THE UNIVERSITY OF ARIZONA®
COMPREHENSIVE CAMPUS PLAN 2003

THE UNIVERSITY OF
ARIZONA®
TUCSON ARIZONA

ADOPTED BY THE ARIZONA BOARD OF REGENTS JUNE 2003

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Dear Colleagues,

Managing growth has been a significant challenge for the University of Arizona. During the past year two actions by the Arizona Board of Regents (ABOR) have together provided us with the means to manage the growth of our University for the foreseeable future.

· ABOR granted us the authority to manage future enrollments by easing the constraints on resident freshman admissions.

· ABOR approved a new comprehensive Campus Plan that develops in detail strategies for developing the "responsible capacity" of the land within the boundaries negotiated long ago with our neighbors.

In the absence of a campus plan and the capacity to control enrollment growth, decisions to accommodate uncontrolled growth are made incrementally, with negative consequences over time both for ourselves and for neighbors. Only by comprehensive, long term planning can we preserve the unique character of our campus and extend our signature mall concept beyond its current place as the central East-West feature of the main campus. We need more livable open space, including buffer space on our perimeter, and yet we must accommodate desirable growth to responsible limits.

Our planning consultants tell us that the 490 acres within our planning boundaries can be developed over time in a way that can accommodate 40,000 students properly distributed over the ranks and disciplines, at the same time allowing for significant expansion of research space as well as space for living and learning. Now we know what constraints must be respected as we manage enrollments.

When I arrived at the University of Arizona campus for the first time, I was awed by the majesty of the Main Mall and the stately elegance of the historic west campus. The University of Arizona campus is truly a special place. As stewards of the campus, it is our responsibility to care for it and improve upon it for future generations, just as our predecessors did for us. This campus plan will guide day-to-day decisions, both large and small, and help us fulfill that awesome responsibility. A great campus must respect the past, enhance the present, and provide for the future.

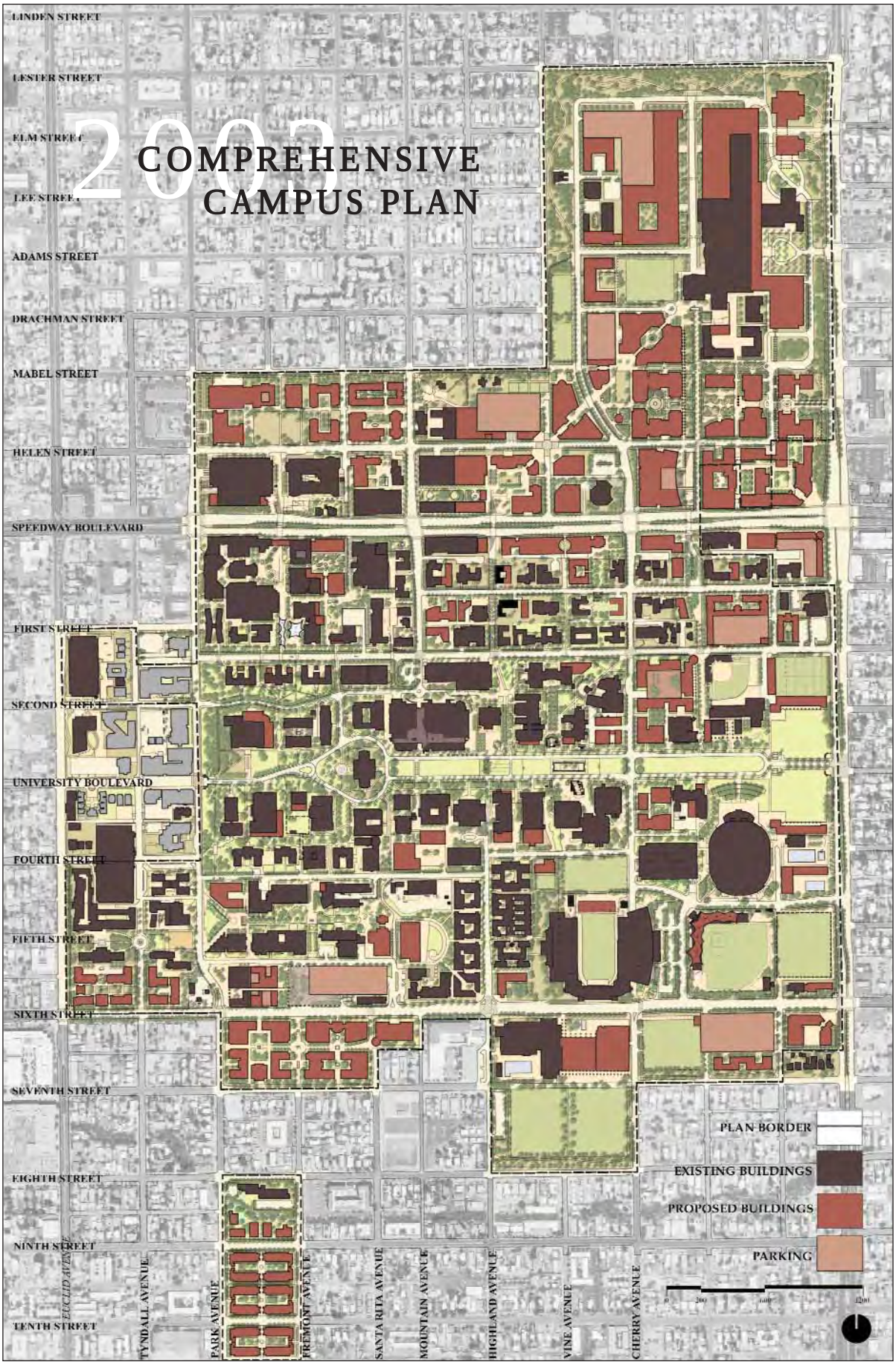
I am pleased to share with you an exciting vision of the future campus of the University of Arizona. It is largely a consensus vision, resulting from an incredible collaboration of planners, architects, students, faculty, our neighbors, and the City of Tucson. Three years in preparation, the plan is based on principles of community building, sustainability, and the responsible use of the limited land resources available for campus development. It strengthens linkages with downtown Tucson and includes strategies to reduce the impact of the University on our neighbors. The plan will make for a better-connected and efficient campus, reduce long-term operational costs, and fundamentally improve the University's conduct of its education and research enterprise.

During the past year we developed the strategy we call Focused Excellence. While these notions dealt fundamentally with the University's strategic directions and program priorities, they have been incorporated into the Comprehensive Campus Plan. The plan represents a change in direction from past campus development practices by emphasizing the creation of usable outdoor space, and the retrofit and integration of "leftover" outdoor space. The plan also promotes the development of new buildings that accommodate a variety of uses and are flexible over time, rather than the single-use, inflexibly designed buildings of the past.

Growth is an inevitable aspect of many cities and universities. It is how we manage the pressures of growth that sets us apart. Pushing outwards, sprawl if you will, is a typical response. This new plan demonstrates that the University can accommodate a significant increase in space within existing campus growth boundaries, through well-planned infill development. It is a sustainable plan in that it represents responsible, efficient, and appropriate use of limited land resources. It defines the limits within which growth must be planned.

A campus is so much more than a collection of buildings. It is a community of people engaged in a common pursuit of knowledge. A quality campus environment nurtures this noble undertaking, fosters a true sense of community, and enriches the lives of all. This plan will provide the direction and incentive to achieve a high quality campus for generations to come.

October 2003


2003
COMPREHENSIVE
CAMPUS PLAN
LINDEN STREET
LESTER STREET
ELM STREET
LEE STREET
ADAMS STREET
DRACHMAN STREET
MABEL STREET
HELEN STREET
SPEEDWAY BOULEVARD
FIRST STREET
SECOND STREET
UNIVERSITY BOULEVARD
FOURTH STREET
FIFTH STREET
SIXTH STREET
SEVENTH STREET
EIGHTH STREET
NINTH STREET
TENTH STREET
EUCLID AVENUE
TYNDALL AVENUE
PARK AVENUE
FREMONT AVENUE
SANTA RITA AVENUE
MOUNTAIN AVENUE
HIGHLAND AVENUE
VINE AVENUE
CHERRY AVENUE
PLAN BORDER
EXISTING BUILDINGS
PROPOSED BUILDINGS
PARKING

EXECUTIVE SUMMARY

The goal of the University of Arizona Comprehensive Campus Plan 2003 is to provide the best environment for teaching, research, and service to the State of Arizona. The creation of a university campus is an art and a science. It involves the careful balancing and weaving of interconnected and interdependent issues. At a major research institution like the University of Arizona, these aspects include the relationship between teaching, research and service, utility infrastructure, transportation, circulation and parking, building placement, sustainability, pedestrian circulation, neighborhood concerns, economic development, housing and student life, and the nature of open space. Successful interconnectedness of these issues is essential in creating a great campus.

Ayers/Saint/Gross Architects + Planners was retained to develop a plan that organizes these relationships into an implementable framework. The plan recognizes that every design initiative, at any scale, is a fragment embedded in a larger context, and that neither the fragment nor the context can be well understood without reference to the other. Thus, the desk is a fragment of the classroom, the classroom a fragment of the building, the building a fragment of the quadrangle, the quadrangle a fragment of the campus, and the campus a fragment of Tucson.

The heart of the University of Arizona campus

A major goal is to continue building a great campus with superior architecture that frames inspiring outdoor spaces. The Comprehensive Campus Plan 2003 attempts to live up to its title by being truly comprehensive in incorporating these interrelated issues. By considering a series of overlapping issues, this plan provides the University with a flexible road map to grow into an ever more beautiful and efficient place. In doing so, the plan interweaves the following issues into a tapestry that envisions what the University of Arizona can become.

The Comprehensive Campus Plan 2003 can positively affect the greater tucson region

OPEN SPACE

The west to east axis of the University's central mall creates a mental map that the faculty, staff, students, and alumni cherish. From the sublime balance of the historical buildings and grounds west of Old Main, to the extraordinarily unique east mall, this central collection of open spaces is a seminal touchstone for all who spend time at the University of Arizona. These spaces are the model for the rest of the campus, and the entire thrust of the Comprehensive Campus Plan 2003 is to extend and export these well-grounded open spaces to the rest of the campus. New paradigms of open space can be introduced, using the best traditions of the Sonoran Desert. This open space network will improve walkability and create clear connections within campus as well as connections outward to the larger Tucson community. Gateways will reinforce these connections and campus edges will provide useful transition zones between campus and community. In the end, this armature of "intellectual open space" is the framework upon which the rest of the plan depends.

CIRCULATION AND PARKING

There is no single solution to address this challenge. The plan suggests incremental transformation of most large surface parking lots into landscaped open spaces and building sites. The retention of smaller parking lots in critical locations for disabled and visitor access is key. New buildings sited on existing parking lots serve an increase in the students and faculty. To partially solve this problem, the plan suggests of a series of new parking structures. The final recommendations suggest decreasing the overall number of cars on campus by a percentage basis compared to the increasing population. The only exception is the need to serve the Hospital and Clinics at their current ratio as they grow. The overall reduction will be handled by a series of interdependent solutions such as remote park-and-ride lots serviced by shuttle buses, and increases in service by the City of Tucson bus system, on-campus housing, an increase in ride sharing, and higher utilization of bicycle facilities.

The Comprehensive Campus Plan 2003 promotes more and better public transportation.

Stewardship of the land is University policy.

Shade encourages the use of outdoor space and creates a pedestrian friendly campus

SUSTAINABILITY

The Comprehensive Campus Plan 2003 responsibly guides growth by promoting environmental sensitivity within the campus, community, and region. The following eight environmental initiatives are suggested: Institutional Action, Educational Initiatives, Integrated Processes and Systems, Operations, Energy, Regional Position, Transit and Waste Stream. Underlying these initiatives is a desire to maintain and nurture a responsible level of growth that is respectful of natural and cultural resources.

The Plan recommends housing faculty and staff members in neighborhoods adjacent to the campus.

The Plan sites new recreation fields. (Photo courtesy of AHSC Biomedical Communications)

HOUSING

A higher percentage of on-campus housing, may benefit the academic quality of an institution. With this in mind, the plan attempts to identify a series of sites for new housing. Of particular interest is a concept to integrate housing throughout campus to enliven and make the campus an active environment. This can increase a sense of intellectual vitality, increase security, and reduce the need for students to have cars on campus. The plan also suggests sites for graduate housing in close proximity to the colleges of law, business, engineering, and medicine. The University should work with the City of Tucson and the neighborhoods to explore development opportunities for the faculty and staff housing near campus. This will help build a better intellectual community, stabilize neighborhoods, encourage healthy retail/college town opportunities, and reduce parking demand as the faculty and staff would more easily be able to walk, bike, or bus to campus.

STUDENT LIFE

With more housing comes the need for more student life space. The plan identifies locations for new student support, dining, and recreation spaces, and recreation fields.

UTILITY INFRASTRUCTURE

With new facilities comes the need for new infrastructure to service their functions. The plan sites new mechanical plants in a way that builds on the existing network of utility infrastructure. Along with the services of mechanical, electrical, and plumbing utilities, the infrastructure of the campus must address storm water runoff and open space issues. A series of storm water detention areas have been identified. One crucial piece is a proposed continuous open space to ring the campus. This open space can act as a park, a green buffer, and a natural-appearing edge between the campus and the community, while serving as an area to help slow storm water runoff.

Landscaped campus buffer at Park Avenue

Old Main

NEIGHBORHOOD ISSUES

The best campuses are defined, yet porous, and have a mutually supportive relationship with their neighbors. There is an attitude that improvements made in one area promote similar desires to improve adjacent situations. The University recognizes this relationship and is committed to grow responsibly and support a healthy campus and a healthy neighborhood. In terms of the University's edges, the plan proposes a continuous landscaped buffer ranging in width from 20 to 50 feet. The University buildings that front this buffer will be lower in scale, with taller buildings stepping up to the center of campus.

TEACHING, RESEARCH, AND SERVICE

With the integration of the elements described above, the plan guides growth in a way that establishes a network of open spaces, building sites, and pedestrian paths that knit the campus together. The plan shows that through strategic infill in the central campus and wholesale transformation of surface parking lots, growth can dramatically improve the function and physical character of the campus. These new facilities are sited to connect interdisciplinary functions between teaching, research, and service, heightening the intellectual climate.

The plan provides direction for future developments to further enhance a functional and beautiful campus that reflects the spirit of the University of Arizona.

Currently, the campus supports approximately 35,000 FTE students and a University community of about 50,000. There are upwards of 16,000 parking spaces and 8,600,000 gross square feet of buildings. The Comprehensive Campus Plan 2003 provides the capacity for anticipated growth of up to 40,000 FTE students and a University community of 75,000. A relatively modest growth in parking spaces is recommended to 21,000, supporting a new total of more than 17,000,000 gross square feet of campus buildings.

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2003

I. INTRODUCTION

INTRODUCTION

The University of Arizona is a land-grant research university dedicated to education, research, and public service. Founded in 1885, the institution is in its second century with the challenge of providing assistance and leadership to the people of Arizona as the state grows and develops. The University is centrally located in the Tucson metropolitan area, which has an estimated population of 850,000.

The University is committed to raising the quality of undergraduate education, focusing on inquiry-centered programs. In 2003, more than 6,000 courses lead to more than 325 undergraduate and graduate degrees. The Carnegie Foundation recognizes the University as a Research 1 University, the highest category, and 1999-2000, The National Science Foundation ranked it 22nd among all universities and 15th among public universities for research and development expenditures.

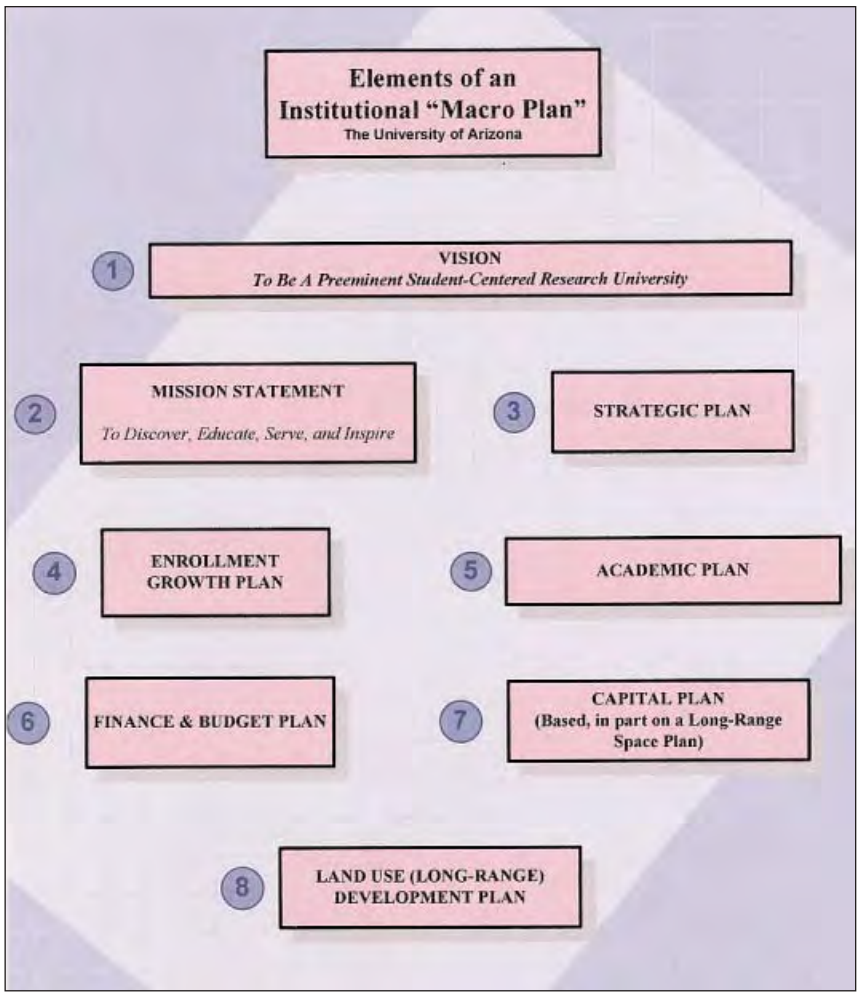
In public service, the University is an integral part of the Tucson community and the state. It is a cultural and recreational resource and contributes to the community economic development and the employment base.

Recent headcount enrollments are in the range of 35,000 students per year (excluding the College of Medicine), with about 77 percent undergraduates. Headcount classified staff number approximately 6,000, and unclassified staff (administrators, faculty, and professionals) about 7,800. The total campus community numbers approximately 48,800 people by headcount.

The University is in a planning area of 490 acres northeast of downtown Tucson. This area includes about 100 major buildings and facilities, totalling approximately 8.1 million gross square feet (GSF) of permanent non-residential space. In addition, the campus area includes considerable open space, a series of surface parking lots and streets, and a number of temporary buildings.

The University is in the urban heart of the community and is surrounded by a series of predominantly residential neighborhoods. Each is different, depending on building age and character, socioeconomic status, occupancy/home ownership, and population mix. In addition, there are a number of commercial areas in proximity to the campus.

PURPOSE AND SCOPE OF THE LONG RANGE PHYSICAL DEVELOPMENT PLAN



PURPOSE AND SCOPE BACKGROUND

In 2000, the University of Arizona began a comprehensive update to its 1988 Campus Plan. This three-year activity involved hundreds of meetings with more than 1,000 participants. The initial draft plan was prepared under the auspices of the Campus Planning Committee, chaired by the Dean of the College of Architecture, Richard Eribes, Ph.D. The committee included students, faculty members and staff, as well as representatives from adjacent neighborhoods and the City of Tucson. The plan was developed with the assistance of Ayers/Saint/Gross Architects & Planners, in collaboration with the University's Department of Campus and Facilities Planning.

THE UNIVERSITY OF ARIZONA COMPREHENSIVE CAMPUS PLAN 2003

The purpose of the University of Arizona's Comprehensive Campus Plan 2003 is to provide guidelines for orderly physical development and enhancement within the campus planning area to 2010 and the foreseeable future. The plan functions as one in a series of interrelated long-range planning activities including the mission and scope statement, strategic plan, academic plans, budget and finance plans, and the Capital Improvement Plan, which is a list of projects the University proposes to and initiate fund in the next several years.

RECENT HISTORY OF CAMPUS PLANNING AT THE UNIVERSITY OF ARIZONA

In the decades leading up to 1980, campus planning at the University, as well many other colleges and universities, consisted primarily of a map identifying future building sites.

In 1980-81, a committee created by the Arizona Board of Regents examined capital development planning and land acquisition policies for the University. The result was the Proposal for Realignment of the University Planning Area Boundaries, together with the Draft Statement of Land Acquisition Guidelines. Public comment was solicited during hearings presided over by Esther Capin, a member of the Board of Regents. In 1981, the Board-adopted University Planning Area was reduced in size from that designated in 1967. In 2003, the physical growth limits represented by the University Planning Area boundaries are 100 acres fewer than those designated for the future campus in 1967, making the University of Arizona campus one of the smallest in the nation when compared with peer universities of similar enrollment. In addition, the Board requested preparation of a

long-range facilities plan, including an examination of land acquisition and utilization. Subsequently, executive management at the University approved and funded a program to prepare the Comprehensive Campus Plan in 1983. This action culminated in the University's release of a draft campus plan for public review and comment in 1986, and the Board's subsequent adoption of the plan in 1988.

Today, Board policy requires all three state universities to prepare long-range campus development plans, and that the plans be updated at five-year intervals. In 2000, the University funded a comprehensive update of the 1988 plan. The Comprehensive Campus Plan 2003 document represents the final phase of that effort.

CHANGING DIRECTIONS: FOCUSED EXCELLENCE

The 2003 campus plan builds upon the best components of the 1988 plan but also represents a change in directions. While the plan demonstrates how the campus can accommodate significant new infill construction, its emphasis is not on buildings, which was largely the emphasis of the 1988 plan. The new plan recognizes that while formal learning and research may occur largely within buildings, it is the open space on a campus that fosters a true sense of connectedness and community. The theme of a better "connected campus" is carried throughout the plan by connecting different areas of the campus through an enhanced network of pedestrian paths. The careful, intentioned development of this "intellectual space" will enhance learning, chance encounters, and foster connections between people in well-designed outdoor public space, which are essential for building a campus community. This plan represents focused excellence in that it pays special attention to those components that are essential to a successful campus master plan and incorporates, whenever practicable, the best practices of campus planning, architecture, and landscape architecture.

CAMPUS CARRYING CAPACITY

How much development can a campus handle without spilling over its boundaries or becoming so congested that the quality of life for its students, faculty, and staff declines? How much new space can be supported by existing campus infrastructure? To answer these questions, the University first confirmed enrollment growth projections and then undertook a Long-Range Space Analysis to determine the institution's projected space needs by 2010. Additional analyses were conducted to determine the infrastructure and land area that would be required to support these growth projections. The plan concludes that the 490-acre University Planning Area should, through careful implementation of the plan over time, be of sufficient area to accommodate 2010 space projections.

The Comprehensive Campus Plan 2003 outlines a number of principles and goals for the physical development of the campus that are consistent with other institutional long-range planning activities. To implement these goals and considerations, a series of development guidelines and proposals are set forth. The plan places great emphasis on the contribution of open space to the functioning, health, and vitality of a campus community and the need to make serious reductions in the number of vehicles being brought to campus.

The plan represents an emerging, consensus vision of the future physical campus. As this vision may evolve over time, the plan should not be considered a static document. Instead, it is intended to provide for the orderly physical development of the campus far into the future, and some flexibility in its interpretation will be required due to the continually evolving needs of the University. The act of planning produces sequential products, each of which is a more definitive response to future needs. Therefore, the task of this document is not to predict the future as much as it is to document principles of actions and directions of development.

PLANNING PROCESS AND FRAMEWORK

THE PROCESS IS AS IMPORTANT AS THE PRODUCT

The process to develop a campus plan for the University of Arizona encouraged broad participation throughout a two-year planning period. During this time the planning team participated in hundreds of meetings involving more than 1,000 people. The work is the effort of a team of campus and community leaders, professional staff from Campus and Facilities Planning and Facilities Design and Construction, and the consultant group.

This interdisciplinary process attempted to ensure bridge-building between University departments, students, administration, the City of Tucson, and the local community. Creating a sense of constituent ownership has, hopefully, fostered a sense of pride in the creation of the final plan.

PLANNING PROCESS

The goal of this project was to develop a physical plan to guide future growth which embodies the spirit of the University of Arizona. Five phases of work centered around inclusive on-site workshops, providing a clear understanding of the history and culture of the institution and current strengths and trends, while engendering recommendations for physical and intellectual growth.

The process was undertaken in phases, with presentations and feedback at every stage.

The phases are:

- Observations
- Concept Plan
- Precinct Studies
- Design Guidelines
- Comprehensive Plan

OBSERVATIONS

The Observations phase analyzes the quantitative and qualitative aspects of the campus to generate a set of guiding principles reflecting the philosophies, culture, and setting of the institution. Theses principles serve as a foundation for the creation of a Concept Plan. An Observations summary is found in Chapter III. The full Observations report is Appendix 1. (Bound separately)

CONCEPT PLAN

With a broad-brush approach, like a sketch before a painting, this diagrammatic plan illustrates the structure, layout, and relationships of proposed planned open space, circulation systems, buildings, and focal points. This plan is used to describe development ideas, obtain input, and build consensus from stakeholders. See Chapter III.

PRECINCT STUDIES

These studies explore discrete areas of the campus at a greater scale of detail. The technical feasibility of conceptual ideas is tested and refined plan information is generated. Building setbacks and massing, architectural character, pedestrian and vehicular circulation, service points, treatment of open space and entrances, general code compliance, and landscape composition are addressed. See Chapter IV.

DESIGN GUIDELINES

Guidelines for buildings and grounds are developed to support architecturally unified precincts and campus-wide planning proposals. These guidelines should serve as a flexible reference for the evaluation of existing and future implementation projects. See Chapter V.

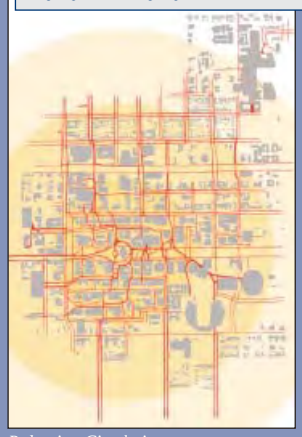
COMPREHENSIVE PLAN

The final plan consists of documents that aggregate the information prepared in previous project phases. It takes the form of a plan drawing that shows existing and proposed buildings and open space. Included are implementation diagrams recommending how this plan can be put in place incrementally. Illustrative before and after perspective views are included. See Chapter IV.

Integral to the planning process was a Space Needs Analysis undertaken during the Observations phase. This analysis provides critical data that inform the placement and size of future University programs. An Executive Summary of Space Needs Analysis follows in Section II.

Observations: Analyzing the campus

1. OBSERVATIONS

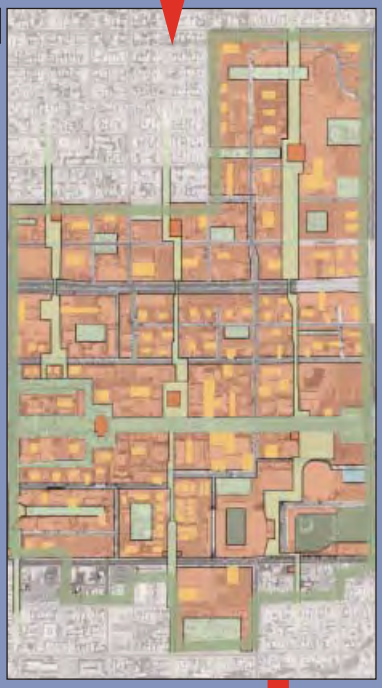


Pedestrian Circulation

Existing Parking Decks and Surface Lots

Consolidated Surface Lots

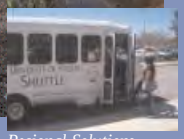
2. PRINCIPLES AND CONCEPT



Earth, Water, Sky

Academic Advancement

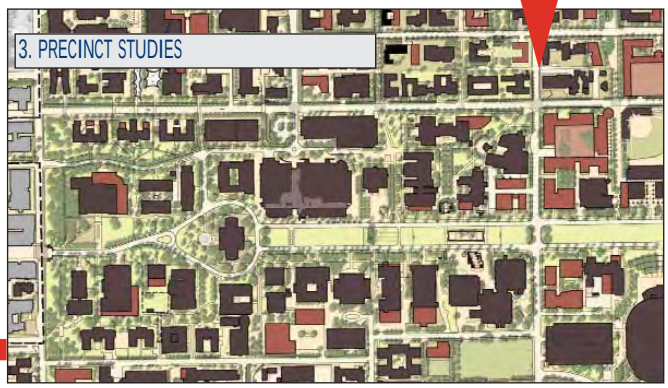
A Climate for Learning



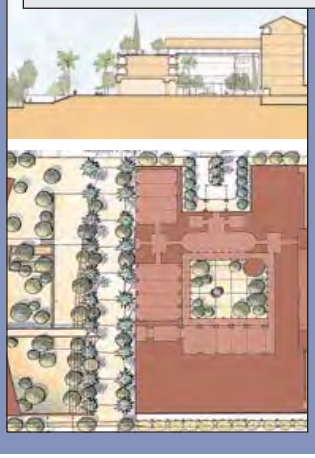
Regional Solutions

Creating Community

3. PRECINCT STUDIES



4. DESIGN GUIDELINES



5. FINAL PLAN

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2003

II. COLLEGE LEVEL SPACE NEEDS AND FORECAST

SPACE NEEDS AND FORECAST II

Paulien & Associates, Inc. was contracted to examine the building space needs for the University of Arizona. This study was conducted as part of a campus facility master planning effort headed by Ayers/Saint/Gross Architects & Planners. The major responsibility of Paulien & Associates, Inc. was to:

- Apply appropriate space guidelines to determine current and future space needs
- Compare projected space needs to the existing and near-future facilities

The study was conducted on a college-by-college and major administrative unit basis. The base year is Fall 2000 (31,000 FTE students) and the target year is Fall 2010 (37,000 FTE students). For planning purposes, the 2010 target year subsequently evolved into an enrollment threshold of 37,000 FTES, which is labeled as a future Phase 2 of campus development.

The University of Arizona provided Paulien & Associates, Inc. with facilities, enrollment, course, staffing, and research data. Meetings were held with the deans and vice presidents to become familiar with the unique needs of the colleges and administrative units. In addition, visits were made to various spaces throughout the campus to gain familiarity with facilities.

The University of Arizona has made a commitment to interdisciplinary focus centered on several themes. These themes create relationships among the colleges and are the focus of centers and initiatives for partnerships among law, public health, medicine, and social behavioral sciences; science, medicine and engineering; science and education; science and agriculture and life sciences; social and behavioral sciences, humanities, and business; and business, fine arts, computer science, and engineering.

The University determined that the target year should assume growth of approximately 7,000 FTE students, from about 31,300 to about 37,000, a 20 percent increase. College-by-college assumptions for undergraduate and graduate enrollments are included in the complete report. (Available at www.cfp.arizona.edu.) The plan also accommodates significant research growth, taking expenditures from about $287 million to $520 million, an 81 percent increase. College-by-college assumptions are included.

EXECUTIVE SUMMARY

According to the space needs analysis, the University has an overall space deficit of 1,549,000 assignable square feet (ASF) when comparing guidelines to actual space. When buildings in planning, design, or construction are added to the facilities inventory and the revised square footage is compared to target year guidelines, the deficit is projected to increase to 2,989,000 ASF.

The University operates with less space in certain categories than normative space guidelines would recommend. The consultants lowered the guidelines in those categories to reflect numbers closer to the actual need as communicated by the University. These areas include physical plant space and physical education and recreation space. In the case of physical plant space, the campus uses economies and efficiencies such as just-in-time delivery and e-commerce to reduce the need for space. The University is fortunate to be located in a climate that allows many of the physical education and recreation and athletic facilities to be outdoors, reducing the need for indoor facilities.

TABLE 1: SPACE NEEDS ANALYSIS

	Fall 2000 Base Year *Student FTE = 30,960* *Staffing FTE = 9,278*				Target Year (Phase 2) *Student FTE = 37,230* *Staffing FTE = 10,609*			
SPACE CATEGORY	**Existing ASF**	**Guideline ASF**	**Surplus/ (Deficit)**	**Percent Surplus/ (Deficit)**	**Existing ASF**	**Guideline ASF**	**Surplus/ (Deficit)**	**Percent Surplus/ (Deficit)**
Academic Space								
Classroom & Service	300,794	297,496	3,298	1%	322,545	350,866	(28,321)	(9%)
Teaching Laboratories & Service	280,807	300,154	(19,347)	(7%)	295,119	349,563	(54,444)	(18%)
Open Laboratories & Service	91,728	123,840	(32,112)	(35%)	108,336	148,920	(40,584)	(37%)
Research Laboratories & Service	914,194	1,309,506	(395,312)	(43%)	971,540	2,015,400	(1,043,860)	(107%)
Academic Offices & Service	1,221,006	1,501,415	(280,409)	(23%)	1,274,749	1,736,708	(461,959)	(36%)
Physical Education & Recreation	127,639	169,800	(42,161)	(33%)	127,639	201,150	(73,511)	(58%)
Other Academic Space	212,704	247,680	(34,976)	(16%)	258,117	297,840	(39,723)	(15%)
Academic Space Subtotal	*3,148,872*	*3,949,891*	*(801,019)*	*(25%)*	*3,358,045*	*5,100,448*	*(1,742,403)*	*(52%)*
Academic Support Space								
Administrative Offices & Service	238,061	239,185	(1,124)	(0%)	295,808	263,677	32,132	11%
Library	479,470	643,995	(164,525)	(34%)	498,844	761,479	(262,635)	(53%)
Athletics	196,786	300,000	(103,214)	(52%)	243,691	300,000	(56,309)	(23%)
Assembly & Exhibit	176,525	313,838	(137,313)	(78%)	191,896	451,458	(259,562)	(135%)
Physical Plant	91,627	95,757	(4,130)	(5%)	56,316	147,221	(90,905)	(161%)
Other Administrative Space	36,967	61,920	(24,953)	(68%)	53,107	74,460	(21,353)	(40%)
Academic Support Space Subtotal	*1,219,436*	*1,654,695*	*(435,259)*	*(36%)*	*1,339,662*	*1,998,295*	*(658,633)*	*(49%)*
Auxiliary Space								
Student Union	190,512	278,640	(88,128)	(46%)	287,203	335,070	(47,867)	(17%)
Residence Life	745,804	965,800	(219,996)	(29%)	1,000,904	1,537,900	(536,996)	(54%)
Health Care Facilities	57,733	61,920	(4,187)	(7%)	71,330	74,460	(3,130)	(4%)
Auxiliary Space Subtotal	*994,049*	*1,306,360*	*(312,311)*	*(31%)*	*1,359,437*	*1,947,430*	*(587,993)*	*(43%)*
INSTITUTION TOTAL	**5,362,357**	**6,910,946**	**(1,548,589)**	**(29%)**	**6,057,144**	**9,046,173**	**(2,989,029)**	**(49%)**
Parking Garages	*1,136,078*				*1,136,078*			
Inactive/Conversion Space	*69,380*				*44,704*			
Temporary Buildings	*154,633*				*153,410*			
Outside Organizations	*38,890*				*38,890*			

ASF = Assignable Square Feet

Student Support Space (Photo Courtesy of Ayers/Saint/Gross)

At the base year enrollment and staffing levels, the University shows an overall need for an additional 1,549,000 ASF of space. This is a 29 percent deficit in square footage when comparing guideline assignable square feet to existing assignable square feet on campus. Assignable square footage is defined as the usable space inside classrooms, laboratories, offices, etc. It does not include circulation and building service space or the thickness of walls. For most types of space, gross square footage is 30 percent to 40 percent more than assignable square feet.

- The academic space categories show a deficit of 801,000 ASF over existing space. Academic support space categories show a deficit of 435,000 ASF. Auxiliary space shows a deficit of 312,000 ASF. The space categories with the greatest space needs at the base year (Fall 2000) include:
  - Research laboratories with a deficit of 395,000 ASF
  - Academic offices with a deficit of 280,000 ASF
  - Residence Life with a deficit of 220,000 ASF
  - Library space with a deficit of 165,000 ASF
  - Assembly and exhibit space with a deficit of 137,000 ASF

- The colleges and units with the greatest needs, excluding classroom space, at the base year include:
  - Vice President for Campus Life with a deficit of 386,000 ASF
  - College of Medicine with a deficit of 366,000 ASF
  - College of Fine Arts and University Libraries each with a deficit of 160,000 ASF
  - College of Science with a deficit of 103,000 ASF
  - Office of the President (which includes athletics) with a deficit of 97,000 ASF
  - Vice President for Research and Graduate Studies with a deficit of 75,000 ASF
  - College of Agriculture and the Optical Sciences Center each with a deficit of 43,000 ASF
  - College of Pharmacy with a deficit of 40,000 ASF

TARGET YEAR (PHASE 2)

- At projected target year enrollment and staffing levels, the University shows a campus-wide need for 2,989,000 ASF. This is a 49 percent increase over the amount of projected existing space at the target year.

- The space categories with the greatest needs at the target year include:
  Research Laboratories with a deficit of more than 1,044,000 ASF
  Academic Offices with a deficit of 462,000 ASF
  Residence Life with a deficit of 537,000 ASF
  Library space (main library, its branches, health, and law libraries) with a deficit of 263,000 ASF
  Assembly and exhibit space with a deficit of 260,000 ASF

- The colleges and units with the greatest needs, excluding classroom space, at the target year include:
  College of Medicine with a deficit of 737,000 ASF
  Vice President for Campus Life with a deficit of 686,000 ASF
  University Libraries (main library and its branches) with a deficit of 223,000 ASF
  Vice President for Research and Graduate Studies with a deficit of 210,000 ASF
  College of Fine Arts with a deficit of 205,000 ASF
  College of Science with a deficit of 187,000 ASF
  College of Agriculture with a deficit of 143,000 ASF
  College of Pharmacy with a deficit of 98,000 ASF
  Optical Sciences Center with a deficit of 94,000 ASF
  Vice President for Business Affairs with a deficit of 59,000 ASF

Research space

State-of-the-art classroom (Photo Courtesy of Ayers/Saint/Gross)

CLOSING COMMENTS: SPACE NEEDS ANALYSIS

The primary goal of the study was achieved by applying the Arizona Board of Regents Space Guidelines to identify base and target year space requirements. Applying space guidelines as the sole criteria to determine space needs is a recognized methodology that uses standard measures to quantify space needs. Results provide a means for the University to review the distribution of existing space in relationship to identified needs and provide another variable to evaluate proposed major capital projects.

Student Union construction

The success of a quantitative study is related to using a consistent methodology and standard data sources. Only official University sources were used, and subsequent review of questionable areas verified the reliability of the data. It also is important to recognize that the quantitative analysis did not consider the quality or age of the existing facilities while determining overall space needs and has resulted in a more conservative space deficit figure. If these factors were incorporated into the analysis, overall space needs would be higher.

A college-level space analysis has a number of limitations due to the global nature of the study. Areas of concern revealed after the report was completed include:

1. Campus recreation space needs are incorporated into the Physical Education and Recreation space category listed under Academic Space. Although this is the correct space category placement, it does not reflect the nature of the non-academic program. Campus Recreation provides programs, facilities and educational opportunities, that seek to meet the diverse recreational, fitness, and wellness needs of the students and community.

2. The College of Engineering shows a space surplus in the base year and a deficit in the target year. Refer to Table as mentioned above, the analysis did not consider the age or condition of the existing facility. Earlier University space studies using a different methodology have shown that the College has a research laboratory deficit. The college level space study did not allow for a more detailed review to explain the differences between the two methods. Subsequent University analysis concluded that the College's research laboratory space needs are greater than the figures presented in this report.

McKale Addition

3. University Libraries space computations assumed the use of compact shelving, which is one of many options that can be implemented to accommodate the growing print collection. As noted in the report, overall space needs for the library will increase by 75,000 NASF if compact shelving is not installed.

Target year space needs are based on projected growth in enrollment and research expenditures. As these variables evolve, overall space needs will change. The report was completed during challenging times and regional economic considerations may have influenced direction given to the consultants during the data collection and interview process. Prospects of diminished financial resources were a factor and may have influenced direction on future programmatic growth provided by the deans. Based upon the selected methodology and the information provided, the space needs analysis furnishes a reasonable projection of current and future University space requirements and is an important part of the overall comprehensive campus planning process.

TABLE 2: SPACE NEEDS ANALYSIS BY COLLEGE/ADMINISTRATION

	Fall 2000 Base Year *Student FTE = 30,960* *Staffing FTE = 9,278*				**Target Year (Phase 2)** *Student FTE = 37,230* *Staffing FTE = 10,609*			
COLLEGE/UNIT	**Existing ASF**	**Guideline ASF**	**Surplus/ (Deficit)**	**Percent Surplus/ (Deficit)**	**Existing ASF**	**Guideline ASF**	**Surplus/ (Deficit)**	**Percent Surplus/ (Deficit)**
College of Agriculture & Life Sciences	281,317	324,275	(42,958)	(15%)	285,385	428,827	(143,442)	(50%)
College of Architecture, Planning & Landscape	23,611	53,113	(29,502)	(125%)	44,091	57,053	(12,962)	(29%)
Eller College of Business & Public Admn	98,385	91,191	7,194	7%	96,802	102,032	(5,230)	(5%)
College of Education	54,872	56,042	(1,170)	(2%)	54,872	65,098	(10,226)	(19%)
College of Engineering & Mines	307,072	269,201	37,871	12%	307,072	330,868	(23,796)	(8%)
College of Fine Arts	182,712	343,109	(160,397)	(88%)	199,172	404,108	(204,936)	(103%)
College of Humanities	65,219	81,768	(16,549)	(25%)	81,469	91,745	(10,276)	(13%)
James E. Rogers College of Law	77,458	78,329	(871)	(1%)	77,458	93,683	(16,225)	(21%)
College of Medicine	471,517	837,853	(366,336)	(78%)	471,517	1,208,136	(736,619)	(156%)
College of Nursing	29,579	36,781	(7,202)	(24%)	29,579	58,431	(28,852)	(98%)
College of Pharmacy	44,167	83,656	(39,489)	(89%)	44,167	141,654	(97,487)	(221%)
College of Public Health	15,173	40,884	(25,711)	(169%)	15,173	66,878	(51,705)	(341%)
College of Science	665,504	768,131	(102,627)	(15%)	722,825	910,247	(187,422)	(26%)
College of Social & Behavioral Sciences	122,407	140,118	(17,711)	(14%)	122,407	164,806	(42,399)	(35%)
Graduate College	15,013	17,950	(2,937)	(20%)	15,013	22,116	(7,103)	(47%)
Optical Sciences Center	61,001	103,532	(42,531)	(70%)	89,381	183,315	(93,934)	(105%)
School of Health Professions	16,270	7,016	9,254	57%	16,270	7,709	8,561	53%
University Libraries	363,768	523,604	(159,836)	(44%)	383,142	605,736	(222,594)	(58%)
Vice President for Academic Affairs & Provost	63,792	69,719	(5,927)	(9%)	63,792	74,827	(11,035)	(17%)
Vice President for Research & Graduate Studies	275,191	349,836	(74,645)	(27%)	291,898	501,855	(209,957)	(72%)
Vice President for the Health Sciences Center	86,370	87,851	(1,481)	(2%)	86,370	111,928	(25,558)	(30%)
Vice President for Undergraduate Education	74,055	91,154	(17,099)	(23%)	117,565	143,410	(25,845)	(22%)
Office of the President	265,406	361,974	(96,568)	(36%)	315,036	367,786	(52,750)	(17%)
Vice President for Advancement	8,989	11,745	(2,756)	(31%)	8,989	12,431	(3,442)	(38%)
Vice President for Business Affairs	174,490	180,593	(6,103)	(3%)	173,504	232,679	(59,175)	(34%)
Vice President for Campus Life	1,218,225	1,604,025	(385,800)	(32%)	1,621,650	2,307,951	(686,301)	(42%)
TOTAL	**5,061,563**	**6,613,450**	**(1,551,887)**	**(31%)**	**5,734,599**	**8,695,307**	**(2,960,708)**	**(52%)**

ASF = Assignable Square Feet

NOTE: Does not include classrooms, parking garages, inactive/conversion space, temporary buildings or outside organization space

The consultants recently compiled benchmark studies at major public universities comparing ASF per student FTE or ASF per headcount for business, engineering, and law schools. These schools may not be the University's peers, yet the results are worth noting. In all three cases, the ASF per student at the University of Arizona was at the lower end of the benchmark range. Although the planning process did not imply that space should be equivalent to other institutions, the benchmark data suggest that other factors may need to be considered when evaluating space needs at a finer level.

For the full Space Needs Analysis, go to the Web site of the University of Arizona Campus and Facility Planning Department at www.cfp.arizona.edu

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III. SUMMARY OF OBSERVATIONS, PLANNING PRINCIPLES AND CONCEPT PLAN

III

Historic Tucson

Balance of built form and open space

Landscaped campus edge

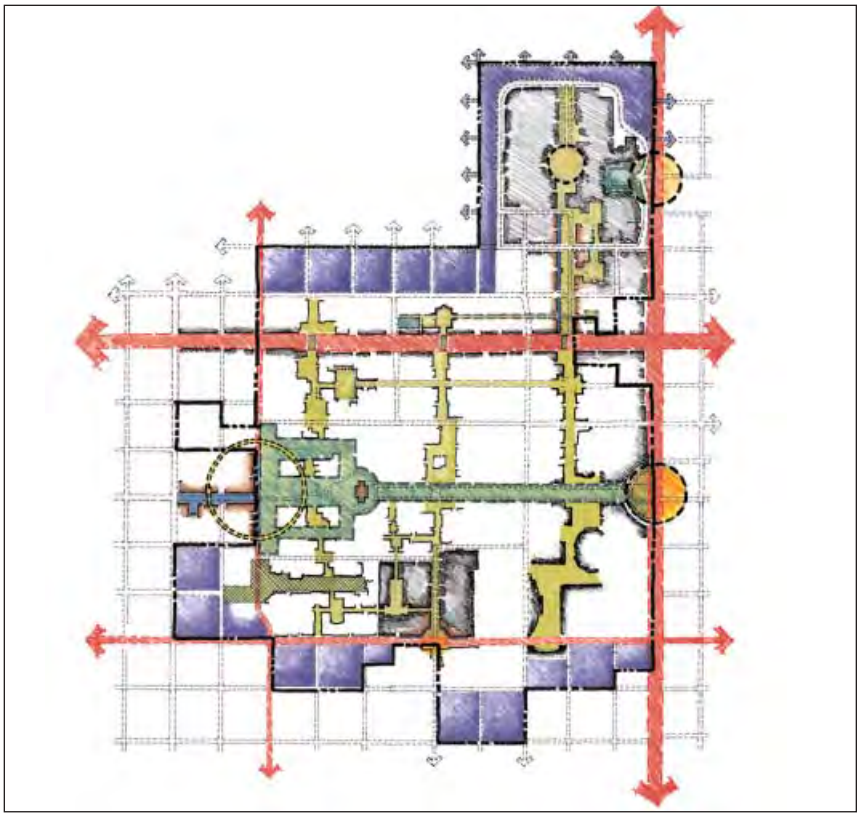
SUMMARY OF OBSERVATIONS

The Observations phase of the planning process identified the salient features that have and will guide the physical development of the University. The planning principles are the direct result of those Observations, and are intended to act as a compass to the map that is the Final Plan. (Please refer to Appendix 1 for the complete Observations report. Appendices bound separately.)

1. Look to historic parts of the campus, city, and region for lessons in ways to mitigate the sometimes harsh climate with landscape and architecture. Look forward to new technologies for climate mitigation and harvesting (sun and water).

2. Growth has been in patterns of low density. Though the University land holdings are relatively small, there is room for growth through higher density (infill). Infill can positively influence the plan by better defining the campus. Creating a better balance of built form and outdoor space will result in a more unified feeling. An additional benefit is more built space and more usable outdoor intellectual space.

3. Improving edges, gateways, pedestrian paths, and outdoor intellectual spaces will improve connections to neighborhoods physically and psychologically. The University should fit seamlessly into its larger context. The plan should embody the service mission of the University.



Campus analysis diagram

PLANNING PRINCIPLES

Planning participants generated a set of guiding principles stating the philosophical position of the University. These principles and the information gathered during the Observations phase inform the content and composition of the Concept Plan and serve as a touchstone for the remainder of the planning process.

ACADEMIC ADVANCEMENT

The physical plan promotes, reflects, and supports the core mission of the University to discover, educate, serve, and inspire. Every investment in the campus supports this mission.

EARTH, WATER, SKY

The campus respects and is informed by the natural systems and indigenous cultures of the Sonoran Desert. Best practice standards provide for the stewardship of water, land, and the environment.

REGIONAL SOLUTIONS

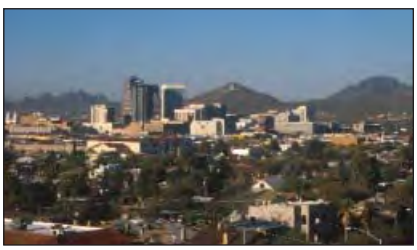
The campus plan is coordinated with regional solutions to the built environment including traffic, transit, energy, and water resource management. The campus contributes to the positive long-term development of the region and state.

A CLIMATE FOR LEARNING

The campus takes advantage of the climate by creating and linking usable outdoor intellectual space. The campus encourages and facilitates walking and biking.

CREATING COMMUNITY

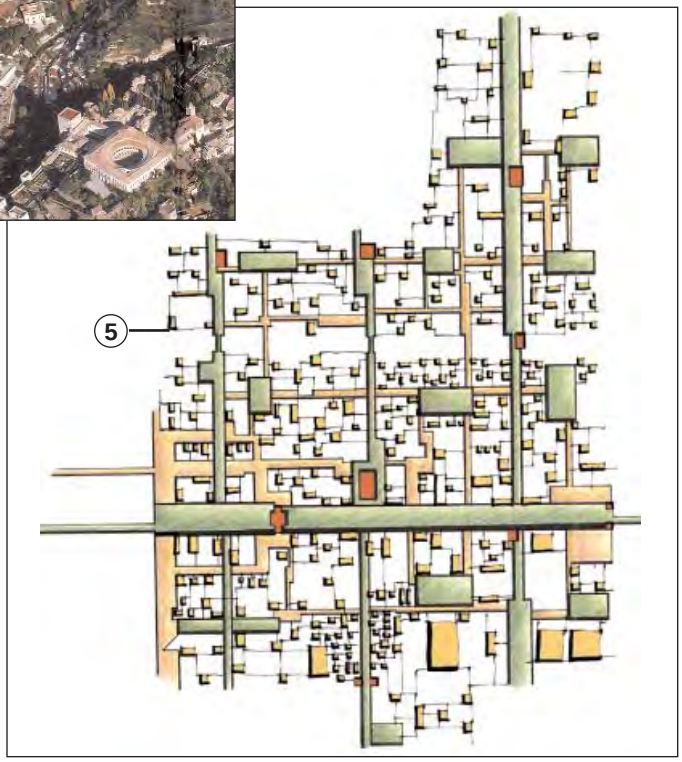
The University, its neighbors, and the City of Tucson, benefit from the creation of community within and surrounding the campus. The University is an active, integral partner that respects and supports its neighbors.



Main Mall – Primary open space

Multiple scales of open space networks overlayed onto existing campus

Courtyard network, Grenada, Spain



Courtyard network within overall open space network

CONCEPT PLAN

Based on the Principles and the consistent themes, a Conceptual Plan was developed.

The Concept phase used the Observations analysis to apply broad-brush strategies across the entire campus. It is a response to climatic issues, the grid and early growth patterns, and future needs.

The diagram at right shows a hierarchy of open spaces that forms the pedestrian circulation network. The existing mall (1) is the primary open space and the symbolic "Town Square" of the campus community. There are recommended primary paths connecting the campus in the north-south directions (2). Secondary open spaces form the hearts of campus districts (3). Secondary pathways connect these. Architectural markers are highlighted in red (4).

Tertiary interconnected open spaces or courtyards are formed at the block level (5). Early settlement patterns of arid climates and the city grid inform this pattern. The multiplicity of scales of open spaces will clarify campus navigation as well as make traversing the campus a much richer experience. It will create University-wide shared spaces, local meeting places, and quiet, intimate study spaces. This network is intended to continue into the surrounding community via the existing street and bicycle path network.

Concept Plan – Courtyard Mosaic

Diagrams A-E further illustrate the concept of establishing a hierarchical open space network that serves as the foundation of the Comprehensive Campus Plan 2003. These are conceptual in nature and may not reflect the actual placement of elements in the final plan.

Diagram (A) indicates the generalized boundaries of the current campus. The orange color represents an abstracted solid of built form. The heart of the campus, the historic core, and mall is shown, as is Speedway Boulevard, the major campus divider. These elements are carved out of the campus' built form. Diagram (B) shows the insertion of the major north-south connectors and architectural markers. These paths include the three underpasses along Speedway Boulevard. Diagram (C) carves out secondary scale district level spaces.

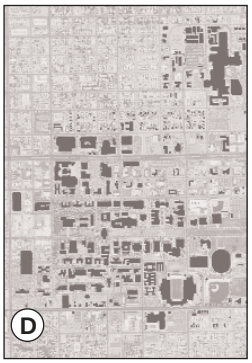
In the courtyard mosaic plan to the right, courtyards are shown in yellow. The courtyard model is climatically appropriate to Arizona, and is of historic importance as well. Each new building project should seek to incorporate a courtyard to frame and structure a larger space. Developing many of these interconnected spaces would create a rich and multilayered campus circulation system.

Diagram (D) shows the existing campus fabric. Diagram (E) implies a campus-wide open space network using building footprints to create space. A hierarchically unified fabric is created through the consistent application of the open space network. Potential paths and routes are clear. District centers and courtyard connections are apparent. This unifies the University's overall character. The plan should foster diversity within individual open spaces.

General Boundaries

Connectors

Concept Development Plans



District Scale Open Space

Conceptual Infill Creating Open Space Network

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2003

IV. COMPREHENSIVE DEVELOPMENT PLAN

COMPREHENSIVE DEVELOPMENT PLAN IV

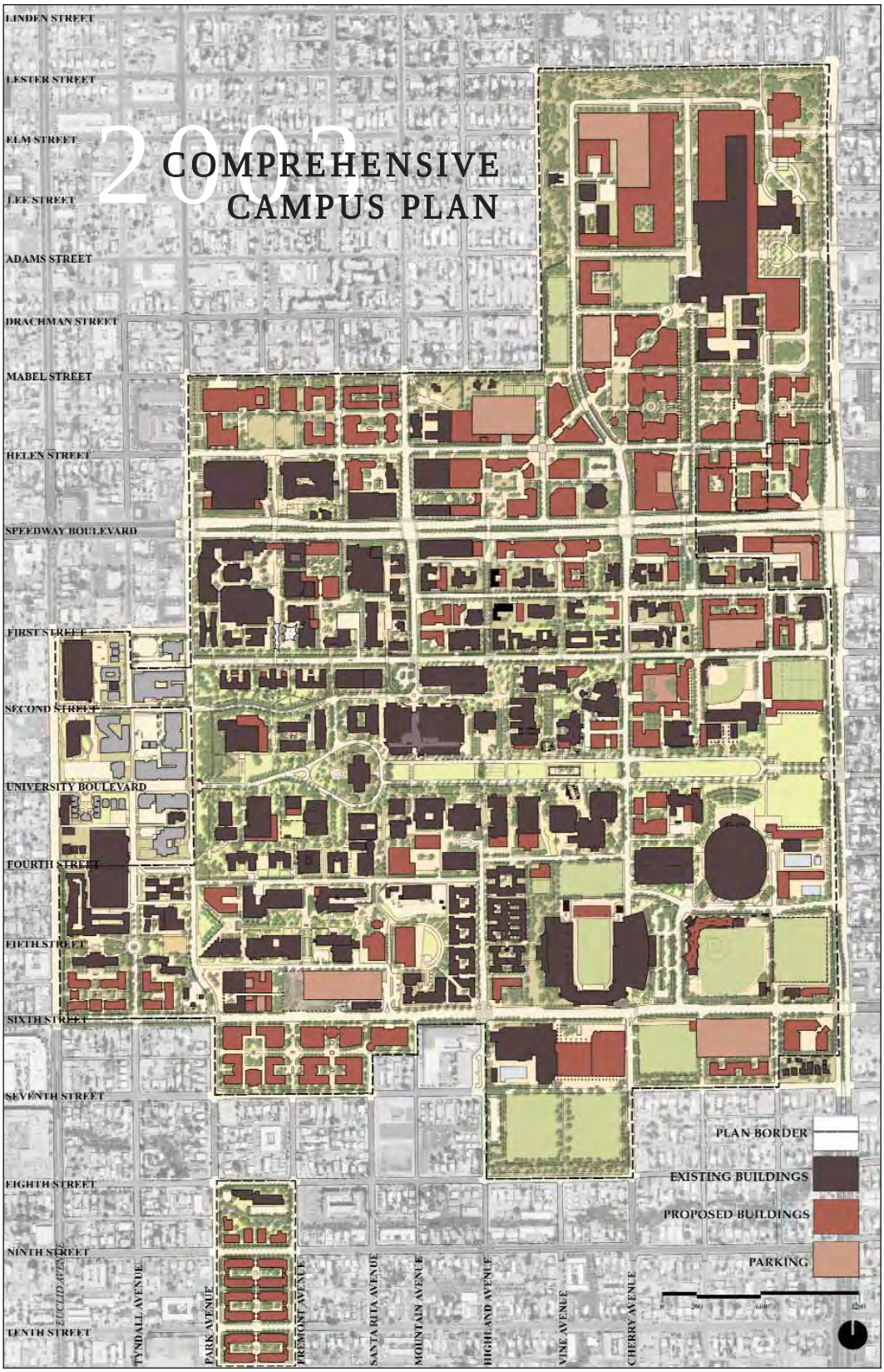
The Comprehensive Campus Plan 2003 represents the synthesis response to the Observations, Concept Plan, and Precinct Studies, and was generated during the phases of the master planning process. The goal of the plan is to serve as a flexible road map for growth at the University of Arizona.

The plan consists of several illustrative elements; each designed to help give a full understanding of the recommendations presented. The Final Plan graphic shows existing buildings, identifies locations for potential future buildings, and proposed open space enhancements. Diagrams explain and reinforce major design elements in the plan. Precinct scale graphics highlight specific goals for each area of campus. Renderings provide an interpretative look at the future campus. Implementation plans illustrate a phased build-out of the plan over time.

Distinguished campuses across the country have several common features. First, they all have a sense of intellectual community. With a coherent composition of buildings and grounds, the well-planned campus has a strong sense of place unique to its situation. This community is characterized by a mix of uses in which students live, learn, and play together, thereby growing intellectually, spiritually, and physically.

The second feature is a respect for the capacity of the land. Compact campuses with a balance of open spaces and built forms are pedestrian oriented and humanly-scaled. Infilling within the existing campus rather than sprawling outward creates a more dynamic and safe environment.

The third feature is stewardship of the campus, teaching respect for the history of the place and natural systems; it instills pride and ownership. It also promotes diligence and care when adding new buildings or grounds.


2003
COMPREHENSIVE
CAMPUS PLAN
LINDEN STREET
LESTER STREET
ELM STREET
LEE STREET
ADAMS STREET
DRACHMAN STREET
MABEL STREET
HELEN STREET
SPEEDWAY BOULEVARD
FIRST STREET
SECOND STREET
UNIVERSITY BOULEVARD
FOURTH STREET
FIFTH STREET
SIXTH STREET
SEVENTH STREET
EIGHTH STREET
NINTH STREET
TENTH STREET
EUCLID AVENUE
TYNDALL AVENUE
PARK AVENUE
FREMONT AVENUE
SANTA RITA AVENUE
MOUNTAIN AVENUE
HIGHLAND AVENUE
VINE AVENUE
CHERRY AVENUE
PLAN BORDER
EXISTING BUILDINGS
PROPOSED BUILDINGS
PARKING

COMPREHENSIVE CAMPUS PLAN

The intent of the plan is to guide growth in a way that establishes a network of open spaces, building sites, and pedestrian paths that knit the campus into a unified whole.

The final plan shows that through strategic infill in the central campus and wholesale transformation of surface parking lots in the north, growth can dramatically improve the physical character of the campus. Underutilized land such as surface parking lots will become building sites; lost parking spaces will be consolidated in new parking garages or decks. Buildings will be sited to form new usable open spaces. A network of these open spaces will be formed, recognizable at the district and campus-wide levels. This open space network will improve walkability and create clear connections within the campus and outward to the larger Tucson community. Gateways will reinforce these community connections, and campus edges will provide useful transition zones between campus and community.

The plan integrates the elements described above that guide growth by establishing a network of open spaces, building sites, and pedestrian paths. These features knit the campus together to create an environment that directly supports the University's educational programs, world-class basic and applied research, and creative achievements. The plan provides direction for future development to further enhance a functional and beautiful campus that reflects the spirit of the University of Arizona.

Existing campus

Infill and open space

Edges and gateways

Connections

PLAN ELEMENTS

Within the campus plan are a series of consistent themes that provide the building blocks of the Final Plan. These elements guide individual districts, and the campus as a whole.

INFILL

Current space deficiencies in the University programs are addressed through the addition of facilities within the campus-planning boundary. Limited campus acreage requires facilities to be built upon underdeveloped real estate throughout the campus. The result is a denser campus, that provides a consistent urban pattern within its boundaries. This consistency helps define the University realm as a distinct and unique place. Goals:

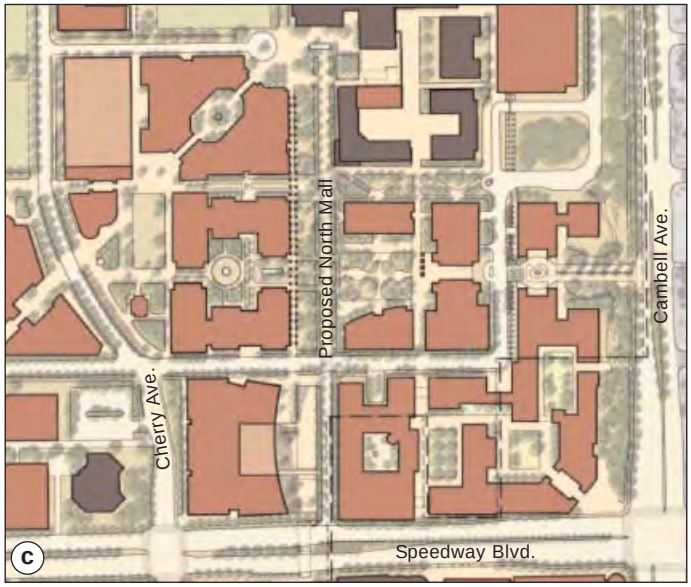
- Increase density by balancing built space with open space.
- Promote efficient and responsible land use.
- Create a more coherent and legible campus through better-defined and connected open spaces.
- Create a mixed-use community at the campus, district, and building scale.

Existing Figure/Ground

Proposed Figure/Ground

b. University village area

Infill within campus fabric
a. Area south of mall at Highland Avenue



Infill on surface parking lots
c. Northwest of Speedway Boulevard & Cambell Avenue intersection

OPEN SPACE

Usable open space is created in unbuilt areas defined by the edges of infill. These are the outdoor rooms of the campus. A linked network of identifiable open spaces creates an understandable structure to the campus, which allows easy navigation and orientation. Shade and landscape treatments make these spaces usable year-round, creating natural extensions of the space within buildings.

Goals:

- Develop across campus a hierarchy of open spaces that creates identifiable centers and edges at every scale (campus, district, local), to which programs and buildings are associated.

Open space framework

Open space types

- Create new or reinforce existing campus-wide intellectual open space that can become the image of the University.
- Create and reinforce secondary open spaces that are the heart of campus districts.
- Create and reinforce tertiary open spaces that serve as centers for particular programs.
- Link these open spaces in an open-space network containing formal, axial relationships and informal, meandering pathway systems.
- Provide shaded walks throughout campus to promote cross campus travel with the goal to provide shade year-round.

Primary Open Space (Campus-Wide Scale)

a. Main Mall

b. Proposed North Mall

Secondary Open Space

c. Quad at Proposed Museum and Poetry Center

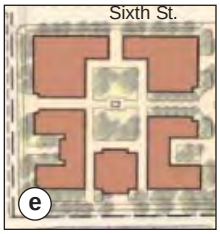
Tertiary Open Space (Local Scale)

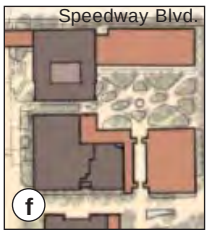
d. Proposed Housing at Euclid Avenue & Sixth Street

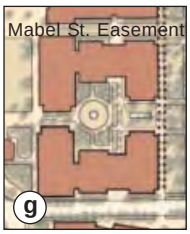
e. Proposed Research Zone south of Sixth Street

f. CAPLA addition & Libratory

g. Proposed Research Zone at North Mall



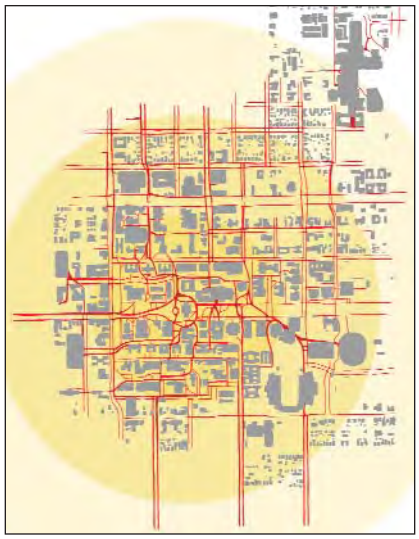




CONNECTIONS

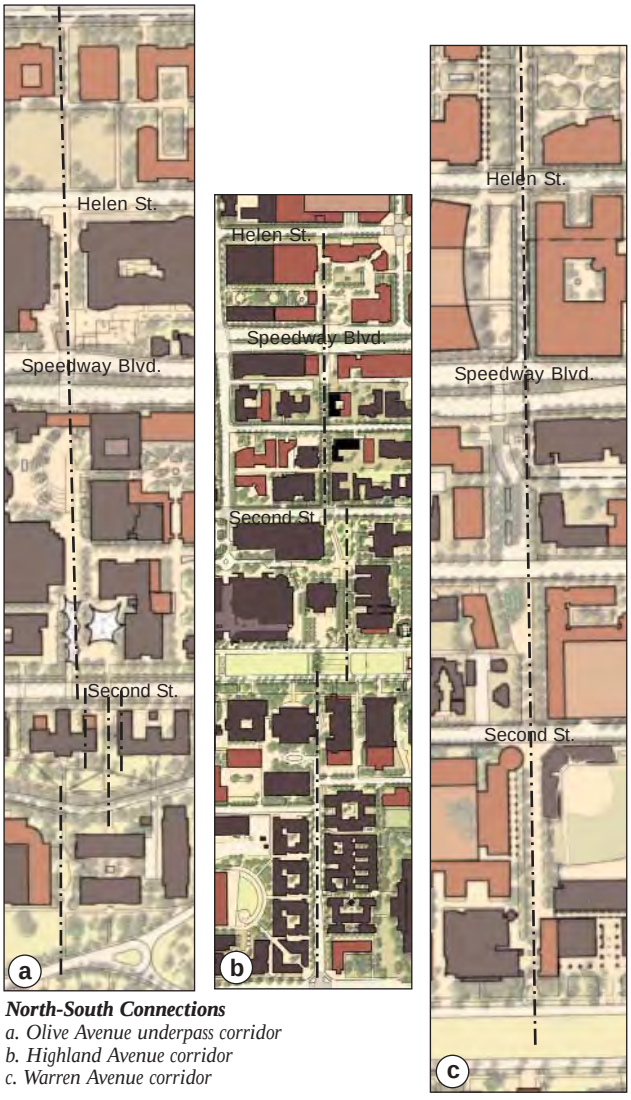
The campus is composed of many small communities with centers and edges. They are connected with a hierarchy of paths and open spaces. Primary connections are clarified through axial relationships from one community to another, views from one space to another, and consistent landscaping and paving patterns. Secondary connections allow diagonal movement from open space to open space for those more familiar with campus. Goals:

- Create a pedestrian-oriented campus.
- Create a series of interconnected open spaces throughout campus.
- Connect campus districts through clearly linked streets, paths, and open space.
- Provide district centers reinforced by major pathways.
- Clarify campus navigation through clear pedestrian and bike paths.
- Provide attractive, shaded, and well-lit paths.
- Major north-south paths make campus-wide connections.
- East-west paths connect locally or at the district level.
- Diagonal connections link central campus and the Arizona Health Science Center (AHSC).



Existing pedestrian circulation

Proposed pedestrian circulation



North-South Connections
a. Olive Avenue underpass corridor
b. Highland Avenue corridor
c. Warren Avenue corridor

EDGES AND GATEWAYS

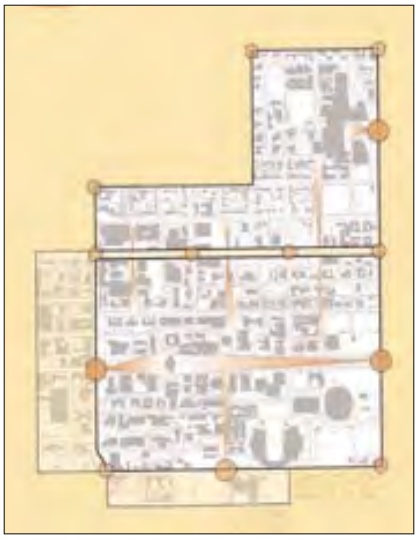
These elements provide a transition from the lower scale and density of the surrounding community to the greater scale and density of the campus. The landscaped perimeter of the campus is a smooth transition with gateways (orange circles) announcing the threshold of the University realm. Edges and gateways create strategic access points that immediately connect into the primary circulation network.

EDGE GOALS:

- Create a greenbelt around the campus that acts as a porous yet defined buffer between the University and residential neighborhoods and contains usable open space.
- Provide neighborhood interface that promotes interaction with the community with better, more attractive edges.
- Create an environmental zone for storm water detention.
- Create a compact, walkable, and pedestrian-oriented campus.

GATEWAY GOALS:

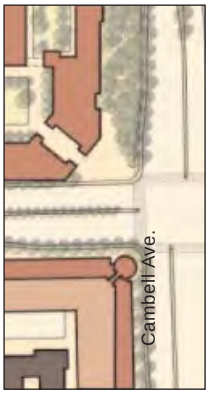
- Identify University boundaries.
- Reinforce the campus precinct to create a sense of arrival and a sense of place.
- Identify campus as a destination center of larger community.
- Put forth best face to community.



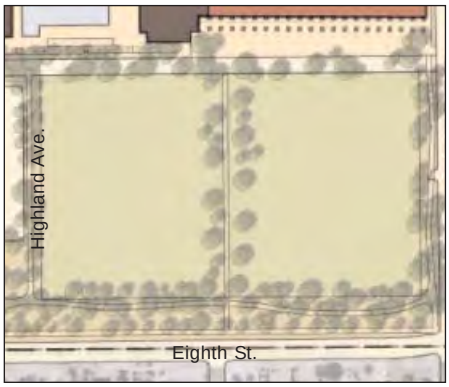
Existing edges and gateways

Proposed and enhanced edges and gateways

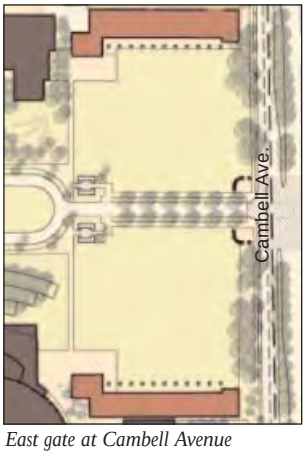
North campus at neighborhood edge



East edge of campus a Cambell Avenue



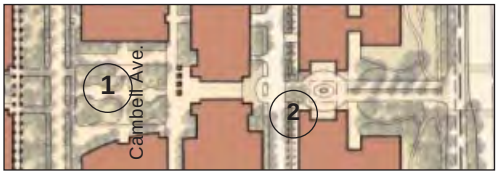
South campus at neighborhood edge



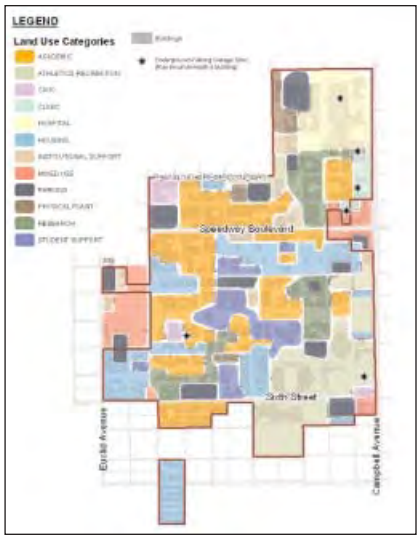
East gate at Cambell Avenue

Intersection of Highland Avenue and Sixth Street

Intersection of Speedway Boulevard and Cambell Avenue



AHSC Gateways 1. Pedestrian 2. Vehicular



Generalized Land Use at Buildout

LAND USE

The plan proposes to build upon the traditions of the historic core. While there are clusters of like functions, there is a rich mix of programmatic uses throughout the zone. Residential, academic, civic, and student support are among the varied building uses found here. At the campus-wide level, many districts can be identified, such as the historic core, the academic core, AHSC, University Village, Highland District, the Sciences Concourse, the arts district and the Inter-Collegiate Athletics (ICA) student recreation district. Within these districts the intent of the plan is to reinforce them as places, and diversify the programmatic uses. For example, University Village will continue to be a residential district, but other space types, such as classrooms, advising, social space, etc., will add to the students' overall living and learning experience.

MAP OVERVIEW

This land-use map conveys the generalized spatial pattern of uses that are anticipated to exist on campus when the plan is fully implemented (i.e., at "Build-Out"). Categories shown on the map indicate the predominate uses in the area. Key elements of the land-use pattern include: student services concentrated in the heart of the campus; distribution of parking garages largely around the perimeter; civic uses located toward the neighborhood/city interface; mixed-use associated with major perimeter streets, intersections, and entries; clusters of research and academic buildings; and distinct housing communities distributed throughout campus. This map does not reflect underlying open space patterns. Rather , it provides an abstraction of how buildings are grouped into functional/use clusters.

LAND USE CATEGORIES:

Academic predominately instructional activities, including classrooms, teaching laboratories, offices, and related support spaces

ATHLETICS-RECREATION

Includes ICA and campus recreation facilities and fields

CIVIC

Predominately public outreach components (may include some academic space)

CLINICAL

Outpatient medical facilities and associated offices

HOSPITAL

University Medical Center

HOUSING

University and other housing. Predominately for students but may include faculty/staff housing.

INSTITUTIONAL SUPPORT

Predominately office and support space related to administrative/ancillary functions.

MIXED USE

Primarily commercial uses that may be combined with University uses. Intended to support the campus community and may be developed with a public private partnership. Development will be driven by private market needs.

PARKING

Predominately parking garages. The small number of strategically located service, handicap, and visitor spaces that will be maintained as surface lots are absorbed within other land use categories.

PHYSICAL PLANT

Facility management and related support functions, such as heavy infrastructure and utilities

RESEARCH

Primarily research laboratories, researcher offices, and related support space

STUDENT SUPPORT

Predominately academic and social services (e.g., counseling, libraries) and consumer services (e.g., bookstore, food service) for students.

HOUSING

Academic experiences are inextricably tied to residential experiences. Nationwide, universities are realizing the benefit of housing a higher percentage of students on campus. Students' living environments should support and reinforce scholarship, and housing trends include classroom space within residence halls to foster a dynamic learning community. Students want more classroom interaction with faculty members, graduate assistants, advisors, and other mentors.

The plan indicates, at full campus build out, the potential for 2,300 additional undergraduate beds as well as 1,400 beds for graduate and married students. New residence halls would infill currently underutilized areas of the campus, generally in existing residential districts. Two proposed residence halls at the East Gate to the University on the mall would bring an added dimension to the heart of campus. Student support spaces and recreation areas would be accommodated in all new undergraduate housing. Graduate and married student housing is focused on the campus edges, physically and symbolically closer to or within the greater Tucson community but within an easy walk to the campus core.

The plan also recommends the University encourage the faculty and staff to consider locating to the neighborhoods immediately surrounding the campus. Through various means, including University-owned properties or financial incentives. This strategy would invite closer cooperation between campus community. Housing more students on campus and increasing the percentage of owner-occupied houses in neighborhoods would create stronger communities with increasing property values.

Partnerships between the University and the City of Tucson could establish student or faculty and staff housing on major transit routes throughout the region. More faculty and staff living near campus or on transit routes would lessen the demand for on-campus parking and reduce regional congestion and pollution. Less parking demand frees University funds for supporting its academic mission. These strategies for common sense housing approaches would demonstrate the University's leadership in regional issues such as smart growth, traffic reduction, and sustainability.

Many universities around the nation have recognized the value of providing affordable housing to the faculty and staff and simultaneously strengthening the surrounding community. Trinity College, The University of Pennsylvania, Stanford University, Duke University, the University of Notre Dame, Columbia University and many others have found this strategy essential for recruiting and retaining top-notch faculty members. Creating a vibrant college town surrounding the school helps to recruit top students as well. (See the Implementation Section for the phased implementation of new housing.)

Existing and Proposed university housing

Graduate student housing at Mabel Street

Undergraduate student housing at the Main Mall

Undergraduate student housing at Sixth Street

PARKING AND TRANSPORTATION

Parking is an issue on every major university campus. The plan attempts to reconcile increased parking demand with the limitations of land resources and road capacity. This is a complex issue with no single solution. As the University grows over time, surface parking lots will be lost for new facilities. However, physical growth increases parking demand. New parking in the form of above-or-below-ground decks is far more expensive to build than surface lots. So as the campus grows, inexpensive parking is lost, demand increases and parking replacement is expensive. In addition, the existing road network capacity limits the amount of additional parking possible within the campus. Though several new parking decks are necessary to meet new demand, the conclusion drawn from the planning process is that the University should immediately begin investing in parking demand reduction strategies. (Refer to the full Parking and Transportation Report in Appendix 4 bound separately.)

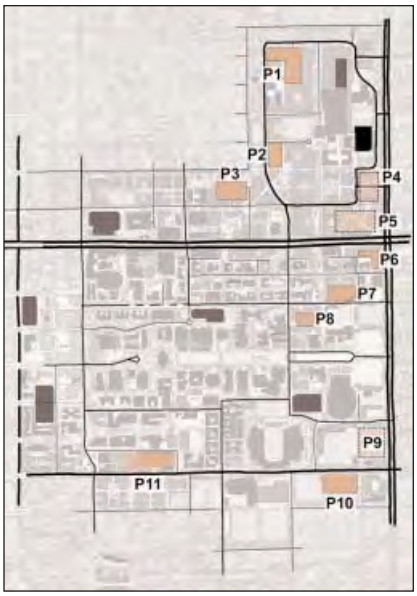
PARKING DEMAND REDUCTION STRATEGIES

To create a truly pedestrian-oriented campus:

- Improve the comfort of the walk with shade.
- Improve the quality of the walk with landscape, lighting, paving, benches, and other amenities.
- Provide a clear and efficient net-work of paths and bike routes.
- Mitigate the perceived length of the walk by connecting the pedestrian circulation network to the open space network and other activity centers.

Existing parking and street network

- Move parking to the perimeter of campus.
- Provide more on-campus student housing.
- Initiate faculty and staff housing programs in the surrounding community
- Continue to improve and expand the regional bicycle path network.
- Improve and expand the campus shuttle system.
- Provide neighborhood shuttles.
- Connect University shuttles to the regional transit system - bus, trolley, potential light rail.
- Continue to promote and expand ride-sharing programs.
- Seek remote park-and-ride opportunities.
- Restrict parking privileges for freshman or for on-campus residents.
- Raise parking permit prices to market value.
- Offer incentives for using transit alternatives.
- Supply free passes to students, faculty members, and staff for campus and city-wide transit.



Proposed parking and street network

- Pay the faculty and staff a stipend for not driving to work.
- Modify class schedules to mitigate peak demands and road congestion.
- Move non-essential programs off campus.
- Expand the emergency ride program.
- Introduce the concept of shared, clean fuel burning cars for the University and, possible, student use.
- Create a staff position for a Travel Demand Management Coordinator.

	Levels	Parking Spaces
P1	6	2,100
P2	7	1,000
P3	5	1,500
P4	3	800 (below grade)
P5	7	1,300 (below grade)
P6	4	300
P7	5	700
P8	3	300
P9	3	1,000 (below grade)
P10	5	1,400
P11	6	1,650

Student recreation fields and facilities

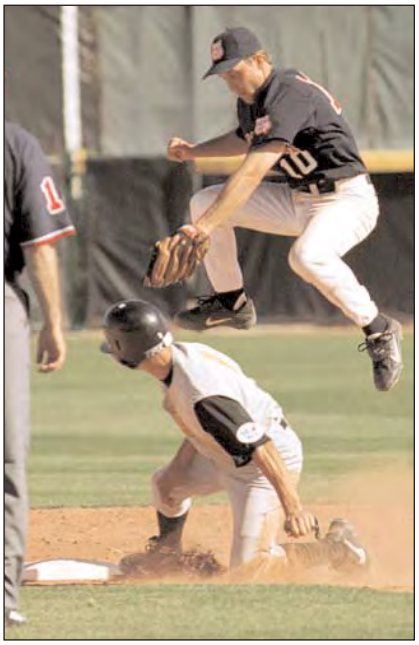
RECREATION

More than two-thirds of the student population participate in recreational sports, and that number is rising. The plan proposes:

- Athletics and student recreation facilities are an important part of the plan
- 5 new programmed fields and facilities
- 9 new or enhanced un-programmed fields and casual recreation
- More than 80,000 new building GSF of student activity space
- Shared 4,000-seat spectator venue

OPEN SPACE USE

Usable open space is intended to be associated with district centers. These open spaces should be flexible enough to allow varied activities from private study to active recreation. The plan also adds five programmed campus recreation fields and facilities, nine new or enhanced unprogrammed and casual recreation fields, more than 80,000 new gross square feet in building and a shared 4,000 seat spectator venue. Key programmed fields and facilities are grouped for efficiency on the north and south parts of campus. Smaller and unprogrammed fields may be associated with various districts



The plan promotes scheduled and unscheduled recreation activities.

SUSTAINABILITY

"Sustainability refers to the ability of a society, ecosystem, or any such ongoing system to continue functioning into the indefinite future without being forced into decline through the exhaustion or overloading of key resources on which that system depends."

Dr. Robert Gilman, Ph. D.

(President of the Context Institute and Founding Editor of IN CONTEXT A Quality of Humane Sustainable Culture)

The University Green Initiative complements the University's goal to provide leadership in the region and is integral to sustaining the institution's mission. It extends the strong environmental research programs and affiliations with the Environmental Research Laboratory. The University campus is the natural site for the application of the principles being studied and taught there.

To promote the health and well-being of the campus, community, and region, while fostering discovery, education, service, and inspiration, the University will undertake green initiatives at three scales of action: They are University-wide operations, administration, and philosophy; campus planning; and project implementation. The first category covers the organizational infrastructure, educational outreach, and habits of maintenance for the day-to-day and era-to-era life of the University, independent of new planning or capital projects. It provides a necessary umbrella for the other categories, including the second that guides the vision for the physical form and future of the campus, and the third that ensures each individual capital project undertaken adheres to a standard beyond best practices. Together, and in cooperation with the ongoing research at the University into allied subjects, this three-pronged approach outlines a comprehensive sustaining operation. The University should develop a committed policy to address operational issues. The Comprehensive Campus Plan 2003 provides the framework for implementing overall campus strategies. The Design Guidelines address the implementation of open space and building projects on a project-by-project basis.

UNIVERSITY-WIDE OPERATIONS/ADMINISTRATION/PHILOSOPHY

- Institutional Action
- Educational Initiatives
- Integrated Processes and Systems
- Operations
- Energy
- Regional Position
- Transit
- Waste Stream

CAMPUS PLANNING INITIATIVES

- Site Strategies
- Best Planning Practice
- Hydrology
- Landscape: Vegetation and Superstructures

PROJECT IMPLEMENTATION

- Principles
- Following LEED Guidelines
- Sustainable Sites
- Water Efficiency
- Indoor Environmental Quality
- Additional guidelines for design and construction specific to Tucson
- Materials and Resources
- Energy and Atmosphere
- Innovation and Design Process
- Green Power
- Materials

Plan Proposal – Mitigate storm water flow at campus edges with landscape buffer

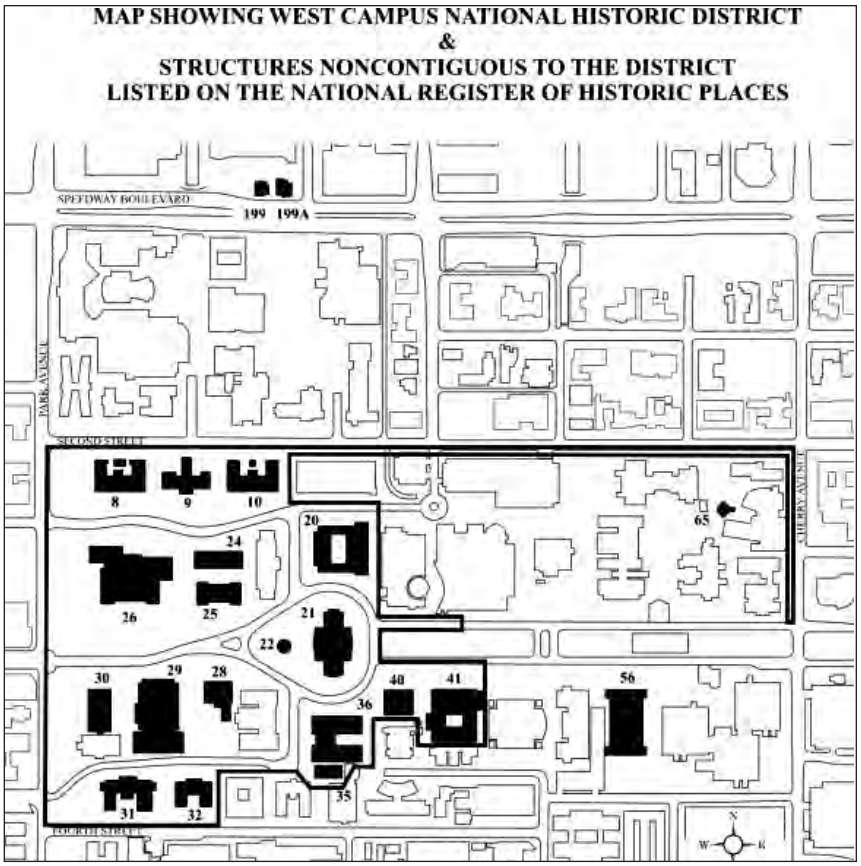
Plan Proposal – Use photovoltaic cells as shade devices and energy collectors on top of parking decks

HISTORIC PRESERVATION

The historic assets of any university are invaluable in providing a sense of permanence and tradition that speak to the origins and continuation of the mission. The historic core, along with the mall, gives the University of Arizona its physical identity. Its architectural consistency and spatial configuration make it an archetype of 19th century American campus planning. Its plan layout, diverse mix of uses, strong architectural character, picturesque, shade-giving landscape, understated gateway, and clear edges make the historic core one of the memorable parts of the campus. Its attributes are touchstones for growing the University campus in a functional and beautiful way.

Making the historic core a National Historic District and adding structures to the National Register of Historic Places demonstrates the University's dedication to honoring and learning from its past. Buildings on the Register range in date from 1887 to 1937. There is a rich mix of architectural styles within a consistent theme including Late Territorial Victorian, Roman Revival, Classical Revival, Vernacular Classic, Renaissance Revival, Italian Romanesque Revival, Queen Anne Style, and Bungalow Style. (Refer to Appendix 5 for a complete list of registered structures.)

Continuing to respect and preserve both built and natural assets on the campus are paramount to the University's charge to discover, educate, serve, and inspire.



Historic district and buildings

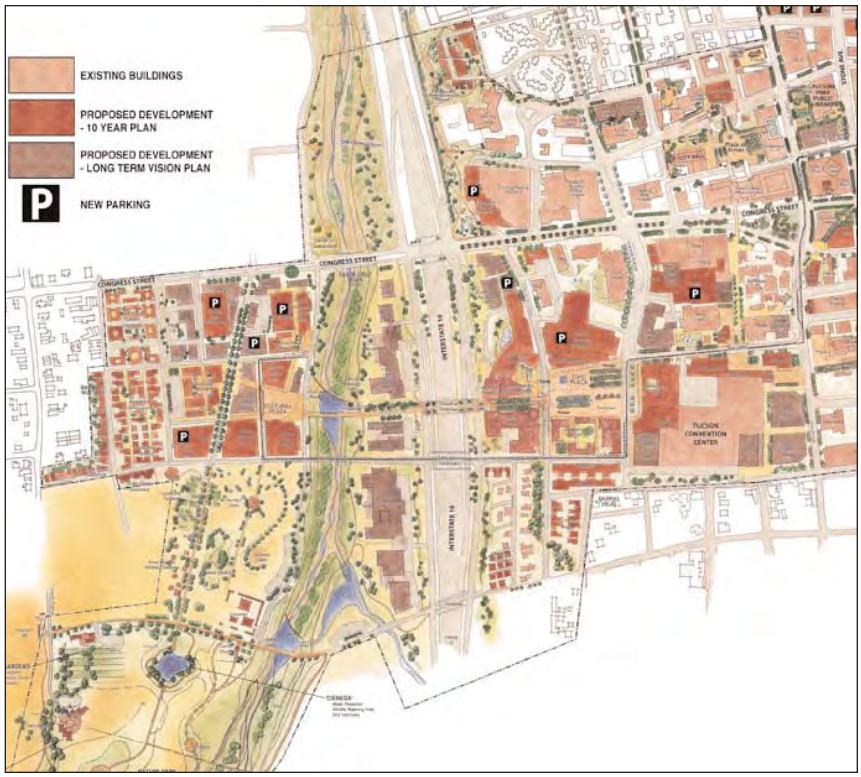
The University's role as environmental steward leads regional thinking on preserving the best natural and manmade assets of Tucson. Arboretum officials should review all new projects, in or out of the historic district, to identify heritage or otherwise important trees and landscape features within the project boundaries. Efforts should be made to preserve the landscape feature, move to a suitable location, or temporarily move and return where possible. Similarly, any building deemed of architectural importance any where on campus should be preserved in place or moved to a suitable new location if possible. (Refer to University Policy F in Chapter VI. Also see the *Secretary of the Interior's Standards for the Treatment of Historic Properties, 1995* for more information. www2.cr.nps.gov/tps/secstan2.htm)

Arizona State Museum

Bear Down Gymnasium

CITY/UNIVERSITY PARTNERSHIPS

The City of Tucson and the University of Arizona are exploring potential projects in the downtown area to help revitalize portions of city and to strengthen connections between the two major employment centers. The Rio Nuevo Master Plan is one opportunity that will bring the University attractions such as the Flandreau Science Center to downtown. Another identified site at Broadway and Fourth Avenue could bring more of the University functions to the area. A November 5, 2002 report by the Arroyo Group identifies benefits for the city and the University by locating in downtown a facility, housing, commercial enterprise, or mixed-use presence sponsored by the University.



Proposed Rio Nuevo Master Plan will help revitalize downtown with University presence

Benefits to Downtown:

- An increase in cultural events at museums, galleries, and entertainment venues and more city life at night, generating greater revenues for existing shops and restaurants
- Activities making the city a 24-hour activity zone which will, improve area security.
- Link the existing downtown attractions and transit centers and provide gateways into the city.
- Create a high-quality edge to existing historic neighborhoods like Armory Park.
- Pedestrian, trolley, and future light rail connections strengthened between the University and downtown attractions.

Benefits to the University

- The creation of unique, downtown housing options for students, faculty, and staff
- Educational and public outreach opportunities for University programs
- Strengthened transit (shuttle, trolley, and light rail) connections between the University and downtown, creating a synergy between the two.

The University of Arizona Comprehensive Campus Plan 2003 encourages City and University partnerships downtown and in the neighborhoods surrounding the campus. By complementing and sharing assets, the City of Tucson and the University can focus resources and strengthen the region as a whole.

Town/Campus Connector - Old Pueblo Trolley

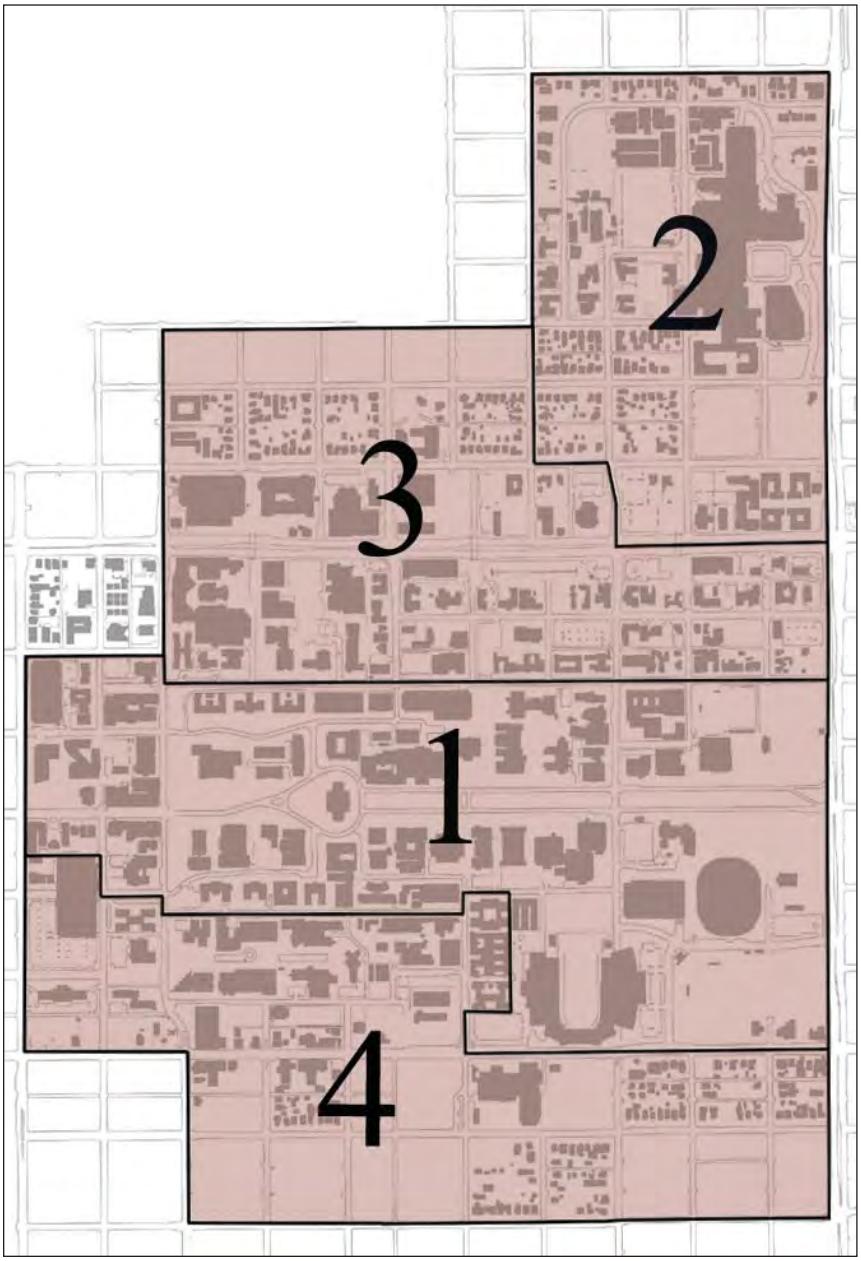
University Cultural Outreach at Childrens' Museum

Student, faculty, and staff housing options in downtown (hypothetical example)

THE FOUR PRECINCTS OF CAMPUS

Precinct workshop

Precinct walk



Precincts

To develop this plan, the campus was divided into four discrete precincts:

1. Central Core
2. AHSC and Environs
3. North Campus
4. South Campus

Precinct-relevant issues were studied in on-campus workshops with individuals who work and live in each of the precincts and, therefore, have a particular stake in its development. A walking tour with participants through each part of campus was followed by intensive workshops that generated the bulk of the plan. Designers relied heavily on the input from user groups and comments informed design decisions.

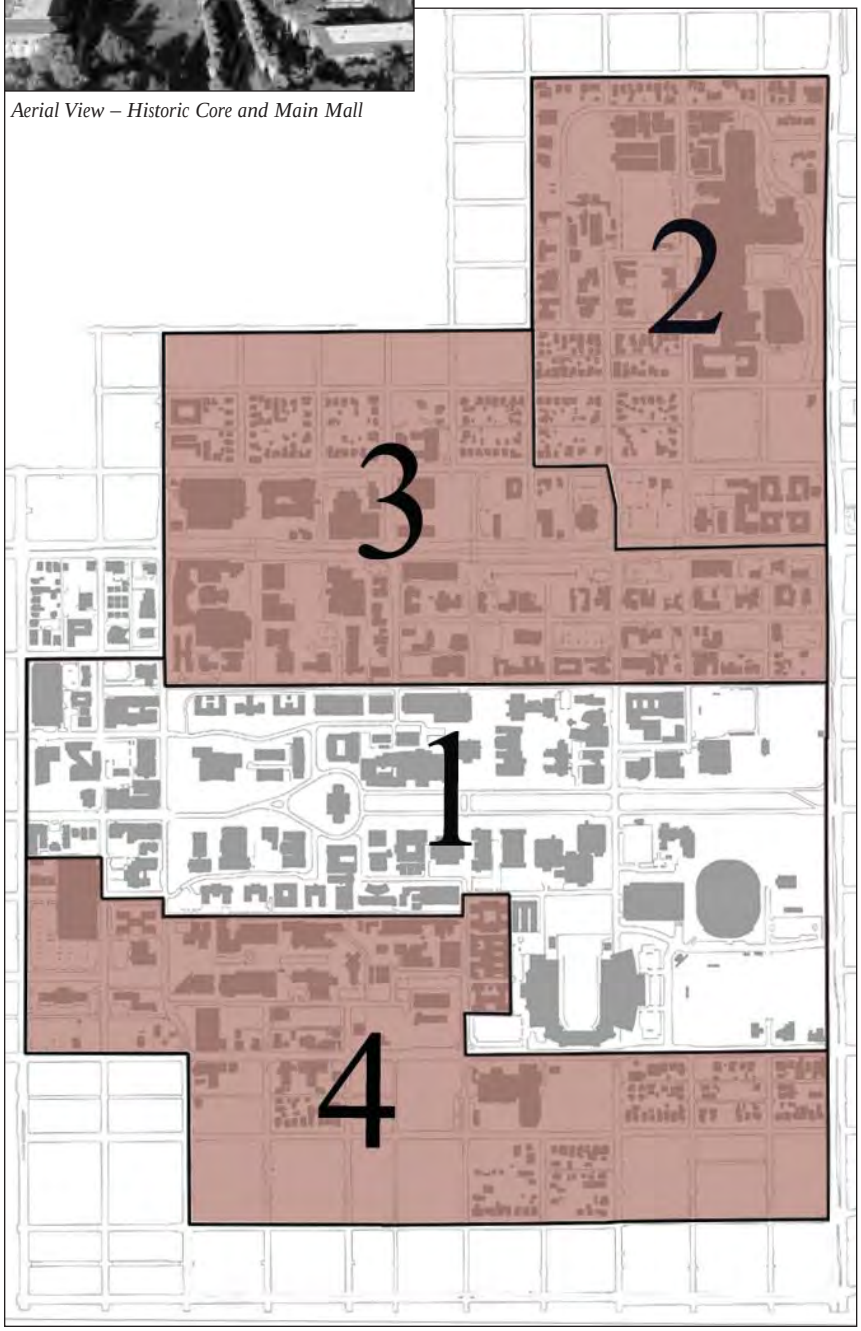
The individual precinct studies are merged to configure an overall plan. This plan was reworked into the final plan explained on preceding pages. The precinct work is shown after the final plan to highlight specific features at a larger scale.

Before and after aerial images of these areas further illustrate their future potential.

An important difference between this plan and the previous campus plan is that the current one eliminates individual planning districts. This allows the plan to meet the needs of the entire university within the designated planning area.

Aerial View – Historic Core and Main Mall

Precinct 1 walking tour



Precinct 1

PRECINCT ONE GOALS

Perceived as the heart of the campus, Precinct 1 includes the historic core and the mall, among other notable campus elements.

HISTORIC CORE

- Minimally infill in historic core
- Provide for growth of Arizona State Museum
- Create better north-south pedestrian movement
- Remedy pedestrian/vehicular conflict along Second Street
- Reduce surface parking to restrict further conflict and enhance open space
- Create a pedestrian-and-bicycle-friendly zone around Old Main
- Create a drop-off zone on North Campus Drive
- Create a pedestrian-oriented open space at existing South Campus Drive

MAIN MALL

- Better define edges of mall
- Orient buildings to face the mall with clearly defined entries at grade
- Reduce pedestrian/bicycle conflict
- Create better north-south movement from the mall to other parts of campus
- Redevelop underutilized or outdated buildings along the mall
- Refine east gateway at Cambell Avenue
- Provide sites for expansion of academic and student life facilities north and south of the mall
- Create usable outdoor intellectual space between buildings

INTERCOLLEGIATE ATHLETICS

- Expand and enhance existing facilities
- Reduce dominance of surface parking lots on the landscape
- Provide storm water mitigation
- Create appropriate gateway at intersection of Sixth Street and Cambell Avenue
- Enhance landscape buffer along Sixth Street and Cambell Avenue

IMPLEMENTATION

This section of the Comprehensive Development Plan illustrates how the plan will be put in place over time, where new projects will be located, their use and how many gross square feet (gsf) they will be.

The image at the right and accompanying table show existing buildings in gray and summarizes the plan buildout over three major phases. These phases are based on enrollment increases over time from the current 31,000 students to 37,000 in Phase 2 and 40,000 in Phase 3.

The following pages will examine phasing in more detail, buildout by precinct, and buildout by building use.

For comparative use with the Space Needs Analysis (Ch.II), the building use types for this section are shown below. The correlating space category of the Space Needs Analysis (p.19) is shown in parenthesis.

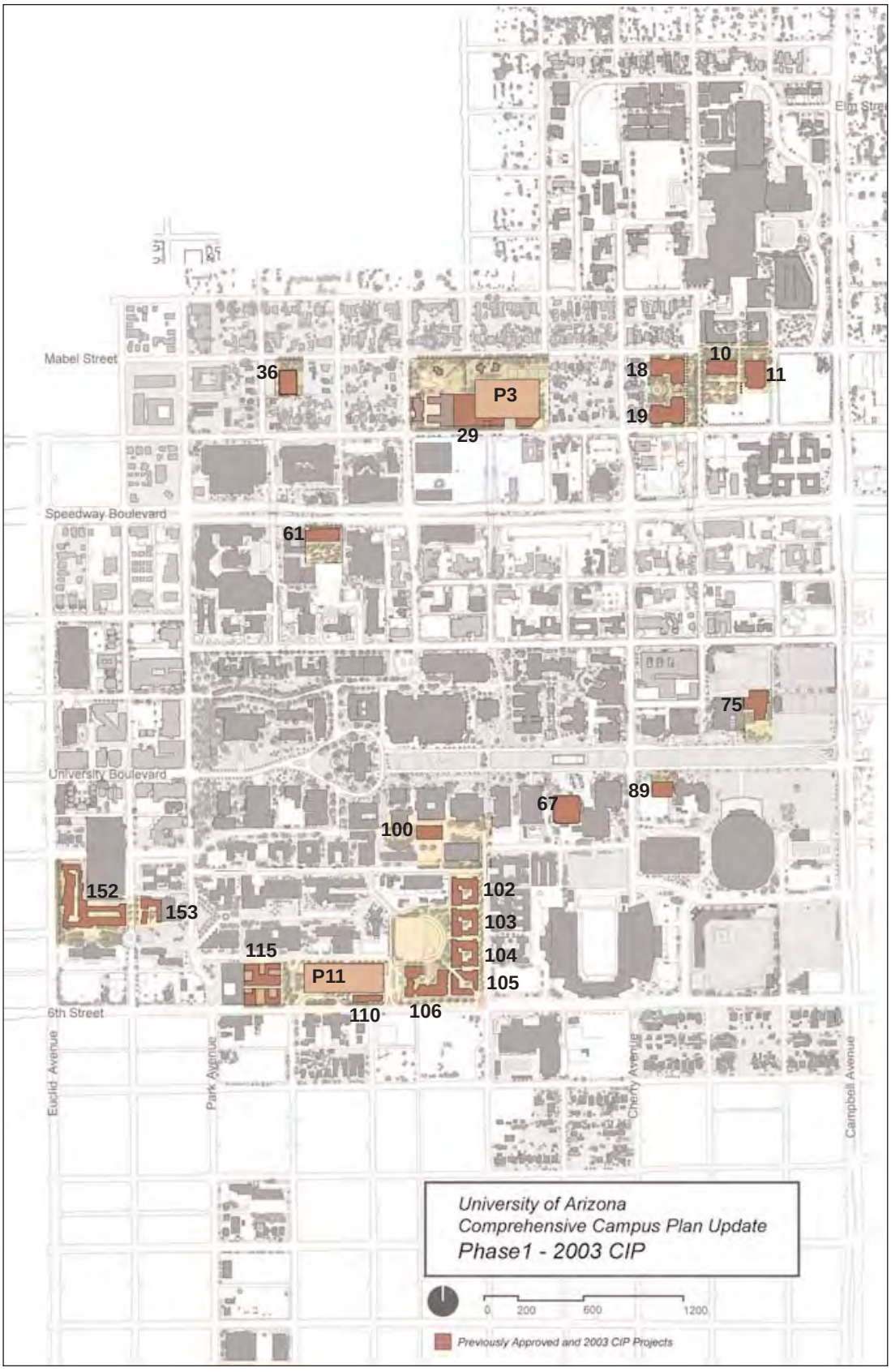
1. Academic (Academic Space)
2. Athletics-Recreation (Academic Support Space)
3. Civic (Academic Support Space)
4. Clinic (N/A)
5. Hospital (N/A)
6. Housing (Auxiliary Space)
7. Institutional Support (Academic Support Space)
8. Mixed Use (N/A)
9. Parking (same)
10. Physical Plant (Academic Support Space)
11. Research (Academic Space)
12. Student Support (Auxiliary Space + Library)

Summary Phasing Plan

	Gross Square Feet (gsf)	Need (gsf)	Deficit (gsf)
Existing Campus	8,600,000	11,100,000	2,500,000
Phase 1	+ 1,594,618		
(Planning, Design, Construction)	10,194,618	11,100,000	905,382
Phase 2	+ 4,969,155	5,000,000	
(37,000 FTE students)	15,163,773	16,100,000	936,227
Phase 3	+ 1,877,285	941,058	
(40,000 FTE students)			
Full Campus Build Out	17,041,058	17,041,058	0

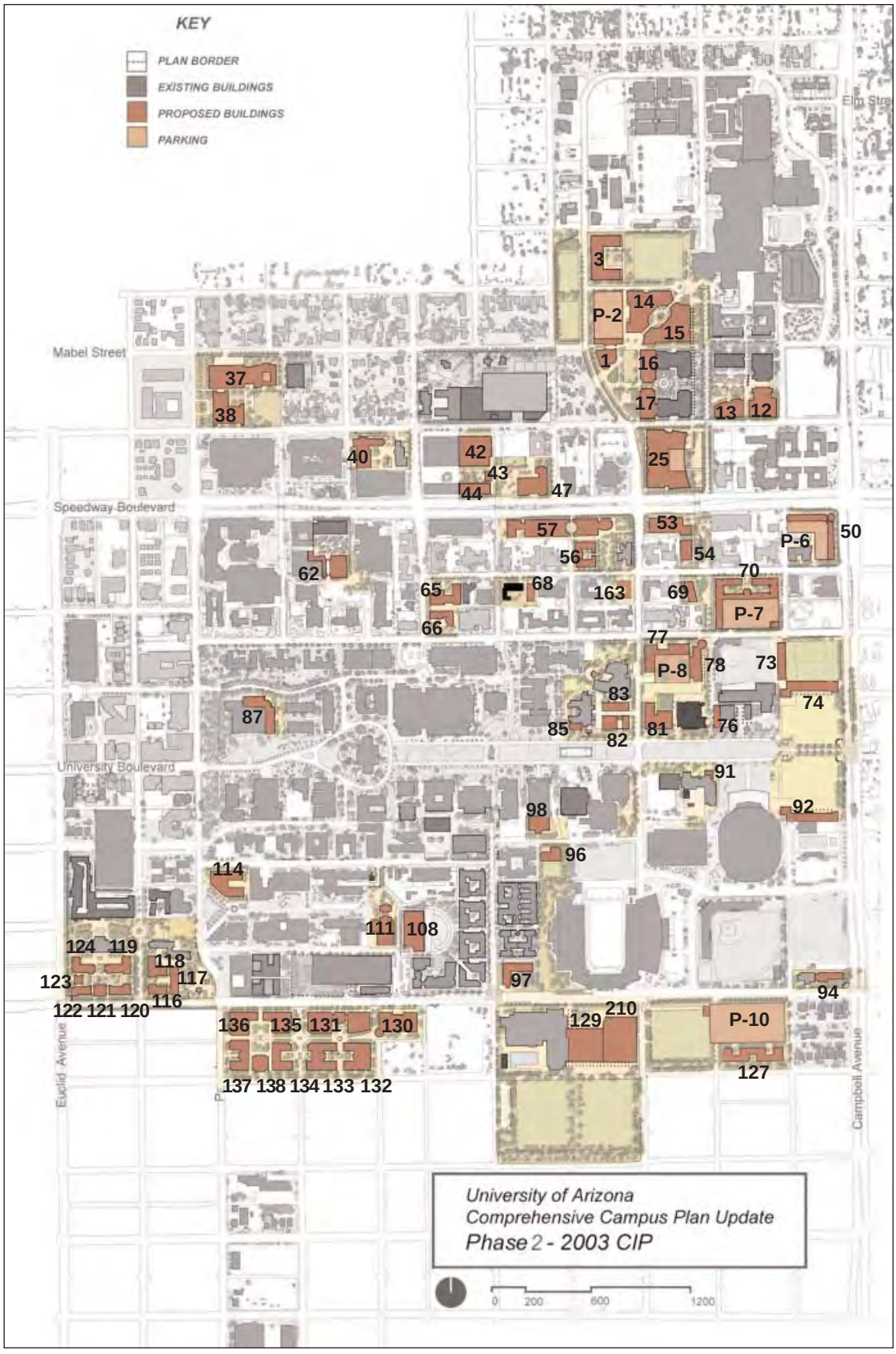
PHASING IMPLEMENTATION

PHASE 1 AREA CALCULATIONS					
BLDG_NO	BLDG_ID	SF / FLR	# FLOORS	TOTAL SF	BUILDING TYPE
UNIVERSITY OF ARIZONA					
10		14,373	4	57,491	ACADEMIC
11		19,004	4	76,016	ACADEMIC
36		14,143	2	28,286	ACADEMIC
*61		15,032	3	45,097	ACADEMIC
*75		16,524	2	33,048	ACADEMIC
				239,938	**ACADEMIC TOTAL**
*102		20,074	3	60,222	HOUSING
*103		20,074	3	60,222	HOUSING
*104		20,074	3	60,222	HOUSING
*105		17,398	3	52,194	HOUSING
*152		67,025	3	201,075	HOUSING
				433,935	**HOUSING TOTAL**
29		38,840	5	194,200	PHYSICAL PLANT
				194,200	**PHYSICAL PLANT TOTAL**
18		24,697	5	123,483	RESEARCH
19		26,096	5	130,480	RESEARCH
*89		11,493	5	57,464	RESEARCH
*100		12,511	4	50,044	RESEARCH
115		38,278	5	191,390	RESEARCH
				552,862	**RESEARCH TOTAL**
*67		6,221	3	50,044	STUDENT SUPPORT
*106		28,879	3	86,637	STUDENT SUPPORT
*110		6,898	2	13,796	STUDENT SUPPORT
*153		11,603	2	23,206	STUDENT SUPPORT
				173,683	**STUDENT SUPPORT TOTAL**
Phase 1: UNIV. OF ARIZONA TOTAL GFS				**1,594,618**	
	Total Without Previously Assigned Projects			801,347	
P-3		90,503	7	633,520	PARKING
*P-11		83,280	4	446,959	PARKING
				1,080,479	**PARKING TOTAL**
Phase 1: UNIV. OF ARIZONA PARKING				**3,087**	**APPROX. PARKING SPACES**
* These spaces have been assigned per the Space Needs Analysis					
and therefore are not applicable for future buildable capacity					


Mabel Street
Speedway Boulevard
University Boulevard
6th Street
Euclid Avenue
Park Avenue
Cherry Avenue
Campbell Avenue
36
P3
29
18
10
11
19
61
75
89
67
100
152
153
102
103
104
105
115
P11
110
106
University of Arizona
Comprehensive Campus Plan Update
Phase1 - 2003 CIP
0
200
600
1200
Previously Approved and 2003 CIP Projects

PHASING IMPLEMENTATION

PHASE 2 AREA CALCULATIONS				
BLDG_NO	SF / FLR	# FLOOI	TOTAL SF	BUILDING TYPE
UNIVERSITY OF ARIZONA				
12	25,966	4	103,862	ACADEMIC
13	16,617	4	66,468	ACADEMIC
38	27,659	2	55,318	ACADEMIC
40	19,703	3	59,109	ACADEMIC
42	34,690	5	173,450	ACADEMIC
43	2,180	8	17,440	ACADEMIC
44	11,949	4	47,796	ACADEMIC
47	22,287	4	89,146	ACADEMIC
53	21,002	4	84,009	ACADEMIC
54	7,982	3	23,947	ACADEMIC
57	53,720	4	214,880	ACADEMIC
62	21,850	5	109,250	ACADEMIC
65	15,117	3	45,351	ACADEMIC
66	8,190	3	24,569	ACADEMIC
76	5,379	3	16,138	ACADEMIC
82	11,070	5	55,350	ACADEMIC
83	8,296	5	41,481	ACADEMIC
85	2,916	2	5,832	ACADEMIC
98	10,861	2	21,722	ACADEMIC
**111	22,114	6	132,684	ACADEMIC
**114	23,214	5	116,068	ACADEMIC
130	27,165	5	135,827	ACADEMIC
131	39,427	5	197,133	ACADEMIC
132	23,135	4	92,542	ACADEMIC
133	23,582	4	94,328	ACADEMIC
134	15,205	4	60,822	ACADEMIC
135	17,481	5	87,407	ACADEMIC
136	17,481	5	87,407	ACADEMIC
137	16,349	4	65,398	ACADEMIC
138	9,048	3	27,143	ACADEMIC
			2,351,877	**ACADEMIC TOTAL**
73	10,749	2	21,498	ATHLETICS/RECREATION
96	8,375	2	16,750	ATHLETICS/RECREATION
129	42,859	2	85,718	ATHLETICS/RECREATION
210	54,691	2	109,382	ATHLETICS/RECREATION
			233,347	**ATHLETICS/REC TOTAL**
37	50,670	2	101,340	CIVIC
94	7,745	3	23,234	CIVIC
			124,574	**CIVIC TOTAL**
56	13,886	2	27,771	HOUSING
68	4,739	3	14,217	HOUSING
69	6,240	3	18,720	HOUSING
70	38,805	3	116,414	HOUSING
74	21,015	3	63,044	HOUSING
92	18,230	3	54,691	HOUSING
97	13,376	3	40,129	HOUSING
116	6,280	4	25,122	HOUSING
117	8,586	4	34,344	HOUSING
118	9,515	4	38,060	HOUSING
119	10,435	4	41,739	HOUSING
120	6,980	4	27,921	HOUSING
121	5,201	4	20,804	HOUSING
122	6,132	4	24,526	HOUSING
123	2,553	4	10,213	HOUSING
124	9,100	4	36,400	HOUSING
127	22,672	3	68,015	HOUSING
163	10,643	4	42,572	HOUSING
			704,705	**HOUSING TOTAL**
3	34,471	3	103,413	INSTITUTIONAL SUPPORT
			103,413	**INSTITUTIONAL SUPPORT**
1	17,091	4	68,364	RESEARCH
14	43,207	5	216,035	RESEARCH
15	42,879	5	214,393	RESEARCH
16	17,690	5	88,451	RESEARCH
17	16,454	5	82,271	RESEARCH
25	80,908	5	404,540	RESEARCH
77	20,858	3	62,575	RESEARCH
78	15,256	4	61,025	RESEARCH
81	20,041	5	100,203	RESEARCH
87	18,716	3	56,148	RESEARCH
			1,354,005	**RESEARCH TOTAL**
56	13,886	1	13,886	STUDENT SUPPORT
**108	27,783	3	83,348	STUDENT SUPPORT
			97,233	**STUDENT SUPPORT TOTAL**
Phase 2: UNIV. OF ARIZONA TOTAL GFS			**4,969,155**	
** Does not include removal of existing building's gsf				
P-2	49,463	7	346,244	PARKING
P-7	60,538	5	302,688	PARKING
P-8	36,677	3	110,031	PARKING
P-10	106,277	5	531,387	PARKING
			1,290,350	**PARKING TOTAL**
Phase 2: UNIV. OF ARIZONA PARKING			**3,687**	**APPROX. SPACES**
Phase 2: MIXED USE				
50	19,883	4	79,532	MIXED USE
Phase 2: MIXED USE TOTAL GFS			79,532	
P-6	31,258	4	125,032	PARKING
			125,032	**PARKING TOTAL**
Phase 2: MIXED USE PARKING			**357**	**APPROX. SPACES**


KEY
PLAN BORDER
EXISTING BUILDINGS
PROPOSED BUILDINGS
PARKING
Mabel Street
Speedway Boulevard
University Boulevard
Euclid Avenue
Campbell Avenue
3
14
P-2
15
1
16
17
13
12
37
38
40
42
43
44
47
25
57
56
53
54
P-6
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P-7
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P-8
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132
129
210
P-10
127
University of Arizona
Comprehensive Campus Plan Update
Phase 2 - 2003 CIP
0
200
600
1200

PHASING IMPLEMENTATION

PHASE 3 AREA CALCULATIONS				
BLDG_NO	SF / FLR	# FLOORS	TOTAL SF	BUILDING TYPE
UNIVERSITY OF ARIZONA				
9	6,614	3	19,841	ACADEMIC
32	24,668	3	74,003	ACADEMIC
33	11,038	3	33,115	ACADEMIC
34	17,778	3	53,333	ACADEMIC
35	17,778	3	53,333	ACADEMIC
45	16,296	4	65,184	ACADEMIC
46	4,388	4	17,552	ACADEMIC
48	21,042	4	84,166	ACADEMIC
63	5,029	3	15,086	ACADEMIC
64	3,856	1	3,856	ACADEMIC
84	8,370	3	25,110	ACADEMIC
86	2,898	5	14,488	ACADEMIC
99	7,073	3	21,218	ACADEMIC
**101	23,375	6	140,250	ACADEMIC
**112	1,863	3	5,588	ACADEMIC
113	3,714	3	11,142	ACADEMIC
			637,268	**ACADEMIC TOTAL**
26	32,722	2	65,444	ATHLETIC/RECREATION
93	21,720	3	65,160	ATHLETIC/RECREATION
95	1,575	1	1,575	ATHLETIC/RECREATION
			132,179	**ATHLETIC/REC. TOTAL**
158	9,679	4	38,715	CIVIC
			38,715	**CIVIC TOTAL**
30	10,616	3	31,848	HOUSING
31	20,972	3	62,916	HOUSING
41	1,129	3	3,387	HOUSING
52	5,870	3	17,609	HOUSING
60	6,788	3	20,365	HOUSING
72	13,845	3	41,534	HOUSING
140	4,576	3	13,729	HOUSING
141	4,543	3	13,628	HOUSING
142	4,543	3	13,628	HOUSING
143	5,577	3	16,732	HOUSING
144	10,271	3	30,814	HOUSING
145	10,271	3	30,814	HOUSING
146	10,271	3	30,814	HOUSING
147	10,271	3	30,814	HOUSING
148	10,271	3	30,814	HOUSING
149	10,271	3	30,814	HOUSING
150	10,271	3	30,814	HOUSING
151	10,271	3	30,814	HOUSING
155	937	3	2,811	HOUSING
159	10,271	3	30,813	HOUSING
160	10,271	3	30,813	HOUSING
161	10,271	3	30,813	HOUSING
162	10,271	3	30,813	HOUSING
138	3,533	3	10,599	HOUSING
			618,547	**HOUSING TOTAL**
49	25,506	4	102,024	INSTITUTIONAL SUPPORT
59	5,280	3	15,839	INSTITUTIONAL SUPPORT
				INSTITUTIONAL SUPPORT
			117,863	**TOTAL**
211	16,875	2	33,750	PHYSICAL PLANT
			33,750	**PHYSICAL PLANT**
58	4,159	3	12,477	RESEARCH
80	21,931	4	87,726	RESEARCH
90	5,716	4	22,863	RESEARCH
91	18,141	5	90,705	RESEARCH
157	5,261	2	10,522	RESEARCH
			224,293	**RESEARCH TOTAL**
27	23,178	3	69,533	STUDENT SUPPORT
156	1,712	3	5,137	STUDENT SUPPORT
			74,670	**STUDENT SUPPORT TOTAL**
Phase 3 UNIV. OF ARIZONA TOTAL			**1,877,285**	
** Does not include removal of existing building's gsf				
P-9	138,159	3	414,477	PARKING
BELOW GRADE			414,477	**U of A PARKING TOTAL**
Phase 3: UNIV. OF ARIZONA PARKING			**1,184**	**APPROX. SPACES**
CLINIC				
20	20,858	4	83,432	CLINIC
21	51,568	4	206,274	CLINIC
Phase 3 CLINIC TOTAL GSF			**289,706**	
P-4	89,144	3	267,432	CLINIC PARKING
BELOW GRADE			267,432	CLINIC PARKING TOTAL
Phase 3: CLINIC PARKING			**764**	**APPROX. SPACES**
HOSPITAL				
4	177,061	4	708,244	HOSPITAL
6	28,595	2	57,190	HOSPITAL
7	55,547	4	238,712	HOSPITAL
8	186,000	4	744,000	HOSPITAL
213	66,000	1	66,000	HOSPITAL
Phase 3 HOSPITAL TOTAL GSF			**1,814,146**	
P-1	129,551	6	777,306	HOSPITAL PARKING
			777,306	HOSPITAL PARKING TOTAL
Phase 3: HOSPITAL PARKING			**2,221**	**APPROX. SPACES**
MIXED USE				
22	23,300	7	163,100	MIXED USE
23	39,261	4	157,045	MIXED USE
24	59,508	5	297,540	MIXED USE
39	6,039	1	6,039	MIXED USE
55	15,473	4	61,891	MIXED USE
125	24,508	3	73,524	MIXED USE
126	8,748	3	26,243	MIXED USE
Phase 3: MIXED USE TOTAL GSF			**785,382**	
P-5	63,154	7	442,078	PARKING
BELOW GRADE			442,078	MIXED USE PARKING TOTAL
Phase 3: MIXED USE PARKING			**1,263**	**APPROX. SPACES**


KEY
PLAN BORDER
EXISTING BUILDINGS
PROPOSED BUILDINGS
PARKING
Mabel Street
Speedway Boulevard
University Boulevard
Euclid Avenue
Campbell Avenue
P-1
P-4
P-5
P-9
211
213
University of Arizona
Comprehensive Campus Plan Update
Phase 3 - FULL BUILD OUT
0
200
600
1200

PHASING IMPLEMENTATION

UAZ PHASE 1 SUMMARY

UNIVERSITY OF ARIZONA	SF / TOTAL
ACADEMIC	239,938
ATHLETICS/RECREATION	0
CIVIC	0
HOUSING	433,935
INSTITUTIONAL SUPPORT	0
PHYSICAL PLANT	194,200
RESEARCH	552,862
STUDENT SUPPORT	173,683
PHASE 1 TOTAL: U of A	**1,594,618**
*TOTAL W/O CURRENT PROJECTS	801,347
U of A PARKING SPACES	**3,087**
CLINIC	**0**
CLINIC PARKING SPACES	**0**
HOSPITAL	**0**
HOSPITAL PARKING SPACES	**0**
MIXED USE	**0**
MIXED USE PARKING SPACES	**0**

UAZ PHASE 2 SUMMARY

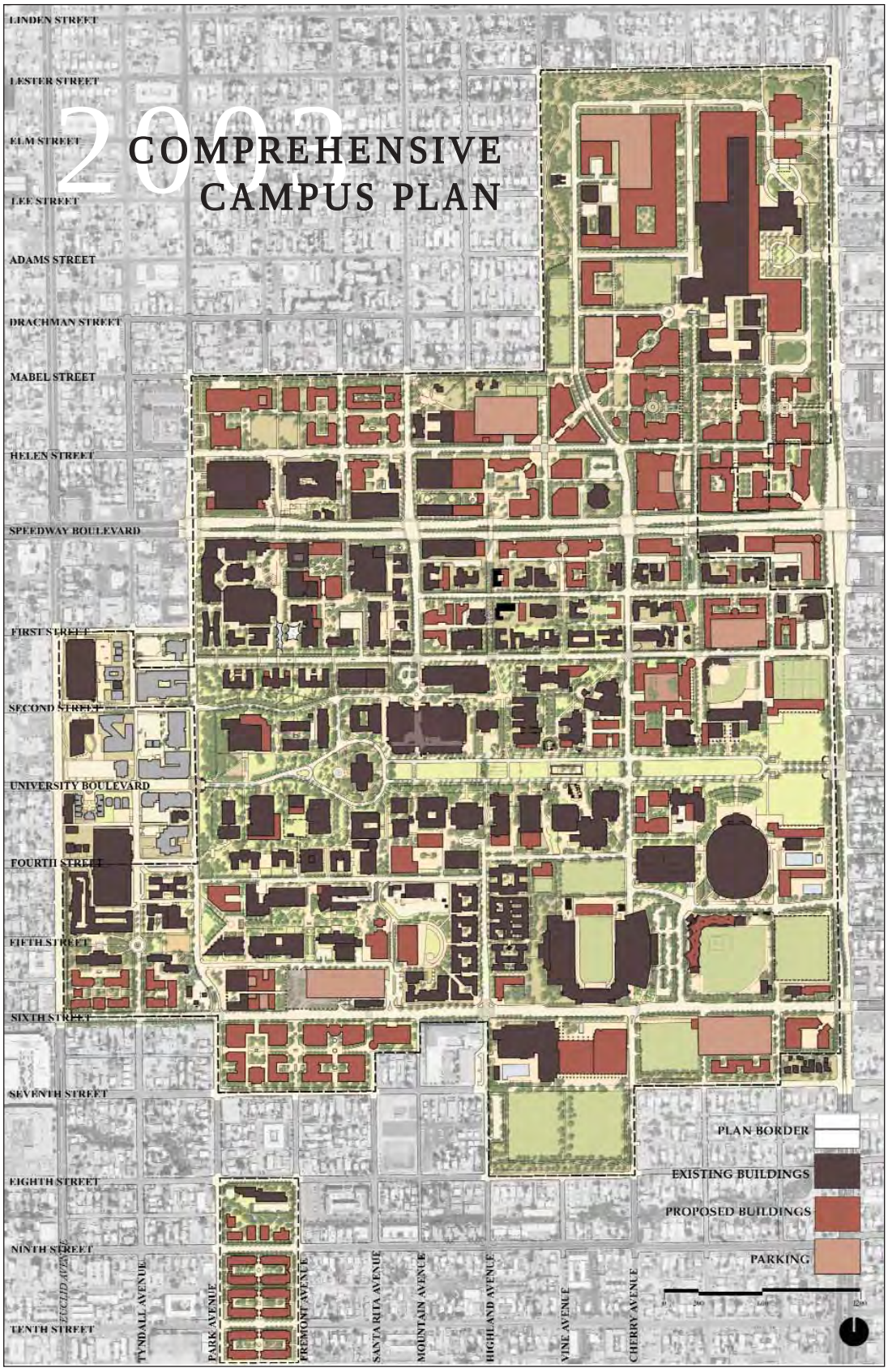
UNIVERSITY OF ARIZONA	SF / TOTAL
ACADEMIC	2,351,877
ATHLETICS/RECREATION	233,347
CIVIC	124,574
HOUSING	704,705
INSTITUTIONAL SUPPORT	103,413
PHYSICAL PLANT	0
RESEARCH	1,354,005
STUDENT SUPPORT	97,233
PHASE 2 TOTAL: U of A	**4,969,155**
U of A PARKING SPACES	**3,687**
CLINIC	**0**
CLINIC PARKING SPACES	**0**
HOSPITAL	**0**
HOSPITAL PARKING SPACES	**0**
MIXED USE	**79,532**
MIXED USE PARKING SPACES	**357**

UAZ PHASE 3 SUMMARY

UNIVERSITY OF ARIZONA	SF / TOTAL
ACADEMIC	637,268
ATHLETIC/RECREATION	132,179
CIVIC	38,715
HOUSING	618,547
INSTITUTIONAL SUPPORT	117,863
MIXED USE	785,382
PHYSICAL PLANT	33,750
RESEARCH	224,293
STUDENT SUPPORT	74,670
PHASE 3 TOTAL: U of A	**1,877,285**
U of A PARKING SPACES	**1,184**
CLINIC	**289,706**
CLINIC PARKING SPACES	**764**
HOSPITAL	**1,814,146**
HOSPITAL PARKING SPACES	**2,221**
MIXED USE	**785,382**
MIXED USE PARKING SPACES	**1,263**

UAZ TOTAL SUMMARY

UNIVERSITY OF ARIZONA	SF / TOTAL
ACADEMIC	3,229,084
ATHLETIC/RECREATION	365,527
CIVIC	163,288
HOUSING	1,757,187
INSTITUTIONAL SUPPORT	221,276
MIXED USE	864,914
PHYSICAL PLANT	227,950
RESEARCH	2,131,159
STUDENT SUPPORT	345,587
FINAL PHASE TOTAL: U of A	**8,441,057**
TOTAL W/O CURRENT PROJECTS	7,647,786
U of A PARKING SPACES	**7,958**
CLINIC	**289,706**
CLINIC PARKING SPACES	**764**
HOSPITAL	**1,814,146**
HOSPITAL PARKING SPACES	**2,221**
MIXED USE	**864,914**
MIXED USE PARKING SPACES	**1,620**


2003
COMPREHENSIVE
CAMPUS PLAN
LINDEN STREET
LESTER STREET
ELM STREET
LEE STREET
ADAMS STREET
DRACHMAN STREET
MABEL STREET
HELEN STREET
SPEEDWAY BOULEVARD
FIRST STREET
SECOND STREET
UNIVERSITY BOULEVARD
FOURTH STREET
FIFTH STREET
SIXTH STREET
SEVENTH STREET
EIGHTH STREET
NINTH STREET
TENTH STREET
EUCLID AVENUE
TYNDALL AVENUE
PARK AVENUE
FREMONT AVENUE
SANTA RITA AVENUE
MOUNTAIN AVENUE
HIGHLAND AVENUE
VINE AVENUE
CHERRY AVENUE
PLAN BORDER
EXISTING BUILDINGS
PROPOSED BUILDINGS
PARKING

PRECINCT 1 IMPLEMENTATION

Building Construction

	Bldg. #	# Floors	Total GSF	Building Type
Phase 1	75	2	33,048	Academic
	89	5	57,464	Research
	100	4	50,044	Research
Phase 2	76	3	16,138	Academic
	82	5	55,350	Academic
	83	5	41,481	Academic
	85	2	5,832	Academic
	98	2	21,722	Academic
Phase 3	41	3	3,387	Housing
	80	4	87,726	Research
	84	3	25,110	Academic
	86	5	14,488	Academic
	90	4	22,863	Research
	91	5	90,705	Research
	93	3	65,160	Athletic/Recreation
	94	3	23,234	Civic
	95	1	1,575	Athletic/Recreation
	99	3	21,218	Academic
	101	6	140,250	Academic
	113	3	11,142	Academic
	155	3	937	Housing
	157	2	10,522	Research
	158	4	38,715	Civic
Total			**838,111**	

Parking (University Controlled)

	Deck #	# Floors	Spaces
Phase 2	P8	3	300
Phase 3	P9 (below grade)	3	1,000
Total			**1,300**

PRECINCT 2 IMPLEMENTATION

Building Construction

	Bldg. #	# Floors	Total GSF	Building Type
Phase 1	10	4	57,491	Academic
	11	4	76,016	Academic
	18	5	123,483	Research
	19	5	130,480	Research
Phase 2	1	4	68,364	Research
	3	3	103,413	Institutional Support
	12	4	103,862	Academic
	13	4	66,468	Academic
	14	5	216,035	Research
	15	5	214,393	Research
	16	5	88,451	Research
	17	5	82,271	Research
	25	5	404,540	Research
Phase 3	4	4	708,244	Hospital
	6	2	57,190	Hospital
	7	4	238,712	Hospital
	8	4	744,000	Hospital
	9	3	19,841	Academic
	20	4	83,432	Clinic
	21	4	206,274	Clinic
	22	7	163,100	Mixed Use
	23	4	157,045	Mixed Use
	24	5	297,540	Mixed Use
	156	3	5,137	Student Support
	211	2	33,750	Physical Plant
	213	1	66,000	Hospital
	Total		**4,515,512**	

Parking (University Controlled)

	Deck #	# Floors	Spaces
Phase 2	P2	6	1,000
Phase 3	P4 (below grade)	3	800
	P1	5- 6	2,100
	P5 (below grade)	7	1,300
Total			**5,200**

PRECINCT 3 IMPLEMENTATION

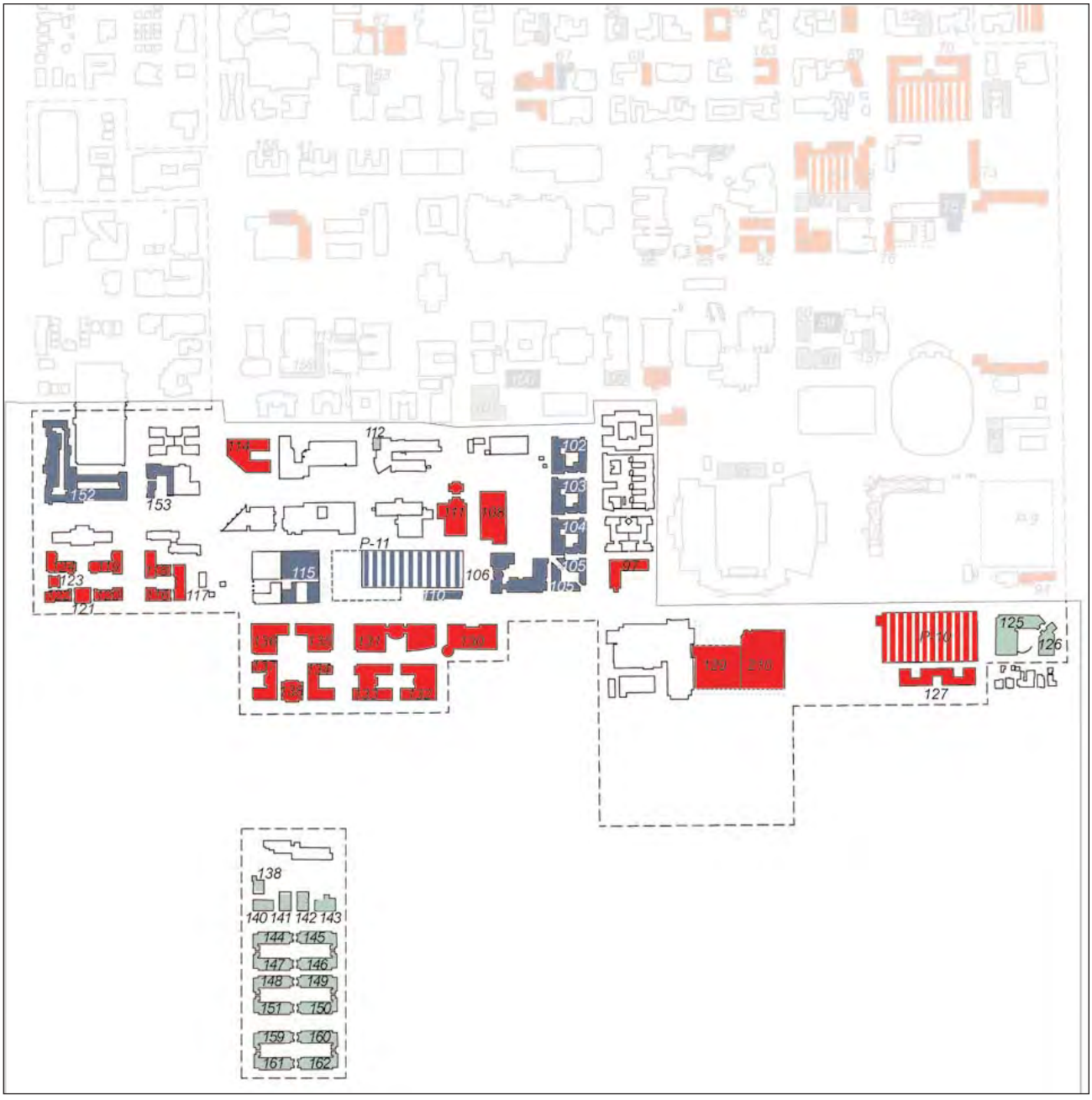
Parking (University Controlled)

	Deck #	# Floors	Spaces
Phase 1	P3	5	1,500
Phase 2	P7	5	700
	P6	4	300
Total			**2,300**

Building Construction

	Bldg. #	# Floors	Total GSF	Building Type
Phase 1	29	5	194,200	Physical Plant
	36	2	28,286	Academic
	61	3	45,097	Academic
	67	3	50,044	Housing
Phase 2	37	2	101.340	Civic
	38	2	55,318	Academic
	40	3	59,109	Academic
	42	5	173,450	Academic
	43	8	17,440	Academic
	44	4	47,796	Academic
	47	4	89,146	Academic
	50	4	79,532	Mixed Use
	53	4	84,009	Academic
	54	3	23,947	Academic
	56	1	13,886	Student Support
	56	2	27,771	Housing
	57	4	214,880	Academic
	62	5	109,250	Academic
	65	3	45,351	Academic
	66	3	24,569	Academic
	68	3	14,217	Housing
	69	3	18,720	Housing
	70	3	116,414	Housing
	163	4	42,572	Housing
Phase 3	26	2	65,444	Athletic/Recreation
	27	3	69,533	Student Support
	30	3	31,848	Housing
	31	3	62,916	Housing
	32	3	74,003	Academic
	33	3	33,115	Academic
	34	3	53,333	Academic
	35	3	53,333	Academic
	39	1	6,039	Mixed Use
	45	4	65,184	Academic
	46	4	17,552	Academic
	48	4	84,166	Academic
	49	4	102,024	Institutional Support
	52	3	17,609	Housing
	55	4	61,891	Mixed Use
	58	3	12,477	Research
	59	3	15,839	Institutional Support
	60	3	20,365	Housing
	63	3	15,086	Academic
	64	1	3,856	Academic
	72	3	41,534	Housing
Total			**2,583,491**	

PRECINCT 4 IMPLEMENTATION



Parking University

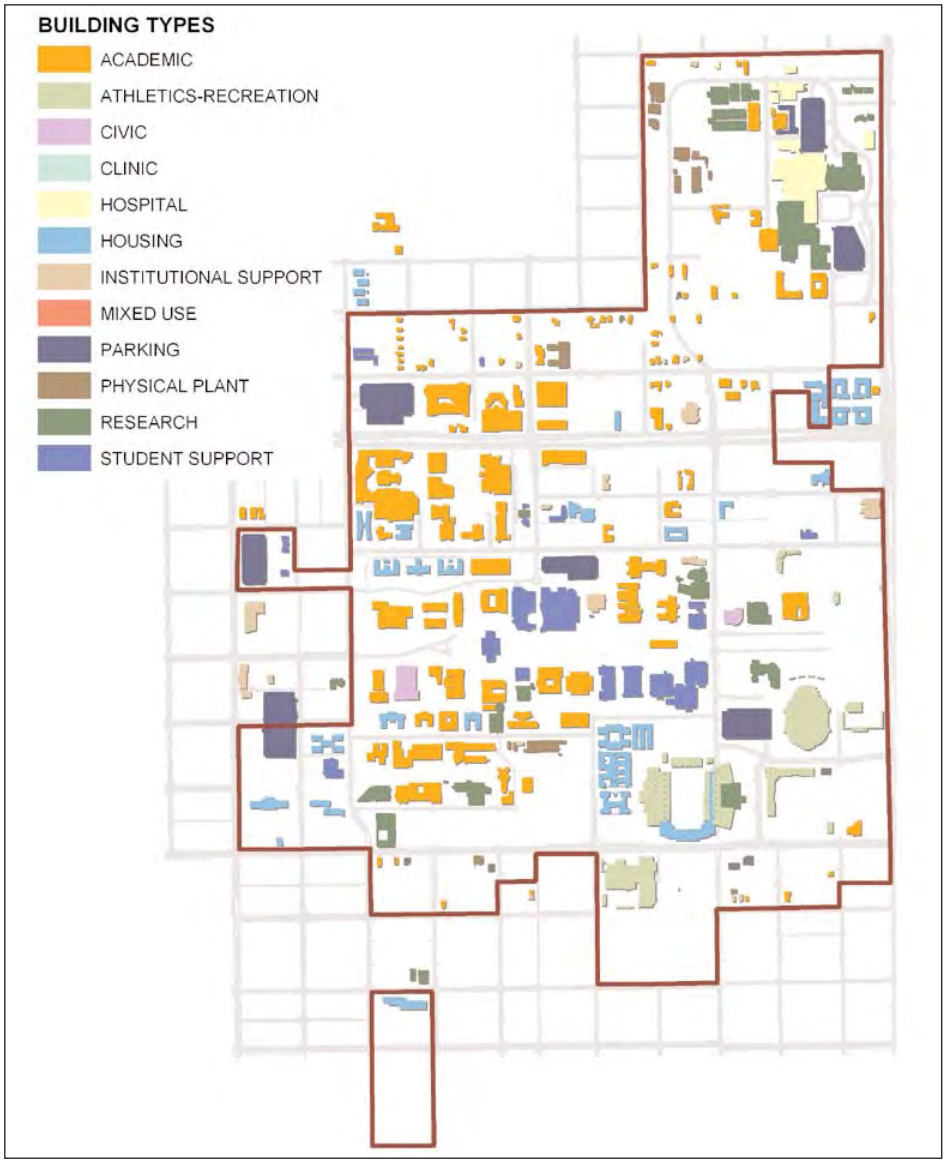
	Deck #	# Floors	Spaces
Phase 1	P11	6	1,650
Phase 2	P10	5	1,400
Total			**2,000**

Building Construction

	Bldg. #	# Floors	Total GSF	Building Type
Phase 1	102	3	60,222	Housing
	103	3	60,222	Housing
	104	3	60,222	Housing
	105	3	52,194	Housing
	106	3	86,637	Student Support
	110	2	13,796	Student Support
	115	5	191,390	Research
	152	3	201,075	Housing
	153	2	23,206	Student Support
Phase 2	97	3	40,129	Housing
	108	3	83,348	Student Support
	111	6	132,684	Academic
	114	5	116,068	Academic
	116	4	25,122	Housing
	117	4	34,344	Housing
	118	4	38,060	Housing
	119	4	41,739	Housing
	120	4	27,921	Housing
	121	4	20,804	Housing
	122	4	24,526	Housing
	123	4	10,213	Housing
	124	4	36,400	Housing
	127	3	68,015	Housing
	129	2	85,718	Athletic/Recreation
	130	5	135,827	Academic
	131	5	197,133	Academic
	132	4	92,542	Academic
	133	4	94,328	Academic
	134	4	60,822	Academic
	135	5	87,407	Academic
	136	5	87,407	Academic
	137	4	65,398	Academic
	138	3	27,143	Academic
	210	2	109,382	Athletic/Recreation
Phase 3	112	3	5,588	Academic
	125	3	73,524	Mixed Use
	126	3	26,243	Mixed Use
	138	3	10,599	Housing
	140	3	13,729	Housing
	141	3	13,628	Housing
	142	3	13,628	Housing
	143	3	16,732	Housing
	144	3	30,814	Housing
	145	3	30,814	Housing
	146	3	30,814	Housing
	147	3	30,814	Housing
	148	3	30,814	Housing
	149	3	30,814	Housing
	150	3	30,814	Housing
	151	3	30,814	Housing
	159	3	30,813	Housing
	160	3	30,813	Housing
	161	3	30,813	Housing
	162	3	30,813	Housing
Total			2,974,657	

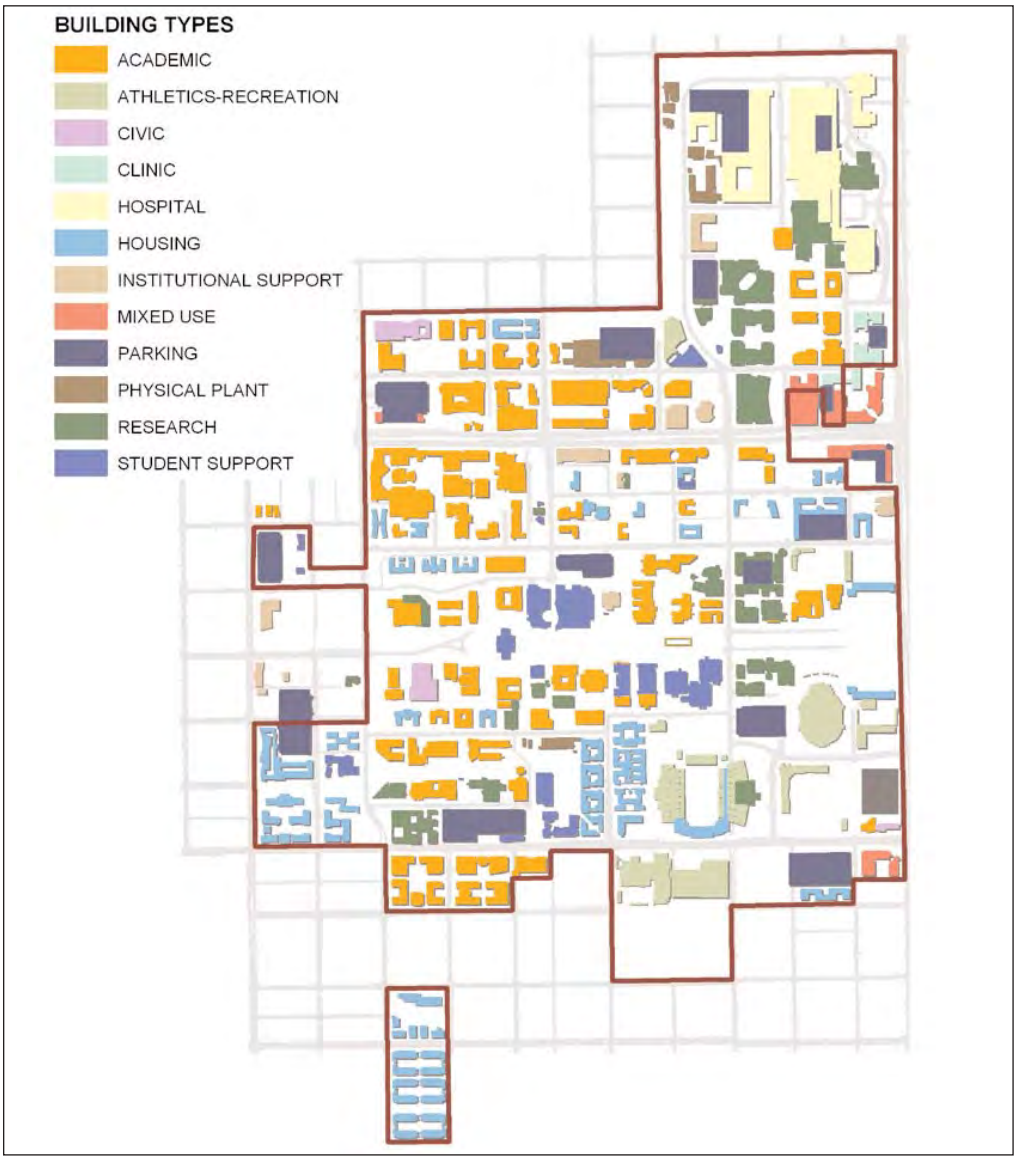
BUIILDINGS

	Existing GSF (2002 GSF Minus Future Demolitions)	GSF Added (Phases 1, 2, and 3)	Total GSF at Phase 3 Build-Out
ACADEMIC	3,629,160	3,229,084	6,858,244
ATHLETICS-RECREATION	609,149	365,527	974,676
CIVIC	85,881	163,288	249,169
HOUSING	1,088,603	1,807,231	2,895,834
INSTITUTIONAL SUPPORT	239,225	221,276	460,501
PHYSICAL PLANT	131,863	227,950	359,813
RESEARCH	1,690,769	2,131,159	3,821,928
STUDENT SUPPORT	849,693	295,542	1,145,235



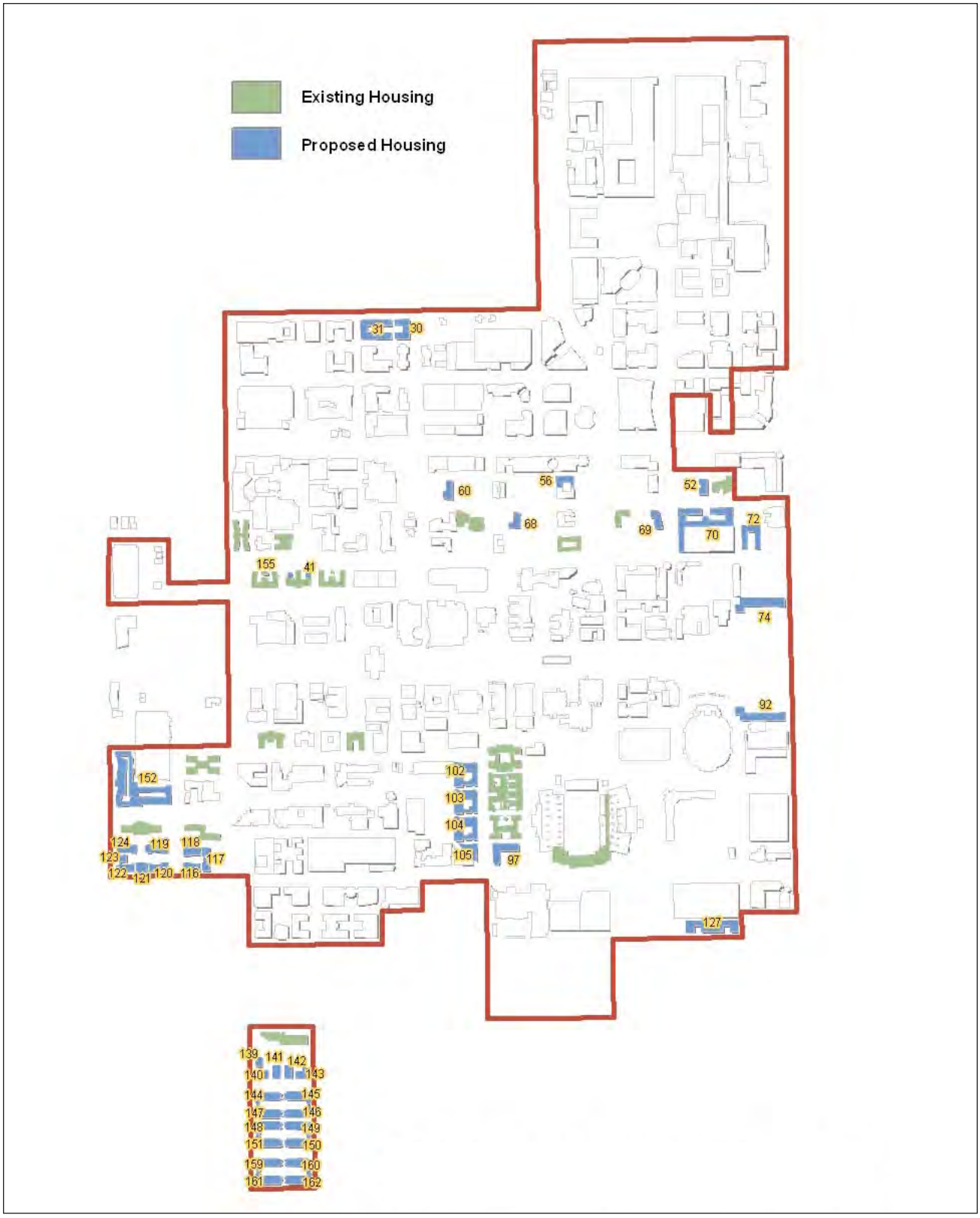
Existing Building Use

PARKING	Existing Spaces	Net Addition of Spaces	Total Spaces at Phase 3 Build-Out
	13,800	7,958	21,758



Proposed Building Use

EXISTING AND PROPOSED HOUSING



HOUSING SUMMARY

Number	GSF	Beds
30	31,848	69
31	62,916	137
41	3,387	7
52	17,609	38
56	27,771	60
60	20,365	44
68	14,217	31
69	18,720	41
70	116,414	253
72	41,534	90
74	63,044	137
92	54,691	119
97	40,129	87
102	78,000	238
103	78,000	238
104	78,000	238
105	20,500	63
116	25,122	55
117	34,344	75
118	38,060	83
119	41,739	91
120	27,921	61
121	20,804	45
122	24,526	53
123	10,213	22
124	36,400	79
127	68,015	148
138	10,599	23
140	13,729	30
141	13,628	30
142	13,628	30
143	16,732	36
144	30,814	67
145	30,814	67
146	30,814	67
147	30,814	67
148	30,814	67
149	30,814	67
150	30,814	67
151	30,814	67
152	184,446	323
155	2,811	6
159	30,814	67
160	30,814	67
161	30,814	67
162	30,814	67
TOTAL	1,719,630	3,883

THE UNIVERSITY OF ARIZONA®
COMPREHENSIVE CAMPUS PLAN 2003

V. DESIGN GUIDELINES

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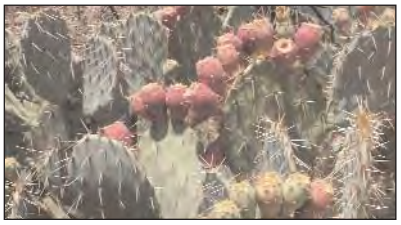
"In trying to define an appropriate regional architecture for the American Southwest, it is valuable to understand the essential characteristics of an architecture of place. It does not grow from clichéd forms or Spanish roof tiles or Indian motifs or vigas (beams) protruding through adobe-colored walls or pastel shades of pink and green. It grows directly from the essence of the place itself and the collective cultural memory of the community."



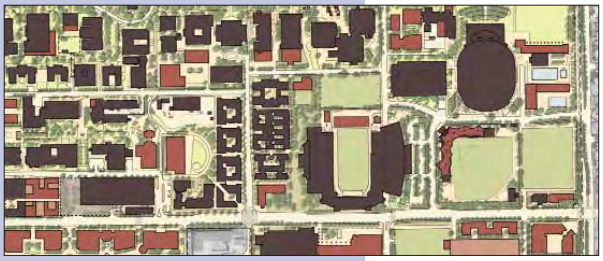
Corky Poster, Architect and Planner
Associate Professor
College of Architecture, Planning, and Landscape Architecture (CAPLA)
University of Arizona

This quote and the foundational principles of shade, enclosed space, and contained greenery for these guidelines come from an article written by Professor Poster entitled *Sombra, Patios, y Macetas: Modernism, Regionalism, and the Elements of Southwestern Architecture*. Please see the credits at the end of the chapter for more information.

V

INTRODUCTION

A campus plan is only as good as its execution. Most important, of course, is the implementation of the plan through the coming years and decades. The eventual success of the plan will be judged not only by today's efforts but by those of the University's future generations of regents, trustees, administrators, faculty, staff, and students. The plan is intended to guide the location of future buildings and grounds. The goal of the Design Guidelines is to promote well-designed open space and excellent architecture as well as standards for the long-term implementation of aesthetically unified buildings and grounds.

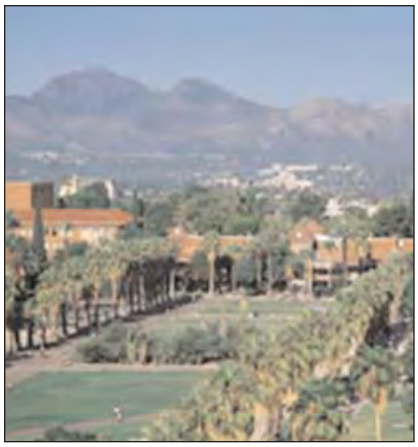


The elegance and utility of the University's physical plan are dependent largely on the coherence and quality of its grounds and buildings. These Guidelines are not intended to prescribe solutions or limit creativity; rather, they establish a flexible framework that respects the University's past and addresses its current challenges while being inventive in establishing its future.

The future character of the University campus will develop through a variety of interrelated goals: the refinement of existing open spaces, the creation of new open spaces, the placement of new buildings and additions, and the clarification of pedestrian and vehicular circulation systems. The Design Guidelines provide recommendations concerning site development, massing, proportions, and materials that will help direct the implementation of these goals. The recommendations set forth by the Building Design Guidelines are grouped into four areas: the Central Campus, AHSC and Environs, North and South Campus, and Campus Edges.

The principles that guide the recommendations are borne out of an attempt to understand the essence of this place: the history, setting, and climate. As Corky Poster asks, "Which architectural and urban design principles are appropriate for this arid Southwestern region, and how can we incorporate these principles into our contemporary work?" In the Observations phase of this planning process (see Appendix) it was concluded that the historical model of Southwestern development (a network of interconnected, moderately-scaled communities centered around courtyards) provide valuable lessons for campus growth. The density provided by this growth pattern will allow the University to add necessary square footage within a relatively limited boundary. The primacy of open space inherent in this growth pattern allows the University to use outdoor space as intensively as indoor space. The balance of infill building and open space creates opportunity for natural and manmade shade. Shaded connections between community courtyards link inhabitants into a civic whole. The historic core is based more on traditional campus planning. Moderately dense buildings form edges to a large quadrangle, which provides useful precedent for future growth as well.

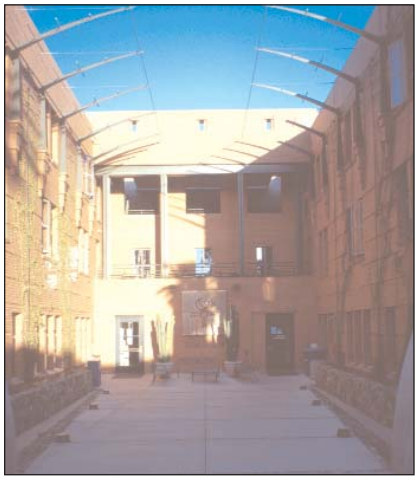
While the history of the region and traditions of the campus should be the starting point, inventiveness also should be encouraged. Like a good academic curriculum, future projects should combine tradition and innovation. Innovation should be encouraged primarily in the composition of building elements, as well as in building performance. Materials should be compatible with the original palette of the University's buildings while recognizing the need for innovation to promote sustainability, energy conservation, etc. The Guidelines for the grounds are intended to be more prescriptive, siting and defining open space types, while creating a consistent, unified foreground to the buildings.



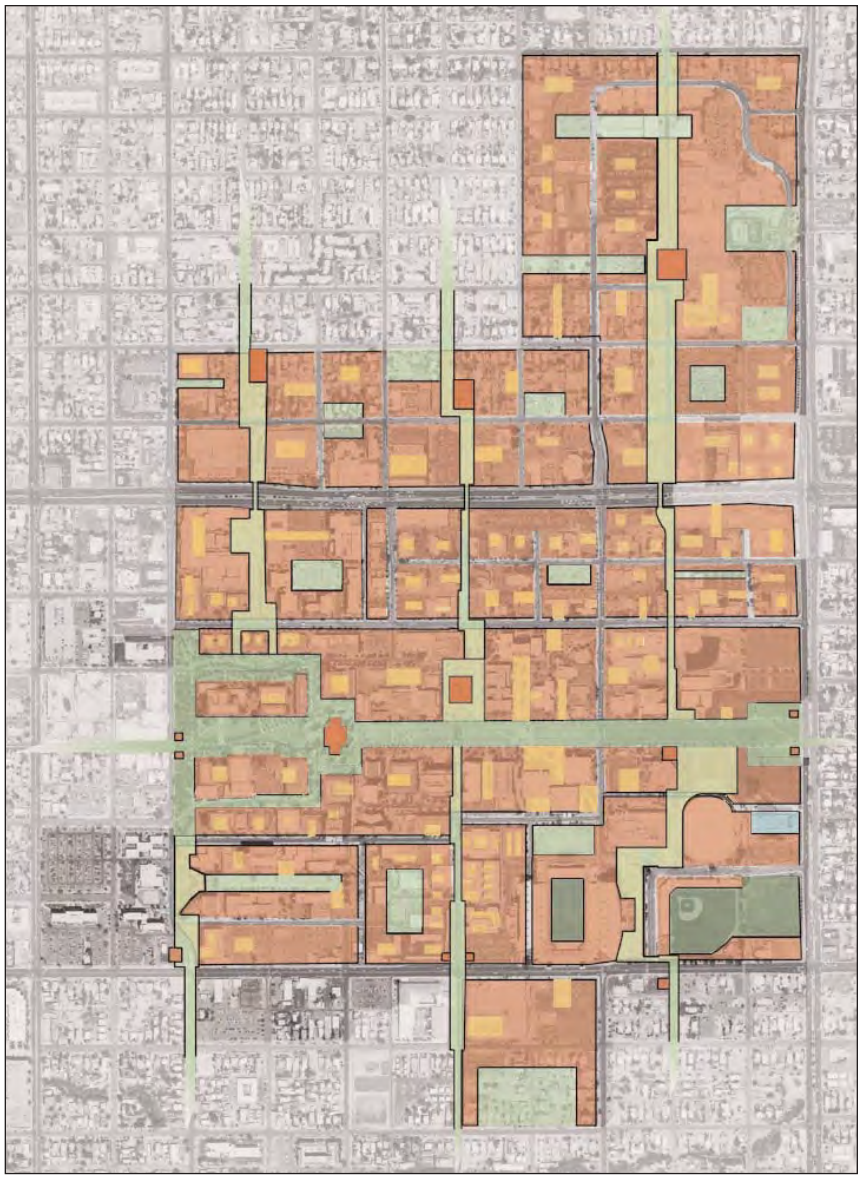
The mall

Aerospace and Mechanical Engineering (AME) Building

Residence hall courtyard



Residence hall courtyard



Concept Plan – Courtyard mosaic; a hierarchy of open space

"The desert Southwest represents a special historical, cultural and bio-climatic environment that is distinctly different from the vast majority of the United States. Arid regions are unique and exacting environments that require a clear-thinking approach. If we are to create (a campus) that responds intelligently to our uniqueness, we need to fully understand its primary variables: sunlight (control, shade and modulation); space (pattern, human scale, proportion and edge quality); and water (plant materials, landscape design and conservation). Only when we return to these fundamental principles can we create an architecture and (campus) design of respect, utility, endurance and beauty." Corky Poster

THE ESSENCE OF THE UNIVERSITY OF ARIZONA: THREE PRINCIPLES

Attempting to define the physical essence of the University is a complicated task. There are several layers of influence that contribute to this overall essence. The history, culture, and physical setting play a role. We believe that within these three spheres of influence, the three principles of shade, enclosed space, and contained greenery have been critically important to the development of the campus and should be the guiding principles for growth.

The University campus was built as a community centered on central spaces. The historic west edge and the mall are characteristic of the three principles. Shade is key to living in the desert. Trees and manmade shading devices continue to make these areas comfortable year round. The urban space of the mall is a turf and palmed oasis contained by the buildings that form its edge. Though the origins of the University campus lie not in Southwestern urban design, but in more traditional campus design philosophy, the important lessons of space making and climate control were clearly important in creating this intellectual community. Traditionally, these civic spaces have held the major events on campus and continue to serve as the heart and soul of the University.

The culture of indigenous peoples centered on the three principles. They built compact settlements connected by shaded open spaces that contained their crops and gardens. Their most public social interaction took place in these central spaces, while smaller courtyards at the center of the home provided private space. The active culture of today's University campus also relies on these principles for special occasions and everyday activities. The most public spaces, such as the mall, act as public gathering places. Other spaces may serve as recreation fields or smaller courtyards for study. They have contained edges, judiciously utilizing the precious resource of shade and greenery.

The physical environment of the region is what informs the principles of shade, enclosed space, and contained greenery. The climate and landscape had a direct influence on the history and culture of the region. The three principles offer a functional planning methodology for living in the desert. Building in this manner is compact and efficient. It saves resources and exemplifies the stewardship of natural systems important to a healthy campus.

Having established the relevancy for the three principles, it is appropriate to look deeper into their meaning.

SOMBRA

Sombra, or shade, is an energy-conserving response to the special climatic and solar characteristics of the desert region that has historically marked places of human habitation. The term transcends the idea of shade alone to include the modulation of sunlight in architecture and urban design. It is a logical response to the sun: letting it in when it is useful and blocking it out when it is dangerous, and developing a flexible way to respond to the range of possibilities in between. Ramadas, covered walkways, porticos, window shading devices and plazas with shade-giving structures or trees make life comfortable by mitigating the harshness of the sun. A low-rise, high-density building configuration allows the continued presence of appropriate shade for pedestrians. Structures built right up to the property line immediately adjacent to pedestrian routes guarantee virtually continuous shade somewhere along the street during any hour of the day.

PATIOS

Patios are urban areas structured around contained spaces at a human scale. The notion of patios, is a conception where indoor and outdoor spaces interlock and they mimic each other's qualities. "Cities, neighborhoods, and houses all become a honeycomb of indoor and outdoor space, all with human scale dimensions and proportions." The Concept Plan shown on the previous page embodies this thought. A hierarchy of connected open spaces forms the campus structure. The mall is the primary campus-wide space. Secondary spaces form the hearts of districts. Individual buildings or blocks are centered on tertiary space or courtyards. Primary north-south paths connect the major parts of campus. Secondary east-west paths connect districts and blocks.

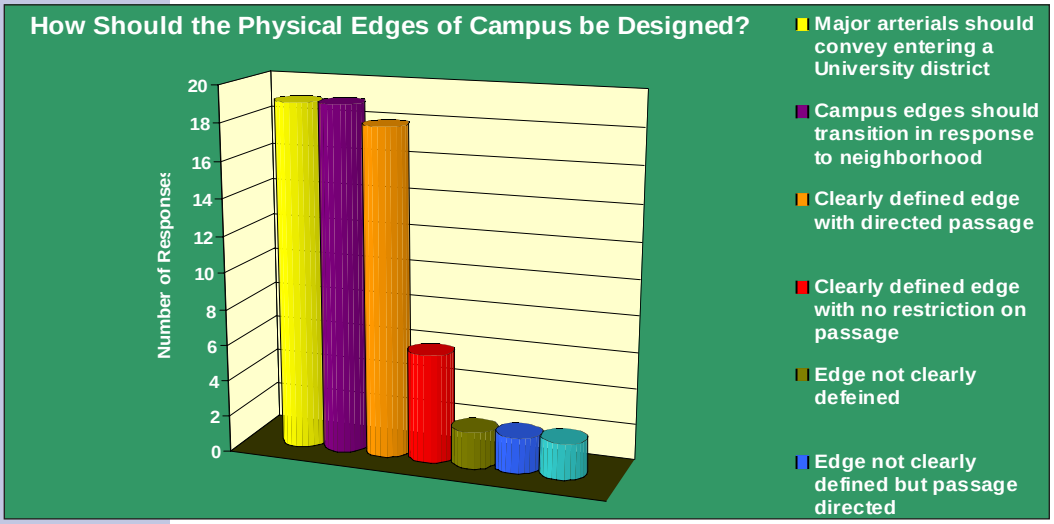
MACETAS

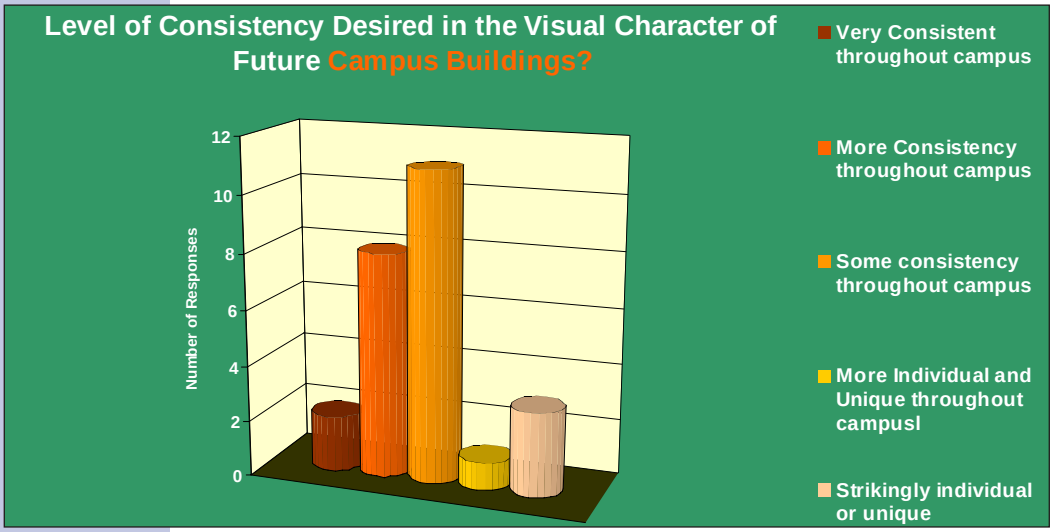
Macetas are limited, contained, and water-conservative in their approach to urban landscaping. The idea of macetas, or contained greenery, pertains to an oasis view of landscape design. In a world of limited water supply, green plant materials are used judiciously and cautiously and only where they are most needed and can do the most good. Plant life needs to be concentrated, contained, and nurtured. The campus as a whole may be viewed as contained greenery. Space and landscape types distinguish parts of the campus and imply different concentrations of greenery. They are investigated in the Open Space section of this chapter.

If the essence of the campus is derived from its history, culture and physical setting, the three principles of shade, enclosed space and contained greenery are the building blocks of these basic qualities. We use these building blocks as our guide for future projects on campus.

> *"Any image of Southwestern architecture and urban design which is not structured around these variables is a false image, no matter how it is packaged or marketed… It is equally true for the pseudo-Hispanic and pseudo-Pueblo architecture that all around the Southwest mimics the image of the region but not the essence of it."*
>
> *Poster*

GUIDELINES SURVEY

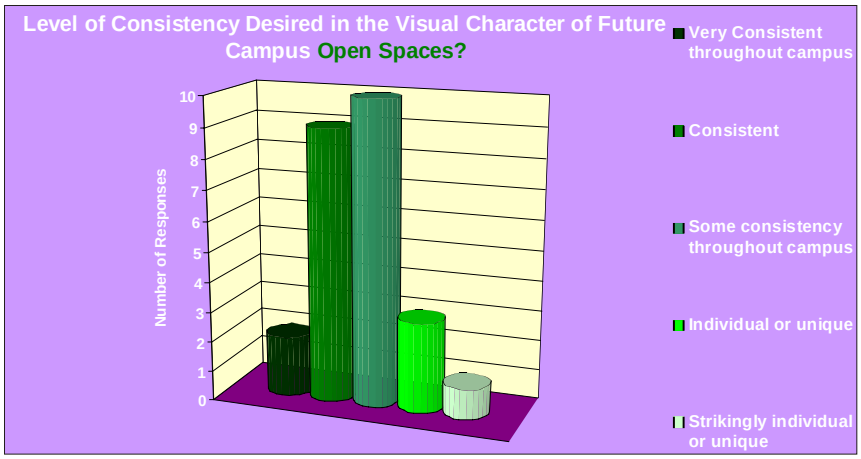




The design guidelines survey was initiated for several reasons:

- Establish a vision for the future character of campus design.
- Follow-through on the President's request to develop a set of design guidelines.
- Provide a starting point for development of design guidelines in support of the Comprehensive Campus Plan 2003.

The goal of the survey was to create a basis for developing preliminary design guidelines that would subsequently be tested in other public forums and revised based on feedback. The survey included 20 open-ended and structured questions and was sent to 70 people, including administrative employees in academic and non-academic departments, along with the University's design review committee members. Twenty-six surveys were returned. A series of tables, charts, maps, and text summaries was prepared to communicate the results. Following is a summary:



CAMPUS EDGES

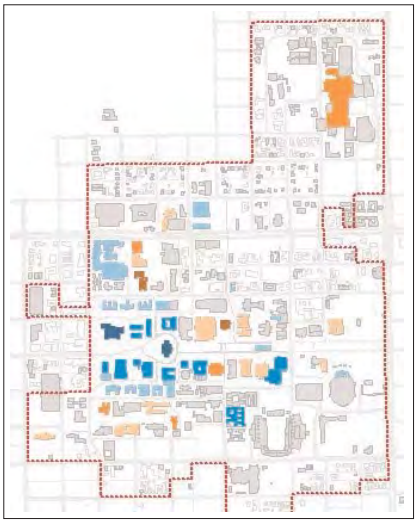
The survey revealed a preference for identifiable campus edges and a clear physical identity, along boundaries adjoining neighborhoods and along major arterials passing through campus. Further, there is a desire to see the campus transition in response to neighborhood edges. Access to the campus was thought to be best when directed to key points of entry. This relates primarily to auto access. Boundary access points at traditional roadway alignments would still permit bike and pedestrian passage, while autos would be directed to major gateways.

CONSISTENCY IN DESIGN (OPEN SPACE AND BUILDINGS)

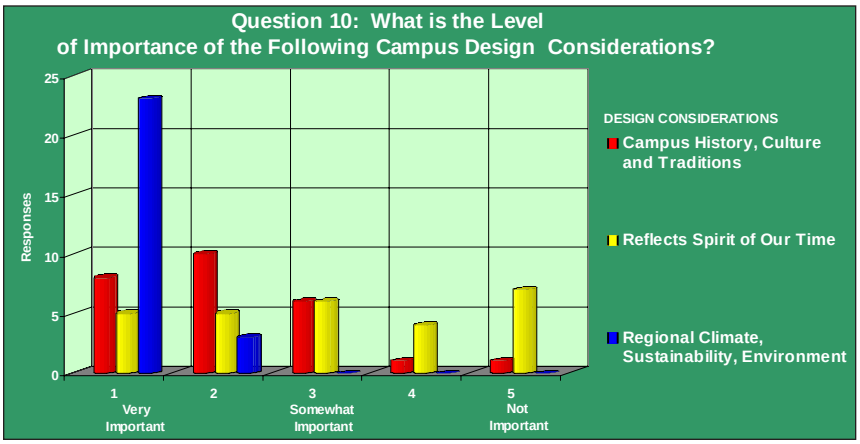
The responses indicated a preference for some level of consistency in open spaces and buildings. Open spaces suggested as models for consistency emphasized the historic core of campus, along with the Main Mall and several recent streetscape redevelopment projects. A number of more contemporary projects were included, such as the AME Courtyard, Modern Languages Quad, the AHSC detention basin, and the plaza developed in conjunction with the Heart Center Addition. Buildings noted as models for consistency emphasized the historic core. Highest were Social Sciences, Arizona State Museum, and Centennial, Communications. Somewhat lower were the next ring of buildings within the historic core, such as North Campus Drive, residence halls, Old Main, Forbes, South Hall, etc. More contemporary buildings that were rated positively (though not to the level of the historic core) were La Paz, AME, Integrated Learning Center (ILC), and the Student Union. Elements in the buildings that seem to be common are red brick, simple, elegant building forms, a sense of organization around open spaces. The commonalities in landscapes seem to be shade, higher density of vegetation, and that an intentional landscape design was implemented.

LIKED AND DISLIKED DESIGN (OPEN SPACE AND BUILDINGS)

Buildings that were liked centered on the historic core of campus, with Old Main and Arizona State Museum topping the list. Many of the other historic buildings in the area were rated quite highly as well. La Paz, the main library, and AME are contemporary buildings rated positively. Among the least liked were Harvill, Administration, AHSC, Franklin, Math, Koffler, and Architecture. Liked open spaces centered on the Main Mall, historic district, and Park Avenue greenbelt. Some contemporary open spaces were rated highly, such as AME Courtyard, modern languages quad, and the University Boulevard streetscape. Among the disliked open spaces were the AHSC Plaza Deck, Arts Oasis, Sciences Concourse, main library plaza, and most of Sixth Street. Preferences seem to correspond to areas of mature vegetation and ones that have been intentionally designed and fully implemented. The most pronounced aspects of the disliked open spaces was excessive hardscape, which is often auto oriented; absence of shade; and the lack of any landscape.



Liked buildings are in blue, disliked buildings in red



PRIMARY INFLUENCES ON DESIGN

Regional climate, sustainability, and environmental influences were ranked as the most important. Campus history and traditions also were rated by most as being either somewhat or very important. The importance of reflecting the spirit of the time was split evenly between those who felt it is not/somewhat/very important.

INTEGRATION BETWEEN BUILDINGS AND CONTEXT

Nearly half of the respondents felt it is important to have a high level of integration between new buildings and their context. Most others felt there should be at least a moderate level or some integration.

DISTRICT CONSISTENCY

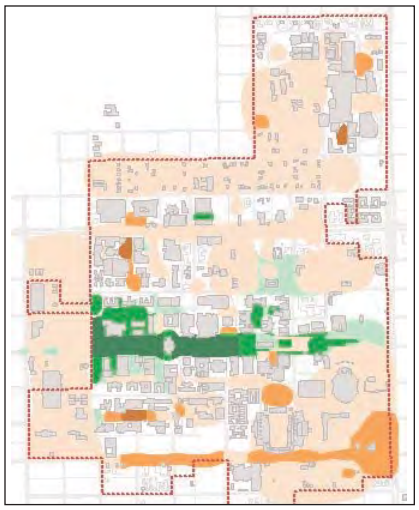
Maintaining consistency within districts apparently was not a large concern since many respondents did not answer. However, those that did provided ideas on possible boundaries for districts. There was a level of similarity in the boundaries for some areas, such as the historic area, University Village, athletics, arts, and AHSC.

ACTIVITIES

The most important function to accommodate was sitting. Also highly ranked were walking, and accommodation of a variety of intellectual and social activities, ranging from groups to individuals and from informal to organized. Other activities to be accommodated were bicycling, eating, solitary and quiet activities. Other activities not rated as highly overall, but still considered needed in various areas, were group and solitary athletic activities, special events, and performances. The results indicate that the campus should accommodate a wide range of uses, although some will be distributed in key locations throughout campus while others will be ubiquitous, such as, sitting and walking.

ELEMENTS

The most important physical element noted was shade. Also important were mature trees, seating, a connection to the natural world, and lighting at night. Many other elements were noted as desirable although it appeared that some things, such as food service, are not likely to occur everywhere. These activities would be connected to areas designated for special uses.



Liked open space in green, disliked in red

Arts oasis in need of enhancements

Much admired AME Courtyard

OPEN SPACES ADJACENT TO NEW BUILDINGS

Nearly 90 percent of respondents felt the landscapes developed with new buildings should flow seamlessly into the fabric of the existing campus landscape. Very few felt these new landscapes should visually and functionally serve only the building users, and no one felt new landscapes should provide visual amenity only (e.g. something to look out at but not for people to go there and use.)

COMMUNITY

Creation of outdoor spaces designed for people was seen as the best way to create community on campus. Many other strategies were discussed and supported. Themes that emerged were "eating places/events for connecting people," and "conveying history, identity, and image."

DIVERSITY

Open-ended responses ranged from process suggestions to design solutions. Process ideas included hiring good architects, opening up the process to wider review, more staff and design committee reviews, and having diverse representation on committees. Design ideas focused on incorporating indigenous cultural elements, using a diversity of creative elements such as color, and reflecting our desert setting at a fundamental level in all design.

VISION

A question was asked about the vision of the future campus. The results, written as narratives, conveyed a wide range of ideas. Some of the themes included providing connections between people and between areas of campus, a sense of order and identity for campus, the need for effective processes and budgets, responsiveness to the desert and cultural context, excellence in intellectual and design pursuits, and creating a network of shaded people places throughout campus.

OTHER EXAMPLES

Locally, there was a focus on historically inspired places, along with contemporary uses of desert landscape materials. Nationally, the campuses mentioned have a strong sense of coherence and tradition in their organization, along with premier open spaces systems (mature landscapes that interconnect, are fully developed and well maintained, etc.). Examples include Stanford University, Rice University, University of North Carolina, Cornell University, and University of Virginia.

CONCLUSIONS

The campus community is concerned about design. There is a need for a level of coherence and consistency in building and landscape design. Image, identity, edges, and access are critical concerns. Creating an interconnected, shady system of open spaces that encourage use and have a positive connection with every building is key. Budgeting for enhancements is critical. Design guidelines are the necessary tool to implement these ideas and directions to future design teams.

Outdoor gathering space

Clear pedestrian path

Clear building entry

V

OPEN SPACE GUIDELINES

Open space and its relationship to the facilities that frame it is an essential part of the image, sense of place, and educational, social, and recreational experience of every college and university campus. The Sonoran Desert setting of the University provides unique opportunities and challenges. Rainfall is scarce, but native flora and fauna are diverse and beautiful. The climate is "overheated" (it is uncomfortably hot more often than it is uncomfortably cold), but outdoor space can easily be made comfortable throughout most of the year.

In the early stages of the University Comprehensive Campus Plan 2003 update process, a network of open space corridors, malls, plazas, greens, and courtyards (framed and defined by colonnades, buildings, and walls) was envisioned to create a functional and beautiful campus mosaic.

The Comprehensive Campus Plan 2003 and Design Guidelines further define the mosaic in light of the physical, social, and climatic issues unique to this campus and its desert context. The *General Open Space Guidelines* apply to all building and open space development or redevelopment within the campus planning boundaries. These guidelines must be addressed at the concept design stage of every project. For the purposes of these guidelines, open space refers to outdoor places where people can sit or gather, as well as the corridors that allow pedestrian and bicycle movement. Open space may consist of small "eddy" areas along circulation routes, or any of the other space types described below. The Open Space Organization section describes a hierarchy of open spaces, with guidelines associated with each type of space. The Open Space Materials and Features section addresses specific design elements, such as benches and markers.

A basic tenet of effective open space development is to create places that support multiple uses and that use resources conservatively and efficiently. The plan adds the concept of intellectual open space, meaning they are variously stimulating or calming, renew and inspire, and encourage interactions among students, the faculty, staff, and the community). To these ends, the design of campus and facility development must be an integrative and collaborative process among members of all the design disciplines, landscape architecture, architecture and engineering. Design teams must recognize that:

- Building walls define interior space and open space. The investment in these walls must address equally the quality of both spaces.
- Building walls can bring shade and/or reflected light and heat into open spaces in ways that increase human comfort through most of the year.
- Storm water runoff is an opportunity to conserve resources and enhance open space, not a nuisance to be mitigated.
- Open spaces must be intentionally programmed and designed to support and facilitate educational, social, and recreational uses.
- The University's role as community leader makes it incumbent on design teams to demonstrate excellent design in keeping with these guidelines, and best management practices for all resources.
- All space is valuable; there must be no unimportant, leftover, and un-designed space.

GENERAL OPEN SPACE GUIDELINES

OUTDOOR COMFORT

The climate of Tucson is conducive to outdoor activity much of the year, day and night. Outdoor comfort is greatly affected by the low precipitation and humidity, and corresponding high evaporation rates inherent in the climate. These factors produce intense sun, large day-night temperature swings, and a climate that is more often uncomfortably warm than cold.

Traditional Tucson sidewalk shaded by trees and building walls. (El Presidio Neighborhood, Tucson)

They also create a capacity to mitigate climatic extremes and increase comfort by providing choices of usable outdoor settings with varying aspects (orientation to north, south, east west), proximity to buildings, amounts of sun or shade, cooling of air temperature through evaporation (and collecting this cooled air in low lying areas), and air circulation. The overheated nature of the climate necessitates plenty of contiguous shade, cooled air, and good air circulation. With these factors in mind, General Open Space Guidelines are:

- Design all developments to provide a mix of open spaces and a variety of microclimates, scales, and uses.
- University campus planners and the University Arboretum maintain a map and database of campus plant material, including heritage, one-of-a-kind, mature, and other particularly valuable plants, as well as the common trees and plants that contribute shade, cooling from transpiration (water released by leaves), character, beauty, and other benefits to the University. Review this information with these groups at the outset of design and prepare a range of layout plans that maintain existing plants in place, in accordance with the University's Tree Protection Policy.
- Incorporate groves of trees and other shading and cooling techniques in accordance with the Framework and Space Type Guidelines. Make use of deciduous trees to provide seasonally appropriate sun and shade.

In the summer, people go out of their way to find shade in Tucson. (The University of Arizona)

- Collect air cooled by evaporation and transpiration in low lying, people oriented areas.
- Consider the orientation and exposure of surfaces when choosing materials and colors to minimize glare and reflected heat.

Sidewalk shaded by Sweet Acacia trees. (Temple of Music and Art, Tucson)

Courtyard, linked to a green that is part of a block quadrangle. Functions well for intimate or public uses. (Learning Services Building, University of Arizona)

FUNCTION

The potential to be comfortable outdoors so much of the time makes the design and construction of multi-purpose, unconditioned campus open space a particularly logical and cost-effective investment. Classes, displays, performances, special events, relaxation, exercise, and chance encounters (social, intellectual, or otherwise) can all take place within the University's Open Space Framework of corridors, malls, quadrangles, courtyards, and greens. The framework map and guidelines define a rational network of shared open and built spaces. The space type map and guidelines add detail to the framework. Each building and open space project development area incorporates one or more corridors or open space types within its boundaries. Therefore:

- Follow guidelines for Open Space Framework and Space Types that occur in project development areas.
- Recognize need for connections to framework and space types adjacent to the project development area.

Open Space in the University historic district provides relaxation, exercise, and chance encounters. (The University of Arizona)

ORIENTATION & WAYFINDING

Difficulties locating parking and finding destinations are common on campuses and in urban environments. Open space elements such as corridors, edges, and markers play an essential role in orientation and wayfinding. The Comprehensive Campus Plan 2003 and Open Space Framework define a hierarchy of districts, gateways, parking structures, corridors, quadrangles, malls, and signs designed to make it easier and more pleasant for students, the faculty, staff, and visitors to find the University campus, park if needed, and access desired destinations. Guidelines are:

- Districts: Since the more than 400 developed acres that comprise the University campus within the planning boundary are hard to grasp as a single place, the plan designates nine districts, within which are organized many of the basic facilities of the larger campus. The districts are typically simple, rectilinear areas, with informally defined edges, each including one or two parking structures, a primary (civic) open space (mall or district scale quadrangle), orientation and wayfinding information, one or more transit connections to community and the University systems, housing, and food service.
- Edges: In addition, the plan clarifies the edges of the University and identifies gateways and other points of access. The plan provides a green buffer at the perimeter of the campus, parts of which will be developed in the tradition of the park-like green on the east side of Park Avenue. (Actual materials may vary.) Refer to Open Space Materials section.
- Circulation: Pedestrian circulation is emphasized throughout the campus. The plan designates bicycle, transit, and vehicular circulation routes (and combinations of these) as a system that overlays and links the districts and connects to the community beyond the campus. Refer to Circulation sections.

Shared pedestrian/bicycle corridor with good line of sight and signs to assist wayfinding. (The University of Southern California)

OPEN SPACE ORGANIZATION GUIDELINES

FRAMEWORK

The Organization Guidelines are presented using two classifications of campus open space. The first is a conceptual framework that conveys, among other things, how open space works as an interconnected system that maintains a balanced distribution of various kinds of open space. The second classification includes discrete space types conveying programmatic intent regarding desired activities and elements. Each of the categories within the Framework may break down into several of the space types.

Open Space at the University is physically structured as interconnected malls, quadrangles (at two scales: district and block) courtyards, greens, and corridors, typically framed by buildings and other facilities. Malls and district quadrangles are large civic spaces for campus and district scale uses, functions, and special events. The grand scale of the mall is often associated with monumental termini, significant buildings, sculptures, or other features.

Within the framework categories listed above are finer grained space types: plazas, front porches, groves, lawns, fields, and gardens, defined by the activities and elements within them. More detailed descriptions of the framework and space types follow.

Each category within the Open Space Framework represents one of several fundamental "open space building blocks" which make up the campus.

Open Space Framework Plan

The Framework was created as a way to understand and communicate the essential physical structure, magnitude, and functional role of each of these "building blocks". The Framework makes evident the need for connectivity as well as location of critical linkages. Further, the Framework presents as balanced distribution of a variety of open spaces. (e.g., District-Quadrangles are distributed to provide a "home-base" open space that "anchors" each major precinct of campus).

MALL DEFINITION

"Public area, often set with shade trees and designed as a promenade or as a pedestrian walk" WEBSTER

Malls are the largest open spaces on the University campus. They are significantly longer than they are wide and lined with buildings, most with a consistent setback. Malls emphasize pedestrian uses and movement, as well as opportunities for social interaction. They also accommodate bicycles and service/delivery vehicles. There are two malls on the campus: the Main Mall along University Boulevard, from Old Main to Campbell Avenue, and the Warren Mall linking the AHSC and central campus. Shaded walkways and eddy spaces are integral to both malls.

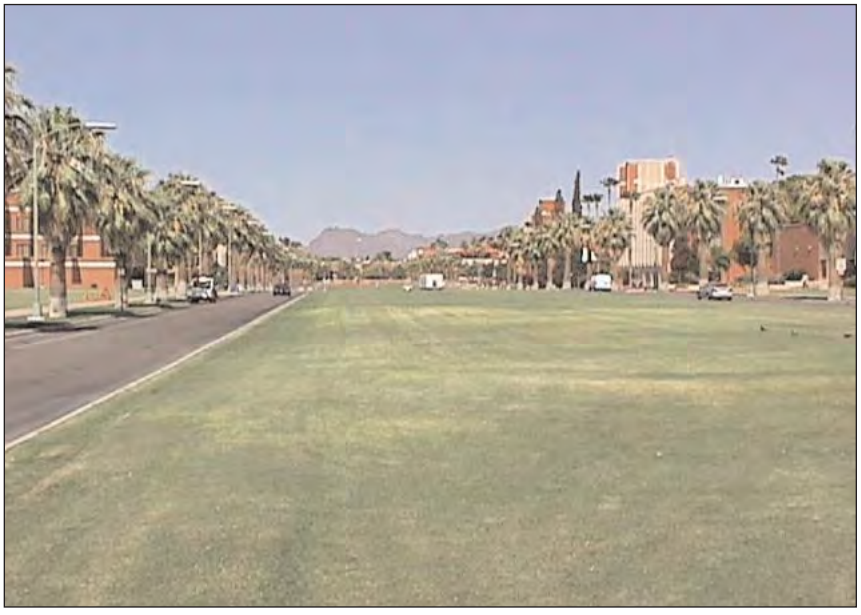
SPACE TYPES INCLUDED

Malls may include plazas, front porches, groves, lawns, gardens, and corridors.

MAIN MALL

The Main Mall follows the traditional pattern of a central open lawn (used daily and for special events), with pedestrian promenades at the perimeter, shaded by groves of trees. Bicycle parking and seating areas are located within the groves. The primary tree in the Main Mall groves is Arizona's state tree, the *palo verde* (refer to Material Guidelines). The Main Mall helps visitors and daily users orient to the campus. It displays a history of architectural styles with the original building, Old Main, terminating the west end of the Main Mall. A new gateway will frame views to and from the campus at the east end.

Main Mall, looking east from Old Main. (The University of Arizona)

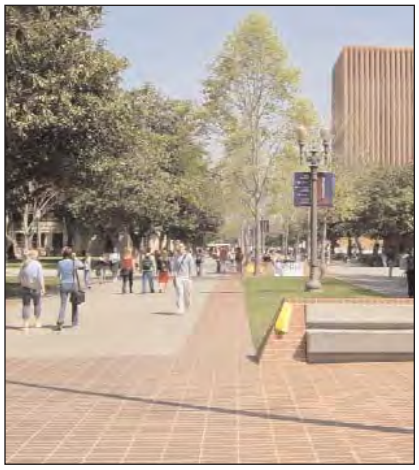


Main Mall at eye level

Map of malls from larger Framework Map

WARREN MALL

The Warren Mall will be narrower than the Main Mall, with a greater emphasis on paving. The mall is visually consistent, offering variety and/or landmark elements at intersections with plazas and corridors. Shade from trees and building arcades is nearly continuous along at least one side. The Medical Library and Optical Sciences buildings terminate the north and south ends of the Warren Mall.



Prototype for Warren Mall: tree lined with seating, lawn, and eddy space. (University of Southern California)

Mall borders a green with eddy space, seating, and shade trees; note colonnade in background. (University of Southern California)

GREEN

"Covered by green growth or foliage; pleasantly alluring; also, a color whose hue is somewhat less yellow than that of growing fresh grass or of the emerald or is that part of the spectrum lying between blue and yellow." WEBSTER

It is appropriate to note that the many Sonoran Desert "greens" are alluring. At the University, greens are distinguished by vegetation density rather than by architectural edges and are, typically, dominated by plants native or adapted to Tucson's desert environment. Greens create cool microclimates and useful outdoor space. With the exception of the field space type, greens are generally more focused on passive than active uses. Trees define greens as spaces, with trunks serving as walls and canopies serving as a roof.

Greens provide space to collect rainwater to reduce runoff and benefit plants. Campus edges are buffered by greens that the University and adjacent neighborhoods can enjoy.

SPACE TYPES INCLUDED

Greens may include front porches, groves, lawns, fields, gardens, and corridors.

Map of greens, from larger Framework Map

Green containing groves of trees, lawn, seating, and paving. The lawn also collects storm water from roof runoff. (University Services Building, University of Arizona)

Map of corridors, from larger Framework map

CORRIDORS

"A passageway into which compartments or rooms open; also a narrow strip of land through foreign-held territory. From correre, French, to run." WEBSTER

Corridors are the pedestrian-oriented, multi-modal circulation networks within the University campus. Corridors are linear open spaces, supporting or emphasizing one or more circulation modes, and always welcoming to pedestrians. Routes are shaded most often by trees and also by arcades or other structures. Eddy spaces along corridors provide seating, food service, and places to stop or meet with friends. As links between destinations, corridors must simply and clearly connect quadrangles, courtyards, plazas, front porches, and other destinations. Similarly, from within a given open space, corridors to other spaces must be clearly identifiable. Routine service and delivery operations are restricted to corridors. (It is understood that emergency or occasional service may need to access other open spaces). Corridor design must include continuous and complete circulation-related elements without relying on adjacent or future projects. Corridor design actively engages adjacent open spaces. Views along corridors often terminate at significant buildings, monuments, or sculptures. Corridors may incorporate or be coincident with other open space types along their lengths.

SPACE TYPES INCLUDED

Corridors may include front porches, groves, and gardens.

Tree-lined pedestrian corridor. (University of California, Berkeley)

QUADRANGLE

"A four-sided enclosure, especially when surrounded by buildings." WEBSTER

Map of quads from Framework map

Map of quads from Framework map

Buildings define the lawn within the district scale quadrangle. (Duke University)

Traditionally, quadrangles are strongly rectilinear, formally arranged spaces framed by buildings, often arcaded, and with geometrically arranged lawns and walks. At the University, quadrangles occur at two scales, district and block. Both are generally rectangular, with edges strongly defined by buildings or other facilities, and with spatial proportions where the widths and lengths are three to six times the height of adjacent buildings. Quadrangles provide approximately 50 percent summer shade from trees, walls, and structures. This percentage may vary depending on the space types included. Quadrangles provide a mix of seating types, drinking fountains, kiosks, maps, transit stops, and are adjacent to bicycle access and parking.

Larger, **district scale** quadrangles are typically 1.5 to 1.75 acres in size, are located along and link major corridors, feature food service, comfortable seating and gathering areas, wayfinding information, and other social needs. Like malls, quadrangles serve as the central gathering area for districts. They provide a key wayfinding function through convenient physical connections to parking and transit, open views of surrounding facilities, strong visual and physical ties to adjacent open spaces, and availability of maps and other information.

Traditional quadrangle with paved circulation, lawns, significant public art, gardens, and colonnades. (Stanford University)

Smaller, **block scale** quadrangles provide the primary organizing and wayfinding function for a smaller group of facilities, and they may be comprised of a single space type.

University capital facilities budgets include public art. In consultation with the University Public Art Advisory Committee, consider integrating public art.

SPACE TYPES INCLUDED

As with malls, quadrangles may include plazas, front porches, groves, lawns, gardens, and corridors.

This block scale quadrangle is strongly defined by buildings. Trees and shade provide a transition from outdoor to indoor light. Benches and bicycle parking are integral. (University of California, Davis)

Map of courtyards, from larger Framework map

COURTYARD

"An open space enclosed wholly or partly by buildings or circumscribed by a single building" WEBSTER

At the University, courtyards are strongly defined by a single building, typically on at least three sides, and by walls, arcades, trees, or other strong landscape elements on any side not enclosed by the building. They are controlled by and serve the users of the associated building (programs for these spaces are determined by the building users), but may be accessible to passers by. Courtyard design, character, and materials typically relate and respond to the predominant elements of the enclosing building, often extending them into the walks, walls, furnishings, and plant material. The widths and lengths of courtyards are typically two-to-three times the height of the enclosing building. The proportions and materials used in the design of courtyards emphasize daylighting, seasonal shading, and a variety of exposures to provide for comfortable use most days of the year. Seating and other site furnishings are provided. Refer to Open Space Materials Guidelines.

Courtyards are an essential part of the pattern of open space, however, they do not break down into 'finer grained units' on the Space Type map since the intent is for the program for these spaces to be developed by building users. Thus, the courtyards category is the same on both the Framework and Space Type maps. All buildings are encouraged to incorporate a courtyard element, although only some have been shown, for illustration purposes, on the open space maps.

SPACE TYPE GUIDELINES

Space types included are plazas, front porches, groves, lawns, fields, and gardens. These space types are defined by the activities supported by the space, as well as its physical characteristics, materials, and site furnishings.

Typically, each of the Framework categories discussed in the previous section are comprised of several of these space types. The space types do not suggest literal edges and sizes of projects. Rather, they are placeholders for the approximate quantity and location of that space type within future project development areas. The Space Type map assists with budgeting and programming, along with determining how to package open space development projects (e.g., implemented as a stand alone project or completed in conjunction with a building project).

Open space types

Map of corridors, from Space Types Map

CORRIDOR

Please refer to the previous Framework section for the Corridor definition.

TRANSPORTATION FUNCTION OF CORRIDOR SEGMENTS

Corridors are classified as pedestrian/bicycle corridor, bicycle boulevard, major and minor arterial roadways, malls, and traffic access at gateways. Refer also to Circulation Guidelines. For readability, the functional classification of corridor segments has not been included in the map at left.

West entrance to campus

Minor campus roadway

Path at campus edge

Pedestrian path

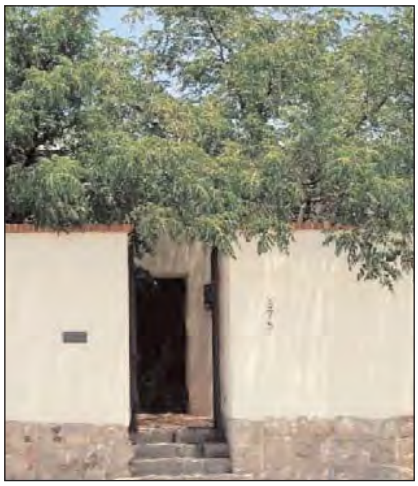
COURTYARD

Please refer to the Courtyard definition in the previous Framework section.

Courtyard provides students and faculty members with a place to study or relax between classes. (Family & Consumer Resources, University of Arizona)

Courtyard enclosed on three sides by building and by vines on the fourth side. (Forbes Building, University of Arizona)

Map of courtyards from Space Types Map



Entrance to historic, private courtyard. (El Presidio Neighborhood, Tucson)

Map of Fields, from Space Types Map

Arizona Stadium

FIELD

"An area or division of and activity: an area constructed, equipped, ore marked for sports" WEBSTER

Fields are recreational spaces under the exclusive control of one entity, including athletic facilities for specific uses and open turf. At the University, ICA or Campus Recreation controls most fields. Fields include courts, tracks, and similar facilities. Transit stops, parking structures, and bicycle paths are near fields, or fields are located near them. They also provide seating for spectators in perimeter shade zones.

- Refer to Architectural Guidelines for buildings associated with fields.
- Refer to the University Manual of Design & Specification Standards for turf and irrigation.

Bear Down Student Recreation Field

Hillenbrand Stadium. (The University of Arizona)

FRONT PORCH

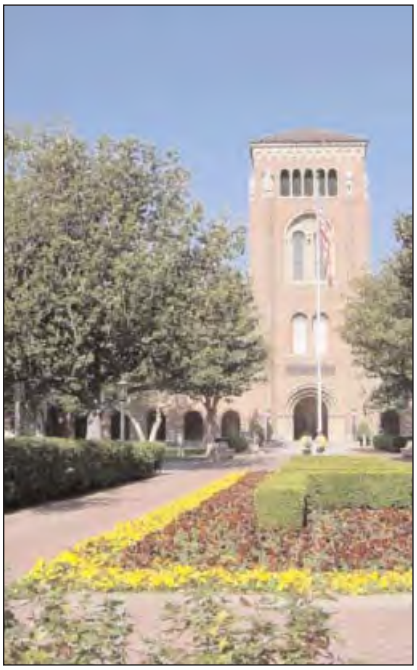
"A covered area adjoining an entrance to a building and usually housing a separate roof" WEBSTER

Front porches are clearly associated with the front entry to an individual building or facility. They provide transition from out of doors to in, make transitions to malls, quadrangles, courtyards, greens, and corridors and serve as informal social spaces. They are paved, universally accessible, and large enough to receive small groups of 10 to 20 people. They are used for informal meeting, waiting, etc., but are not intended for larger gatherings, which would be programmed as part of a different space type. Front porches feature furnishings and/or walls for sitting, transitional shade from architectural overhangs, and/or trees, lighting, and identifying signs. They extend 15 to 20 feet out from the front door, and are a minimum of 15 feet and a maximum of 50 feet in any horizontal dimension. Front porches may be expressive of the interior use of the building. Forms and materials respond to the adjacent building.

Map of front porches, from Space Types Map

Students gather between classes on stairs and benches at this front porch . (The University of Arizona)

Map of gardens, from Space Types Map



Traditional garden helps create terminus at the end of a corridor. (University of Southern California)

GARDENS

"A plot of ground where herbs, fruits, flowers or vegetables are cultivated. A public recreation area or park. An open-air eating or drinking place." WEBSTER

Gardens are spaces with a higher than average density or variety of vegetation. They may include plants of particular botanical, historic, or memorial significance. Garden design often includes walks, seating, shade, and interpretive information. Gardens are frequently small spaces in order to limit the size of the area cared for. Garden designation, design, and plant material selection must be coordinated with the University Arboretum.

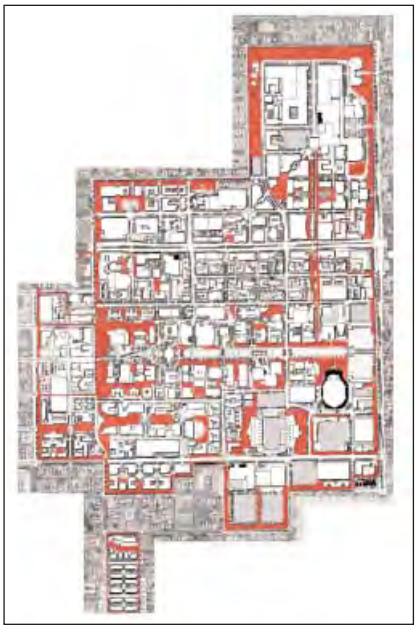
Perennial garden with benches. (City Hall, New York City)

The garden at Fred Enke Plaza displays Sonoran Desert plants and honors Hall of Fame athletes. (The University of Arizona)

GROVE
"a small wood without underwood." WEBSTER

At the University, groves are stands of mature trees, typically informally spaced and often primarily of one species. Groves are typically quiet, restorative spaces that may border plazas and lawns. Trees provide contiguous shade and are in sufficient quantity to create spatial definition and enclosure vertically from overhead canopy, and horizontally from tree trunks. Pedestrian-level visibility is maintained due to minimal undergrowth. Ground surfaces are often unpaved to emphasize growing conditions but may be paved with cutouts for trees. Seating and bicycle parking may be located in groves. Refer to University Grounds and Labor's Landscape Standards and Details.

- Plant species are prescribed for significant campus and district groves, and perimeter buffers. Refer to Open Space Materials Guidelines.
- Protect tree root and soil health from compaction, with structural soil near pavement and where a high volume of pedestrian use is anticipated.
- Scale, color, texture, and density of trees are be based, in part, on the scale and materials of the adjacent architecture.
- Provide approximately 70 to 80 percent summer shade cover in groves.
- Provide seating at approximately one bench per 800 square feet.



Map of groves, from Space Types Map

Historic groves of olive trees play a significant role in defining the historic character of the University campus. (The University of Arizona)

Signature pine groves (University of California, Los Angeles)

Street converted to pedestrian corridor in historic core of the campus. (The University of Pennsylvania)

Map of lawns, from Space Types Map

LAWN

"Celtic: Land or open space; an open space between woods: glade; ground covered with grass kept mowed in a garden or park." WEBSTER

Lawns are areas of turf grass predominately open without trees. Lawns serve more than one building and are typically a district or campus level space associated with malls, quadrangles, and greens. Lawns have few barriers to entry and often are designed with walks and eddy spaces at the perimeter. A lawn may serve as a "green plaza" for one or more buildings. Lawns are used judiciously on the University campus, irrigated with reclaimed water, and useful for dispersing storm water runoff. Unlike fields (below) under the control of Campus Recreation or Intercollegiate Athletics (ICA), lawns are available for use by the entire campus community, though event scheduling for more popular lawns may be necessary.

- The minimum width of lawns is 15 feet.
- Provide no more than 20 percent shade within lawn areas.
- Use desert adapted, non-allergenic hybrid Bermuda grass varieties.
- Direct storm water runoff to lawns and prepare subsurface for rapid water percolation.
- Provide shaded seating at perimeter of lawns.
- Locate irrigation backflow preventers, valve boxes, and utility boxes in screened areas away from lawns.

Seating and shade at the edge of a lawn. (Kansas State University)

Variety of uses, open shade at a lawn. (Photo by Keith Stanley)

PLAZA
"Broad street," or "a public square in a city or town"
WEBSTER

At the University, plazas emphasize paved surfaces, site furnishings, lighting, social interaction, and shade provided by trees, buildings, and/or other structures.

Plazas are designed to accommodate special events, large groups, and high pedestrian use. Seating and shade are plentiful. Plazas often serve memorial, ceremonial, and/or interpretive functions.

The horizontal dimensions of plazas are not greater than four times the average height of surrounding buildings. Typically, plazas are a minimum of 40 feet and a maximum of 200 feet in any horizontal direction, based on the need for intimate gathering space as well as more public uses. These scale guidelines may vary based on a plaza's setting within a given framework category.

Typically, plaza design is the most expressive of the space types, with materials and forms that respond to those used in bordering facilities. Plazas are the more "heroic" open spaces of the campus and are good candidates for public art projects. Guidelines suggest:

- Drinking fountains, bicycle access, and parking nearby.
- Tables and approximately one linear foot of seating with benches, chairs, seat walls, and/or steps, for every 30 square feet of plaza space.
- Approximately 75 percent summer shade in the plaza from trees, walls, and structures. Use evaporation from trees, fountains, misters, or other sources to cool plazas.
- Working with the University Public Art Advisory Committee, user groups or others to integrate public art, a ceremonial function, or other unique features into plazas as appropriate.

Map of plazas, from Space Types Map

This seat wall is at the edge between a plaza and a lawn. (University of Southern California)

Paving patterns, building walls, and columns link this plaza to the building's entry and courtyard. Seating, shade, and garden space are also integral. (University of Rochester)

Stone and pre-cast concrete paving and tree canopies define this plaza. (City of Phoenix)

OPEN SPACE MATERIALS AND FEATURES

GATEWAYS, MARKERS AND WALLS

University Campus Planning Boundary markers and Campus Gateways, in combination with the green at the perimeter of the campus, serve to clarify the edges of the University within the Tucson community and to help direct visitors. (Refer to the Architectural Materials Guidelines for the design of gateways, markers, and walls.)

West Gate

Walled edge along Park Avenue

Fish pond

Fountain at Old Main

WATER FEATURES

Water is a precious resource in the Sonoran Desert. Any use that might appear wasteful or otherwise inappropriate, particularly in a public institution setting such as the University of Arizona, is to be avoided. Accordingly, water features must be designed to be multi-purpose (e.g. air-cooling or noise-masking benefits), water conserving (e.g. using small amounts of water, minimal exposure to evaporation, shaded) and to be attractive when water is not present (e.g. when turned off or when the supply is exhausted --for features that rely on available storm water). In addition, reflecting pool or other such standing water type features are not allowed. Features are to be places where they can be enjoyed by many people. (Refer also to Water Management in the Open Space General Guidelines.)

SITE FURNISHINGS

Site Furnishings include benches, lighting, trash receptacles, drinking fountains, and other elements that support and improve pedestrian comfort. Furnishings also can add to campus coherence, legibility, wayfinding, and sense of place. The mild Sonoran Desert setting of the University encourages the design of open space that is available and usable much of the year, day and night. Accordingly, the plan emphasizes the use of site furnishings in all open spaces, with certain caveats related to movable seating, for which a user group must take responsibility, and limiting light pollution (see below).

The University standard tables & chairs, color similar to standard.

These guidelines describe the elements and then address their use and application. The standard version of each element is provided. Variation is allowed on a case-by-case basis where an artist-designed or other significantly unique option is sought.

SEATING

Seating will be included on all projects and in all open spaces. Incorporate a mix of seating types such as benches with or without backs, tables and chairs, seat walls, and/or widely spaced stairs. Research has shown that a variety of seating is important to fostering comfort and interaction, and that seating types and arrangements that encourage and facilitate conversation are preferred. Seating arrangements must accommodate wheelchair users without obstructing circulation. (Refer also to Space Type Guidelines for guidance regarding the quantity of seating needed, to Outdoor Comfort Guidelines for additional information that may affect seating design, and to site furnishings and seatwall guidelines, next page.)

Fabricator's drawing of the University standard bench, standard color. (Drawing by T.A. Caid Industries)

- Benches, tables and chairs, trash receptacles, recycling bins, ash urns, and news racks are fabricated of powder-coated steel. Frames are fabricated of Schedule 40 or heavier gauge pipe, 3/16" angle or ½" flat stock, or solid bar stock. Panels are fabricated of perforated steel sheet or steel strap. Expanded metal, woven wire, woven strap, steel rod, and other materials are not acceptable. Steel sheet panels are 11 gauge and steel straps shall be ¼" thick, or heavier in both cases. Color shall be Sage Green (Pantone 5625M). All furnishings are provided and installed with vandal resistant hardware. In addition:
- Benches a minimum of six feet long and, typically, have backs and arms. Benches without backs are three feet wide and located to allow seating from both sides. Seats and backs may be one piece or separate panels
- Movable seating is preferred if an adjacent facility agrees to take responsibility for security
- Tables include holes and supports for umbrellas. Tables with fixed seating accommodate wheelchairs

The University standard trash receptacle with standard color

- Seatwalls are be constructed of brick, stone, and/or architectural finish cast-in-place concrete (refer to Architectural Materials Guidelines). Pre-cast concrete caps are acceptable. Seat height may vary, but average 18 inches. Design of seatwalls be inherently skateboard resistant by stepping seat width and height along the length of the wall, including reveals, or other means integral to the design. Metal castings or other materials applied after construction as deterrents to skateboard use are unacceptable.

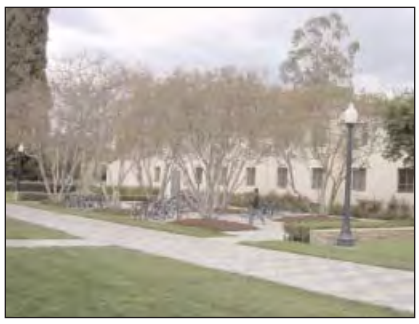
- Trash receptacles and recycling bins have liners and lids. Lids are be inconspicuously cabled or chained to the frame.

- Permanent shade structures that use fabric panels or awnings use natural or white colored fabrics for better light quality. Synthetic fabrics are white or off-white. Refer to Architectural Guidelines regarding colonnades, trellises, and other shade structures.

- Tree grates are be fabricated of cast iron and be installed using frames provided by the grate manufacturer. Individual grates are at least 28 square feet in area (approximately the area of a circular grate, six feet in diameter).

BICYCLE PARKING

Small bicycle parking area near the primary building entrance provides a safer place to park after hours. (University Services Building, the University of Arizona)



This bicycle "corral" is an integral part of this residence hall's entry courtyard. (Pomona College)

- Primary bicycle corrals are well-lit, centrally located bicycle parking areas for 60 to 100 bicycles. Located adjacent to bikeways and other bicycle routes.
- Secondary bicycle parking areas are well-lit, bicycle parking area for 5 to 10 bicycles, located near building entries to allow for convenient access to bicycles during off hours.
- The University standard bicycle rack is Arizona Correctional Industries Model MP4113 to match the racks already installed in many locations on campus. Color is Sage Green. Arrange racks to permit access from both sides and ease of use. Installation of the bicycle racks is in accordance with University standards.
- Bicycle parking areas should be intentionally designed as an integrated part of the landscape, including appropriate screening and planting around the perimeter.

Shielded, largely indirect pedestrian light. High pressure sodium lamp, aluminum base and pole. (Louis Poulsen Lighting, Inc. Photo by Frank Domin Photography)

LIGHTING

- Lighting serves many roles at the University. It must be appropriate to its use, preserve dark skies for astronomy and general night sky viewing, and comply with the University's Design and Specification Standards. Lighting design (poles, fixtures, arrangement, and spacing) will vary with the application and light source. All light sources must be fully shielded with no light emitted above horizontal and with hard cutoffs to limit light pollution. (Refer to the University Lighting Policies regarding intensity and uniformity.)
- General purpose site lighting from dusk to dawn uses single frequency, low pressure sodium lamps. Light poles may be as high as 40 feet to efficiently illuminate large areas such as parking lots.
- Pedestrian lighting in primary pedestrian open spaces (malls, quadrangles, plazas, front porches, bicycle boulevards, and along primary pedestrian corridors) is supplemented with high pressure sodium light sources, to be shut off at or before 10:30 pm (per the Tucson and Pima County Outdoor Lighting Control Ordinance). The intent is that pedestrian lighting be designed to attract pedestrians to safe, open, more highly populated areas. General purpose lighting, while providing for basic security, is not attractive to pedestrians and does not provide as high a level of comfort and safety as the pedestrian lighting described in these guidelines.
- Light poles and fixtures are pedestrian scale (approximately 12 to 16 feet high), spaced to provide uniform light levels, and located to facilitate wayfinding, facial recognition, and a sense of security.
- Poles are Sage Green or Sage Grey.
- Fixtures are of the indirect type with light source in the pole and a reflective plate above.
- Existing globe fixtures within the project development area will replaced unless they were installed prior to 1950 (see Historic District, below). As stated above, all new fixtures must be fully shielded.
- Low-voltage lighting may be included in groves, gardens, and other mostly planted areas.
- Bollard lights are generally unacceptable for area lighting but may be used to call attention to crossings, entries, steps, or other features.
- Special purpose lighting for sports field, court, or special events and occasions may be used only during the course of the event or occasion.
- Historic light fixtures within the historic district dating earlier than 1950 will be preserved in place and supplemented with pedestrian lighting (above) in areas where pedestrians are expected to gather. Note: as stated above, all new fixtures must be fully shielded.

Signage softened with landscape treatment is preferred.

Signage should be simple, clear and consistent.

SIGNAGE

Signs serve to identify facilities and other destinations, to provide direction to visitors and daily users, and to highlight special events. They supplement and add detail to campus wayfinding, ideally to confirm that the user is proceeding to the intended destination. The University has adopted standard facility identification signs, signs identifying departments within facilities, and campus map kiosks (refer to the University Identification Guide). Traffic control signs must follow the Manual of Uniform Traffic Control Devices.

- It is important that all signs function as part of the campus wayfinding system, beginning with directional signs along interstate routes and city streets, and continuing with campus maps in all parking structures, malls, and quadrangles.
- Information kiosks for daily users will be located in malls and quadrangles, and at public information facilities (e.g. Student Union and Bookstore, Visitor Center, ticket offices). Provide conduits for electric power and telecommunications links to kiosks. Design supports routine attachment of announcements, installation of video terminals, magnetic card readers and printers, and allows for intensive daily use and regular rejuvenation.
- Facility design may include support for temporary signs (free-standing, banners, electronic marquees).

Simple Entry Signage at Park Avenue and Speedway Boulevard. Placement is important.

PEDESTRIAN PAVING

Open space paving includes sidewalk, roadway, and other corridor materials, as well as the surfaces of plazas, front porches, and perhaps groves and gardens. Pavement materials and patterns are consistent along malls and within quadrangles. The use of pervious pavement (e.g. special mixes of concrete and asphalt, masonry units, and structurally reinforced soil and gravel) and sloping pavement to drain to groves, greens, and gardens is encouraged where appropriate to storm water management systems. Decomposed granite and other inert earth and stone materials also are used as pavement or plating material. However, the pavement structure must be fully ADA accessible.

Paving materials shall be fundamental indicators of the intended use of the pavement:

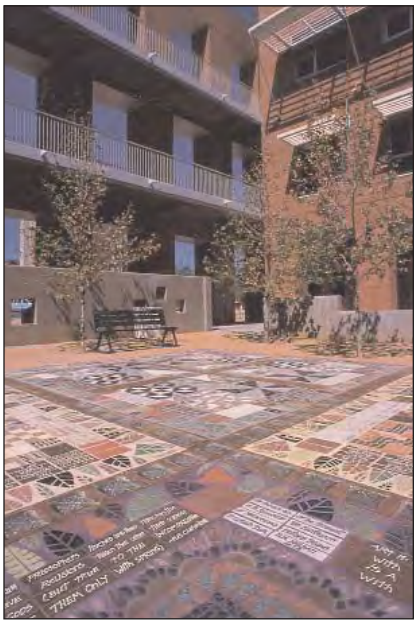
- Sidewalks are be gray concrete, 6-to-10 feet wide, scored in regular patterns and have a medium broom finish as found in the historic portions of the University. Areas of pavement greater than 10-feet wide must be something other than gray concrete. Design score joints at an angle to path of travel or in other manner to minimize jarring wheel chair users.

Pavement other than Sidewalks

- Colored concrete uses gray cement. Colorant is integral to the concrete. Color materials applied after placement, concrete stains, and paints are not acceptable.
- Alternative concrete finishes, such as exposed aggregate, bush-hammer, rock salt, and ground face are acceptable where used as contiguous treatments (e.g. courtyards or front porches). All finishes are slip resistant in all weather conditions and ADA accessible.
- Simple, rectangular shaped unit pavers, stone, brick or concrete, may be used in contiguous areas. Concrete unit pavers shall have a smooth, exposed aggregate, ground face, or tumbled finish. Applied aggregate finishes are not acceptable. Typically, unit pavers shall have tight joints similar to brick pavers to minimize jarring wheelchair users.
- Paving in many pedestrian areas may need to support large vehicles for occasional service or in emergencies. Coordinate with the University Facilities Groups and University Risk Management and safety to understand access requirements, to determine such need, and to design pavement sections, accordingly. The structural capacity of pavement in such areas might need to be increased; however, surface treatments blend with the surrounding pavement to retain the visual integrity of the space.

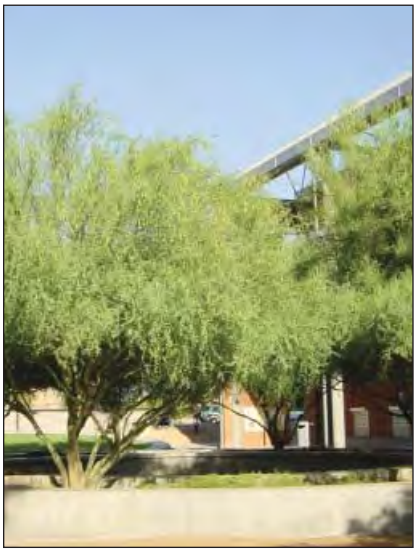
Unit pavers in simple, rectangular shapes

Unit pavers with standard gray concrete pedestrian pavement (The University of Arizona)



Mosaic pattern at place of assembly (The University of Arizona)

Skyline trees



Desert flora

PLANT MATERIAL

As with other open space materials, plant material choices are based on the Open Space Framework and Space Types. Plants are used to delineate and reinforce the framework and individual open spaces and as themes at the campus scale.

- Existing plants, particularly trees, within the University Planning Boundary, are valued for their many benefits, including shade, cooling from transpiration, character, beauty, aids to wayfinding, and educational values. Large and mature trees give the campus a sense of place and history in the community and convey institutional permanence, appropriate to a university. In 2002, the University attained the status of Arboretum, further elevating the value of existing trees and other plants, particularly those that are rare or unique. (For further information please refer to http://arboretum.arizona.edu.) Additionally, research has shown urban forests provide great value to communities by mitigating heat island effects and erosion, improving air quality, supporting wildlife, and other tangible benefits.
- The University campus planners and the University Arboretum maintain a map and database of campus plant material, including heritage, one-of-a-kind, mature, and other particularly valuable plants, as well as the more common trees and plants that contribute to the University's urban forest. Review this information with these groups at the outset of design and prepare layout plans that maintain existing plants in place, in accordance with the University's Tree Protection Policy.
- Include botanical and common name labels for typical and unusual plants.

Shade-giving trees

PLANT PALETTES

In general, plant materials are chosen from the most current version of the Arizona Department of Water Resources Low Water Use/Drought Tolerant Plant List. Plant palettes are described in detail for certain corridors, groves, and other designated open spaces on the campus. The intent is that two-thirds or more of the plants in these areas are chosen from the prescribed palette, allowing for variation to accommodate existing plant material and special uses.

Primary automobile route theme tree - Chinese Pistache (The University of Arizona)

Specifically:

- Plant material added to or replaced in the historic district of the campus are consistent with the existing palette.
- The Main Mall will continue to be formally lined with California fan palms. Existing trees will be supplemented with new trees to fill in gaps. Palo verde trees (blue, foothills, and/or desert museum hybrid) will be the primary tree forming the academic groves lining the Main Mall.
- The Warren Mall will be developed with two or three species of Sonoran Desert riparian trees (including sycamore and ash). These trees will receive supplemental water from storm water runoff and/or harvested storm water (refer to Water Management in the General Guidelines). Note: Sycamore and ash are species or hybrids that have demonstrated improved performance, compared to natives, in an urban, Sonoran Desert setting.
- The primary automobile routes serving the campus (Campbell Avenue, Speedway Boulevard, Euclid Avenue, and Sixth Street) will be lined with a mix of *fraxinus velutina* 'Rio Grande' (fan-tex ash) and *pistacia chinensis* 'Arizona red push' (*Chinese pistache*); and supplemented with evergreen trees such as oak and pine to match existing.
- The primary shared bicycle/automobile loop serving the campus (Cherry Avenue, Second Street, Park Avenue, and Fourth Street) will be delineated by *olneya tesota* (ironwood).
- Perimeter greens will be predominantly Sonoran Desert native trees and shrubs, allowing for existing trees and the introduction of other species to fit the adjacent community or neighborhood. Shrubs do not obscure views into the greens in keeping with Crime Prevention Through Environmental Design principles.
- Gardens will developed, in coordination with the University Arboretum, around themes such as existing materials (the expansion of the Krutch Garden as part of the Alumni Plaza project), geographic regions (native Sonoran, Chihuahuan, Australian, or other deserts), or research and demonstration (the Desert Legume Program, or butterfly and hummingbird attracting plants).

Possible garden theme - native cacti (The University of Arizona)

Possible garden theme - other desert regions

Possible garden theme - hummingbird attractors

Examples of perimeter buffer plant material (City of Phoenix)

Riparian species for Warren Avenue Mall - native Arizona Sycamore (The University of Arizona)

PLANT PLACEMENT

The sunny climate of the Sonoran Desert, with up to 310 sunny days per year, creates high insolation rates (i.e. light and heat energy from the sun), particularly on east and west building faces. Research has shown that placement of trees to shade these walls can reduce air conditioning demand and create pleasant microclimates outside. Because lower angle winter sun is often desirable, even in Tucson, use relatively transparent deciduous trees along south facing walls.

ROOT ZONES

The University is committed to fostering a healthy urban forest on the campus, which requires compaction resistant soils and adequate space for tree roots. Planting trees over building basements or other structures should be avoided. (Refer to http://www.hort.cornell.edu/department/faculty/bassuk/uhi/article.html) for additional information related to structural soils that improve tree vigor.

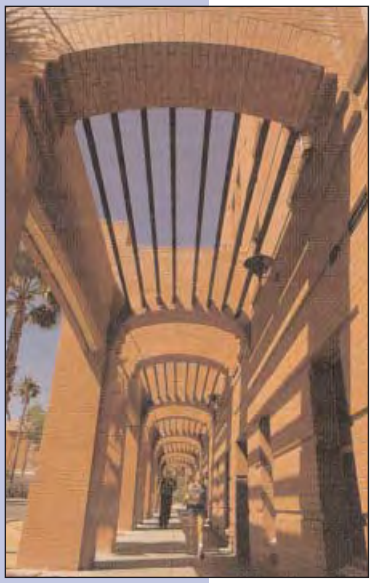
LANDSCAPE IRRIGATION

Because of the dry climate, irrigation must be provided to most plant material; even Sonoran Desert natives benefit from supplemental irrigation. The University's principle source of irrigation water is reclaimed water purchased from the City of Tucson. Storm water runoff is conserved for use as a supplement to irrigation systems. (Refer to the Water Management portion of the General Guidelines for more detailed information.)

- Landscape irrigation systems equipment and materials shown in the most current version of *University's Manual of Design and Specifications Standards.*
- Automatic control systems fully compatible with and link to the University's central control system via modem and telecommunications connections.
- If the water source will include a cistern or other source of harvested storm water, design the system to use storm water as the primary source and reclaimed water as the secondary source.
- Locate irrigation valve boxes and backflow preventers in screened areas outside of lawns.

ARCHITECTURAL GUIDELINES

V



"The message that we give future generations should be embodied in the buildings we use to teach them." U.S. Department of Energy, Energy Design Guidelines for High Performance Schools

INTRODUCTION

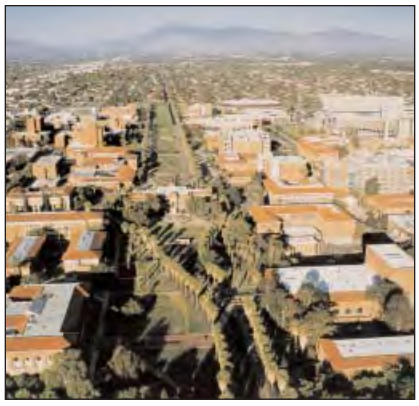
The strength of a campus lies in the harmony between its open space and built forms. The open space network or campus structure is perceived via the building edges that define its space. Siting, massing, proportion, and material are critical factors in how a building responds to space and surrounding buildings. Architects working on the University of Arizona campus have an obligation to understand and respect the unique relationships between open space and built form on this campus. Just as there is a hierarchy of open space, a hierarchy of buildings and building facades exists. In defining the essence rather than the image of the University, we have developed guidelines that respect the history of the place and encourage inventiveness in response to setting and climate. Principles set forth in the introduction to these guidelines will be expanded and more closely examined on the following pages.

Listed here are several policies and standards regarding the built environment that warrant a thoughtful and thorough response by designers working on the University campus.

- Each project should seek to physically embody the mission of the University as well as the principles set forth in this plan.
- Each project should be considered with regard to its place within the totality of the campus. Each part should strengthen the whole.
- Historic buildings, districts, and neighborhoods should be preserved and protected.
- Projects should be considered on the basis of quality as well as cost. Life cycle building costs should be compared with short-term construction costs.
- New buildings should be designed to be flexible, sustainable, and contribute to a mixed-use environment.

CAMPUS-WIDE GUIDELINES

The next few pages discuss guidelines applicable campus-wide. More detailed guidelines for specific campus zones follow.



The heart of the University of Arizona

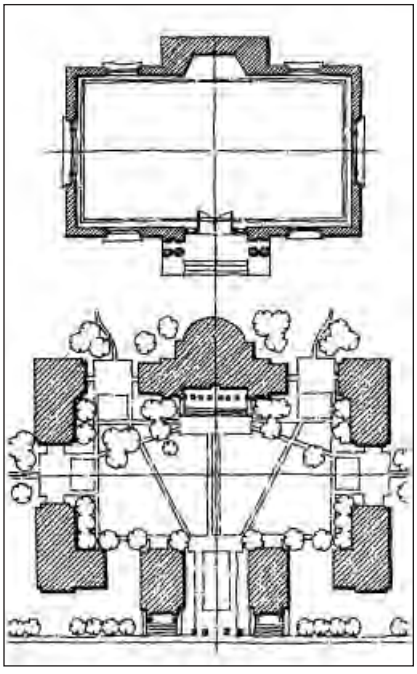
The need for new building square footage, coupled with limited land resources, demands that the campus grow according to an efficient and functional campus plan structure. The open space network is centered on a hierarchy of intellectual open spaces depicted in the Concept Plan. The campus plan principles, "A Climate for Learning", urged the use of outdoor space as intensively as indoor space. Primary open spaces are the historic core, mall, and future Warren Avenue Research Corridor (1). These spaces act as the heart of the entire campus. Secondary spaces serve as district centers (2). Tertiary spaces are building or block-level courtyard spaces (3). Similarly, a hierarchy of connections exists. Three primary paths connect the mall to north campus via the Speedway Boulevard underpasses and to south campus (a). Secondary pathways including streets would connect district level spaces and tertiary paths would connect courtyards. The building block of the open space network is the outdoor room.

Concept Plan – Courtyard Mosaic: A hierarchy of open spaces – Numbers represent examples of open space types at left.

THE OUTDOOR ROOM

In the diagram to the right, a prototypical room is juxtaposed with a typical university quadrangle of like proportions. Analogies are evident: Walls of a room and buildings around the quad; windows and the space between buildings; a door and an entry court; a fireplace and a prominent building. In the room and the quadrangle, each element plays a part in the greater compositional whole. The interdependency of specialized parts creates a hierarchy that gives focus and meaning to the composition. The fireplace and important building are the focus of their respective spaces. Other elements have their own integrity but must work together to form a coherent composition.

The beauty and power of a symphony lies in each musician playing his or her piece as a unified whole with one or two soloists highlighting the performance. On the University of Arizona campus, the sum of its architectural components should be its most compelling feature.



Typical campus open space

ARCHITECTURAL TYPOLOGY

BAR BUILDING

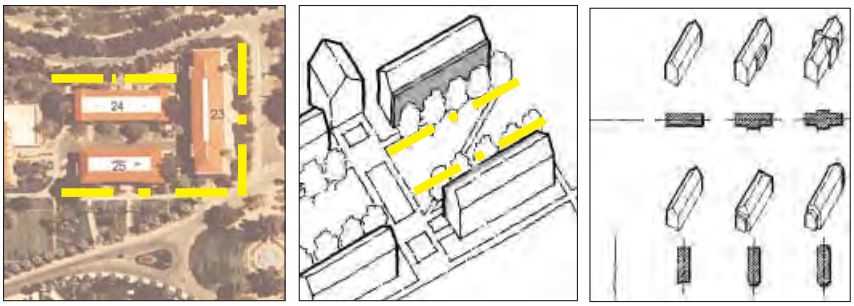
- Elongated and rectangular volume
- Entry generally at center of long facade
- Buildings define and reinforce geometry of space
- Typical width is 45 to 90 feet
- Typical length is 120 to 300 feet
- Design accommodates a variety of functions, such as housing, classrooms, laboratories, and offices
- An essential building block of campus architecture

CENTRALIZED BUILDING

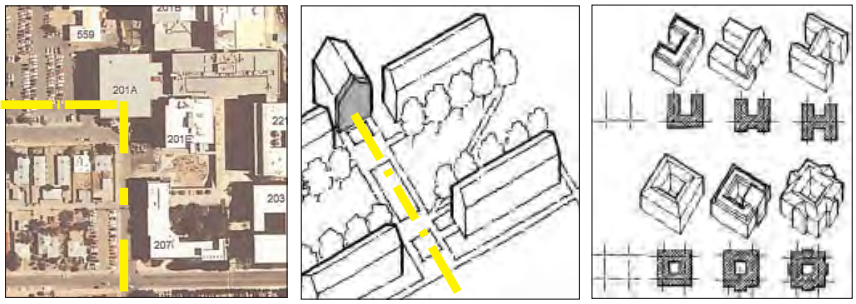
- Usually sited prominently within open space
- Often an important building on campus with room for public assembly. Examples include chapels, lecture halls, gymnasia, libraries, and dining halls
- Large assembly space often articulated in building mass
- Generally symmetrical in form
- Prominent entry at center of main facade leads to public lobby
- Combined with bar building type, an unlimited variety of building forms can be created.

COMPOSITE BUILDING

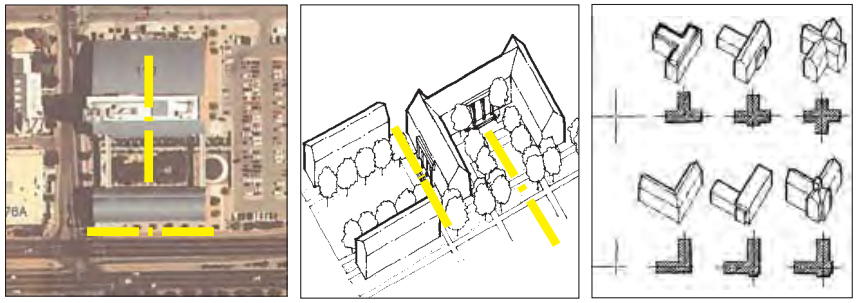
- Created through combination of bar types or bar and centralized types
- Composition of parts define outdoor courtyards
- May be sited to define space or more prominently as a terminus to an axis
- Large footprint allows greater mass
- Height of each component part may vary as appropriate



Bar Building



Centralized Building



Composite Building

- Footprint accommodates housing, classrooms, laboratories, and offices and may contain large gathering spaces

Architectural typology typically refers to the overall geometry of a building's plan or its "footprint".

The shape of a building's footprint is significant because, in addition to dictating the building's internal organization, it affects how the building relates to adjacent structures and the resultant outdoor spaces they create together. The important principle for campus design is to utilize these types to create a balance of simple building forms defining clear outdoor spaces. This methodology will create a simple, flexible plan adaptable to changing priorities over time.

ARCHITECTURAL HIERARCHY

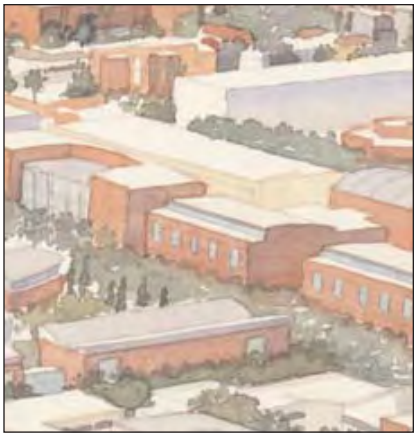
It is important to note the difference between space-defining buildings and space-occupying buildings. Space-defining buildings form edges of the open space network structure. Their relative consistency in siting, massing, proportion, and material creates an identifiable container for open space. They also set up clear axial connections between parts of campus. Space-defining buildings should have clear entries fronting the space that they define. Creativity and inventiveness should be encouraged in interpreting characteristics found in the campus's most admired space-defining buildings as well as in response to climatic issues. They are characterized by a restrained elegance.

Space-occupying or landmark buildings should be reserved for positions of honor within the campus. They should terminate a view or axis with a prominent entry and architectural feature. They should be limited to those building types (churches, libraries, and places of assembly) that embody and relate the most universal and lofty aspirations of the institution. Gateway buildings, as the name suggests, create thresholds to campus, district, or space. They may share characteristics of both space-definer and space-occupier. They may be the central figure within the architectural composition or at the edge. Care should be taken to selectively identify true gateway locations.

The hierarchy of buildings on campus should reinforce the hierarchy of the open space network. Old Main, the University's most identifiable building sits in the most identifiable open space. The proposed Warren Avenue Research Corridor will become the center of the AHSC campus; terminating this axial corridor is the AHSC library with its associated symbolism. A collection of buildings defining any open space should display an identifiable hierarchy.

Landmark buildings or elements (red) occupy prominent locations within the open space network Space-defining buildings (gray) form the open space network. The above diagram is not meant to represent exact locations of all landmarks, space-definers and open spaces

Landmark building at Sciences Concourse



Space-defining buildings at Warren Mall

SERVICE ZONES

The Campus Plan recommends consolidating service, delivery, and refuse locations in central locations at the district scale. Central service locations will reduce and concentrate service traffic to particular areas of campus as well as decrease unsightly dumpsters and loading docks. Distribution from these central areas to specific programs or buildings would be with small electric vehicles. Similarly, refuse would be picked up from a central location within individual buildings with electric vehicles and transferred to a district-wide location for truck removal. All locations should be easily accessible by large trucks and centrally located within the district. Care should be taken when siting these locations to keep traffic out of pedestrian zones.

Centralized service zones (conceptual)

TEMPORARY BUILDINGS

The Campus Plan recommends not using this type of building if at all possible. "Temporary buildings" tend to become permanent once the added space has been occupied. It is difficult for users to relinquish space even if they are constructing a brand new building. The use of temporary buildings may also be perceived as a reflection of the quality of the institution. The reality may be a reflection of state funding, nonetheless perceptions from prospective students and faculty members can be damaging. If it is impossible to avoid temporary structures, great care should be given to strategic siting. Place them in unobtrusive locations and use screening devices, such as landscape or architectural elements.

"Temporary" buildings at AHSC

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ARCHITECTURAL CHARACTER

The collective architectural response to the essence of a place (history, culture, and physical setting) can be termed the architectural character. We use the term "character" as opposed to style. Style connotes a particular period in time and often relies on idiosyncratic details to define it. Character is based on a series of more general design principles that have been applied throughout the continuum of building on the campus. These principles are the basis for more specific architectural guidelines.

SITING
MASSING AND HEIGHT
SCALE AND PROPORTION
MATERIALS

Highland Avenue corridor

Warren Avenue corridor

Clear Building Entry

Outdoor Space Connected to Building

SITING

- Site space-defining buildings to form edge to open space, and space-occupying buildings to act as focal point of open space. Base on existing and proposed plan relationships for the larger district.
  Front primary facades, entries, and other architectural elements on open space and link to pedestrian circulation system to assist in wayfinding.
- Preserve view corridors by using buildings to frame views.
- Orient building in east-west direction where possible for increased daylighting and solar gain.
- Design open space for sun and shade to encourage year-round use.
- Link bright outdoor space to darker interior space via partially shaded transition zones such as porches.
- Site colonnades, ramadas, pergolas, etc. to provide shade along pedestrian routes.
- Site buildings to minimally affect natural systems, valued landscape, and the existing site context.
- Site loading and service areas with the larger district plan in mind, and use shared centrally located facilities where possible.

MASSING

- Massing is one of the more significant factors that contribute to establishing the character of a specific building. It should reflect status as landmark, gateway, or space-defining building.
- Architectural features should terminate axial views.
- Of particular importance in defining the mass of a building is the overall height, actual and perceived, as well as roof geometry.
- Low-rise, high-density approach to massing:
  - Maximizes limited land resources.
  - Creates shade.
  - Establishes interlocking indoor and outdoor space.
- Overall mass of buildings should step down at campus edges.
- Stair-step building mass away from open spaces to preserve light and views.
- Relate height to width of space:
  - Primary space width approximately six to eight times the height
  - Secondary space width approximately four times the height
  - Tertiary space width approximately two times the height

Buildings form edge to space

Consistent massing at Stanford

Facade rhythm

SCALE & PROPORTION

- Relate a building's parts to its whole. Analyze campus precedents in order to interpret facade compositions and build on the University context

Hierarchical Entry

- Dictate how a building relates to the human body
- Govern relationship between building and the outdoor room the building defines
- Modulate scale with facades using a tripartite composition: base-middle-top. Buildings should meet the ground and meet the sky.
- Vertical rhythms of facade hierarchy (bay system) also modulate scale.
- Scale and proportion of fenestration and other elements should reflect building use and facade hierarchy.
- Use a series of humanly-scaled architectural elements to enable today's large footprint buildings to exhibit pleasing proportions: towers, porches, arcades, trellises, window bays, etc.

MARKERS

Towers provide vertical accents on the otherwise low-profile campus. They mark significant buildings and open spaces. Because they can be seen from a distance, towers help orient campus users and can include cooling towers, bell towers, clock towers, and viewing towers.

Archways or gateways mark the transition from one realm to another. Gateways at the boundary announce the campus threshold. They provide a framed view of a building or open space, usually along an axial walk or street. Their scale should be appropriate to the space they front. They may also provide the opportunity to bridge between buildings, thereby creating useful connections.

Other markers include large facade openings, roof forms, sculpture, and fountains.

Architectural elements are compositional tools that tie buildings to one another and to surrounding open space. They can create hierarchy by delineating building entry or marking important places on campus. In this way they are functional elements as well wayfinding and climate control aids. Two of the most prominent elements are markers and building entries.

ENTRIES

Entries provide clear and memorable transitions between outdoor and interior spaces. It is typical of the entry to be the most hierarchically important facade feature, often centrally located or coupled with a tower.

The entry should be visible from afar and front open space to make the building understandable and welcoming. The scale of the opening should be appropriate to the building type.

Humanly scaled detail and ornament surrounding the entry should be encouraged as well as seating and other site amenities.

Other architectural elements are more subtle, improving building scale and facade composition. These include window placement, bay structure, arcades, shade devices, and ornamental detail. These elements also have a functional role, providing shade, introducing light into the building, delineating pedestrian routes, etc. Reinterpreting historic elements encourages creativity and invention.

FENESTRATION

Facade composition of historic core buildings should be analyzed as precedents.

Windows may be cut from the wall or grouped to create bays. Window groupings can provide visual interest and facade hierarchy.

Three-dimensional relief adds detail and shadow. Special windows should appear in the base or attic if programmatically possible. Scale of opening should be appropriate to building type and placement on facade.

A 30 to 40 percent window-to-wall ratio provides a welcoming countenance, though climatic factors may dictate a lower ratio.

SHADE DEVICES

Shade and its functional uses are critical in a desert climate. These elements also provide opportunity to add scale to building facades and mitigate the mass of large buildings. They define building and open space boundaries as well as pedestrian routes.

Freestanding devices, such as arcades, provide shaded cover between buildings. Attached devices shade the building interior and can shade the exterior perimeter as well.

The play of light and shadow rendered from shade devices provides inspiring temporal sculpture on building and ground surfaces. It is a source for invention in creating a realm that transitions between indoors and out.

BRICK

Brick is the historic material of choice and should remain the primary building material. Brick buildings on campus are composed of various elements including wall, frame, and volumetric solid.

STUCCO

Stucco can be used alone in smaller expanses or in combination with brick. Stucco is used historically in the Southwest. Qualities include the potential for rich colors and textures. EFIS or Dryvit should not be considered alternates.

CONCRETE/STONE

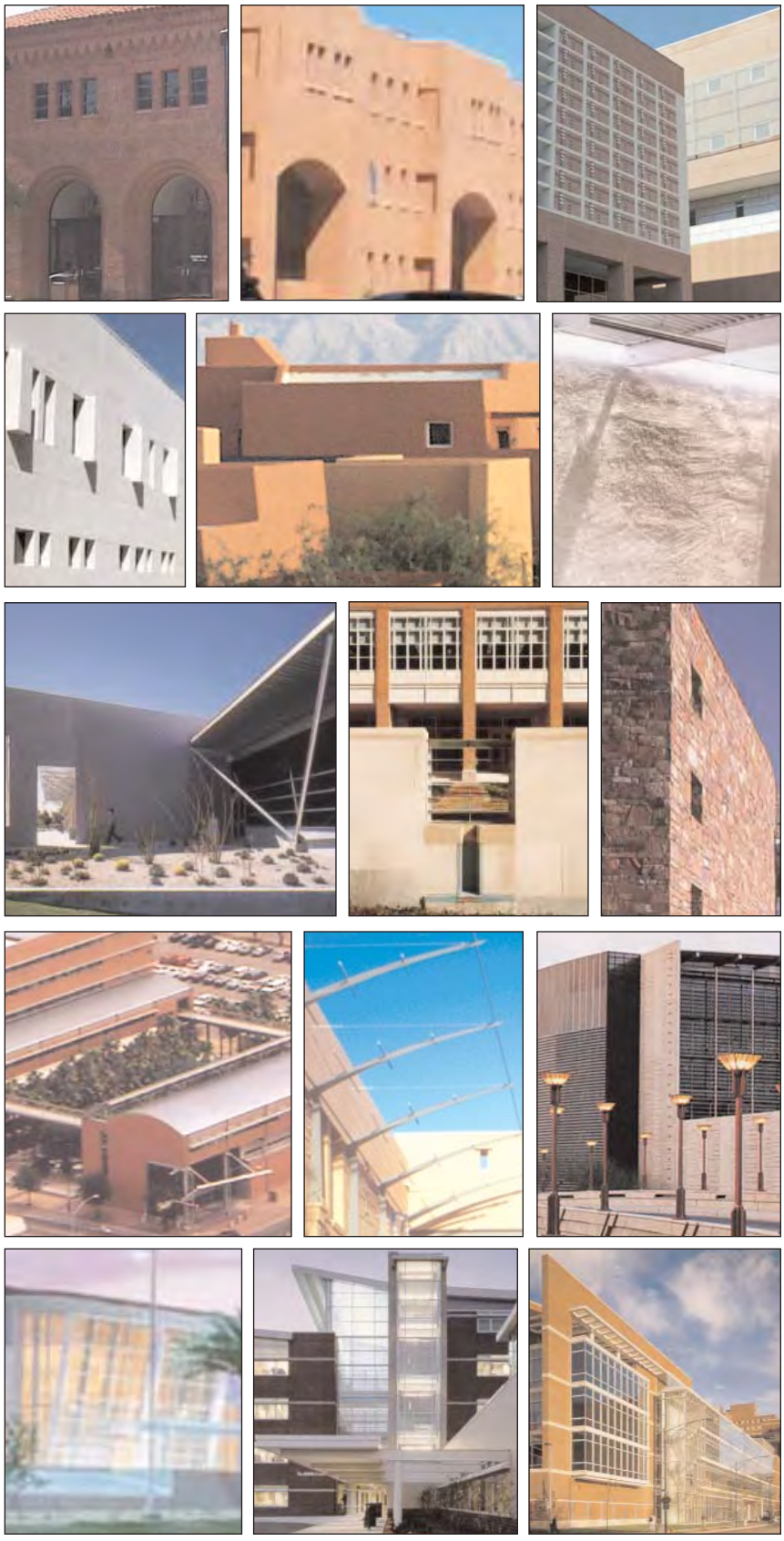
Concrete and stone can be used alone or to complement brick. These materials fit well in the desert context as monolithic walls or stacked units. Lighter toned material reflects the intense heat of region. Use lava stones for gateways and low walls in the historic district.

METAL

Metal should generally be used as a secondary material for sun shading, vine armatures, balustrades, site furnishings, roofs, etc. Lightness in color and thinness is a good contrast with heavy masonry.

GLASS

Use glass primarily at entries and accent areas. Shade devices are necessary on all facade orientations. Glass allows connection between indoor and outdoor spaces. Use clear glass only or with UV sensitive coating. The project will be individually reviewed when the architect wishes to use a different type of glass.



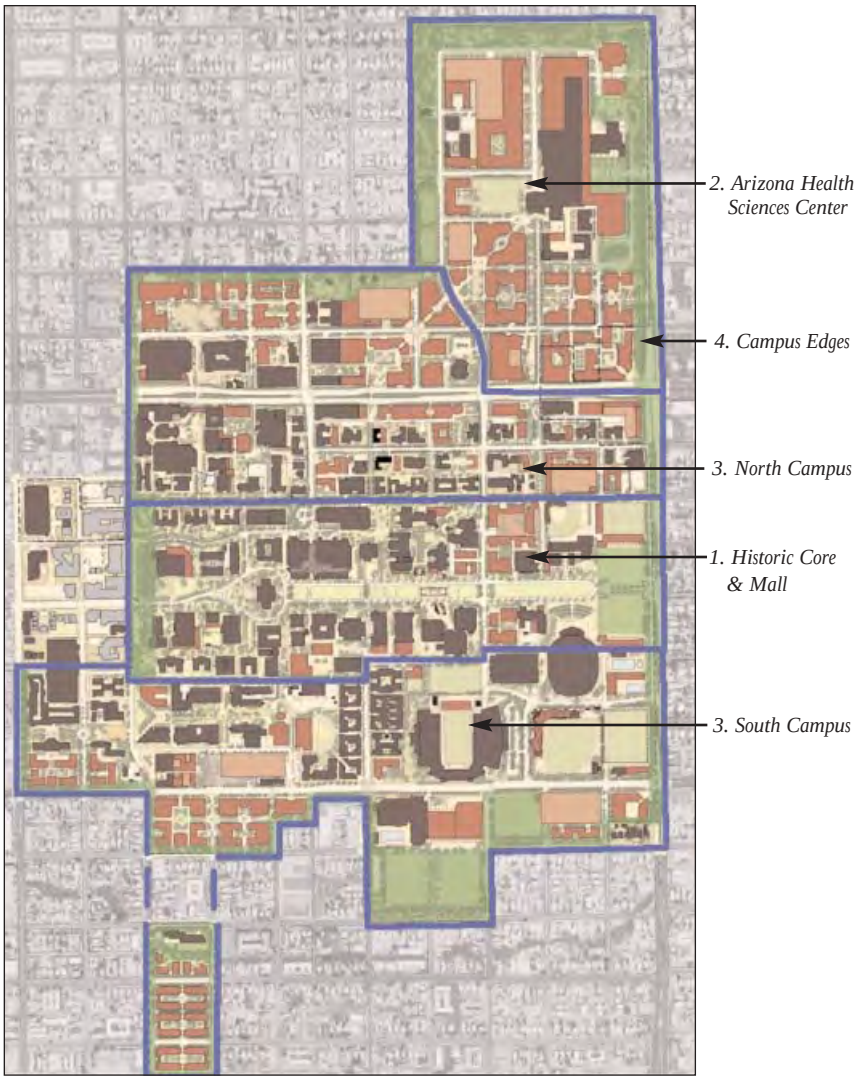
GUIDELINES BY ZONE

On the following pages, guidelines governing campus-wide issues are tailored for specific zones and their unique circumstances. These areas are delineated mainly for reasons of mass, scale, and character.

The historic core and mall demand special attention to the history and traditions of the University of Arizona. New projects should strive to reflect a continuity of architectural theme. Reinforcing the powerful campus structure of the historic core and the mall should be paramount. Enabling clear pedestrian connections to other parts of campus is also critical.

The Arizona Health Sciences Center and its environs offer a different yet related set of circumstances. Larger footprint buildings require skill in composing pleasing mass and scale. The existing conditions provide fewer precedents for emulation though consistency in architectural character is desirable. New projects in this area should strive to create and reinforce a clear campus structure centered on a hierarchy of open space. Connections within the zone and to other parts of campus are key.

The north and south campus zones exhibit a scale closer to that of the historical core. A more heterogeneous architectural character exists in this area. Here consistency is important in massing and scale as well as in relationships to streets and open space. Again, connection within the zone and to the other zones is important.



Design Guidelines Campus Zones

The continuous edge of campus is the final zone. Its uniqueness lies largely in its relationship to the surrounding community. It is the transition zone from larger scale University buildings to smaller scale residential areas. Care should be taken in this area to create an identifiable campus edge while simultaneously displaying an open and inviting presence. Major and minor gateways provide connection between campus and community and should be thoughtfully configured.

For each zone, the architectural mission, goals, and objectives are conveyed and illustrations of successful buildings are provided. A matrix of recommendations and illustrative sketches follows. These recommendations are not meant to proscriptively constrain inventiveness but serve to lay a foundation for creatively building a coherent, functional, and beautiful campus.

HISTORIC CORE & MALL ZONES MISSION

New projects should reinforce the existing structure of the historic campus and seek to complement this unique context through architectural continuity.

GOALS AND OBJECTIVES

- To strengthen the powerful symbol of the mall as the heart of academic life at the University.
- To accomplish this by reinforcing edges to contain this symbolic space.
- To create an appropriate gateway at the east end of the mall that announces its civic presence.
- To preserve and strengthen the historic core.
- To reinforce the pedestrian-oriented campus with clear and simple building access.
- To create a network of secondary open spaces that provide utility, comfort, and a connection to other parts of campus.

Bucoliz open space epitomizes the University campus

Old Main

Bear Down Gymnasium

Courtyard wall

Mall view west

	RECOMMENDATIONS
1. GENERAL	• Look to historic campus buildings for inspiration and basic architectural principles.
2. SITING	• Buildings sited along the mall should have a setback consistent with existing buildings. • A clear main entry should front the mall and ideally align with entries across the space. • Buildings in other locations should similarly front the major adjacent open space and help to define its edges. • Site buildings to work with those in its immediate context to strengthen the overall campus composition. • Major building elements should be sited at the end of an axis or at a gateway location.
3. MASSING	• The overall relatively low profile of this zone should be preserved with building heights of four to five levels. • Building height should be consistent along the edges of the mall, but may vary to some degree in other areas to provide a skyline with visual interest. • Massing should reflect building use and hierarchy, smaller building mass for residence halls and larger masses for major public spaces within buildings. • Buildings at the east end of the mall should step down to allow views into campus and to respect the scale of the residential neighborhood across Campbell Avenue.
4. SCALE/PROPORTION	• Humanly-scaled elements for residence halls, a mix of smaller-scale and civic-scaled gestures for academic and research buildings, and grand-scaled elements for landmark buildings. • Buildings along the mall should have civic-scaled entries with humanly-scaled elements and detail. • The tripartite system of base-middle-top should be used. • Scale elements in historic core buildings provide useful lessons.
5. ARCHITECTURAL ELEMENTS	• Should be used to highlight entry, terminate axes, provide a gateway or otherwise reinforce the overall campus structure. • These elements should be used strategically to reinforce the goals and objectives of this zone. • Architectural elements should be appropriate to the scale and hierarchy of the space in which they sit or front.
6. MATERIALS	• Red brick is the preferred material on this part of campus, with stone or precast concrete elements. • Windows should be of an appropriate scale to relate to the existing context as well as the desert climate. • Large expanses of glass should be used only to express important entries or spaces and should be appropriately shaded. • Sloped roofs should use material appropriate to sustainable design in the desert climate, such as light-colored metal or those that incorporate photovoltaic technology.

AHSC & ENVIRONS ZONES MISSION

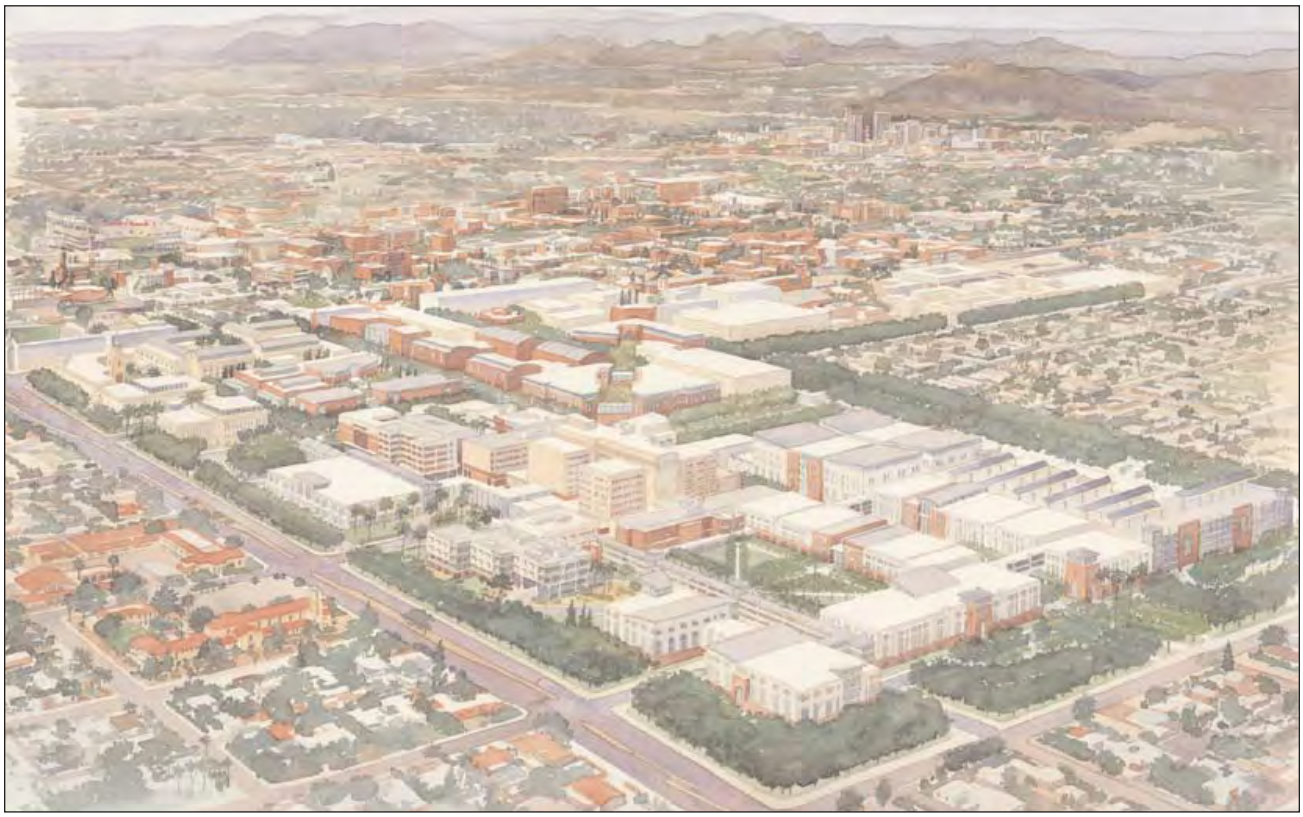
New projects should work to create an environment of collaboration between students, professors, researchers, and clinicians embodied in the physical form of the campus. The built form of the AHSC also should promote clear orientation and ease of movement for daily inhabitants as well as visitors. Further development of AHSC is found in Appendix 2 (bound separately).

GOALS AND OBJECTIVES

- To create a physical and symbolic heart to the AHSC campus similar to the mall on main campus
- To create closely connected academic, research, clinical, inpatient, and mixed-use zones, each with an identifiable center and edges
- To connect the AHSC campus to main campus to promote interdisciplinary collaboration
- To present an identifiable edge with clear gateways to the public along Campbell Avenue and Speedway Boulevard
- To respect the surrounding community by creating a usable landscaped buffer around the AHSC perimeter
- To create clear circulation systems throughout the campus for all modes of transport

Building as bridge at campus entry (University of Illinois at Chicago)

Outdoor space



Southwest view at AHSC

	RECOMMENDATIONS
1. GENERAL	• Export campus-making strategies from the historic core and mall and transform them to work with the larger-scaled buildings typical of this zone.
2. SITING	• Buildings along Campbell Avenue should maintain a consistent setback from the street, strengthening the identifiable front lawn that currently exists. • A minimal setback of about 20 feet along Speedway Boulevard should be maintained to create an urban street section that encourages pedestrian activity. • Site new buildings to create a balance of open space and built form. • Buildings should form edges to open spaces. • Large buildings may break the program footprint into smaller-scaled units to create usable courtyards. • Site centrally located shared service areas within buildings where possible.
3. MASSING	• The overall AHSC zone will have greater mass and height than other zones. • Buildings should generally step down from the center of the AHSC campus to its edges, though greater height at the corner of Campbell Avenue and Speedway Boulevard may be appropriate. • Buildings of larger height and mass should front larger open spaces to promote light penetration. • Massing should step back from open space edges to promote light penetration. • Massing of large footprint buildings should be broken into a composition of smaller parts that frame courtyards and patios.
4. SCALE/PROPORTION	• Especially important buildings, such as the library or a major public auditorium, should exhibit grand-scale elements; research and academic buildings should have some civic-scaled proportion; and the mixed use zone should be scaled to the pedestrian. • Buildings fronting all open spaces should have entries scaled to the size of the space as well as humanly scaled colonnades or porches. • The tripartite system of base-middle-top should be used. • Roof forms should be used to further break down the scale of taller buildings. • The use of vertical bay systems can mitigate the scale of large buildings.
5. ARCHITECTURAL ELEMENTS	• Highlight entry, terminate axes, provide a gateway, or otherwise reinforce the overall campus structure. • These elements should be used strategically to reinforce the goals and objectives of this zone. • Architectural elements should be appropriate to the scale and hierarchy of the space in which they sit or front. • Bridges connecting buildings on upper floors may be a distinguishing architectural element for this part of campus; they should be designed as part of the architecture of the building.
6. MATERIALS	• Red brick is the preferred material for academic buildings in the AHSC. • Brick as well as other lighter-colored materials, such as concrete, are appropriate for other building types. • Windows should be of an appropriate scale to relate to the existing context and the desert climate. • Large expanses of glass should be used only to express important entries or spaces and should be appropriately shaded. • Sloped roofs should use material appropriate to sustainable design in the desert climate, such as light-colored metal or those that incorporate photovoltaic technology.

NORTH AND SOUTH CAMPUS ZONES MISSION

New projects should seek to create and strengthen the courtyard mosaic concept of a hierarchy of connected open spaces, rendering a balance of built form and open space.

GOALS AND OBJECTIVES:

- To use building infill to create district centers around which new buildings form clear edges and participate in the life of the open space.
- To create local open space nodes that offer semi-private intellectual outdoor space for surrounding programs.
- To connect these open spaces in a pedestrian and bike circulation network that promotes cross-campus movement in a clear, efficient, and comfortable way.
- To reinforce the major north-south campus connectors that flow through each of the Speedway Boulevard underpasses.

View southeast at Park Avenue

Humanly-scaled architecture

View northeast at Euclid and 6th Street

Civic-scaled architecture

	RECOMMENDATIONS
1. GENERAL	• Look to buildings of architectural merit in this zone for inspiration and principles. The quiet elegance of buildings such as Colonia de La Paz residence hall and the AME building reflect this approach.
2. SITING	• New projects should be sited to work with neighboring buildings to form useful and comfortable outdoor spaces as an extension of the building program. • New projects should anticipate future projects and begin to form the framework for these open spaces. • Buildings along streets should similarly form a consistent edge along the space of the street. • Main entries should front on these spaces. • Site building to maximize daylighting benefits.
3. MASSING	• The overall relatively low profile of this zone should be preserved. Building heights should be no more than four to five levels. • Massing should allow for visual interest in the skyline. • Massing should reflect building use and hierarchy, smaller building mass for residence halls and larger masses for major public spaces within buildings. • Massing should be generally consistent along street edges and reflect the scale of the right of way - larger buildings along streets such as Speedway Boulevard and Sixth Street, smaller massing along neighborhood streets such as First Street and Highland Avenue. • Building mass should reinforce the desired height and width ratios for various types of open spaces. • Mass may step down at edges of open space to allow greater sun penetration.
4. SCALE/PROPORTION	• Use humanly scaled elements for residence halls, a mix of smaller scale and civic-scaled gestures for academic and research buildings, and grand-scaled elements for landmark buildings. • The tripartite system of base-middle-top should be used. • Architectural elements, such as porticos and colonnades, provide humanly scaled transitions from outdoor spaces to building interiors. • Building facades and entries should reflect the scale of the open space they front.
5. ARCHITECTURAL ELEMENTS	• Highlight entry, terminate axes, provide a gateway, or otherwise reinforce the overall campus structure. • These elements should be used strategically to reinforce the goals and objectives of this zone. • Architectural elements should be appropriate to the scale and hierarchy of the space in which they sit or front. • Elements can be used to aid in wayfinding through this low-scale, high-density zone.
6. MATERIALS	• Red brick is the preferred material on this part of campus with stone or precast concrete elements. • Other materials appropriate to the immediate context may also be used, such as stucco or stone. • Windows should be of an appropriate scale to relate to the existing context as well as the desert climate. • Large expanses of glass should be used only to express important entries or spaces and should be appropriately shaded. • Sloped roofs should use material appropriate to sustainable design in the desert climate, such as light-colored metal or those that incorporate photovoltaic technology.

CAMPUS EDGES ZONE MISSION

New projects should create an identifiable campus edge while displaying an open and inviting presence.

GOALS AND OBJECTIVES

- To create a landscaped buffer around the perimeter of to give the University a unique identity and provide a usable transition zone between campus and community.
- For this to be a functional landscape zone for purposes of screening, recreation, and storm water detention.
- For buildings at the edge of campus to participate in the transition by being of appropriate mass and scale.
- To create pedestrian and vehicular gateways to campus appropriate to the importance of the portal.
- For these gateways to aid in campus orientation and wayfinding.
- To extend from these gateway connections into the surrounding community.

View southeast at AHSC and Campbell Avenue

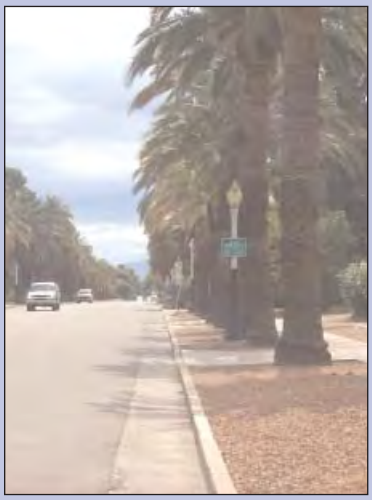
Edge condition at AHSC

Edge along Park Avenue

	RECOMMENDATIONS
1. GENERAL	• Campus edge buildings should be designed to display a respectful presence to the neighboring community and simultaneously announce the civic realm of the University. A landscaped buffer will provide a transition zone between the community and the University.
2. SITING	• New buildings should provide a welcoming front to the University at campus edges. • Buildings should be sited to define a consistent landscape zone and building edge. • Important buildings may be set back from this edge to create an open space associated with a public gateway to the campus. • A well-defined but porous edge should be maintained. • Service areas should be sited away from this public front or screened from view.
3. MASSING	• Step building mass down toward lower-scale residential areas, generally three levels maximum at the edge. • Buildings along Speedway Boulevard and Sixth Street should maintain appropriate massing relative to the width of the street. • Consistent massing along each edge of campus is preferred. • Avoid massing that presents the image of an impenetrable campus wall. • Break down the mass of large footprint buildings into appropriately scaled parts. • Massing for important public buildings may include grander civic elements that announce campus gateways and building use.
4. SCALE/PROPORTION	• Humanly scaled elements should be used, especially at gateways and pedestrian entries into campus. • Porches, porticos, and colonnades provide well-scaled transitions between the landscape zone and building entry. • The tripartite system of base-middle-top should be employed. • Façade elements, such as window size, and building units should reflect the scale of similar elements used in neighboring structures.
5. ARCHITECTURAL ELEMENTS	• Elements, such as gates, water features, signage, and sculpture, may be used in conjunction with building elements to highlight campus gateways and entries penetrating the campus edge. • Elements, such as sidewalk paving patterns, low walls, and colonnades used in tandem with landscaping create a subtle, graceful, and identifiable transition zone between campus and community. • Architectural elements should be appropriate to the scale and hierarchy of the edge on which they front.
6. MATERIALS	• Red brick is the preferred material for campus buildings to give the campus a uniform identity. • Stucco and stone appropriate to the context also are acceptable. • Windows and entries should be of an appropriate scale to relate to the existing context as well as climatic issues. • Large expanses of glass should be used only to express important entries or spaces and should include shading elements. • Sloped roofs should use material appropriate to sustainable design in the desert environment, such as light-colored metal or incorporating photovoltaic technology.

CIRCULATION GUIDELINES

V



CIRCULATION

The Comprehensive Campus Plan 2003 shows a network of multi-modal corridors that, in combination with auto and bicycle parking areas and open spaces, are arranged to improve wayfinding, access, and pedestrian comfort. Many of these corridors are located along existing streets that, by current standards, are "over-balanced" in favor of automobiles (refer to Glatting Jackson traffic report, Appendix 4 bound separately). Glatting Jackson states that even moderate modifications of roadway cross-sections can "vastly improve service and safety to pedestrians and bicyclists while having little effect on motorized vehicular capacity." The two main objectives are:

- Shift the balance toward pedestrians and cyclists to create strong, multi-modal corridors.
- Slow prevailing traffic speeds through campus to improve safety and comfort.

It is particularly important to make walking, cycling, and transit more desirable near the campus to limit growth of automobile traffic and the associated impacts to surrounding streets and neighborhoods. Locating expanded auto parking off campus with rapid transit access is another part of this system.

CIRCULATION GUIDELINES

All outdoor areas on the campus are intended to be pedestrian friendly, regardless of function or modal mix. It is also expected that bicycle use will greatly increase on the campus as academic and research facilities outpace the growth of related on-campus automobile parking. Bicycle traffic is primarily carried in dedicated bikeways and in lanes shared with slow-moving auto traffic. Pedestrian traffic is carried in corridors along sidewalks and malls, as well as informally through plazas, greens, and courtyards.

To develop a clear system that works for cyclists and pedestrians and minimizes conflicts, the guidelines require that pedestrian spaces be visually distinct and physically separated from bicycle, auto, and transit/moving vehicle facilities. Specifically:

- Bicycle, auto, and transit corridors are paved with asphalt and separated from sidewalks and open spaces by curbs, landscape buffers, and/or bollards, posts, and chains.
- In keeping with the Paving Material Guidelines, pedestrian paving materials include cast concrete, brick, stone, and concrete unit pavers.
- Pedestrians cross bike routes at clearly designated, labeled crossings with pedestrian paving that is signed for bicycles to yield to pedestrians.
- Bicycle parking is located conveniently along bicycle corridors to reduce the need for cyclists to use pedestrian areas in order to reach destinations and close enough to destination facilities to encourage the use of appropriate parking facilities.
- Specific parking spaces for service or department-owned golf carts should be identified in appropriate areas and signed accordingly by Parking and Transportation Services.

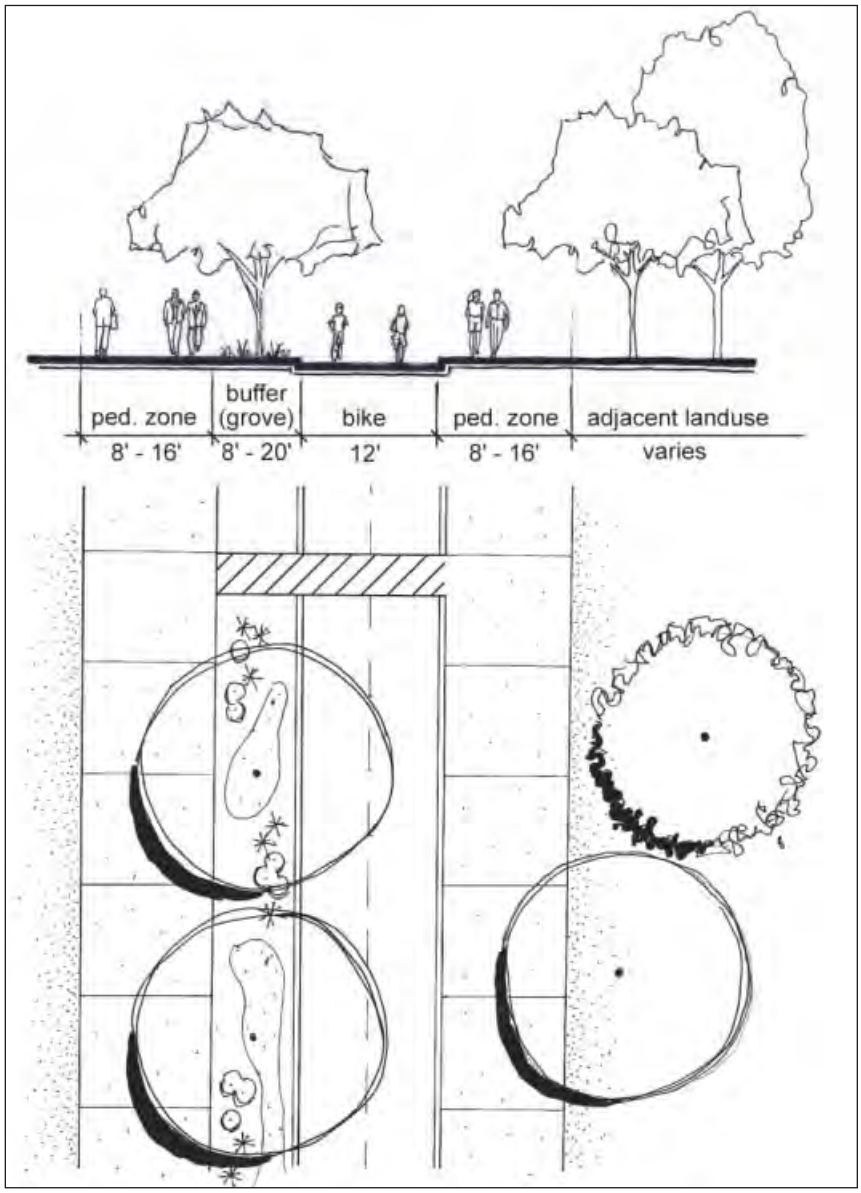
CORRIDOR TYPES

PEDESTRIAN/BICYCLE CORRIDOR

Similar to Glatting Jackson's "Bikeway" & the University Area Circulation Study's "Bicycle Lane/Route."

DEFINITION

The primary, non-auto, pedestrian/ bicycle network that links facilities within the University.



Pedestrian/Bike Corridor

PEDESTRIAN/BIKE CORRIDOR

Bikeway	*Buffer (Green)*	*Pedestrian Zone*
(2) 6' lanes	6' wide minimum	8-18' wide depending on demand
Striped asphalt	Refer to Plant Material Guidelines.	One or both sides

BICYCLE BOULEVARD

Similar to Glatting Jackson's "Bike Blvd.," "Local Parking" & "Narrow Parking" corridors, & the University Area Circulation Study's "Bike Blvd." & "Connector."

DEFINITION

Tree-lined, continuous bikeways shared with autos and pedestrians. May include on-street parking or no parking. The corridor consists of:

TRAFFIC ACCESS AT GATEWAYS

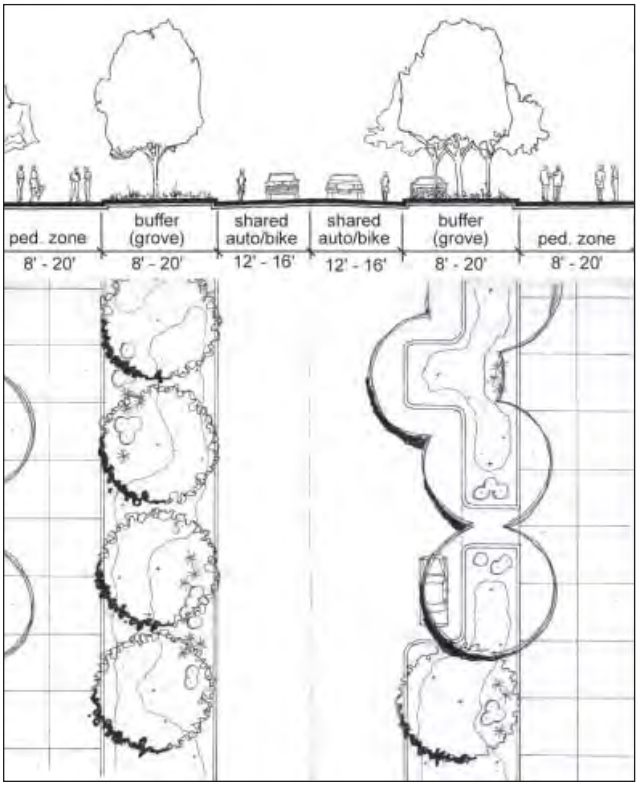
Provides clear visitor access at major auto/transit access points to the University. See the chart to the right.

BICYCLE BOULEVARD

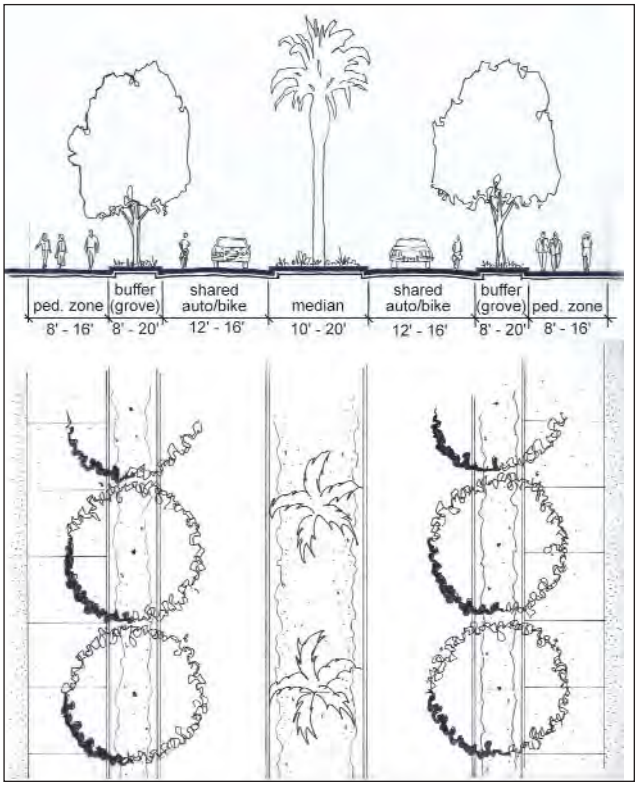
Shared Auto/Bike	*Buffer (Green)*	*Pedestrian Zone*
(2) 11-17' wide lanes	10-20' wide with trees	8-18' wide depending on demand
Striped asphalt	Refer to Plant Material Guideline	Both sides

GATEWAYS

Median (Garden or Grove)	*Shared Auto/Bike*	*Buffer (Garden or Grove)*	*Pedestrian Zone*
10-20'	(2) 12-16' lanes	8-20'	8-16' one or both sides
Refer to Plant Material Guidelines	Striped asphalt	Refer to Plant Material Guidelines	Sidewalk or Pedestrian



Bicycle Boulevard



Gateway

CORRIDOR TYPES

ARTERIAL ROADWAYS

These guidelines are suggested refinements to the existing University Area Circulation Study, for review by the University and the City of Tucson.

DEFINITION

Arterial roadways comprise the network of major streets that provide automobile and transit access to and from the University. From an urban design standpoint, Speedway Boulevard and Campbell Avenue are considered major arterials, with up to six travel lanes each, and Euclid Avenue and Sixth Street are considered minor arterials, with up to four travel lanes each. It is intended that all arterials function as pedestrian-friendly corridors with:

Major arterials include a center median and barriers to discourage pedestrians from crossing except at signals. Minor arterials' narrower width makes pedestrian crossings easier. Provide refuge spaces in medians and/or pedestrian activated signals.

Arterial Road

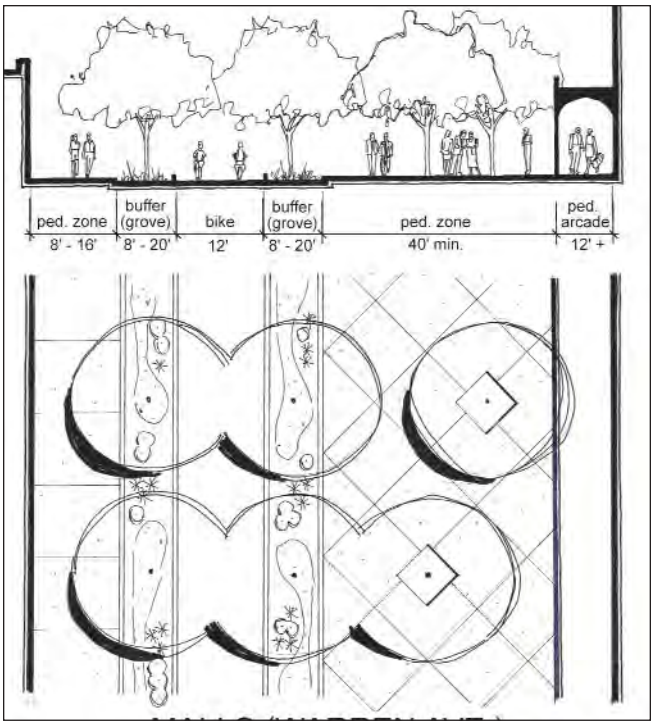
ARTERIAL ROAD

On Street Bike Lanes	*Buffer (Grove)*	*Pedestrian Zone*
Per COT standards	10' minimum (both sides)	12' minimum (both sides)
	Refer to Plant Material Guidelines	Sidewalk or Pedestrian Paving

CORRIDOR TYPES

MALLS

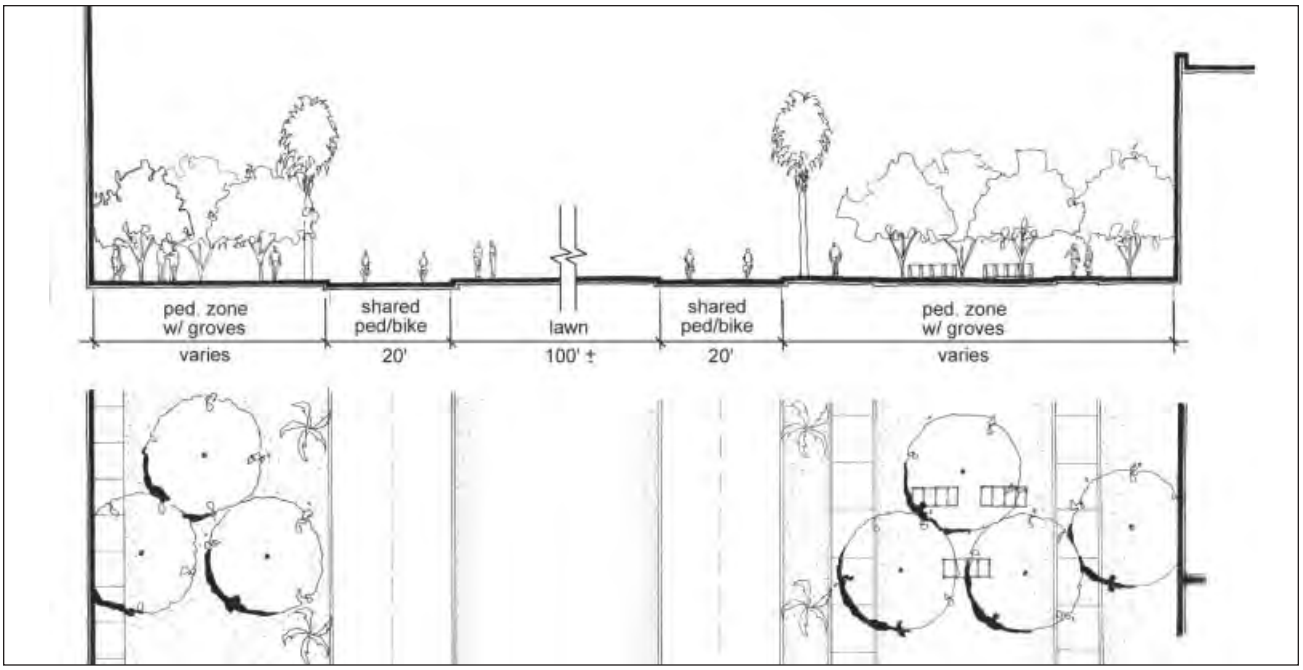
Please refer to Open Space Framework Guidelines.



Warren Mall

MALL

Bikeway	*Buffer (Grove)*	*Pedestrian Zone*
Min. one 12' bikeway	Min. one 8-20' buffer with trees	One or two 8-100' wide Refer to Open Space General
Striped asphalt	Refer to Plant Material Guidelines	Guidelines Pedestrian Paving. May also include turf



Main Mall

WATER MANAGEMENT & SUSTAINABILITY V

Who is the leader on a ship crossing the ocean? It's not the captain or navigator, but the designer of the ship. Everyone on that ship is affected by its design. No matter how good the captain is, if the ship isn't seaworthy, it is going to sink. It turns out that the system we've designed is not seaworthy. It's not air-worthy or soil-worthy. It just ain't worthy. So go out there and be designers who can work at the level of the community, because that's the level at which it is going to happen. The university is the ideal level of community to start with.

William McDonough, Dean
University of Virginia School of Architecture
Remarks to the Campus Earth Summit

Sustainability and "high performance building" are no longer concepts on the fringe of constructing our built environment. Increasingly, the benefits of building in this way are being realized through real economic, public health, cultural and environmental gains. Students coming to the University of Arizona will increasingly demand sustainable practices from the administration. States around the country are adopting policies that require new construction projects to meet minimum sustainability guidelines. University neighbors and the City of Tucson rely on the University for leadership in policy, research, and education.

The Comprehensive Campus Plan 2003 describes many fundamental sustainable planning initiatives, such as building compactly, preserving and enhancing the natural environment and open spaces, creating shade, reducing storm water runoff and preserving historic buildings and plants, among many others. These guidelines will barely scratch the surface of the myriad ways of building sustainably. They are intended as a basic guide to the fundamental issues, including principles for high-performance building, LEED guidelines, the design process, and institutional actions.

The principles for building sustainably are inextricably tied to the University's mission to discover, educate, serve, and inspire. John Porretto, Executive Vice President at UT-Houston, recognized this in building the Nursing and Biomedical Sciences Building at The University of Texas Health Science Center in Houston. He says of a similar mission:

> *"These principles will also help us to prevent, not create, illness and economic burdens. They will lead us to think in long-range terms. . . Their use will engender sound investments designed to achieve significant savings in operation and maintenance costs. These savings will make it possible to redirect dollars otherwise required for infrastructure to the core mission of the university – the cultivation of knowledge." (from an article by Penny Bonda, FASID, entitled "Zero Tolerance" in GREEN@WORK JAN|FEB|01, www.greenatworkmag.com.)*

Buildings and grounds that uplift the spirit and inspire creativity, collaboration, collegiality and learning are the best investments that a university can make.

Courtyard, linked to a green that is part of a block quadrangle, functions well for intimate or public uses. (Sciences Concourse, the University of Arizona)

Detention basin collects water for tree grove and wildflowers. (Pima Community College, East Campus)

Pervious pavement allows storm water infiltration. (Nature Conservancy Offices, Tucson)

WATER MANAGEMENT

Tucson receives an average of 10 to 12 inches of rain annually. Combined with low humidity and high evaporation, this results in thin, poor quality soils. However, two rainy seasons (summer and winter) make this part of the Sonoran Desert relatively lush compared to many other deserts, at least until periodic droughts occur. Intense summer storms can result in flooding and erosion of shallow desert soils. Water management on the University campus, therefore, consists of managing for too much water during floods and for too little the rest of the time. The University's goal is to conserve storm water on each project site as much as possible, to reduce downstream runoff into city streets and adjacent neighborhoods, to use runoff to supplement landscape irrigation, and to support other means of cooling the campus. All building and open space developments or redevelopments are expected to incorporate passive and/or active water management strategies as features in the landscape, such as:

- On-site solutions including directing runoff to gardens, greens, swales in groves, etc., collecting runoff on rooftops or in cisterns for future use to supplement landscape irrigation, and supply cooling towers and water features.
- District-and-campus scale solutions including reducing the volume and slowing the flow of storm water runoff through the landscape with vegetated swales, porous pavement, and sequences of check dams and catchments along the paths of runoff
- Developing larger open spaces at key storm water runoff locations as multi-purpose greens or groves that also function as detention/retention basins
- Dispersing storm water across stable pervious surfaces, including turf and pervious pavement
- Directing storm water to special leach fields, French drains and other systems designed to disperse water to the root zones of trees and other plants
- Use of low water use plant material and water conserving irrigation systems
- Conservation of potable water by using reclaimed water as the primary source of landscape irrigation water
- Educational interpretation of water conserving measures
- Do not include dry wells, injection wells, or other deep level storm water recharge systems

Refer also to City of Tucson Water Harvesting Guidance Manual and Arizona Department of Water Resources water harvesting and water management guidelines.

SUSTAINABILITY – OPEN SPACE

The Comprehensive Campus Plan 2003 has building footprints and open spaces arranged in a logical way that, as it is implemented, will reduce the need to rely on automobiles, improve pedestrian environments, minimize energy use and water management costs, and improve the quality of life. This section summarizes and clarifies the methods included in the plan that will foster a more sustainable campus through thoughtful open space development.

Wherever possible, the plan uses unconditioned (outdoor) spaces to link buildings and provide places for social, educational, and intellectual interaction. This approach can reduce the gross square footage of buildings needed to meet the campus's program, as well as reduce energy and other costs. The plan and the design guidelines achieve this goal by setting requirements for:

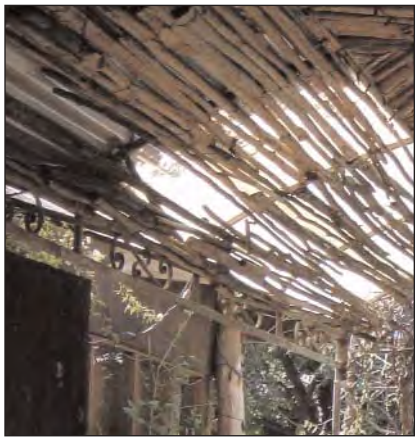
- Structuring and programming outdoor spaces to address user and campus needs
- Improving outdoor comfort by providing a choice of microclimates, adding shade, and collecting air cooled by evaporation from plants, fountains, misters, or cool towers in low lying open space areas.
- Create an inviting pedestrian and bicycle network with convenient transit links. As the planned circulation system is implemented, it will reduce and/or slow traffic and reduce fuel use, emissions, and runoff over impervious surfaces.
- Continue to reduce reliance on traditional storm water management

Plan proposal – mitigate storm water flow at campus edges with landscape buffer

structures and adopt more on-site management approaches. The following practices will improve infiltration of rain water, reduce the need to import water for irrigation, and improve plant health on the campus:

- Less paving and more emphasis on pervious surfaces in greens
- Use biotechnical erosion control solutions in lieu of impervious approaches
- Plant trees and understory plants to use of existing drainage patterns and/or directing on-site storm water to benefit plants
- Store storm water for use in irrigation systems, fountains, misters, and/or cool towers
- Emphasizing use of low water-use plant species and efficient irrigation systems.

Promote a healthy "urban forest" through design, management practices, and tree protection policies. Urban forestry research has shown that healthy trees and plants will cool the campus, reduce energy costs, minimize gas emissions from unshaded parked cars, reduce erosion, and stress, and help people



Shaded patio and garden at the Arizona Inn

Hydrology research at the University's Environmental Research Lab (ERL)

The University of Arizona Campus has been designated an arboretum

heal more quickly. A healthy urban forest requires:

- Regionally appropriate plant selection and biodiversity
- Correct pruning
- Root zone health
- Appropriate irrigation
- Commitment to the University plant protection policy
- A qualified arborist on staff, with knowledge of sustainable landscape practices and authority to make decisions affecting open space resources
- Use materials that meet recognized standards for sustainability.

Design lighting to achieve reasonable lighting levels, in accordance with the Open Space and other University Design Guidelines.

- Design pedestrian lighting to draw pedestrians to a network of safe corridors and open spaces.
- Provide for basic security, using standards for general purpose lighting in areas other than the pedestrian network described above.
- Do not evenly light the entire campus.

Use sustainable construction policies, such as:

- Appropriate construction machinery (i.e., the lightest equipment possible)
- Require site protection in construction documents, including clear designation of protected features and areas; protect soils from compaction; and build with great care near or under trees
- Clarify the need for sustainable practices in pre-construction meetings
- Enforce sustainable requirements during construction

Heal sites damaged by construction or neglect:

- Restore damaged soils
- Use green waste and other compost
- Restore regionally appropriate vegetation
- Use Sonoran Desert native plants, as well as others that will provide forage and cover for native birds

Native flora at Old Main

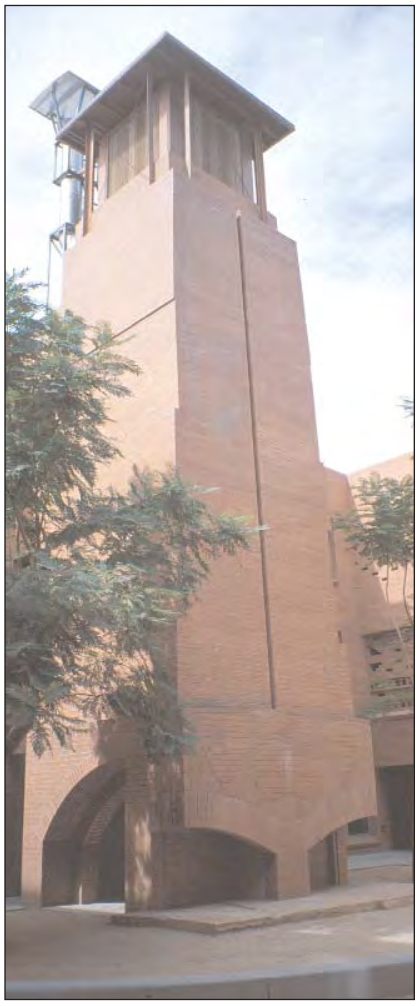
References: Thompson, J. William and Kim Sorvig, *Sustainable Landscape Construction, A Guide to Green Building Outdoors,* Island Press, 2000.

Interior daylighting

Plan proposal: Photovoltaic cells as shade device and energy collector on top of parking decks

What is high-performance building? The Commonwealth of Pennsylvania High-Performance Green Building Guidelines lists the following criteria:

- A project created via cooperation among building owners, facility managers, users, designers, and construction professionals through a collaborative team approach
- A project that engages the local and regional communities in all stages of the process, including design, construction, and occupancy
- A project that conceptualizes a number of systems that, when integrated, can bring efficiencies to mechanical operation and human performance
- A project that considers the true costs of a building's impact on the local and regional environment
- A project that considers the life cycle costs of a product or system. These are costs associated with its manufacture, operation, maintenance, and disposal.
- A building that creates opportunities for interaction with the natural environment and defers to contextual issues, such as climate, orientation, and other influences
- A building that uses resources efficiently and maximizes use of local building materials
- A project that minimizes demolition and construction wastes and uses products that minimize waste in their production or disposal
- A building that is energy, and resource-efficient
- A building that can easily be reconfigured and reused
- A building with healthy indoor environments
- A project that uses appropriate technologies, including natural and low-tech products and systems, before applying complex or resource intensive solutions
- A building that includes an environmentally sound operations and maintenance regimen.
- A project that educates building occupants and users to the philosophies, strategies, and controls included in the design, construction, and maintenance of the project



Cooling Tower at La Colonia del Paz Residence Hall

The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program is the generally accepted benchmark for sustainable building. The LEED rating system guides the process through a thorough and understandable checklist. Six sections are identified below and can be found at http://www.usgbc.org:

1. SUSTAINABLE SITES
- Site selection
- Urban redevelopment
- Brown field redevelopment
- Alternative transportation
- Reduced site disturbance
- Storm water management
- Landscape and exterior design to reduce heat islands
- Light pollution reduction

2. WATER EFFICIENCY
- Water efficient landscaping
- Innovative wastewater technologies
- Water use reduction

3. ENERGY AND ATMOSPHERE
- Fundamental building systems commissioning
- Minimum energy performance
- CFC reduction in HVAC&R equipment
- Optimize energy performance
- Renewable energy
- Additional commissioning
- Elimination of HCFCs and Halons
- Measurement and Verification

4. MATERIALS AND RESOURCES
- Storage and collection of recyclables
- Building reuse
- Construction waste management
- Resource reuse
- Recycled content
- Local/regional materials
- Rapidly renewable materials
- Certified wood

5. INDOOR ENVIRONMENTAL QUALITY
- Minimum IAQ performance
- Environmental tobacco smoke control
- Carbon dioxide monitoring
- Increase ventilation effectiveness
- Construction IAQ management plan
- Low-emitting materials
- Indoor chemical and pollutant source control
- Controllability of systems
- Thermal comfort
- Daylight and views

6. INNOVATION AND DESIGN PROCESS
- Maximize benefits of green planning by addressing issues at initial stages of a project

The design process as described by The Commonwealth of Pennsylvania High-Performance Green Building Guidelines follows:

Predesign
- Assemble green team
- Develop green vision
- Establish project goals
- Establish green design criteria
- Set priorities
- Develop performance-based building program
- Establish energy and lighting budget
- Develop partnering strategies
- Develop project schedule
- Review laws and standards
- Conduct research

DESIGN
- Confirm green design criteria
- Develop green solutions
- Evaluate green solutions
- Check cost
- Integrate systems
- Refine green solutions
- Check cost
- Document green materials and systems
- Verify material test data

CONSTRUCTION
- Verify submittals for green products and systems
- Commission the systems

OCCUPANCY
- Regularly Confirm System Performance
- Perform Maintenance
- Conduct Post-Occupancy Evaluation

Sustainable environment at Environmental Research Laboratory

Sun shade over glass facade

Thermal mass at Pima Community College

Additional guidelines for design and construction specific to Tucson:

1. Green Power

- Individual buildings should produce rather than use energy photovoltaics (PV) – full cost accounting (life cycle and externalized costs) glazing/PV combinations (screen/scrim effect) building integrated photovoltaics (tiles and other exterior finishes) retrofit or field installations (parking deck roof, remote campuses) possible wind power
- Fiberoptics to take advantage of abundant light selectively
- Passive solar to modify heat pulse
- Direct solar for local water heating
- Emphasis on insulation
- Demand insulation (timed foaming agents)
- Tectonic insulation (shading benefits not just for glazing but for solid envelope)
- Brise-soleil
- Thickened envelope (occupiable or not, rain screens, greenhouse envelopes)
- Canopied roofs (both occupiable and not; can be PVs)

2. Materials

- Establish a renewable, recycled, recyclable palette
- Maintain sources for renewing renewables
- Pursue local procurement
- Reduce, reuse, recycle, renew
- Examine material selection for deferred impact on air and water (extraction, manufacture, transport)

Overhead sun shades

UNIVERSITY-WIDE OPERATIONS, ADMINISTRATION, AND PHILOSOPHY

These recommendations are independent of new planning or capital projects.

A. INSTITUTIONAL ACTION

1. Charter a Sustainable Advocacy Group for the University
2. Write a vision statement
3. Adopt a sustainable platform to guide practice
4. Perform an institution-wide sustainability audit
5. Pursue third party review and certification of all projects (LEED program for buildings and look for institutional criteria and measures as they become available)
6. Institute a Sustainable Advocacy Group for planning and individual projects
7. Join U.S. Green Building Council
8. Keep abreast of local trends, incentives, and regulations
9. Promote innovative and collaborative thinking to make the institution more sustainable

B. EDUCATIONAL INITIATIVES

1. Be a model institution – teach other institutions
2. Keep staff, faculty, students, and neighbors informed on relevant policies, initiatives, goals
3. Operate as a clearinghouse for the many threads of related research going on within the University
4. Create an umbrella organization to bring together RNR, ERL, water resources, geology and soils, and other relevant programs
5. Coordinate classes with the drive for sustainability
6. Tie student projects and exercises into implementation

C. INTEGRATED PROCESSES AND SYSTEMS

1. Foster a holistic view of land and institutions
2. Develop and maintain a comprehensive sustainable master plan
3. Reinforce importance of pursuit of long-range vision and mission for all participants
4. CFP, FDC, G&L need to operate together
5. Integrate core and remote campuses with region
6. Consider sustainability in growth of remote campuses
7. Institute whole-cost accounting, cross-budgeting
8. Integrate capital and operations budgets for planning purposes

D. OPERATIONS

1. Site/vegetation audit and advocacy
2. Integrated pest management, strive to be pesticide-and herbicide-free
3. Seek out environmental products, services and expertise
4. Examine procurement policies for sustainable opportunities
5. Hire consultants with experience in sustainable design and construction
6. Screen vendors
7. Maintain nursery for mature plant source
8. Institute canopy sustaining program
9. Maintain facilities and grounds
10. Reduce light pollution

E. ENERGY

1. Reorient campus power supply to renewable, non-polluting sources
2. Reduce CFCs
3. Eliminate HCFCs and Halons from HVAC&R systems
4. Move physical plant into cogeneration
5. Use direct solar for water pre-heat and building tempering
6. Install evaporative cooling/cooling towers
7. Integrate photovoltaics into supply
8. Consider ground source heat pumps
9. Pursue integration and synergies in utility design

F. REGIONAL POSITION

1. Mitigate carbon balance off-site (e.g. forestry support)
2. Educate public through outreach, research, publication, participation, coordination
3. Balance stewardship, preservation, and conservation of people and place, culture, and community history as well as physical buildings and grounds
4. Support local initiatives for sustainability
5. Strengthen the surrounding neighborhoods and businesses
6. Advocate for mixed-use development
7. Build to improve regional systems like streetscape networks and linear greenways

G. TRANSIT

1. Encourage walking
2. Accommodate more students on and closer to campus
3. Create incentives for faculty and staff to live near campus
4. Provide more on-and near-campus employment for students
5. Encourage and facilitate biking
6. Retool campus transit and facilities fleet for alternative fuels
7. Maintain alternative fueling stations
8. Promote a campus and community car co-op
9. Develop park-and-ride
10. Integrate transit pass into student fees; put parking fees on top
11. Improve city bus service
12. Improve campus shuttle service
13. Institute traffic calming
14. Promote transit-oriented development
15. Integrate transit considerations into remote campus development

H. WASTE STREAM

1. Monitor and safeguard pollution-free operations
2. Provide closed loop for waste generated by animal feed, compost, recycling, recycled content products, building salvage, etc.
3. Composting toilets
4. Reclaimed water, grey water, and storm water harvesting
5. Lead in research on closed loop, industrial ecology systems

INFRASTRUCTURE

V

UTILITIES

OBSERVATIONS / EXISTING CONDITIONS

The objectives stated in the 1988 Comprehensive Campus Plan continue to be the priorities for utilities infrastructure development. The principal objective of the campus utility systems is to provide utility production and distribution services to campus facilities while meeting the demands of the facilities in an energy-and cost-efficient manner.

The campus utilities system includes three central plants for steam and chilled water production, two cogeneration (electric/steam) plants, and several miles of tunnels, distribution lines, collection lines, building service lines, water production ground water wells, and facilities for centralized interfaces with non-university utilities systems.

The three central plants include the Central Heating and Refrigeration Plant (CHRP) located within the north central quadrant of Precinct 4. Currently, the production capabilities of the CHRP include 8,500 tons of chilled water capacity and 180,000 pounds per hour of steam generation, including heat recovery from the adjacent cogeneration plant. Additionally, the CHRP produces reverse osmosis (RO) water for the main campus. The Central Refrigeration Building (CRB) is located in the north central quadrant of Precinct 3 and is solely a chilled water production facility with an existing capacity of approximately 12,000 tons of chilled water. The Arizona Health Sciences Center (AHSC) Central Plant is located in the west central quadrant of Precinct 2 and has a capacity of 7,000 tons of chilled water and 75,000 pounds per hour of steam generation, including heat recovery from the adjacent cogeneration plant. From the chilled water production and steam generation standpoints, the central plants have the capacity to meet the existing demands. However, as growth occurs on campus, all three plants will need to increase their capacities in a logical sequence.

The chilled water distribution system is interconnected to all three central plants, allowing for each of the central plants to produce chilled water for facilities in all four Precincts. The distribution system consists of a combination of direct buried mains, ranging from 42-inch to 18-inch in diameter, and tunnel piping ranging from 36-inch to 6-inch in diameter. The direct buried mains are interconnected with the tunnel piping, forming an integrated, looped distribution system. The system operates at a "Delta T" of 18 degrees with low head losses.

The distribution system exists in building areas with the primary expansion occurring within the redevelopment areas near the perimeter of the master plan and within the two-block area north of Speedway Boulevard Due to the cost associated with installing chilled water mains within tunnels, the trend at the University is to install new chilled water mains as direct buried piping.

It is anticipated that this trend will continue, with only smaller diameter lines installed within existing tunnels.

The existing steam distribution system includes 125-pound and 45-pound steam mains, condensate (pumped and gravity) lines, and appurtenances. The steam distribution system is divided into the areas north and south of Speedway Boulevard. The CHRP provides steam to the majority of existing buildings south of Speedway, and the AHSC central plant provides steam to existing facilities within Precinct 2. With expansion of the campus, interconnection of the existing steam distribution systems will increase the capacity of the system and add redundancy to the system. Interconnecting the steam distribution systems will necessitate a condensate management system. This system will address the requirement that the condensate return volume is commensurate with the steam production at each plant. To achieve this, a condensate transfer system should be developed. The existing steam distribution system is only in tunnels, with no direct buried lines, due to maintenance requirements. Cost constraints have prompted newer steam lines to be installed in smaller trench tunnels rather than in "walking" utility tunnels, as has been the University's standard in the past. It is anticipated that this trend will continue. However, the design of new facilities on campus should consider the development of utility chases through building basements that will allow the building requirements to be integrated with the utility requirements.

Tucson Electric Power (TEP) Company provides electrical power for the campus. TEP's primary high voltage feeders are interfaced with the University's distribution system at the CHRP and AHSC electrical substations. In addition to the TEP power source, the University operates two cogeneration plants. The 8 MW turbine adjacent to the CHRP is paralleled with the electrical distribution grid providing power to the campus. The 5 MW turbine adjacent to the AHSC central plant is islanded with power being provided to the CRB central plant. Currently, the capacity of TEP's existing high voltage feeders and substations are approaching their limits, requiring additional capacity for the future. From the substations and cogeneration plants, the University operates a high voltage electrical distribution system, incorporating cabling, underground duct banks, switches and building service transformers. The distribution grid is looped, providing multiple feeders to campus facilities. Recent and planned improvement to the University's electrical distribution system includes converting the distribution system, expanding the capacity of the system, and converting the entire system to 4160 volts.

Communications and data systems are provided by a number of carriers to the University with the major switch at the Computer Center in the central quadrant of Precinct 3 on the south side of Speedway Boulevard. The distribution system includes duct banks, conduits within tunnels, and copper

and fiber optic cabling to provide voice and data services to the campus facilities. Other services transmitted over the University's communications system include security phones and Energy Management Control Systems (EMCS) data transfer. In addition to the University's telecom system, other communications carriers provide service directly to specific facilities, most notably University Medical Center (UMC).

Other centralized University utility systems include fire alarm, RO water, compressed (instrument) air, reclaimed water, security systems, and EMCS. These systems are integrated into campus facilities through a combination of local cabling, conduit/cabling runs within tunnels and duct banks, and data transmission over the University telecommunications systems. Energy management and energy conservation has been a key component of the University's utility management protocol. The EMCS allows for utility demands at buildings to be monitored to facilitate optimization of the plant's operation as well as identify demands which deviate from expected parameters so that deficiencies in the system can be promptly addressed.

The compressed (instrument) air system includes a compressor plant located within the Harvill Building, compressors at the AHSC central plant, and a number of individual compressors within buildings in the area north of Speedway Boulevard. The Harvill plant was designed to be the main compressed air plant for the campus. Currently, the compressed air distribution is system adequate on the main campus. However, there is no existing air connection to the area of campus north of Speedway Boulevard. It is anticipated that the distribution system will be extended north through the Aerospace and Mechanical Engineering (AME) tunnel to the CRB. From this point, the compressed air distribution system will be extended through future steam tunnels in Precinct 2 and the northern half of Precinct 3.

The reclaimed water system receives water from Tucson Water at the meter station east of Hillenbrand Pool in the east central quadrant of Precinct 1. The meter station was designed in partnership with Tucson Water as a prototype to educate the public on the benefits of reclaimed water use as a means to reduce ground water withdrawals in the community. The University's reclaimed water distribution system extends from the meter station to the three central plants, the large turf areas which include east and west central mall, baseball, softball, and football stadiums and practice fields, and Bear Down field. Additionally, the distribution system extends to the southern limits of the proposed Warren Street Mall near Helen Street and Warren Avenue. Currently, reclaimed water is used for irrigation of most of the large turf areas and for the cooling towers at the CHRP. The cooling towers at the CRB and AHSC central plants are currently being converted to reclaimed water. A projection of future demands predicts that the reclaimed water system will result in a net reduction in potable water usage of more than 650 million gallons per year.

The University operates a public water system within the limits of the campus. The system provides potable water to the majority of campus facilities. However, it is not the source for fire protection water on campus. The water source consists of groundwater from University wells and augmentation from the Tucson Water potable system. There are two production wells (north and south wells) within Precinct 2 that supply the AHSC area, and four production wells (CRB, Architecture, Huachuca, Martin) that serve the main campus area. A fifth well on the main campus is being developed near the west side of McKale Center. The capacity of the existing wells ranges from 180 GPM to 300 GPM. Other than hydro-pneumatic tanks at the well head, there are no water storage facilities in the system. Peak demands exceeding the capacity of the well pumps are meet with augmentation connections (metered connection with booster pumps) from the Tucson Water system. Currently, there is one augmentation connection on the AHSC system and five augmentation connections on the main campus system. The water distribution system consists of piping through tunnels and direct buried piping ranging in size from 4-inch to 12-inch diameter. The distribution system evolved with the growth of the campus, thus the network of the distribution system does not conform to the typical configuration of a municipal distribution system. However, due to the locations of the water wells and augmentation points, adequate capacity exists in the system. As the campus grows, it will be desirable to interconnect the two distribution systems. Additionally, due to the differential between the costs of water produced by the University water wells compared to the cost of water purchased from Tucson Water, maximizing production at University wells should become a priority.

Local utility companies, in conjunction with University utility systems, provide utilities not mentioned above, including sanitary sewer, fire protection water, natural gas, and cable television.

The sanitary sewer collection system is a combination of University private gravity sewers and Pima County Wastewater Department (PCWMD) public gravity sewers. Typically, the sewers that collect only discharges from University facilities are considered private (University owned) and the sewers that collect discharges from University and non-University facilities are considered public. All University sewers eventually discharge into PCWMD public sewers. Discharges to the public sewers are governed by effluent requirements set forth in the Pima Count Industrial Wastewater Control (IWC) regulations. The University employs Best Management Practices (BMP) at the point of discharge rather than developing on-site treatment facilities to address IWC requirements.

The age of the existing sewer collection system ranges from 80 years to 2 years. The older sewer lines are generally 6-and 8-inch diameter vitrified clay lines installed at acceptable slopes, but many are near their conveyance capacity. To facilitate the construction of the Highland District Housing within

Precinct 4, a southwest campus sewer augmentation was recently constructed, increasing the sewer capacity within this precinct by 2 million gallons per day (MGD).

A review of the sanitary sewer collection system on campus indicates that Speedway Boulevard and Campbell Avenue essentially define the approximate limits of the sewer basin. Thus, the sewage flows from north of Speedway Boulevard travel in a north westerly direction while flows from portions of the campus south of Speedway Boulevard generally travel in a south-westerly direction. While some localized sewer augmentations will be required for the proposed development south of Speedway Boulevard, it is anticipated that the extent and expense of the augmentations in this area can be minimized with the selection of appropriate discharge points. However, north of Speedway Boulevard, it is anticipated that a major sewer augmentation will be required to meet the projected growth in this area.

Tucson Water's municipal water distribution system provides fire protection water to the campus and its facilities. The existing fire water system is a network of mains ranging from 6-inch to 16-inch diameter. The system is basically laid out along the original street grid of the area. As streets were vacated and abandoned, the lines generally remained along their original alignments, and some currently traverse open spaces. In converting the area along the mains from streets to open spaces, easements are required to enable Tucson Water to maintain their system. The capacity and configuration of the existing fire water system meets the existing fire demands of the campus. Since a majority of the potable water for the campus expansion will be supplied by the University's water system, the net increase in demands on the Tucson Water system should be minimal. Thus, it is anticipated that if the fire flow demands for the proposed buildings is not excessive, the existing water system should be able to meet the future demands with few modifications.

Southwest Gas (SWG) Corporation provides natural gas to the campus facilities. SWG operates the basic gas distribution system on campus, a high-pressure system to the cogeneration plants and a medium-pressure system to the buildings and central plants. Because the heating and cooling requirements for the new buildings are supplied by central plants, it is anticipated that the majority of new loads will be for emergency generators only. Since these are intermittent loads, the existing gas distribution system can support the new loads with some minor system modifications. However, with the predicted increased steam generation of the AHSC central plant, a new regulating system for the high-pressure gas system will likely be required.

Based on the review of the existing conditions, objectives for the utility systems include:

- Continuation of the current expansion, augmentation, and modernization of the existing utilities systems should proceed, with emphasis on energy efficiency, life cycle costs, and compatibility with utility rate structures.

- The distribution system loops and extensions should be completed in a manner compatible with the full build-out demands, providing safety and compatible improvements within the campus areas.

- Non-plant functions and offices should be relocated to support/service areas, administrative office facilities, or replaced as multistory buildings to release property for plant expansion.

- Planning for the AHSC central plant should recognize the designated expansion area to the immediate north of the existing plant. Planning for the CRB central plant should recognize the designated expansion area to the immediate east of the existing plant.

- Cooling towers near pedestrian and open spaces should be upgraded to cast-in-place concrete towers with an architecturally acceptable facade. Discharge areas on the towers should be at high elevations to minimize tower drift contacting users in adjacent areas.

- Planning should be undertaken to provide utilities services to emerging campus areas, especially the Cherry Outreach and northwest areas. Options to be examined include extension of central utilities to serve the facilities and stand-alone services for the new building(s). This evaluation should be based on full "build-out" development of the area.

- An Implementation Program for each utility system should be developed and periodically updated. This program should be used to plan and construct utilities in a timely manner along with buildings and facilities. Utilities infrastructure installations should accompany or precede, not follow, campus development. Utilities planning and development should recognize the changing state of the art and demands of utilities systems. This is an especially important consideration for providing the indoor environments necessary for research, computers, and for adequate telecommunications. The use of utility corridors that can accommodate additional lines without major disruption to buildings and can “plug in” new buildings along their length is one flexible approach to the situation. These corridors should make us of tunnels and/or direct burial.

- The location and design of above ground facilities should consider aesthetic impacts. Use of landscape and wall screening, and rooftop and basement locations out of sight from major open spaces and pathways is encouraged.

UTILITY - INFRASTRUCTURE NEEDS

As the campus grows to meet the mission and programs at the University of Arizona, the utility infrastructure must evolve with the proposed expansion to adequately support the existing and new facilities. New buildings totaling more than 8.4 million square feet are proposed during the full implementation of the master plan, substantially increasing campus utility demands. Fortunately, previous utility planning and expansion projects have established a sound foundation for the required utility expansions and augmentations.

The principal objectives for the expansion of the utility systems is to provide utility production and distribution services to campus facilities that meet the demands of the facilities, utilizing an efficient approach, with emphasis on energy efficiency, life cycle costs, and compatibility with utility rate structures. Generally, the use of central plants and cogeneration will continue to be the primary source to meet heating and cooling demands as well as reducing the requirement for the purchase of electrical power. Distribution systems will be extended and augmented within the areas of construction. Non-University utility providers will continue to provide electrical power, natural gas, off campus telecommunications networks, potable water, and reclaimed water to the campus.

CHILLED WATER SYSTEM

The three existing central plants, -- the Central Heating and Refrigeration Plant (CHRP), Central Refrigeration Building (CRB), and the Arizona Health Sciences Center (AHSC) Central Plant -- will remain and their chilled water production capacities will be expanded. The combined chilled water production capacity at the existing central plants is 27,500 tons. The projected future demand on the campus will increase to 48,000 tons. To accommodate this growth, the projected implementation plan proposes increasing the capacity of the CHRP to 12,000 tons with a new 3,500-ton chiller and 12,000 tons of new cooling towers, completely replacing the existing towers that are approaching the end of their service life. The CRB will be expanded to 24,000 tons with 12,000 tons of new chillers and towers. The implementation plan under consideration by the University is also evaluating ice generation and storage systems at the CRB. The addition of ice storage at the CRB could reduce a portion of the projected additional chiller requirements. The AHSC central plant will be expanded to 12,000 tons with 5,000 tons of new chillers and 10,000 tons of towers, expanding the tower capacity and replacing towers that are at the end of their service life. The chilled water distribution system will be expanded to the new building. The new system will be direct buried piping and networked with the existing large diameter mains.

STEAM AND CONDENSATE SYSTEM

Steam production will remain at the CHRP and the AHSC central plants. The capacity of the existing plants, in conjunction with the adjacent cogeneration plants, is 255,000 pounds per hour. This capacity will be sufficient to meet the anticipated campus steam loads through the midpoint of Phase 2. At this point, it is projected that a new 50,000 pounds per hour boiler will be required at the AHSC central plant. This implementation concept assumes that the stream distribution system is interconnected between the two central plants. To address the hydraulic problem that the interconnect will create with separate vented condensate sumps at each plant, a transfer system is proposed between the plants. The condensate transfer system will effectively add operational redundancy in the steam system that is not in the existing system where the two plants operate independently. The steam distribution system will be extended to the new facilities with a principal 8-inch, 125-pound loop installed in trench tunnels rather than in walking utility tunnels, as has been the University's standard in the past. Smaller diameter lines will be stubbed off the main loop to provide steam service to the new facilities.

ELECTRIC POWER SYSTEM

Tucson Electric Power (TEP) Company provides electrical power to the campus. Currently, the campus loads are approximately 30 MW, of which the on-site cogeneration plants can contribute 12 MW. Projections of the future loads indicate that the existing TEP substations and feeder will be at capacity during Phase 1 of the proposed development. To facilitate the campus development beyond this point, modifications to the substations and offsite feeders will be required. Currently, the University is developing an implementation plan in conjunction with TEP to expand TEP's service to the University to approximately 50 MW. The final location of the substation modifications will affect the alignment of the future distribution cabling. The electrical distribution system will be extended to the new facilities utilizing looped feeders to ensure a reliable power service to each facility. The distribution system will use existing and new duct banks for the expansion.

TELECOMMUNICATIONS SYSTEM

Voice and data service to the new buildings will be via the Center for Communications & Information Technologies (CCIT) campus communications system. It is anticipated that the main switches will remain in their existing locations but will be expanded. New copper and fiber optic cabling will be run in existing and new duct banks to provide service to the new facilities. The implementation plan for the new distribution system should be coordinated with the electrical distribution system and other utility systems to maximize the use of joint trenches, which will minimize the required area of the utility corridors.

NATURAL GAS SYSTEM

Southwest Gas (SWG) will continue to provide and distribute natural gas. With the heating and cooling loads being supplied by the central plant utility systems, the projected increase in demands for natural gas will be associated primarily with the emergency generators at buildings and the new boiler at the AHSC central plant. The area around the AHSC central plant is a low-pressure node within SWG's medium pressure distribution system. The implementation plan addressing this issue should consider the installation of a new regulating station on the high-pressure distribution system to augment the medium pressure system.

POTABLE WATER SYSTEM

The University's ground water well system will be utilized to the fullest extent possible. However, the projected potable water demands will exceed the capacity of the existing wells. To increase the capacity of the system, two options are available for the implementation plan. Wells could be developed, additional interconnections to the existing Tucson Water system could be constructed, or a combination of the two alternatives. There are benefits to utilizing a combination of the alternative water sources. Without water storage facilities in the system, the investment in new water wells could be maximized if the wells are designed to meet the average daily demands and allow connections to the Tucson Water system supply the difference between the average daily demands and the peak daily demands.

FIRE PROTECTION WATER SYSTEM

Fire protection water will continue to be supplied by the Tucson Water public water system. The existing distribution system is well networked within the campus and has the capacity to meet reasonable fire flows. It is anticipated that some modifications will be required to reroute existing mains from under future building footprints and replace isolated areas where the mains are undersized.

RECLAIMED WATER SYSTEM

The existing reclaimed water distribution system is developed to the extent that it can supply reclaimed water to the cooling towers all of the central plants and to all large irrigated areas. As future open spaces are developed, minor system extensions will allow the open spaces to use reclaimed water for irrigation. Using reclaimed water to the fullest extent possible is not only environmentally responsive; it mitigates the future demands on the potable water system.

SANITARY SEWER SYSTEM

The existing sanitary sewer collection system on the campus is a combination of University-owned, private sewer mains and Pima County Wastewater Management Department (PCWMD) public sewer mains. The existing sewer collection system covers the full extent of the campus; however, capacity issues exist. The recent construction of the 2.0 MGD sewer augmentation within the southwest quadrant of the campus addressed the majority of capacity issues within Precincts 1 and 4. However, there exist substantial capacity issues within the area north of Speedway Boulevard (Precinct 2 and the north half of Precinct 3). Based on the projection of future flows, an interceptor sewer with a capacity of 3 MGD will be required to serve the planned development in these areas. The nearest acceptable point of connection to the existing public sewer system is on the east side if Interstate 10, approximately 2 miles west of campus.

The consultant team wishes to acknowledge and thank the valuable input received from the many Design Guidelines workshop participants. Special thanks to Grant McCormick for his involvement with the Open Space Guidelines, Bob Smith and the Facilities Design and Construction staff for their insight into the Architectural Guidelines, and especially to Corky Poster for his inspiring and practical principles for creating an architecture true to this special place. His article *Sombra, Patios, y Macetas: Modernism, Regionalism, and the Elements of Southwestern Architecture* is from the Journal of the Southwest, vol. 35 no.4 (Winter 1993).

Courtyard at Mission San Xavier del Bac

THE UNIVERSITY OF ARIZONA®
COMPREHENSIVE CAMPUS PLAN
2003

VI. UNIVERSITY DEVELOPMENT AND PROCEDURAL POLICIES

INTRODUCTION

The purpose of the University Development and Procedural Policies Section is to outline the goals, the direction, and the conduct desired by the institution as it implements the Comprehensive Campus Plan. Actions, development tactics, and strategies will be framed within the guidelines of the policies.

The policies cover the review and renewal of the Plan and its implementation through the Capital Improvement Plan, building delivery processes, and land acquisition.

Close interactions with the neighborhoods adjoining the campus and the community and local governments are described as an element of planning goals, and of daily operations.

As host to a significant historic district listed on the National Register of Historic Places, the University aspires to a stewardship role with existing resources and identification of future resources.

Infrastructure and transportation goals and policies will help the institution implement its plan in a more challenging, highly urban context.

A. LONG RANGE DEVELOPMENT PLAN PERIODIC RENEWAL

Vision

The quality of education offered by the University of Arizona is directly linked to the quality of its physical environment. A significant objective in the University's mission is to offer an environment and culture that support all members of the University community. Long-range physical planning and plan renewal provide the administration with the tools to use scarce resources most efficiently and to develop and maintain a quality environment effectively.

Policy 1

A long-range development plan will be developed by the University to guide physical development on its main campus. Precinct or subarea plans within the campus planning boundaries shall be developed as necessary where there is a need for refinement. Plans will be presented to the Arizona Board of Regents for approval.

Policy 2

The long-range plan and precinct plans will guide the direction, physical needs, land acquisition, and overall approach of the University for a 10 to 20 year timeframe. The long-range plan will be based on the academic and research services the institution intends to provide; on the student population it projects to serve; and on the image the University leadership wishes to project.

Policy 3

The University will maintain an ongoing planning process and conduct comprehensive long-range plan reviews and updates at approximately five-year intervals. Significant revisions or concept changes long-range development plan or precinct plans will be presented to the Board for review.

Policy 4

Specific design standards or architectural guidelines are referenced in the plan but also may be amended or redeveloped as delegated by the University President after the plan is approved.

B. CAPITAL PLAN DEVELOPMENT

Vision

The Capital Improvement Plan is the state-mandated mechanism for programming and budgeting major new and adaptive re-use facilities deemed necessary by the University to support its strategic plan. The Capital Improvement Plan draws on guidance in the long-range development plan for appropriate programmatic relationships and facility siting, site-related issues that impact project budgets, and phasing of the required infrastructure necessary to support the capital projects.

Policy 1

The University will prepare a Capital Improvement Plan (CIP) every two years for submission to the Arizona Board of Regents. The CIP will contain proposals for spending on land acquisition, capital projects, energy systems, energy management systems, and building renewal.

Policy 2

The biennial Capital Improvement Plans have three main functions:

1. To serve as reference documents for current facilities inventory and related financial management information;
2. To request general fund monies, including building renewal, from the state; and
3. To identify capital projects the University intends to implement during the next biennium, along with a forecast of proposed activities.

C. PROJECT DELIVERY PROCESS

Policy 1

The University will submit an annual Capital Development Plan for the upcoming fiscal year to the Arizona Board of Regents. No capital project can go forward if not identified in the Capital Development Plan.

Policy 2

The University follows the process outlined in the Arizona Board of Regents Policy Manual to develop its capital facilities.

SUMMARY OF THE FIVE PHASES

1.Capital Development Plan Approval. The University identifies potential capital projects that contribute to the attainment of the mission statement and strategic plan, justifies the project need, and presents preliminary total cost implications for the University and the state.

2. Project Implementation Approval. The University defines elements of the project scope, schedule, and budget and proceeds with completion of schematic design.

3. Project Approval. The University completes the design and prepares construction documents

4.Project Construction. The University awards contracts and constructs the project.

5. Project Closeout. The University obtains substantial completion, completes building commissioning, final inspection, accepts and occupies the facility, and provides final payment to the consultants and contractors.

D. LAND/PROPERTY ACQUISITION

LAND ACQUISITION GOAL

Acquisitions of real property in support of the University Capital Improvement Program and Capital Development Plan will meet the essential needs of the institution.

Campus Planning Area History:

1967		575.0 acres
1981	Reduced	56.5
	Added	2.6
1996	Reduced	42.9
	Added	11.4
2003	Total	489.6 acres

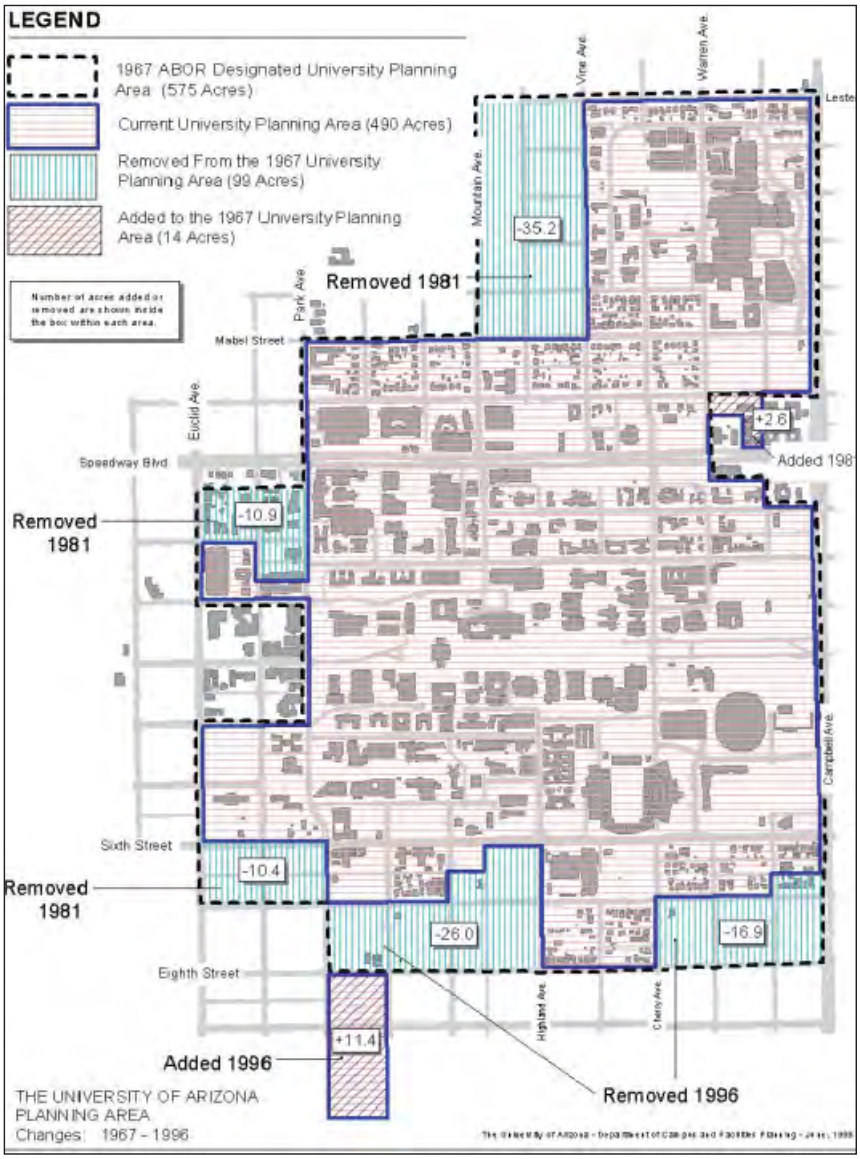


Figure 1

Policy 1

Purchases of real property by the University are conducted in compliance with all requirements of Arizona Board of Regents Policy Chapter VII, Buildings, Infrastructure and Land.

Policy 2

Planning Area Defined: A district whose boundary represents growth limits of the University of Arizona's main campus for the foreseeable future. These boundaries are similar to those of a municipality and may be subject to change over time. As cities grow and evolve, so do university campuses. The primary purpose in ABOR's designation of the original University of Arizona campus planning district was to provide residents in neighborhoods adjacent to campus some reasonable certainty about limits of campus expansion. The boundary of the district is not intended to remain fixed in perpetuity. The Planning Area has changed over the years, having been reduced in size on three occasions. In the future, the boundaries may be reconfigured again. The University of Arizona and Board of Regents reserve the right to consider and undertake such changes and would do so in consultation with area neighborhoods and the City of Tucson.

The 2003 update of the Comprehensive Campus Plan concluded that with a higher density of campus development, the existing boundary of the University Planning Area may remain in place for the foreseeable future. In addition, the district could support the space needs associated with an enrollment of 40,000 FTE, and approximately 80% growth in research.

Retain the existing planning area boundary as delineated in 1996. (Figure 1) The boundary will function as the limit of University development, protecting the neighborhoods and commercial areas outside the planning area from encroachment. The boundary will be reviewed at five-year intervals in conjunction with the five-year review of the Comprehensive Campus Plan.

This policy does not apply to outlying University properties, such as the Campus Agricultural Center, University Services Annex, or Rincon Vista Recreation Center.

Within the immediate environs of the University Planning Area, the University may participate in public/private ventures or act solely on its behalf to develop student/faculty housing, retail, and/or other support land uses for the campus community. These potential undertakings would be coordinated in close cooperation with the City and neighborhoods.

University use of leased space outside the University Planning Area and within the immediate environs of the campus will be consistent with the City of Tucson Land Use Code.

Policy 3

Retain the "grandfathering" provision of the Land Acquisition Guidelines incorporated into the Comprehensive Campus Plan adopted in 1988. Under the "grandfathering" provision, all property owners who have continuously resided in the same residence within the University Planning Area prior to December, 1967 may remain in their present residence for as long as they wish.

Policy 4

The University will accommodate University-affiliated and support usage by entities such as religious groups, fraternities and sororities, and government entities within the University Planning Area. This accommodation may include disposal or trade of University property on a case-by-case basis in support of University-affiliated uses. Due to land area constraints, it is possible that not all Greek organizations with chapter houses may be accommodated within the campus.

Policy 5

Retain the Historical Society Museum and Mansfeld Junior High School. This may include the trade of University property to consolidate holdings respective to each institution.

Policy 6

Develop a program to inventory all buildings outside of those already on the National Register of Historic Places under University ownership in order to identify historical resources. This is proposed to include historical assessment or properties as the University acquires them.

Policy 7

Property-purchase activity undertaken by the University business office responsible for land acquisition includes:

1. Initiation of contracts with owners concerning their possible interest in selling properties to the University;
2. Coordination of efforts required to conduct a professional appraisal of such properties for the University or multiple professional appraisals for the University and the property owner;
3. Negotiation within the range of two independently determined appraisals;
4. Participation in discussions with property owners to negotiate purchase;
5. Dissemination of information to property owners, real estate professionals, and the general public regarding University land acquisition guidelines for the Planning Area; and,
6. Preparation of documents required to consummate sales of real property to the University within the Planning Area.

LAND USE GOAL

The campus land resources will accommodate the campus development requirements with development intensified in appropriate areas of University-owned property over the next planning period.

Policy 1

Planning Objectives. The University is cognizant of the impact of planning activity and land acquisitions on property owners and residents within the University Planning Area, as well as the implications of such to the entire community. While it is recognized that real property purchases in the University Planning Area are essential in meeting the capital facilities requirement of the teaching, research, and public service functions of a major university, it is important that the institution be sensitive to the concerns of residents in the University Planning Area and surrounding neighborhoods.

Policy 2

Develop facilities, including parking structures, that will minimize horizontal extension of the campus and increase the utilization of available space.

Policy 3

Stimulate private-sector investment for construction of student housing.

Policy 4

Pursue cooperative study efforts with the City of Tucson to develop comprehensive means of addressing pedestrian and vehicle circulation and parking in the campus area.

Policy 5

Provide recreational facilities in multiple locations, primarily in areas where students circulate or reside (i.e., student housing, McKale Center, etc.).

Policy 6

Develop agricultural research activities and other non-instructional or support service functions in areas remote from the campus to conserve limited space in the University Planning Area for institutional “highest and best use.”

Policy 7

Continue cooperative efforts with the City of Tucson to support existing business activity consistent with the need to reduce pedestrian and vehicular conflicts on major thoroughfares.

E. INTERACTIONS WITH COMMUNITY AND LOCAL GOVERNMENT

Vision

Cooperation with neighborhoods surrounding the University is crucial to maintaining sound functional and aesthetic relationships over time. The basis for this cooperation is the recognition that physical planning and development issues impact the University and its neighbors and are a mutual concern. To this end, the University and its neighbors and other community members participate in joint information sharing and working committees.

Policy 1

The Campus Community Relations Committee (CCRC) exists for the purpose of bringing together the University of Arizona, the City of Tucson and the neighborhoods in the University area to discuss issues, resolve conflicts, find and implement mutually satisfactory solutions to problems, and work for the betterment of the community in an atmosphere of respect.

Policy 2

The Community Planning Advisory Committee (CPAC) exists to involve/gain input from neighborhood residents/representatives on aspects of projects that might impact neighborhoods, based on CPAC guidelines.

The CPAC will solicit community comment/advice on the external elements of the University projects. The committee is advisory in character, therefore comment/advice is not required to be incorporated in the final design and construction. The overall goal is to achieve a balanced design compiled from all input.

Vision

Interagency coordination is a critical aspect of plan implementation, in particular in regard to infrastructure systems and storm water drainage. The intent is to develop seamlessly within the infrastructure of the surrounding urban fabric.

Policy 1

Significant and on-going coordination will be maintained with the following entities:

City of Tucson
Pima County
Pima Association of Governments
Southwest Gas Corporation

Tucson Electric Power Company
Tucson Unified School District
SunTran

Policy 2

Intra-agency coordination will be maintained within the University Planning Area to ensure orderly and systematic development and other activities with affiliated entities, such as University Medical Center, University Physicians Incorporated, and the University of Arizona Foundation.

In particular, coordination is necessary between University Medical Center (UMC) and the University in assessing the development needs of each entity and properly locating new facilities in relation to the entire AHSC complex. To implement development proposals, cooperation is required in:

- Facility planning and design;
- Land and space arrangements such as leases and easements;
- Circulation and open space improvements, such as new streets, street widening, and pedestrian linkages;
- Financial arrangements for construction and maintenance.

Policy 3

The private sector and other entities, such as religious or fraternal organizations, may participate in physical development within and at the perimeter of the campus Planning Area. The private sector involvement currently or potentially may include the provision of residential, commercial, recreational, office/services, and parking facilities in proximity to and at least partially serving the campus community. The relationships between private entities and the University can vary widely, from formal legal relationships concerning particular projects to informal cooperation and information sharing.

F. STEWARDSHIP OF CAMPUS HISTORIC RESOURCES

Vision

The University recognizes that historical, archeological, cultural, and architectural resources must be considered in the planning for land and facility use and development. The University assumes a stewardship role and responsibilities regarding preservation of these resources within the University planning area and at other locations owned or under the control of the University (e.g., Tumamoc Hill, Campus Agricultural Center).

Policy 1

The University will continue to comply with the provisions of the State Historic Preservation Act of 1982 and the Arizona Antiquities Act of 1960, as amended.

Policy 2

The University will document historic or potentially historic resources consistent with the 1982 act in a professionally competent and reasonable manner and in consultation with the State Historic Preservation Office (SHPO).

Policy 3

The University will consider adaptive use or re-use of historic resources (e.g., buildings and sites) under ownership and control of the University in the planning and implementation of projects.

Policy 4

The University will encourage public appreciation of historic values through educational programs and through the study and interpretation of archeological, architectural, and historic resources throughout Arizona.

Policy 5

The University designated Historic Preservation Coordinator (HPC) is responsible for ensuring compliance with the above policy guidelines and all applicable regulations of the State.

Policy 6

The HPC is responsible for coordinating University activities and projects with SHPO as necessary or appropriate and will be supported in these efforts by campus planning staff.

Policy 7

The University's HPC will be appointed by the President, is the University's designated liaison with the SHPO, and is responsible for annual reports, if requested, on preservation activities of the University.

G. CAMPUS INFRASTRUCTURE

Vision

The Capital Improvement Program should include projects to complete infrastructure development and enhancements in conjunction with buildings and other facilities. Utility and other infrastructure should accompany, not follow, campus development. The location and design of aboveground facilities must consider aesthetic impacts. Use of landscape and walls to screen the facilities and rooftop or basement locations away from major open spaces and pathways is preferred.

Policy 1

Large open-space development projects, such as malls, corridors, and district-level quadrangles will be funded where possible through district infrastructure projects, especially in cases where the district as a whole is being redeveloped and/or improved.

Major capital projects will fund an equitable share of open space development associated with and adjacent to the project, such as a block-Level quadrangle or building courtyard. The Comprehensive Campus Plan will be the basis for developing the preliminary landscape budget.

Policy 2

Where possible, sufficient land will be reserved on campus to provide adequate storm water detention to mitigate the impacts of existing conditions and new campus development on other parts of campus or the surrounding community

The University will partner with the city and other entities as needed to develop storm water management plans for drainage basins where there is a mixture of jurisdictional control.

Policy 3

Utility planning and development should recognize the changing nature of the technology and demands of utility systems. The use of utility corridors that accommodate additional lines without major disruption will be utilized. The designated corridors could contain tunnels or direct burial of systems. Connections to central utility systems are preferred. Stand-alone service for individual buildings is allowed only in special circumstances.

DISTRIBUTION NETWORK GOAL

The modernization and expansion of the existing utility systems should proceed with emphasis on completing an efficient and effective system distribution network and provide safety improvements and upgrades within the existing campus systems.

PLANT FUNCTIONS GOAL

Central plant compounds should be configured to maximize capacities by placing non-plant functions in designated support/administrative areas.

Policy

Infrastructure improvements to streets and roads, where feasible and appropriate, will reconfigure the surface to promote pedestrian-oriented environments, using traffic calming techniques, shade, and other amenities.

OPEN SPACE GOAL

Improvements to surface infrastructure projects are incorporated as components in the project to address pedestrian, bicycle, motor vehicle circulation, and surface drainage. Open space development will incorporate these elements into the campus landscape and fabric and improve functional connections.

The combination of utility and open space enhancements will establish the framework for orderly and aesthetic campus development.

H. TRANSPORTATION AND CIRCULATION

Vision

The University is committed to meeting the challenges associated with growth, land use, travel, and public access. The primary aim is to improve and enhance the manner and means by which people move to, on, and around the campus.

Policy 1

Transportation and circulation within and surrounding the University should maintain a balance of travel modes, along with providing a sense of order and convenient access. Circulation routes and transportation systems should contribute to a pleasing environment for individuals who work at, attend, and visit the University as well as for those who live in adjacent neighborhoods. Providing a clearly organized system of pedestrian, bicycle, transit, and vehicular facilities is essential for creating this environment. Expanding transit services, consolidating parking services and providing additional facilities off campus, improving travel routes and way-finding, increasing the use of alternative modes, encouraging modal connectivity, and obtaining funds to support these activities are critical to achieving the vision within the University area.

GOAL

To create and maintain a balanced multi-modal transportation system that provides choices among all modes, reduces reliance on any single mode, and takes advantage of the inherent benefits of each mode.

OBJECTIVES

- Promote alternative modes and flexible hours to reduce vehicle miles traveled and peak-hour congestion.
- Continue to develop and expand the University shuttle system, especially to park-and-ride lots.
- Continue to coordinate SunTran services, especially park-and-ride lots, schedules, and circulator routes.
- Develop and implement projects that accommodate multiple modes.

GOAL

Create a pedestrian, transit, and bicycle-oriented circulation system on campus while maintaining access for emergency and service vehicles.

OBJECTIVES

- Provide an access network within campus for all mode types
- Emphasize pedestrian and bicycle circulation as the primary modes of travel on campus
- Develop convenient bicycle parking and a safe, efficient, and continuous bicycle circulation system with separated facilities wherever feasible

GOAL

Improve the function and legibility of transportation access to campus

OBJECTIVES

- Implement design concepts for Sixth Street that recognize the University and pedestrian character while reducing the auto orientation and conflicts between modes.
- Identify highly visible gateways and provide way-finding aids at each gateway and along permanent corridors
- Define access and circulation routes by mode preference and design each route to minimize congestion and on-campus vehicular circulation
- Identify potential improvements to alleviate congestion and operational problems on surrounding streets

GOAL

Protect area neighborhoods from University related traffic and arterial traffic and promote neighborhood quality of life through traffic management and control strategies

OBJECTIVES

- Support programs that restrict or manage on-street parking by non-residents in adjacent neighborhoods
- Provide an acceptable level of access for local traffic, minimize unwanted traffic, and encourage alternate modes in adjacent neighborhoods
- Provide safe and continuous travelways for pedestrians and bicycles
- Maintain acceptable level of service for arterial streets to minimize intrusion/diversion

GOAL

For the proposed solutions, programs, and actions to be undertaken, seek creative and innovative implementation strategies, policies, tools, costs and financial resources, and roles and responsibilities to achieve them.

Policy 2

Coordinate the University, City of Tucson and community transportation planning and operations.

GOAL

Coordinate the University and City of Tucson transportation and operations within the University area by enhancing communication and relationships between the neighborhoods and the jurisdictions.

OBJECTIVE

Maintain relationships with the neighborhood associations and community organizations, such as the Campus Community Relations Committee, City of Tucson Citizens Transportation Advisory Committee, and the Tucson/Pima County Bicycle Advisory Board

GOALS

- Clarify and document the transportation planning and decision making processes to gain greater support for transportation improvements
- Maintain and enhance campus and community education through coordination with the University and City of Tucson Alternative Modes and Travel Reduction Programs
- Examine possible modifications to the University work and class schedules that could provide positive impact to the community circulation system

OBJECTIVES

- Explore shifting class start times to 20 minutes past the hour, scheduling more evening classes and programs, and pursuing the telecommuting potential for various campus activities and certain positions
- Explore with the Tucson Unified School District the options for adjusting class schedules in schools near the University, especially those located on Sixth Street, to ease the peak-hour use of the transit system.

Policy 3

Coordinate transportation and land use planning to ensure that future developments positively contribute to the quality of life on campus and in the University area

GOAL

Encourage and endorse the University area land use decisions that will better support the transit, bicycle, and pedestrian systems, and improve the quality of life

OBJECTIVES

- Identify off-campus areas appropriate for student, faculty, and staff housing that are clustered or concentrated along major transit corridors (Transportation Oriented Developments – TODS), or are within walking and biking distance from campus.
- Encourage compatible development within the neighborhoods
- Increase student residential capacity on campus and relocate student family housing closer to campus
- Work actively to attract sustainable commercial/mixed use development to the University area
- Reassess the results of the 1997 SunTran Comprehensive Operational Analysis (COA) used to assess the value of the benefits to the community and users, resulting in good decisions regarding enhanced transit service to, and within, the University area. Investigate potential circulator and feeder routes that could more intensely service the surrounding two to three miles.

GOALS

- Change the urban design of transportation routes to eliminate or reduce conflicts between transportation modes
- Modify the City of Tucson Major Streets and Routes Plan and Development Standards to include the designation and design of "traffic-calmed" streets around the University area.

Policy 4

Develop a University visitor service system of facility reception centers, parking attendant booths, information kiosks, campus directories, and other devices to provide a campus network of visitor information at campus entry points (Cherry Avenue and Speedway Boulevard, Campbell Avenue and the University Mall, Highland Avenue and Sixth Street, Park Avenue and Sixth Street, University Boulevard at Euclid Avenue or Tyndall Avenue, Park Avenue and Speedway Boulevard, and Mountain Avenue and Speedway Boulevard). Establish a more visible visitor service center in the historic main gate area (generally located between Old Main, Euclid Avenue, Fifth Street and Second Street) to provide visitor orientation from the historic gateway to the campus.

Policy 5

Designate Sixth Street and Campbell Avenue as a light rail and/or transit corridor and further explore the potential development of this system

Policy 6

In the University area, support improvements and projects proposed by the City, which will enhance the level of service for Speedway Boulevard in conjunction with other strategies that promote the use of alternative modes.

GOAL

Research and implement changing traffic signal timing and activated devices to encourage safe pedestrian and bicycle crossing and changing traffic signalization cycles to allow a left turn sequence at key intersections

Policy 7

Continue to replace campus surface parking lots with transit supportive, mixed-use parking structures to more effectively utilize the limited land area available to the University campus for non-parking purposes.

GOAL

Develop off-campus park-and-ride lots and the supporting shuttle system to serve the University campus community

GOAL

Determine the criteria and performance measures to assess the traffic impact of new structures on campus and require that these be used in each Traffic Impact Assessment conducted under the requirements of the PAG/University Memorandum of Intent. This applies to facilities that will generate more than 100 vehicle trips per day.

GOAL

Improve the coordination between, and connections to, VanTran, SunTran, and CatTran and various visitor needs, such as disabled visitor parking spaces on campus

Policy 8

Universal accessibility will be provided entering into and throughout campus. Case-by-case exceptions may be made where prior development simply cannot achieve this level of universal accessibility

GOAL

Accessible routes of travel will coincide with routes of travel used by individuals who are ambulatory

GOAL

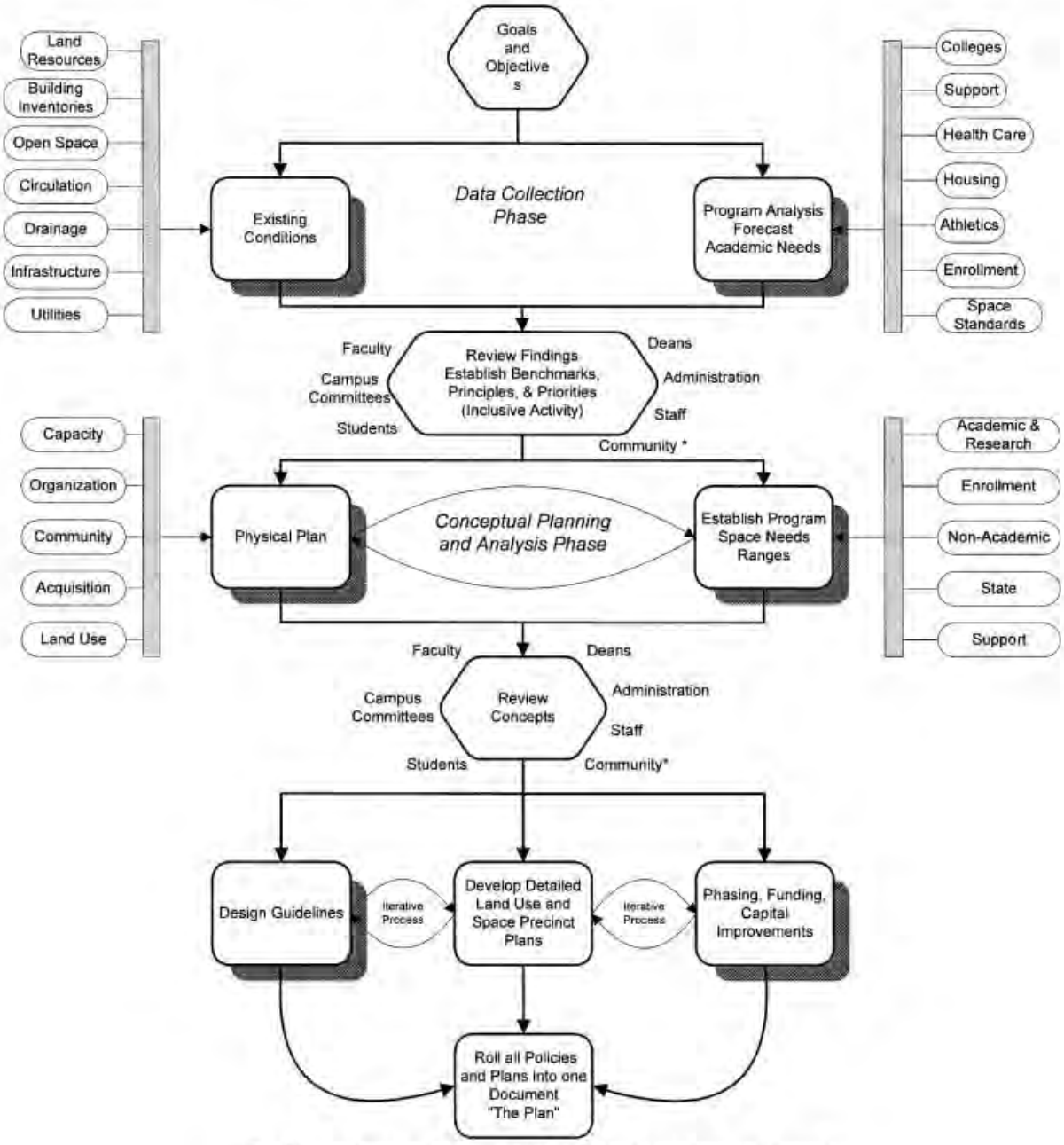
Aesthetically appealing signage indicating accessibility accommodations, such as locations of TDDs, should be consistent with the decor and ambiance of the surrounding area while maintaining maximum functional usability

GOAL

Seating, circulation, meeting, and building approach areas will be fully integrated rather than specialty areas or paths for those with disabilities

Process for the

Comprehensive Campus Plan Update 2000 - 2003



The Comprehensive Campus Plan is physically implemented through the Capital Improvement Plan, other campus improvements and funding opportunities, and design guidelines.

* Community includes Alumni, Neighbors, City Staff, etc.

The University of Arizona
Campus and Facilities Planning
November, 2002

ACKNOWLEDGEMENTS

Updating the 1988 Comprehensive Campus Plan requires the support and commitment of a broad crosssection of the University community. The Planning Team wishes to acknowledge the following for their active participation:

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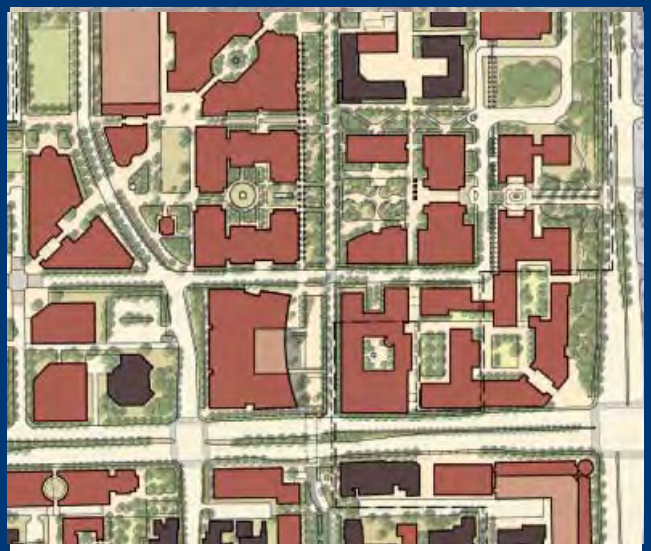
THE UNIVERSITY OF ARIZONA®
COMPREHENSIVE CAMPUS PLAN
APPENDIX

2003



THE UNIVERSITY OF
ARIZONA®
TUCSON ARIZONA

ADOPTED BY THE ARIZONA BOARD OF REGENTS JUNE 2003

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THE UNIVERSITY OF ARIZONA®
COMPREHENSIVE CAMPUS PLAN
2003

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INTRODUCTION

PURPOSE

The first phase of the campus planning process is the Observations. Through this process we analyze the quantitative and qualitative aspects of the campus to generate a set of guiding principles that reflect the philosophies, culture, and setting of the institution. Through the lens of these principles, all campus plan recommendations are made. The Observations phase lays the foundation for a comprehensive campus plan.

PROCESS

This process relies on existing data; studies; visual assessment; interviews; and separate, ongoing planning and design efforts. The observations are organized into four main categories: history, natural systems, built systems, and program. The goal is to understand how these elements have influenced the physical environment over time and how they may be used strategically in the future to enhance and affect growth.

HISTORICAL GROWTH

Historical growth patterns for the campus and the city reflect attitudes and opportunities over time and provide insight into current physical relationships. A rather modest initial land grant, coupled with its adjacency to a rapidly growing city, has resulted in the University's finding itself somewhat constrained by neighboring communities. Efforts by the University to find room to grow have sometimes put it at odds with neighbors. In the following pages, we look at the historical growth of the University of Arizona relative to the growth of the City of Tucson. Four periods of growth are studied.

Old Main – 1891

1891

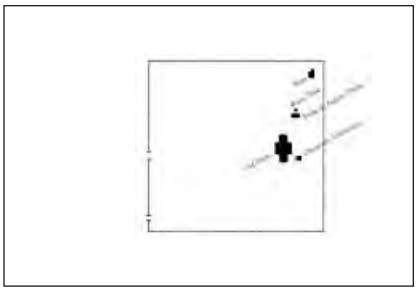
These historical images illustrate the growth of the University and city together.

The map below shows the extent of the town in the given period (purple) with respect to the current main, agriculture, and science-tech campuses (orange), all on the larger backdrop of the modern limits of development.

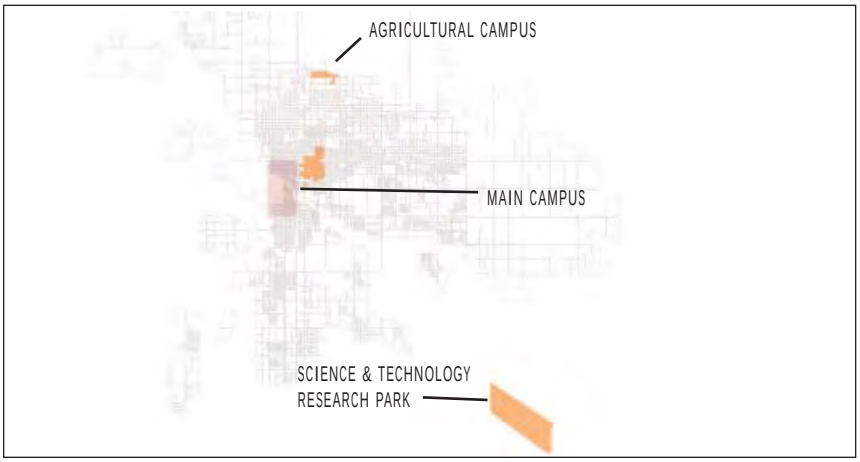
Below right is the contemporaneous plan of the campus – Old Main in the desert. The photos demonstrate the character of campus and its context in each period.

In 1886, 40 acres of what was called "the barren land with the glorious view" was deeded from private donors to become the campus of the University of Arizona. It is interesting to note that although a land grant institution under the 1862 Morrill Act, the University began with only 40 acres. This is in sharp contrast to other comparable universities that obtained significant land holdings at their foundings.

The original cactus garden to the west of Old Main, c. 1898



Opening Day, 1891



City Growth – 1891 (Historic City Boundary in Purple)

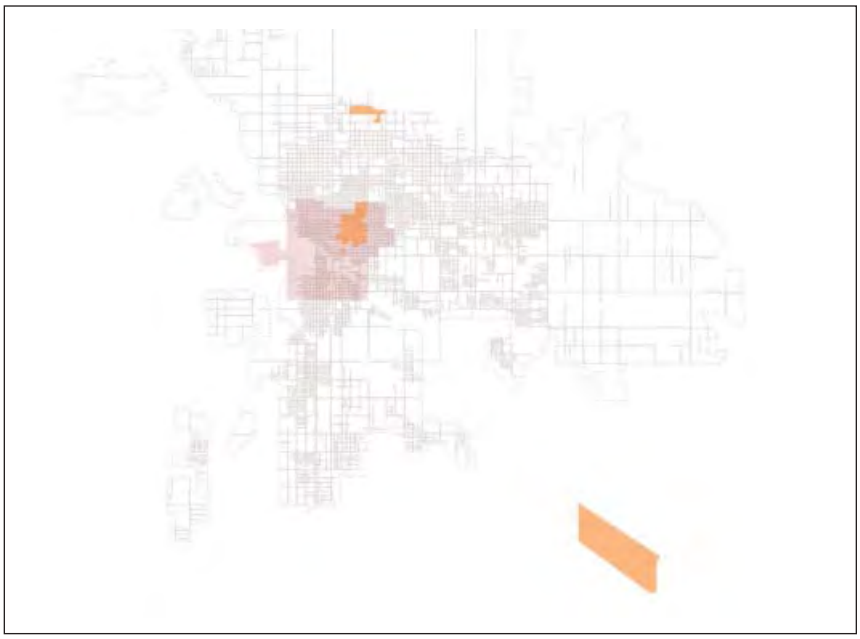
**Photos and campus diagrams from* "A Photographic History of the University of Arizona 1885-1985" by Phyllis Ball, © 1986 Phyllis Ball

Aerial view – 1919

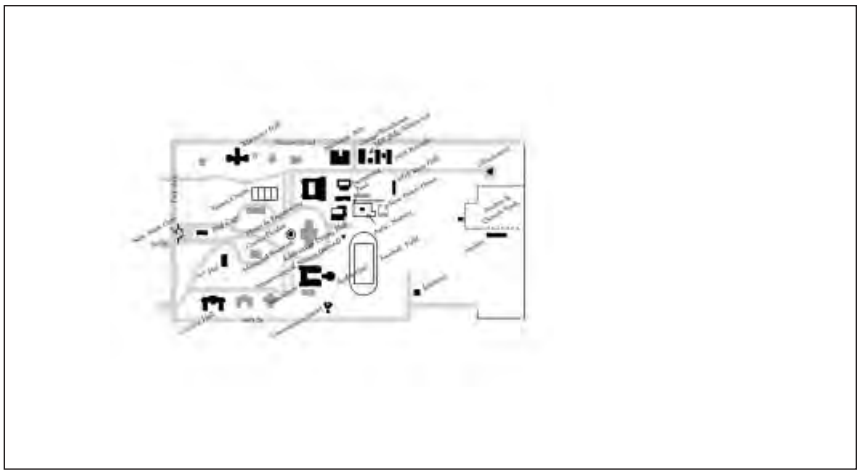
View from Old Main toward what is now Arizona State Museum

1914-1921

The historical core of the campus develops within a rectilinear envelope, within which a loosely defined grid is formed. The original campus was laid out in a manner based on historic Eastern schools. At the heart of the campus, Old Main is flanked by buildings, thus creating a cross axis connecting the primary open space in front of Old Main with the secondary open spaces in front of the north and south residence halls. A main gate is established on axis with Old Main. The urban grid of Tucson begins to engage the University from the southwest. At the same time, the campus maintains a casual, ranch-like atmosphere with meandering roads and diagonal pathways.



City Growth – 1920



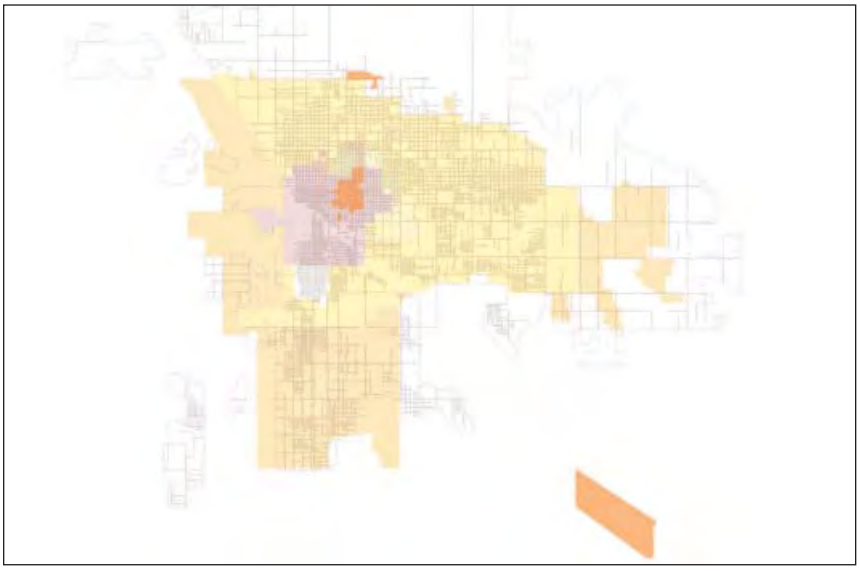
Campus Growth – 1914-1921

1951-1961

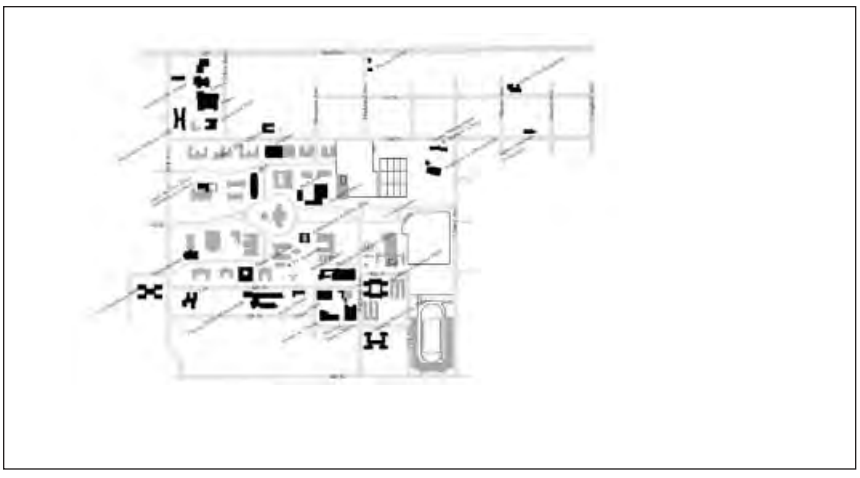
In the post-war years, the city leapt over the University and enclosed the campus. The historic core of campus is now relatively densely built. The central campus expands farther to the east in a hierarchically horizontal grid. The mall has taken shape to the east of Old Main. The main gate to the west has moved south in order to connect with the city grid surrounding the campus. Post-war housing surrounds the polo grounds to the north. Fraternity houses also are built to the north. The town experiences the post-war population boom and begins to fill the valley.

City Growth – 1960

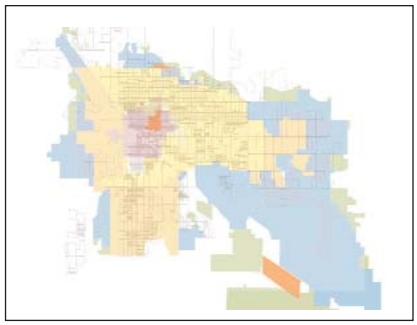
Aerial view – 1954



Campus growth – 1951-1961



View west along mall towards Old Main



City Growth – 1990

Aerial view prior to new union/Integrated Learning Center (ILC)

View west along mall overlooking the ILC

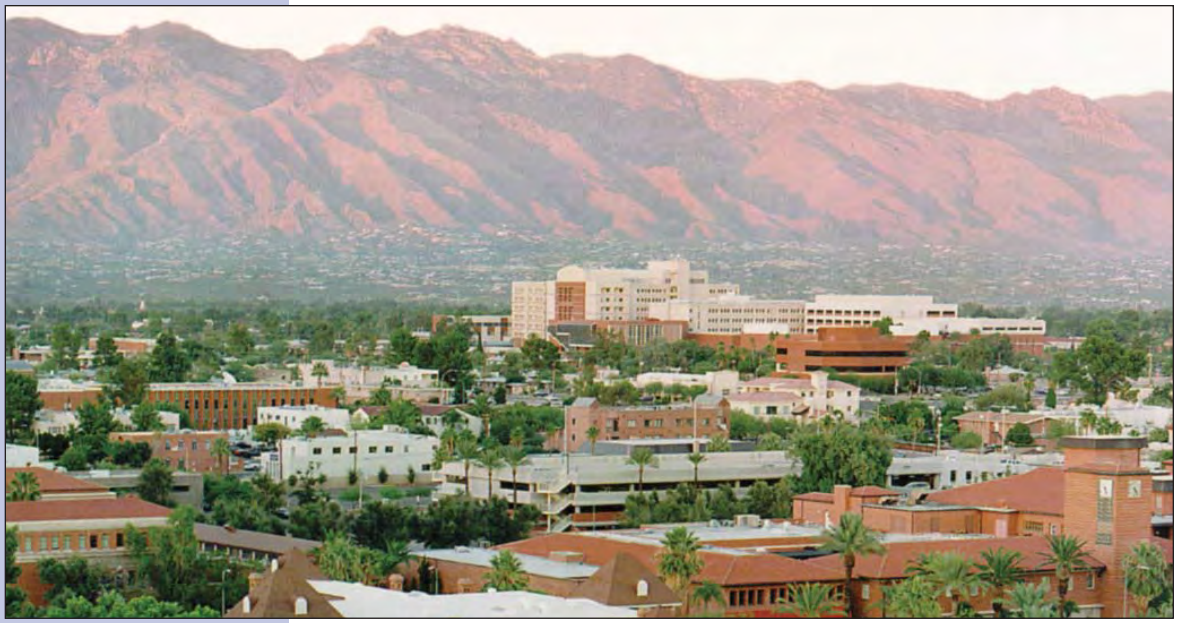
PRESENT

The current campus plan shows the narrowing gap between north campus and main campus. The Arizona Health Sciences Center now dominates the north campus. The main campus has grown in a grid fashion to its current east boundary at Campbell Avenue. Where larger footprints of new buildings block streets, the grid becomes deflected. The campus has grown in a relatively uniform moderate density. The incorporated city limits have enclosed the science and tech park.

Current Campus – 2001

NATURAL SYSTEMS

1

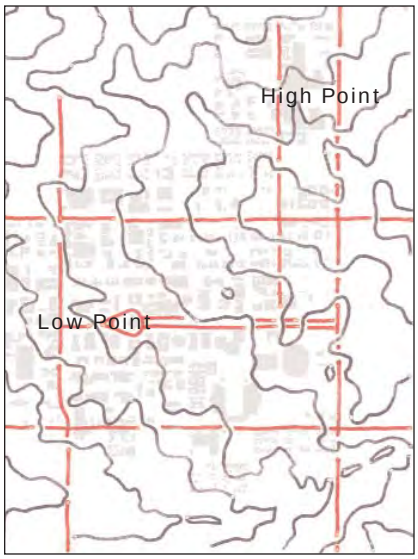


The University of Arizona is in a remarkable environment. Stark and stunning, the landscape provides a unique setting in which to live and learn. It is a place of dualities – the unique desert terrain beckons exploration and recreation, but is an extreme environment. The hot, arid climate is inviting and comfortable for most of the year but can be overheated at others. The days are hot, but desert nights can be cold. Water is scarce, but when it rains, monsoons cause rapid flooding. Desert vegetation is sculpturally beautiful but does not provide comforting shade. Where there is water however the vegetation can provide a verdant oasis.

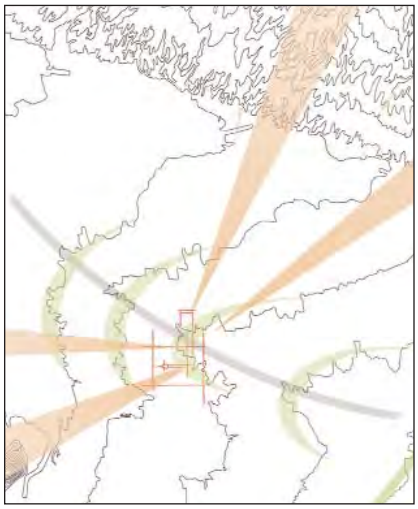
Indigenous people learned over centuries how to live harmoniously with these extreme conditions. European settlers found suitable land with adequate water on which to farm and began asserting their will over the natural systems. This tradition has left the natural systems in retreat the water greatly depleted.

One goal of the campus planning process is to understand the *genius* loci or "spirit of place" and to offer recommendations that allow a living environment complementary to nature and a learning environment that capitalizes on the region's natural assets.

Mountain views



Campus topography – 5 foot Interval contours



Diagonal flow through campus – 1923

TOPOGRAPHY

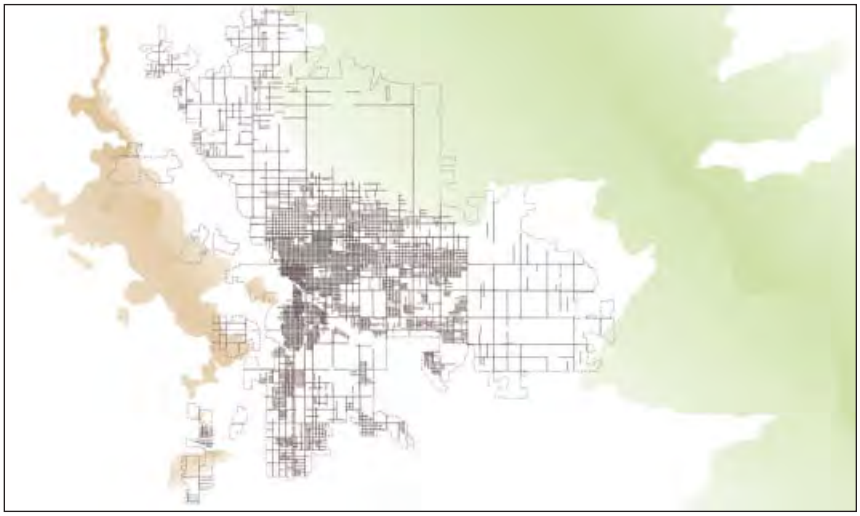
Tucson and the University of Arizona are between the Tucson Mountains to the southwest and the Santa Catalina Mountains to the northeast. The city was founded on the valley floor adjacent to the Santa Cruz River, once a fullflowing river, now ephemeral. The similarly dry Rillito River sits nearby to the northeast.

The "Grid in the Valley" diagram shows how topography affects the way we build. The city is clearly located in the valley, taking advantage of wind and water flowing through the confluence between the ranges. The grid is a highly rational planning system, especially on flat land. As the city grew into the foothills to the north, the grid deflects and then disappears entirely.

The University sits on relatively flat ground. The "Mountain Views" diagram that shows the topography in the valley. The gently curved line running northwest and southeast indicates a slight ridgeline. In the area around the campus, this ridge divides the north and south campuses even more than the perceived boundary of Speedway Boulevard. In fact, because of the way the land slopes subtly away from the ridge, views are oriented more consistently toward the west from the south campus and toward the northeast from the north campus.

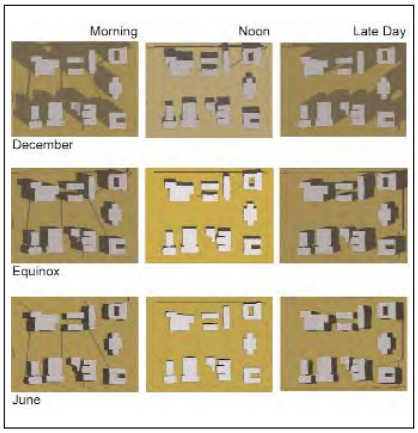
The "Campus Topography" diagram illustrates, at closer range, the ridge running just north of Speedway Boulevard and a high point near the Speedway Boulevard and Campbell Avenue intersection. The topography slopes gently to the northwest and southwest.

The "Diagonal Flow" image indicates water runoff paths perpendicular to the slope and diagonal to the grid of the campus. It is the path of least resistance. This phenomenon and how it may relate to pedestrian movement across campus will be explored further.



The grid in the Valley

University of Arizona's Environmental Research Laboratory



Sun Angle at Various Times of Day and Year

CLIMATE SUN

The sun is a defining element of Tucson. Averaging 360 sunny days per year, sunshine is mostly a comforting amenity, but the climate can become overheated during the summer. Areas of shade can reduce the temperature 10 to 20 degrees. The historic core of the University campus is a lovely example of natural shading. Trees in this area provide cooling shade as well as a pleasing environment in which to use the outdoors for study or recreation. Exporting this functional landscape elsewhere will allow more of the campus to be used in valuable ways.

The "Sun Angle" diagram shows the range of intensity and direction of the sun throughout the year. Each time period models the shade and shadow on the space west of Old Main. The climate is overheated, but it also experiences significant north side winter shading. This calls for provision of a wide range of outdoor spaces for use at different times of year in different weather conditions. This diagram will aid in the design of shading structures for buildings and pedestrian pathways as well as maximizing daylighting within buildings.

Another potential sun amenity is energy. Solar energy is free and sustainable. In the Tucson climate, further exploration into the use of solar energy seems inevitable and potentially rewarding. The University of Arizona's Environmental Research Laboratroy develops energy-saving methods applicable to main campus.

Well points and water flow

Tuscon Street runs through high school wash

Increased impervious paving causes more flooding

Campus hydrology

CLIMATE WATER

For most of the year, this region is characterized by a scarcity of water. For several weeks during the monsoon season, however, there is overabundance. In a rapidly growing metropolitan area, increased consumption exacerbates the problem of dwindling water supply. Increased impervious pavement due to development impacts storm water runoff. It is increasingly necessary to use less water and save more water. The most obvious solution is to capture rainfall for purposeful use. Detention ponds are already used but present some problems with standing water. These ponds do not collect water for reuse. Water harvesting can be accomplished with rooftop cisterns or underground tanks. Arroyo-like landscape areas can spread water runoff over larger areas, therefore, reducing flooding. The use of pervious materials for walks and parking lots can greatly reduce storm water runoff.

Most of the watercourses throughout the city boundary are only active during a storm event, and their relatively straight layout with minimal branching is characteristic of desert washes. It is notable that the street grid has disrupted most of them.

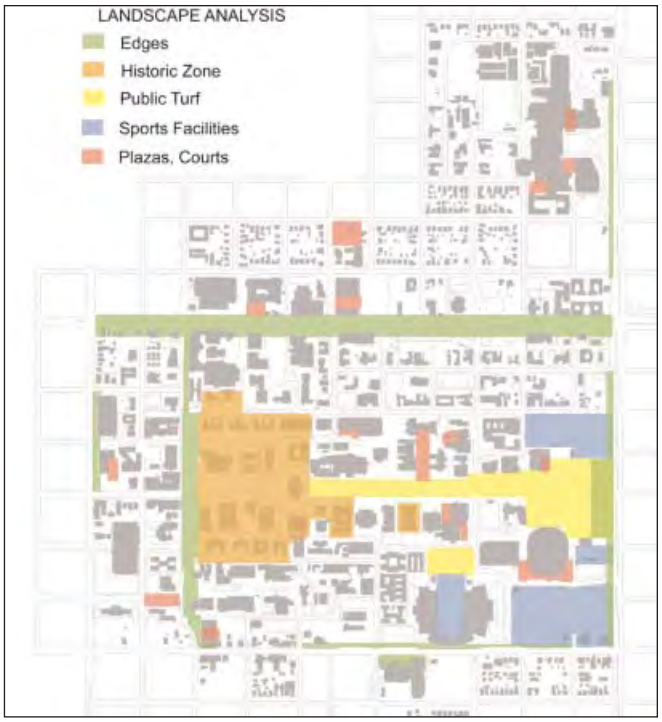
The "Campus Hydrology" diagram shows additional sites for storm water detention. Those to the east collect runoff from the bordering neighborhood. Those to the south, north, and west address runoff from the campus, mitigating storm water flow released into the surrounding neighborhoods.

AREA WATER FACTS

- Tucson – net importer of water
- Average yearly rainfall: 12"
- The natural water supply (aquifer) has dropped to 400 feet below ground.
- The University uses seven wells.
- Water cost: 745 gallons = $1.00
  Well water cost: $100 acre/foot
  Reclaimed water cost: $475 acre/foot
- City of Tucson: 75,000 acre/feet per year of waste water treated into reclaimed water
- The main campus uses 700 acre/feet per year of water. 180 acre/feet per year is reclaimed. Proposed to increase by 100 acre/feet each year.
- 175-350 acre/feet per year falls on main campus
- A 100-year storm event would cause major flooding on campus.
- A 10-year storm event is about 50 percent of a 100 year storm event.
- The City of Tucson requires water harvesting of 100 percent storm water on sites in 100-year flood plain.

LANDSCAPE TYPOLOGY

The next step in analyzing natural systems is an assessment of vegetation. The historic core of the campus is characterized by spaces clearly defined by a range of distinct plant types, including cactus, citrus, and palm.



The public turf consists of greenswards available for different kinds of student use including outdoor learning, campus functions, recreation, and casual enjoyment. This space type may be more formal and symbolic like the mall, or informal, like a recreation field. The scale of this space type, regardless of formality, lends a monumental feel and encourages interaction of varied user groups.

The edges noted have the beginning of specific landscape articulation. There are some breaks in the continuity of these streetscape treatments, but they are already recognizable as they stand in these areas. The western edge of campus is the most consistent and successful of this type. These edges occur at real or perceived boundaries of campus and should act as open and identifiable transitions from city to campus.

Edges

There are already a number of plazas and courts throughout campus articulated with an independent and site-specific vocabulary. They facilitate a range of uses, from outdoor learning to quiet study space to chance encounters with friends and colleagues. Creating a fabric of these smaller-scale open spaces throughout campus would allow a network of pedestrian connections that weave the campus into a unified whole.

The sports facilities represent the last major type of landscape seen on campus, including competition and recreation fields. They often are forgotten as types of landscape. The nature of the events that take place in these large restricted access venues necessitates study of functional access needs and game-day activity needs. This implies a zone of affected area much larger than the venue itself. The opportunity will be investigated for more people to enjoy these open spaces (whether physically or visually) more of the time through proximate uses such as housing, classrooms or other student services.

Plazas and Courts

Historic zone

Public turf

Sports facilities

TREE TYPES

SPREADING TREES

The palette of tree types available for use in the Tucson area consists largely of desert trees that tend to be low and spreading. They take on shrub shapes in the wild but can be pruned or planted slightly elevated to afford under-story space and shade. They generally have an informal feel.

SKYLINE TREES

The skyline tree is a desert accent tree that takes advantage of the consistent horizontality of the desert landscape. These trees can be seen from a distance, emerging from the low-slung context. They are associated with sites that have been occupied and tended for many decades. They typically include the palm, which provides visual accent, and the pine, which provides shade. Due to their visual presence, this tree type connotes a place of importance or acts as a visual guide or terminus to a view.

UPRIGHT TREES

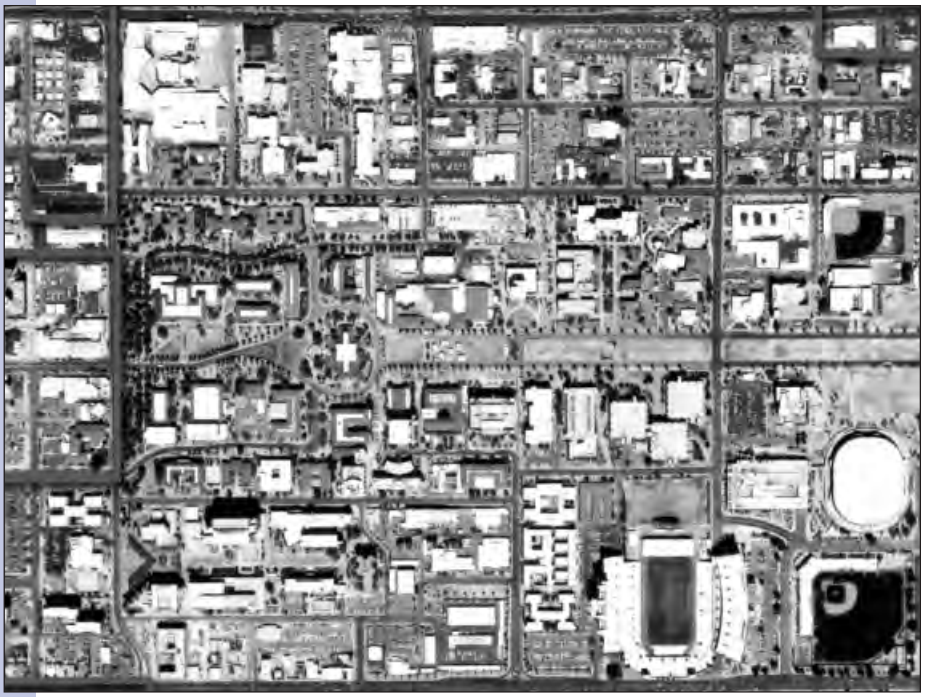
A range of canyon-dwelling natives and drought tolerant non-native species often are used to satisfy a need for more upright tree profiles. These trees may be used in smaller courtyards or along streets where clearances for bikes and motor vehicles need to be maintained. They can be planted in a naturalistic or formal way.

PATIO SCALE TREES

Smaller trees can be used in courtyards. They often flower and bear scented fruit and are appropriate for localized accents. These can be planted in a formal or informal manner.

BUILT SYSTEMS

1



In the flat valley floor of the desert, the plans of the City of Tucson and the campus of the University of Arizona are grids. The grid is a rational planning method for easy orientation and navigation. The grid is easy to extend until topographical resistance meets it. This is how the campus and city have grown for the last 100 years. The expanse of the desert floor has allowed the growth to be of low to moderate density. Streets are wide and houses far apart. As the campus now finds itself landlocked, it will need to focus on infill strategies in order find much needed square footage to increase the density of buildings on campus.

The University of Arizona campus structure includes open spaces and streets that help connect disparate parts of campus. These open spaces are the hallways and rooms of campus. One may walk along the mall (hallway) to go from Old Main to McKale (rooms) or across the mall to get from the Highland District to University Village. This open space structure must be well-defined with a clear hierarchy.

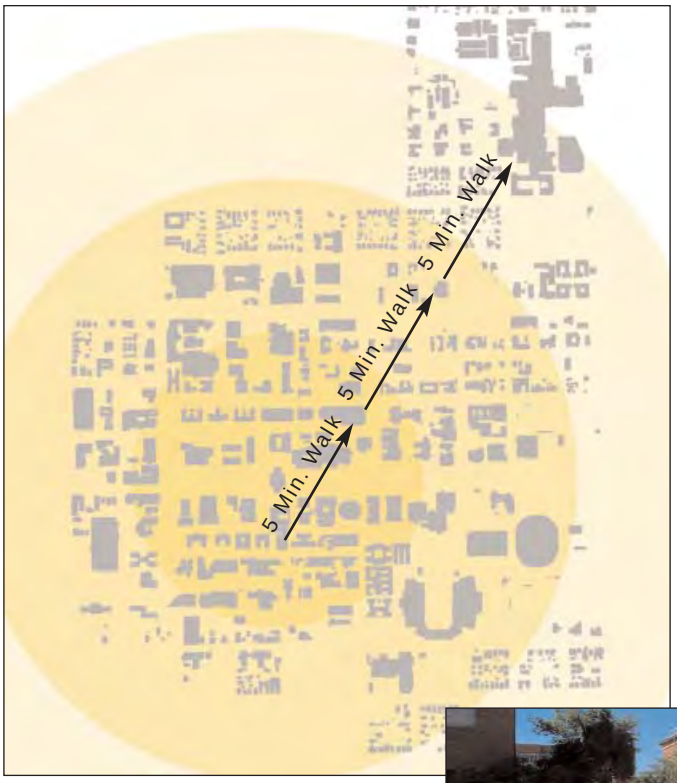
Just as some rooms in a house are hierarchically more important than others, the hierarchy of open spaces on campus implies levels of importance and facilitates orientation. The definition of these spaces is critical to their being identifiable. Infill strategies will help define the edges of these spaces and make the overall structure of the campus more understandable and easier to navigate.

Systems of circulation, whether pedestrian, bike, transit, or car, will benefit from clearer paths and campus spatial hierarchy.

PEDESTRIAN AND BICYCLE CIRCULATION

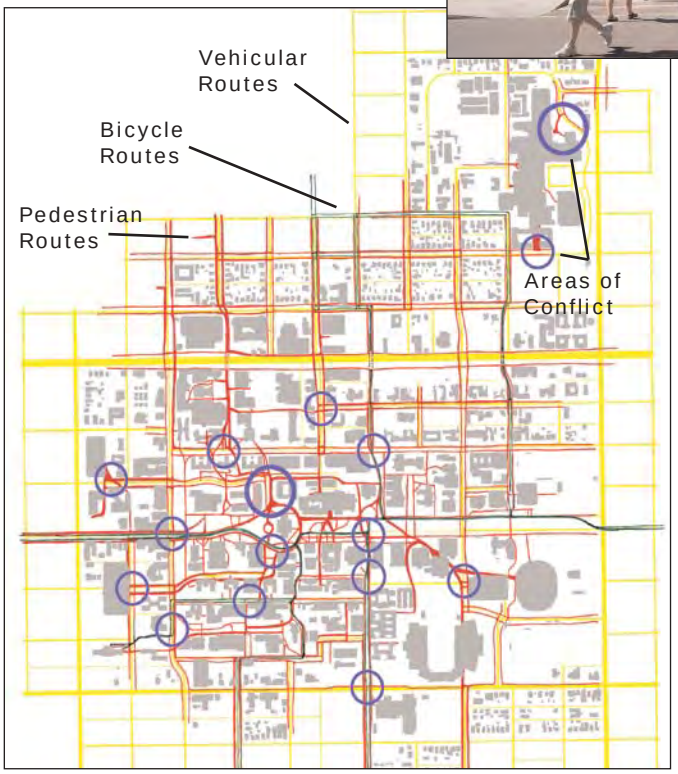
The five-minute walk is based on a one-quarter mile radius. This is a generously slow pace of one mile in 20 minutes. This also emphasizes the pedestrian's bias toward the shortest route possible. Planning for pedestrians means enabling those routes and multiplying the options available.

The diagram at right, shows that walking from Old Main to the hospital would take 15 minutes if one could walk it in a straight line. The perceived distance between these buildings is much longer because of the harsh nature of the walk. Creating clear, comfortable, and direct circulation routes around campus will improve the walkability, thus promoting greater interaction among campus groups. Healthier lifestyles through exercise and less pollution are another benefit.



5-Minute walk radius

Points of conflict occur mostly at busy intersections and at the heart of campus. High traffic and service areas should be separate from pedestrian circulation routes. A hierarchy of streets and pedestrian routes should be established.



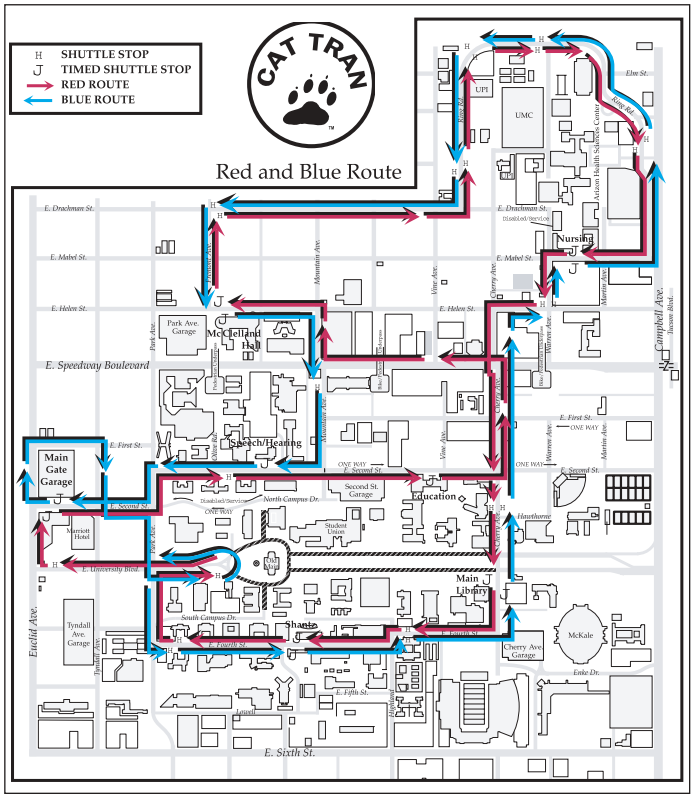
Circulation conflicts

Vehicular Circulation Grid

VEHICULAR CIRCULATION

The street grid surrounds the campus but is interrupted at the campus edges. Major portions of the campus should be free of vehicles to allow the students and faculty a safe environment in which to live and learn. Street hierarchy is an important tool for organizing the flow of traffic around and through the University. Speedway Boulevard and Campbell Avenue are primary streets designed to move people quickly through the area.

Sixth Street and Euclid Avenue are secondary streets with faster movement. There are tertiary streets running in and around campus that are slower, quieter, and safer. Finally, there are alleys and service drives used occasionally that are designed for large vehicles. An efficient distribution of these different types of streets is critical.



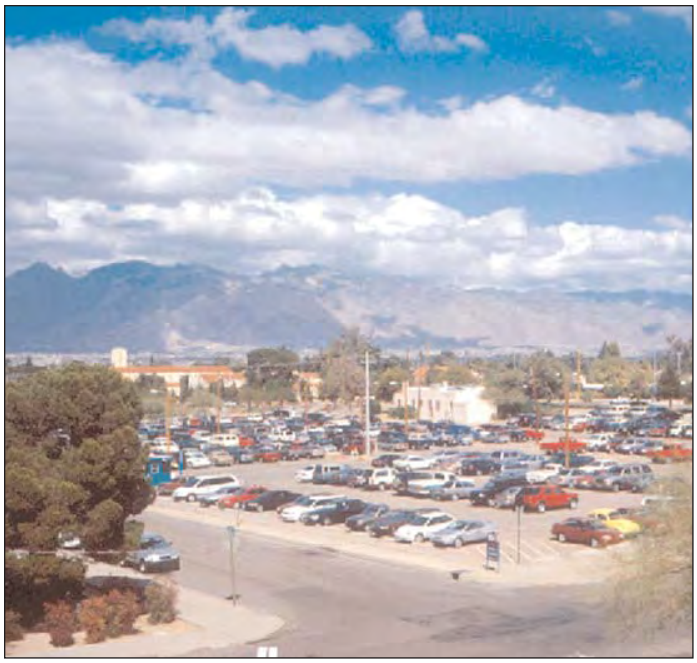
Cheap and efficient public transportation can provide fiscal benefits and added convenience for those who currently drive to campus everyday. It is environmentally friendly. SunTran on the metropolitan scale and CatTran on the campus level provide improving levels of service to the University community. Trolley service will connect downtown Tucson to the University. Real transit alternatives will ease traffic and parking issues and make the campus more pedestrian friendly.

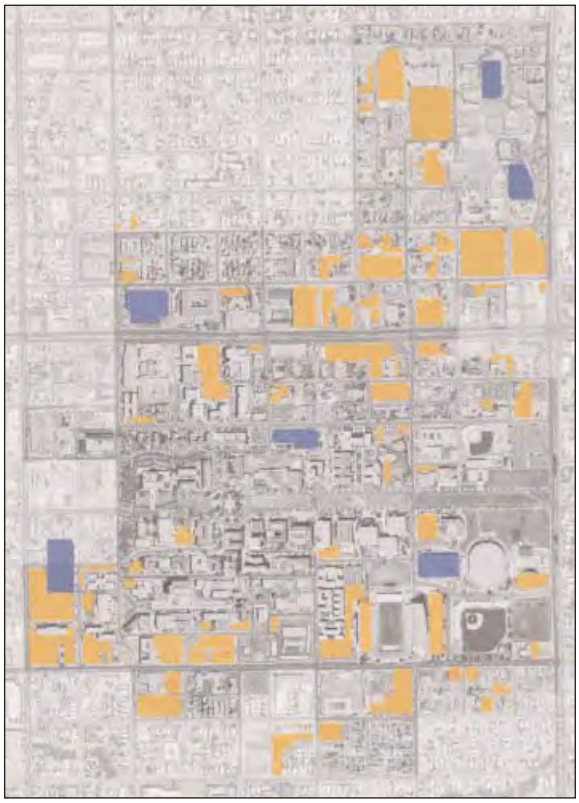
PARKING

Consolidated surface parking square footage is equivalent to all of the historic core and most of the mall combined. It is also roughly equivalent to the total campus build out in 1951.

Consolidated surface parking area

Surface lots occupy valuable real estate needed for expansion. Using decks to consolidate parking makes land available for better uses and improves the overall feeling of the campus.



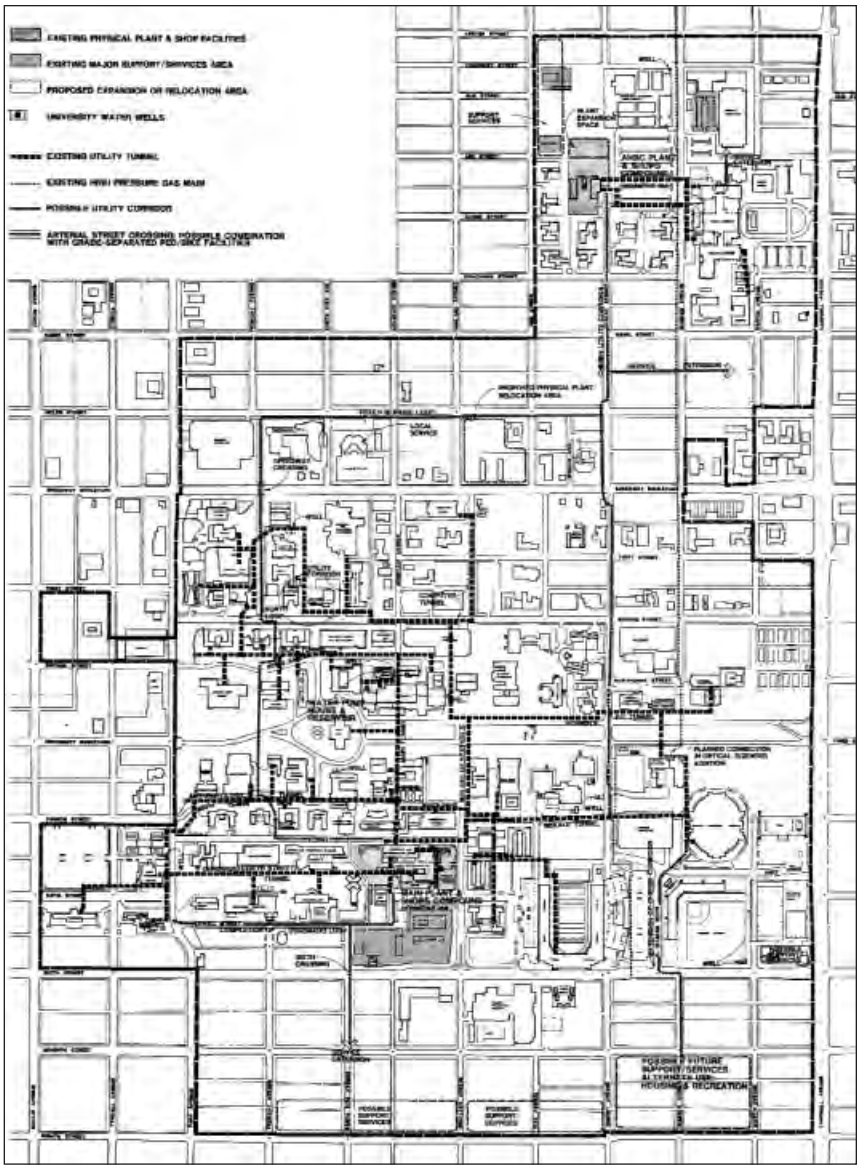


Surface lots and parking decks

UTILITIES

The objectives stated in the 1988 Comprehensive Campus Plan continue to be priorities for utilities infrastructure.

Campus utilities systems include distribution lines, tunnels, housing lines, and plants and facilities for centralized utilities operated by the University. Some utilities are provided by parties other than the University on a non-centralized basis.



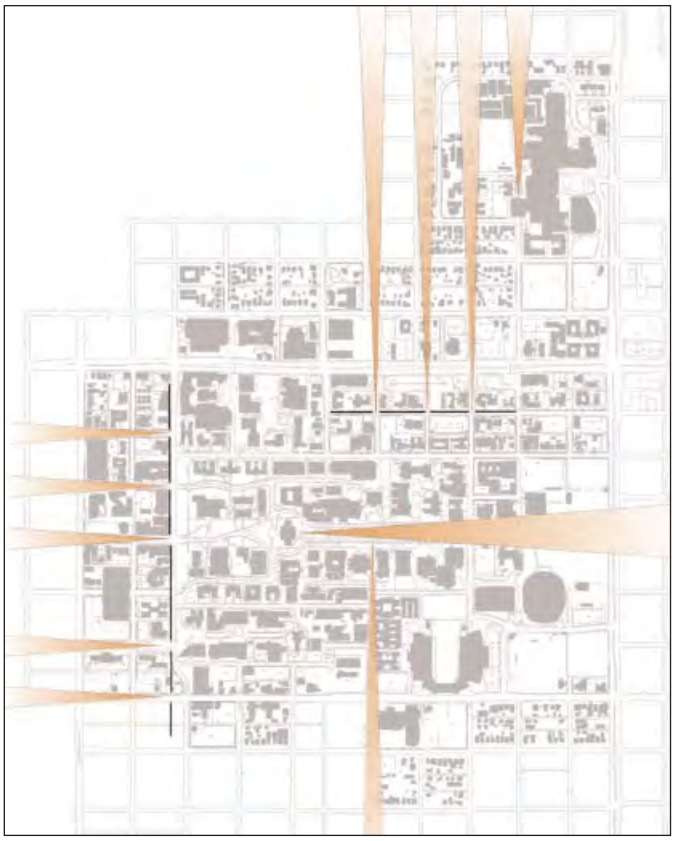
- The current modernization and expansion of the existing utilities systems should proceed, with emphasis on completing tunnel loops and providing safety improvements within the existing campus areas.
- For the central plant compounds, non-plant functions and offices should be relocated to designated support and service areas, administrative office facilities, or replaced as multistory buildings to release property for plant purposes.
- Planning for the AHSC central plant should recognize the designated expansion area to the immediate north of the existing plant.
- Planning should be undertaken to provide utilities services to emerging new campus areas, especially the Cherry Outreach and northwest areas. Options to be examined include extension of centralized service, facilities serving the complex or area only, and stand-alone service for each new building.
- The Implementation Program, as periodically updated, should be used to plan and install utilities in a timely manner along with buildings and facilities. Utilities infrastructure should accompany, not follow, campus development.
- Utilities planning and development should recognize the changing state of the art and demands of utilities systems. This is an especially important consideration in providing the indoor environments necessary for research and computers and for adequate telecommunications. The use of utility corridors that can accommodate additional lines without major disruption to buildings and can "plug in" new buildings along their length is one flexible approach to the situation. These corridors can accommodate tunnels and/or direct burial.
- The location and design of above ground facilities should consider aesthetic impacts. Use of landscape and wall screening, and rooftop and basement locations out of sight from major open spaces and pathways, is encouraged.

VIEWS

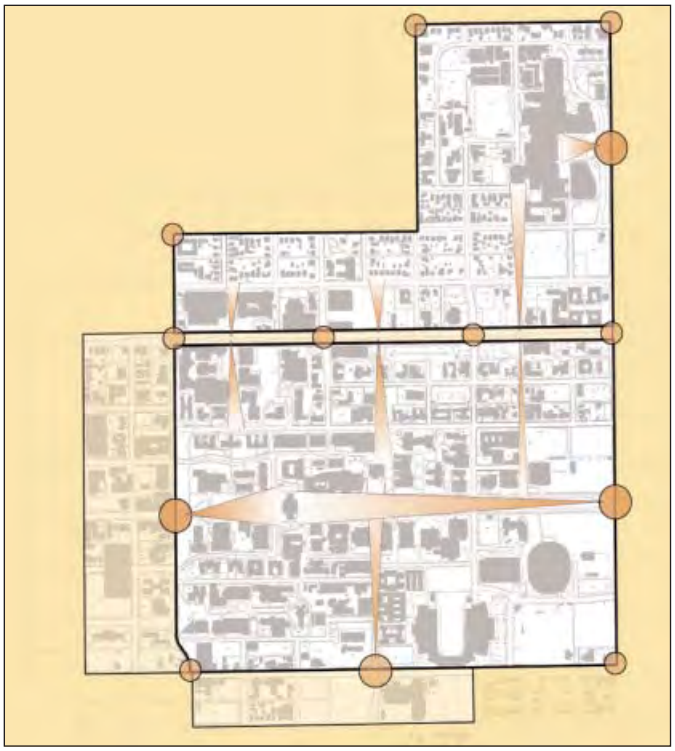
Views create a visual connection to the larger region and reinforce our sense of place. Views can be axial. They reinforce the importance of a space or a street like the mall. They also can be a series of framed views that one sees while moving through space. Driving along Park Avenue looking west, there is a series of views to the Tucson Mountains in the distance.

Views can be designed to reinforce the plan, serve as orientation points, and provide memorable images of how to move around the University. Views within and outside of the campus should be considered in space making, path making, and building siting. A way to mitigate high-speed traffic on Speedway Boulevard and Campbell Avenue may be to provide view windows into the University along these routes. Traffic slows when there is something to see.

View to Old Main



Building defined views from campus



Edges, gateways and views within campus

West end of mall – defined open space

Existing open space

OPEN SPACES

The existing open space network on campus follows the structure of the grid. It is based on manmade systems rather than on natural ones. While major streets, the historic core, and the mall are identifiable, a series of secondary and tertiary open space lacking. With the exception of the historic core, even the identifiable open spaces lack clear definition. The mall's edge is increasingly jagged towards the east. At Campbell Avenue the mall looses definition. Creating spatial definition through building infill and landscaping will add needed program space provide usable outdoor spaces and improve the quality of experience in the existing open space.

Warren Avenue Corridor looking north

Open space network

This diagram shows emerging open spaces on campus in green. Some are much better defined than others. Connecting existing and future open spaces via pedestrian pathways will form an open space network that organizes the campus. This organization becomes apparent in this drawing. Using the existing Speedway Boulevard underpasses as locators, north-south connectors are identified that will knit the campus together. Weaving at a finer level, other smaller scale circulation patterns could be formed to connect east-west.

PROGRAM / SPACE NEEDS

CAMPUS DATA	LAND USE			POPULATION						ON-CAMPUS HOUSING				
Name	Land (Acres)	Total GSF	Parking on Campus	Under-graduate Students	Graduate Students	Total Students	Faculty	Staff	Total Pop.	Under-graduate	Graduate & Married	Faculty	GSF/ Acre	Comments
Texas A&M University	5,200	12,153,842	32,044	36,229	5,306	44,026	2,123	6,837	52,986	10,432	650	0	2,337	P/LG/M
University of Florida	2,000	18,204,616	24,000	32,260	8,786	46,107	3,584	7,319	57,010	6,905	2,255		9,102	P/LG/M
University of Minnesota, Twin Cities	2,000	18,878,468	19,000	26,972	10,951	45,615	2,793	11,537	59,945	5,627	824	0	9,439	P/LG/M
University of Missouri-Columbia	1,351	14,680,296	15,620	15,980	3,218	19,198	4,094	4,750	28,042	5,600	417	28	10,866	P/LG/M
Ohio State University	1,715	20,500,000	25,188	35,647	10,047	48,511	4,522	14,343	67,376	8,100	859	18	11,953	P/LG/M
University of Kentucky	687	8,213,639	17,246	16,899	4,837	23,852	1,892	8,651	34,395	5,044	729	0	11,956	LG/M
University of Wisconsin at Madison	933	18,353,252	11,600	29,516	10,593	40,109	2,135	15,576	57,820	6,780	1,100	150	19,671	P/LG/M
University of Arizona	**355**	**7,720,201**	**10,560**	**26,404**	**7,392**	**34,488**	**2,057**	**8,793**	**45,338**	**4,795**	**0**	**0**	**21,747**	
University of Washington	703	16,627,355	12,000	27,587	9,974	37,541	7,800	14,846	60,187	4,680	1,335	0	23,652	P
Averages	**1,660**	**15,036,852**	**18,582**	**27,497**	**7,801**	**37,716**	**3,444**	**10,295**	**51,455**	**6,440**	**908**	**26**	**13,414**	
University of Arizona	**355**	**7,720,201**	**10,560**	**26,404**	**7,392**	**34,488**	**2,057**	**8,793**	**45,338**	**4,795**	**0**	**0**	**21,747**	

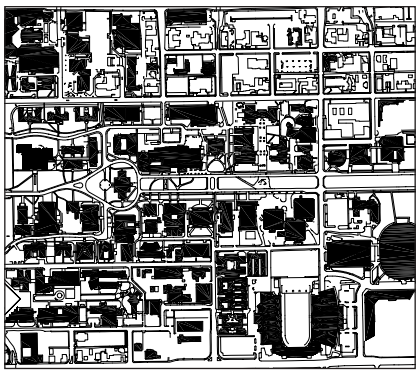
Peer comparison is a useful tool to gain a preliminary view of a school's programmatic and physical deficits and strengths. These Observations, together with in-depth studies of need, inform the physical structure of the future campus.

The University of Arizona is significantly below peer institution averages in Campus acreage, total building gross squar feet, and number of undergraduates housed on campus.

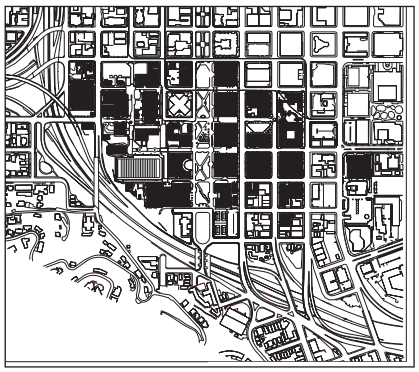
The University is average in number parking spaces/GSF building student population.

DENSITY COMPARISON

The University was compared to its peers in regard to physical operations, that is, form and space. In this set of comparisons, the other campuses were chosen for the way they relate to the surrounding urban fabric and how they define the space of the campus within that larger system.

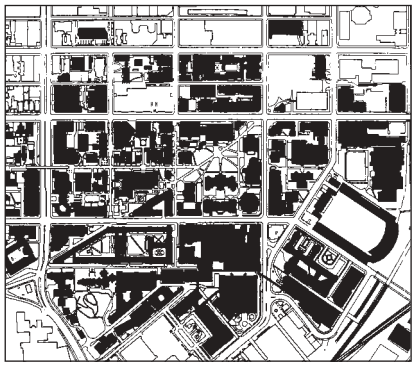


University of Arizona



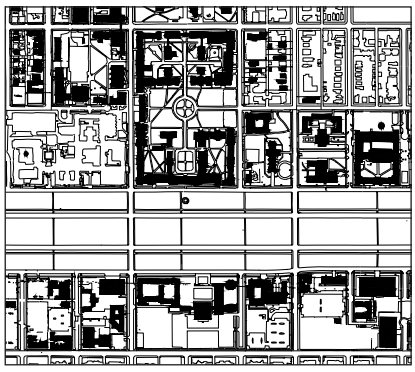
Portland State University

Portland State University buildings almost without exception maintain the pattern of the urban grid. Some streets may be closed, but the resulting area remains open space. The pattern of the grid is unbroken. Open spaces are either subsets of a city block or accumulations of contiguous blocks. Some buildings bridge streets and combine blocks, but the grid remains the primary circulation system.



University of Pennsylvania

At the University of Pennsylvania, the campus also is fully defined by the pattern of the city streets. Exceptional spaces have been created not by consolidating entire blocks for open space, but by claiming selected streets for the campus and converting them to pedestrian-only malls. When the space was separated from the grid, a primary green was set up, its edge defined in a far less urban way. Further adding to the texture of the campus, one of the closed streets cuts across the campus on the bias, facilitating desire-line travel. The circulation streets define the space of the campus, but the character of those spaces is no longer street-like.



University of Chicago

The University of Chicago campus works within and beyond the pattern of the city. The complex on the upper side of the drawing shows how spaces can be defined within the larger order of the grid and maintain their own independent geometries. This campus shows a range of scale in open spaces and how smaller open spaces can be defined nearby yet clearly delineated from massive spaces.

The UCLA campus does not demonstrate a connection to a surrounding urban grid, but it does provide an example of designing around a series of many courtyards at different scales. The bulk of the part of campus shown consists of space-defining buildings often containing a courtyard within and helping define several without. There are clearly separate circulation systems like, the space of the street and the labyrinthine space of the courtyard network.

University of California, Los Angeles

Historic Tucson

Balance of built form and open space

Landscaped campus edge

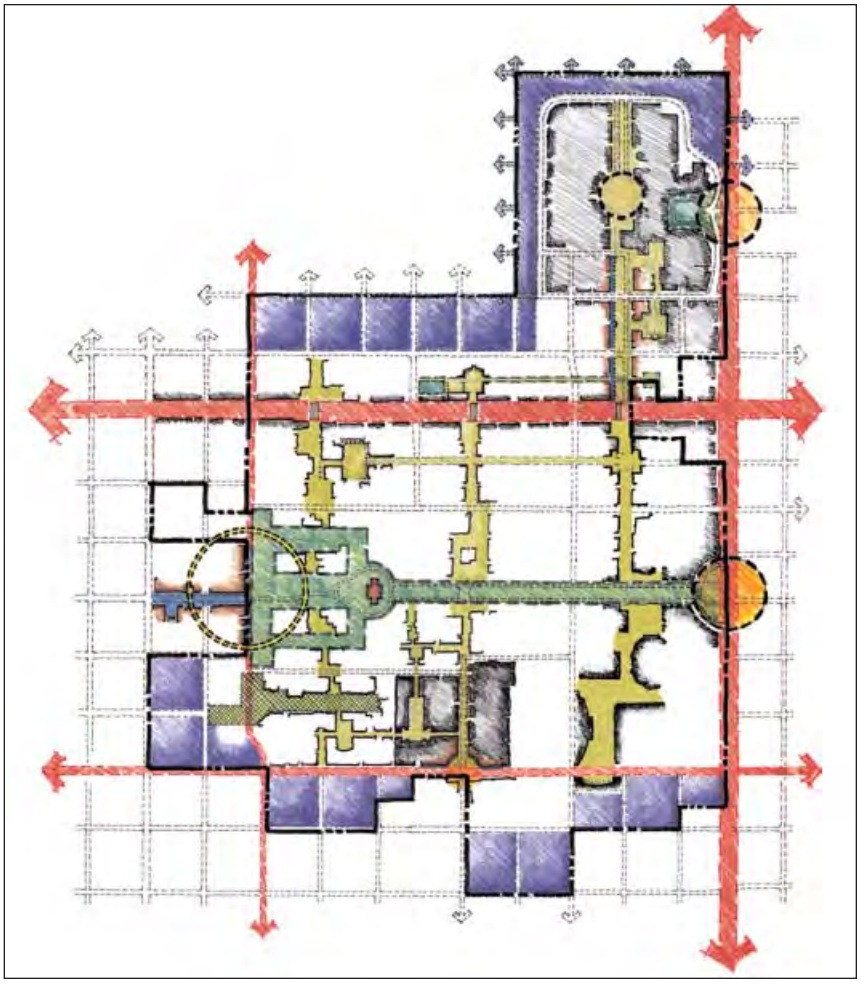
SUMMARY OF OBSERVATIONS

The Observations phase of the planning process identified the salient features that have, and will, guide the physical development of the University of Arizona campus. These Planning Principles are the direct result of those observations and are intended to act as a compass to the map that is the Final Plan.

1. Look to historic parts of campus, city, and region for lessons in ways to mitigate the sometimes harsh climate with landscape and architecture. Look forward to new technologies for climate mitigation and harvesting of sun and water.

2. Growth has occurred historically in patterns of low density. Though the University land holdings are relatively small, there is room for growth through higher density (infill). Infill can positively influence the plan through better spatial definition of campus. By creating better balance of built form and outdoor space, the University will feel more unified. Another benefit is more built space and more usable outdoor intellectual space.

3. Improving edges, gateways, pedestrian paths, and outdoor intellectual spaces will improve connections to neighborhoods physically and psychologically. The University should fit seamlessly into its larger context. The Plan should embody the University's service mission.

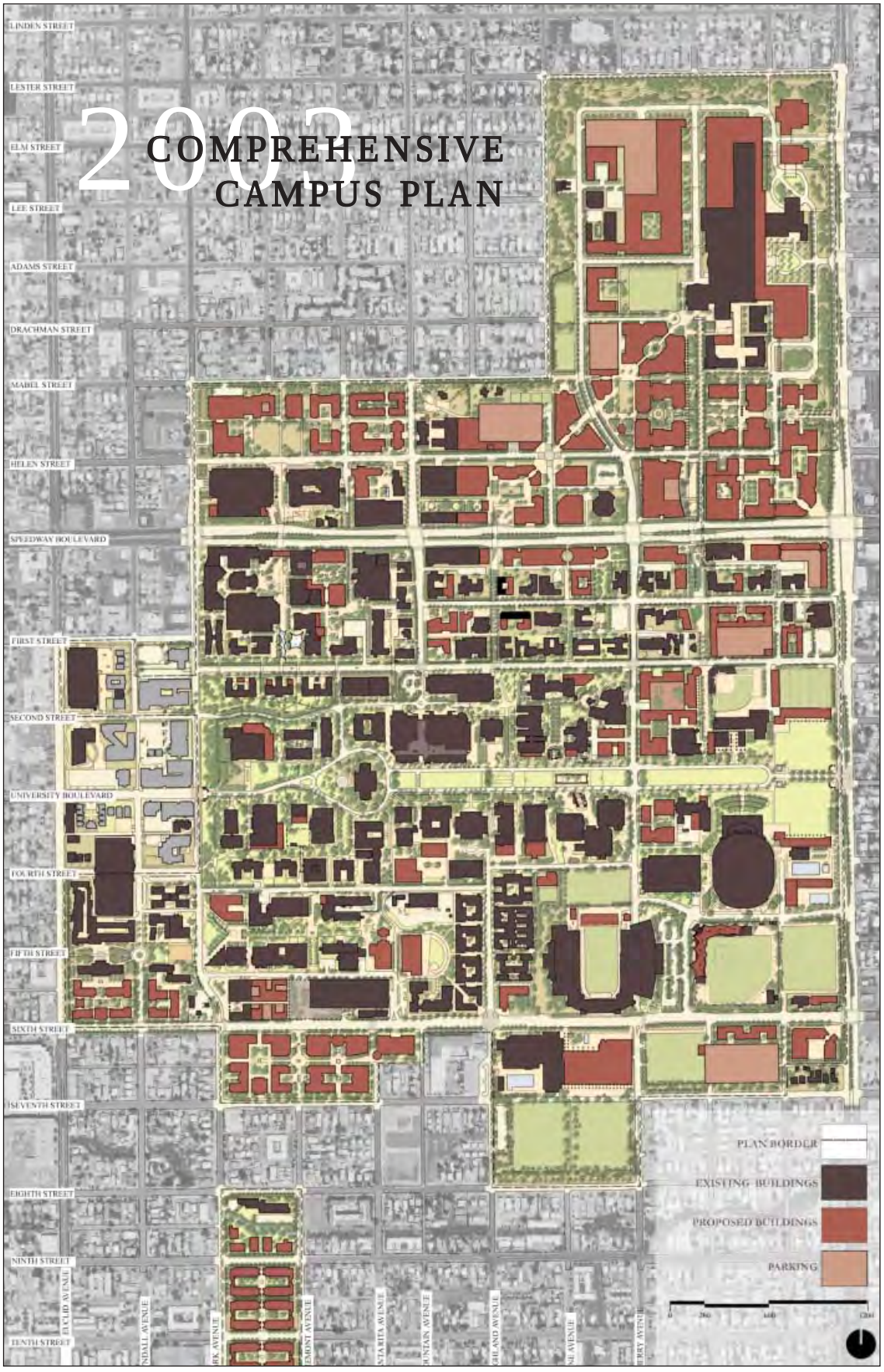


Campus analysis diagram

THE UNIVERSITY OF ARIZONA®
COMPREHENSIVE CAMPUS PLAN
2003

ARIZONA HEALTH SCIENCE CENTER SUB-PRECINCT PLAN APPENDIX 2

2003 COMPREHENSIVE CAMPUS PLAN



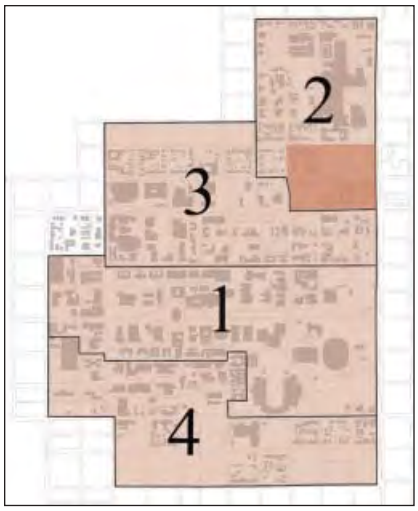


Figure 1 – Comprehensive Campus Plan – precincts

INTRODUCTION

In 2001, a planning process began to update the Comprehensive Campus Plan for the University of Arizona. As part of the campus planning effort, the area known as the Arizona Health Sciences Center (AHSC) became a key district to the overall success of the plan. Several imminent building projects and an accelerated programmatic growth projection warranted further study. This Arizona Health Sciences Center Sub-precinct Area Plan focuses on the area designated for these upcoming projects.

The AHSC is a 48-acre area located in the northeast quadrant of the University. Nearly 5,000 people are employed there. Receiving $85 million yearly in research grants and gifts, AHSC provides state-of-the-art treatment for patients and up-to-date information for students at the colleges of medicine, nursing, pharmacy, and Public Health, and the University of Arizona School of Health Professions. More than 2,000 undergraduates and 500 graduate students are enrolled.

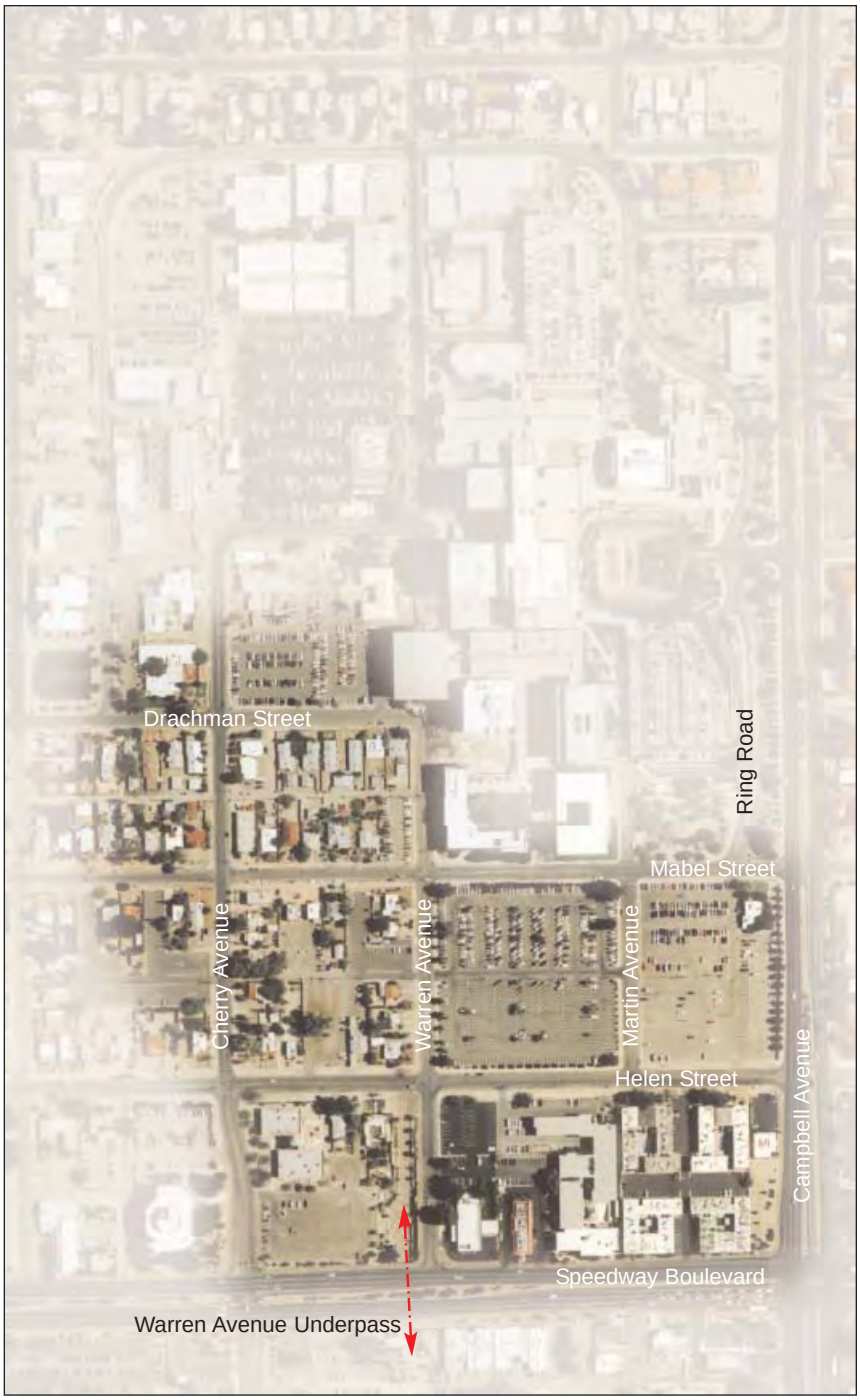


Figure 2 – Aerial view – AHSC and environs

The mission of the AHSC is to provide health care education, research, patient care, and service for the people of Arizona. Accordingly, AHSC is comprised of four main entities: the academic programs, research functions, the University Medical Center (UMC), and University Physicians Incorporated (UPI) which provides outpatient clinical care.

SITE

Figure 1 shows the University campus and its four precincts delineated for the Comprehensive Campus Plan 2003. AHSC is the majority of Precinct 2. Other uses are integrated within the precinct, including retail, outreach, associated research space, and support spaces. The dark area within Precinct 2 represents the area in the sub-precinct plan.

Bounded on the east by Campbell Avenue and on the south by Speedway Boulevard, this portion of the university campus is situated prominently on one of the busiest intersections in Tucson.

The north and west edges of this precinct are bordered by low-scale residential neighborhoods.

Figure 2 indicates the limits of study for this document. The study includes the area bordered by Campbell Avenue and Speedway Boulevard to the east and south respectively, by Cherry Avenue to the west, and by Drachman Street to the north.

As evidenced by Figures 2, 3, and 4, this area is dominated by surface parking lots and low-density residential and commercial uses. The existing AHSC Ring Road terminates at the northeastern edge of the sub-precinct at Mabel Street. Warren and Martin avenues run north-south through the site and Helen Street bisects the area running east-west. The Warren Avenue underpass (indicated by dotted line in Figure 2) allows for uninterrupted pedestrian flow under Speedway Boulevard.

PURPOSE OF THE PLAN

The purpose of the plan is to identify the unique needs of the AHSC community within the larger University community, as well as the surrounding neighborhoods and greater Tucson and to recommend a comprehensive land-use plan for the AHSC. This plan will organize and clarify programmatic adjacencies, and in so doing strengthen relationships and connections between different uses. The plan also will clarify wayfinding for visitors while creating an obvious edge to the AHSC campus.

Goals:

- To recommend appropriate densities for growth on the AHSC campus, balancing the need for new square footage with that of creating a healthy, inspiring environment.
- To create physical and psychological connections to central campus that will spur interaction and collaboration between disciplines. As programs become increasingly interdisciplinary, research buildings will not be located on adjacent sites, but will contain multiple disciplines within single buildings.
- To recommend building sites and general architectural design guidelines for specific projects.
- To create a connected open space network that orders the AHSC campus while encouraging casual and organized recreational activities.

Figure 3 – Aerial view looking southwest – AHSC and central campus beyond

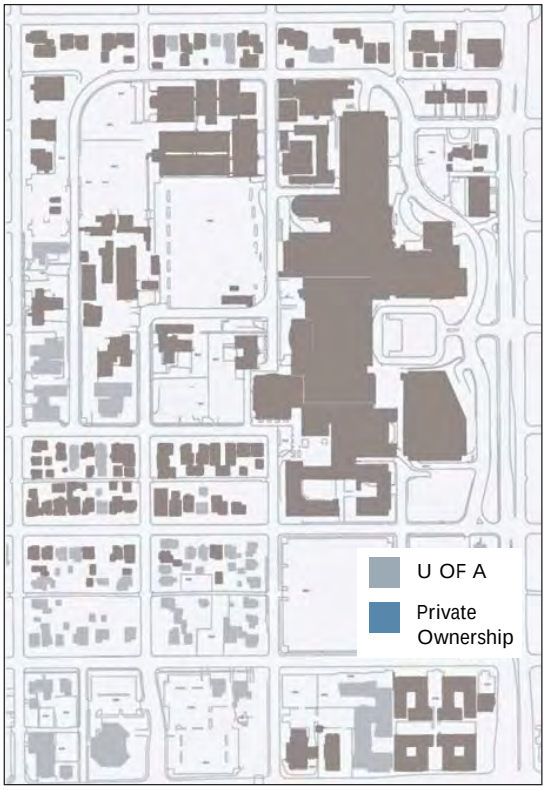
Figure 4 – Aerial view looking northeast – AHSC

Please refer to the University of Arizona Comprehensive Campus Plan, Chapter 5 Design Guidelines for recommendations regarding architectural, open space, transportation and utilities guidelines.

Vacant Fraternity House suitable for acquisition

DENSITY

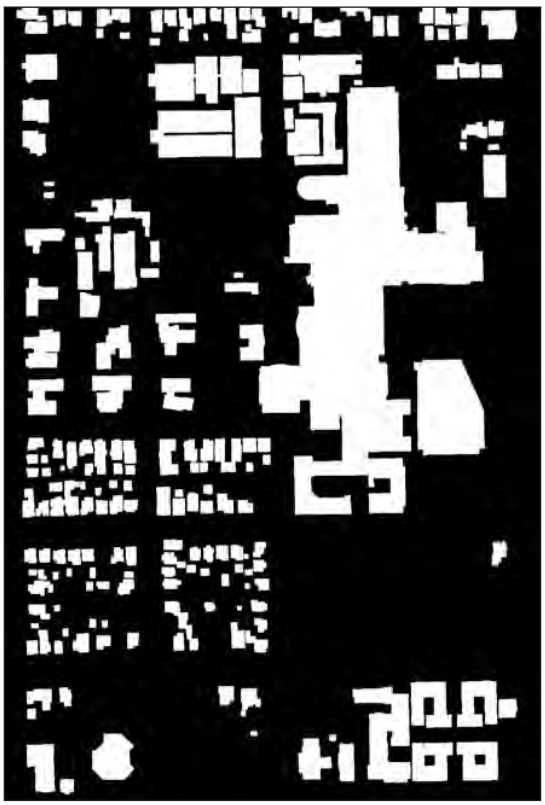
- To develop property acquisition strategy and phasing schedule taking into consideration current ownership patterns
- To encourage public/private partnerships in developing the corner of Speedway Boulevard and Campbell Avenue.
- Land is either privately owned, primarily by commercial entities (Campbell Avenue / Speedway Boulevard) or in residential uses.
- The Arizona Board of Regents owns the University property; certain land and building leases are held by UMC & UPI.



Existing property ownership

Surface parking lots are prime sites for new facilities.

- Diagrams indicate large areas of open space and small-scale uses suitable for development
- Lack of an existing spatial hierarchy reinforces the need for a long- term planning strategy
- The University should seek a density for the area that balances built form and open space



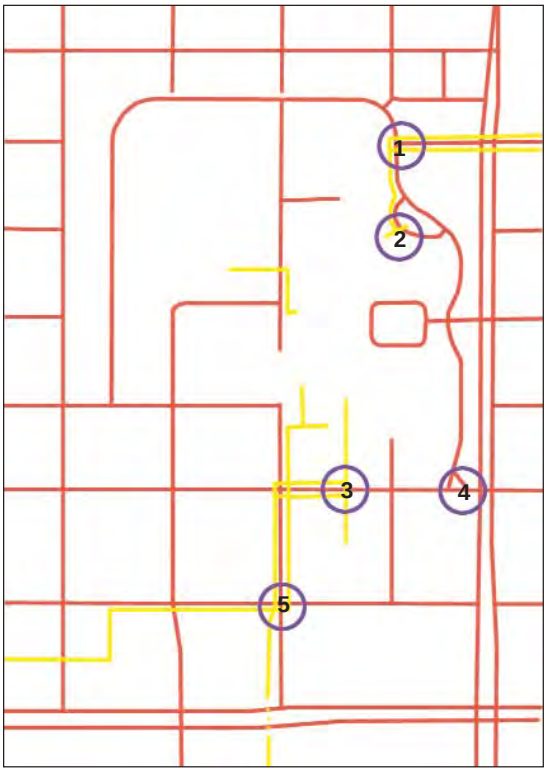
Figure/ground reversal

Vehicular access and parking

AHSC Ring Road is in need of streetscape improvements

CIRCULATION

- White indicates the area dedicated to cars
- There is a high proportion of parking and roads to natural landscape and buildings.
- Minimizing areas dedicated to the automobile will add valuable building square footage and usable open space.
- Create a campus environment friendly to pedestrians while fostering community.



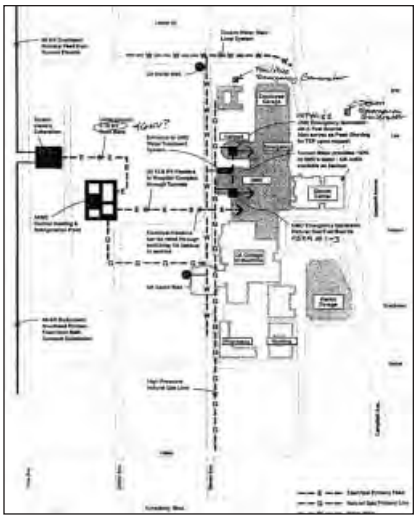
Existing AHSC street network with major pedestrian routes

The concourse and Mabel Street intersection are a congested area with pedestrians, bikes, cars and shuttle buses.

- Pedestrian Conflict Points (blue circles)
  1. Elm Street and Ring Road
  2. Emergency drop-off area
  3. Mabel Street and AHSC Concourse
  4. Mabel Street and Ring Road
  5. Helen Street and Warren Avenue
- Existing road network is discontinuous; Ring Road completion will clarify automobile movement
- Pedestrian circulation network is limited

INFRASTRUCTURE: PRIMARY UTILITY FEEDS

- Utility infrastructure must be coordinated with future planning efforts
- Major plan axes will serve as utility corridors



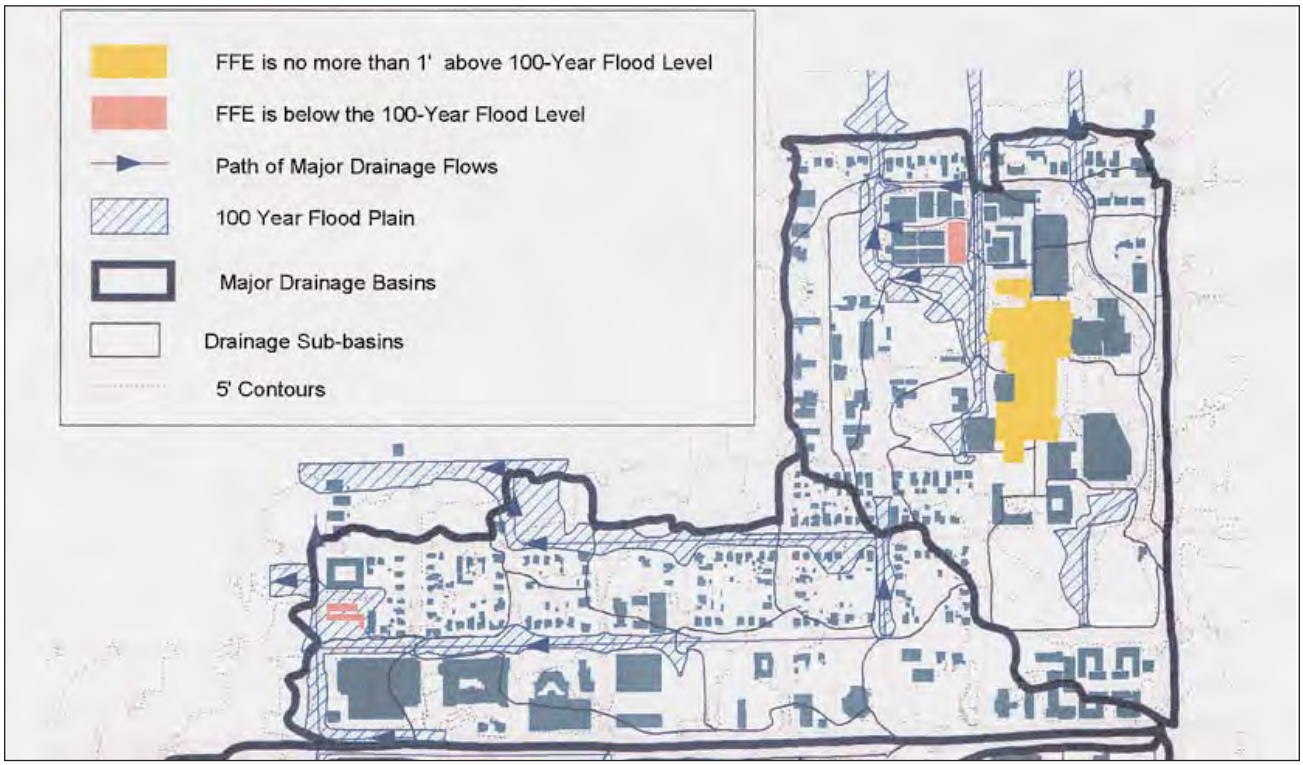
Utility infrastructure

STORM/WATER MANAGEMENT

Storm water mitigation on the east side of AHSC has been implemented at the detention basin east of the College of Nursing. However, further measures are needed to fully resolve the problem, especially along Mabel Street.

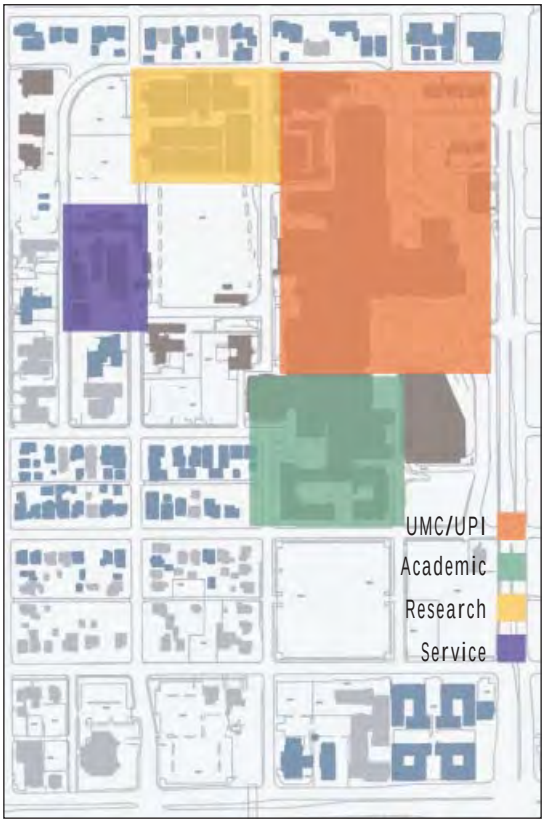
Improvements needed on west side of AHSC:

- Flooding occurs along the Cherry Avenue corridor between Helen Street and Mabel Street.
- Major flooding occurs north of Drachman Street along Cherry Avenue and Warren Avenue.
- The plan proposes a major detention basin west of the AHSC library as well along northern boundary of the AHSC campus.



Floodplain Diagram

Flood Control – Detention basin mitigates storm water runoff into neighborhood, the proposed landscape buffer would better mitigate runoff and serve as an attractive edge to AHSC.

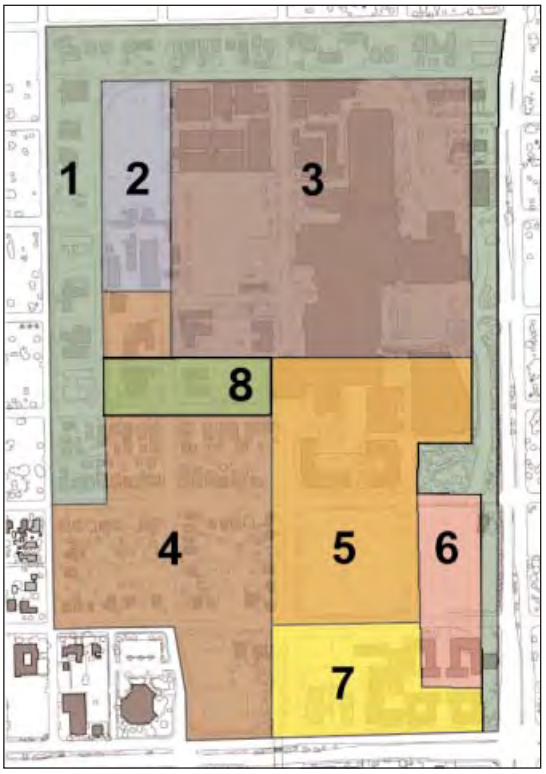


Existing land-use

LAND-USE

Acquisition of fraternity housing on Ring Road is subject to terms of property sale restrictions.

- Academic functions in close proximity to inpatient and clinical care
- UMC and UPI functions intermingled
- Research zone isolated and in outdated buildings
- Service zone at periphery
- Loading dispersed throughout campus in consolidated locations that serve multiple buildings



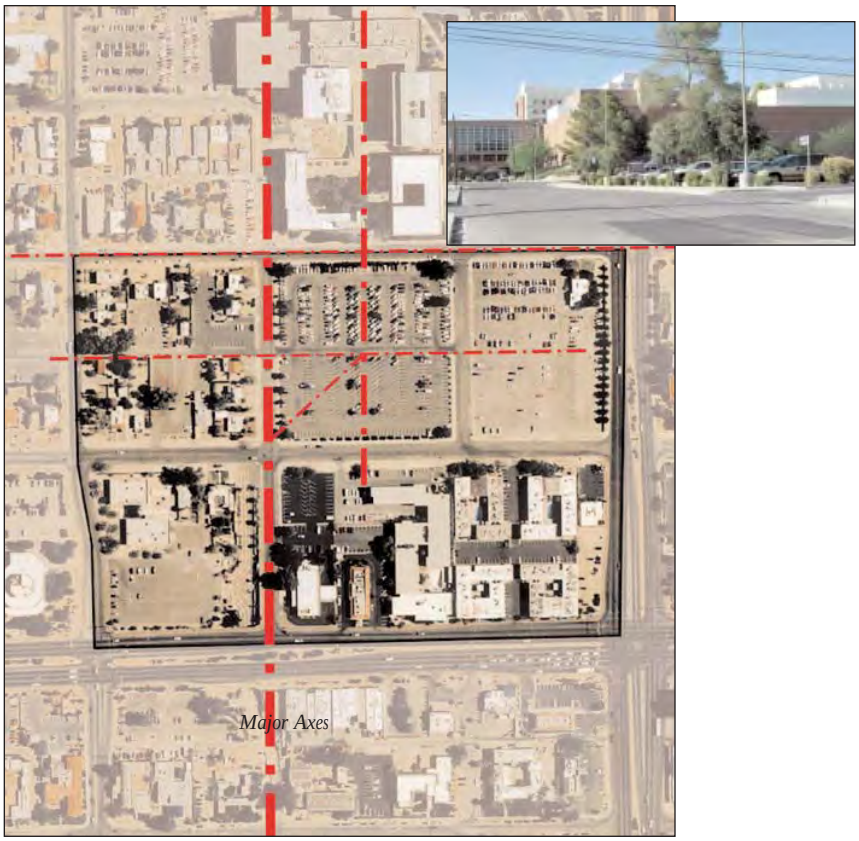
Proposed AHSC use zones

The AHSC Library is in the center of campus, allowing for a monumental presence and a terminus to the Warren Avenue corridor

1. Landscape buffer
2. Service Zone
3. University Medical Center
4. Research Zone
5. Academic Zone
6. Outpatient Clinics
7. Mixed-Use Zone
8. Open Space/Detention

ORGANIZING ELEMENTS

- Major axis along Warren Avenue corridor links AHSC with main campus
- Health Sciences Library terminates axis at north
- Secondary north-south axis is a continuation of hospital and medical school circulation spine that links academics to UMC
- Several east-west connectors are derived from the existing street grid.
- Provides area with a clear structure that aids in wayfinding and visitor orientation



Warren Avenue will become the primary connector between AHSC and central campus.

Public concourse leads to Medical school main entry

- Major public spaces and circulation zones within the existing AHSC complex are the generators of future growth strategy.
- Major public buildings, such as a library or auditorium, often occupy positions of importance within the plan. They can be referred to as landmark buildings.
- Other buildings define the edges of space that frame the building. These can be referred to as space defining and typically are characterized by orientation, mass and/or architectural asserted character/ style at variance with its context.
- Future circulation corridors should continue and reinforce existing patterns, thus simplifying orientation.

Major public access in existing structures

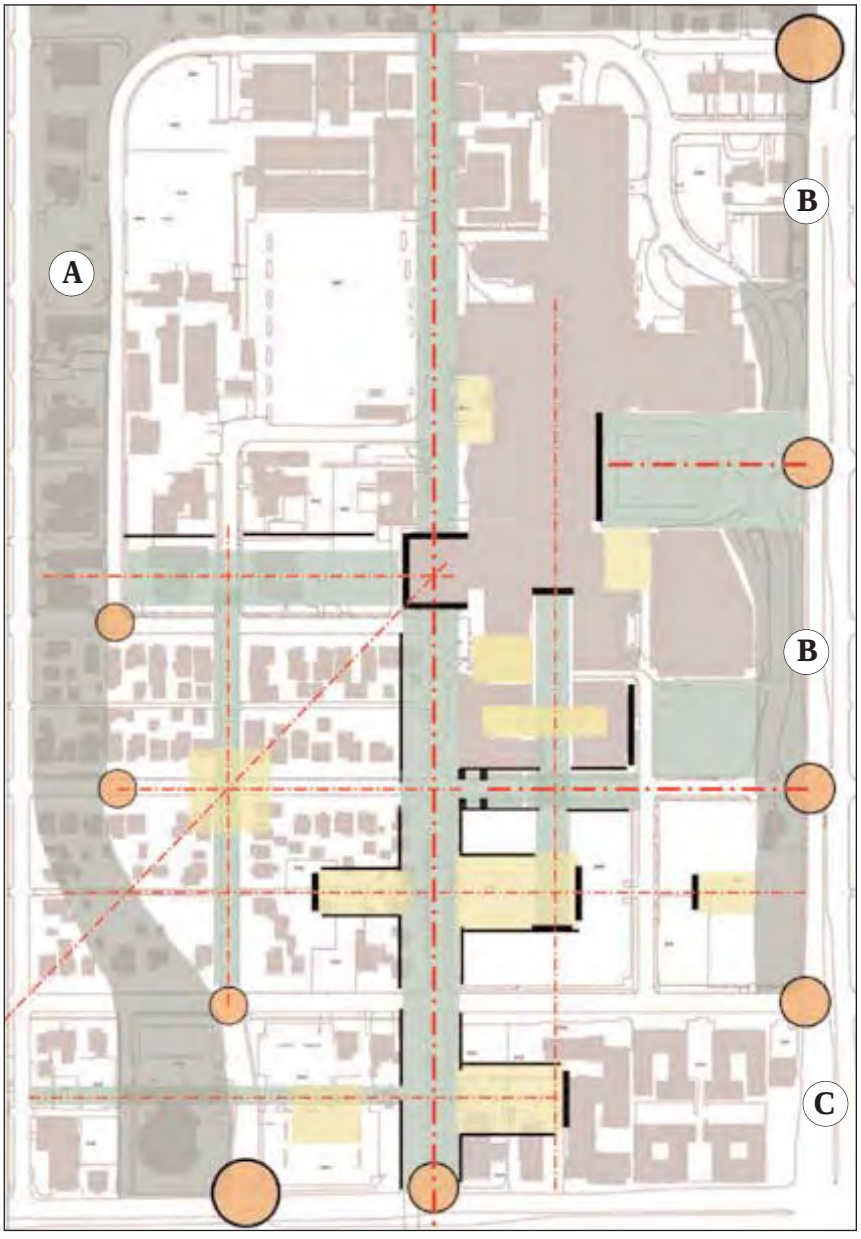
View from adjacent neighborhood to AHSC – A landscape buffer will create a usable transition zone.

AHSC presence on Campbell Avenue – A clear entry and simple wayfinding are important for visitors.

PRECINCT DIAGRAM

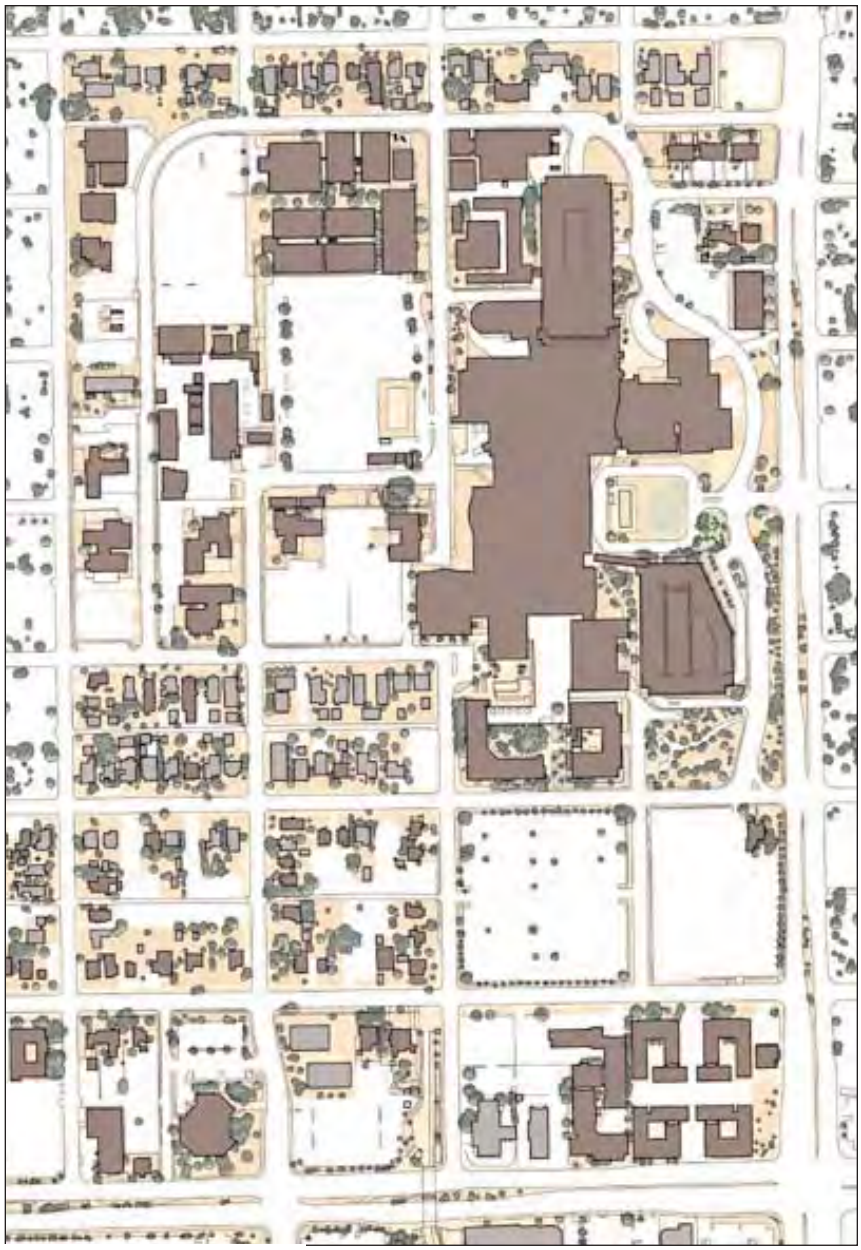
A–Landscape buffer provides interface with neighbors to the north and west.
B–Serves as transition zone between Campbell Avenue and campus setting of AHSC
C–Edge at Campbell Avenue and Speedway Boulevard gives the University major regional public presence

- Area organization derived from existing street configuration (dotted lines)
- Hierarchy of linked open spaces creates easy orientation and encourages walking and biking (green).
- Important public buildings such as the library terminate vistas and axes.
- Building edges define open space (dark lines).
- Gateways often occur at one end of an axis (circles).
- Gateways serve as entry markers and help clarify campus organization.

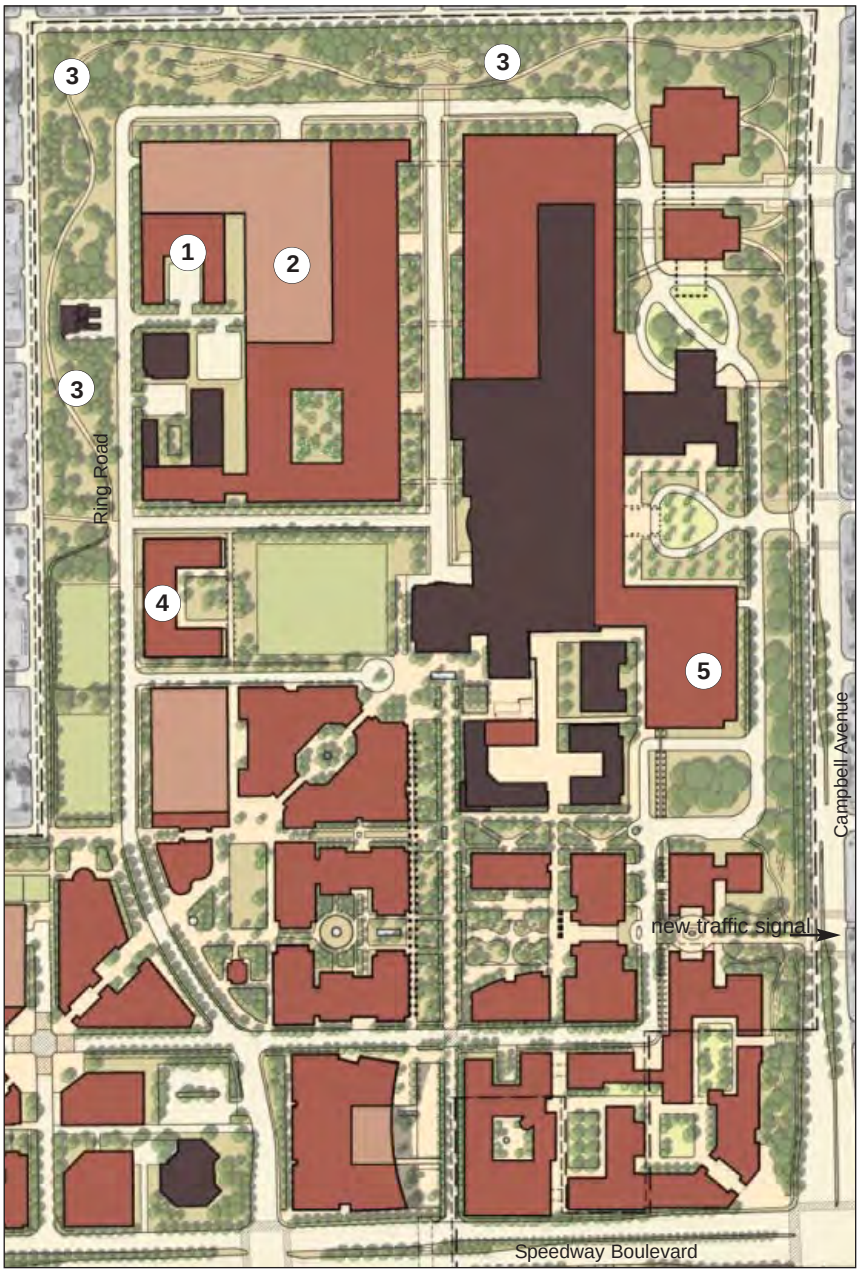


EXISTING PRECINCT

The image (near right) shows the existing conditions for the AHSC area of the University campus. The image at the far right is the Concept Development Plan for this Precinct. Gray indicates existing buildings and red indicates proposed buildings. This Precinct-wide plan features a fully realized Ring Road with a central service facility in the northwest corner of the campus (1). There is a large expansion of the University Medical Center to the northwest with its exigent need for parking (2).



Precinct 2 – Existing Conditions



Precinct 2 – Concept Development Plan

PROPOSED PLAN

A natural buffered edge surrounds the campus to help detain storm water runoff as well as provide an amenity for the surrounding neighborhood (3). Other plan features include a site for UMC and the University facilities offices (4), and a new Health and Wellness Center on top of an existing parking deck (5). Please refer to the Comprehensive Campus Plan 2003, Precinct 2 for more information on these concepts.

The AHSC Sub-precinct Plan attempts to create a stimulating learning environment that is organized clearly and encourages collaboration. The basic plan configuration is a modified grid influenced by the existing street pattern. A hierarchy of open spaces that create a memorable and usable place connects blocks of the program. These spaces act as links to other parts of campus as well as within the AHSC area. There are spaces for gathering, spaces that create buffer, spaces for active recreation, and spaces for contemplation. Each building is directly connected to an outdoor space that may be a formal entry or a more private courtyard.

Existing conditions

To promote a pedestrian environment, parking for 3,400 cars is provided in three decks, all at the periphery of the sub-precinct. The interior of the AHSC campus is largely free of automobile traffic, making it safer and more efficient for users.

Programmatic functions in this area as recommended in the AHSC Use Zones include (far right) the landscape buffer (K), a research zone (1.1-2.2 and 5), an academic zone (3.1-3.3), clinic space (4.1-4.3), and a mixed-use zone (6.1-6.3).

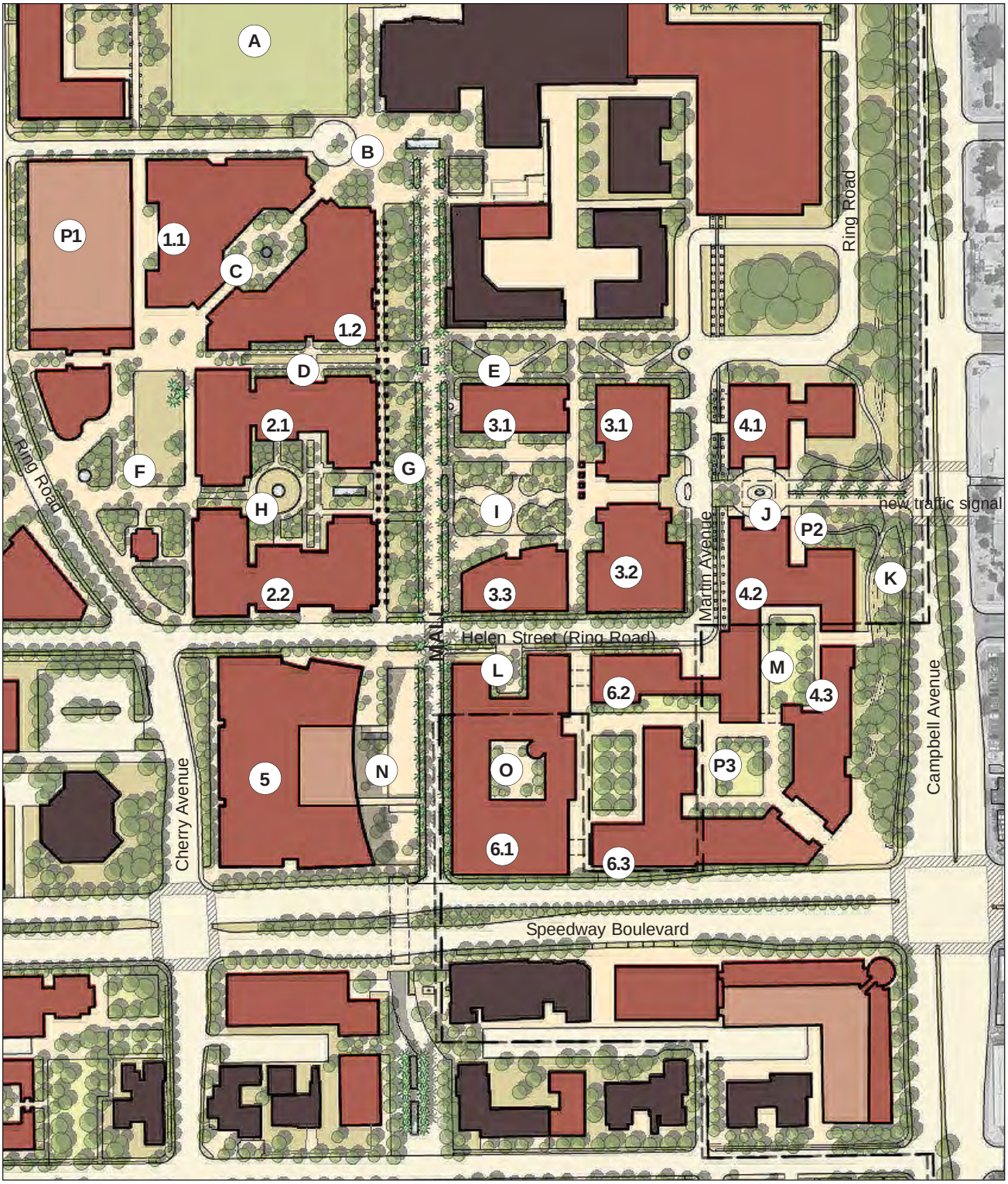
The major organizing element in this plan is the mall that is the continuation of Warren Avenue. This corridor connects the central campus to AHSC via the Warren Avenue underpass. The mall terminates at the AHSC library. Research functions are sited on the west side of this central spine closer to engineering and the central campus. A diagonal circulation route from the library through the research zone to the Highland Avenue underpass further connects a diverse array of disciplines. A detention basin with turf areas for multi-use activities (A) is located west of the library. The Ring Road is realigned on the west side in order to create larger building sites and to clarify traffic flow.

On the east side of the mall, academic functions lie between Helen and Mabel Streets. The relationship of the academic zone to the research zone encourages the flow of information between the two. A hotel and mixed-use complex is sited along Speedway Boulevard and the mall south of Helen Street. This complex would provide needed meeting space not only for AHSC use, but for various other professional schools as well. Clinic space is prominently located along Campbell Avenue with a new entry into the complex midway between Helen and Mabel streets.

The chart at right indicates a responsible capacity for growth in this area. Implementing a long-term planning strategy that creates a clearly organized campus is critical to the success of these future ventures.

Buildings*			GSF
	1.1	Research	
	1.2	Research	435,000
	2.1	Research	
	2.2	Research	600,000
	3.1	Academic	
	3.2	Auditorium/Academic	
	3.3	Academic	270,000
	4.1	Clinic/Office	
	4.2	Clinic/Office	
	4.3	Office/Mixed Use	380,000
	5	Research	385,000
	6.1	Mixed Use	
	6.2	Misc. Office Use	
	6.3	Mixed Use	60,000
		Total	2,280,000
Parking	P1	Research Zone	1,300 cars
	P2	Clinic (below grade)	800 cars
	P3	Mixed Use Zone (below grade)	1,300 cars
			3,400 cars
Open Space	A	Detention Basin/ Multi-Use Open Space	
	B	AHSC Plaza/Drop-off	
	C	Plaza	
	D	Connector Space	
	E	Low Water Use Corridor Landscape	
	F	Plaza	
	G	Mall	
	H	Plaza	
	I	Corridor Landscape/Plazas	
	J	Clinic Drop-off	
	K	Buffer	
	L	Hotel Drop-off	
	M	Plaza	
	N	Warren Avenue Plaza	
	O	Hotel Courtyard	

**Research buildings will provide space for University-wide initiatives as well as more traditional ones serving the medical fields.*

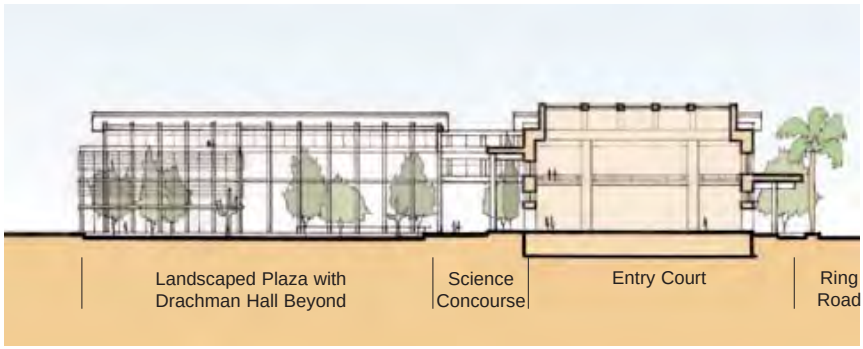


AHSC and Environs Concept and Development Plan

ACADEMIC

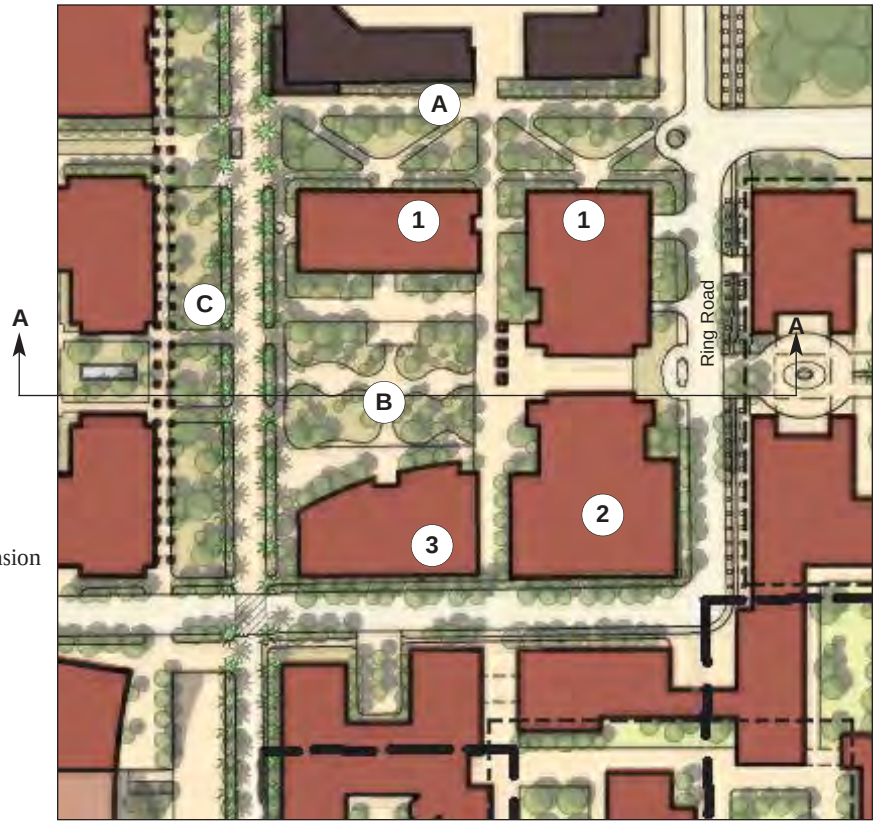
Academic programs are sited as a southern expansion of the existing academic core. There is a direct connection to UMC via an extended Health Sciences Concourse. Adjacent to the mall, the academic functions would have a clear connection not only to the rest of AHSC but to central campus.

Arranged around a central open space (B), Drachman Hall (1) is the first building slated for construction. As the new home for the College of Public Health and pharmacy and nursing expansions, the building is sited to relate as closely as possible to the existing academic buildings. Reconfiguring Mabel Street from Martin Avenue to the Ring Road creates an open space centered on the former street (A) that connects the new with the old. A future academic building with a potentially large auditorium fills out the east side of the block (2). A service court between buildings 1 and 2 would serve the block. Another future academic building (3) creates the final edge to the central open space.



Section AA

The section at right illustrates the landscaped open space at the center of the complex. The buildings are generally three to four stories high with a composition that breaks down the mass.



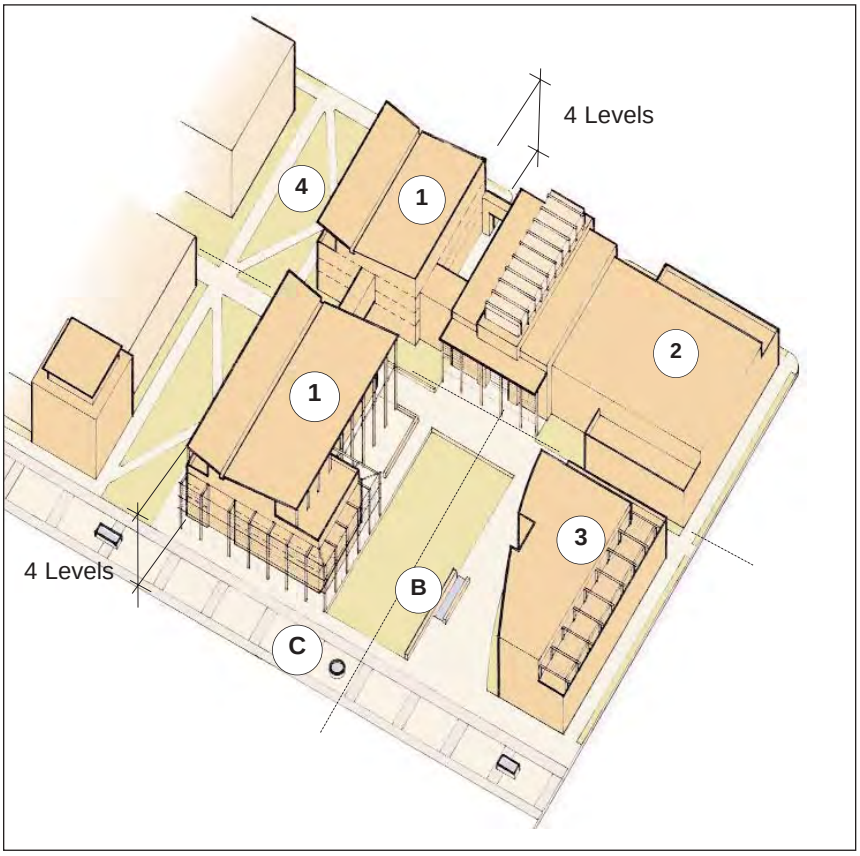
Plan

Buildings

1. Drachman Hall and potential future expansion
2. Future auditorium/academic
3. Future academic

Major Open Spaces

A. Mabel Street
B. Plazas with low water use landscape
C. AHSC Mall



Axonometric

Total GSF	270,000
Drachman Footprint GSF (4 levels)	35,000
Drachman GSF	25,000
Parking spaces	0

Drachman Hall is conceptually illustrated in section (far left) and axonometrically as two buildings connected by a bridge that allows the continuation of the Health Sciences Concourse underneath. This arrangement allows a clear connection to the existing academic buildings while creating a threshold to the newly created space (B).

As shown far left, the buildings in this area should be designed to have more than one front. Drachman Hall should have entries on the mall (C), the plaza to its south (B) and open space to the north (A). Climate mitigating architectural and other elements such as sunshading, water harvesting, and xeriscaping should be encouraged.

The axonometric drawing indicates a consistent massing throughout this zone. Roof elements can be used to identify entry points, especially at the entry to a major public building like the auditorium. Covered porches at the entry allow for social interaction through incidental meetings. Water elements will help to cool outdoor open spaces.

Perspective View

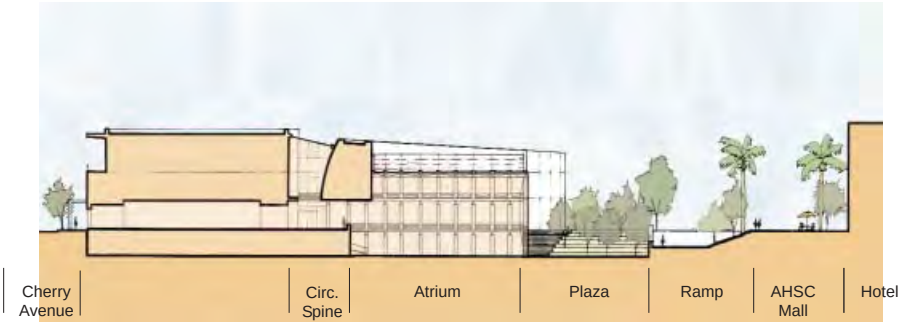
RESEARCH

The future research building (1) is sited to take advantage of the Warren Avenue underpass. An interior atrium connects at the elevation of the underpass to an outdoor plaza (A). A bridge over that plaza connects the research building to the mall (B).

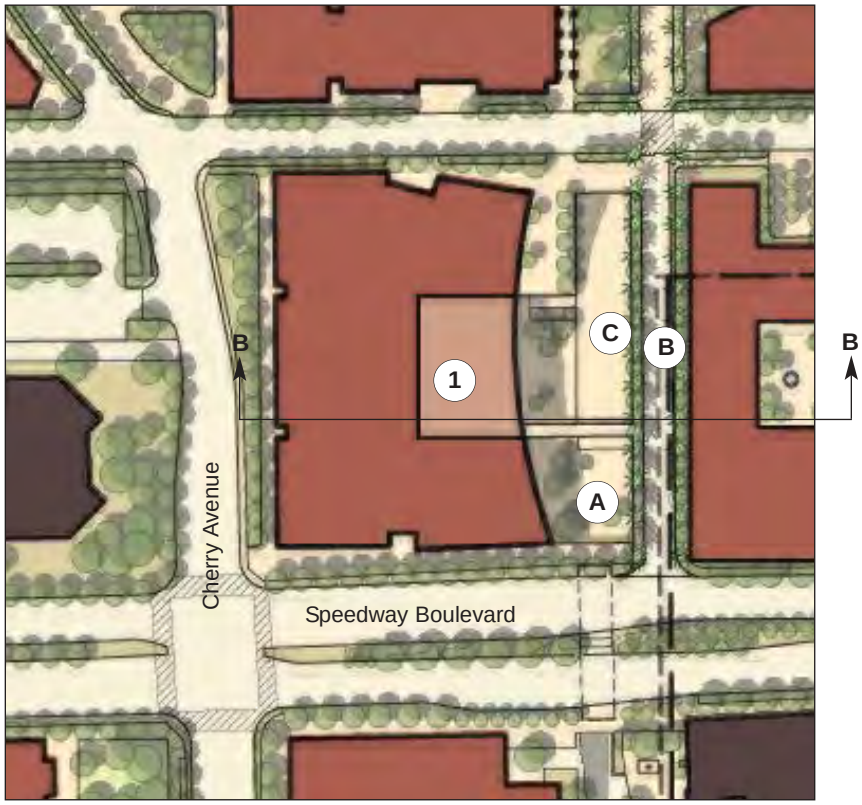
Another entry to the building is on Speedway Boulevard and becomes the major circulation spine of the building that continues through to Helen Street.

The section below indicates the interior atrium space adjacent to the outdoor plaza at the underpass. The central circulation spine is also shown as an entry off of Cherry Avenue.

The building is shown as four levels, the bottom level being underground at some locations. A ramp between the lower plaza and the mall allows for smooth pedestrian flow between levels. (C)



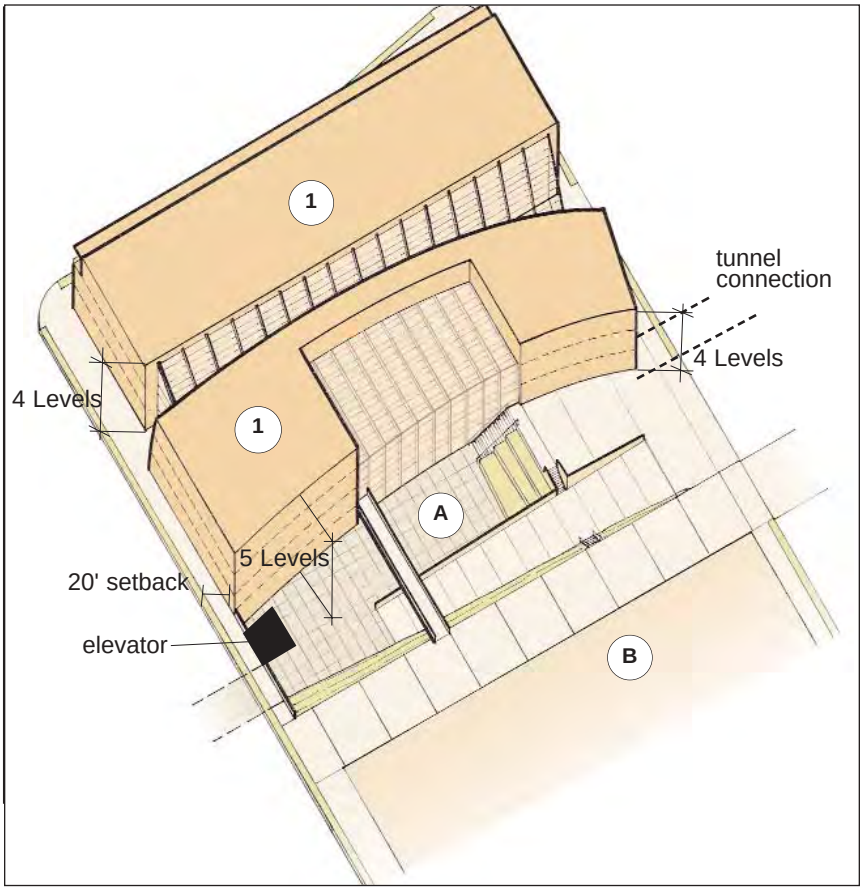
Section BB



BioMedical Sciences and Biotechnology Block

Buildings
1. Research Building

Major Open Spaces
A. Warren Avenue Underpass Plaza
B. Mall
C. Indicates Ramp Area



Axonometric

The axonometric drawing (left below) shows the breakdown of the building into two wings separated by the central spine. The atrium is shown opening onto the lower plaza.

The massing is kept simple to allow focus on the spaces. The building has four fronts and should be considered in the whole. It will be serviced via an underground tunnel system connecting to the other research buildings or by a small loading dock on Helen Street.

Footprint GSF (4.5 levels)	87,000
Total GSF	385,000
Parking spaces	0

Perspective view looking southeast

CLINICS

The layout of the clinic complex is designed to create maximum exposure on Campbell Avenue while creating a clear procession from arrival to clinic. A new signalized gateway entry midway between Helen Street and Mabel Street will help direct visitors directly to the heart of the clinic complex. A drop-off area (A) will allow patients to directly enter wings 1 or 2 while parking provided under the complex connects vertically into the buildings. Wing 3 is connected to a below grade parking deck behind the buildings at the corner of Speedway Boulevard and Campbell Avenue.

A large setback with landscaping along Campbell Avenue (B) creates a buffer from the traffic along Campbell Avenue and provides attractive views toward the clinic complex.

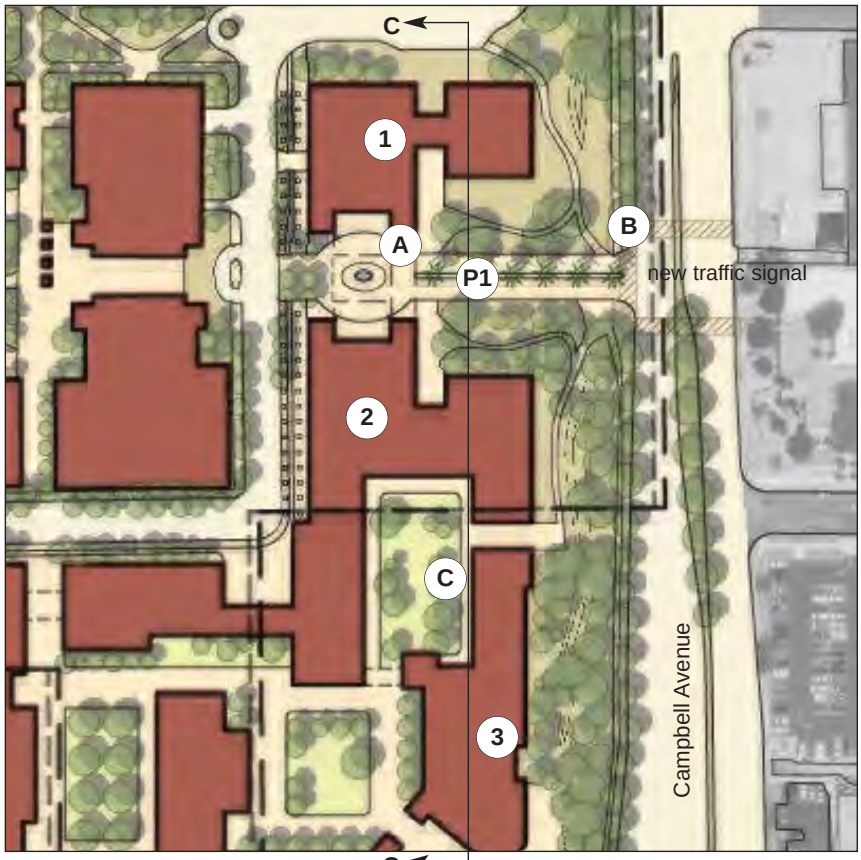
An interior courtyard (C) aids in wayfinding by creating a memorable space that visitors and staff can refer to while moving through the building.

The section (below) shows retail and office uses on Speedway Boulevard on the south with the clinic complex attached to the north. The courtyard (C) is enclosed by four-and five-level circulation corridors that allow visitors views into the garden.

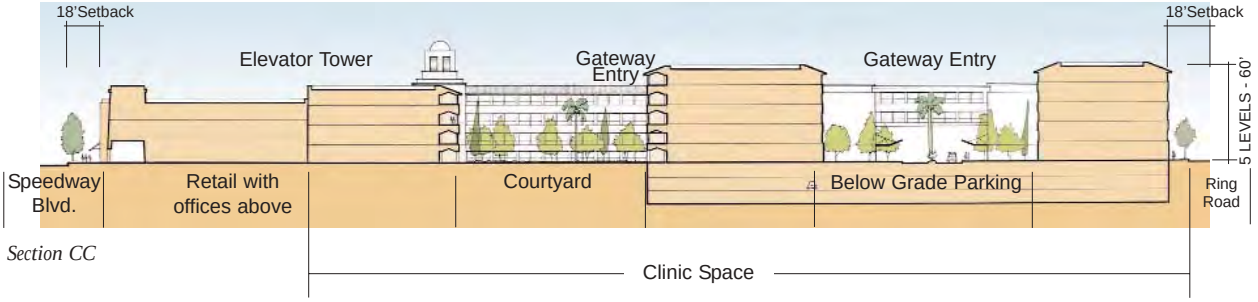
Buildings
1. Reserve site (Jan. 2008)
2. Clinic/Office
3. Office/Retail

Parking
P1 – below grade

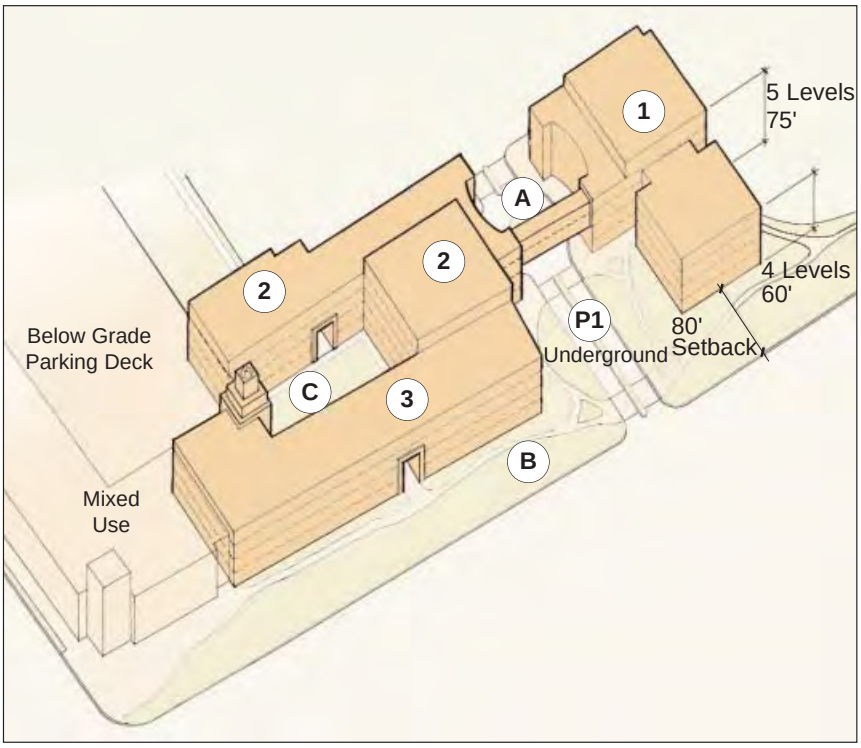
Major Open Spaces
A. Clinic drop-off
B. Landscape buffer
C. Courtyard



Clinic/Office



Section CC



Axonometric

A tower element that serves as vertical circulation for the parking deck is another reference point. Three levels of underground parking are shown under a portion of the buildings.

The drop off area is shown in the section and axonometric drawings with a bridge connecting wings 1 and 2. Massing is simple and is slightly stepped back to a high point in the middle of the block.

The main entry to the complex is at the drop-off area; secondary entries occur from the parking deck and tower and also from Campbell Avenue.

Footprint GSF	88,000
(4-5 levels)	
Total GSF	380,000
Parking spaces	800
(3 levels underground)	

Perspective View

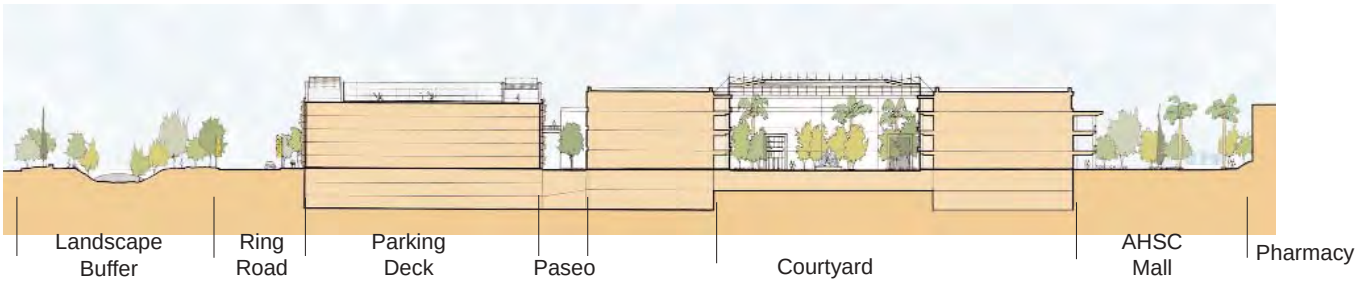
RESEARCH

This portion of the research zone has been proposed as the future Bobbi Olsen Cancer Research Building. Phased in two parts, the research complex form two important edges to major open spaces for AHSC (A and F). The mall to the east is the major circulation spine for the campus. The north-facing elevation is an important entry point for the campus as a whole, especially at the drop-off area (B).

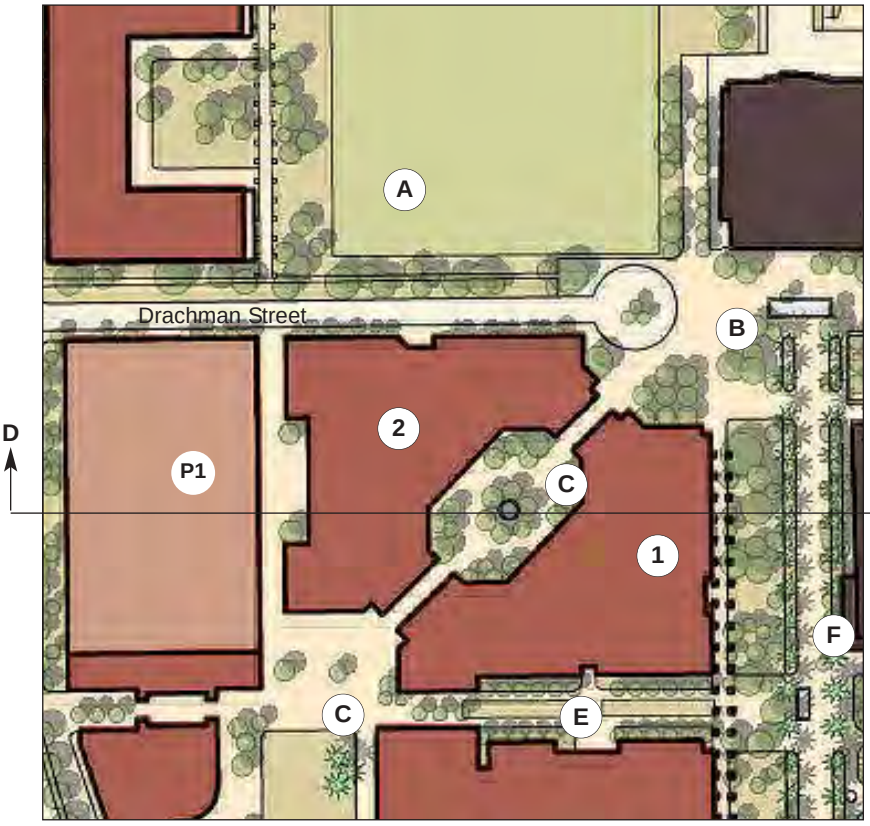
The buildings are sited to facilitate diagonal movement between AHSC and the central campus via the Highland Avenue underpass. Courtyard C provides a semi-private area for building users.

While the complex has an identifiable character and composition, it fits into the larger fabric of the research zone, reinforcing connectedness between departments. The plan allows pedestrian movement through the site in almost any direction, which will promote walking and outdoor activity.

The P1 deck is eight levels partially below grade that yields 1,300 spaces. It is sited at the edge of the AHSC campus to keep traffic volume out of the center. Central loading is housed in the basement level connecting to local buildings via a tunnel system.



DD Section

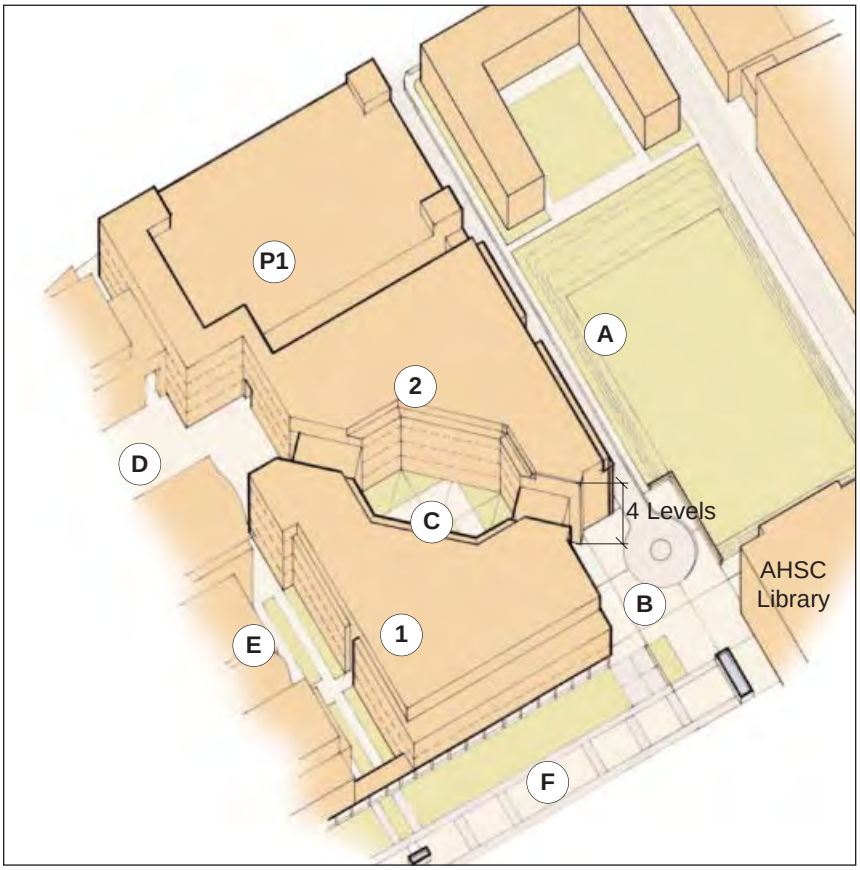


Plan

Buildings
1. Research – Phase 1
2. Research – Phase 2

Parking
P1 – deck

Major Open Spaces
A. Detention basin/Multi-use turf area
B. Drop-off area
C. Courtyard
D. Plaza
E. Connector space
F. Mall
G. Tunnel access for service and delivery



Axonometric

The section and axonometric drawings show a four-level structure above ground with one or two basement levels. A major service area at the lower level of the parking deck serves much of the research zone via this lower level.

The central courtyard space (C) is the focal point of the complex and acts as a gathering space for special functions. Another feature shown in the axonometric drawing is a continuous covered walkway along the west side of the Mall. A landscaped zone between the building and public walkway of the mall encourages small gatherings and study space. The detention basin to the north of the research zone also serves as outdoor recreation space. This open space in front of the west facing side of the library creates a memorable entry sequence to AHSC from the neighborhood side as well.

Footprint GSF (4-5 levels)	90,000
Total GSF	435,000
Parking spaces (8 levels)	1,300

Perspective view looking southeast

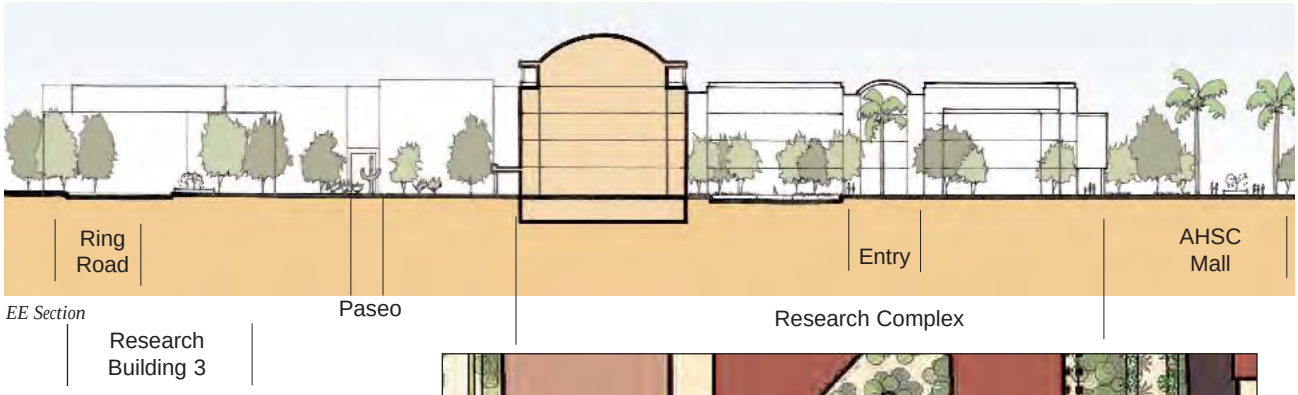
RESEARCH

Future research buildings (1, 2 and 3) are sited to create a seamless transition between the research clusters to the south and to the north. Phases 1 and 2 face major open spaces on the east and west. Open spaces (B and D) create semi-private zones and also allow pedestrian circulation from AHSC mall (C) to the plaza (A).

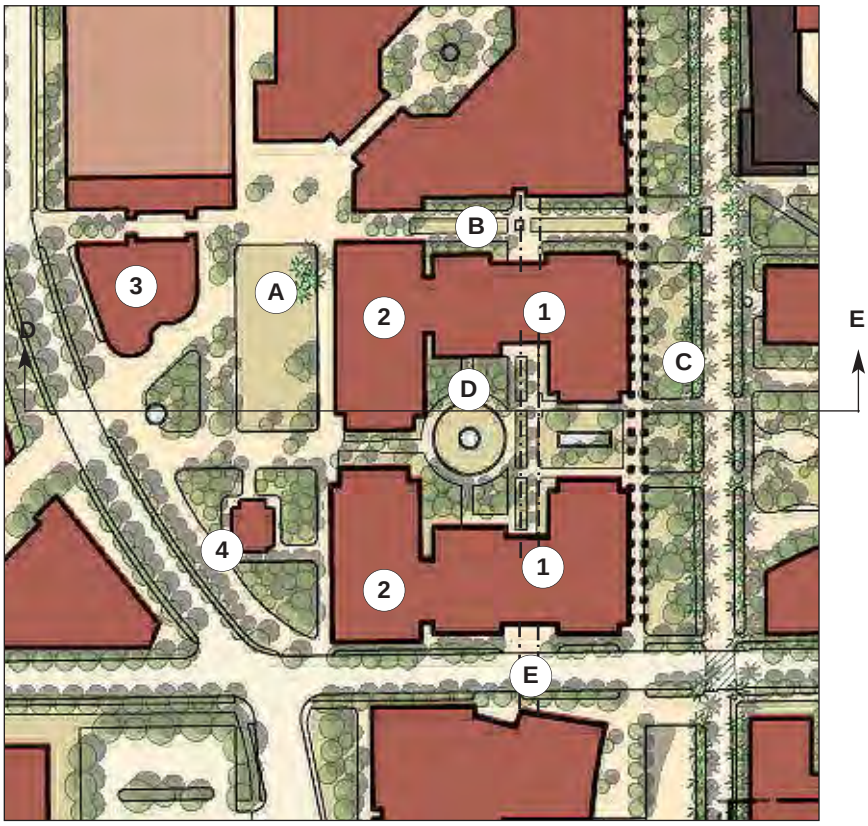
Phase 3 is a smaller building attached the south face of the parking deck. It is conceived of as an object in the landscape and helps define the diagonal path from the library to the Highland Avenue underpass. Building 4 is a small pavilion for food service or to house outdoor functions. The size of this building is subject to the nature of its use, but the site should include considerable plaza space with tables and chairs both in sun and shade.

The basement connects to the service area at the lower level of the parking deck to the north via a tunnel. Building 1 will construct the tunnel to the south.

The section below shows a consistent five-to six-level building height. The smaller barrel vault indicates an entry that allows for continuous circulation from and through both buildings of the complex (path to east of circle in plan, above tunnel).



EE Section



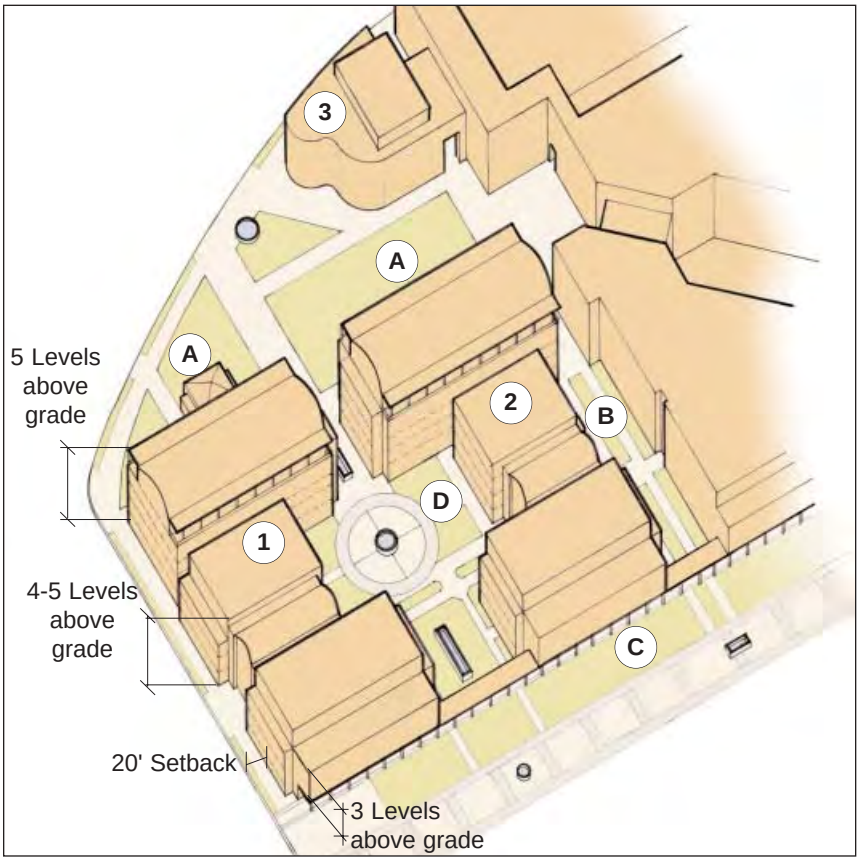
Plan

Buildings

1. Research – phase 1
2. Research – phase 2
3. Research – phase 3
4. Food service/special functions

Major Open Spaces

A. Plaza
B. Connector space
C. AHSC Mall
D. Courtyard
E. Tunnel access for service and delivery



Axonometric

The axonometric drawing indicates the continuous covered walkway along the west side of the mall. It serves as a threshold into the space of the research complex. Building massing highlights the connected footprints that constitute the plan. Slightly differing heights and facade rhythm further reinforce the idea of a collection of buildings rather than one massive structure.

The east wings step down to three levels at the AHSC mall side.

*In the final building there will be no surface or structured parking on this block. At that time, if there is a need for frequent public access to the research units, alternative assistance, such as a shuttle cart would be implemented. Drop-off areas could be located adjacent to the AHSC mall and Helen Street intersection, as well as along the Cherry Avenue extension/Ring Road adjacent to building 3.

Footprint gsf (3-6 levels)	110,000
Total GSF	600,000
Parking* spaces	0

Perspective view looking southeast

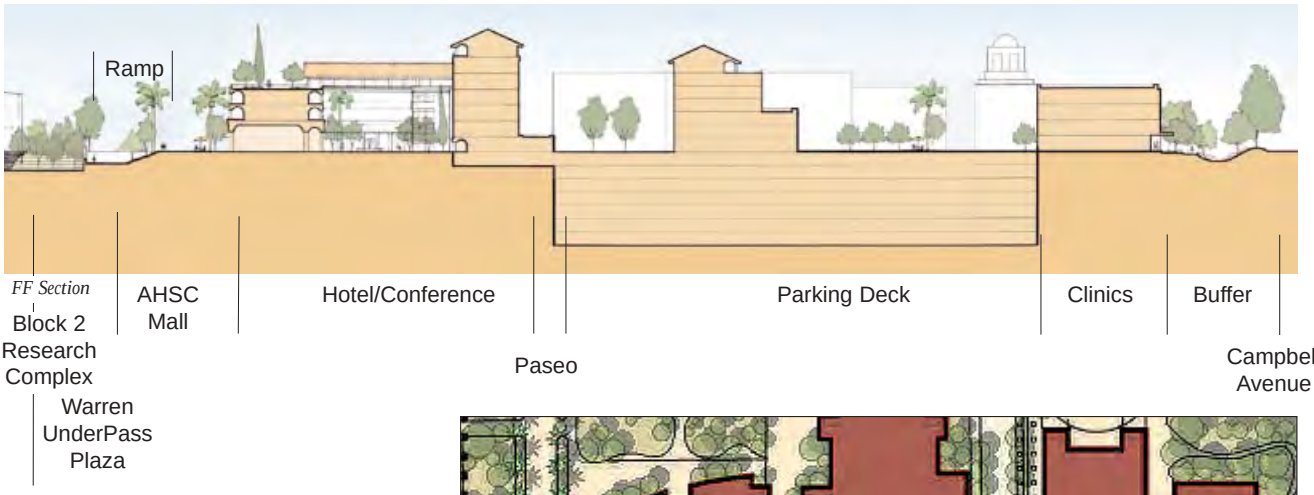
MIXED-USE

The hotel and mixed-use complex proposed for the corner of Speedway Boulevard and Campbell Avenue become a vital University gateway. The hotel and conference facility (1) face Speedway Boulevard and the mall and Warren Avenue underpass plaza. Retail and restaurant uses are at the ground floor on both sides with conference facilities behind and above.

Retail with office space above (2) faces Speedway Boulevard and turns the corner on Campbell Avenue. Building 3 contains office space.

Parking is provided in a below grade seven-level 1,300 car deck (P1). The hotel features an interior courtyard (D). The landscape buffer (E) terminates just before the corner of Speedway Boulevard and Campbell Avenue to allow pedestrian flow.

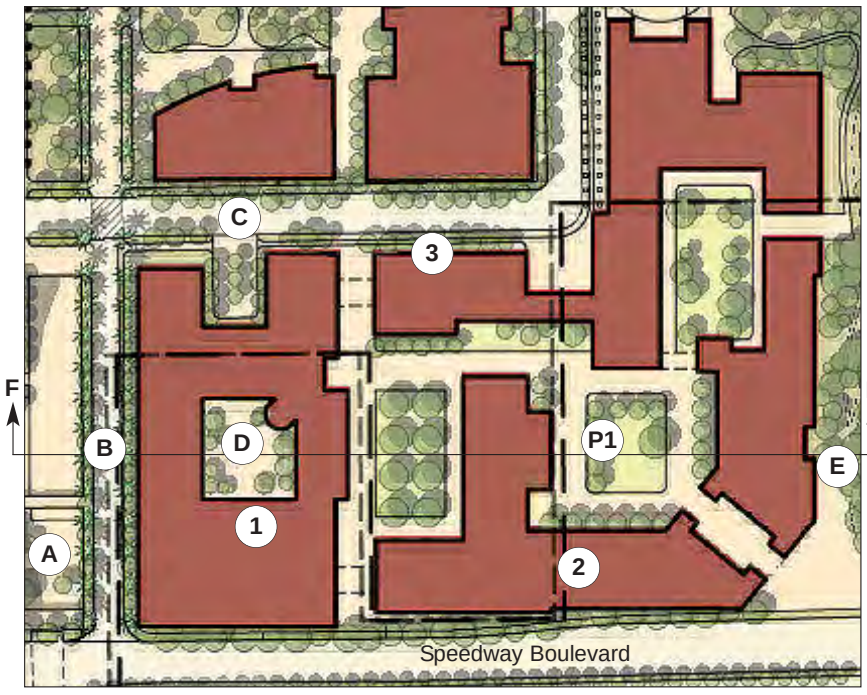
The section below indicates the multi-layered silhouette of the hotel creating rooms with spectacular views and usable rooftop terraces. Stepping the building height allows for more light into the central courtyard.



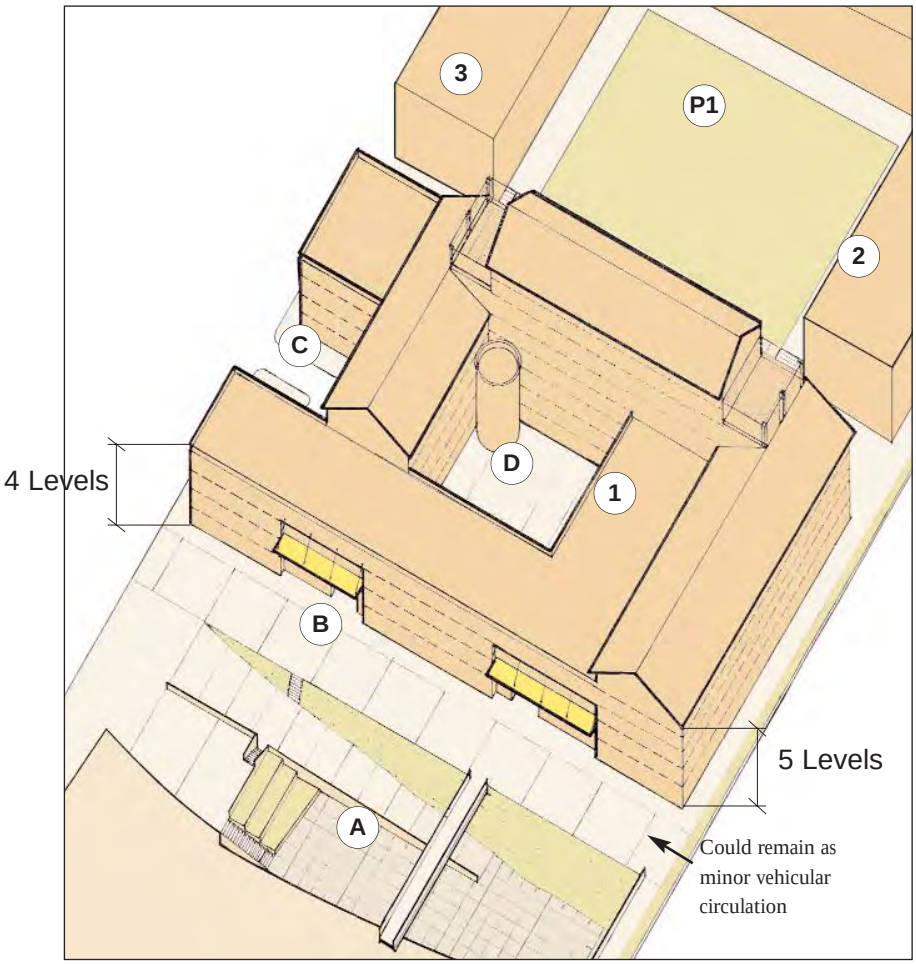
Buildings
1. Hotel/Conference/Mixed Use
2. Retail/Mixed Use
3. Office

Parking
P1 – deck (below grade)

Major Open Spaces
A. Warren Avenue Underpass plaza
B. Mall
C. Hotel drop-off
D. Courtyard
E. Landscape buffer



Plan



Axonometric

The axonometric drawing shows layered masses of the hotel that range in height from four to seven levels. Major hotel and conference entries are shown with yellow overhangs. The bridge from the research building connects directly to the entry for the conference center.

Retail spaces and restaurants spilling out onto the mall greatly animate this space, creating a beacon for the area.

Footprint GSF (3-7 levels)	116,000
Total GSF	460,000
Parking spaces (7 levels)	1,300

Perspective view looking southeast

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APPENDIX 3
TACTICAL IMPROVEMENTS, OPERATIONAL AND PARTNERSHIP OPPORTUNITIES

TACTICAL IMPROVEMENTS, OPERATIONAL AND PARTNERSHIP OPPORTUNITIES

Proposed Strategy	Analysis and/or Intent
I. TRANSIT RESTRUCTURING AND CHANGES IN SERVICE	
A. Restructure Sun Tran Services	
1. Conduct transit restructuring study to evaluate refocusing services for the University faculty, staff, and students journey-to-work/school and to better serve proposed park-and-ride lots.	Based on student surveys and key person interviews, there is a strong desire to evaluate Sun Tran to better serve the University community. Service changes may require either reduction in other services or increased funding.
2. Expand Sun Tran coverage to serve the University student's needs particularly with more area coverage consistent with student housing locations.	Similar to above as faculty, staff, and student housing locations change, additional service coverage is required to provide opportunity to capture trips on transit.
3. Extend hours of operation to better serve student travel by being consistent with library and evening class hours	Later night Sun Tran service would assist in providing alternative modes of travel and not "abandon" evening students.
4. Rehabilitate existing campus transit centers with expanded passenger services, shade, and transit information materials.	Rehabilitation would provide improved services to user and reflect University's commitment to transit as an alternate mode.
5. Design transit zones at intersections of Sun Tran and Cat Tran routes and parking structures to clearly identify the linkage between these providers.	Modest "transit zone" improvements in the form of co-signing transfer locations, routes, and transfer policy would facilitate cross-usage.
6. To boost ridership, implement marketing program to communicate to University community benefits of taking transit, transit pass program, and transit schedules/hours of operation.	Improved marketing of benefits and operations would assist in capturing additional market share.
B. Expand Community Remote Park-and-Ride Lots	
1. Identify and undertake off-campus lease agreements.	Potential sites intended to serve as "intercept" sites and reduce need for on-campus parking or parking in neighborhoods.
2. Serve with new or re-routed Sun Tran services which provides a direct service to the University transit center.	Park-and-Ride sites need to be coordinated with existing routes and restructuring study.
C. Expand CatTran Shuttle to Serve More Park-and-Ride Lots	
1. Expand shuttle connection north to Campbell Avenue Farm area via Mountain Avenue and connect to park-and-ride lots.	Shuttle connection to research units and other units such as potential clinic space at Tucson General would reduce parking demand on campus.
2. Expand shuttle to Stone Avenue park-and-ride, I-10, and Pima Community College Downtown and East campuses to provide direct connection to University students.	Shuttle connection to the west and PCC campuses would reduce parking demand on campus.
II. PARKING, RESTRUCTURING, PRICING AND EXPANSION	
1. Provide high-cost, short-term parking on campus for commercial activity and student convenience. Provide drop-off parking at each key point of campus entry.	Short-term parking on Enke Drive, Warren, First, Second, and Fourth Streets would facilitate turnover usage and serve new market of commercial service providers. (check with PTS)
2. In new garages and on-street where possible, provide preferential parking for carpool/vanpool users controlled by employees and permits.	Preferences for parking by carpools and vanpools would encourage their usage.
3. Locate all future parking structures as proposed in adopted plans. Parking structures to be generally located north of Speedway, along Sixth Street and adjacent to Euclid.	The garages currently planned will reach the necessary on-campus permit spaces. The garages should be phased with the CIP. Off-campus park and rides fill remainder of need.
4. Increase the number of accessible visitor handicap parking spaces in proximity to the CatTran stops.	Linkage between accessible parking and transit routes is needed to create a seamless transportation system.
III. CORRIDOR IMPROVEMENTS	
D. Improvements to Mountain Avenue Corridor, North of Campus	
1. Assess means for limiting auto intrusion on bikeway especially at Grant Road where right turns typically impede the flow of bicyclists.	Improve flow and safety of bicyclists on Mountain Avenue. May be used elsewhere as warranted.
2. Monitor effectiveness of recently-installed double yellow striping and signs to prohibit passing of autos which create hazards for bicyclists.	Improve flow and safety of bicyclists on Mountain Avenue and reduce auto speed.
3. Redesign Mountain/Helen intersection to facilitate movement of bicycles to the Highland Avenue "bike spine" and movement of autos to service the Park avenue garage access on Helen Street.	A key component of the Vision. This would alter travel patterns on Mountain Avenue (reducing auto) and improve flow to garage. Bicycle focus improved.
E. Improvements to Euclid Corridor, Grant Road to Sixth Street	
1. Increase length of NB-to-EB right-turn bay at Speedway Blvd. to better accommodate traffic queue.	Present auto demand suggests safety enhancement should be assessed and implemented, if required.
2. Improve drainage at Euclid Avenue/Second Street to eliminate ponding.	As required. Assumed to occur with other actions.
3. Construct raised medians to control side street access and provide pedestrian refuge. Add pedestrian-scale lighting and crosswalk design treatments to "notify" autos of pedestrian crossing areas.	A key component to provide improved level of neighborhood protection to WUNA, pedestrian refuge/safety, and aesthetic enhancements.
4. Construct acceleration/deceleration lanes on Euclid Avenue at Fourth Street to facilitate right-turn ingress/egress to parking garage.	Set back garage structure and provide adequate room for lanes to accommodate traffic queue(s).

Proposed Strategy	Analysis and/or Intent
5. Consider restriping to include bike lanes, Speedway to Grant, where sufficient right-of-way and pavement are presently available.	Sufficient ROW exists and bicyclists use today. Adding striping would formalize bicycle option.
6. Improve bike route/pedestrian crossing of Euclid at Lester through design treatments, possible median refuge, and lighting changes to "notify" autos of modal crossing.	East-west bicycle route uses Lester, and crossing Euclid Avenue is difficult. Suggested improvements would reduce conflicts and slow autos at crossing.
F. Improve Speedway Corridor, Stone Avenue to Country Club Road	
1. Assess east-west turn visibility at Park, Mountain, and Cherry and consider changing traffic locational indicators to "pull back" vehicles so that they don't encroach on oncoming travel lane.	Vehicular conflicts appear to be enhanced with present design; assessment should be undertaken to determine if changes are required.
2. Assess viability of constructing median break U-turns in select areas to reduce left-turn queues at signalized intersections.	Median breaks should be assessed. Due to safety and aesthetic concerns, this is not a strong strategy.
3. Assess viability of installing left-turn phasing and greentime allotment at Euclid, Park, Mountain, and Cherry to facilitate left-turns with a lagging protected movement.	Assessment should be undertaken in concert with other Speedway strategies and Mountain Avenue strategy to determine viability and safety benefits.
4. Assess viability of constructing dual left-turn lanes EB-to-NB and WB-to-SB at Speedway/Campbell while maintaining bike lanes E-W.	Strategy improves flow at relatively low cost until GSI ADT threshold reached.
5. Consider modifying bicycle and pedestrian-actuated signal crossings at Stone, Sixth Ave., Fourth Ave., Euclid, Park, Mountain, Cherry, and Campbell to improve bike and pedestrian access to campus.	Public input indicates green time is too short to cross all lanes or signals are simply not working.
6. Assess the viability of removing the existing center turn lane on Speedway, Stone to Euclid, and restripe with bike lanes to provide an improved bicycle connectivity to the westside.	As a short-term strategy, consider to facilitate bicycle connectivity and safety. Concern with adequate ROW where LT pockets required.
7. Assess viability of constructing dual left-turn lanes SB-to-EB (and potentially NB-to-WB at Speedway and Stone.	Traffic study required to validate need for this strategy.
G. Improve Sixth Street Corridor, Stone Avenue to Country Club Road	
1. Improve drainage along Sixth Street as needed to eliminate ponding.	As required. Assumed to occur with other actions.
2. Signalize intersection with Park Avenue for access to Parking Garage and to facilitate pedestrian crossing of Sixth Street. Provide a positive means of median control to eliminate NB/SB traffic on Fremont, south of Sixth Street.	Install signal as part of Parking Garage implementation. Signal provides controlled access to garage, improves ped/bicycle crossing, and calms traffic on Sixth Street.
3. Construct acceleration/deceleration lanes on Sixth at Vine or Cherry to facilitate RT ingress/egress to future parking garage south of Sixth Street.	Similar to above, provide traffic lanes for long-term parking garage to accommodate traffic queues.
4. Increase length of left-turn bay SB-to-EB to Campbell Avenue to accommodate existing/future queue.	Present auto demand suggests safety enhancement should be assessed and implemented if required.
5. Add right-turn lanes NB and SB at Campbell Avenue/Sixth Street to accommodate turn movements.	Present auto demand suggests safety enhancement should be assessed and implemented if required.
6. Enhance pedestrian streetscape from Euclid Avenue to Campbell Avenue.	A key component. This strategy is intended to change the character of Sixth Street to more pedestrian and urban scale.
H. Improvements to Park Avenue Corridor, Sixth Street to Grant Road	
1. Add shoulders, sidewalks, sign and stripe with bike lanes, Speedway Boulevard to Grant Road	Sufficient ROW exists and bicyclists use today. Adding striping would formalize bicycle option.
2. Add bike lanes Sixth Street to Speedway per typical cross-section.	Adding bicycle lanes would assist in calming traffic on Park.
I. Other Transportation Improvements	
1. Assess concept of trolley possibly penetrating west end of campus onto Second Street..	Old Pueblo Trolley seeks to extend track east of Park Avenue.
IV. NEIGHBORHOOD ENHANCEMENTS TO IMPROVE QUALITY OF LIFE	
J. North University	
1. As Helen Street corridor develops/re-develops, minimize on-street parking, where feasible.	Helen Street is envisioned as a bike boulevard; this is one strategy to reduce bike/auto conflicts.
2. Enhance pedestrian/environment for ¼-mile streets by improving sidewalk continuity, lighting, and shading on Fremont and Highland.	A key element is to improve connectivity to adjacent neighborhoods. These streets are consistent with other strategies.
3. See also "improve Mountain Avenue Corridor"	See other strategy comments
K. Blenman Elm	
1. Assess feasibility of traffic calming design of Adams Street to mitigate effects of Saints Peter and Paul school traffic.	Strategy arose from neighborhood meetings and should be assessed and implemented if required.
2. Sign Elm and Pima consistently at 25 mph throughout entire length.	Strategy arose from neighborhood meetings and should be assessed and implemented if required.
	Strategy arose from neighborhood meetings and should be

Proposed Strategy	Analysis and/or Intent
4. Enhance pedestrian environment for ¼-mile streets by improving sidewalk continuity, lighting, and shading on Mabel and Adams.	A key element is to improve connectivity to adjacent neighborhoods. These streets are consistent with other strategies.
L. Sam Hughes	
1. Improve Third St. bicycle/pedestrian crossings at Tucson Blvd. and Country Club through design treatments, possible median refuge island, and lighting changes to "notify" autos of modal crossings.	E-W bicycle route uses Third St. and arterial crossings are difficult. Suggested improvements would reduce conflicts and slow autos at crossing
2. Conduct traffic calming study in SE quadrant (Seventh and Eighth Sts. and Treat) to determine if actions are required.	Sam Hughes neighborhood suggested strategy to determine extent of problem and solutions.
M. Rincon Heights and Pie Allen	
1. Expand Residential Parking Permit (RPP) program in neighborhoods to eliminate daytime and special events on-street parking by non-residents.	RPP program has been successful elsewhere and is supported for expansion by Rincon Heights
2. Eliminate special event parking on Vine Street south of Sixth Street.	Elimination of special events parking supported by Rincon Heights neighborhood.
3. As campus expands within new southern boundary, implement traffic calming strategies to reduce traffic impacts on neighborhood. Especially required for Seventh, Ninth, and Tenth Streets.	Traffic calming strategies along boundary will help reduce University impacts on neighborhood. Proposed Sixth St. improvements will reduce through-traffic conflicts; calming will slow and further reduce penetrating traffic from south.
4. Restrict auto access on Highland, north of Seventh Street.	Strategy requires that school busses and CatTran shuttle vehicles have access.
5. Upgrade Highland for non-auto modes by adding bike lanes, additional stop signs, and possible one-way (southbound) operation for autos.	Strategy in conjunction with Highland, Seventh to Sixth Street. Will change function of street to less auto-oriented.
6. Enhance pedestrian environment for ¼-mile streets by improving sidewalk continuity, lighting, and shading on Warren, Highland, and Fremont.	A key element is to improve connectivity to adjacent neighborhoods. These streets are consistent with other strategies.
7. Consider installing streetlights on Tenth Street at Euclid and Vine.	Strategy arose from neighborhood meetings and should be assessed and implemented if required.
8. Consider constructing new sidewalks at Park Avenue and Tenth Street.	Strategy arose from neighborhood meetings and should be assessed and implemented if required.
9. Construct cul-de-sac on Tyndall at Sixth Street.	Strategy arose from neighborhood meetings and should be assessed and implemented if required.
10.See also "Improve Sixth Street Corridor" for additional strategies.	See other strategy comments.
N. West University	
1. Assess need to resurface alleyways in neighborhood.	Issue/strategy raised by WUNA.
2. Enhance pedestrian environment for ¼-mile streets by improving sidewalk continuity, lighting, and shading on Second and Fourth Streets.	A key element is to improve connectivity to adjacent neighborhoods. These streets are consistent with other strategies.
3. To improve bike safety, assess ability and cost of retrofitting trolley tracks at intersection of Fourth Ave./ University Blvd. By eliminating or reducing space between pavement and track. If feasible, do.	Bicycle accidents resulting from tires sliding into track way should be reduced. However, strategy may conflict with historical character of trolley.
4. Improve bicycle/pedestrian crossing at University Blvd and Stone Ave. through design treatments, possible median refuge island, and lighting changes to "notify" autos of modal cross-section.	East-west bicycle route uses University Blvd., and crossing Stone Ave. is difficult. Suggested improvements would reduce conflicts, slow autos, and facilitate transit crossings.
5. See also "Improve Euclid Avenue Corridor"	See other strategy comments.
O. Feldman's	
1. Expand Residential Parking Permit program within neighborhoods to eliminate on-street parking by non-residents during daytime.	Residential Parking Permit program has been successful elsewhere and is supported for expansion by Feldman's.
2. Improve drainage along Mabel Street as needed.	Recommended by neighborhood.
3. Enhance pedestrian environment for ¼-mile streets by improving sidewalk continuity, lighting, and shading on Mabel and Adams.	A key element is to improve connectivity to adjacent neighborhoods. These streets are consistent with other strategies.
V. UNIVERSITY CAMPUS	
P. Modify Street Hierarchy on Campus	
1. Construct RT lane on EB Elm at Campbell signalized intersection to improve storage capacity and facilitate turn movements.	This improvement would reduce queuing and auto waits at existing signalized intersection.
2. Implement traffic calming on Helen, east of Mountain.	Helen Street is envisioned as a bicycle street long-term. This is one strategy to achieve that.
3. Install traffic calming devices (speed hump, pavers, lighting) on First Street at Highland Avenue crossing enhance bicycle and pedestrian travel through intersection.	Key element intended to change character of street to be consistent with needs for bicyclists as part of bicycle spine.

Proposed Strategy	Analysis and/or Intent
4. Close Warren Avenue to autos from First Street to Hawthorn. Make accessible for service.	Key element intended to change character of street to be consistent with needs for bicyclists as part of bicycle spine.
5. Change Mountain Avenue to 2-way auto travel (w/o bike lanes) from Second Street to First Street.	Key element intended to provide all access to garage from Mountain Avenue and eliminate through traffic in University Village.
6. De-emphasize auto traffic on Second Street; enhance bicycle and pedestrian travel.	Key element intended to change character of street to be consistent with University Village Plan.
7. De-emphasize auto traffic on North Campus Drive; enhance bicycle and pedestrian travel.	Key element intended to downgrade auto and provide improved aesthetics for other modes. Existing ADA parking would remain as is.
8. Remove on-street parking on Olive Road north of second Street; enhance bicycle and pedestrian travel.	Element intended to eliminate autos and existing interior parking and provide improved aesthetics for other modes.
9. De-emphasize auto traffic on Fourth St. between Park and Cherry Aves; enhance bicycle and pedestrian travel.	Element intended to downgrade autos and provide improved aesthetics for other modes.
10.De-emphasize auto traffic on Lowell St.; enhance bicycle and pedestrian travel.	Element intended to downgrade autos and provide improved aesthetics for other modes.
11.De-emphasize auto traffic on Highland north and south of Sixth Street; enhance bicycle and pedestrian travel.	Key element intended to upgrade Highland as the north-south bicycle spine on campus.
Q. Bicycle Circulation Modifications	
1. Sign Helen St. as bike route. Minimize/remove on street parking on Helen, Mountain to Highland, to facilitate bike travel as part of reconstructing Helen/Mountain Ave. (see Strategy D3).	Key element reflecting the north-south bike spine concept on Highland.
2. Narrow roadway, widen sidewalk. Modify gate to allow bike access and reduce conflicts south of Old Main (between Forbes/Social Sciences). (Add bollard and chain fencing.)	Secondary element of bicycle network intended to facilitate north-south movements on west side of campus.
3. Narrow roadway and widen sidewalk to reduce bicycle/ pedestrian conflicts north of Old Main (between Economics and Engineering bldgs.). (Add bollard and chain fending.)	Secondary element of bicycle network intended to facilitate north-south movements on west side of campus.
4. Extend Warren Ave. bike route south to Mall streets and then west to connect with Cherry Avenue. Close Warren Avenue to autos.	Secondary element of bicycle network intended to facilitate north-south movements on east side of campus.
5. Check/install bike-activated signals on major arterials adjacent to campus (see Strategy F5)	Ensure signals are working and bicycle actuation coordinated with future signalized intersections.
6. Improve street maintenance on all bike routes on campus.	Improved maintenance improves safety and usage.
R. Pedestrian Circulation Modifications	
1. Expand pedestrian-oriented improvements on campus such as open space, lighting, shade, sidewalks, etc.	Key element to enhance pedestrian environment.
2. Install and maintain updated pedestrian-oriented maps on campus for improved way-finding.	Way-finding remains a key limitation on campus and should be studied further to determine precise locations of signage.
3. Separate pedestrians and bicycles on Highland Ave. bicycle route east of Administration Bldg. per typical cross-section.	Key element. Cross-section separates two modes.
4. Separate pedestrians and bicycles on Mall.	Key element. Cross-section separates two modes.
5. Widen sidewalk, narrow roadway to reduce bicycle and pedestrian conflicts south of Old Main (between Forbes/ Social Studies) (See Strategy Q2)	Element to reduce conflicts.
6. Widen sidewalk and narrow roadway to reduce bicycle/ pedestrian conflicts north of Old Main (between Economics and Engineering bldgs.) (See Strategy Q3)	Element to reduce conflicts.
7. Check/install pedestrian-activated signals on major arterials adjacent to campus (see Strategies F5 and Q7).	Ensure signals are working and pedestrian-actuation coordinated with future signalized intersections.
S. Visitor's Center	
1. Evaluate and select new Visitor's Center location on Campus.	Plan and program Visitor Center's need.
2. Provide improved Visitor's Center at new location	Provide facility longer-term as a key element of Vision.

Developed from the University Area Circulation Study, February 1997.

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ARIZONA HEALTH SCIENCE CENTER SUB-PRECINCT PLAN APPENDIX 2

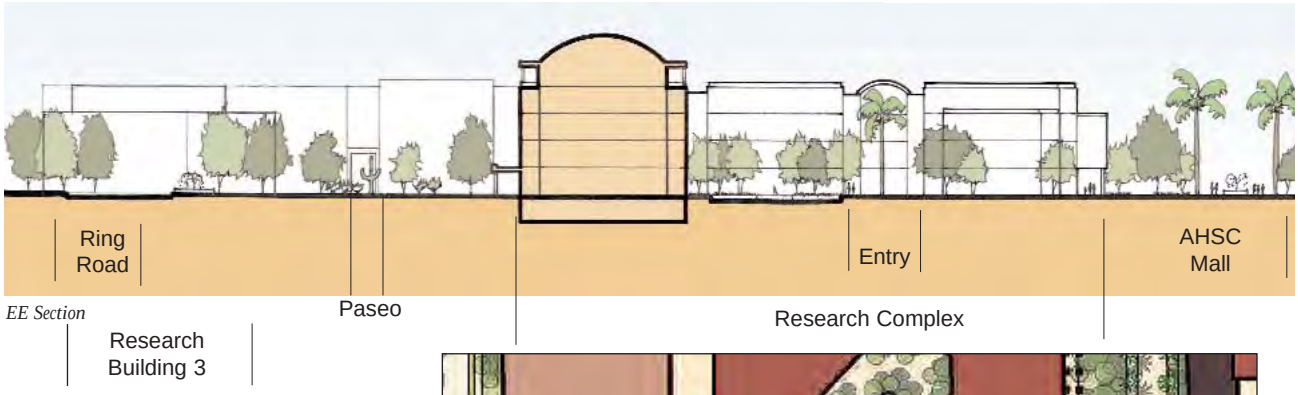
RESEARCH

Future research buildings (1, 2 and 3) are sited to create a seamless transition between the research clusters to the south and to the north. Phases 1 and 2 face major open spaces on the east and west. Open spaces (B and D) create semi-private zones and also allow pedestrian circulation from AHSC mall (C) to the plaza (A).

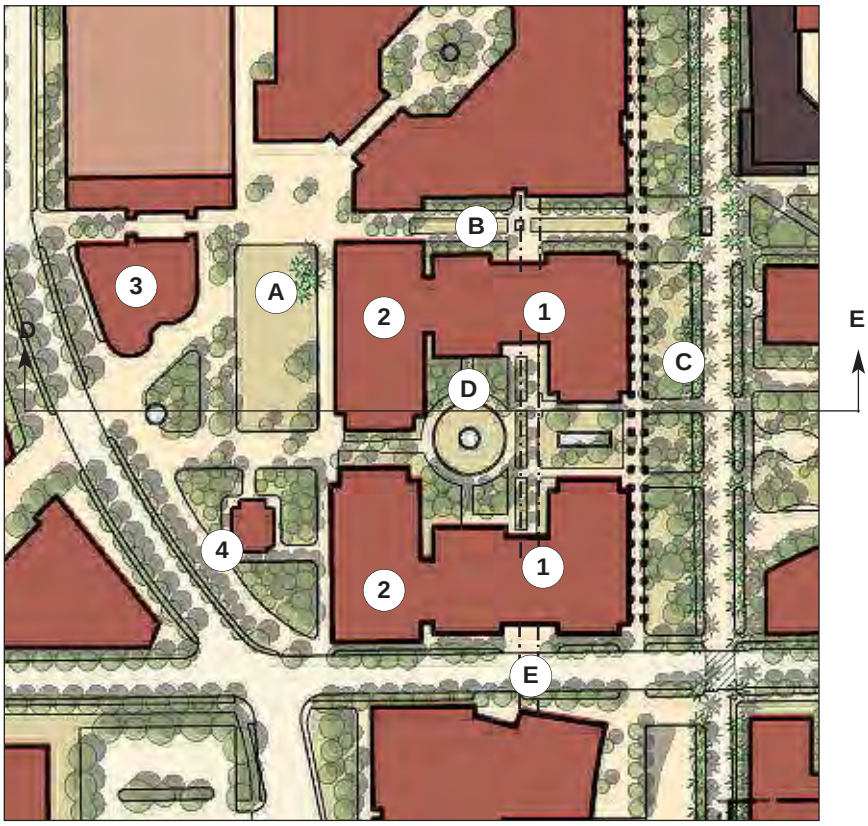
Phase 3 is a smaller building attached the south face of the parking deck. It is conceived of as an object in the landscape and helps define the diagonal path from the library to the Highland Avenue underpass. Building 4 is a small pavilion for food service or to house outdoor functions. The size of this building is subject to the nature of its use, but the site should include considerable plaza space with tables and chairs both in sun and shade.

The basement connects to the service area at the lower level of the parking deck to the north via a tunnel. Building 1 will construct the tunnel to the south.

The section below shows a consistent five-to six-level building height. The smaller barrel vault indicates an entry that allows for continuous circulation from and through both buildings of the complex (path to east of circle in plan, above tunnel).



EE Section



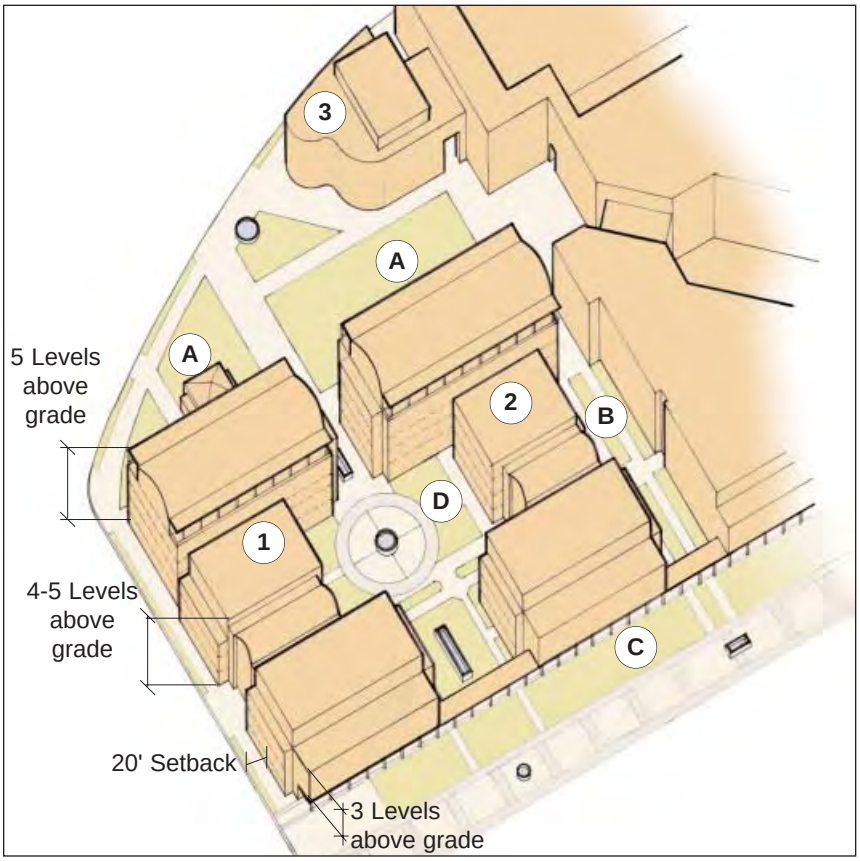
Plan

Buildings

1. Research – phase 1
2. Research – phase 2
3. Research – phase 3
4. Food service/special functions

Major Open Spaces

A. Plaza
B. Connector space
C. AHSC Mall
D. Courtyard
E. Tunnel access for service and delivery



Axonometric

The axonometric drawing indicates the continuous covered walkway along the west side of the mall. It serves as a threshold into the space of the research complex. Building massing highlights the connected footprints that constitute the plan. Slightly differing heights and facade rhythm further reinforce the idea of a collection of buildings rather than one massive structure.

The east wings step down to three levels at the AHSC mall side.

*In the final building there will be no surface or structured parking on this block. At that time, if there is a need for frequent public access to the research units, alternative assistance, such as a shuttle cart would be implemented. Drop-off areas could be located adjacent to the AHSC mall and Helen Street intersection, as well as along the Cherry Avenue extension/Ring Road adjacent to building 3.

Footprint gsf (3-6 levels)	110,000
Total GSF	600,000
Parking* spaces	0

Perspective view looking southeast

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APPENDIX 4
PARKING AND TRANSPORTATION REPORT

SECTION 1: OVERVIEW

With respect to its transportation, the University of Arizona campus is undergoing the same transition, from suburban to a mature urban pattern, as cities and their major institutions throughout the U.S. This is not surprising, since the University constitutes a significant part of Tucson; is its single employer, generator of traffic, and concentration of daytime population.

The maturing process, from "suburban" to an "urban" outlook on transportation, is characterized by several distinctive characteristics (*Table 1-1*). Most important is the realization that more traffic capacity (more lanes, more parking, etc.) is no longer the answer and adds to the problem. Rather than more traffic capacity, the emerging vision calls for different approaches to travel: attention to different modes (walking, transit, bicycling); less travel (on-campus residency, walking-distance residency); improving the overall quality of travel, not just the amount and speed of traffic; and undoing damage caused by previous transportation actions.

Table 1-1: Comparison of Suburban and Urban Transportation Features

Transportation Feature	Suburban Pattern	Urban Pattern
Walking environment	Small zones of good walking environment, not connected	Extended, connected environment superior for walking
Primary purpose of streets	Vehicular traffic	Premier public space
Traffic level of service target	High-service, free-flowing, stated goals for traffic service	Low (if any) goals for traffic, congestion accepted
Road size	Open-ended widening	Stabilized, capped road size
Road design emphasis	Traffic capacity, vehicle speed	Overall quality of travel, all modes
Parking expectation	On premises of destination	Within an extended park-once district
Parking walk radius	Less than 500 feet	Extended walk, up to 1500 feet
Parking appearance	Dominates streetscape	Mostly concealed from view
Parking pricing	Subsidized, hidden from user	Explicit, paid by user
Transit role	Last resort for those unable to drive	Mode of choice by some users, even with vehicles available

Solving the transportation issues at the University of Arizona underscores the need to move vigorously toward a mature pattern of urban transportation. Major examples of this shift in emphasis are:

- **Traffic Congestion** – Traffic congestion continues to grow in the University area as a result of the University's own growth and the growth in through traffic (i.e., with neither origin nor destination at the University). Traffic "level of service" goals appear unrealistic, and, to many, increasingly irrelevant. Road widening, once the ready answer to traffic congestion, becomes difficult and then impossible, due to monetary and social/environmental costs. The major implication for campus transportation planning: recognize traffic capacity as limited, withdraw the "target" of free-flowing traffic, and direct attention to other ways of meeting travel needs or eliminating travel needs all together.

- **Parking** – As the campus grows, the parking program faced the loss of its inexpensive surface space capacity as more buildings create the demand for more parking. The first-generation

response -- more parking in decks on the fringe of the campus -- quickly develops its own problems of cost, neighborhood impact, and campus aesthetics. The major implication for campus transportation planning: begin to develop parking at fringe locations served by transit shuttles.

- **Walking** – As the campus grows, distances for a number of intra-campus walking trips inevitably increase, many of them beyond the range now considered reasonable distance. Campus expansion also brings intra-campus walking trips across streets that formerly bordered the campus that still function as arterial streets in the larger city network. These streets usually interrupt the continuity of the campus walking environment. Duplication of earlier generation approaches to hostile public streets (for example, tunneling under Speedway) are no longer affordable. The areas of superior pedestrian qualities on and near campus, while numerous and individually high in quality, are generally separated by stretches of distinctly inferior pedestrian environments. Longer walking distance, rather than being a continuously vibrant and pleasant experience, is disconnected series of passages through good and poor pedestrian environments. The major implication for campus transportation planning: fuse the existing and planned pedestrian environments on and near campus into a highly connected fabric of superior pedestrian qualities.

- **Bicycling** – Bicycling already has assumed a place of importance as a serious mode of travel to and within the campus. Associated challenges are the consistency of the bicycle routes, legible wayfinding for bicyclists, comfortable and effective separation of bicycle and pedestrian travel, and a network of internal campus streets that recognizes the importance and value of bicycle travel. The major implications for campus transportation planning: rebalance the street system within the campus, giving more emphasis to bicycle travel; raise the legibility and continuity of the bicycle network through landscape and hardscape design features.

THE UNIVERSITY CAMPUS CIRCULATION VISION

The University Area Circulation Study (Final Report issued February, 1997), sponsored by the University of Arizona, the City of Tucson and the Pima Association of Governments, developed a comprehensive vision for campus circulation that is the basis for transportation recommendations in the current Campus Strategic Master Plan. This vision for campus circulation is based on the following goals:

1. "To provide a sense of order to [the] system of circulation and decision-making process:"

    - With way-finding aids, vision cues and a new street hierarchy.
    - By organizing interconnections between transportation elements at well-defined points.
    - With a revised hierarchy of streets to decrease the impact of the automobile.
    - With gateways, boulevards, lighting and a goal of a one-quarter mile maximum walk to transit/parking facilities.
    - Through replacing random off-street surface parking with structured parking at defined locations on the perimeter of the campus, integrated with mixed-use.
    - By restoring a more "traditional" campus image through landscape and streetscape features.

2. "To re-think typical travel behavior by considering the changing function of existing transportation system:"

    - With new street and travel-way hierarchy.
    - By balancing the needs of competing travel modes on roadways currently dominated by automobiles.
    - With traffic calming on perimeter streets.
    - Through use of dispersed, off-site parking to limit auto penetration of campus.
    - With better pedestrian and bicycle enhancements at gateways on minor ("one-quarter-mile" streets) to encourage travel, by pedestrians and bicyclists, from adjacent neighborhoods.
    - Through pedestrian zones that control bicycle travel.
    - Through restricted peak-period auto use, with deliveries and service access controlled by gates or other means.

3. "To provide access to delivery and shipment of goods:"

    - Through more intra-campus distribution during off-peak periods.
    - Through using smaller on-campus delivery vehicles which fit into the University's urban environment.

4. "To build aesthetic characteristics…based on land use, access, and desired effects:"

    - Through design quality and consistency in the individual components of the system, such as bike paths or traffic calming.
    - Through integration of plantings, public art and well-designed pedestrian facilities.
    - Through recognition of existing land-use patterns and site lines.

5. "To organize and orient bicycle travel to limit confusion:"

- By enhancing north/south travel along Highland Avenue (transitioning to Mountain Road) and east/west travel along University/Third Street.
- By providing bicycles with continuous convenient travel, clearly separating bicycle travel from pedestrian travel in pedestrian areas.
- Through providing continuous "bicycle boulevards" that incorporate continuity and strong visual cues for bicycle travel.
- By improving the security of bicycle storage and reducing its conflict with pedestrian zones.

6. "Make pedestrian safety and comfort the highest priority:"

   - By defining and differentiating on-campus pedestrian zones and pathways.
   - By landscaping to increase shade coverage.
   - By providing distinctive cues to make pedestrians more obvious to all wheeled traffic.
   - By providing pedestrian amenities throughout the pedestrian system.

7. "Develop an alternative mode street hierarchy:"

   - That expands beyond the current traffic-only definitions for street function.
   - That recognizes and balances auto/transit/bicycle and pedestrian use without domination by any mode.
   - That fosters better orientation of all travelers within the campus.

Advancing of Circulation Visions in the Current Campus Master Plan

The current Campus Master Plan is an important way of advancing the circulation goals advanced and ratified in the 1997 University Area Circulation Study. Obviously, the current Campus Master Plan cannot advance all of these concepts, nor can it advance the concepts equally. However, the current Master Plan advances a large number of the important concepts across a broad spectrum. The following sections describe the transportation elements of the current Master Plan and demonstrate the extent to which they advance the visions of the campus circulation, as defined in the 1997 University Area Circulation Study. This analysis of the accomplishment of the 1997 goals is structured along the lines of travel mode, specifically: pedestrian circulation, bicycle circulation, transit circulation, external traffic (i.e., off campus), internal (on campus) traffic circulation and parking. The following sections continue this discussion, by mode, in detail.

SECTION 2: PEDESTRIAN CIRCULATION

Pedestrian Goals and Issues

Of the eight major goals for the University Area Circulation Study (UACS), five relate directly to the improvement of pedestrian travel within the campus. These goals approach the improvement of pedestrian travel primarily through the re-balancing of the street system, by making "pedestrian safety and comfort the highest priority" of the street system, by developing an alternative mode street hierarchy based on function and level of use" and "rethinking typical travel behavior by considering the changing function of existing transportation system". In support of the major objective of rebalancing the street system, the campus circulation goals also call for an improvement in overall quality of the pedestrian experience" by providing "a sense of order to the system of circulation and decision making" and building aesthetic characteristics…by emphasizing design quality."

The current Campus Master Plan advances the goals of the UACS by making pedestrian circulation a high priority and extensively detailed element. Specific elements of the pedestrian circulation improvements include:

- An alternative mode street hierarchy that includes walking as one of the major modes to be incorporated on most streets.
- Further definition of on-campus pedestrian zones and pathways.
- A diagonal multi-use pedestrian/bicycle corridor between the Medical Center and the main campus.
- Landscape treatments to increase the on-campus tree shade coverage.
- More delineation of bicycle routes to reduce conflict between pedestrians and wheeled vehicles.
- Standard pedestrian amenities, such as seating, drinking fountains, night lighting, and defensible space.
- Reduced vehicular penetration of campus.
- Traffic calming devices at most points of vehicular/pedestrian overlap (conflict) within the campus.
- Restriction of peak-period auto use.
- Pedestrian enhancement at gateways.
- Restoration of a more traditional campus image, which decreases the perception of pedestrian travel time and distance required for intra-campus travel.

Proposed Pedestrian System

The proposed pedestrian system consists of the following main enhancements:

a. Redistribution of pedestrian space versus automobile space on all campus streets. This is discussed in detail in a following section, "Internal Traffic Circulation."
b. A new main diagonal connection to AHSC as highlighted in *Figure 2-1*; and,
c. Raised crosswalks at locations where the primary pedestrian system crosses the campus roadway system (see *Figures 2-2 and 2-3*).

Figure 2-1: New Campus Diagonal Connection (Elm St.)

Figure 2-2: Raised Crosswalk

The redistribution of cross-sectional elements on streets (Section 6*)* is important because the narrowing of the cartway (i.e., paved) width would have two main beneficial aspects for pedestrians:

a. The narrowing itself would decrease the speed at which motorists would feel comfortable driving, thus slowing the average speed of traffic on the street.
b. The narrowing would free-up space for expanded sidewalks and/or buffer between sidewalk and street, each of which would increase the comfort level and safety of pedestrians.

On streets with parking, curb-lines should be extended ("bulbed-out") across the parking lane at intersections to minimize the pedestrian crossing distance.

The new proposed diagonal connection is important because it would formalize a growing pedestrian trip pattern and, by making the route into a straight line rather than an east-west to north-south zigzag pattern, would help bring the walk from the center of campus to AHSC into the range of comfortable walking distance (½-mile to ¾-mile; 10-minute to 15-minute walk). Since pedestrians are the least intrusive of all travelers and require no vehicle storage space, it is essential to take every opportunity to encourage pedestrian trips above all else.

The pedestrian system would be given priority over the vehicular system wherever they meet along internal campus roadways. At these points, raised crosswalks (like that displayed presently on Elm Street at the Arizona Inn, but generally wider due to larger streams of pedestrian flow on campus) would calm

the approaching traffic, provide a convenient and accessible crossing, and provide a visual cue to motorists and pedestrians that they are about to enter a crossing zone. The latter would be achieved by using a texture or color that clearly is differentiated from the street and the sidewalk, alerting all travelers to the changing nature of the travel space.

Figure 2-3 shows areas of campus that would qualify as high-priority locations for raised crosswalks due to high existing or anticipated pedestrian flows crossing notable vehicular routes.

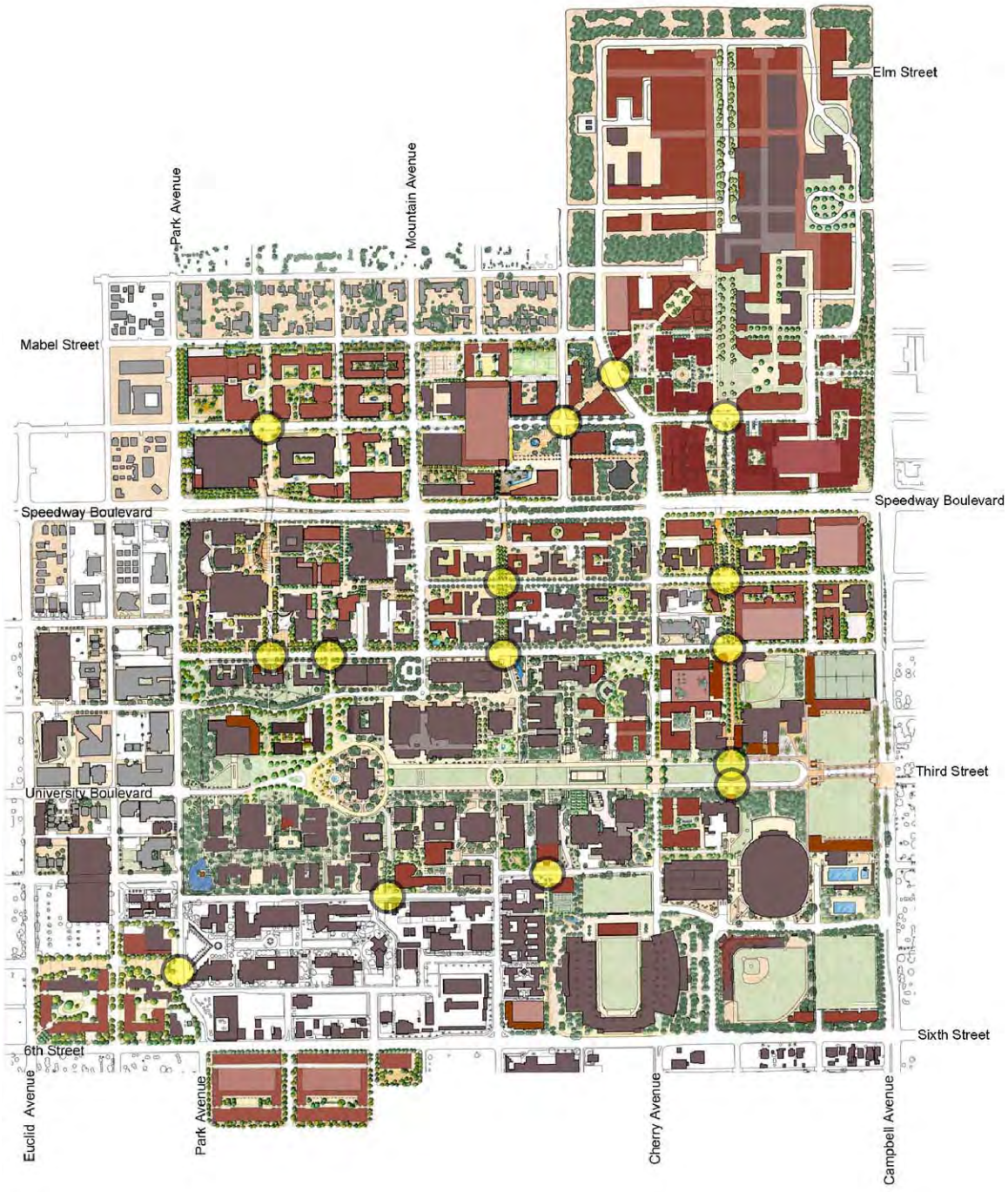

Figure 2-3: Priority Raised Crosswalk Locations

In support of these pedestrian recommendations, close attention also should be given to the main thoroughfares bordering and traversing the campus. Sixth Street, the subject of a recent redesign study, should accommodate pedestrians through wider sidewalks, landscaping and streetscaping, a slower-speed design concept with narrower lanes and turn lanes, and a median to break down the large scale of the street to make it feel more similar to the surrounding campus streets. Crosswalks should be clearly marked and highly visible, and bicycle facilities, since they would require another 10 feet of asphalt on an already-wide street, would be better suited to one or more of the parallel smaller-scale streets to the south.

SECTION 3: BICYCLE CIRCULATION

Bicycle Goals and Issues

Four of the goals for the University Area Circulation Study (UACS) relate to bicycle travel within the campus "to organize and orient bicycle travel to limit confusion." Three other goals from the UACS support this overarching goal of organizing bicycle travel: the goals "to develop an alternative modes street hierarchy" and "to provide a sense of order to the system of circulation and decision making" closely support the primary goal of organizing and orienting bicycle travel. Further, the goal "to promote aesthetic characteristics" includes those features that make bicycle travel more attractive within the campus.

In advancing these goals, the current Campus Master Plan recommends the following major features:

- A bicycle lane and path system comprising 7.4 miles of route within the campus (*Figure 3-1*). These routes are a combination of on-street bike routes, off-street bike paths, and some limited segments of multi-use bicycle/pedestrian path.

- A total of 18 major bicycle parking facilities, located in response to the following factors: (1) areas of main campus activity and (2) along the main bicycle route system, thereby minimizing the inconvenience to bicyclists in deviating from designed bike routes.

- In addition to the major bicycle parking areas, a series of smaller caches of parking where space is available along the bicycle route system. The major and smaller areas should be placed according to the principles shown in *Figure 3-2* in order to minimize conflicts between bicyclists and pedestrians. They also should give biyclists, once parked, immediate access to the pedestrian walkways.

- Treatment of the bicycles as wheeled vehicles and, therefore, appropriately "traffic calmed" at the crossings with the pedestrian walkways. This is accomplished with a shallow rise in the bikeway to bring bicycles up to the level at the points of pedestrian crossing, thus slowing the bicycles by requiring elevation change and reminding the bicyclists of the presence of foot traffic.

  At these junctions, the bicycle path and sidewalk pavement should be distinct, alerting all users to the crossing condition. A change in texture and color would maximize the effect.

  Finally, a raised landscaped buffer should be used to separate bicycle and foot traffic wherever space permits, as illustrated in *Figure 3-2*. Where not possible, it is important to maintain different surface elevations of at least six inches, separated by a curb (i.e., sidewalk at the upper level, wheeled vehicles at the lower level).

Proposed Bicycle System

The circulation requirements of bicyclists are accommodated by a variety of proposed street types as presented in Section 6 (*Figures 6-1 and 6-2*). These routes combine to form a comprehensive campus bicycle circulation system.

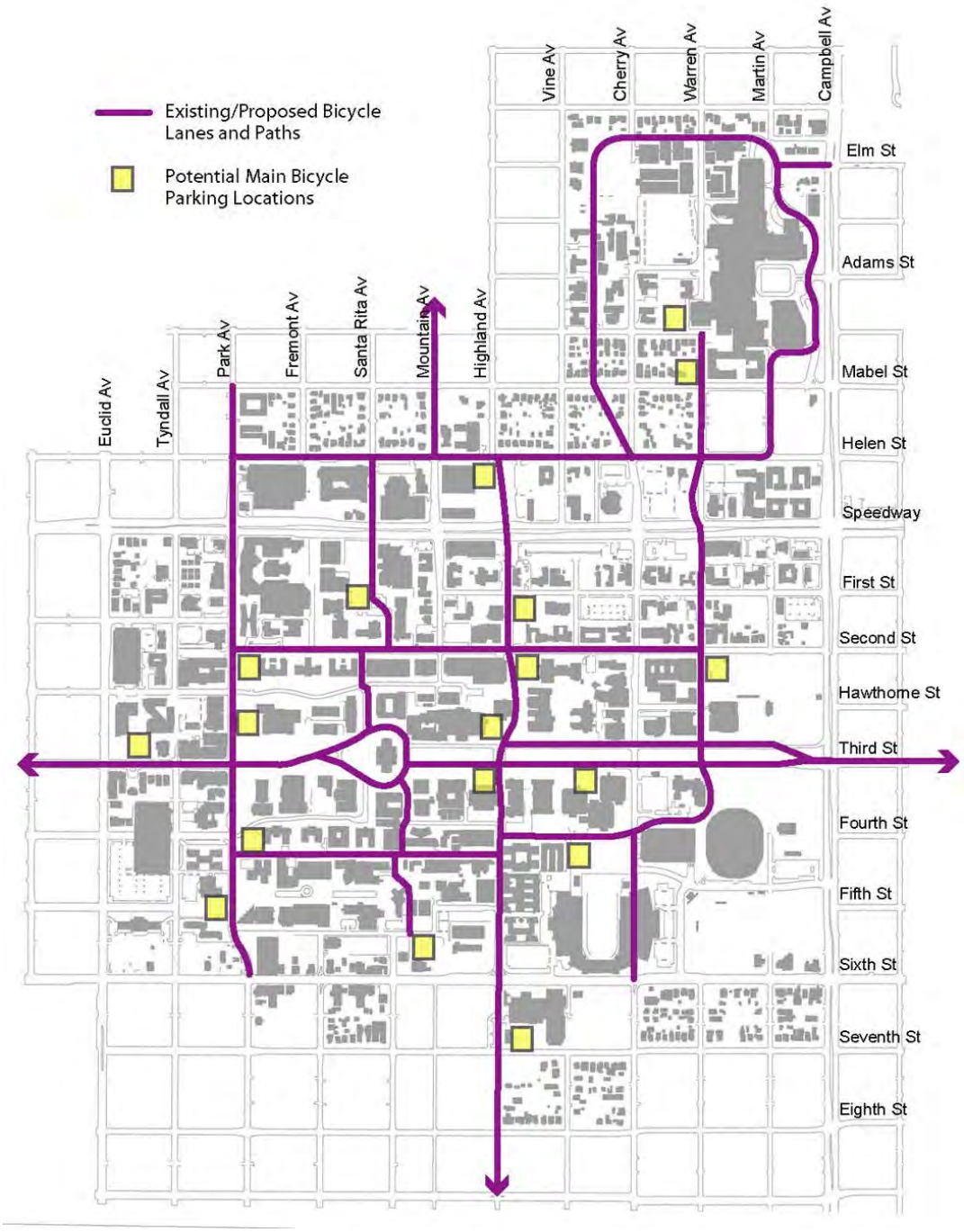

Figure 3-1: Proposed Bicycle Route System and Prime Bicycle Parking Locations

Staff will continue to evaluate and address the distribution of major bicycle parking facilities as well as assign adequate parking space throughout campus. At full campus buildout, the need for approximately 11,000 bicycle parking spaces is expected.

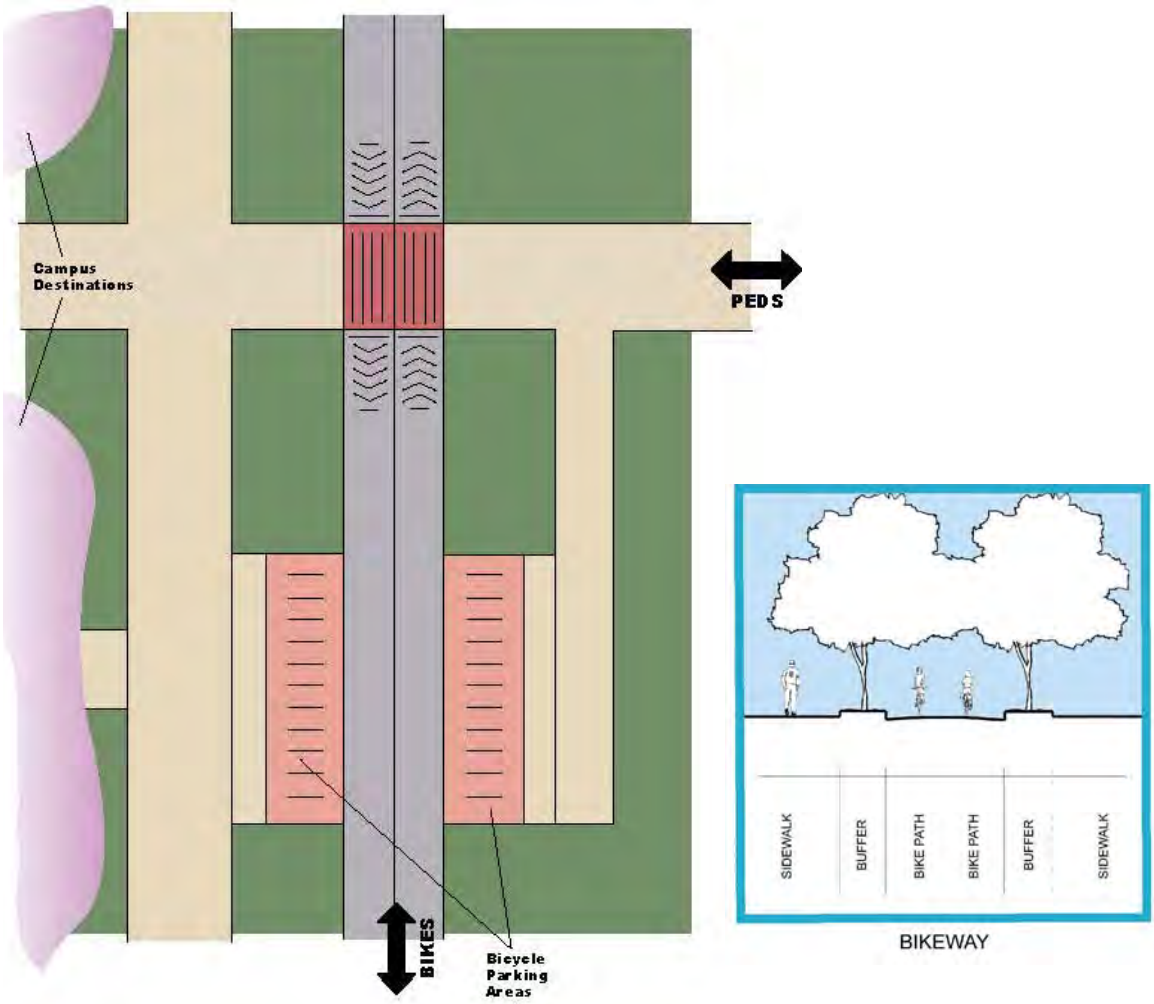

Figure 3-2: Bicycle System Typical Detail

SECTION 4: TRANSIT CIRCULATION

Transit Issues and Goals

The transit services used by the students, staff, and faculty of the University of Arizona include those operated by CatTran, SunTran, and the Old Pueblo Trolley. Each has its own issues and potential for further use and development:

CatTran: As the main provider of transit service through campus (*Figure 4-1*), CatTran's primary functions are circulation and distribution of the students, staff, and faculty on short-range trips to and from the campus and short-distance trips *within* the campus. The present system consists of several campus loops and express park-and-ride shuttles. The reorganization of some of these routes is scheduled over the next several years.

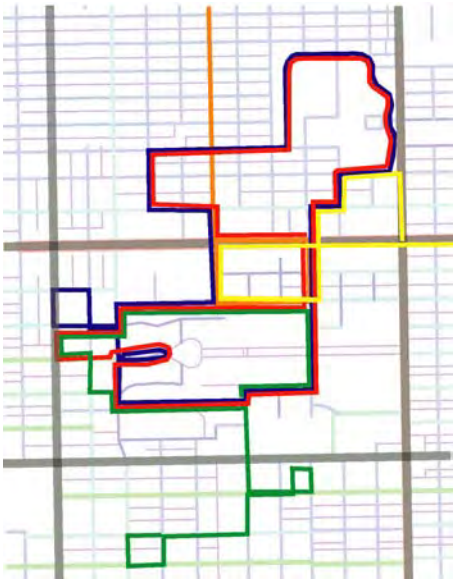

Figure 4-1: CatTran Route System

Figure 4-2: Old Pueblo Trolley

SunTran: SunTran carries longer-distance commuters to the campus. SunTran is in the midst of restructuring several of its routes and modifying the headways of several others. Moreover, several stops on campus will be modified to provide improved transfer locations for intersections of multiple bus routes.

Old Pueblo Trolley: The present operation of the Old Pueblo Trolley (*Figure 4-2*) does not lend itself to frequent student use, because: the Trolley is an all-volunteer operation run more as a tourist attraction than as a practical transit alternative; the Trolley is operated only on weekends; the Trolley route barely extends beyond comfortable walking distance; Trolley headways are limited by is single-tracking for the vast majority of the route; and, the vehicles used on the Trolley route are not air-conditioned, making them less attractive on hot Arizona days than other bus and shuttle options.

Nonetheless, the combination of municipal takeover, daily operation, route extension (including the addition of passing tracks), and new vehicle acquisition could make the trolley a valuable piece of the regional transit system. Route extensions for both ends have been discussed—further into the campus and into downtown Tucson—while options for modernized (yet historical in appearance) vehicles are available from several manufacturers.

In its review of the transportation strategies, the University Area Circulation Study concurred with the overall transit strategy of "restructuring" transit services, "refocusing services for the University faculty, staff and students' journey to/from work/school and to better serve proposed park-and-ride lots." Specific elements of this strategy include expanding SunTran coverage to serve University student housing locations, extending the hours of operation, rehabilitating the existing transit center and designing transit zones at the intersections of SunTran and CatTran routes. This generally subsidizes approximately 3,000-4,000 faculty, staff, and student permits per year at one-half the cost of a regular SunTran bus pass. The funds used for subsidies are generated through sale of parking permits.

In further advancing these strategies of the University Area Circulation Study, the current Master Plan includes the following recommendations:

- Provide transit passes to all University populations (i.e., students and staff) at a user cost, far below that of the current annual pass cost of $190.

- Revamp the route structures of the campus shuttle system, beginning the transition from loops to a radial route configuration.

- Build on the fixed guideway transit system (Old Pueblo Trolley) already abutting the campus front door.

- Serve off-campus park-and-ride lots with high-frequency transit service into the campus.

Low-Cost Transit Passes for Entire University Population – From a policy standpoint, the first step that could be taken to help make transit a more competitive mode of transport is to reduce the charge of SunTran passes to students below that of a parking permit. Through a University payment of $300,000 to $400,000 per year to SunTran, the transit agency is able to offer a subsidized pass to students and staff at $190 per year. However, compared with the $185/year cost of a parking permit, there is clearly no cost incentive for personnel to change their travel behavior in favor of a mode that places less stress on the University roadway and parking system.

A more effective method of subsidizing transit travel would be to spread the costs of passes among the entire student body. With a student population of 31,000, a mandatory fee of $10 to $20 per semester would initially be sufficient (depending upon negotiations with SunTran) to allow the issuing of a transit pass to every student. The incremental cost to the student of driving rather than using the regional bus system would be the full cost of a parking permit and the cost to own, maintain, and run a personal automobile.

The reason such a program could be supported at such a reasonable cost to the students is that the majority in the short term would not use the bus system despite the free pass. After a few years, however, as the program has time to develop and students begin to make residential location decisions based on bus routing, and as development patterns surrounding the university begin to exhibit larger concentrations of students who take advantage of the "free" bus service, ridership figures would grow and the mandatory fee to maintain the program would have to be raised. At this point, however, the regional bus service would have been ingrained as a viable transport alternative, and there could be little defendable opposition to a further raise in fee.

Given the student population of 31,000, it is reasonable to expect that 5 percent would take advantage of the program in the short term to reduce their transport costs by electing to live in transit-serviced areas, *so long as the program is well-advertised in advance of its implementation.* Assuming that two-thirds of this

5% would have otherwise driven to campus and sought a parking permit, this translates into a reduced demand for 1000 parking spaces.

In the longer term, given a target 2010 student population of 37,000, the proportion of students electing to use the bus to travel to campus would rise based on modified regional development patterns and the emergence of more transit-serviced housing options. If a conservative 10% percent of students elect to utilize the bus service, two-thirds of which would have otherwise driven to campus, then the relieved demand on the campus parking system would be 2500 spaces.

Revamping of Internal Transit Routes – The second imminent method of increasing the share of trips made by transit is to revamp the route structures of the campus shuttle system. A good start has been made with scheduled service and upgrading transit stops with amenities such as shelters and lighting, but the route system (as illustrated with the routes overlayed on each other in *Figure 4-1*) is still relatively confusing and inefficient.

As transit circulator systems are developed throughout the world, it is increasingly learned that the benefits of the traditional "loop" systems (specifically the ability to get from one point to many others without requiring a transfer) are being undermined by the additional time it takes to travel the long, cumbersome, indirect routes, especially as traffic on campus streets continues to grow and travel around the loop becomes increasingly slow. Many campuses are discovering that a simple radial-type system, despite often requiring a transfer, could decrease the time it takes for patrons to get from point A to point B by reducing the distance that the buses must travel on congested roadways. The concept of a radial system is illustrated in *Figure 4-3*, with each route running across campus and intersecting at several major transfer points in the campus interior.

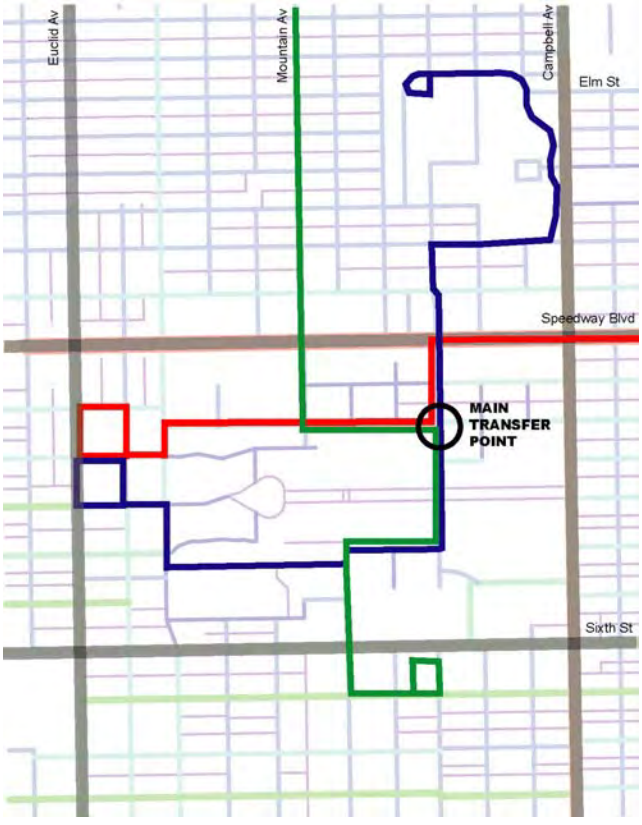

Figure 4-3: Radial Route System Concept

The radial system would reduce the amount of redundant service through some parts of campus while reducing route running times, thereby allowing significant increases in frequencies on each of the new routes. *Figure 4-3* illustrates the concept only; final route alignments should be based on a detailed study of campus origins and destinations as well as on an examination of existing route ridership data.

As part of a shorter-term strategy to address parking shortages, it would be beneficial to locate a park-and-ride lot on land outside the University boundaries and serve it with frequent CatTran shuttle service, ideally as an endpoint of one of the main cross-campus routes. In order for this strategy to be effective, however, it is important that service is frequent and that there is a significant financial incentive for the use of the park-and-ride lot as opposed to on-campus parking. Optimally, the park-and-ride lot should be provided free-of-charge or at a nominal cost, and at most should be no more than one-half the cost of on-campus parking.

Extension and Upgrading of Old Pueblo Trolley – A longer-term solution to the University's transport challenges is to build on the fixed guideway transit system that abuts the campus's front door. The Old Pueblo Trolley, while currently a tourist operation with limited service hours, is in the planning stages of an upgrade to a practical, comfortable transit service. An extension is planned through downtown Tucson to the Rio Nuevo development site, with upgrades all along the route and new vehicles to provide air-conditioned, speedier operation. The types of vehicles being considered for the service are replica trolleys that retain the historic image of the line but provide all the amenities of modern transport vehicles (*Figure 4-4*).

Tampa

New Orleans

Figure 4-4: Modern Replica Trolley Vehicles

The true value of this upgrade and extension to the University is that it will enable the creation of a strong physical and perceptual connection between the campus and downtown. With the consistency and permanence of a fixed-rail system as opposed to standard bus service, many students will be more apt to live along the route, specifically in downtown Tucson and Rio Nuevo.

The trolley project over time has the potential to steer and direct campus-related growth more than the proposed transit pass program and CatTran restructuring, due to its permanence and visibility, qualities important to the developers and new housing. For the year 2010, on top the estimated 2,500 students who would elect to use the bus due to the then-ingrained free transit pass program, it is reasonable to expect

that a further 10 percent would be attracted to the use of transit by the housing opportunities provided along the upgraded trolley line. Again assuming that two-thirds of these potential riders would have otherwise driven to campus, another 2100 on-campus parking spaces could be saved or eliminated.

Further potential for the reduction of parking needs could be realized with the extension of the trolley through campus to the Arizona Health Sciences Center. In the same way that new housing opportunities would be opened up in downtown and elsewhere for students with the initial upgrade, a further extension would provide opportunities for the numerous staff of the medical center. This would be another benefit for downtown as a mix of housing types and income levels could then be developed and supported, so it is worthwhile to examine the potential of a partnership with the city in the expansion of the system.

The concept of a historic trolley service to a major medical center is already established in the United States as illustrated in *Figure 4-5*, as Memphis is presently constructing an extension of its downtown trolley loop service to the city's main medical center complex, primarily to tap the vast employment pool of the medical center to add support to the development of new housing options in the downtown area, thus establishing Memphis as a 24-hour city.

Figure 4-5: Memphis Trolley Medical Center Extension

Figure 4-6 illustrates two other technologies often used for medical center circulation, but each has its respective drawbacks vis-à-vis the trolley concept. The shuttle bus option, no matter how flashy and modern, suffers from all the same image and traffic-related problems of standard service and requires a wider dedicated surface than the trolley if transit-only lanes were installed (due to allowances for steering room). The "people-mover," also shown, requires a grade-separated guideway that is expensive to build and difficult to make aesthetically non-intrusive. The trolley is thus the most cost-efficient and least intrusive transit option for the medical center that has the potential to provide quick, reliable, consistent, and visible transit service.

Figure 4-6: Other Medical Center Circulation Technologies, Bus and People-Mover

The proposed route through campus is shown in *Figure 4-7*, and would be primarily in a mixed-traffic operating condition with the potential for dedicated trolley lanes on portions of the route.

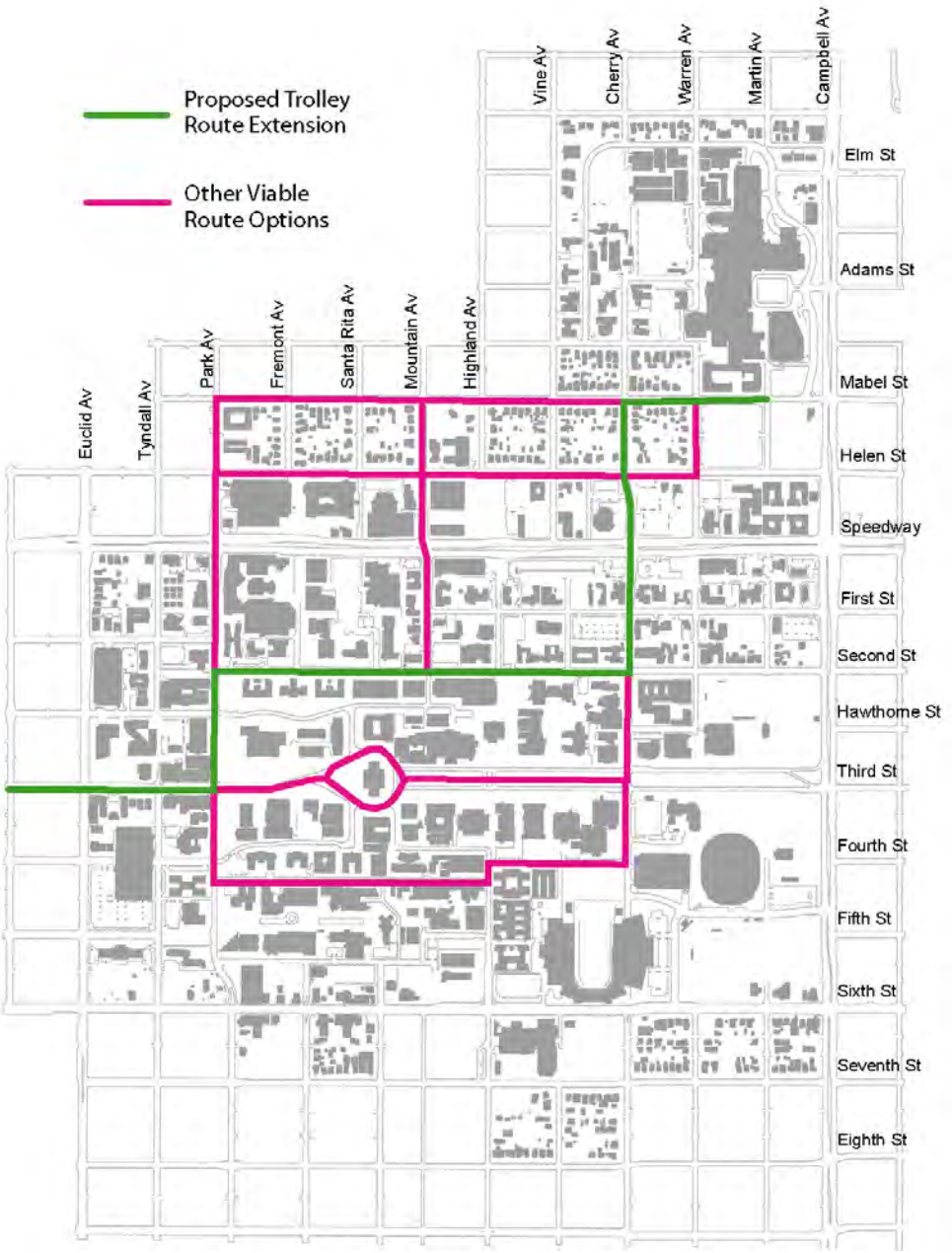

Figure 4-7: Proposed Trolley Route Extension and Alternate Route Options

The advantage of using Second Street as the main transit spine is that it is central to the campus and already serves a significant transit function. The southern-most route is appealing because it would provide good service to the stadium and arena and could serve as a transit shuttle during special events. The northern routes, along Helen Avenue and Mabel Avenue, are offered as technically viable options, but they would fail to serve the heart of the campus and limit the trolley's utility to students and faculty members living along the route off-campus.

SECTION 5: EXTERNAL TRAFFIC CIRCULATION

In the most important goal for external traffic, the University Area Circulation Study (UACS) vision explicitly calls for "reducing local area traffic," not for accommodating more of it. External traffic improvements, consequently, do not involve more capacity, but: (1) fixing of distressed perimeter streets adjacent to the campus and (2) protecting neighborhoods from the impact of campus traffic.

In keeping with these goals, the current Campus Master Plan advocates the following major features:

- Order and legibility. These actions announce the specialness of the campus, adjust drivers' expectations to the realities of campus congestion and lowered speeds, and defend the campus and its area against proposals for street expansions to accommodate more traffic.

- Medians and traffic control strategies along Euclid Avenue.

- Medians and traffic control strategies along Sixth Street.

- Two actions that, while not external traffic "improvements," are the answer to the call for more capacity: (1) reduction in the need for vehicular access to the campus through fringe parking (see Parking, Section 7) and (2) reduction in the need for vehicular access due to greater use of transit.

- Traffic calming in adjacent neighborhoods, as identified in the UACS.

SECTION 6: INTERNAL TRAFFIC CIRCULATION

Internal Traffic Issues and Goals

In the University Campus Circulation Plan, the overriding principle for internal vehicular circulation centered around the goal "to develop an alternative modes street hierarchy based on function and level of use." Achieving this goal assures progress toward several of the other important campus circulation goals, specifically: "to provide a sense of order…to a system of circulation and decision-making process," "to provide access for the delivery and shipment of goods…" and to establish "the appropriate degree of vehicular penetration."

The current Campus Master Plan advances this vision through the following actions:

- A revised street hierarchy, organizing the streets not only by their traffic function (generally, reduced importance within the campus) but, more importantly, by their increased function for other modes of travel, particularly pedestrian and bicycle.

- A palette of street design guidelines.

- Identified gateways at the major street entrances to the campus. These gateways differentiate the campus streets from the surrounding streets, announce the change in function of the street, and, in some instances, are part of the geometric changes in the street that limit the vehicular use.

- Traffic-calming measures at the pedestrian/vehicular travel interface points within the campus.

- Improved emergency vehicle gates that have a less-intrusive appearance but function effectively.

- Further removal of surface parking lots.

Internal Traffic Circulation Recommendations

Revised Street Cross-Sections – Most of the existing campus streets have cross-sections that are over-balanced in favor of automobiles versus pedestrians, bicyclists, and other users. In many cases, moderate modifications to roadway cross-sections could vastly improve service and safety to pedestrians and bicyclists while having little effect on motorized vehicular capacity.

The majority of the cross-sections proposed and illustrated here are targeted at two main objectives:

a. Rebalance the area dedicated to pedestrians/bicyclists versus that of automobiles to better reflect the space and amenities needed to create strong multi-modal corridors; and,
b. Slow the prevailing traffic speeds through campus, ensuring that automobile circulation does not detract from the quality and safety of campus thoroughfares for other users.

The functions, by mode of travel, for the proposed street cross sections are summarized in *Figure 6-1*.

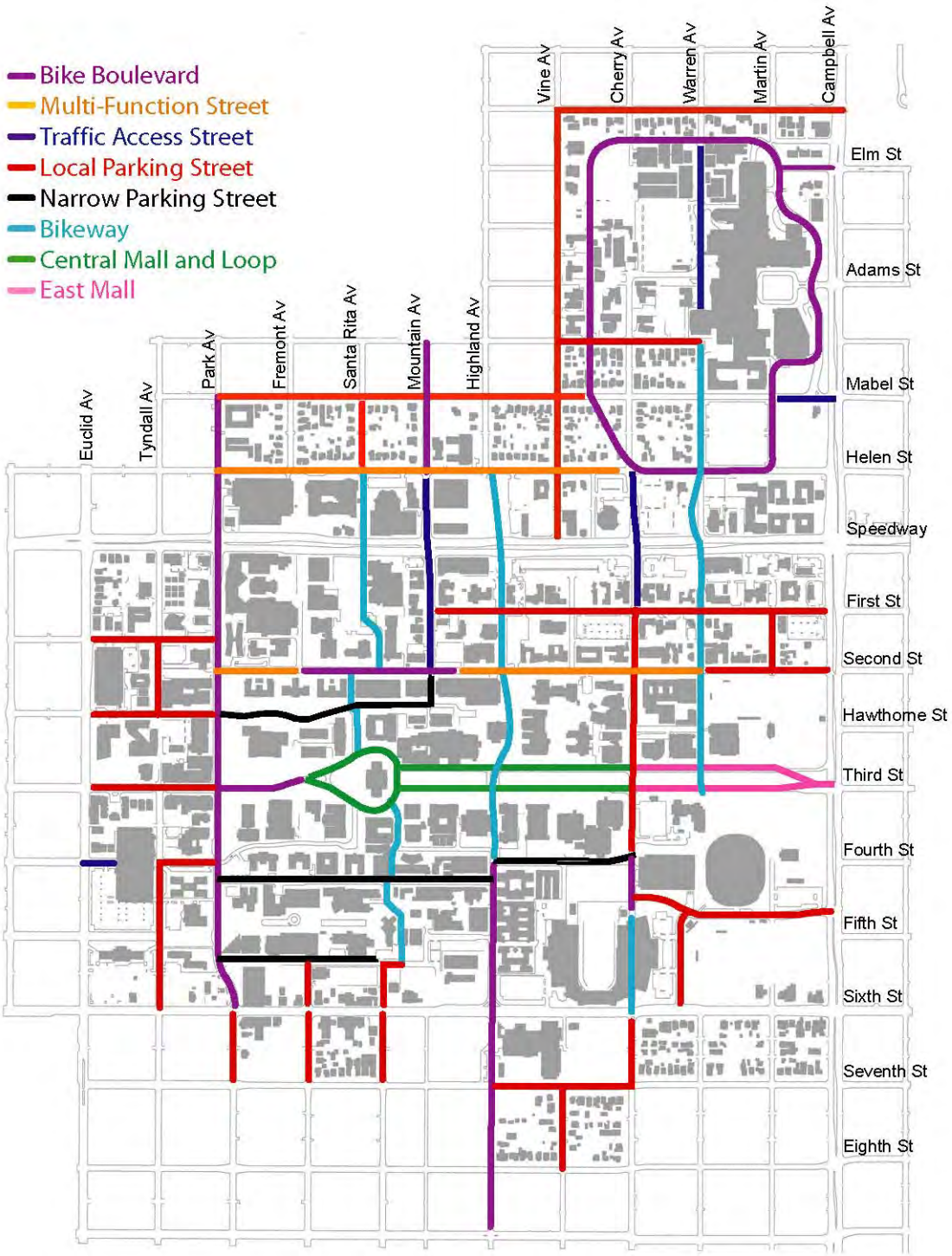

Figure 6-1: Proposed Campus Street Types – Overview

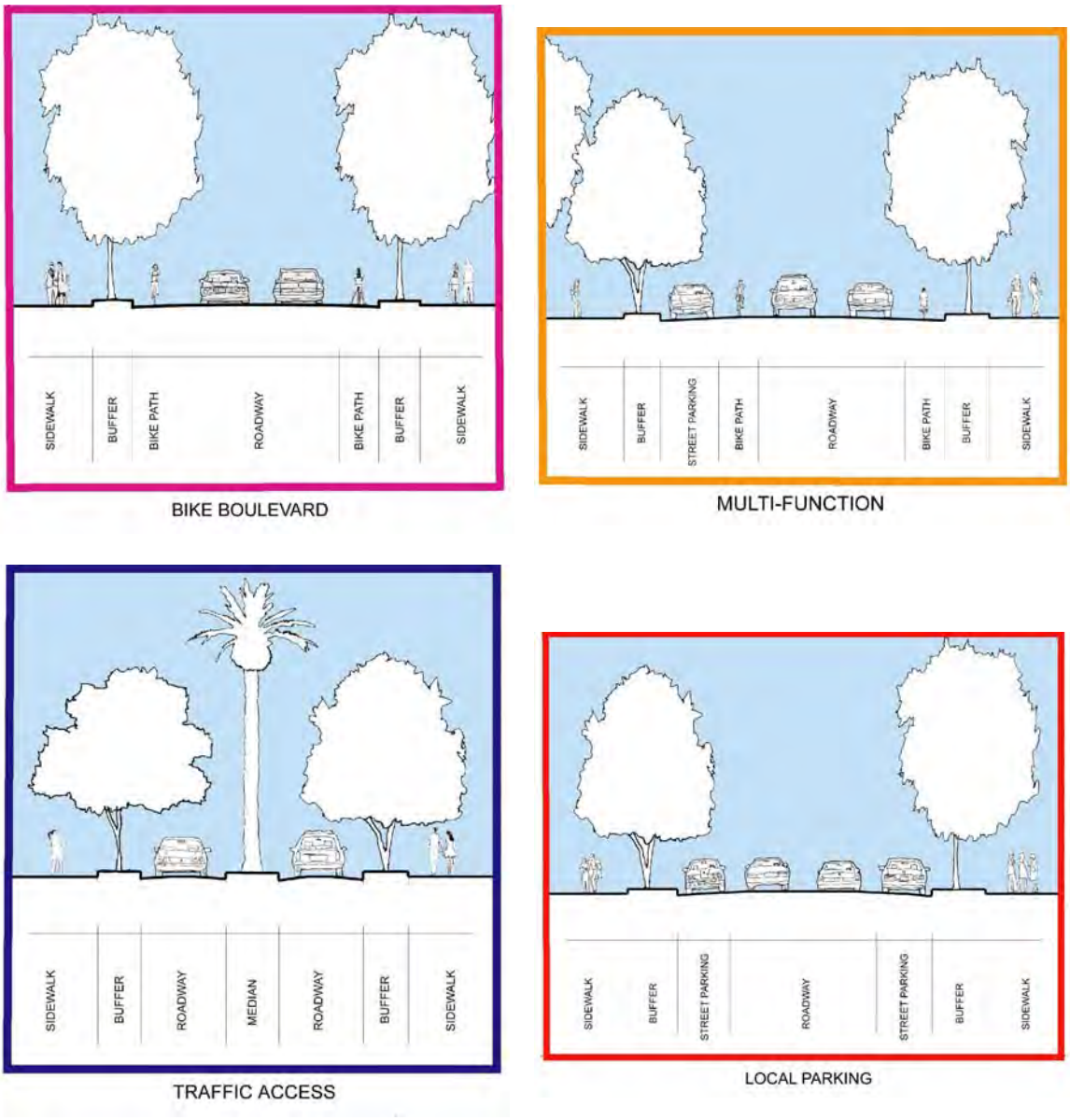

Figure 6-2: Proposed Campus Street Types – Cross-Sections

The proposed cross sections (*Figure 6-2*) are organized on the basis of number of modes of travel accommodated and the level of accommodation, as follows:

- Streets with all modes in their exclusive pavement or lane of pavement:

    - **Bike Boulevard** – Bicycles are accommodated by in-street lanes. Pedestrians are on adjacent sidewalks; traffic is in two lanes divided by a median. Parking is prohibited.

- **Multi-Function Street** – Bicycles are accommodated by in-street bike lanes. Pedestrians are on adjacent sidewalks. Vehicular traffic is in two-lane undivided roadway, with parallel parking allowed.

- Streets accommodating all modes, with some sharing of pavement:

  - **Traffic Access Street** – These streets are primarily for vehicular access, although bicycle use is anticipated and accounted for. Pedestrians are on sidewalks along the street. Vehicular traffic is in two lanes, with parking permitted on both sides.

  - **Local Parking Street** – This street is also primarily for vehicular access, plus the additional function of on-street parking. Bicycle use is anticipated and is accommodated in the low-speed mixed-use mode. Pedestrians are accommodated on sidewalks along the street. The street cross section includes two lanes of traffic (one in each direction) with parking on both sides.

  - **Narrow Parking Street** – This street has the same function as the local parking street; i.e., accommodating vehicular access and on-street parking. Bicycles are anticipated, in mixed traffic, in the low-speed environment. Pedestrians are accommodated on sidewalks on both sides. The vehicular cross section contains two lanes (one in each direction) with parking on both sides.

- Streets that have a primary function of moving traffic:

  - **Arterial Street** – This street is intended for mobility; i.e., longer-distance travel at higher speeds. Access to immediate properties (driveways, etc.) is discouraged or prohibited. On-street parking is generally prohibited. Pedestrians are accommodated on adjacent sidewalks. Generally, arterial streets are not designated as bicycle routes, and on-street bicycle lanes are not provided.

- Corridors to accommodate non-motorized travel:

  - **Bicycle/Pedestrian Corridor** – These are the most important category of route for combined (i.e., bicycle plus pedestrian) non-motorized travel. Bicycles are accommodated in a separate bikeway, with pedestrians on a sidewalk. The bikeway portion of the corridor is at street (lower) level, while the pedestrian way is at sidewalk (upper) level.

  - **Central Mall and Loop** – A combination bike and pedestrian walkway at "street" level, with an option of additional bordering sidewalks. The mall is pedestrian-only south and southwest of the Student Union.

With the exception of the Bikeways and Central Mall and Loop area (both of which are treated as streets due to their functions of moving people through campus), each of the proposed cross-sections accommodates one lane of automobile traffic in each direction, with or without on-street parking based on street function and available space. One-way street patterns are eliminated due to their tendency to carry high speeds (lack of the visual cue of opposing traffic); the confusion they often cause to visitors; and, the circuitous travel patterns they induce, which require longer trips through campus to reach certain destinations.

Throughout the campus, it is proposed that there are two vertical levels of activity: pavement level and sidewalk level. Pavement level would carry all wheeled vehicles (mostly automobiles and bicycles but also skateboarders, rollerblades, and scooters). Sidewalk level would handle all pedestrians. Intersections of vehicular and pedestrian flow patterns would take place at the upper (sidewalk) level, simultaneously establishing priority for the pedestrian system (critical to campus environments) and enacting a traffic calming measure (upslope) to control traffic speeds at these critical points.

SECTION 7: PARKING

The transportation Circulation Plan, while not directly addressing the supply of parking, provides clear guidance to its planning. An important goal of the Circulation Plan is to "remove random off-street surface parking and replace it with structured parking at defined locations on the perimeter of the campus." Further, the plan calls for any additional parking at the perimeter of the campus to "integrate mixed uses." The major goal to "balance competing travel modes on roadway facilities" argues against more parking of any sort (surface, on-street or deck) in the center of the campus and argues for any further on-campus parking to be on the fringe of the campus.

Aside from the direction offered by the Circulation Plan, the rapidly increasing cost of parking, unavoidable as low-cost surface parking is "lost" to campus construction and is replaced by high-cost deck parking, suggests strongly that the option of off-campus parking served by shuttle be developed.

As the campus develops, more and more surface parking will be "lost" to new building sites, and, at first, replaced in new large parking structures distributed about the campus. Although this signifies a rapid increase in cost per space with no built-in increase in revenue per space, there are several positive aspects to this redistribution:

a. Less total land area will be dedicated to parking, allowing more on-campus development and friendlier streetscapes, a major goal of the Circulation Plan.
b. Access to these structures can be consolidated along fewer routes, increasing the flexibility of how to treat other campus roadways and pathways.

Parking Supply and Needs: Currently, there are 11,300 parking spaces allocated to permits on campus. A total of around 17,200 permits (1.4 permits per space, reflecting utilization) are issued for these spaces (*Table 7-1*).

Table 7-1
Parking Projection Summary

	Phase 1		Phase 2		Phase 3	
	Spaces	**Permits**	**Spaces**	**Permits**	**Spaces**	**Permits**
Start of Phase	13,801	16,667	15045	17,786	16,019	18,031
Removed from use during phase	(1,006)	(1,401)	(4,376)	(6,055)	(1,427)	(1,204)
Added during phase	2,250	2,520	5,350	6,300	-0-	-0-
End of phase	15,045	17,786	16,019	18,031	14,582	16,827

Source: Spaces from Memorandum "Phased Parking Space Analysis for Campus Master Plan Update," by Patrick Kass, October 10, 2002. Includes visitor as well as permit parking.
(Permits at 1.4 permits per non visitor space)

By the end of Phase 1 of the Master Plan, the total number of spaces will grow by about 1,200, reflecting that the new planned garages will add more space than the capacity removed from service. However, the number of permits that can be issued will grow by only about 1,100, reflecting the substantial portion (450 spaces) of the new added capacity that will be dedicated to visitor parking and not available for allocation to permit holders.

During Phase 3, the large loss in spaces (4,376) is offset by about 1,000 spaces, with the construction of 5,350 spaces. However, most of the gain is attributable to an increase (870 spaces) in visitor parking. Thus, the spaces allocable to permit parking increase only slightly, from 17,786 at the beginning of Phase 2 to 18,031 at the end of Phase 2, an increase of only some 300 spaces.

During Phase 3, there is a projected decrease in spaces and permits. This reflects the loss of 1,437 spaces, with no new replacement spaces added.

The number of projected spaces falls far short of the projected demand for parking by the end of Phase 3. Accommodation of the projected future growth (26,500 additional campus population), combined with correction of the standing shortfall in permits (around 2,000 permits, or around 1,430 spaces) and further combined with the small decrease in spaces allocable to permits (bottom line of *Table 1*) results in a need for 9,300 spaces. Attempting to meet this shortfall in spaces through further increases in on-campus parking is a problem in the extreme. At a cost per space of $10,000, the additional spaces would require a capital outlay of $93 million. In all likelihood, the construction cost would be much higher, as campus sites become more compromised and the need for more aesthetic parking building designs becomes paramount in a more built-up campus. Simply finding the sites for an additional 9,300 spaces is a major problem, given the construction program for the individual phases of the Master Plan. Further, the traffic generated by the additional spaces would require extensive additions to the existing street capacity. None of these expansions is programmed by either the city or the University.

The fundamental problem with parking, therefore, is simple: a large number of new spaces, a garage construction program that simply maintains current spaces and meets none of the new growth in demand, and a cost of garage construction that, if the new spaces were to be provided, would require a significant increase in the cost of permit parking. In many respects, the parking issue is a double edged problem. Not only are surface spaces being displaced from the campus by growth, but the growth itself increases the parking demand. Similarly, not only are low cost spaces being lost, they are being replaced, if at all, by expensive spaces. Until now, the University's parking operation has enjoyed the ability to finance new garages by subsidizing them with earnings from older, low-priced facilities (surface lots or older garages). This financial self-sustaining program required only modest increases in permit fees. However, the double edged realities noted above are quickly putting an end to the ability to have a financially self-sustaining program of removing inexpensive surface lots, replacing them with expensive garages, and sustaining only modest increases in permit fees. At the University of Arizona, as at numerous universities throughout the United States, the most promising answer to this pinch is to seriously pursue the of a significant number of parking spaces off campus. This strategy is analyzed in detail in the following section of this report.

The Circulation Plan goals and the fiscal realities of the parking situation translate to parking recommendations, within the current Campus Master Plan, as follows:

- Begin a strategy of off-campus parking.
- Convert more on-campus spaces to high-yielding visitor spaces.
- Site new on-campus spaces on the southern fringe of the campus.

- Vigorously pursue the campus pedestrian circulation actions (legibility of the campus, revise hierarchy of streets, etc.) that extend the usefulness of the existing and planned parking spaces.

Off-Campus Parking Strategy – We recommend, as the major parking strategy, that the University begin with the program of encouraging and providing for off-campus parking.

This analysis yields the following conclusions:

- Continuing to accommodate all parking needs in on-campus spaces cannot be financially sustained without an increase in permit fees in visitor parking fees.

- As the campus becomes more densely developed, the building sites become more difficult, and construction of a garage space is likely to exceed current cost per parking space. Also, as appearance becomes more important, architectural features (screening, "liner" buildings etc.) are likely to raise the cost per space well beyond $10,000. Further, the cost of borrowing (and, therefore, debt service) is likely to increase from current unusually low levels.

- Accommodating all growth with on-campus parking will generate an additional 19,000 daily vehicle trips to/from the campus above current levels. This increase in traffic is significant, given existing external (non-campus) traffic volumes and the increasingly limited intra-campus street capacity. With all parking needs accommodated on campus, the increase in traffic would be reflected in measurably lower levels of traffic service, and strong pressure for street improvements (e.g., turning lanes, widening, etc.).

- Off-site parking, served by shuttle transit service, is a far more flexible investment than committing to new garage construction. Lots can be secured for short terms, parking can be shifted, as needed, to other lots, shuttle equipment can be resold or reassigned, and so forth.

Pursuing a program of staged development of off-site parking is a highly appropriate course for the University. In roughly their order of importance, the advantages are: (1) lower cost, (2) diverting vehicular traffic away from campus, (3) providing potential for shuttling non-parking campus population and (4) flexibility to avoid committing to structures for all future parking needs.

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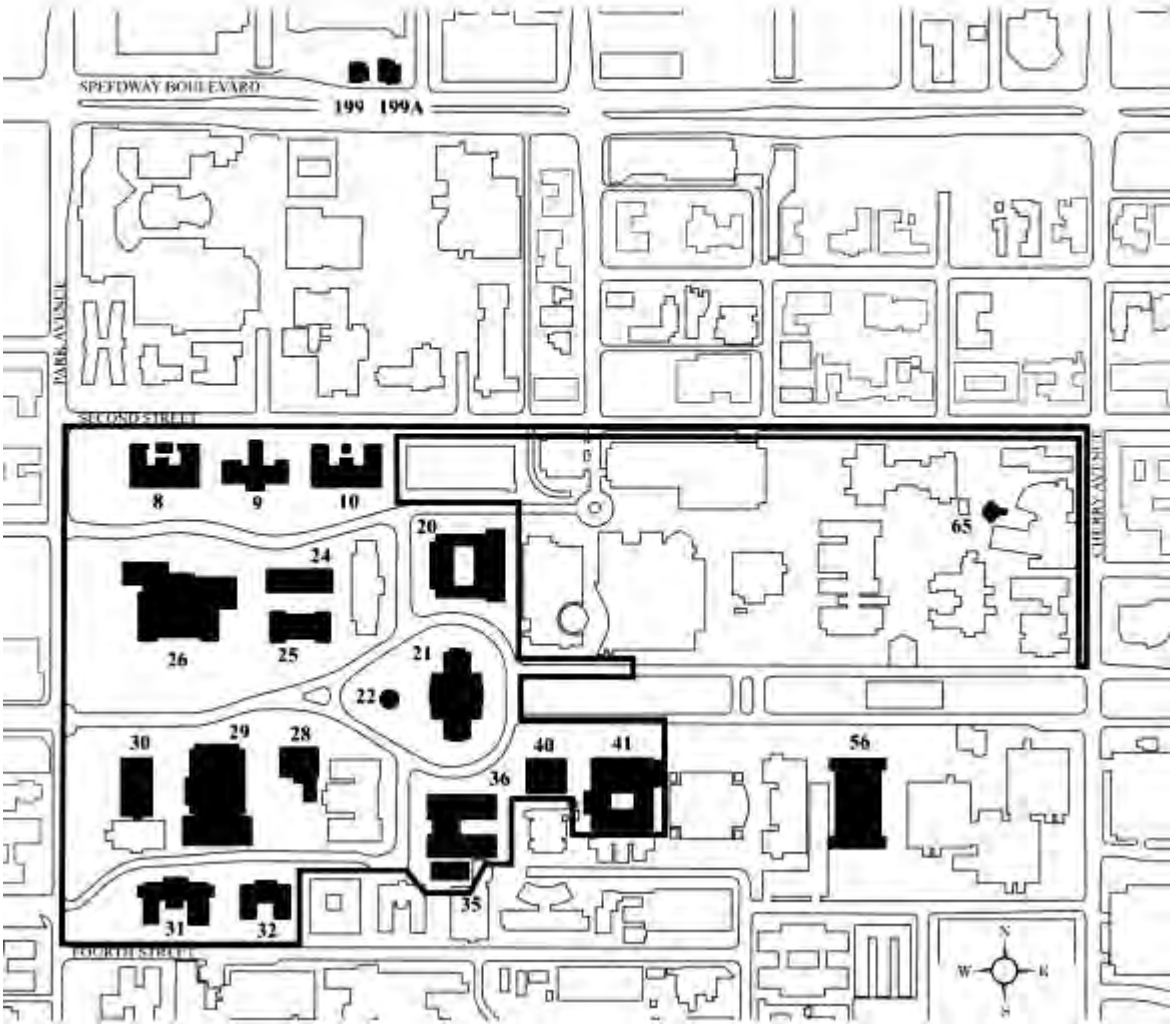
APPENDIX 5
LIST OF HISTORIC BUILDINGS

Structures Within Campus Historic District	Building Number	Architectural Style	Architect	Const. Date	Date on National Register	
					Nomination	Approval
University Hall (Old Main)	21	Late Territorial Victorian	James M. Creighton	1887-1891	1971	1972
Herring Hall	35	Roman Revival	David H. Holmes	1903		1986
Library and Museum (now Douglass Building)	28	Classical Revival	Russell, Mauran, & Garden	1904		1986
Science Hall (now Speech Building)	25	Vernacular Classic	D. H. and J. H. Holmes	1909		1986
Arizona Hall (now South Hall)	32	Classical Revival	D. H. Holmes	1913		1986
Agriculture Building	36	Classical Revival	Lyman & Bristow	1915		1986
Mines and Engineering	20	Classical Revival	J. B. Lyman	1918		1986
Cochise Hall	31	Classical Revival	Lyman & Place	1920		1986
Maricopa Hall	9	Classical Revival	Lyman & Place	1921		1986
University Library (now Arizona State Museum, North)	26	Renaissance Revival	Lyman & Place	1923-1927		1979
Humanities Building (now ESL Center)	24	Italian Romanesque Revival	Roy Place	1935		1986
Arizona State Museum	30	Italian and Spanish Romanesque Revival	Roy Place	1935		1986
Structures Within Campus Historic District	**Building Number**	**Architectural Style**	**Architect**	**Const. Date**	**Date on National Register**	
					Nomination	**Approval**
Chemistry and Physics Building	41	Italian Romanesque Revival	Roy Place	1936		1986
Main Auditorium (now Centennial Hall)	29	Italian Romanesque Revival	Roy Place	1936		1986
Administration Building (now Nugent Building)	40	Italian Romanesque Revival	Roy Place	1937		1986
Yuma Hall	10	Italian Romanesque Revival	Roy Place	1937		1986
Gila Hall	8	Romanesque Revival	Roy Place	1937		1986

Structures Noncontiguous to Campus Historic District	Building Number	Architectural Style	Architect	Const. Date	Date on National Register	
					Nomination	Approval
Steward Observatory	65	Classical Influence	Lyman & Place	1921		1986
Bear Down Gymnasium	56	Classical Revival Tendencies	Roy Place	1926		1989
Smith House	199A	Queen Anne Style	Prof. George E. P. Smith	1904		1982
Cannon/Douglass House	199	Bungalow Style	Dr. William A. Cannon	1906		1982

MAP SHOWING WEST CAMPUS NATIONAL HISTORIC DISTRICT
&
STRUCTURES NONCONTIGUOUS TO THE DISTRICT
LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES



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