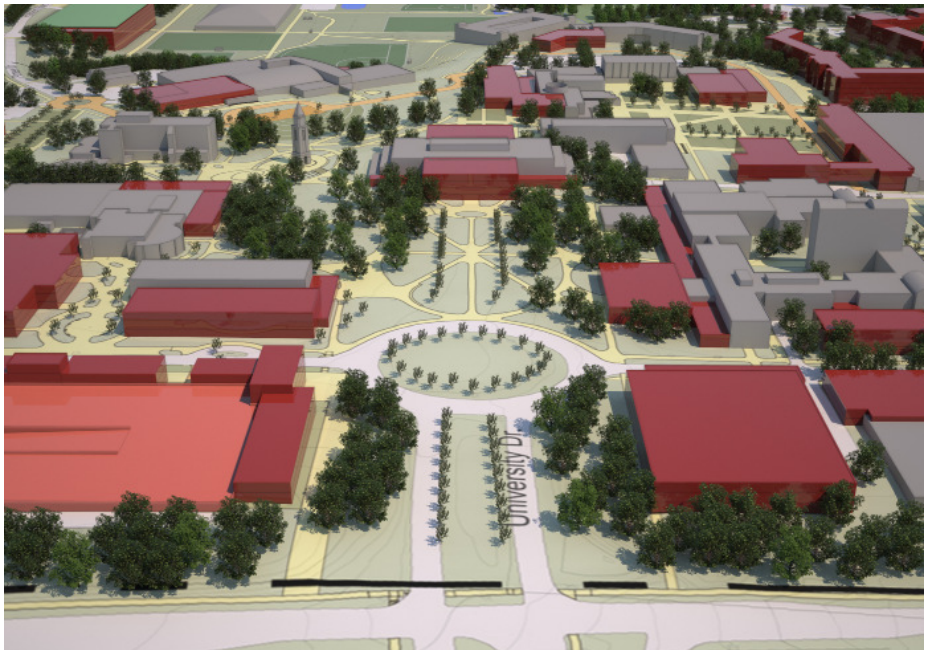


Views Depicted in Renderings

Academic District Plan Features: An Enhanced Campus Identity

The rendering on the following page depicts a redeveloped campus gateway at Wilson Boulevard off of Squirrel Road featuring a new Concert Hall for the College of Arts and Sciences' Music, Theater and Dance program. As part of a mixed-use development on parking lot P-1, the Concert Hall will present a compelling physical presence that puts one of OU's many strong academic programs on display to the broader community. Other development shown creates a one-stop location for student services in parking lot P-2 and connected to the Oakland Center via a bridge.

Additions on the west side of Wilson Hall and North and South Foundation Halls will transform Meadow Brook Road at this location into a campus "Main Street" with student and community amenities such as a bookstore, restaurants and coffee shops. The University Drive campus gateway will be enhanced with a Welcome Center and Alumni Center on the south side of the new parking structure, a new outreach building foreseen on the south side of the gateway, as well as with new additions along Library Mall.



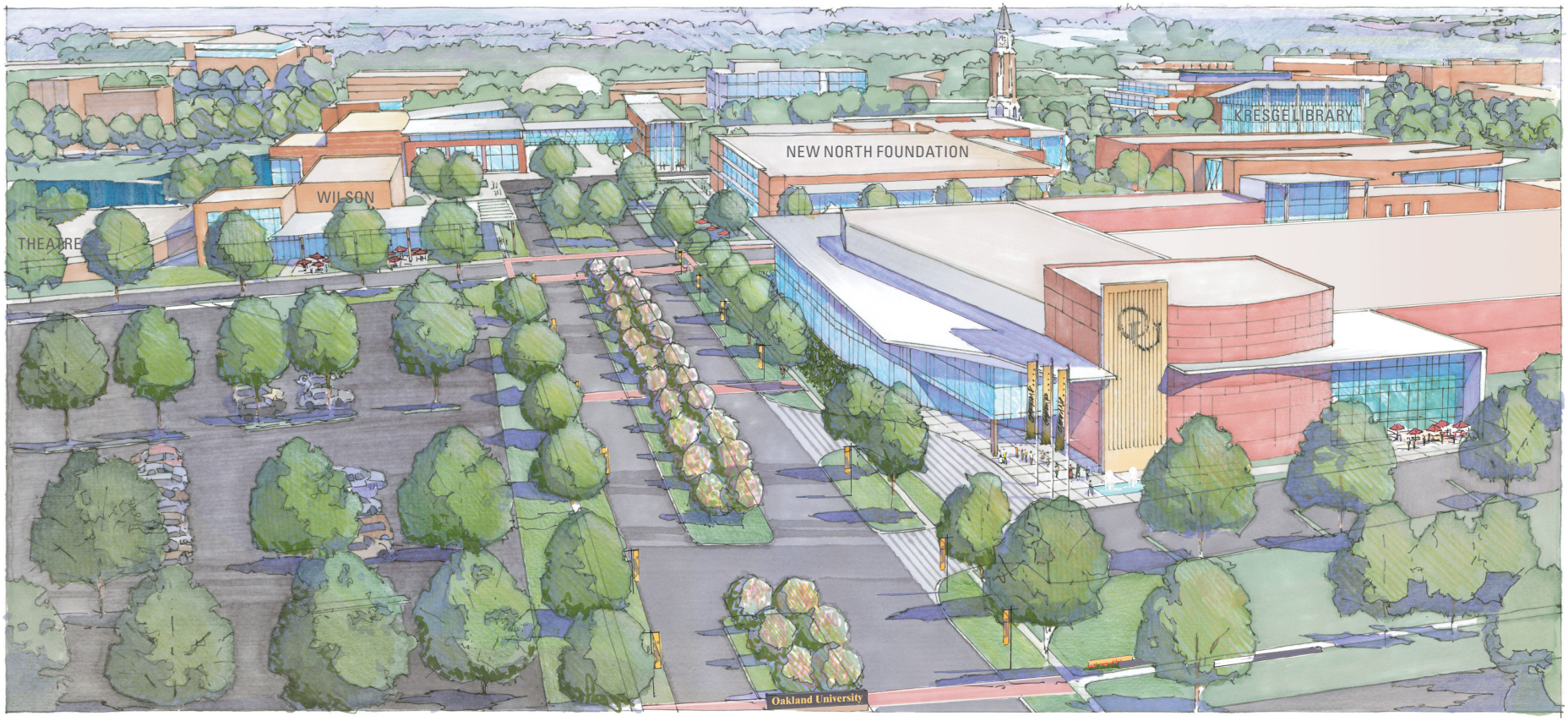
View of Gateway Entry from University Drive towards Library

View down Wilson Boulevard looking East

Precedent image of sustainability best practices

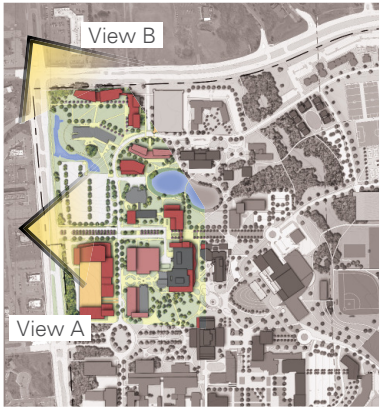
Photo © Erick Saillet

View of P-1 from Human Health Building



View A - View Looking East of Redeveloped Entry at Wilson Boulevard including a New Concert Hall and New Facilities along Meadow Brook Road

View B - 3-D Rendering looking East to Humans Health Building and Future enhancements at the corner of Squirrel and Watson



Views Depicted in Renderings

RESIDENTIAL VILLAGES - NORTH AND SOUTH

Expanding the residential nature of campus is an important element in fostering student success through a robust teaching, learning and living environment. The University is planning for a net increase of 2,000 beds to achieve a total of approximately 4,700 beds – 20% of the future student enrollment of 23,000 HC. Planned residence halls are a mix of new, renovation and replacement housing. Residence Life initiatives call for greater student/faculty and peer engagement within living environments. Public ground floor spaces within residence halls may include classrooms, res life or other offices, food outlets, as well as study lounges/social areas. South-facing outdoor spaces associated with student housing should be programmed for formal and informal activities.

1. **Vandenberg Hall Renovation**
   16,900 sf
2. **Hill Hall and Van Wagoner Hall Renovation**
   Loss of 50 beds in Renovation
3. **Matthews Replacement Housing**
   ± 250 new beds and relocated parking
4. **South Dining Hall & South Housing – Phase 1**
   ± 750 new beds with Dining and Classroom serving the broader campus context
5. **South Housing – Phase 2**
   ± 750 new beds
6. **South Student Center and Recreation Center**
   Dining, Recreation and Classroom serving the braoder campus context
7. **Stormwater Retention Area for South Village – Phase 1 & 2**
   New BMP to account for district growth and stormwater retention

* **Surface Parking for South Housing Village** (incorporated into a parking structure in the long-term buildout of campus), 435 spaces

8. **South Housing – Phase 3**
   ± 600-750 new beds
9. **Recreation Fields for South Village**
   2 fields
10. **Stormwater Retention Area for South Village – Phase 3**
    Expansion of Phase 1 & 2 BMP to account for district growth and stormwater retention

View looking North from South Housing site toward Elliott Tower

Existing View South towards future housing along Pioneer Drive

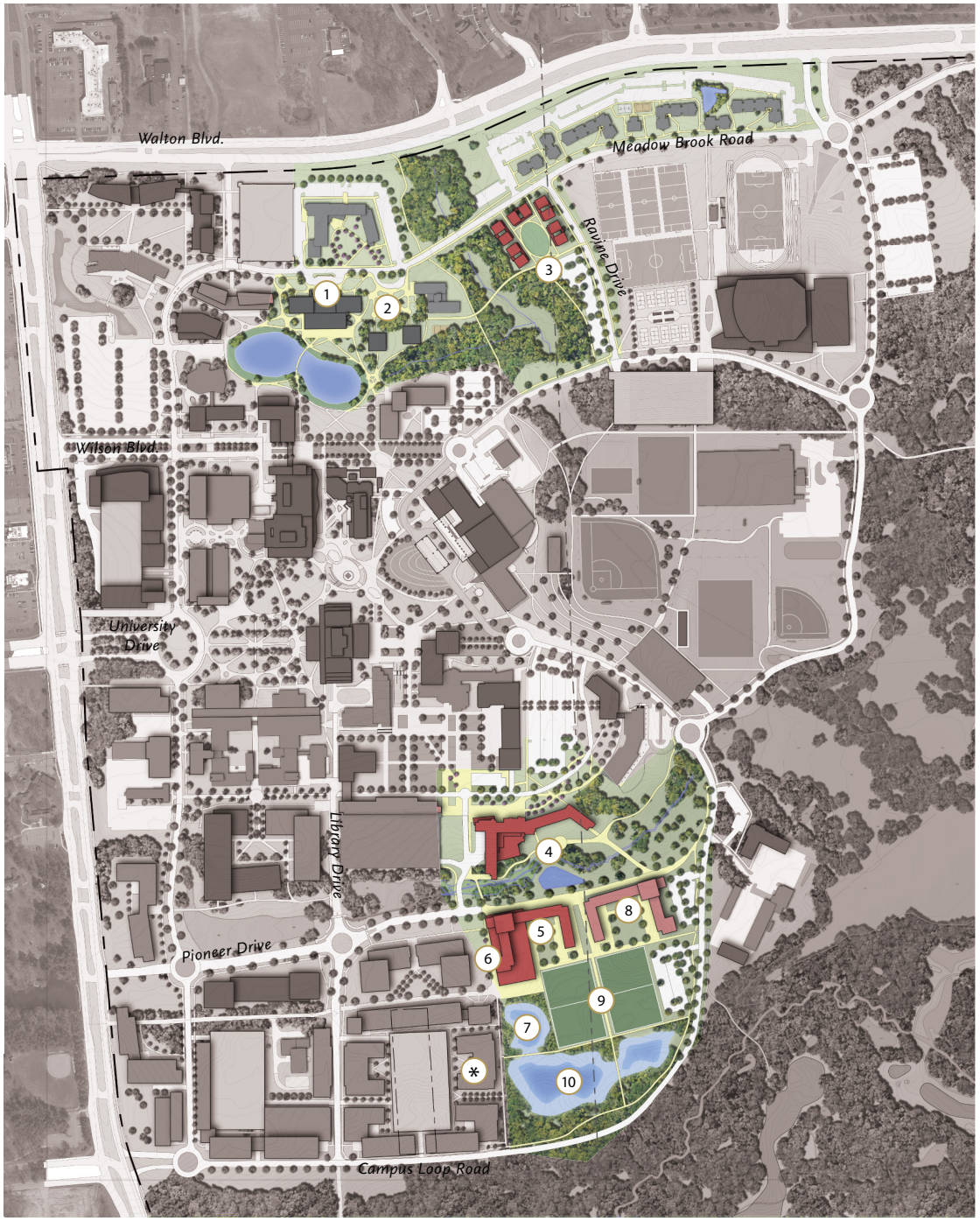


Figure 3.8, Near-Term Plan - Residential Villages, North and South

North Housing Village Proposed Features:

- Renovation of Vandenberg, Hill and Van Wagoner Halls to modernize and create more student engagement spaces
- Replacement apartment housing at the current Matthews Housing site configured to build community with a shared courtyard space
- Emphasis on Meadow Brook Road as a pedestrian/bike connector for the North Housing Village
- North side of Bear Lake better utilized as a student gathering space and outdoor dining
- Clear and simple access to the student recreation fields from student housing

South Housing Village Proposed Features:

- 2,000 new beds to be constructed starting with 750 beds in Phase 1; sited between parking deck P32 and Pawley Hall
- Pedestrian corridor continuation from the Belgian Barn on the east to the Pawley Hall proposed addition on the north side of Phase 1 housing
- South Dining Hall and terraced student spaces on the south side of Phase 1 housing featuring views to the south
- Enhanced stormwater management creek to create a "naturalized quad" between Pioneer Drive and Phase 1
- Eventual decommissioning of Pioneer Drive east of the P32 access drive for auto traffic and its conversion to a pedestrian mall space
- Future satellite student center and recreation center and recreation fields
- Stormwater feature south of rec fields conceived as an outdoor living lab

Long-Term Projects
Near-Term Projects
Renovation Projects
Existing Buildings

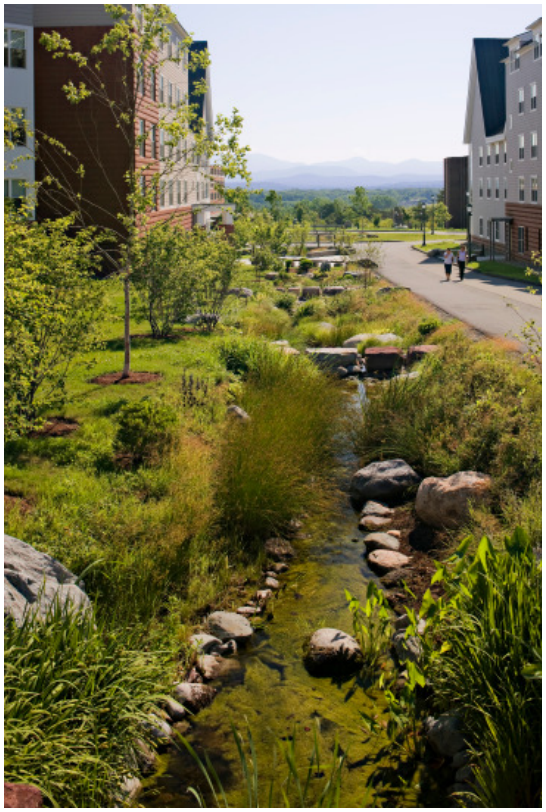
Residential Village Plan Features: A New Campus Identity

The view opposite depicts the South Housing Village's three buildings and grounds. Each individual building phase will be an independent community of 625 – 750 beds. Each community contributes to the overall character and life of the Village. Dining and student activities spaces are sited to stimulate activity at the ground floor along major walks and outdoor spaces. A mix of outdoor spaces will knit the Village together and include linear hardscape pedestrian corridors, naturalized terraced slopes, courtyards, recreation fields and a naturalized wetland feature. Of particular importance will be the area between Phase 1 and Phases 2 and 3. Decommissioning Pioneer Drive will enable a pedestrian oriented open space that unites upper and lower facilities. Visual connections from Phase 1 to the Elliott Tower, from all buildings to the south natural landscape and along Pioneer Drive into the village tie the development to the rest of campus. Bike and pedestrian trails also connect to other parts of campus.

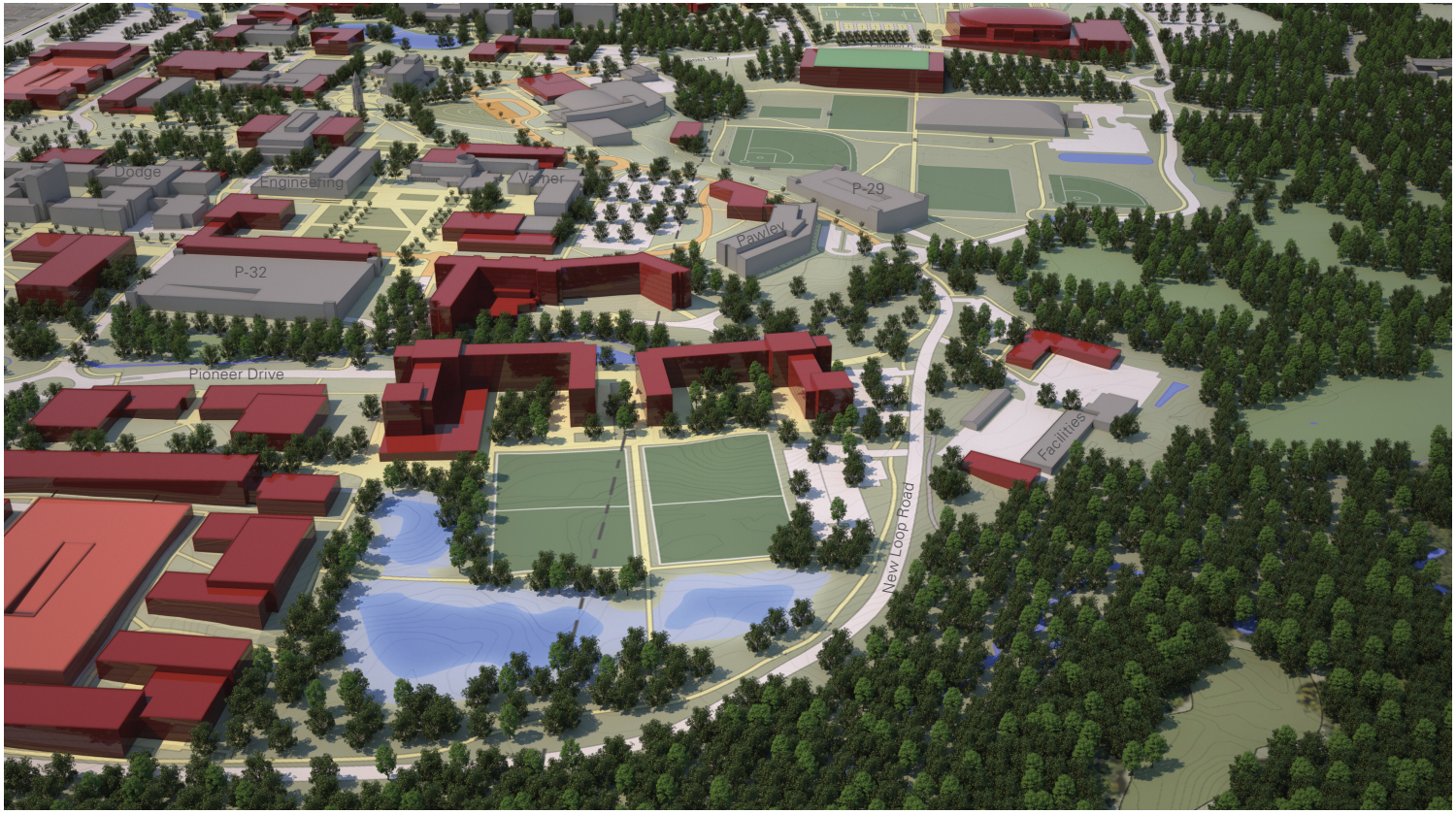
Initially parking for the village will be split between the two existing parking decks and surface lots to the west (here shown in a later phase as the built-out Innovation District). As the Innovation District is developed, structured parking would accommodate both housing and research area parking demand. Service to the South Dining Hall will be underneath on the west side of the building.

Precedent Image of Village Green Space, @ Baylor University

Precedent Image of Pedestrian Connection, @ Ohio University

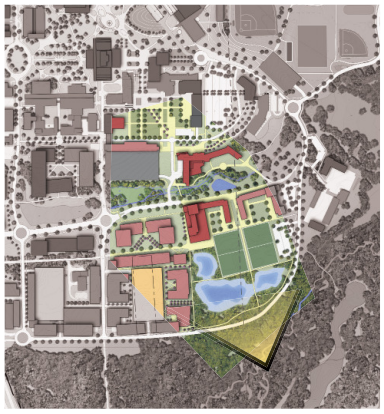


Precedent Image of Rain Garden, @ University of Vermont



3-D Rendering of South Housing Village Looking North

Lakeside Precedent, Umeå Campus Park / Thorbjörn Andersson + Sweco Architects



View Depicted in Above Rendering

ATHLETICS AND RECREATION DISTRICT

The improved and unified Athletics and Recreation District will contribute to all three planning goals of a vibrant campus, strengthening programs and creating a compelling presence. The centerpiece is a proposed 7,500 seat Convocation Center that will front the soccer/track complex and Walton Boulevard beyond on the north and a new public plaza and tennis facility on the west. A north-south pedestrian spine connects the upper fields and Convocation Center to a new 1,800 car parking structure which is sited to take advantage of the large elevation change between upper and lower fields. The top level of the deck could be a walk-out field from the upper public plaza; the structure would provide circulation down to the lower fields thereby uniting the district.

Other Proposed Features in this District are:

- Near-term repurposing and addition to Lepley Pool for Athletics
- Long-Term repurposing of Lepley and O'rena for student recreation
- Support buildings for Athletics adjacent to baseball and soccer fields
- New field on top of parking deck
- Enhanced pedestrian and bike path network connecting upper and lower fields and to nature trails
- Loop road on east side of district connects north and south parts of campus
- Pioneer Drive in front of O'rena and RAC closed to daily traffic becomes event space and connector to academic core
- Parking deck and surface parking for events and daily use

1. **Athletics/Community Interface – Convocation Center**
   200,000 sf
2. **Re-located Tennis Facilities**
   10 courts and stands
3. **Parking Structure**
   1,840 spaces (@110,400 SF/level), 5 levels
4. **Surface Parking for Convocation & Upper Fields**
   ± 470 Spaces
5. **Student Recreation**
   70,000 SF RAC Renovation
6. **Lepley**
   10,000 SF Addition and 9,000 SF Renovation
7. **Event and Transit Only Traffic Lane**
8. **New Traffic Circle**
9. **Re-configured Pedestrian Paths throughout Lower Fields**
10. **Lower Fields Support Building - Soccer**
    6,000 SF
11. **Lower Fields Support Building - Baseball**
    9,600 SF

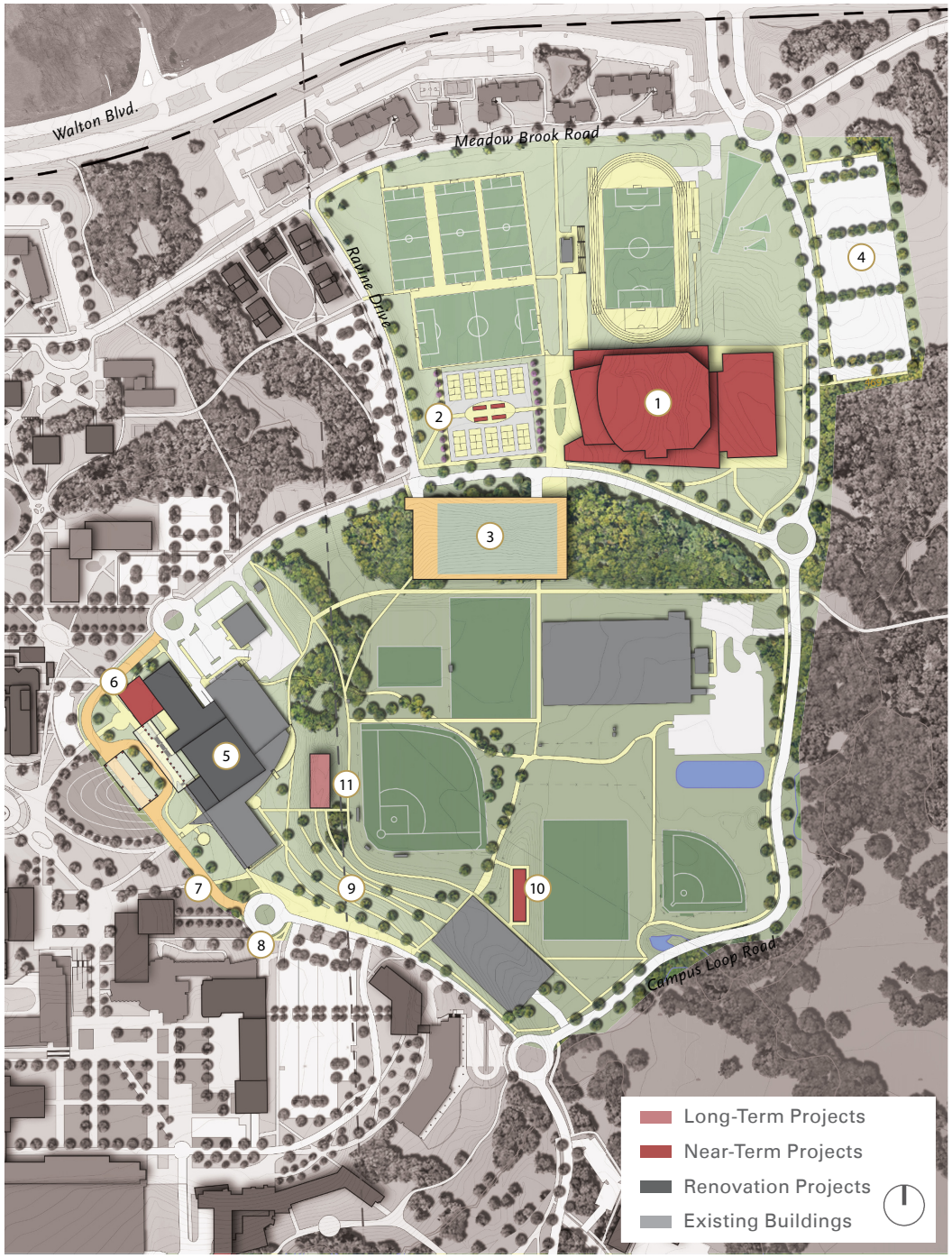
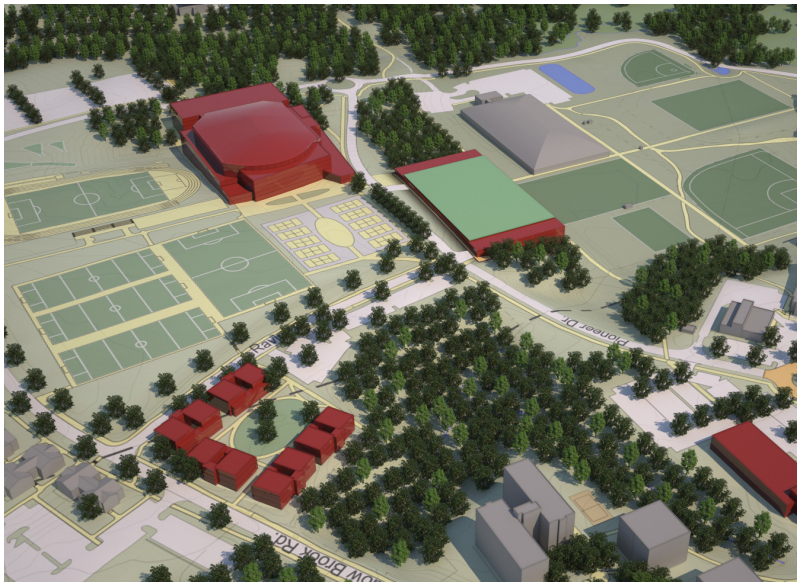
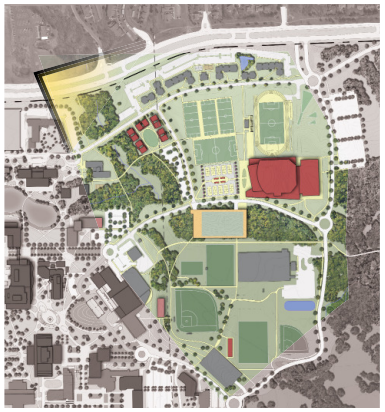


Figure 3.9, Near-Term Plan - Athletics and Recreation District

Existing Baseball Facility at Lower Fields



3-D Rendering of Upper and Lower Fields Looking East Toward New Parking Deck and Convocation Center



View Depicted in Above Rendering

INNOVATION DISTRICT

Goal #2 of the Strategic plan states that Oakland University will be recognized as a strong research and scholarly environment focused on creative endeavors and on discovery, dissemination and utilization of knowledge. In terms of total research and development expenditures within the state of Michigan, the goal is to rank #5 in five years (behind Michigan, Michigan State, Wayne State, Michigan Tech). Assuming no change in other institutions' funding levels, this will require a 20% increase in research funding over the current level.

The proposed approximately 40 acre Innovation District, located primarily between Pioneer Drive and the southern campus gateway and loop road, provides near-term opportunity for interdisciplinary and industry partnered research growth. Long-Term potential growth is quite large and could be considered as a public, private partnership opportunity. The district will anchor the southern edge of campus and help create a new creative and innovative identity for OU.

1. **Integrated BioMedical Research Phase 1 (P-38)**
   150,000 sf
2. **Industry-University Collaborative Research Building (P-37)**
   85,000 sf
3. **South Research Cluster 1**
   679,500 sf of research space, Parking Structure sized to accomodate growth
4. **South Research Cluster 2**
   455,400 sf of research space, Parking Structure sized to accomodate growth
5. **South Research Cluster 3**
   222,000 sf of research space, Parking Structure sized to accomodate growth
6. **Research (P-35)**
   212,100 sf of research space
7. **Integrated Biomedical Research Phase 2 (P-38)**
   150,000 sf of research space
8. **South Research (Temp P-41**
   134,400 sf of research space

View A - 3-D Rendering of Innovation District Looking North

Precedent Image of Research Building, @ Eastern Virginia Medical School

Other Proposed Features in this District are:

- Two primary urban blocks configured on a four street grid tied to existing campus framework
- Services maintained in center of urban blocks
- District configuration is designed to promote collaborative research and foster innovation
- Incubator spaces will help to catalyze and focus entrepreneurial activity
- Primary civic spaces are district streets creating a more urban environment
- Secondary civic spaces include naturalized parks and pedestrian trails
- Housing and commercial/retail/restaurants may be incorporated into portions of the site
- Surface parking in near-term would shift to structured parking over time

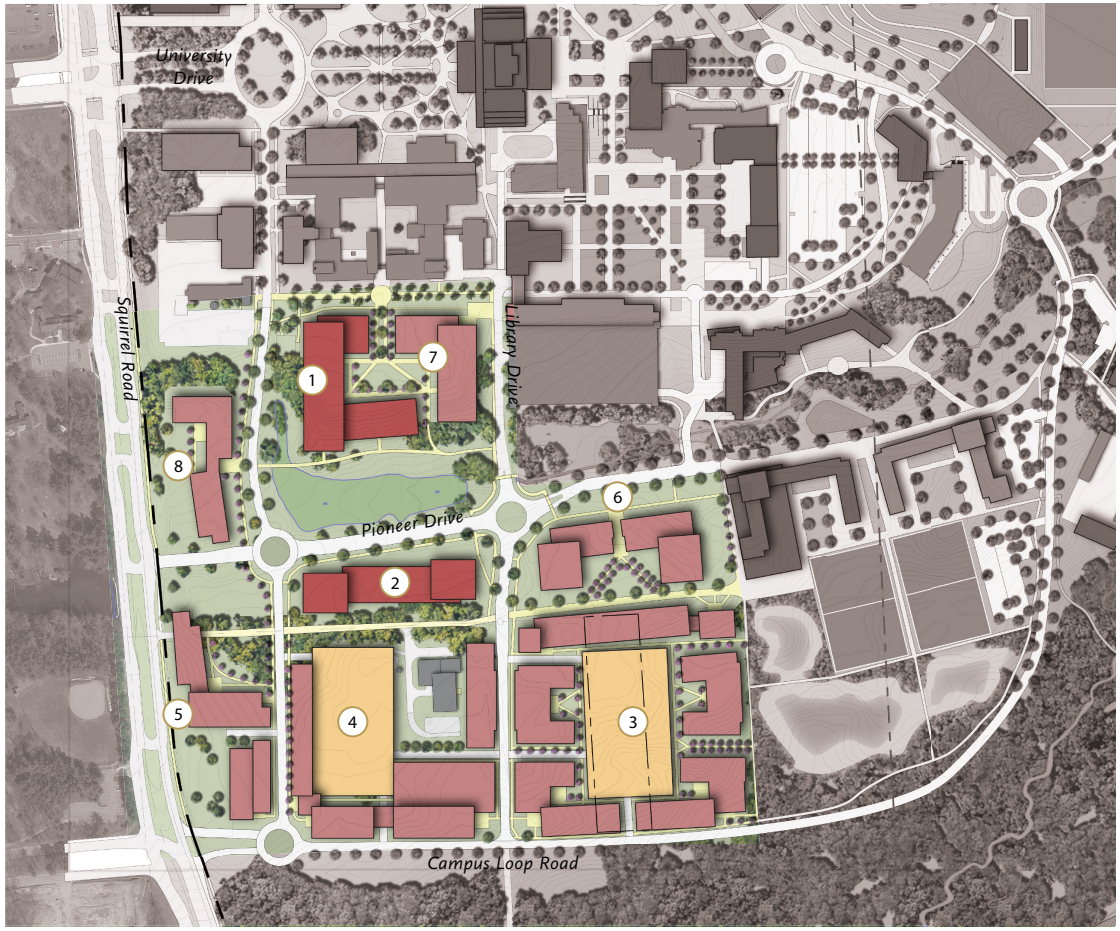
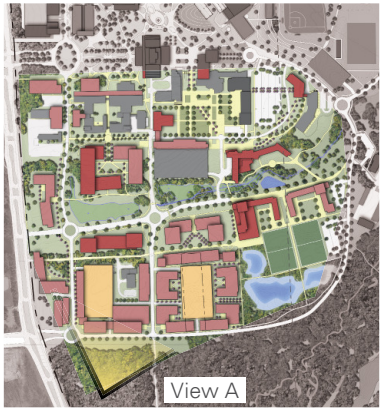


Figure 3.10, Near-Term Plan - Innovation District

Existing View looking South toward P-38 Parking Lot and P-32 Parking Deck



View Depicted in Rendering

Long-Term Projects
Near-Term Projects
Renovation Projects
Existing Buildings

MIXED-USE DISTRICT

Leveraging strategic land assets to help further the institutional mission would have benefits to campus and to the local community while strengthening OU's identity. The master plan recommends careful analysis of these opportunities with long-term retention of ownership and stewardship of the property. The northeast corner of campus at the intersection of Walton Boulevard and Adams Road is a prime location for a partnership to appropriately develop a new mixed use district. Cultural amenities related to the Meadow Brook Estate such as the Meadow Brook Amphitheater, Meadow Brook Hall and the golf courses are a public draw. Complimentary development of a high caliber could complete the property as a regional destination. Adjacent commercial and retail land use off campus is complimentary. Enhancing access via Adams Road would also create more circulation options in the vicinity of campus.

Other Potential Features in this District are:

- Mixed use commercial, retail and restaurants at the ground level of a town center and street with market rate housing above
- A four star hotel and conference center compatible with Meadow Brook Hall and the golf courses
- A Meadow Brook Estate Museum
- Commercial office space or administrative space for OU
- A large outdoor civic space that reinforces the history of the site as the estate's horse track for summer events and a winter ice skating rink
- A designed landscape as a sculpture park with connecting paths to other on-site venues that preserves views and the overall character of the former estate

1. **Mixed-Use Development**
   ± 618,000 SF, Retail, Housing, Conference, Hotel, Open Space, Parking
2. **Meadow Brook Estate Museum /**
   20,000 SF, Former Incubator Space
3. **Faculty Housing Neighborhood**
4. **Opportunity Site for Mixed-Use Development**

Existing Retail at Rocester Hills Photo © Julianna Blankenship

3-D Rendering of Mixed Use Development at the Corner of Adams Road/Walton Boulevard Looking West

Figure 3.11, Near-Term Plan - Mixed-Use District

Meadow Brook Amphitheatre - Baldwin Pavillion © Oakland University

Existing Meadow Brook Hall and Estate © Oakland University

View Depicted in Rendering

Long-Term Projects
Near-Term Projects
Renovation Projects
Existing Buildings

design guidelines

INTRODUCTION - "A COMPELLING PHYSICAL PRESENCE"

The 2016 Campus Master Plan creates a framework for growth that builds on the legacy of the historic core, while providing a road map for physically implementing the OU's Strategic Plan.

The Design Guidelines are high level recommendations for implementation intended to focus on broader principles without constraining design creativity and interpretation. The intent is to steward OU's substantial natural and built resources, to guide sustainable future growth patterns and to inspire the creation of new campus buildings and grounds that add to the unique campus identity.

Great university campuses are memorable, as much for the civic realm of open spaces, as for the individual buildings themselves. The whole is greater than the sum of its parts. Design of individual building and landscape projects should engage the larger campus creatively and functionally and contribute to the campus legacy of architecture and landscape.

DESIGN PRINCIPLES - PUBLIC REALM

Making "Places"

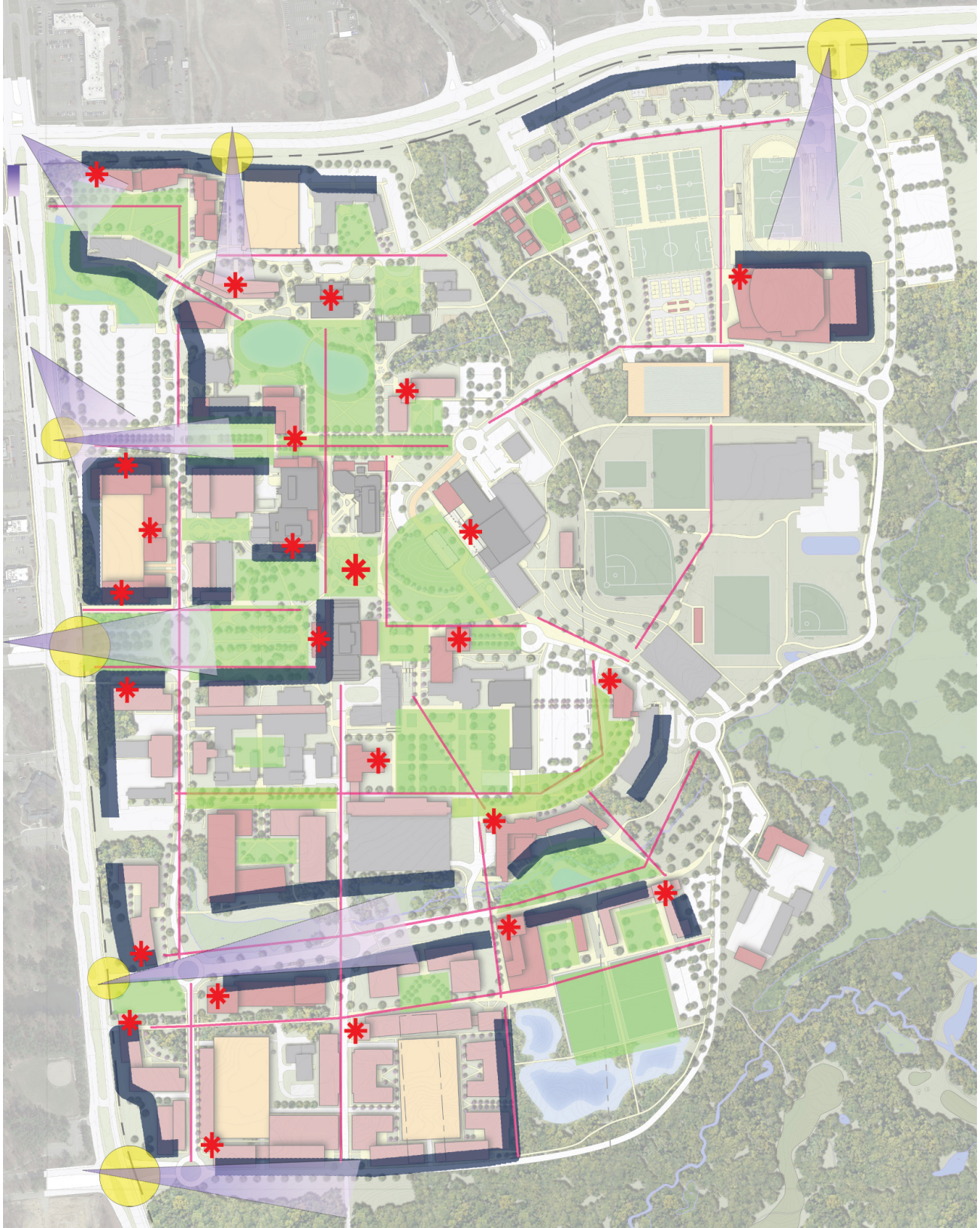
- Variety of Spaces
- Functional, Safe, Beautiful
- High Quality

Connections "Campus Fabric"

- Continuity of Material, Forms, Color
- Views and Vistas
- Pedestrian Oriented
- Transitional spaces important for continuity and connections

Grounds

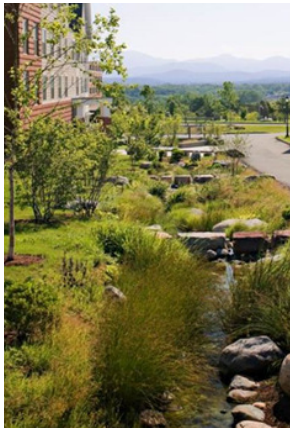
- Respect and preservation of natural systems
- Recognition of topography as a defining element
- Campus as Living Lab

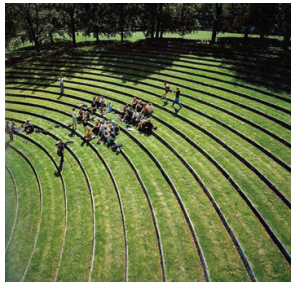

Campus Gateway
Icon / Landmark
Major Campus Edges
Internal Campus Edges
Significant View
Critical Open Space
MajorPedestrian Connections

PUBLIC REALM - GOAL

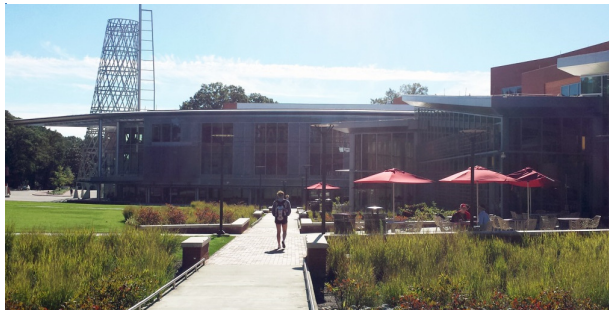
To gradually build a sense of timelessness that links generations of the campus community and is associated with the campus' quality and highly valued physical environment.

teach





gather



quality and variety

DESIGN PRINCIPLES - ARCHITECTURAL CHARACTER

- Consistent evolution of architecture that builds on a continuum of consistent characteristics and elements
- Qualities associated with permanence
- Human Scaled
- Appropriate mass and scale relative to context
- Balanced color and materials to weave buildings into the existing campus fabric
- Function and maintenance
- Sustainable and Healthy

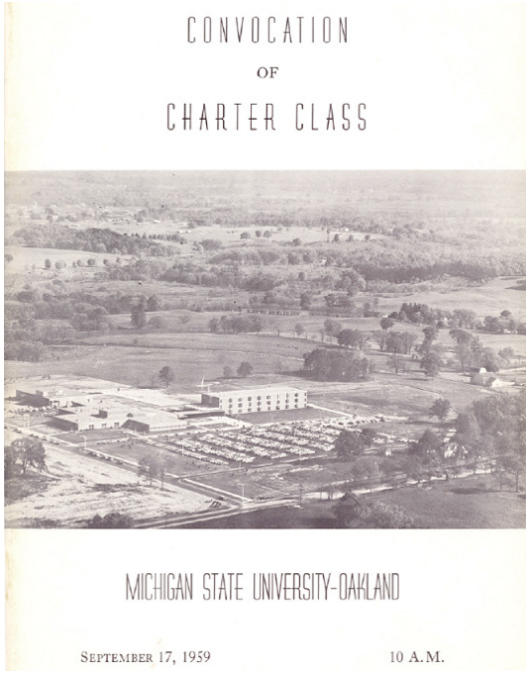
ARCHITECTURAL CHARACTERISTICS OF EARLY CAMPUS BUILDINGS

Academic/Student Life

- Modern "boxes"
- Planes
- Subtractive base
- Brick, stone, concrete, steel, glass
- Façade "weave" of material
- Glass connectors
- "Pavilion" buildings
- Canopies at entries
- Articulated frame

Residential

- Volumetric
- Articulated base
- Punched windows vs frame windows



"Deliberately unembellished buildings, North and South Foundation Halls have remained relatively spartan throughout the years, in accordance with the philosophies of Oakland University's founders. From the university's inception, emphasis has been placed upon the institution's function rather than form, making academics and growth the main focus of both Foundation Halls."


NORTH FOUNDATION HALL


KRESGE LIBRARY

ARCHITECTURAL GUIDELINES

Aesthetics

- Capturing zeitgeist of the moment while remaining contextual through consistent application of principles of architectural character
- Inviting and clearly organized
- Reflective of use (proportion, scale and fenestration should reflect what happens on the inside of the building)
- Signifying permanence - 50 year building
- Durable, low maintenance materials

Fenestration

- *Buil*ding Entry: articulated with canopy (Elliott, Rec Center)
- Transparency at ground floor
- Transparency at public rooms on upper levels
- Articulated frame
- Building signage: contrast in color, appropriate scale, part of architectural design, not an afterthought

Materials

- Brick (limit palette to three colors max)
- Terra cotta
- Pre-cast concrete
- Metal panel
- Glazing (no mirrored glass)
- Roof: metal if not flat

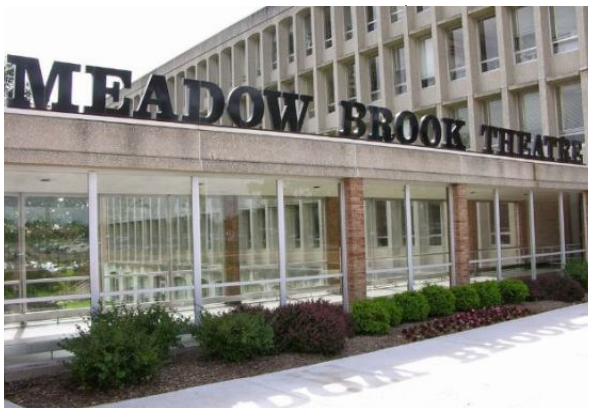
ARCHITECTURAL CHARACTERISTICS TO REMAIN CONSISTENT

Academic/Student Life

- Modern "boxes"
- Planes
- Subtractive base
- Brick, stone, concrete, steel, glass
- Façade "weave" of material
- Glass connectors
- "Pavilion" buildings
- Canopies at entries
- Articulated frame

Residential

- Volumetric
- Articulated base
- Punched windows vs frame windows

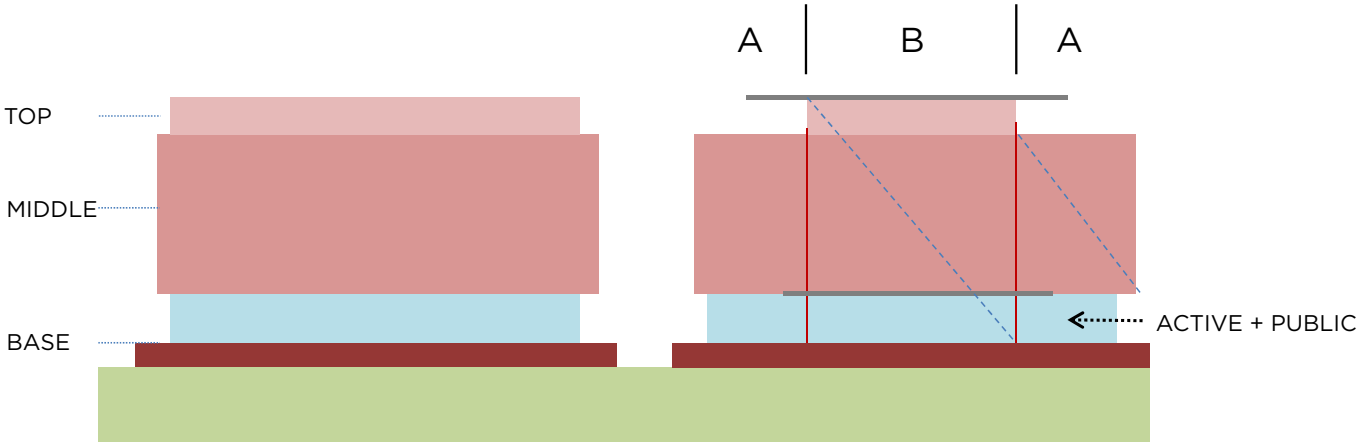


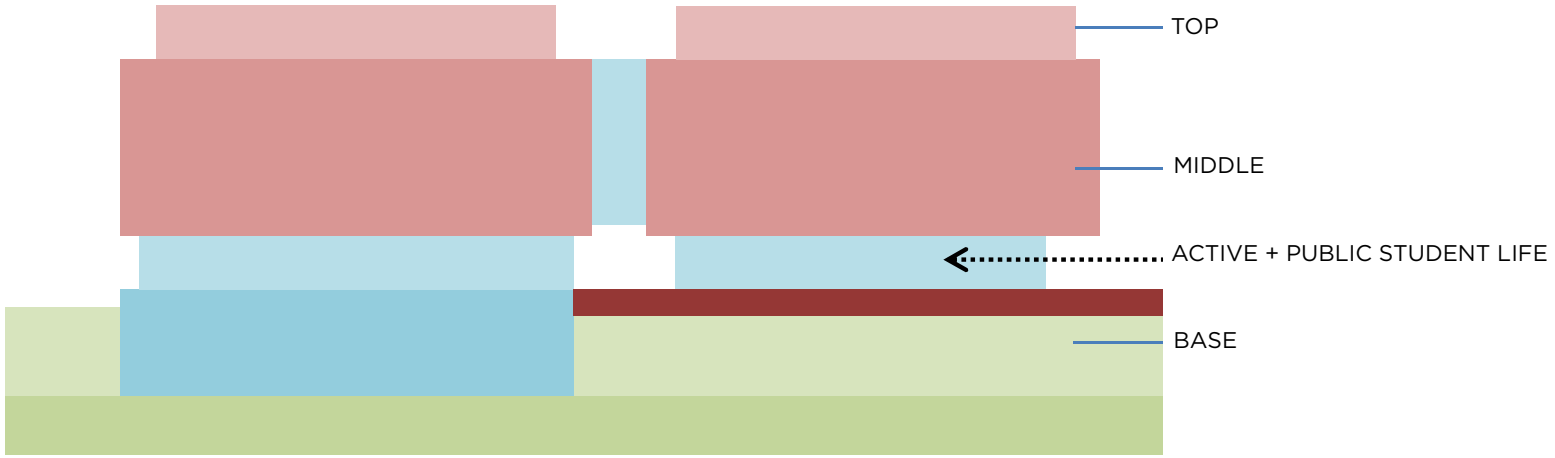
Oakland University Housing

FORM, PROPORTION, SCALE, HEIGHT AND MASSING

Porch, arcade, covered walkway

- *Base*: transparency for public spaces (75%?)
- *Middle*: horizontal massing, vertical fenestration
- *Top*: penthouse, articulate sustainability - green, PVC's





Rice University, South Colleges

Rice University, McMurtry Hall Commons

VISUAL CONNECTIONS

ACTIVE BASE TO CONNECT BUILDINGS TO PUBLIC REALM

OPEN SPACES

- Tie inside to outside
- Small intimate spaces
- Large gathering spaces
- Variety, healthy environment

Rice University, McMurtry Residential College and Duncan Residential College

Tulane University, Weatherhead Hall

Rice University, South Colleges

Tulane University, Weatherhead Hall

Tulane University, Weatherhead Hall

4 Sustainability, Landscape, Utilities & Infrastructure

The broad goal of creating a sustainable campus affects all aspects of this master plan. From sustainable land-use strategies, use of existing infrastructure and energy conservation, to sustainable transportation and storm-water strategies, the master plan emphasizes a holistic approach to landscape design and infrastructure.

sustainability

The University has committed to sustainable design and practices. Facilities Management has developed a general checklist outlining Sustainability Initiatives for proposed projects. The following outlines recommendations for how sustainability initiatives for the various disciplines can be applied.

INFRASTRUCTURE SUSTAINABILITY SUMMARY

The University has already implemented many progressive technologies to decrease independence on non-renewable energy sources, including:

- Geothermal Wells
- Combined Heat and Power Generation
- Photovoltaic Solar Panels
- Solar Thermal Collectors
- Bio-Mass Boiler

Some of these installations are functional while others are used to provide hands-on educational opportunities for the Clean Energy Research Center.

The University has several Performance Energy Contracts in place in an effort to provide proven and economically viable energy conservation strategies at existing buildings.

A further commitment to sustainability by the University is evident by the number of buildings that have attained LEED™ Certification. LEED stands for Leadership in Energy and Environmental Design and is the most recognized rating system for building sustainability. The LEED rating system is based on points accrued in different categories; Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources and Indoor Environmental Quality. The number of points accrued determines what level of recognition a building gets; LEED™ Certified, LEED™ Silver Certified, LEED™ Gold Certified or LEED™ Platinum Certified. The following is a list of LEED™ buildings on campus:

- Human Health Building, LEED™ Platinum Certified
- Oak View Hall, LEED™ Gold Certified
- Engineering Center, LEED™ Gold Certified

Engineering Center, LEED™ Gold Certified

Human Health Building, LEED™ Platinum Certified

SITE AND CIVIL SUSTAINABILITY SUMMARY

Campus Wide Storm / Sanitary Sewer Evaluation

Consider implementing a complete campus wide stormwater modeling to identify areas of concern or capacity and should include identification of existing / proposed storage areas which should be strategically planned to support landscape initiatives. This program needs to take into account the locations of off-site contribution to the campus and the impact of same.

Implement Best Management Practices (BMP)

Future infrastructure improvements should consider implementing BMP programs to treat stormwater through bio-detention areas or rain gardens. Incorporate underground detention where surface features are impractical.

Coordination of Campus Improvements / Existing Infrastructure Condition

Future improvements should consider a pre-development review of the existing utility systems that would be impacted to include review and analysis for capacity and condition, and based on the analysis, incorporate improvements to these systems as part of, or preferably just prior to development.

Campus Site Development Guidelines

Consider updating the campus guidelines for development, stormwater quality and control, storage and conveyance in order to support the OU community's environmental stewardship programs. These programs will improve campus facilities and reduce impact on downstream communities.

Recommendations

To reinforce campus sustainability initiatives, a guide should be developed to assure new projects, additions and renovations meet predetermined levels of sustainability.

The following list is a recommended strategy:

- All projects shall exceed the performance of an ASHRAE 90.1 baseline building by 25%. Verify with energy modeling software.
- All projects shall implement these mandatory energy saving measures:
  - Glazing: Use high performance glazing and provide justification for glazing that exceeds 40% of gross above grade wall area.
  - Window Shading: Implement exterior shading strategies and/or internal blinds on South, East and West facing windows.
  - Minimum Envelope Performance: Heat loss through envelope shall not exceed 200 Btu/hr per linear foot.
  - Envelope Quality Assurance: Implement independent inspection or thermal scanning before interior finishes are installed.
  - HVAC Zoning: Group spaces together in HVAC zones that have similar occupancy type and schedule.
  - Lighting: Lighting power density conforming to ASHRAE 90.1.
- Projects over $15 million construction cost shall be required to be a minimum of LEED™ Certified.
- Projects over $25 million construction cost shall be required to be a minimum of LEED™ Silver Certified.

A published University Standard similar to the list above would require project budgets to include the cost of energy saving measures and give these measures equal consideration in conjunction with aesthetics and programming needs.

LANDSCAPE SUSTAINABILITY SUMMARY

Sustainability practices for landscape can be achieved in multiple ways and to varying degrees. Landscape sustainability practices should be a consideration for every new development on campus.

- When appropriate, provide attractive rain garden areas to reduce storm water run-off and its effect on overall campus storm water management effort
- Consider storm water infiltration systems in lieu of (or to minimize) storm water piping and structures to manage storm water

Rain Garden Precedents Photo © Sites

Sustainability practices associated with landscape design/planning should include:

- Specification of shrub/plant varieties that are drought tolerant to reduce watering requirements. Also, specification of plant material that is naturally limited to grow to the desired size and form intended and not require extensive pruning to maintain size and/or shape.
- Specification of drought tolerant seed mixes to minimize turf watering requirements. Use of meadow lawn mixes in lieu of finish lawn where appropriate.
- Selectively review and plan which turf areas on campus get mowed. Often turf areas are mowed out of 'habit' and could be left as meadow lawn. The definition of mowed finished lawn and un-mowed meadow lawn should be done as a designed effort, providing a balanced interplay between the two.
- Incorporation of 'rain garden' or bio-detention areas for collection of storm water run-off that are significant and designed as a feature of the landscape. These areas should be strategically located and designed as a part of an overall storm water management strategy and landscape design concept. They should be visually attractive and include varieties of plants tolerant of wet and dry conditions. Recharging ground water and reducing the effect of overall storm water run-off are benefits of incorporating bio-detention areas.
- Strategically plan locations of retention ponds to hold water and utilize pond water for irrigation where appropriate. Include installing a well as part of the system to provide make up water in the pond to maintain a desired water level.

Rain Garden Precedents Photo © Erick Saillet

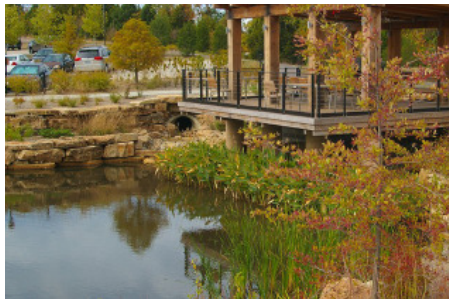


Photo © SWT Design

Photo © Erick Saillet

TRANSPORTATION SUSTAINABILITY SUMMARY

Sustainability considerations relating to campus transportation systems centers around the reduction of greenhouse gas (GHG) emissions. Individual elements from the master plan will contribute towards a more sustainable campus, such as purchasing energy efficient equipment, designing new buildings and major renovations to a minimum standard of LEED certification, encouraging use of public transportation and the University shuttle system, and investing in energy conservation.

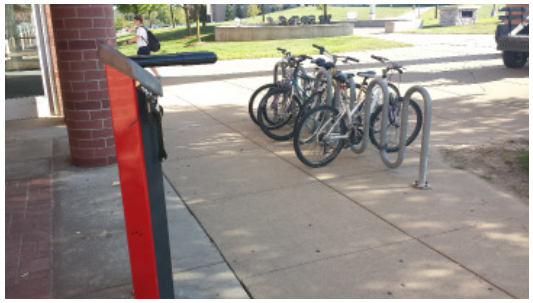
There are four steps to consider for reducing greenhouse gas emissions. The most effective step is to avoid carbon-intensive activities like vehicle use, where practical. The second is to reduce emissions through efficiency, such as carpool, riding the bus, or walking and biking. The third is to replace high-carbon energy sources with low carbon alternatives, such as replacing university fleet vehicles or buses with more fuel efficient (or electric) vehicles. The final step may involve offsets or credits procured for GHG emissions reduction that are accomplished by a third party. These currently are less appealing because they do not offer operational or facility enhancement value to the university.

Some objectives and strategies for reducing GHG emissions within the transportation system include:

1. Reduce single occupancy vehicle use for students and employees by providing incentives such as:
   - Free or discounted transit passes
   - Car-sharing options such as Zipcar or Zimride
   - Emergency Ride Home program
   - Provide preferred parking spaces for carpools and alternative fuel vehicles
2. Develop methods for providing ride-matching (carpool), vanpools, shuttles and/or rideshare opportunities, particularly for regional commuters.
   - Similar program examples are in place at other universities: https://transportation.stanford.edu/commuteplanning/
3. Coordinate with the Regional Transit Authority (SMART) in pursuit of services that are more appealing to the University community.
4. Create fleet equipment purchase and use policies to rationalize use, improve maintenance and phase out inefficient equipment.
5. Increase the fuel efficiency of the University fleet, including the shuttle system, department vehicles and service/maintenance carts.
6. Connect sidewalks and improve intersection crossings to adjacent (off-campus) apartment complexes to promote walking and biking for those living off-campus.

Existing Charging Station at Human Health Building

Existing Bear Bus Shuttle



Existing Bike Rack at Recreation and Athletic Center

landscape

OBSERVATIONS

Open Space

Open space is a critical component of the appeal and character of the campus environment. It should be incorporated throughout the campus as a deliberate and well thought out effort. Open space can range in size from large to small depending on its location and function. The campus should include open space that is designed for a specific reason (i.e. recreation fields) and as multi-purpose space (i.e. Elliott Tower Plaza) which could be used for planned events, socializing, gatherings, studying, informal recreation, etc. Buildings, in combination with plant material, should be arranged to promote preserving and/or defining open space as the campus develops.

Campus Edges and Gateways

Campus edges are integral with the public perception of the university brand and campus appeal. Treatment of the campus frontage along Squirrel Road, Walton Boulevard and Adams Road should be a strong consideration with any new development with a visual presence along these heavily traveled thoroughfares. The landscape along the campus edges should be designed to strengthen campus visual appeal and define the road frontage as distinctly Oakland University. Plant material should consist primarily of trees (shade trees, evergreen trees, ornamental trees) used in large groupings in response to the high speed of the roads and to the scale of the backdrop of the campus itself. Shrub plantings should be limited to campus entrances and used for screening purposes. Large parking lots should be screened from views and selected views into campus promoted by the arrangement of plant material. The landscape design along road frontages should be done as a simple, cohesive design gesture that promotes the visual appeal of the campus and the Oakland University brand.

Gateways into the campus should clearly identify campus entrances and provide OU identity along the road frontages. They should be designed to suggest a hierarchy of the campus entrances and be in scale contextually with their surroundings. Gateway materials should be used consistently so entry definition is instantly identifiable. Masonry, metal, landscape plantings and lighting (along with text) are currently being used as materials to highlight campus gateways.

See Landscape Insight #1

See Landscape Insight #2

Pedestrian Network

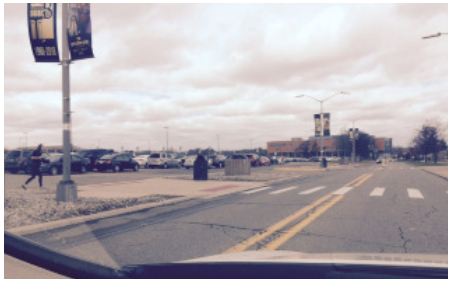
The pedestrian network should address overall pedestrian connectivity throughout the campus. Pedestrian paths need to be considered with each new development as a significant element of the site design and part of the evolution of the overall pedestrian network. New walks should be responsive to the existing campus pedestrian walks and 'gracefully' tie in with the existing network. Pedestrian paths should be designed to strengthen the linkages between outdoor spaces, as well as east and west campus. Designated bike paths vs. pedestrian paths should be separated or clearly defined (when combined) to minimize conflicts.

Streetscapes

Streetscape treatment is a critical factor of the visual appeal of the campus and in forming one's perception of the university when driving through it. The streetscape design should respond to the roadway network, help establish roadway hierarchy and reinforce wayfinding. Main roadways should include sidewalks for pedestrians, and trees along the edges to define the route, add scale and to visually imply an edge. Trees should be planted in large enough groupings, or close enough spacing, to create a significant visual impact. A 'big picture' approach should be taken when considering street tree selections to avoid a haphazard, unplanned landscape appearance, whether trees are used formally or informally in their arrangement.

LANDSCAPE INSIGHTS AND RECOMMENDATIONS

1. Turf - areas being mowed unnecessarily
2. Edges and Entrances - improve to provide a better campus image and collegiate identity
3. Surface Parking - needs buffering; lack of green space and trees reduces aesthetic appeal and detracts from overall campus visual appeal
4. Campus Structure - campus physical structure and primary vehicular circulation routes not strongly reinforced by the landscape
5. People Spaces - campus should include more spaces with varied sizes and use potentials. Improve with stronger landscape definition, take advantage of topographic change and natural areas



See Landscape Insight #3

See Landscape Insight #4

See Landscape Insight #5

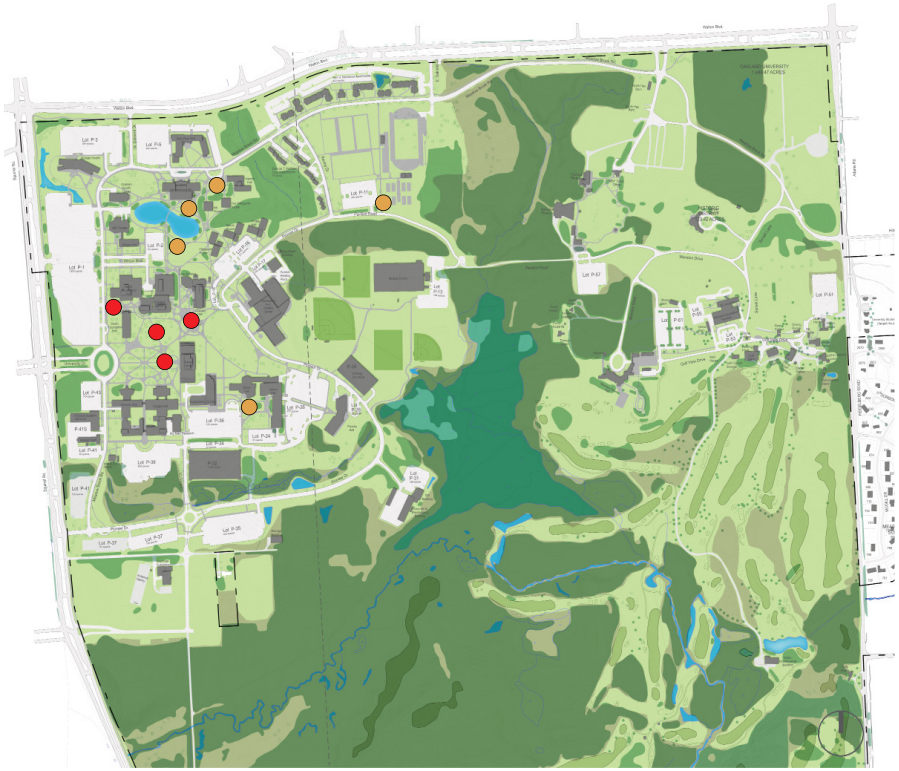


Figure 4.1, Existing Vegetation and Gathering Spaces

- Cut Lawn
- Meadow Lawn
- Tree Massing
- Water
- Wetlands
- Primary Gathering Spaces
- Potential Gathering Spaces

Figure 4.2, Existing Topography

- 960-940 Elevation
- 940-920 Elevation
- 920-900 Elevation
- 900-880 Elevation
- 880-860 Elevation
- 860-840 Elevation
- 840-820 Elevation
- Water
- Wetlands

Existing Elliott Tower Civic Space

LANDSCAPE GUIDING PRINCIPLES

- Improve overall campus environment and aesthetic appeal
- Improve campus edges with landscape to strengthen OU identity/brand
- Integrate parking into the campus environment more appropriately by incorporating visual buffering and green space within lots
- Selectively establish mowed vs. unmowed lawn areas as a 'designed' landscape aesthetically improving the campus, while reducing maintenance and water usage
- Reinforce campus physical structure and primary circulation routes with landscape
- Provide a variety of options of spaces for people (sizes and types) to gather that are visually appealing and desirable to use; promote social interaction
- Enhance natural areas to encourage use by students and the community; promote campus environment as a unique asset within the community
- Strengthen the connections between people spaces
- Promote sustainability and be responsive to aesthetic, academic, function and maintenance capabilities
- Incorporate best management practices for storm water management into landscape design

PLANT PALETTE, TREATMENT AND SCREENING

Trees

Shade trees should be the primary plant material used on campus due to their visual impact, longevity, minimal maintenance requirements and the character they provide for the campus environment. Shade trees can be planted as individual specimens or in linear formal arrangements or in mass groupings. Tree varieties specified should be hardy to the local climatic zone and commonly used in the industry. Species native to Michigan should be considered, but palette should not limited to only native trees. A wide variety of tree species should be used throughout the campus, however small groupings of trees should include a single type; large areas should include varied groupings of single species.

Evergreen trees should be planted in mass (vs. as individual specimens) and used to screen undesirable views, create edges, define space, etc. Care should be taken not to plant evergreens where security could be compromised. A palette of evergreen trees hardy in the local climatic zone, commonly used in the industry and varieties native to Michigan should be considered.

Ornamental trees may include a wide variety of tree types. They can be used as an accent tree, screening, mass plantings, building foundation planting, or as individual specimen. They can include both single trunk and multi-trunk trees, flowering and understory trees.

Shrubs

Shrub varieties should be selected based on their growth habit (height, spread) and location to be installed. Selection considerations should include minimizing maintenance requirements and be hardy varieties common in the industry. In most applications, shrub selection should include drought tolerant varieties, especially when used in non-irrigated landscapes. Shrubs should be planted in mass at an appropriate spacing to allow for growth, but also spaced to fill in the plant bed within a couple of years to minimize weed growth. Shrubs should be used primarily in courtyards (people spaces), at building entries, for parking lot screening, in smaller landscape areas adjacent to buildings that can't support turf.

Existing Library Mall Lawn and Tree Grove

Existing Library Lawn and Tree Grove

Bio-Retention Precedent

Photo © Kongjian Yu

Existing Library Mall Lawn and Tree Grove

Ornamental Grasses and Perennials

Ornamental grasses and/or perennials should be selected based on growth habit and planted in mass and spaced apart with the objective to fill in the plant bed within a couple of years. Hardy varieties commonly used in the industry should be selected. Ornamental grasses, and/or perennials, should be used primarily in courtyards (people spaces), building entries/foundations and in smaller landscape areas adjacent to buildings that can't support turf.

Ground Covers

Typically ground cover plants should be avoided since too much maintenance is required to limit weed growth. Ground cover plants could be used in very selective situations where irrigation is available and appropriate maintenance is anticipated.

Turf

Turf consists of sodded lawn, seeded lawn and meadow lawns. Sod should be limited to areas requiring an immediate finished (cut) lawn and includes irrigation. Sod should not be specified without an irrigation system. Seeded lawn should be used where finished lawn is desired and may or may not include an irrigation system. Seed mixes specified should be hardy to the local climatic zone and be mixes commonly used in the industry. Meadow lawn should be used where a non-finished (uncut) lawn is desired without irrigation. Meadow lawn can be 'rough' cut a couple of times per season or be left completely uncut depending on the application.

A campus wide review of lawn mowing practices should be considered. By selectively determining cut and uncut lawn areas, current maintenance of turf areas could be significantly reduced. A balance of cut lawn and uncut meadow should be determined if applicable, as part of a project's landscape design in response to the contextual landscape.

RECOMMENDATIONS

Landscape recommendations for individual spaces on campus are contained in the following along with precedent images depicting possible solutions.

LIBRARY QUAD

- Provide more seating opportunities and options within the space
- Provide gathering spaces within the larger space for people to gather
- Provide seating configurations that are responsive to the existing forms of the Quad

Precedent Campus Seatwal © Grissim Metz Andriese

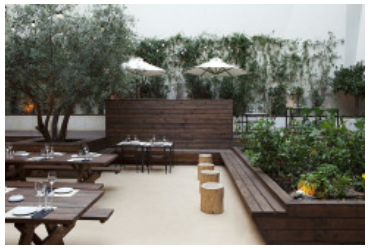
Precedent Campus Seatwall @ Thomas Jefferson University © Andropogon Associates

Precedent Campus Seat Bench © Mikahil Loskutov

Precedent Campus Seat Bench © Gareth Gardner

OAKLAND CENTER

- Provide a variety of outdoor dining / gathering spaces (sizes and types) responsive to varied uses (dining, socializing, studying, informal meeting, individual use, etc.)
- Promote Oakland Center and it's surroundings as a primary people gathering space



Outdoor Space © Nikos Alexopoulos

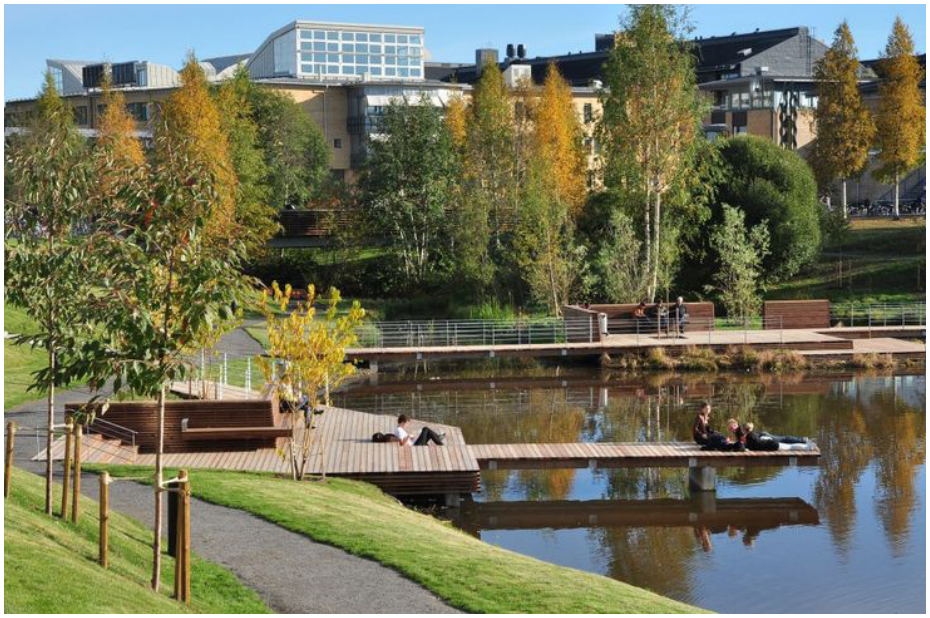
Outdoor Space © Scott Pease

Precedent Seat Area

Outdoor Space © Nikos Alexopoulos

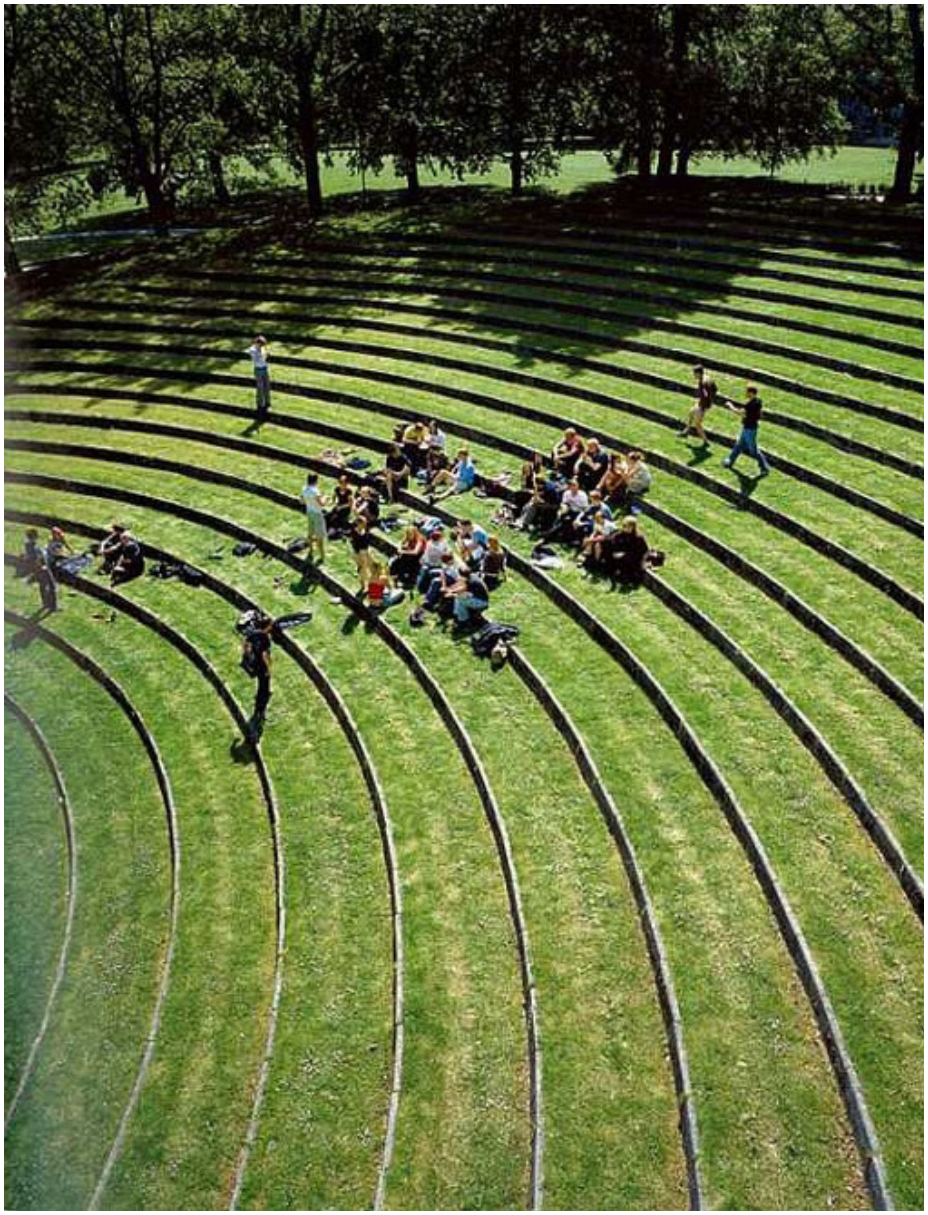
BEAR LAKE

- Take advantage of the water as a unique feature of the campus
- Provide spaces for people to be more engaged with the water and at the water's edge



Precedent Lakeside Landscape © Thorbjorn Anderson and Sweco Architects

© Thorbjorn Anderson and Sweco Architects



Precedent Amphitheater © C.F. Moller

AREA EAST OF LIBRARY

- Consider terracing the hillside to include an amphitheater
- Could be used informally for seating and for special events

Precedent © Gustafson Guthrie Nichol

Precedent Amphitheater © Nord Eriksson

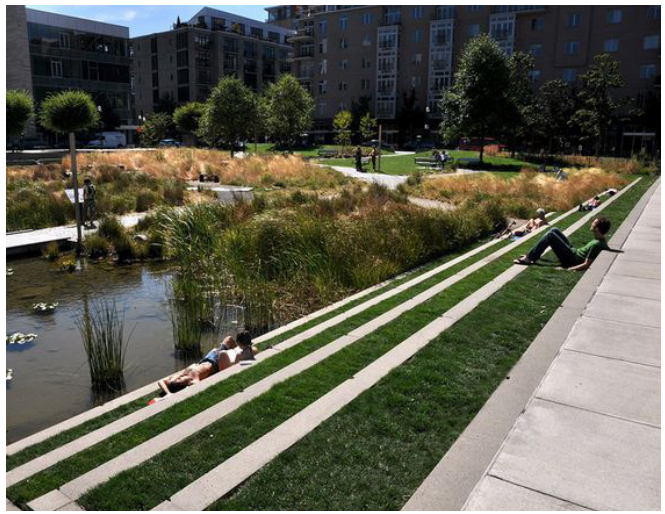
Precedent Amphitheater © C.F. Moller

SOUTH HOUSING - PHASES 1 AND 2

- Architecture should be responsive to existing topography to minimize physical impact on the site
- Maintain existing large trees where possible
- Use a 'naturalized' landscape design approach at project perimeter to re-establish wooded character of the area
- Incorporate storm water retention ponds as part of the overall storm water management and to enhance the natural character of this part of campus
- Include outdoor multi-use spaces and recreation fields

Precedent Storm Water Swale © Atellier De Paysage Bruel-Delmar

Precedent Plaza ©AECOM



Precedent Storm Water Landscape © Herbert Dreiseitl

Precedent Plaza © Aspect Studio

CAMPUS GATEWAY AND NEW CONCERT HALL

- Include OU identity signage at Squirrel Road with identity for proposed concert hall
- Extend Wilson Boulevard to Squirrel Road and visually strengthen with street trees lining the edges and ornamental trees planted in mass in the boulevard island
- Arrange landscape plantings to promote views of the concert hall and screen views of the parking deck
- Extend 'boulevard' concept using pedestrian walks, landscape plantings and green space through the campus, terminating on the new round-about adjacent to the Recreation and Athletics Center

Precedent Gateway Entry Landscape © Karen Labuca

Precedent Gateway Entry Landscape and Signage

Rendering of Potential Gateway Entry Landscape © Grissim Metz Andriese

QUAD AREA SOUTHEAST OF ENGINEERING BUILDING

- Provide a central quad space that includes open space for multi-purpose use, as well as pedestrian walks connecting to adjacent buildings and the existing pedestrian network
- Use trees to reinforce pedestrian walks and define space
- Include outdoor 'hardscape' space(s) adjacent to buildings

Precedent Campus Quad and Landscape © Seamon Whiteside

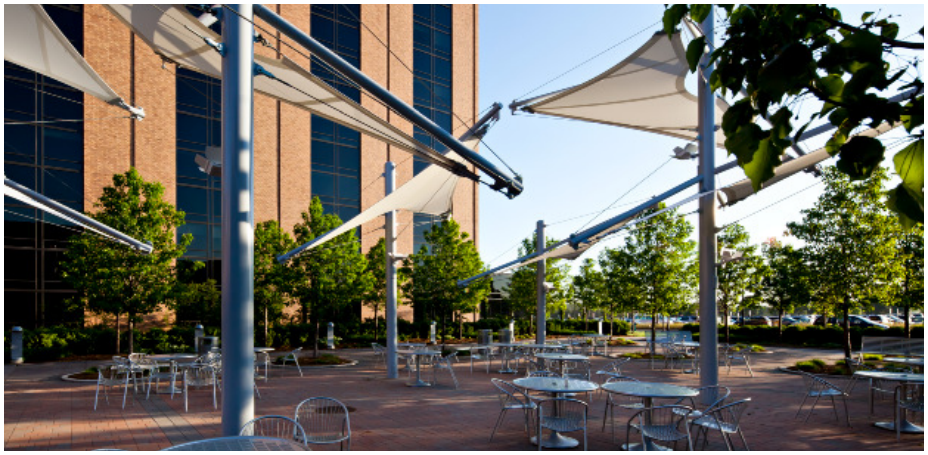
Precedent Campus Quad and Landscape © John Sturrock

AREA EAST OF LIBRARY

- Provide an outdoor terrace on the east side of the library for library users
- Develop pedestrian connections to adjacent buildings and to the existing campus pedestrian network
- Provide landscape treatment to reinforce the overall space, as well as to define the library terrace

Precedent Campus Civic Space and Landscape © Neumann/Smith Architecture

Precedent Campus Civic Space and Landscape © NBBJ



Precedent Campus Civic Space and Landscape © Blake Marvin

Precedent Campus Civic Space and Landscape © NBBJ

MEADOW BROOK ROAD STREETSCAPE CONCEPT

- Develop the north-south segment of Meadow Brook Road adjacent to center campus as an urban streetscape
- Include sidewalks, seating areas, furniture, significant pedestrian crosswalks, informational kiosks, sculpture, OU identity, street trees, bio-retention areas and lighting as part of the streetscape
- Employ traffic calming techniques such as raised crosswalks, closer building setbacks and landscaped edges to slow speed of traffic

Figure 4.3, Meadow Brook Avenue Street Section

KEY

1. IDENTITY ELEMENT AND PLAZA
2. INFORMATIONAL KIOSK
3. RAIN GARDEN (WHERE APPROPRIATE)
4. PEDESTRIAN CROSSING
5. OUTDOOR SPACE AT RETAIL (MIXED USE)
6. STREET TREES
7. LAWN (WHERE APPROPRIATE)
8. LANDSCAPE AREA
9. SIDEWALK ALONG MEADOWBROOK ROAD

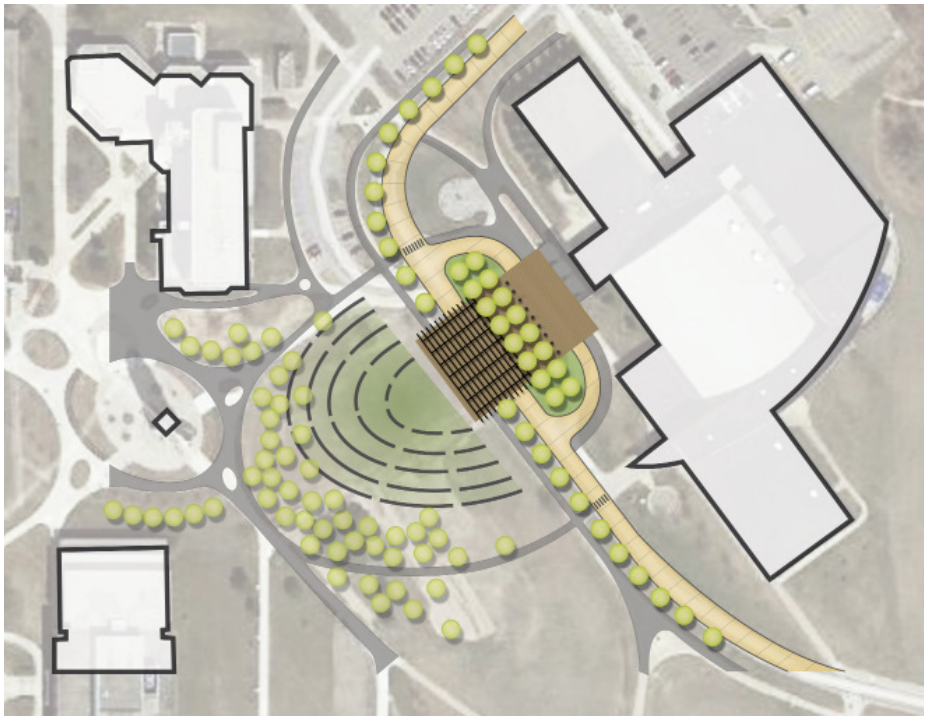


Figure 4.4, Amphitheater Concept

RECREATION AND ATHLETIC CENTER (RAC) PLAZA & AMPHITHEATER

- Provide a pedestrian plaza that strengthens the RAC identity and could be used for large gatherings with temporary closure of Pioneer Drive
- Promote traffic calming with incorporation of a pedestrian plaza on Pioneer Drive to slow traffic
- Strengthen the connection between the RAC and future development on west side of Pioneer Drive
- Utilize the sloped lawn area east of the library to incorporate an amphitheater with terraced seating. It could be used informally by students and used for formal event type gatherings. It could include a permanent or mobile pavilion for outdoor performances

utilities and infrastructure

SUMMARY

The utilities and infrastructure portion of the master plan focuses on broad strategies for the campus high temperature hot water system, general building heating, ventilation and air conditioning (HVAC), electrical distribution, data and communications and security systems as they support the overall goals of the master plan. This section also addresses strategies for storm water management and OU's sanitary water system. The utilities and infrastructure recommendations allow the University to plan for the infrastructure upgrades that will be needed to maintain existing facilities as well as support future projects.

New projects, major renovations or building additions should be used as opportunities to accelerate the implementation of infrastructure upgrades.

DRIVERS AND GOALS

Maintain

Existing buildings need proactive maintenance and systematic upgrades to keep pace with the quality and performance of newer facilities.

Improve

All buildings slated for major upgrades shall comply with sustainability benchmark standards for renovated buildings.

Expand

Future infrastructure and capacity growth should support the Strategic Development Plan outlined in the master plan while also adhering to sustainability goals.

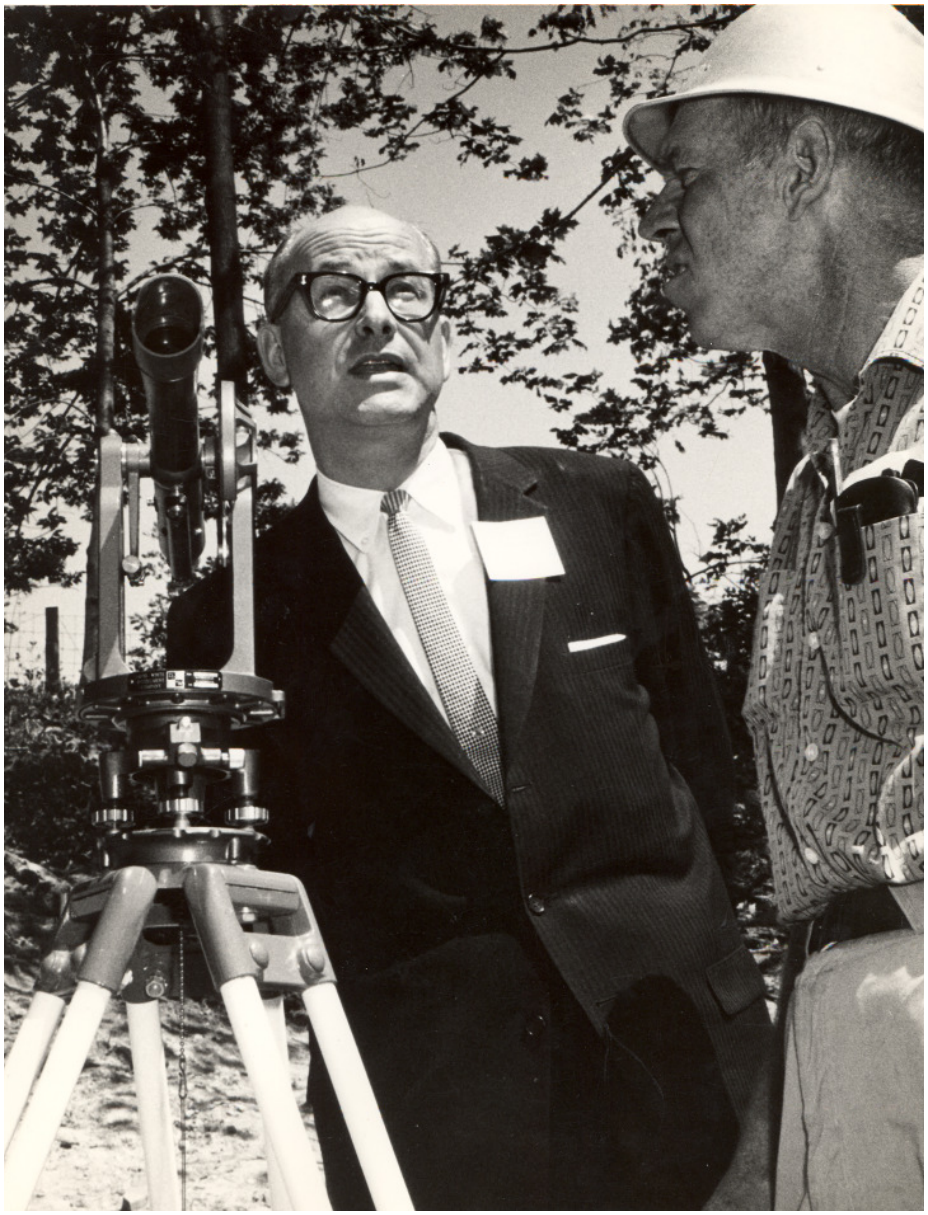
Kresge Library Renovation, 1966

Central Heating Plant, 1966

While the Master Plan proposes strategic moves that are often larger capital projects, there are other productive improvements that are smaller in scale, and with smaller budgets, that can also have a big impact on the campus. The following recommendations are related to campus infrastructure.

Small Moves, Big Impact

- Commissioning of building heating, ventilation and air conditioning systems in buildings that have not been scheduled for major renovation will provide energy savings as well as provide a better quality environment to the occupants.
- Commissioning and metering of existing chilled water plants would provide better performance and reliability as well as help quantify extra capacity available for new projects and additions.
- Develop a 10 year plan and allocate funding to replace air handling units that are at the end of their useful life.
- Develop a brief, plain English set of Design Standards to be published online for design consultants.
- For major renovations, allow budget for extensive infrastructure upgrades and replacement.
- As major renovations occur in older buildings, LED lighting fixtures should be utilized. This will have the effect of decreasing demand loads on the campus primary circuits and reduce costs associated with re-lamping fixtures.
- Thermographic inspections on medium and low voltage distribution equipment should be performed in order to identify where preventive maintenance or replacement is required.
- It would be advantageous to configure the medium voltage switching scheme in a manner that would provide back-up power to housing facilities and required support facilities to allow them to remain occupied in a long duration power outage.



Historical photo of survey activity on campus

CENTRAL HEATING PLANT

Summary

The Central Heating Plant (CHP) provides High Temperature Hot Water (HTHW) to the campus. The fuel source of the CHP is natural gas. The capacity of the central heating plant is 280,000 MBH. In January 2016 a combined heat and power unit was brought online and replaced two of the older boilers in the plant. The capacity of the combined heat and power unit will match the older two boilers of 80,000 MBH. The waste heat from this unit will be added to the HTHW system. Therefore, the philosophy on campus should be to use this whenever possible for heating and cooling via high temperature heat exchangers and absorption chillers.

Recommendations

- Steam cushion equipment such as the expansion tank and steam boilers are at the end of their useful life. This equipment should be replaced immediately.
- All automatic controls should be connected to an uninterruptable power supply to protect the plant during power outages.
- All valves in the CHP that are more than 20 years old should be replaced.

HIGH TEMPERATURE HOT WATER SYSTEM

Summary

The High Temperature Hot Water System (HTHW) is fed from the Central Heating Plant. The HTHW system is used to provide heat to a majority of the core campus and generates chilled water at isolated absorption chilled water plants. The campus HTHW piping is in a mixture of full tunnels, half tunnels or is directly buried.

Recommendations

- Oakland University Facilities Management has developed a 20 year Replacement Recommendation for HTHW campus distribution replacement based on age, condition and functionality. This plan should be executed to ensure the reliability of the campus HTHW system.
- Many building HTHW services only have a single isolation valve and most valves are leaking. It is recommended that all building service valves be replaced with two iron gate valves in series. This is the industry standard for HTHW isolation. Replacement of these valves should follow the 20 year HTHW Replacement Recommendation.
- New HTHW lines are needed between Engineering Center and Varner Hall to complete loop and allow two-way feeds.
- New HTHW lines are needed between Wilson Hall Addition and Vandenberg Hall to complete loop and allow two-way feeds. This line should accommodate the future Wilson Hall Addition and Vandenberg Hall Renovation.

- Existing 6" HTHW lines to Hill House are in poor condition and require immediate replacement.
- Existing 3" and 4" HTHW lines to Van Wagoner House, Vandenberg House and Hamlin Hall are in poor condition and require replacement within three to five years.
- New building projects and major renovations should be used as opportunities to accelerate the implementation of HTHW needs described herein.
- Some new projects in the Strategic Development Plan are far enough away from existing HTHW distribution that economic analysis will be required to determine if a HTHW extension is favorable to self generated heating equipment such as natural gas condensing boilers. This process will also allow for review of the Central Heating Plant load and the performance of the combined heat and power unit. Those future projects are:
  - New Concert Hall
  - School of Medicine
  - Health Professions Research Building
  - Biomedical Research Building
  - Oakland University Welcome Center
  - South Student Recreation Center
  - South Housing

1	Proposed Loop Completion
2	Location of Central Heating Plant
3	Existing High Temperature Hot Water Distribution System
4	Proposed Abandonment

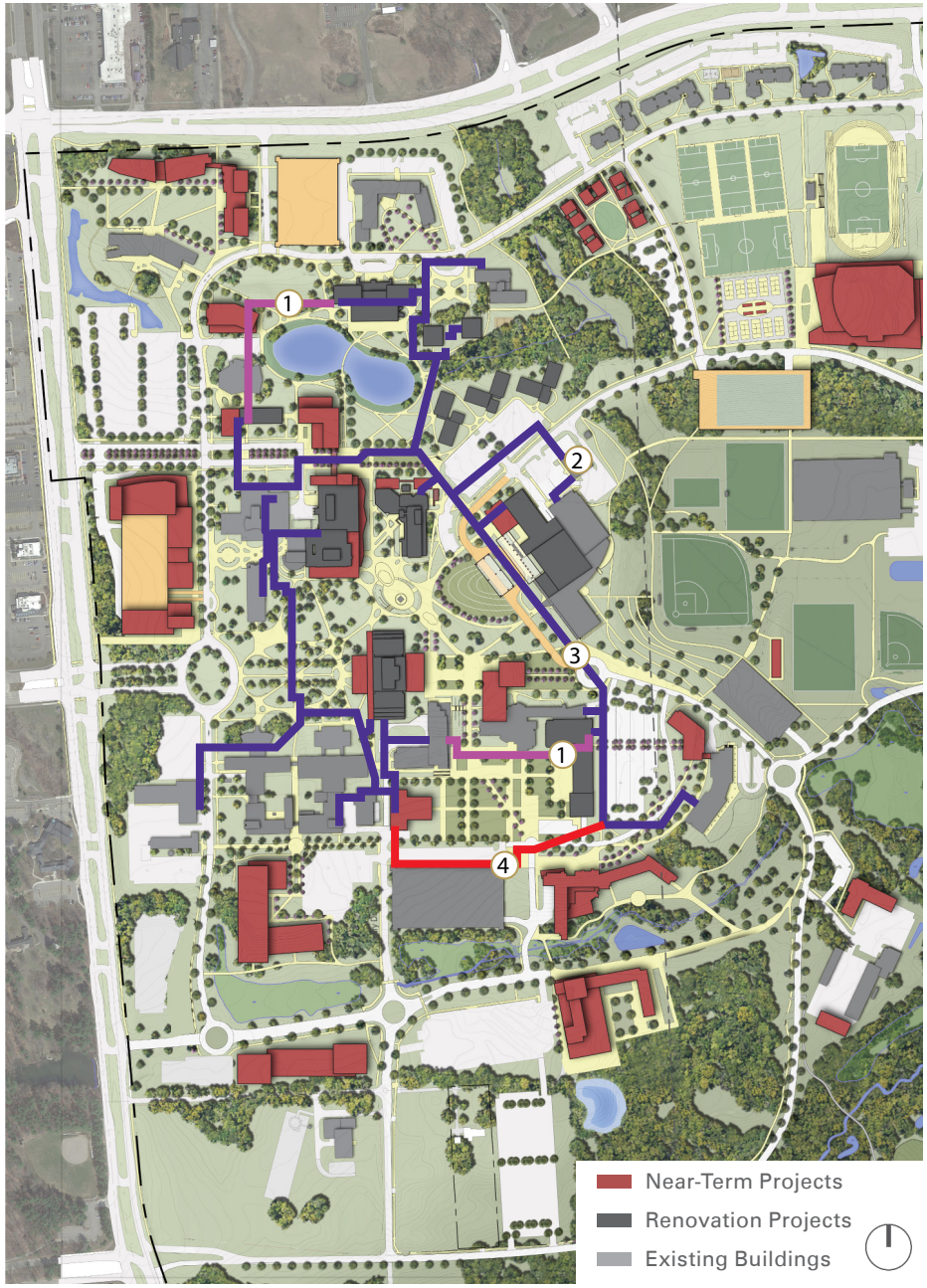


Figure 4.5, Campus High Temperature Hot Water Distribution and Central Heating Plant

CHILLED WATER

Summary

The campus does not have a central chilled water plant or regional distribution. There are many stand alone chilled water plants that utilize either electric centrifugal chillers or absorption chillers. The absorption chillers use the High Temperature Hot Water system. In many cases chiller plants are implemented as sub-regional plants serving 1 or 2 adjacent buildings.

Existing chilled water plants are located in the following buildings:

- Dodge Hall
- Elliott Hall
- Hamlin Hall
- Kresge Library
- North Foundation Hall
- Oakland Center
- O'Dowd Hall
- Pawley Hall
- Athletics Center
- Mathematics and Science Center
- Vandenberg Hall
- Varner Hall

Water-cooled chillers are located in the following buildings:

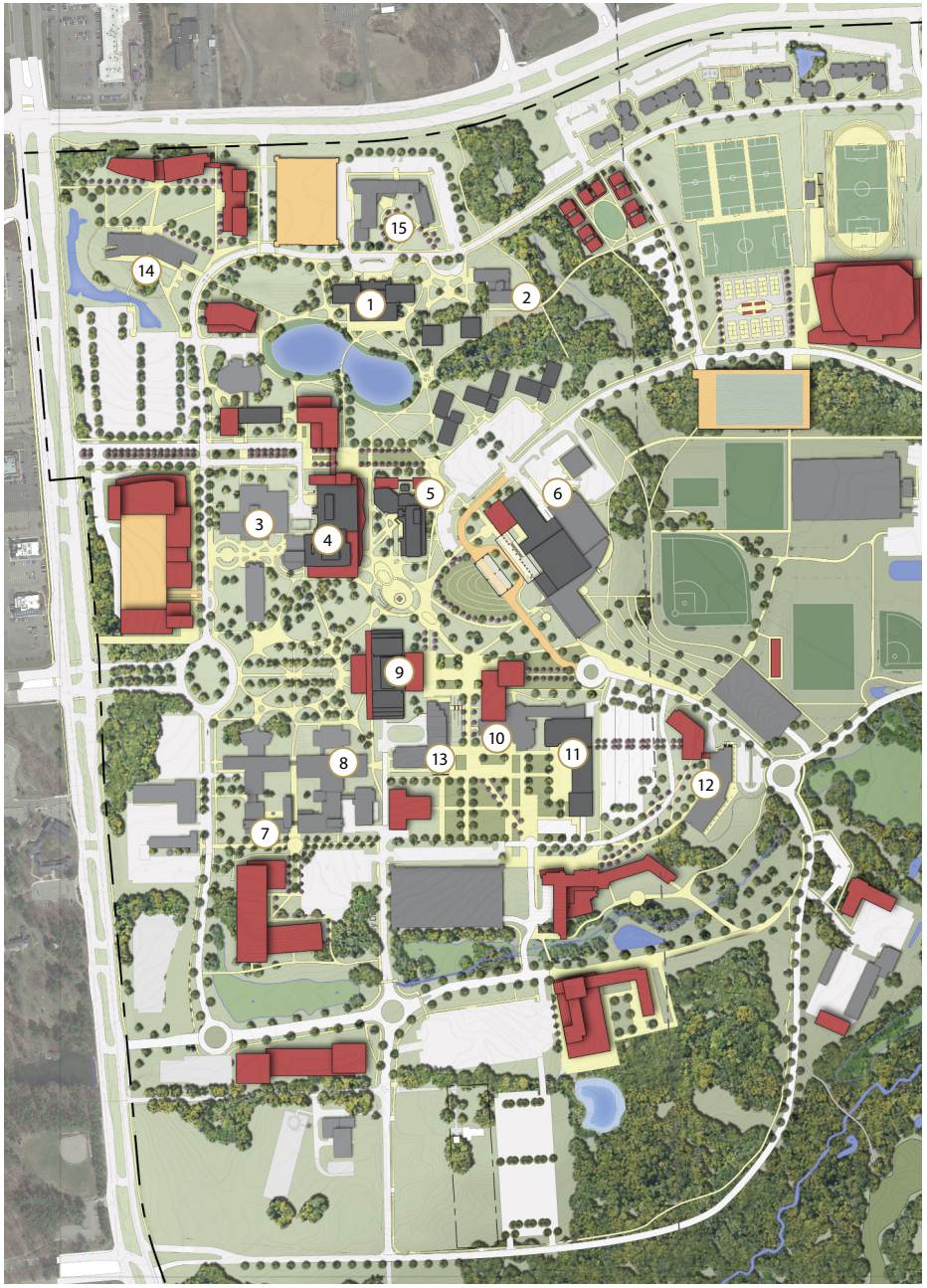
- Engineering Center
- Human Health Building

Air-cooled chillers are located in the following buildings:

- Biomedical Research Support Facility
- Meadowbrook Theatre
- Hannah Hall - Gross Anatomy Lab

Recommendations

- Many chiller plants do not have trending or monitoring capabilities to determine actual load on sub-regional plants. Existing chiller plants should be commissioned and equipped with monitors to determine actual plant load.
- New projects and building additions will need to investigate existing chilled water capacity. If a new stand alone chilled water plant is required absorption chillers should be considered to utilize the waste heat generated by the Combined Heat and Power plant. When sizing new chilled water plants consider chilled water needs of adjacent buildings and future projects.
- New projects identified in the Strategic Development Plan that may be served by existing chilled water plants are:
  - Elliott Hall Addition (125 Tons)
  - Varner Hall Addition (50 Tons)
  - Wilson Hall Addition (50 Tons)
  - Pawley Hall Addition (120 Tons)
  - Kresge Library Addition (220 Tons)
  - Oakland Center Addition (160 Tons)
- New projects identified in the Strategic Development Plan that may require a new dedicated chilled water plant or implement some other form of cooling include:
  - New Concert Hall
  - School of Medicine
  - Health Professions Research Building
  - Integrated BioMedical Research Building
  - University Collaborative Research Building
  - Oakland University Welcome Center
  - South Dining Hall
  - South Student Center
  - South Housing



	Capacity by Tons	Location
1	100	Vandenberg Hall
2	50	Hamlin Hall
3	600	North Foundation Hall
4	380	Oakland Center
5	300	O'Dowd Hall
6	1,150	Recreation Center
7	800	Math Science Center
8	650	Dodge Hall
9	400	Kresge Library
10	335	Elliott Hall
11	334	Varner Hall
12	600	Pawley Hall
13	400	Engineering Center
14	120	Human Health Building
15	200	Oak View Hall

Near-Term Projects
Renovation Projects
Existing Buildings

Figure 4.6, Campus Chilled Water Plants

HEATING, VENTILATION AND AIR CONDITIONING

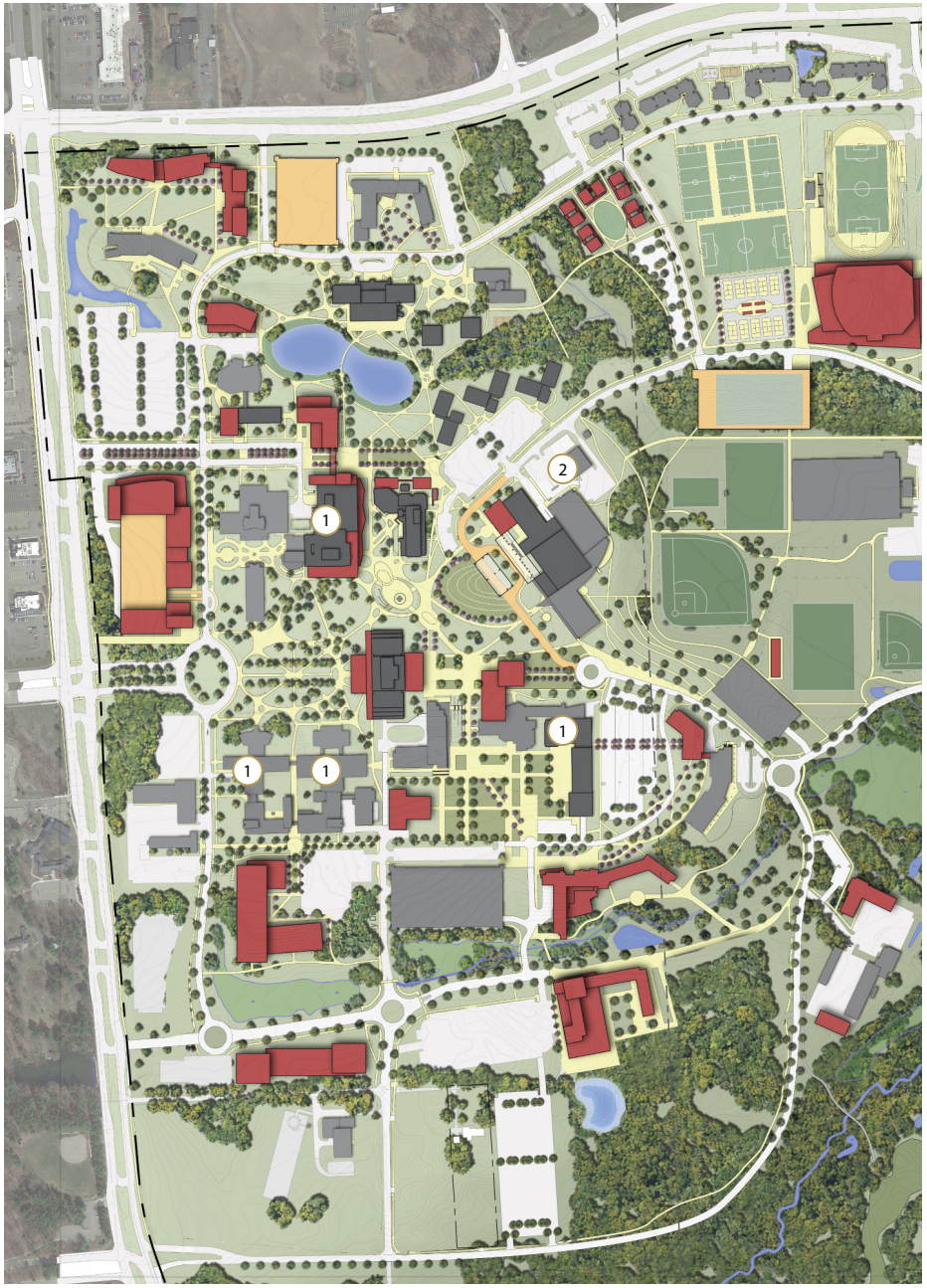
Summary

The University has committed to sustainability and responsible energy practices. Newer buildings have high efficiency Heating, Ventilation and Air Conditioning (HVAC). In some cases progressive HVAC systems are used to achieve LEED certification. However, many buildings contain HVAC and temperature control systems that are more than 40 or 50 years old.

There are predominantly two protocols on Campus for Direct Digital Control of HVAC systems, Automated Logic and Honeywell. There are two controls head-ends, one dedicated to each protocol, in the Central Heating Plant. All building controls report to the associated head-end.

Recommendations

- Oakland University Facilities Management has identified approximately 50 air handling units that require replacement. These units are in many buildings across campus including but not limited to:
  - Dodge Hall
  - Oakland Center
  - Hannah Hall
  - Varner Hall
- There are eight buildings with obsolete pneumatic building controls that are causing environmental quality issues. Replacement parts for these systems are difficult to acquire. These buildings include:
  - Dodge Hall
  - Math and Science Center
  - Recreation and Athletic Center
  - Varner Hall
  - Hamlin Hall
  - Wilson Hall
  - Meadow Brook Hall
  - Hannah Hall
- These deficient systems should be replaced over the next 10 years. All new building control systems shall be either Automated Logic or Honeywell to interface with one of the two existing building control head-ends at the Central Heating Plant.
- Major renovations or building additions should be used as opportunities to accelerate the implementation of the HVAC and temperature controls needs described herein.
- New projects, major renovations and additions should employ HVAC systems to exceed the performance of an ASHRAE 90.1-2007 baseline building by 25%.



1 Air Handlers in Need Replacement

2 Campus Controls Head-Ends in Central Plant - Honeywell, Automated Logic

Near-Term Projects

Renovation Projects

Existing Buildings

Figure 4.7, Campus Air Handlers at the end of their useful life

PLUMBING UTILITIES

Summary

Many of the main utility services are original to the campus. Many systems do not have the ability to isolate campus branches due to the condition or lack of isolation valves. Many older buildings are not protected by fire protection sprinklers.

FIRE PROTECTION

Summary

FM Global has identified approximately 2 million square feet of building area that is recommended to be sprinkled, however, existing buildings are grandfathered under the codes by which they were designed and constructed. Oakland University has developed a 10 year plan for implementation.

Recommendations

- Major renovations or building additions should be used as opportunities to accelerate the implementation of fire protection.
- Conduct a survey and install isolation valves as needed to provide adequate separation of lines to allow shut-downs with minimal impact to other areas of campus.

NATURAL GAS

Summary

There are an insufficient amount of isolation valves in the existing gas distribution mains. The existing natural gas service for the Main Campus is original piping, 50+ years old. The existing natural gas service for Meadow Brook Estate is original piping, 40+ years old. Both gas mains are owned, maintained and regularly tested by Consumers Energy.

Recommendations

- The original Main Campus gas service, owned by Consumers Energy, should be replaced by Consumers Energy in the next 10 to 15 years. When the service is replaced additional isolation valves should be installed.
- The Meadow Brook Estate gas service, owned by Consumers Energy, should be replaced by Consumers Energy in the next 20 years.
- New projects, major renovations or building additions should be used as opportunities to accelerate the implementation of natural gas upgrades.

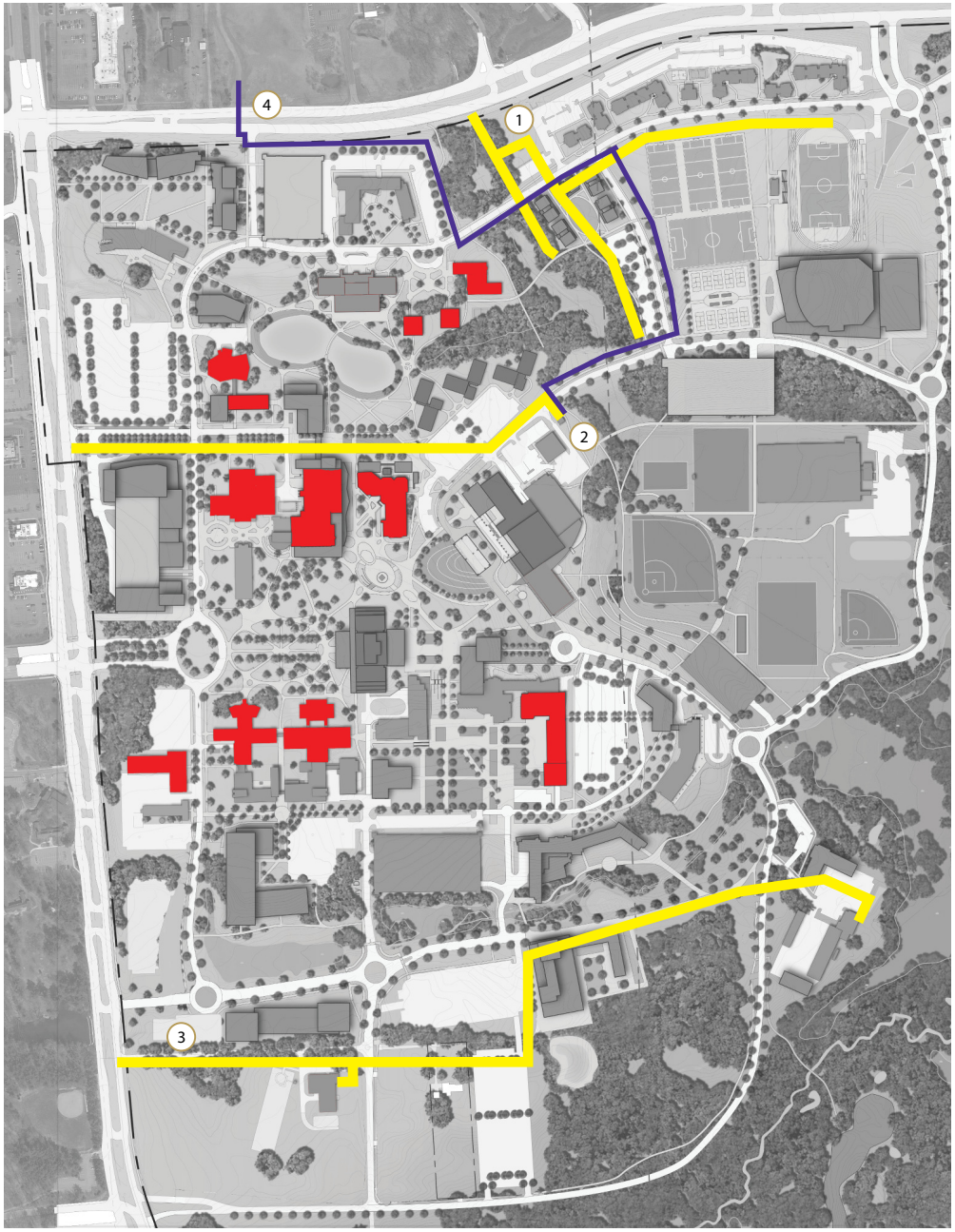
DOMESTIC WATER

Summary

Three water services feed the core campus. One of these feeds is original to the campus, 50+ years old.

Recommendations

- This service should be replaced in the next ten years to ensure domestic water system integrity.
- The South Housing facilities could be served by an existing 8", but it is recommended that an additional water main be added to the existing 12" water service to create a domestic water loop for all new buildings South of Pioneer Drive.



1. North Natural Gas Service
2. Natural Gas to Campus Meter Building
3. South Natural Gas Service
4. High Pressure Gas Pipe

Buildings Recommended for Fire Protection Installation
Gas Lines
High Pressure Gas Pipe
Existing Buildings

Figure 4.8, Natural Gas & Fire Protection

DATA CENTERS/FIBER OPTIC NETWORKS

Summary

The University maintains four (4) data centers to provide services for the campus. The primary data center is located Dodge Hall. The primary communications demarcation data center and secondary data center is located in North Foundation Hall. Additional data centers are located at O'Dowd Hall and the Shotwell-Gustafson Pavilion. These data centers connect to the various campus buildings utilizing fiber optic cabling.

The University maintains multiple virtual LANs (VLANs) to segregate data traffic and maintain data security between the residential and the academic networks. Satellite IT closets exist within each building to provide data services locally.

Two (2) redundant 10GB Internet connections serve the University campus.

Recommendations

- The Shotwell-Gustafson data center is in poor shape with frequent water/flooding issues. It is recommended that this data center be relocated. Due to fiber routing and other infrastructure limitations, the new location should be physically nearby, such as the adjacent Horse Barn.
- Prior building construction projects have left several fiber conduits in a damaged state. These conduits require repair. Better coordination efforts need to be made to avoid damaging the University's outdoor plant technology infrastructure during future construction projects.
- Due to the aging infrastructure and projected growth, data traffic analysis and fiber integrity tests should be performed to determine bottlenecks and failing links. The pathways, conduit capacity/condition and network redundancy should all be evaluated and deficiencies prioritized and corrected in order to strengthen this critical infrastructure.
- To support the projected areas of growth on the University campus, the physical fiber and Resnet VLAN will need to be built out and extended. Extending the Resnet VLAN will require significant network architectural changes. A third redundant internet connection should be added to serve the projected growth on the South end of the campus.
- The satellite IT closets located in the various campus buildings have sufficient space to accommodate growth of the technology systems with the exception of the closets located at North Foundation Hall and Varner Hall. These closets are out of capacity and the buildings need to be evaluated for opportunities to expand or relocate these closets.

WIRELESS DATA AND CELLULAR VOICE NETWORKS

Summary

The existing University wireless network provides adequate coverage within the campus buildings and limited exterior coverage. The wireless network can accommodate network speeds up to and including the 802.11ac standard. The University supports 802.11g/n/ac wireless clients.

Due to the age and construction of the buildings, cellular phone coverage is poor within the buildings. Cellular phone coverage in exterior spaces is sufficient for all major cellular phone carriers.

Recommendations

- As wireless networking standards continue to evolve, it is recommended that the University update their wireless network to the latest ratified wireless standards to provide increased bandwidth and pervasive coverage within the buildings.
- Exterior wireless network coverage should be provided in areas that students congregate.
- The latest wireless network standards require significantly higher quantities of access points due to the RF frequency that they operate on. In addition, newer access points require more power and additional data cabling to support the increased bandwidth. Before upgrading the wireless network, the backend networking switching and data cabling infrastructure should be evaluated and upgraded as needed.
- For any wireless network upgrades, it is recommended the University perform RF surveys.
- Cellular phone service is evolving with newer handsets gaining the capability to "roam" between the public cellular voice networks and private wireless networks. This can be a strategy to address cellular service "dead spots" within the campus buildings. The University should continue to build out their wireless network focusing on providing high density coverage in buildings with troublesome cellular coverage. This will provide support for the higher wireless network demand that will be required to support the additional cellular handsets.

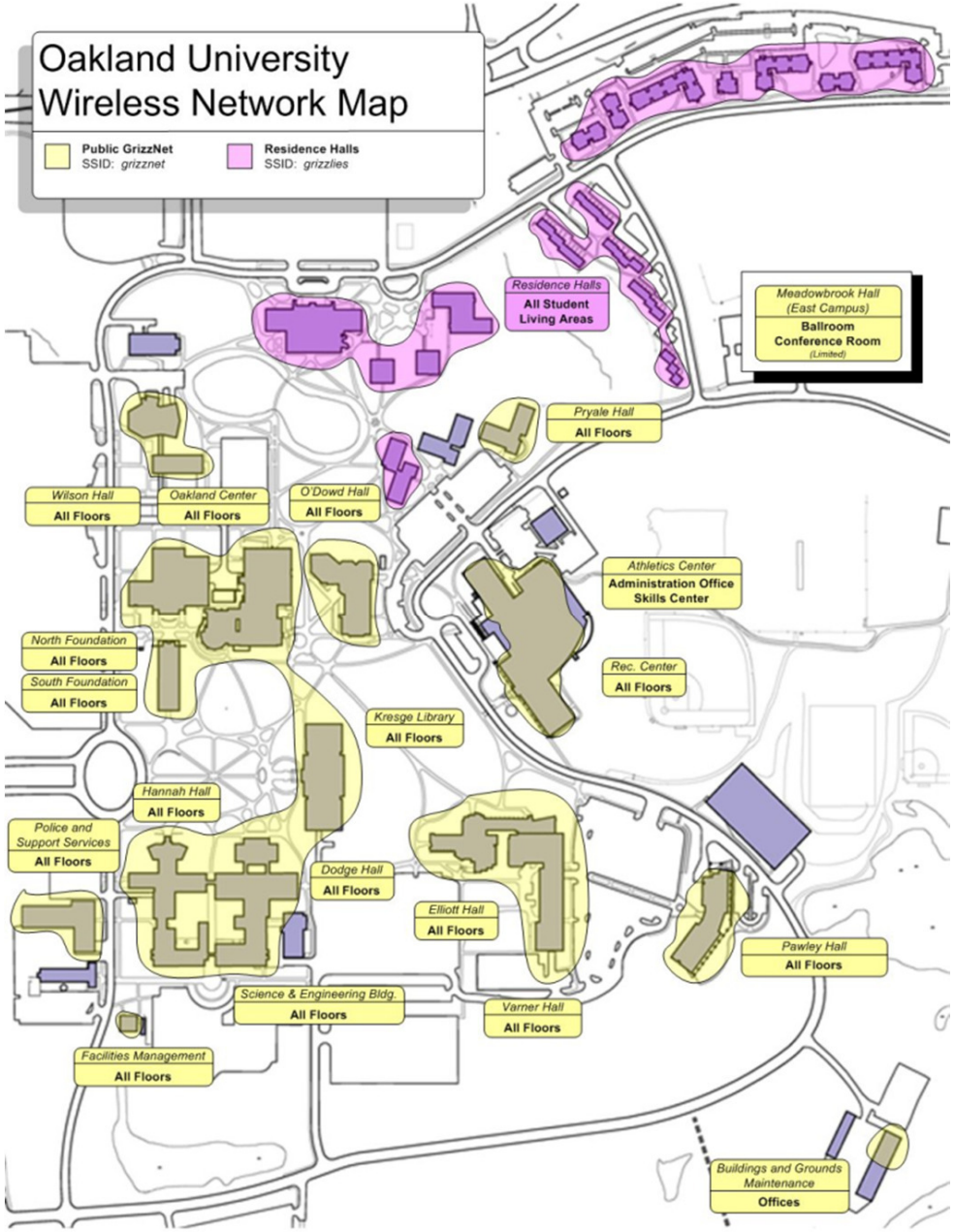


Figure 4.10, Wireless Network Coverage Map

SURVEILLANCE, ALARM AND CARD ACCESS SYSTEMS

Summary

The University utilizes the Pelco Endura video management system to monitor and record approximately 600 cameras throughout the campus. 85% are native IP cameras. The remaining analog cameras utilize analog to digital encoders to transmit video to the Endura VMS system. The current VMS is being phased out by the manufacturer due to changes in technology. Support for analog cameras is coming to an end as manufacturers move to native IP camera technology.

The University's card access system is operated under Blackboard with the ID card office administrating distribution of all card access credentials. The campus police department does not have access to the current card holder list. The police department also does not have the ability to monitor the card access system for alarms and door status. During an emergency on campus there is no way for the police department to lockdown doors through the card access system.

The University utilizes the Siemens Si-Pass alarm system with various capabilities within the campus buildings. There are approximately 1,200 existing alarm points. This system is unable to integrate with the current card access system.

Recommendations

- It is recommended that the University upgrade their Endura VMS to the manufacturer's current version which will provide enhanced analytics and provide a higher level of future surveillance.
- The analog cameras should be replaced with native IP cameras. These new cameras will provide additional functionality as well as improved, more detailed imaging for recorded video.
- License plate recognition cameras are recommended at each vehicular entrance and exit on campus.
- It is recommended that the University switch all card access control over to the Siemens Si-Pass system alarm system. This will allow the police department to review door status, monitor doors for alarms and during an emergency, override all doors and secure them with card access control.
- A link between the existing card access server and the Siemens system should be created to allow the continuation of the student ID card. The current student ID card would need to be upgraded to include proximity technology if card access is required for a student or staff member.

CAMPUS SAFETY AND NOTIFICATION SYSTEMS

Summary

Code Blue emergency phones are located in multiple locations on campus. The Code Blue phones have the ability to make mass voice notification messages through the PA speakers attached to the phones. There is a need for additional emergency phones to be installed in strategic locations on campus.

Mass notification to staff and students via text messaging is accomplished using the Rave Mobile messaging system to send messages to existing University email clients. Text emergency notifications are currently limited to staff, faculty and students who have existing University email accounts.

There are 60 digital signage TV sets on campus in various locations using VISIX digital signage software for content management and delivery via the campus network. The campus police department can access these digital signage TV's for mass notification when required. This is a standalone system requiring access separately from other mass notification systems on campus.

Recommendations

- A review of current on-campus safety and notification system integration should be performed to determine how the various systems can communicate between each other.
- Due to campus renovations and expansion, a review of the entire campus should be performed to determine locations where additional Code Blue phones should be located.
- The text messaging mass notification system provides a very effective method of text messaging for staff, students and faculty. Caution should be exercised due to the fact that there is no way to supervise this system and know that every message reached the intended recipient. Additional mass notification methods must also be used in conjunction with this method of communication during an emergency.
- Provide open access to the text messaging system for individuals who work or are otherwise on campus but do not have University email accounts. Provide access to the parents of registered students so that they are included in campus emergency notifications.
- The mass communication systems should be tested once a month to verify that they function as intended.
- The digital signage system is currently a standalone system. The mass notification systems should be integrated with the signage system to reduce the number of steps emergency personnel must take in order to provide notifications during an emergency.

MEDIUM VOLTAGE ELECTRICAL DISTRIBUTION

Summary

ITC Michigan maintains the transmission system that supplies power to the DTE Energy Spencer Substation located at the southwest corner of the campus. Additional characteristics of the electrical distribution system:

- The substation is configured with two 24/32/40 megavolt-ampere (MVA) transformers.
- The substation feeds adjacent Oakland University (OU) medium voltage equipment that distributes power underground throughout campus at 13.2 kilovolts (kV).
- There are two medium voltage primary selective circuits feeding the majority of buildings on campus (circuits A1 B1 and A2 B2). Circuit A1 B1 is at full capacity.
- Recorded peak demand for the campus going back three years is 9.5 megawatts (MW).
- The Strategic Development Plan, when fully implemented, will increase the campus total electrical peak demand to an estimated 35 MVA which is in the upper range of the DTE Energy transformer capacity.

Recommendations

- As implementation of the Strategic Development Plan increases recorded campus peak demand to levels approaching 20 MW, an evaluation of the Spencer Substation should be conducted in cooperation with DTE Energy. It will need to be determined if the distribution equipment and cabling as presently configured will accommodate future electrical demand beyond the 20 MW level.
- As buildings are added and remodeled, circuits A2 B2, B4 and A3 should be extended to supply and balance the increasing electrical demand.
- Increase the usable capacity on circuits A1 B1 by means of splitting the circuits and splicing them to A2 B2 thus transferring downstream load from A! B1 to A2 B2. Manhole #5 north of the Oakland Center is an example of where this could be accomplished.
- Where new buildings are added on the south and east sides of campus, circuit B4 and future circuit FA3 should be extended to provide primary selective capacity in these areas of campus.
- Older buildings on campus have medium voltage switches and transformers that are near or at the end of their life expectancy. This equipment should be replaced in conjunction with major renovations on their associated buildings.

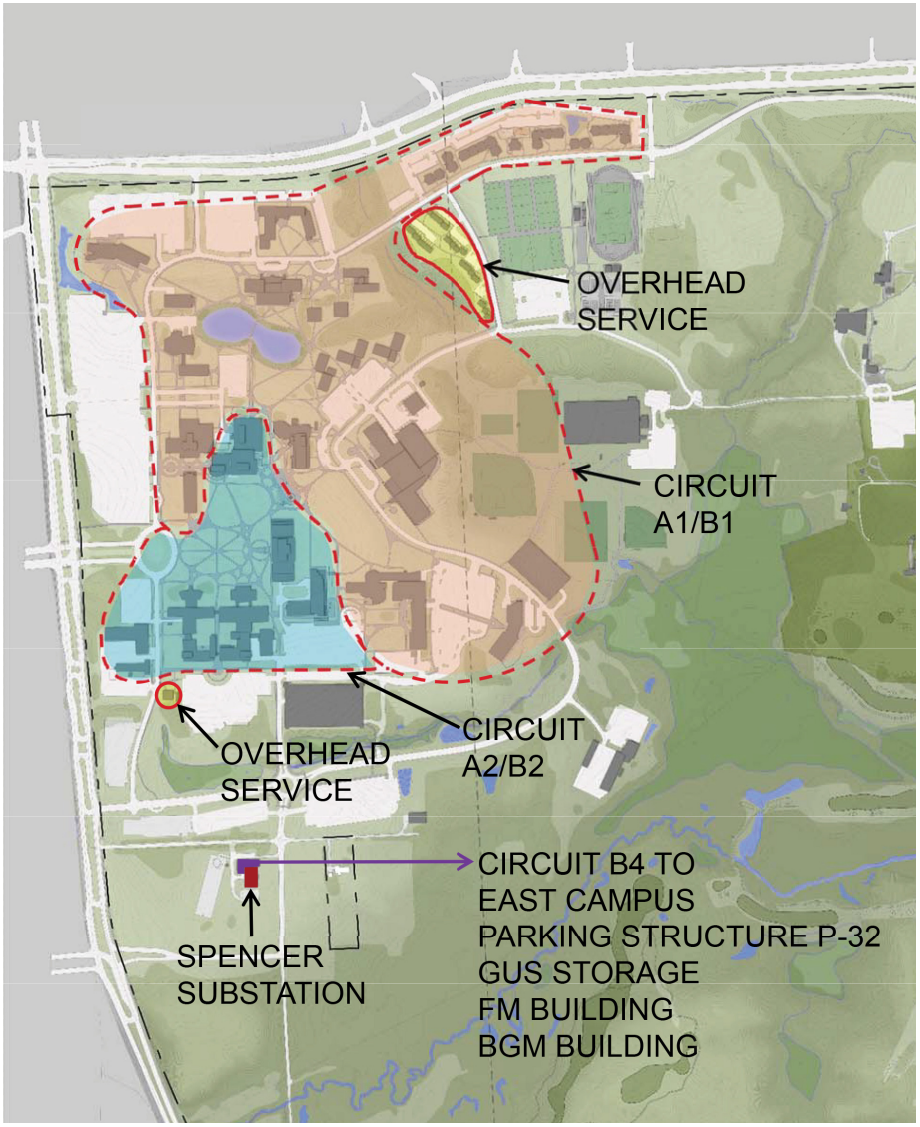


Figure 4.11, Medium Voltage Circuits

COGENERATION

Summary

- The new cogeneration plant will be capable of providing 4.6 megawatts of power to the campus.
- The power will be distributed through the university's medium voltage switchgear near the Spencer substation.
- This is another potential source of centralized power, but it cannot carry the load for the entire campus.
- Power delivered by cogeneration system does not comply with the NEC requirements for legally required stand-by systems.
- This type of centralized power source is advantageous for purposes of keeping a building fully operational in a long duration power outage situation.

LOW VOLTAGE ELECTRICAL DISTRIBUTION

Summary

Secondary distribution to buildings is transformed from 13.2 kilovolt to 480/277 or 208/120 volt service. Secondary transformers are located inside of buildings and are installed as part of a single ended or double ended substation configuration.

Recommendations

- Older buildings on campus have low voltage distribution equipment and wiring that are near or at the end of their life expectancy. This equipment should be replaced in conjunction with major renovations on their associated buildings.
- As substations are being added and replaced, consideration should be given to the option of installing double ended substations. A double ended configuration will add the benefits of transformer redundancy and allow the ability to perform maintenance on medium voltage switches without the need to take the building off line.

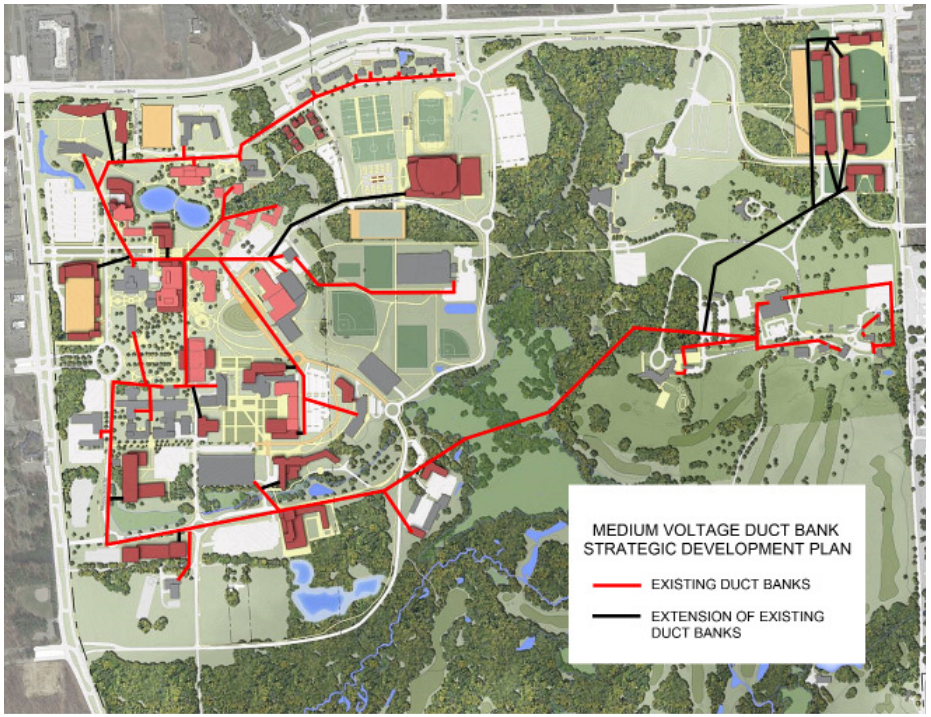


Figure 4.12, Medium Voltage Duct Banks

EMERGENCY POWER DISTRIBUTION

Summary

A review of the existing emergency power distribution system is as follows:

- There are two medium voltage diesel generators at the Spencer Substation.
- Each generator back feeds one side of the OU medium voltage switchgear.
- These generators provide a central source for emergency power, but cannot carry emergency load for the entire campus.
- Emergency power delivered by these generators does not comply with the National Electrical Code (NEC) requirements for legally required stand-by systems.
- This type of centralized emergency power source is advantageous for purposes of keeping a building fully operational in a long term power outage situation.
- Several buildings have local stand-alone emergency generators.
- This type of installation meets the NEC requirements for legally required stand-by systems.
- They generally will only provide emergency power for required life safety systems and optionally provide some building infrastructure protection.
- This type of installation will not allow for a building to remain occupied in a long term power outage situation.

Recommendations

- Local stand-alone generators should be provided at new buildings and at buildings undergoing major renovation.
- Buildings that house university data centers and network hubs should be provided with local stand-alone generators and be connected to the centralized emergency power system in order to achieve continuity of service during testing and maintenance of either of the emergency systems.
- Buildings that presently service emergency life safety lighting with a feeder tapped ahead of the main service disconnect switch no longer meet code. When buildings with this configuration are renovated, implementation of emergency generator for emergency life safety lighting will be required.

Figure 4.13, Emergency Power and Cogeneration

STORM WATER MANAGEMENT

The Strategic Development Plan for the Oakland University campus includes many significant building expansions, and smaller building additions, as shown in red in the adjacent figure.

The existing storm water management system consists of underground piping networks with point node infiltration locations (catch basin / manholes), in conjunction with localized surface impoundment locations. The campus predominantly drains from north to south and west to east. Major wetland areas existing at the lower central and eastern edges of the campus.

Impacts of the proposed Strategic Development Plan include:

- Conflict of building expansions with existing storm sewer locations. System components to be relocated and improved.
- Lack of available infrastructure at major development locations. Need to extend new systems to support development.
- Existing system(s) with deficient / inadequate capacity for current future drainage improvements.
- Existing system was developed in a phased approach that did not necessarily account for future development (lack of major trunk line sewer system throughout campus).
- Off-site storm water contributions not well defined and are impacting the capacity of the on-site system.
- Campus master planning/ capacity analysis needs to be developed.

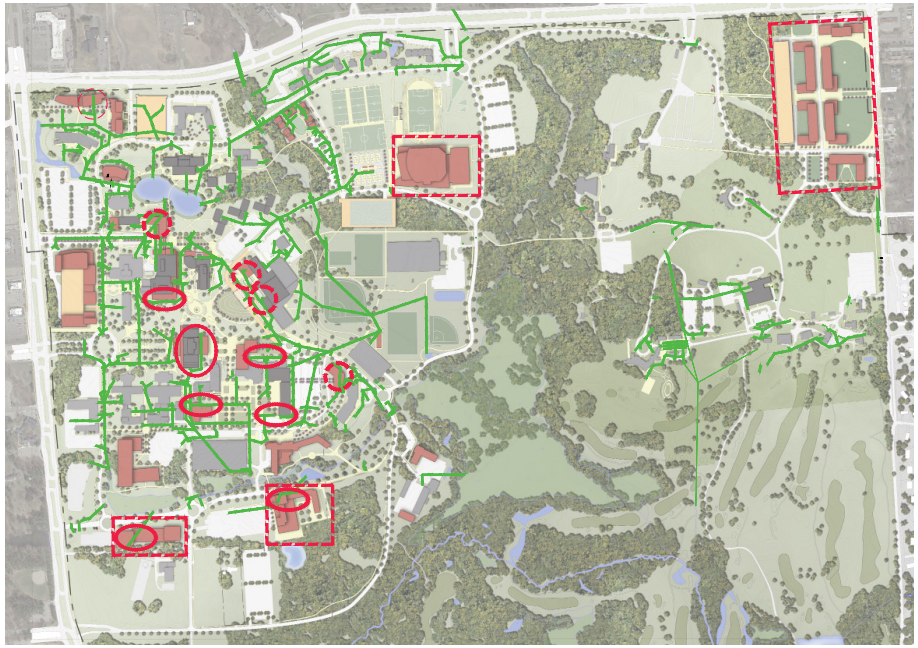


Figure 4.14, Storm Water

SANITARY WATER SYSTEM

The existing Sanitary System consists of major trunk line sewers providing collection from independent leads from the existing buildings; see figure to the right. The campus predominantly drains from north to south. Several major sanitary sewers arrive into the campus from northern suburbs. These systems are typically of substantial age and variable and unknown condition. With major growth in the neighboring communities, the capacity of these systems and impact on the existing campus capacity is not well documented.

Impacts of the proposed Strategic Plan include:

- Conflict of building expansions with existing sanitary sewer locations. Will require relocation of existing sewers.
- Lack of available supporting infrastructure at major development locations. Need to extend new systems to support the development.
- Off-site sanitary contributions not well defined and impacting the capacity of the on-site system.
- Campus master planning/capacity modeling of the existing sanitary sewer is not fully developed and should be performed.
- At the lower ball fields, the existing Oakland County sanitary sewer "passes through" an existing major Oakland County storm sewer. Future maintenance and rehabilitation of the system at this junction will not be straight forward and potentially left in the current condition could have a serious environmental impact if the sanitary sewer were to release inside of the storm sewer. This flow would outlet to the core campus wetland.

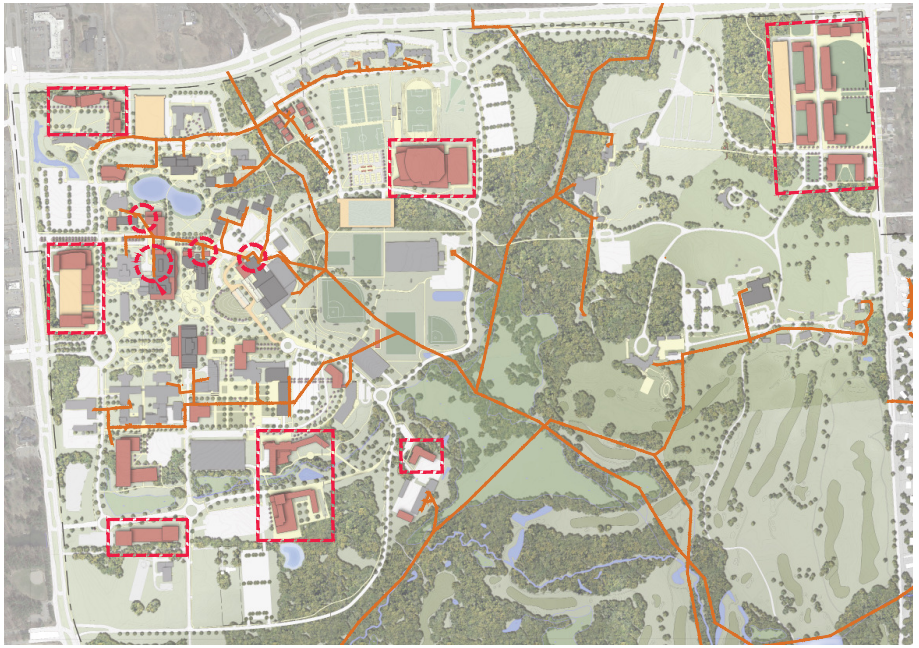


Figure 4.15, Sanitary

Recommendations for Storm and Sanitary Network - Campuswide

1. Bear Lake
   Consider analysis /improvement at Bear Lake to include capacity evaluation and review of the lake level control system. Implement lake level control improvements as well as outflow improvements to prevent erosion and undermining of the downstream ravine.
2. Oakland Center
   Consider reviewing/improving site/building drainage around the Oakland Center (OC) as conditions are problematic. Consider re-routing of the storm sewer system to disconnect from the existing system and re-route with new trunk line storm sewer east of the Tower. In connection with re-routing of the existing system, include an underground detention system to detain and restrict storm water conveyance to accommodate the runoff from additional impervious surfaces that would be installed for the building expansion, and other impervious site improvements. The existing storm sewer on the south side of the building can be re-routed into the proposed underground detention system with restricted outlet back into the existing system in accordance with system capacity modeling and/or city/county standards. Sizing of the underground system will be based upon stormwater calculations developed in accordance with local standards, with preliminary sizing of the detention footprint of 120 feet by 60 feet and located generally within the greenbelt area to the south of the OC and northwest of the Library building.
3. Large Diameter Storm Sewer Crossing at Lower Ball Fields
   Consider a detailed evaluation of this sewer to understand impact of outlet to below grade elevations at the wetland. Further, understand the impact of the sanitary sewer that passes "through" the sewer and potential up-stream issues with back up and flooding due to blockage or capacity issues. Develop a program to improve this trunk line sewer and outlet location.

- Existing System Evaluation/Modeling
  For each proposed building addition/major expansion, the existing storm and sanitary systems need to be evaluated to determine if systems need to be relocated and/or expanded. Future growth of upstream and downstream components need to be included in each phase of development.
- Overall Aging of Campus Infrastructure
  The storm and sanitary sewer networks of the campus are aging. Regularly scheduled cleaning and inspection of the systems, including a GIS system to track conditions and issues, should be implemented. Incorporating the GIS system into a strategic/long term campus improvement program is considered an essential component to supporting campus growth.

Figure 4.16, Storm Water and Sanitary Recomendations

for the vision
in developing
this wonderful
Center
For Making me the person I am today! Go Grizzlies
Bre'Ana
So happy to be here!
For allowing me to bloom and find my inner confidence - Matthew Schuhke
Love it here!
Brianna DiMilia
I get to w... w/ the best ... in the world!
Elizabeth Kendall
Candice Burley
For helping me discover my personal and professional dreams.
Eleanor "74"
Emma M. Eckenrode
Christina Spruk
Cindy Vink
John Toma
Ashl... Preston
For a chance at an excellent education
For letting me be
For 17 years of helping students to help themselves!!
MaTT Hibbard
excellent education & the best years to come.
Maricanna Cassar Admitted Student 2014
Thanks for the memories. Jim + Py Wolfe '64
Tessa Harkey
Maycee Frey
For giving me a place to call home -Kate Hojnacki
A BIG thanks to you OU! -Larissa Lertola
For helping me reach my DREAM! -Maria Karki
For helping me to find my place
Carly Beyer
-Aaron Knowlton
For giving me the opportunity to continue my education
I wish all my projects were this fun. I enjoyed working with all of you.
Bill Hidinger FRS
Kathleen Gordon @keeteee
Shannon Hutchin -FHS '14
Shane Lewis '15
For an outgoing relatable staff!

5 Parking and Transportation

transportation and parking plan

CAMPUS ACCESS

There are five (5) major campus access gateways to the Oakland University campus. Parking lots are generally located along the perimeter of Meadow Brook Road and Pioneer Drive, which are both internal campus streets. Exceptions include surface parking lots and two structured parking decks, one on the current loop road above the athletic fields, and the other near the new Engineering Center building on the southern portion of campus.

Campus roadways are posted between 15 and 25 mph. Student have suggested that the existing pedestrian crossings of Meadow Brook Road near the P1 parking lot, as well as Pioneer Drive near the Recreation Center, are unsafe.

Campus roadways and the surrounding roadway network experience traffic congestion during the AM and PM peak periods. Vehicles queue along Meadow Brook Road, unable to exit campus onto Squirrel Road and University Drive to the west of campus due to the stoplight and external traffic. Traffic and circulation may pose some challenges for the future growth of Oakland University, particularly with limited alternative transportation options.

Key issues, opportunities and recommendations:

- Accessing the two major off-campus roadways (Squirrel Road and Walton Boulevard) present challenges during peak periods.
- Pedestrian crossing Squirrel Road and Walton Boulevard to access the other side of the streets is challenging.
- Circulation among parking lots contributes to unnecessary traffic on campus roadways and potentially unsafe pedestrian crossings. Implementing a permit system would help reduce the congestion caused by searching for parking spaces.
- Restricting vehicular through traffic along Pioneer Drive near the Recreation Center between 9 AM and 5 PM would reduce unnecessary traffic through this busy pedestrian-crossing area. Gating this area could allow it to be open for emergency service and transit vehicles only.
- While it will reduce congestion near the core campus, implementation of the new "outer" loop connection around campus should be carefully planned and designed to discourage cut-through traffic that is caused by congestion at the intersection of Squirrel Road and Walton Boulevard.

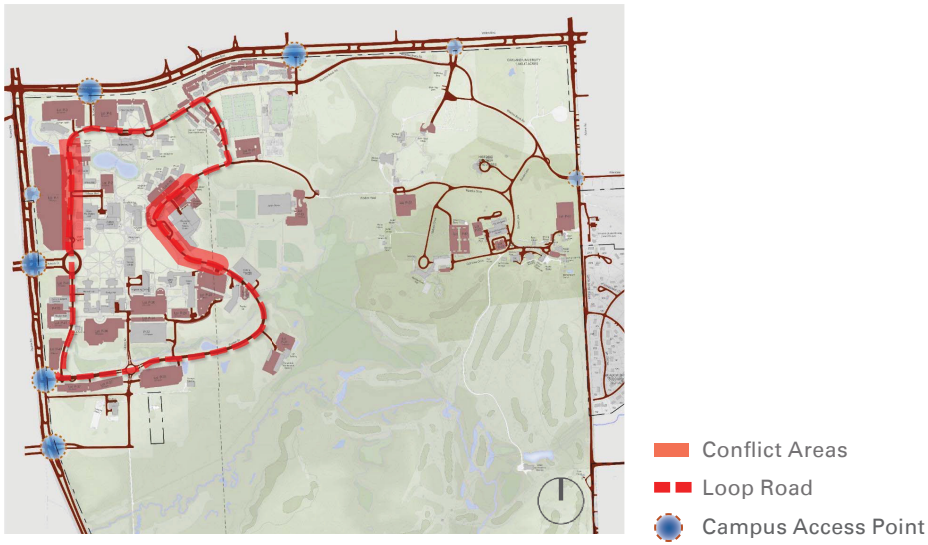


Figure 5.1, Access and Circulation

Bike at Engineering Building

WALKING AND BICYCLING

The central portions of campus are pedestrian-friendly with wide sidewalks connecting buildings, walking routes, green spaces and parking lots. Campus sidewalks are not well connected to off-campus however. There are limited sidewalks and safe crossing areas along Squirrel Road or Walton Boulevard. There are also no greenway paths or off-road trails that connect the surrounding area with the campus.

Bicycling on campus is common, though less frequent during the winter months. The Recreation Center currently offers a no-cost bike loan program for students; previously, a free bike share program was available for on-campus bicycling however the system has been largely decommissioned.

Campus roadways do not include bicycle shared lane markings, which would be preferable over striped bicycle lanes. Bicyclists on campus must either ride along campus streets, or share the sidewalks and pathways with pedestrians. Bicycle connections for off-campus bicycling are limited as well. Squirrel Road and Walton Boulevard surrounding the campus represent significant barriers to bicycling due to their high volume and the speed of vehicles. Commuter students, who may live a very short distance from campus, are effectively forced to drive because there are limited sidewalks or safe bicycle facilities.

Key issues, opportunities and recommendations:

- Internal campus paths largely connect buildings and parking lots, it has been noted that in some cases the paths are not as direct as possible.
- Future parking lots need to be well connected by sidewalk or multi-use paths.
- Sidewalk connections to off-campus destinations (e.g., apartments) are limited.
- Campus lacks on-road bicycle facilities; as a result sidewalks/paths are shared with bicyclists.
- Shared Lane Markings ("Sharrows") would be ideal for campus roadways with speed limits of 25 mph or less. See the photo of "sharrows" below.
- There is a need for regional connections with Auburn Hills and Rochester Hills bicycling and greenway networks, particularly across or under Walton Boulevard to the north and Squirrel Road to the west.
- There are opportunities to implement a bike lane as part of the planned "outer" loop road connection and as part of improvements that could occur within the open space areas on the east side of the campus.

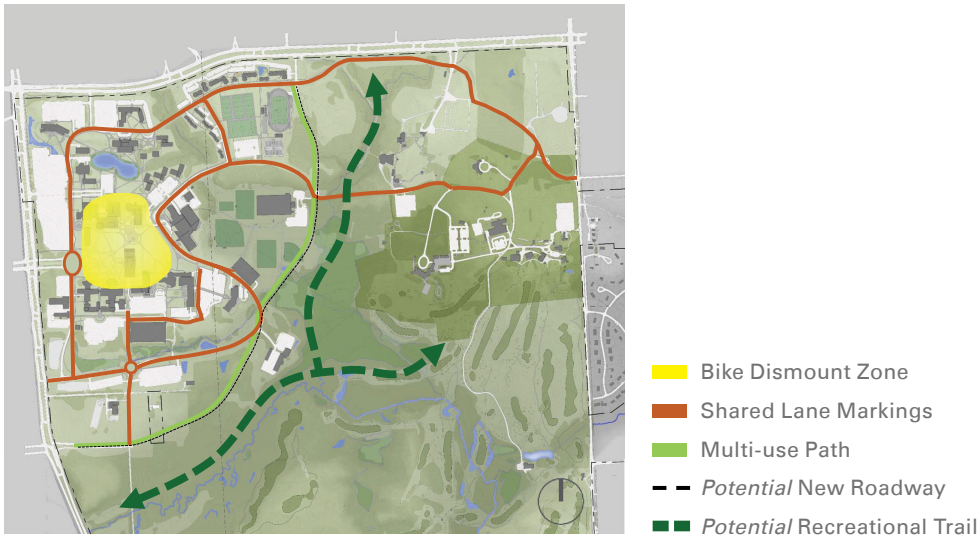


Figure 5.2, Bicycle Facilities

Shared Lane Marking Precedent Image - 'Sharrows'

TRANSIT

The Bear Bus transit system is managed by the Student Housing department and operated by student drivers. There are three (3) weekday routes as well as four (4) evening and weekend routes. Routes are tailored for the resident student population, picking up and dropping off near residence halls and offering shuttles to nearby shopping destinations. A real-time bus locator service is available through the TransLoc mobile app, which allows Oakland University students and employees to view the location of the bus from their phones before walking to the nearest bus stop.

Bear Bus ridership was highest during heavy campus construction periods, when parking lots were out of service. General ridership has declined over the past two years.

Existing weekday routes are generally on campus, with the exception of the Red (Walmart shuttle). Commuting students have little incentive to ride the Bear Bus unless they conveniently live adjacent to one of the off-campus route destinations, or if the route happens to pass near the parking lot they have parked. Traffic along campus roadways can cause a delay for the Bear Bus, rendering the bus inconvenient for students, faculty and staff seeking to travel around campus for classes, meetings or to and from their parked cars.

Students have suggested improvements to the bus stops/shelter locations, particularly for use during the winter months. This process to reassess bus stops and routes, should involve consolidation or elimination of stops to improve bus frequency and reliability.

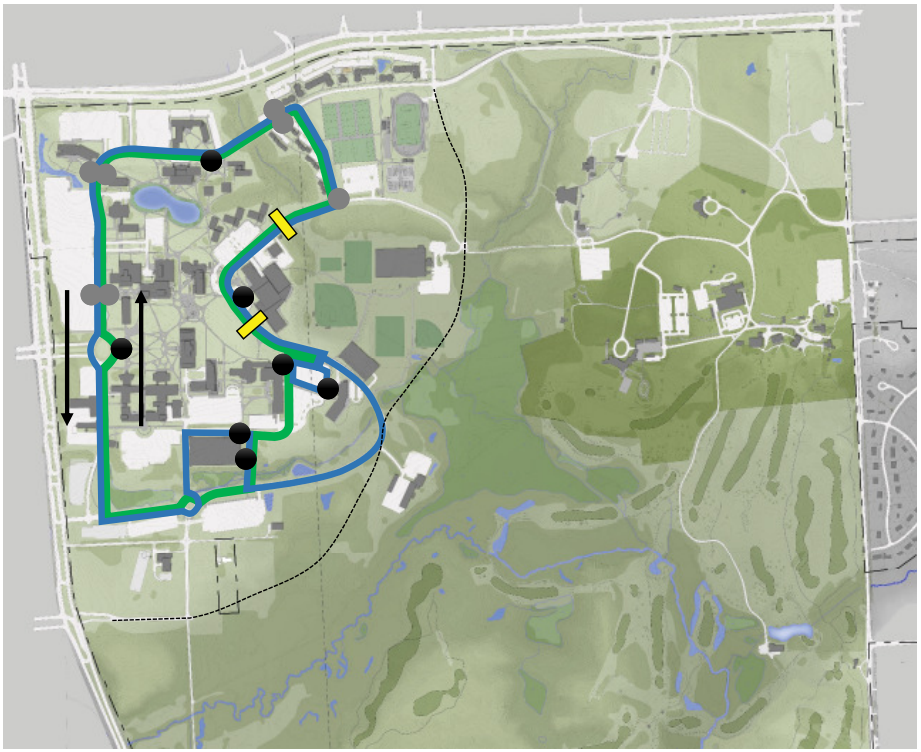


Figure 5.3, Recommended Future Bear Bus Routes and Stops

Key issues, opportunities and recommendations:

- The mission of Student Housing, who operates the bus system, relates to resident student needs and not necessarily campus mobility for all users. As a result, the Bear Bus system maybe less convenient for commuter students and employees.
- Most rubust parking and transit operations are reliant upon one another for campus mobility. Oakland University should consolidate parking and transit into one department with a complementary mission.
- Increased use of the Bear Bus for internal campus trips during the day will help reduce unnecessary traffic congestion along campus roads by diminishing the need for students and employees to re-park multiple times per day. To encourage more ridership the Bear Bus (Blue and Green loops) must increase bus frequency by eliminating unnecessary turns into the Nicholson Student Apartment and Human Health Building parking lots. Instead these routes should stop at formalized shelters along Meadow Brook Drive adjacent to these buildings.
- Off-campus park-and-ride options should be explored from nearby apartment complexes. An analysis of commuter student residential address geocoding should be performed to identify high density areas for potential ridership.
- Southeast Michigan Area Regional Transit (SMART) options are limited, with only one route (756 Pontiac-Perry-Opdyke) that offers service to the Oakland University campus once per hour. The cost to ride is $2 per trip. The university should seek a partnership with SMART to subsidize riders at a reduced rate as one strategy that may help to reduce the demand for parking.

PARKING

Driving is the dominant mode of transportation for students, employees and visitors. As Oakland University has continued to grow, so has the demand for on-campus parking spaces.

Currently there are more than 7,600 parking spaces located in more than 20 lots across the campus. These lots include smaller surface lots, large surface lots and two parking structures. The following is a summary of the existing major parking lots on campus.

LOT #	CAPACITY
P-1	1,692
P-2	60
P-3	589
P-5	484
P-11	246
P-16	211
P-17	109
P-24	95
P-26	477
P-29 Structure	527
P-32 Structure	1,232
P-34	93
P-35	433
P-36	339
P-37	188
P-37 Temp	110
P-38	398
P-41	96
P-41 Temp	150
P-43	134
TOTAL	**7,663**

Figure 5.4, Existing Parking Counts

Parking is provided on a first come, first served basis. A limited number of parking spaces require permits, such as handicapped parking and a limited number of spaces reserved for individuals. Designated parking lots allow resident students overnight parking.

Parking on campus is highly occupied during peak periods of the day, with some areas full on a regular basis throughout the day. The following chart provides a summary of the available parking. This information was provided by Oakland University and was gathered in September 2015. The numbers in each box indicate the number of empty spaces available during each of the time periods. As shown in the chart, there are a number of periods where fewer than 766 (10 percent of the total) spaces are available (dark red cells).

ALL DATES		EMPTY PARKING SPACES			
Day	**Date**	**9:30 AM**	**12:30 PM**	**2:30 PM**	**4:30 PM**
Friday	9/18/2015	2,239	1,526	--	--
Thursday	9/17/2015	1,653	962	492	1,331
Wednesday	9/16/2015	1,771	106	165	335
Tuesday	9/15/2015	2,084	888	249	871
Monday	9/14/2015	1,983	518	531	586
Friday	9/11/2015	1,621	1,134	--	--
Thursday	9/10/2015	2,382	425	294	945
Wednesday	9/9/2015	1,664	116	295	408
Tuesday	9/8/2015	1,629	1,015	383	1,309
Friday	9/4/2015	1,357	1,444	--	--
Thursday	9/3/2015	1,393	1,085	742	1,701

Figure 5.5, Available parking counts at times throughout the day

Key issues, opportunities and recommendations:

- Demand is high for parking lot P1 because of its highly visible location along Squirrel Road at the "front door" of campus and near the academic core. This lot fills up early and during much of the day students circle through the lot "hunting" for an available parking space. Drivers often wait for people to walk to their cars and then park once the space has been vacated.
- The parking survey information that was provided for this study was collected during the first few weeks of class when Oakland University Students are involved in the process of considering class options, late registration and still within the timeframe to get a 100% refund on their tuition. During these first few weeks of school the number of students that are on campus creates the greatest challenges to the existing parking supply. It is recommended that an additional series of counts is done during a more "regular" or "normal" times of the school year such as October or February to provide a second point of reference for parking space usage.
- Most people park once and walk since much of the campus is within a five- to ten-minute walk from the parking lots. During colder weather or in the evening people may tend to re-park their cars to be closer to their building or destination. This condition is common for campuses, regardless of size or setting.
- There are many concerns about availability of parking during the peak times. This fear affects the ability for some staff to leave and return during the day, or for visitors to park near their destinations.
- Campus Police Department, which oversees parking management, is aware of the challenge of finding available parking, particularly when lots are not permitted. Their parking website (https://oupolice.com/parking/) even provides suggestions for those having difficulty finding available parking:
  - Arrive early enough to find parking
  - Study the campus map and have a second parking lot selection in mind
  - Explore the campus to see all available parking

These suggestions do not address the issue of unnecessary circling through high demand lots before ultimately choosing to park in more distant lots on the opposite side of Pioneer Drive. These suggestions also do not encourage drivers to leave their vehicle at home and choose to carpool, bike, walk, or ride transit.

POTENTIAL FUTURE PARKING CONSIDERATIONS

Parking demand at Oakland University has continued to grow in recent years which has put more pressure on the parking supply. Based on enrollment projections for the next 10 years, it is anticipated that the campus population will grow to 25,800 from its current population of 23,211. To develop an estimate of the future parking requirements there are two key factors that help determine the number of spaces. First is the parking ratio of spaces per person and the second is parking utilization.

Currently the campus parking ratio is 1 parking space to 3 persons (or a 0.33 ratio). This ratio is typical for most campuses, which can range from 0.25 to 0.45 spaces per person. This range is largely dependent upon campus location within or adjacent to a major urban center with transit options. Universities with a lower ratio are often located in a very urban setting with a robust public transit system in place. Universities with a higher ratio (0.5 or greater) are often located within a small town and may include satellite parking at a remote football stadium or park & ride facility.

The second factor is the parking utilization. Utilization peaks during the first few weeks of the school year due to the need to sign up for and attend classes during that time. One potential strategy is to plan for a maximum of 90% utilization of parking lots during the beginning of the semester. The other option would be to plan for a maximum of 90% utilization of parking lots during a more "normalized" period of the school year (see the previous section for a recommendation related to additional parking counts).

ENROLLMENT-BASED PARKING DEMAND

The total campus population is 23,211 and there are 7,663 parking spaces available. If the campus population increases to 25,800 by 2025 then +855 new parking spaces would be needed to simply *maintain* the current parking conditions (0.33 spaces per person). These potential parking spaces would not "improve" the parking conditions for users.

The current 98.6% peak is a near-term issue and the university should be estimating future parking demand based on a lower occupancy in the future. Two strategies to achieve this are:

- Prepare a future parking needs estimate based on a 10% reduction from the current occupancy
- Perform parking counts throughout the academic calendar year in order to better determine the future demand.

Key issues, opportunities and recommendations:

- Parking lots are often locations for future master plan buildings. As such they are usually removed as construction begins. This can have a dramatic effect on the parking system each semester. Oakland University administration should consider adopting a parking mitigation policy that would require the replacement of lost parking lots to be provided in a comparable location prior to the initiation of construction.
- Oakland University administration should also include parking mitigation costs into the overall building project costs, if not otherwise restricted. If multiple building projects are to be located adjacent to one another then the parking mitigation costs could be shared among multiple building project budgets.
- Parking demand is greatest during the first few weeks of the fall or spring semester, as described above. The university could identify and communicate parking overflow areas along Pavilion Drive, including lot P-57, or lot P-61, for use by students and employees. These additional parking areas may help to delay or reduce the demand for constructing new parking lots or structures in the near-term.
- Oakland University should consider implementing a parking permit management program that is phased-in over time. The immediate goal is to reduce the "hunting" for parking spaces and the unnecessary driving along campus roadways between parking lots. A North campus permit and a South campus permit could be introduced for a nominal charge (or through a refund on tuition approach), which should limit re-parking and some unnecessary trips. Over time the cost of high demand areas, based on utilization counts, should increase while the cost of low demand areas should remain constant. Over time the parking zone system will establish parking permit options based on distance from the center of campus. Students and employees will have different permit charge choices. This should occur simultaneously with the development of Traffic Demand Management (TDM) programs that encourage bicycling, walking and riding transit.

TRAVEL DEMAND MANAGEMENT (TDM) CONSIDERATIONS

The overall goal of a university transportation system involves efficient mobility of students, employees and visitors. Mobility includes driving, carpooling, being dropped off, riding transit, bicycling, skateboarding, or walking. An effective transportation system includes accommodations for all modes of travel, which allows users to choose whichever suits their needs for that particular day. Reliance upon a personal automobile is a condition of transportation system that has a lack of options for alternative modes.

Physically connecting the Oakland University campus with the surrounding network of sidewalks, greenways, bicycle trails and bicycle facilities within Auburn Hills and Rochester Hills involves coordination with local and state governments. These engineered connections (concrete or asphalt) are often a component of a larger roadway improvement project and may utilize federal or state funding as long as the university is actively involved in these projects along the periphery of campus.

Programs that encourage the use of alternative transportation are far less expensive than roadway projects and have a much shorter return on investment. These TDM strategies are considered the "low hanging fruit" and may take various forms of education and encourage programs. The following TDM programs or strategies are aimed at reducing vehicle trips:

- Freshman student vehicle limitation
- Resident student storage parking lot
- Carsharing programs, such as Zimride, Zipcar, or Car2Go
- Carpool or Ridesharing programs with priority parking location(s)
- Emergency Ride Home voucher program
- Park and Ride shuttle service
- Discounted or free passes on regional transit service (SMART)

The overall goal of TDM is to limit the potential barriers to bicycling, walking or riding transit, for both on and off campus travel. This includes encouraging drivers to park once and walk rather than re-parking during the day. The following strategies are aimed at reinforcing the park once mindset:

- Initiate a low-cost permit management system, with separate north and south permits
- Install traffic control gate access at Recreation Center during 9 am to 5 pm
- Improve Bear Bus frequency and dependability of service
- Formalize bus shelters along Meadow Brook Road and Pioneer Drive
- Conduct an annual student transportation survey to evaluate incentives to not drive and potential barriers to alternative modes
- Install bicycle racks at/near all buildings and parking lots
- Connect with off campus bike/pedestrian and transit facilities

Possible options are described here and on the following page.

"BUSINESS AS USUAL"

The Option A approach to parking is to focus only on the parking supply. This approach would require an increase in parking to meet additional growth of 855 spaces along with an Increase in parking to reduce maximum utilization of 90% during the busiest time of day. This approach would equate to adding 1,589 new spaces.

Current Utilization	98.62%
Targeted Utilization	90.00%

"ENHANCED BUSINESS AS USUAL"

Option B introduces Transportation Demand Strategies to reduce parking demand. These strategies would include:

- Implementation of a "modest" parking charge and permit system
- Implementation of strategies for priority parking/reduced permit charges for carpool drivers
- Improve existing Bear Bus stops/shelters
- Optimize existing Bear Bus routes/service hours
- Provide strategic shuttle options (park & ride)

Based on typical experience with these types of changes there is a potential to reduce parking demand by approximately 5% reduction. That level of reduction would equate to:

- 460 space demand reduction
  - est. 9,252 spaces needed by 2025
  - now 8,792 spaces needed by 2025
- Additional 469 spaces needed over current parking total of 8,323 spaces

"NEW BUSINESSES PRACTICES"

Option C would have the greatest potential to impact parking demand by implementing the boldest set of options. These include:

- Implement parking charge and permit system
  - Portion of revenue goes to transit
- Same improvements from Option B
  - Carpool: priority parking/reduced permit
  - Bear Bus improvements/modifications
- Limit or eliminate freshman parking on campus

These changes have the potential of reducing parking demand by approximately 25% with the biggest portion of that reduction coming from the elimination of freshman parking.

In total these reductions would include:

- A 2,300 space reduction in demand from 9,252 spaces or a total of 6,952
- Reduction from current parking total of 1,371
  - est. 9,252 spaces needed by 2025
  - now 6,952 spaces needed by 2025

The potential result of Option C would be a "Surplus" of 711 spaces from 2015 parking total of 7,663 spaces.

Since many Oakland University students also have jobs off campus, the elimination of freshman parking may not be a potential approach but these Options provide some illustration of the impacts that TDM may be able to have on the overall parking requirements.

Key issues, opportunities and recommendations relating to TDM:

- Oakland University should become more involved in the planning for roadway improvement projects near the campus, including Michigan DOT, City of Auburn Hills, City of Rochester and the Southeast Michigan Council of Governments (greater Detroit area), which would impact OU.
- Adopt a "Park Once" goal and encourage users to walk, bike, or ride the Bear Bus by providing well connected sidewalks, shared lane bicycle markings along campus streets, covered bicycle parking across campus and formalized bus shelters with an improved frequency of service.
- Vehicles of residential students typically are infrequently used during the week, meaning that some of them could be shifted to low-demand (storage) parking lots away from the center of campus.
- Constructing an east-west greenway path along Pavilion Road from the potential overflow parking lots would encourage users to park here and thereby remove vehicles from the center of campus.
- Constructing a north-south greenway path along portions of Galloway Creek would provide potential future off-campus connections with recreational trails, or adjacent student apartments. This greenway system would encourage students to leave their vehicle at home and walk or bike to campus.

The Bicycle Loan Program and the Bike Share Program will become more practical as enrollment increases and parking is removed by future building projects. These programs should develop a student survey to identify improvements that would encourage them to utilize these bicycles and expand the program.

NEAR-TERM PARKING PLAN

The Near-Term development plan will remove several parking lots, modify several parking lots and construct new parking lots and decks. Changes to parking is summarized below.

Parking Lots Removed (total loss of 1,422 spaces)

- P-2 (-60 spaces)
- P-3 (-589 spaces)
- P-11 (-246 spaces)
- P-36 (-339 spaces)
- P-37 (-188 spaces)

Parking Lots Modified (total increase of 515 spaces)

- P-1 New Deck (+115 spaces)
- P-5 New Deck (+815 spaces)
- P-24 (-63 spaces)
- P-26 (-162 spaces)
- P-31 (+12 spaces)
- P-37 Temp (-10 spaces)
- P-38 (-226 spaces)
- Matthews Apts (+34 spaces)

New Parking Lots Constructed (total increase of 2,309 spaces)

- Convocation Surface (+469 spaces)
- Convocation Deck (+1,840 spaces)

The net change in parking is estimated to be +1,400 new parking spaces for the Near-Term development phase. This parking impact will be distributed unevenly across the campus however. The north portion of campus (north of the quad) will experience a net gain of 2,344 new parking spaces, while the south portion of campus will experience a net loss of -976 parking spaces.

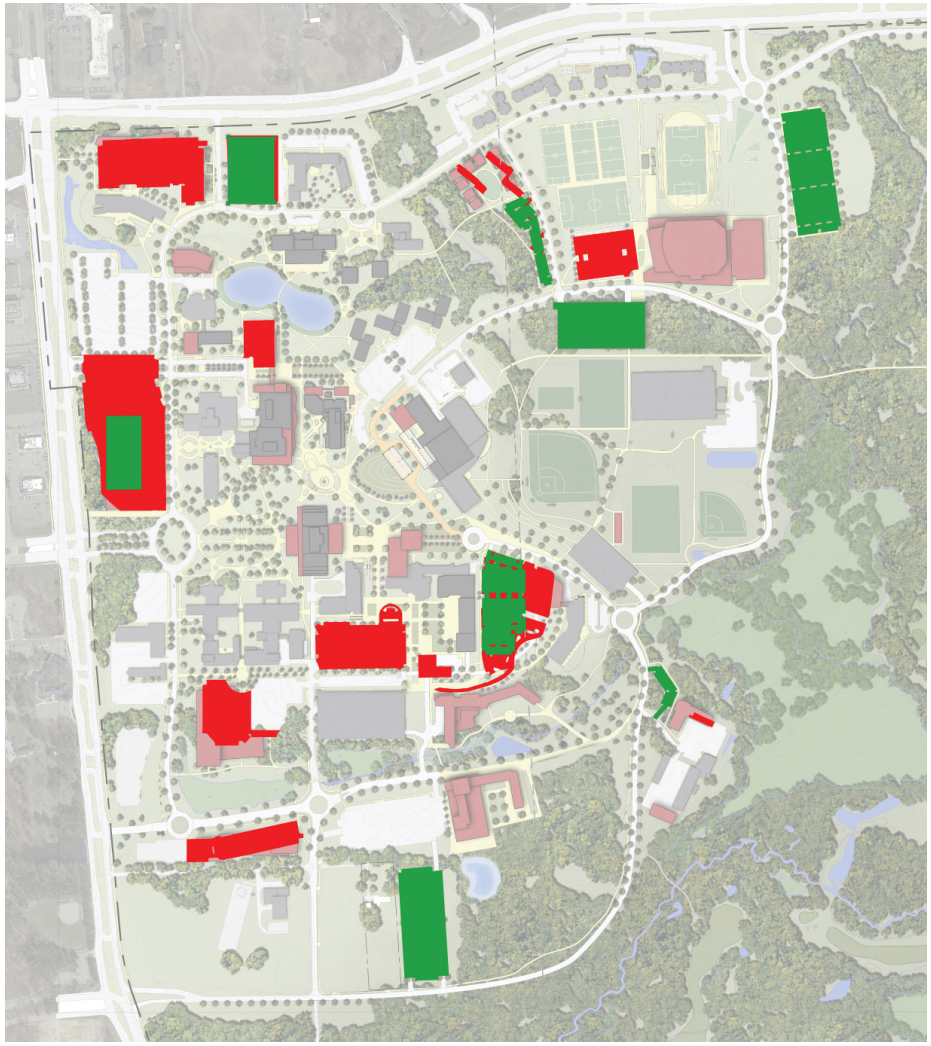


Figure 5.6, Near-Term Parking Plan

Campus Location	2016	Near Term
North	4,140	6,519
South	4,436	3,460
Total	**8,576**	**9,979**
net change		*1,403*

LONG-TERM PARKING PLAN

The Long-Term development plan will further remove, modify and construct parking. The changes below reflect only the difference in the parking space impact between the Near-term and the Long-term development plans.

Parking Lots Removed (total loss of 948 spaces)

- P34 (-93 spaces)
- P37 Temp (-100 spaces)
- P38 (-172 spaces)
- P41 Temp (-150 spaces)
- P35 (-433 spaces)

Parking Lots Modified (total loss of 151 spaces)

- P16 (-51 spaces)
- P43 (-100 spaces)

New Parking Lots Constructed (total increase of 159 spaces)

- New South Housing (+59 spaces)
- New South Housing 2 (+100 spaces)

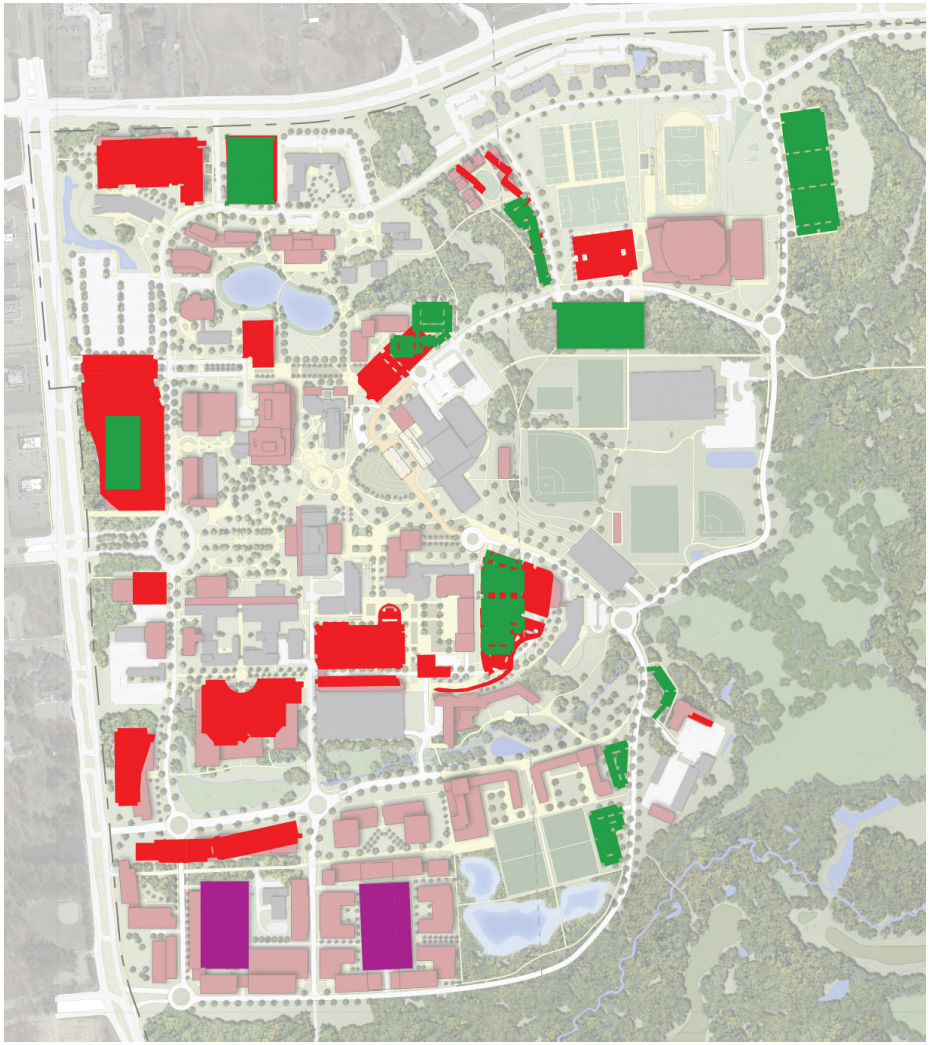


Figure 5.7, Buildout Parking Plan

Campus Location	2016	Near Term	Build Out
North	4,140	6,519	6,468
South	4,436	3,460	2,572
Total	**8,576**	**9,979**	**9,039**
net change		*1,403*	*-939*

The net change of parking is estimated to be a loss of 940 parking spaces after the buildout development phase. The north portion of campus will experience a net loss of 51 parking spaces, while the south portion of campus will experience a net loss of -889 parking spaces.

Considerations for parking calculations:

- Academic area parking is estimated based on enrollment
- Research area parking is estimated on building square footages
- Research area intends to add +3,149 new parking spaces (south)

Existing Bear Bus Transit


View toward P-1 from Human Health Building


View toward P-36 with Engineering Building beyond

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