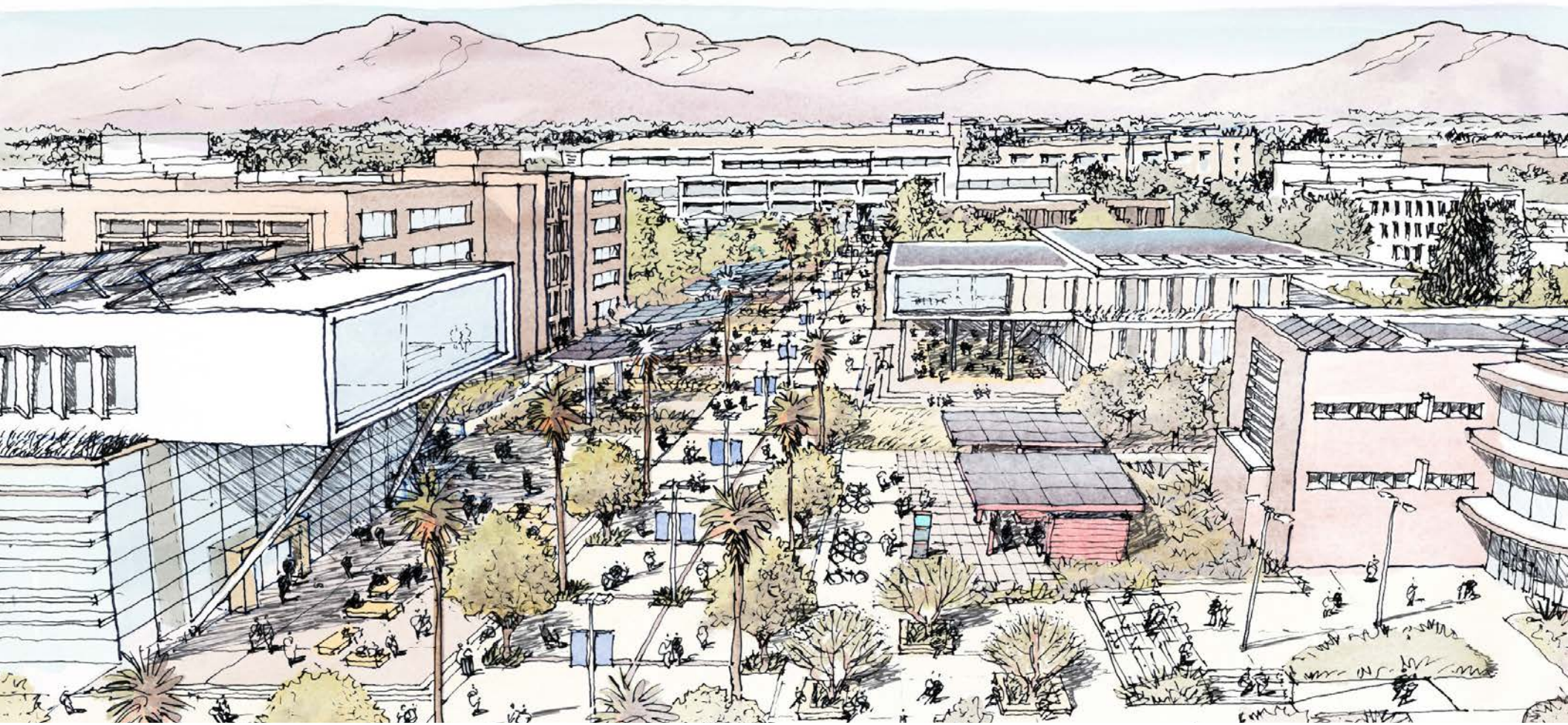

CSUSB

CALIFORNIA STATE UNIVERSITY SAN BERNARDINO | CAMPUS MASTER PLAN

20,000 FTE - 25,000 FTE | 2016

ACKNOWLEDGEMENTS

California State University, San Bernardino
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Liaison to the Executive Planning Committee

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Note: Acknowledgements are alphabetically ordered by administration or department represented, then by surname

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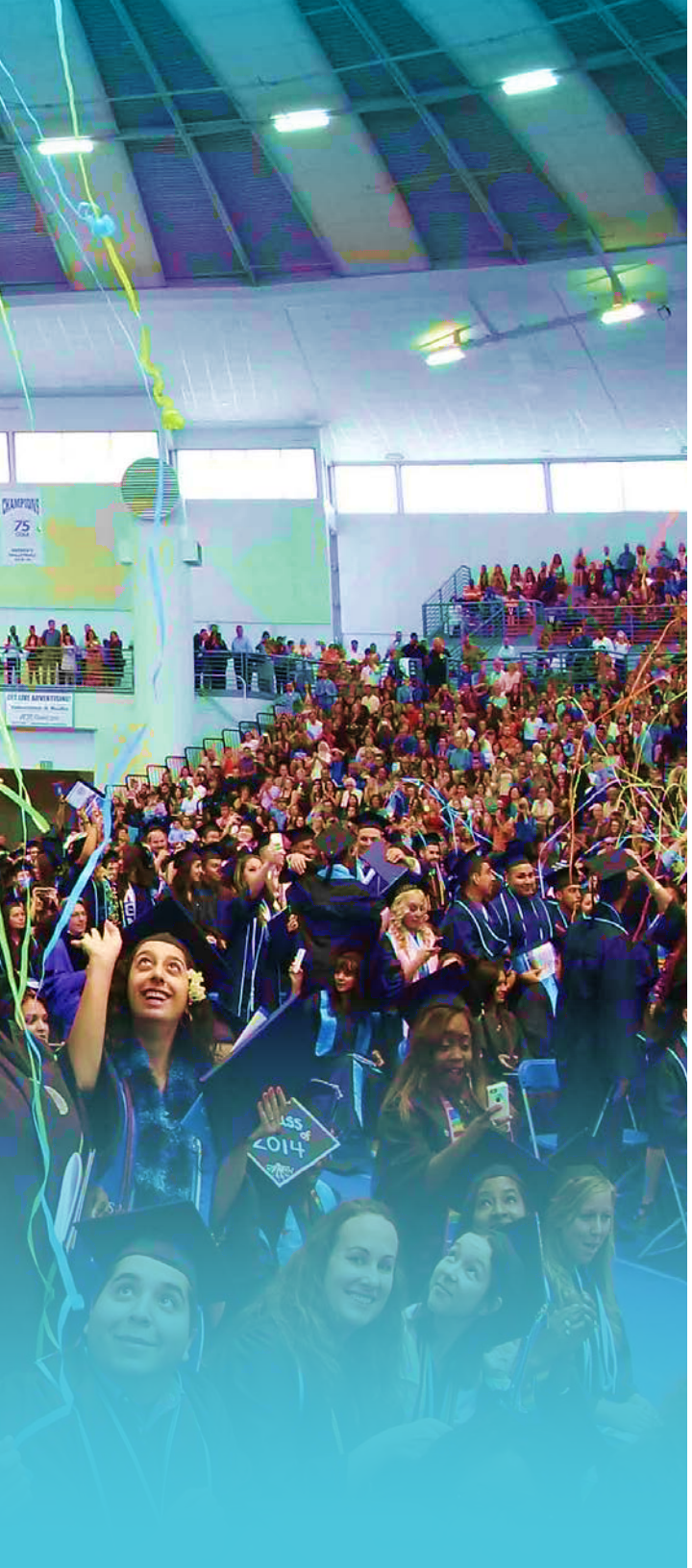


CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO

To the CSUSB Community,

I am excited to share with you the new 2016 Master Plan for our San Bernardino campus. This plan is visionary for the future of our campus and culminates the collaborative work achieved over the past 18 months with our Master Plan Steering Committee, the extended campus community, our neighbors and partners in the community, and our talented group of professional consultants. Through open forums, presentations, online discussions, and committee meetings, our campus community came together and the result is a bright and inspiring future for university life at CSUSB. As you review the plan, I have no doubt you will recognize how we listened carefully and have incorporated many of your ideas and inputs.

CSUSB initiated this master plan process in response to enrollment growth over the last several years that has significantly exceeding forecasts. As we approach the limits of our 20,000 FTE student current capacity, we must look to innovative and advanced ways of funding, while configuring and developing more space for learning, living, and entrepreneurship. This 2016 Master Plan will serve as our roadmap to guide the growth of the university to support 25,000 FTE students in a more collaborative, engaging, and comprehensive setting.

The 2016 CSUSB Master Plan aspires to transform CSUSB from a suburban, commuter campus with long walking distances and large open spaces between buildings into a more walkable urban campus with engaging outdoor environments that are human-scaled, shaded and protected from seasonal winds. The planned configuration of new mixed-use academic buildings, student housing, food service, athletic playfields and expanded recreational opportunities, and student union facilities will create a CSUSB that serves as a vibrant 24/7 live-learn-work-play environment. This 2016 Master Plan also showcases our long-held values and remarkable commitment to an ecologically sustainable, resource resilient, and secure campus.

I would like to offer special thanks to our master plan consultants, Callison-RTKL and Assembledge+, as well as a large team of specialized consultants, who have worked collaboratively with our Master Plan Steering Committee to create this consensus master plan that reflects the best elements of each of the alternative scenarios that you commented on at our Town Hall meetings. I personally want to thank all who contributed their time and hard work to create this comprehensive and exciting Master Plan that envisions a bright and inspiring future for our campus. Together, we have created an exemplary plan that offers an inclusive and clear path forward for our campus, one that will secure a real sense of place for CSUSB, a proud identity, and provide an outstanding environment for higher education that will exceed the expectations of our community.

We are grateful for your participation, this plan belongs to you; CSUSB students, faculty, staff, and friends.

Sincerely,

Tomás D. Morales
President

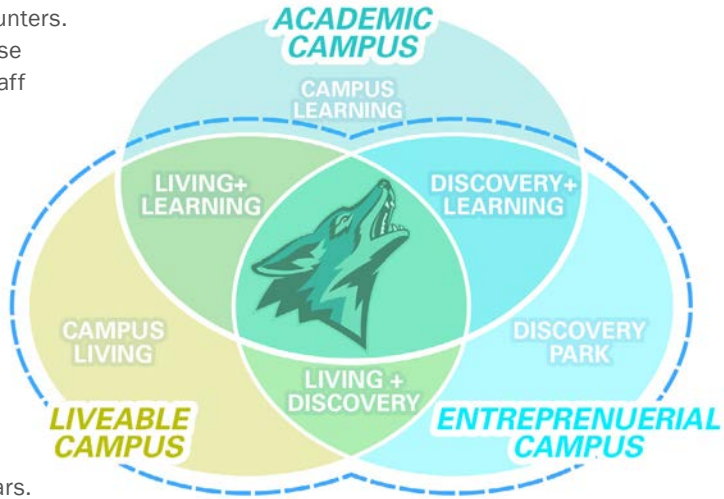
5500 UNIVERSITY PARKWAY, SAN BERNARDINO, CA 92407-2393

EXECUTIVE SUMMARY

INTRODUCING AN INNOVATIVE PLAN FOR CHANGING TIMES

The educational experience in its fullest sense takes place not only in classrooms, but at meals, in residential areas, in the course of recreational activities, and through informal and casual encounters. The physical campus provides the setting for these experiences to be shared by students, faculty, staff and campus visitors and can be a powerful tool in the educational process. To truly create a supportive and vibrant 24/7 campus that is supportive of the University's educational mission, all of these factors must be considered.

The purpose of the California State University, Sacramento 2016 Master Plan is to support and advance the University's educational vision and mission by providing a guide to the development of the physical campus and its facilities over the next twenty years. The Master Plan report describes in detail the vision and goals for campus development to accommodate an enrollment cap of 25,000 full-time-equivalent students (FTES).



LEADING WITH VISION

A State University is built to prepare future generations to fulfill their dreams. **The 2016 CSUSB Campus Master Plan** represents a major planning effort by the university - the result of intense collaboration within this learning community, here and now, dreaming of a campus with renewed vision where the global community will benefit for generations to come.

In 2015, California State University San Bernardino campus celebrated fifty years of service to the Inland Empire. Starting with three initial buildings and 293 students in 1965 the campus **now serves around 20,000 students** and has nearly **reached its original projected capacity**. As the campus nears this goal it was vital that a long term vision for the future be prepared to guide and inspire the continued growth of the University for the next fifty years. This new Master Plan comes at a time of profound social and economic changes within the nation, state and region which are challenging the ways that CSUSB can and will **fulfill its higher education mission** within the community.

Of particular relevance are two forces that now are converging to impact the near and long-term availability of academic spaces at CSUSB:

- The increasingly **rapid growth of student enrollment** demand in the Inland Empire and internationally
- The **limited State of California funds** available for the construction of new or renovated facilities within the CSU system.

These factors along with others became the critical issues that were to be analyzed and addressed in a new master plan for CSUSB. The renewed vision for the 2016 Master Plan emanated from the CSUSB Strategic Plan (2015), which was focused to further address the physical elements of the campus. The 2016 Master Plan re-envisions the physical campus to become a **more vibrant, expanded-full service, 24/7 campus supportive of the CSUSB's educational mission** over the next twenty years. To enable this to occur, as both a practical matter and as directed by the California State University Chancellor's Office, the 2016 Master Plan was developed to accommodate a capacity 25,000 FTE students.

Four key physical elements of the Master Plan are:

- Focus on the **strategic infill** of needed new buildings to address student academic and student activity needs while **increasing building density** and thereby creating a **more walkable** and connected campus;
- Increase the amount of **on-campus student housing** and other student amenities in order to create a more vibrant 24/7 environment;
- Establish **comprehensive approach to sustainability** that reinforces CSUSB's stewardship of campus landscape/environment and human, economic and natural resources;
- Create a series of campus **outdoor spaces framed by buildings** and protected from extremes of sun and wind that facilitate student gathering, learning and passive recreation.

The rapid growth of student enrollment demand in the Inland Empire has placed immediate and looming impacts on the university including **pressures on the availability of**

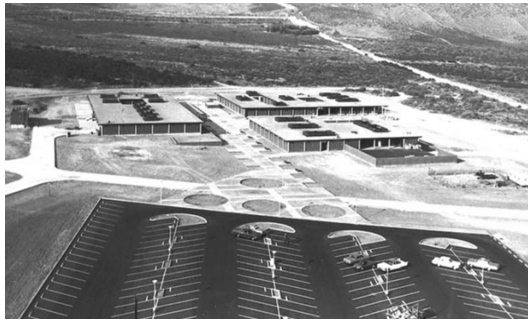
classroom and laboratory spaces to conduct classes, the availability of faculty and faculty offices, the availability of student individual and group study spaces and the availability of research space.

Given the immediacy of these demands, the 2016 Master Plan recommends a series of **Near-Term Options** to quickly address space shortages and allow the University to meet pressing enrollment demands while the more **long-term solutions** evolve over time.

Near term space demand response strategies include:

- Extending **Class Scheduling** and **Distance Education** Options
- Moving **Selected uses Off-Site**: Storage (library reference, records, furniture etc.), and Potential off-campus center(s) to free faculty offices and other space on campus)
- Reconfiguration and **re-purposing of existing spaces**.
- **Creative implementation** of existing funding streams (New College of Extended Learning (CEL) facility (currently in development) will include shared campus academic space for leaseback to the campus)

The 2016 Campus Master Plan for CSUSB is the most ambitious and important planning document crafted by the University since its inception in 1965.



Clockwise from lower left: The initial campus shortly after its founding in 1965; the campus in 2015 at the start of this master plan process; and, students showing school pride on the 50th Anniversary of CSUSB

2016 CAMPUS MASTER PLAN VISION

Prior to developing a plan for the physical campus there must be a **clearly stated vision**. The primary source for the CSUSB vision and plan principles underlying the 2016 Master Plan was the campus CSUSB Strategic Plan (2015-2016) which was further developed to f**ocus on the physical elements** of the campus through an **extensive process of consultation** with the Master Plan Steering Committee.

2016 CAMPUS MASTER PLAN VISION STATEMENT

Cal State University San Bernardino will serve as a global learning center of opportunity and enterprise for regional, national, and international communities.

2016 CAMPUS MASTER PLAN MISSION STATEMENT

As a healthy environment enabling diverse lives to grow and prosper, the campus will provide a setting in which the intellectual and creative pursuits of the University and general community are activated, interconnected, and sustainable.


CAL STATE UNIVERSITY
SAN BERNARDINO
Will become a global learning center of
OPPORTUNITY AND
ENTERPRISE

A PLAN BUILT BY THE CSUSB COMMUNITY

The 2016 CSUSB Master Plan was developed to reflect the hopes, aspirations, and objectives of the entire campus community.

185 COMMITTEE MEMBERS AND PUBLIC PARTICIPANTS LENDING INPUT THROUGH 6 OPEN-DOOR WORKSHOPS AND TOWN-HALL MEETINGS

1,382 VOTES TO SELECT AMONG PLAN PRIORITIES, TOP CONCERNS, PROGRAM ELEMENTS AND PLAN LAYOUT ALTERNATIVES

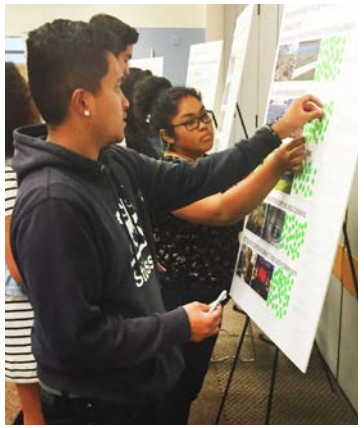
201 DOCUMENTED COMMENTS AND SUGGESTIONS ADVISING THE PLANNING TEAM TO ADDRESS CERTAIN ISSUES OR SHOW SUPPORT

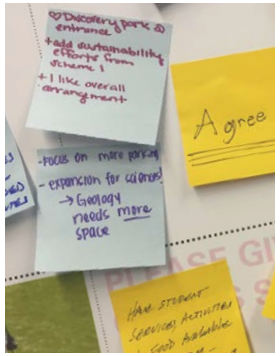
5 MASTER PLAN LAYOUT ALTERNATIVES SHOWN, THEN CONSOLIDATED TO THREE DISTINCT OPTIONS FOR PUBLIC EVALUATION AND SELECTION

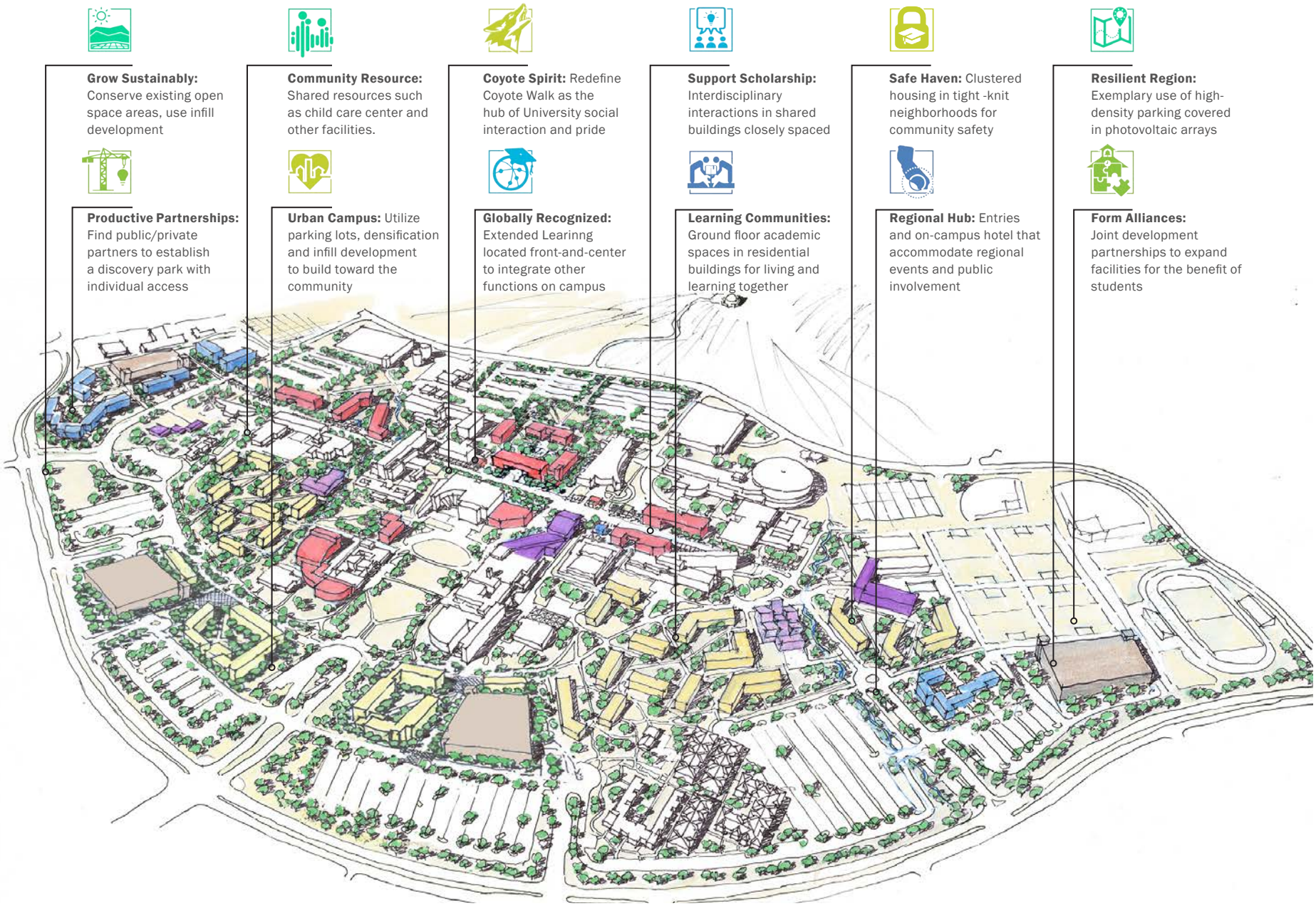
The Master Planning process was crafted to **engage as many as possible** - to ensure that these **collective choices** of the campus community are 'built into' the 2016 CSUSB Master Plan. To accomplish this, the master planning process was conducted over a 14-month period coinciding with the 2015-2016 academic year. The Master Plan consultant team headed by CallisonRTKL and Assemblage+ worked with the CSUSB Master Plan Steering Committee to develop a **comprehensive vision** and **planning principles** to guide the development of the new Master Plan.

The planning process included numerous opportunities for campus and community participation, including **three campus Town Hall** type forums (each Forum consisting of two separate meetings) that were organized to both **present and listen to ideas** and gather feedback as planning proposals were discussed.

The University community v**oted for the overall concept detailed in this plan report by a margin of 26%**, while favored elements from the other two were incorporated to create the **composite plan solution**.







OUTREACH-DRIVEN CONCENSUS PLAN AND RESPONSIVENESS TO PLAN OBJECTIVES

TRANSFORMATIONAL APPROACH

All of these efforts will support the growth of the University as an innovative regional economic engine, a center for academic achievement, community interaction and establish a setting for research & development, internship and entrepreneurial opportunities that bring industry, students and faculty together.

The 2016 Master Plan represents an aspirational plan intended to transform the University into a **complete full service campus community** with state of the art academic facilities, student housing, dining and other amenities that support **a vibrant 24/7 LIVE-LEARN-WORK-PLAY campus life**.

The plan is designed to evolve CSUSB **from sub-urban setting to a more active urban campus** that is easily walkable and human scaled with smaller more pedestrian friendly outdoor spaces that are **more conducive to collaboration**.

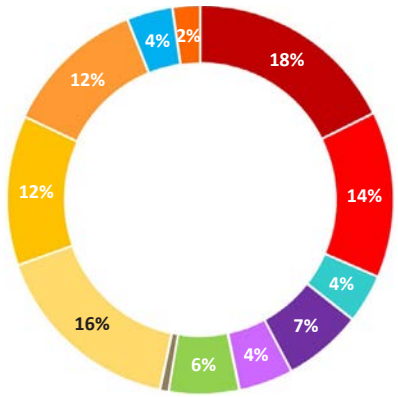
The plan seeks to enhance CSUSB as a global knowledge, cultural and innovation center with a **focus on interdisciplinary collaboration** and that will serve as the foundation for broad-ranging, integrated, globally-renowned University.

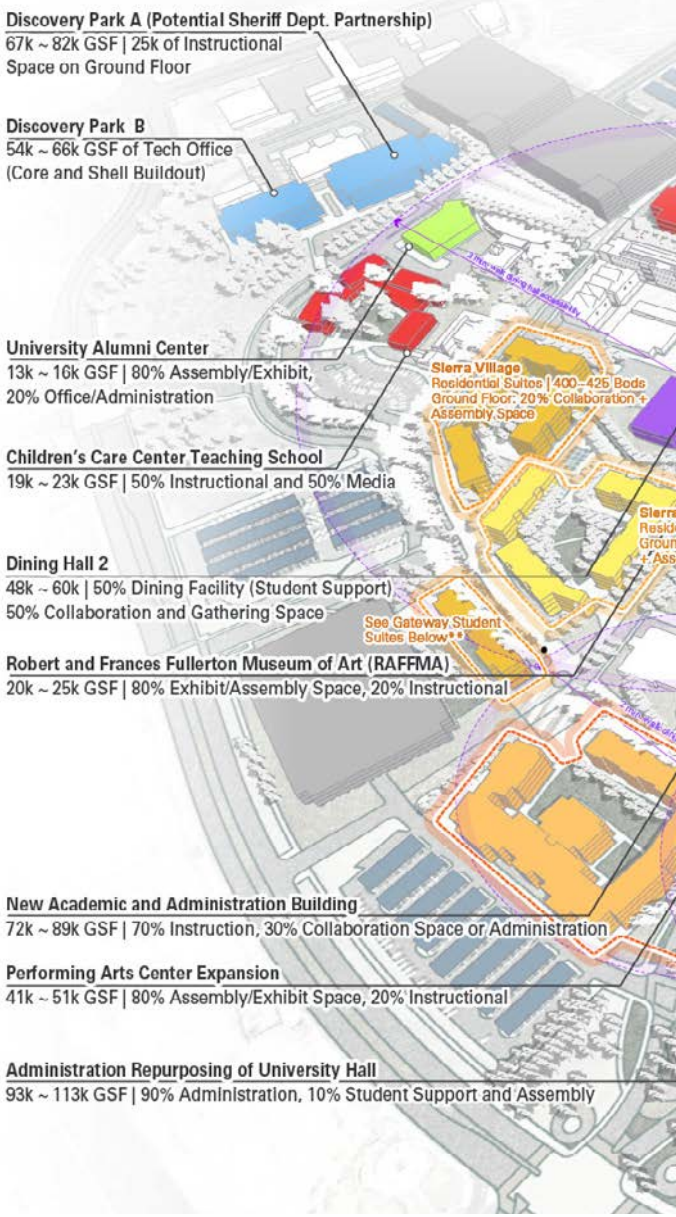
The 2016 Master Plan builds toward a campus that will be world renowned for its leadership in achieving, teaching, and inventing **demonstrable environmental sustainability** and **resource resiliency.**

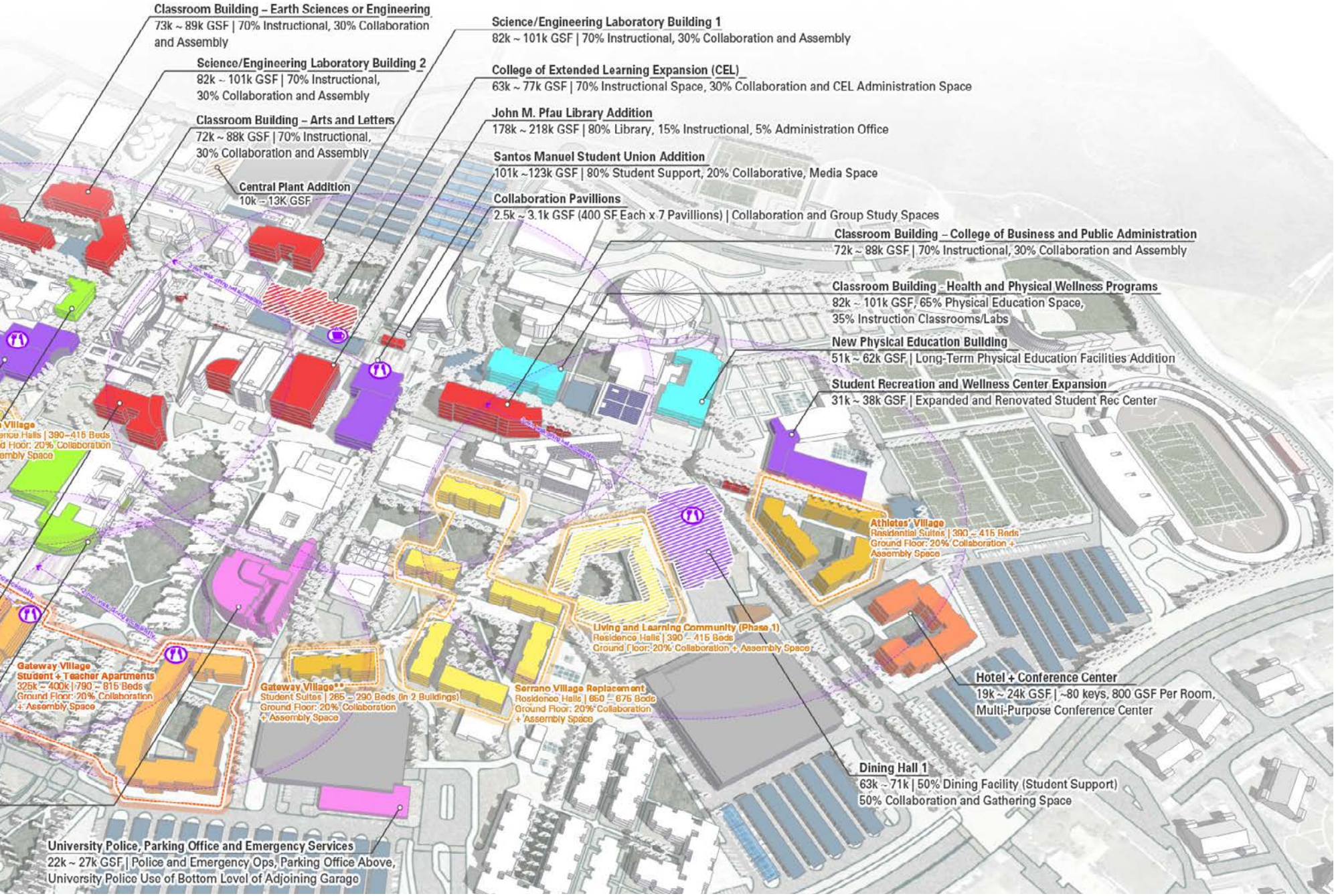
Given the limited availability of State funding, the 2016 Master Plan explores **potential options to diversify funding resources** to implement the plan thru **public/private** and **public/public** partnerships and innovative alternate finance methods.

All of these efforts will support the growth of the University as an innovative **regional economic engine**, a **center for community interaction** and establish a setting for research & development, internship and entrepreneurial opportunities that bring industry, students and faculty together.

- **Physical Education**
- **Assembly & Exhibit**
- **Student Support**
- **Instructional**
- **Library, Media & Collaborative**
- **Physical Plant**
- **General Administration**
- **Housing**
  - Residential Halls
  - Residential Suites
  - Apartments
- **Lodging**
- **Discovery/Innovation Park**



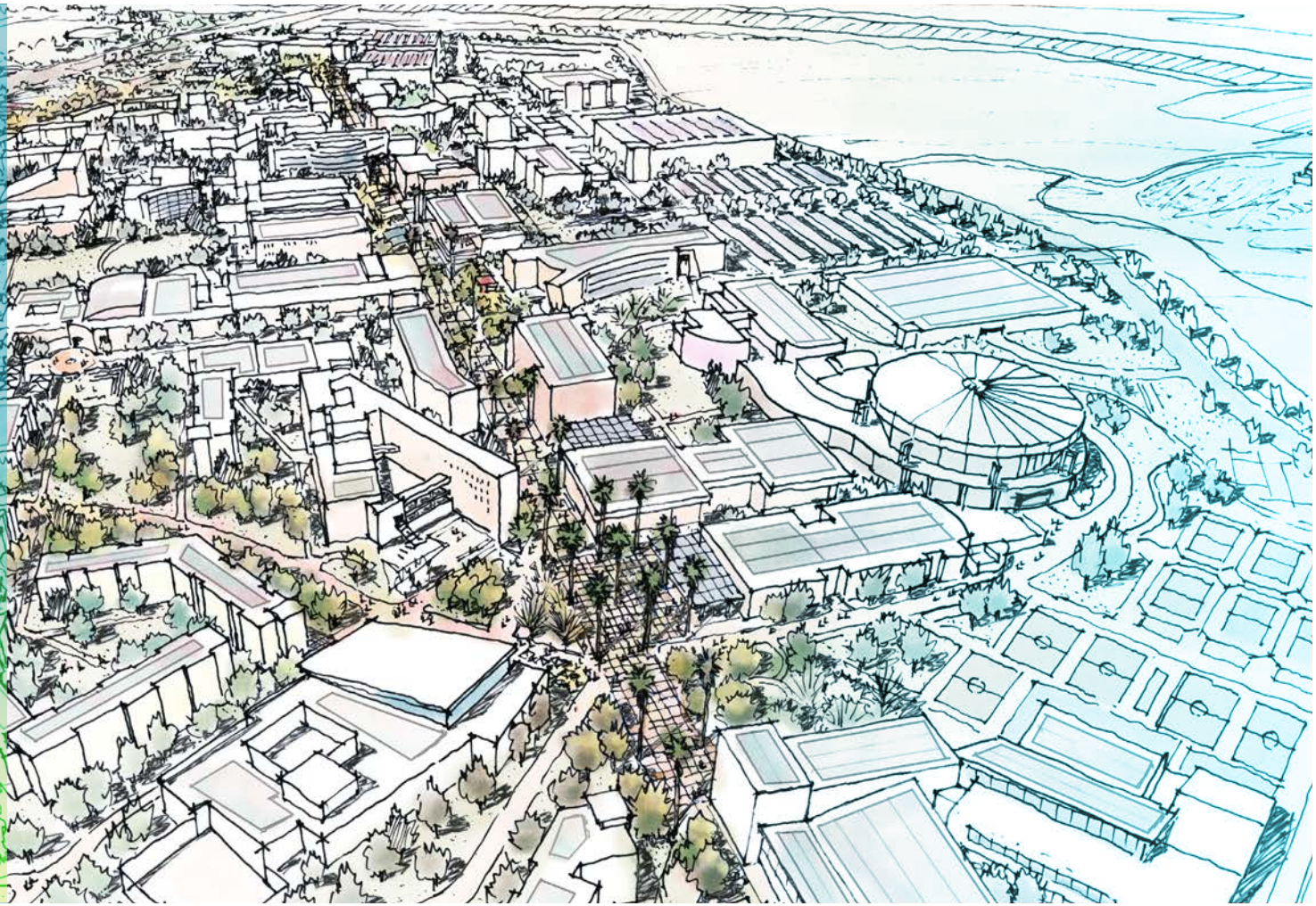




CAMPUS DEVELOPMENT OVERVIEW

THEME 1

ACTIVATE + URBANIZE



ACTIVATE AND URBANIZE THE CAMPUS THRU INFILL GROWTH

The 2016 Master Plan is designed to evolve CSUSB from a spread out, sub-urban environment with large, less optimal undeveloped open spaces that exacerbate walking distances, to **a more dense and active urban campus** that is easily walkable and human-scaled. This will be accomplished through **strategic infill of new facilities along the central pedestrian pathway** "Coyote Walk" to create a denser central academic **corridor lined with shared use facilities**, bustling with collaborative interactions and social activity to reinforce this as **the heart of the University**.

In order to accommodate future unknowns in specific **program growth and new pedagogies**, the 2016 Master Plan encourages most new buildings to be designed as multi-disciplinary and shared-use centers that **support collaboration**.

CSUSB ILLUSTRATIVE MASTER PLAN

LEGEND

Key Campus Development Features

1. Pfau Library Expansion + Infill
2. Academic Development on Coyote Walk
3. Theater Complex + Auditorium
4. New Residential Dining Halls
5. Expanded Student Union + Rec Center
6. Residential Gateway Village Housing
7. CEL Hybrid Knowledge Center
8. Discovery Park + Sheriff's CSI Lab
9. On-Campus Hotel and Conference Center
10. Athletic Field + Track Stadia/Seating
11. Physical Education + Kinesiology Facilities

Key Campus Sustainability Features

12. Solar Photovoltaic (PV) Arrays Over Parking
13. Solar PV Canopies Over Pedestrian Plazas
14. Student-Run Edible Grove + Garden
15. Drought Tolerant Turf Replacement

Key Transportation + Circulation Features

16. Proposed Parking Structure + Police Station
17. Enhanced Social Setting on Coyote Walk
18. Transit Plaza + Special Event Drop-Off
19. Pedestrian-Oriented "Urban Trails"

Key Landscape + Open Space Features

20. Expanded + Revitalized Athletic Facilities
21. Interdisciplinary Collaboration Quads
22. Extended Gateway Commons
23. Pedestrian-Oriented Arrival Plazas

Existing Development

Proposed Academic Development

Proposed Campus Housing

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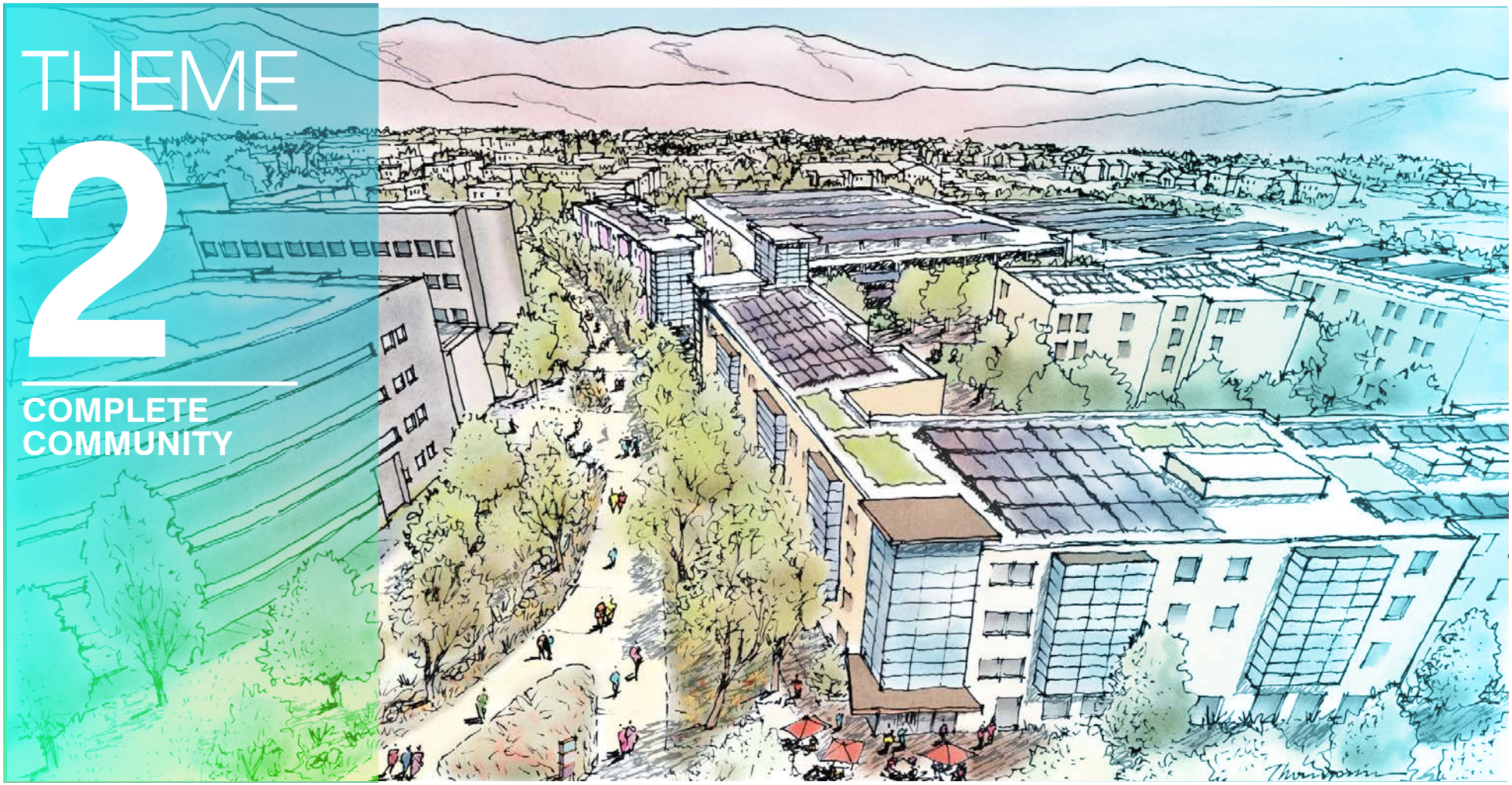
THEME 2

COMPLETE COMMUNITY



BECOME A COMPLETE 24/7 CAMPUS COMMUNITY

The 2016 Master Plan represents an aspirational, holistic and coordinated series of proposals intended to transform the CSUSB campus from a commuter-oriented campus into a **complete campus community** increasingly attractive to students.

To accomplish this the plan calls for **greatly expanded student housing** totaling 3,300 new beds integrated into **residential precincts** complete with dining opportunities, new student amenities such as **expanded wellness, recreational and student union facilities**; and additional and enhanced athletic playfields that combine to support **a vibrant 24/7 LIVE-LEARN-WORK-PLAY campus life**.

LEGEND

Academic Realm
Academic Precincts
Academic Development
Coyote Walk & Green Common
Student Union Development

Student Life Realm
Student Life Precincts
Student Life Development

Athletic Realm
Athletics and Recreation Precincts

Entrepeneurial Realm
Entrepeneurial Precincts
Entrepeneurial Development

Facilities Support Realm
North Campus Precincts

Campus Conservation Realm
Land Lab Precinct (Field Studies and Environmental Preserve)

Student Amenities
Recommended Dining Hall
Recommended Dining Cafe

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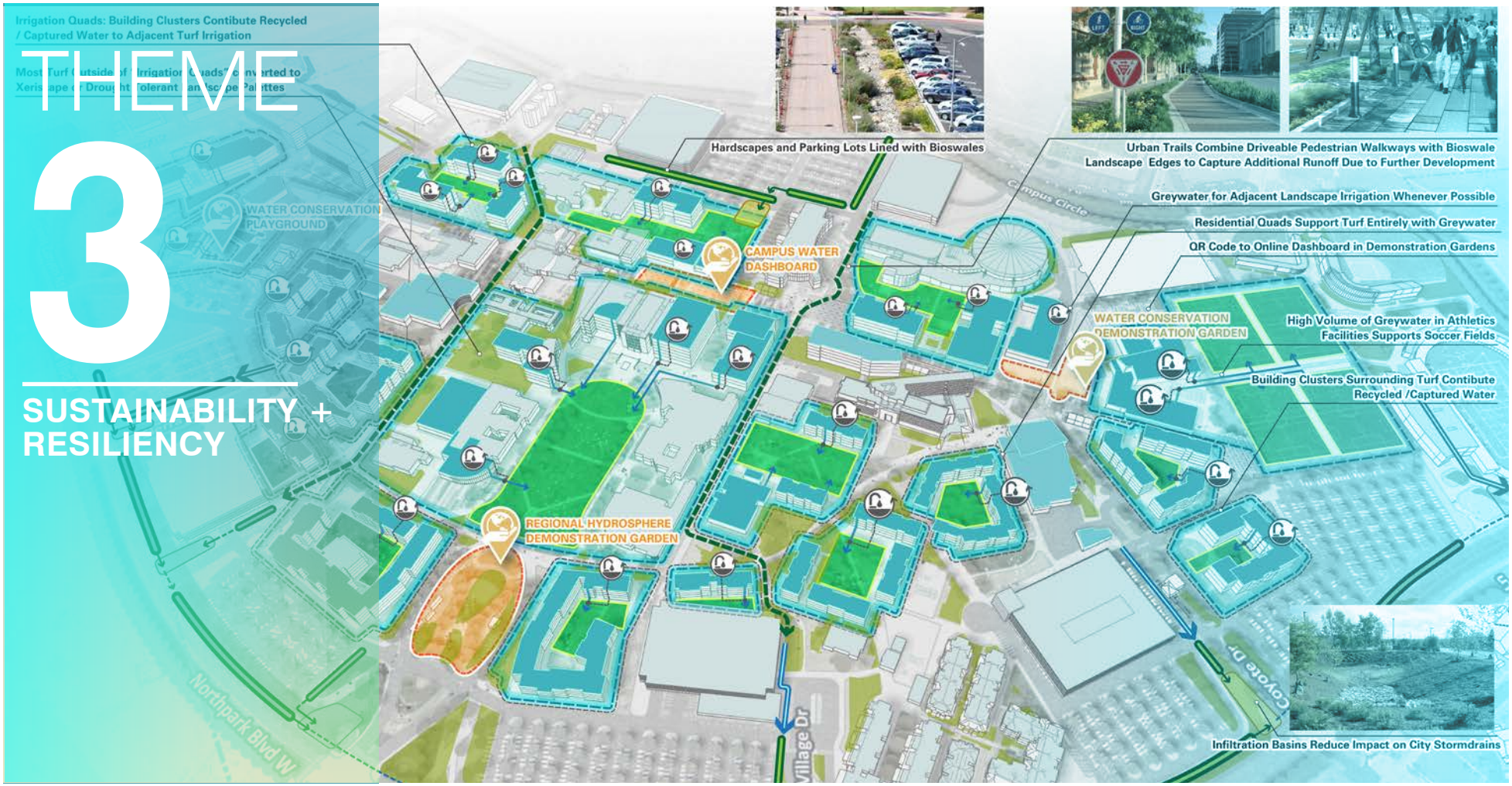
CAMPUS DEVELOPMENT FRAMEWORK PLAN



THEME 3

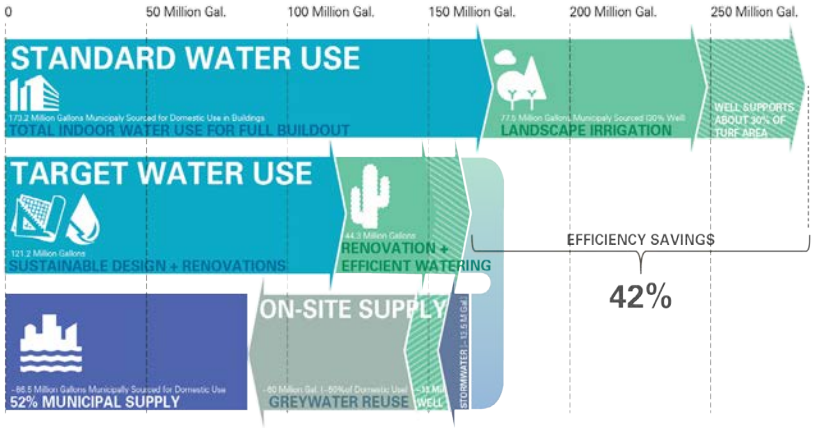
SUSTAINABILITY + RESILIENCY

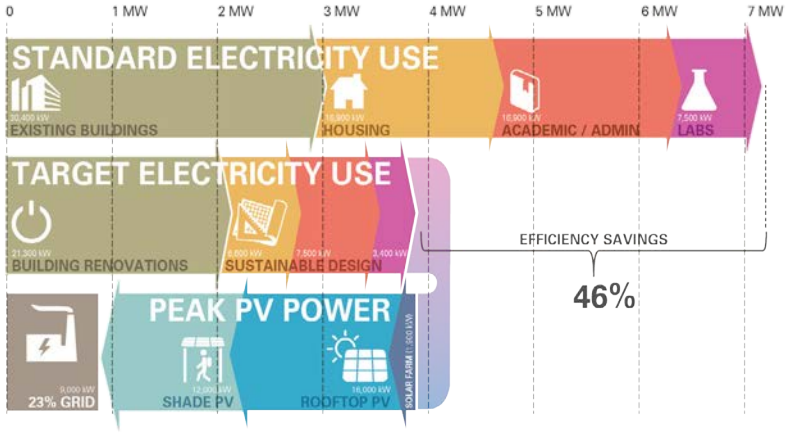


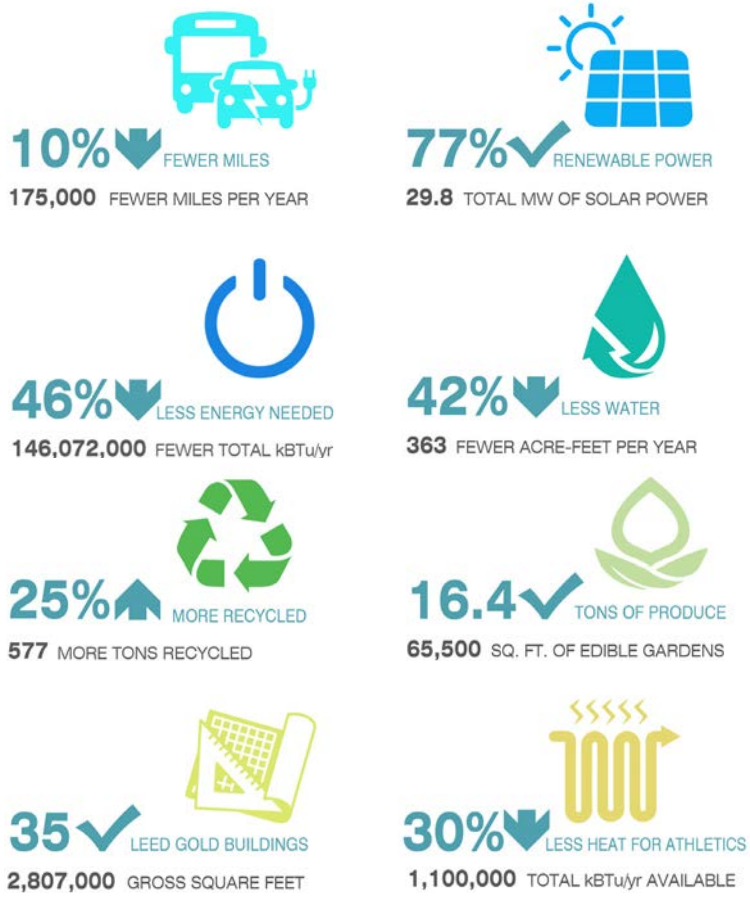
CREATE A 21ST CENTURY SUSTAINABLE + RESILIENT CAMPUS

CSUSB has an unparalleled opportunity to lead-by-example with an active and appropriate **response to continuing threats from climate change** while simultaneously **engaging and educating the student body and the community**.

The 2016 CSUSB Master Plan recommends a series of policies and practices for sustainable development and operations of the campus. Research-based **sustainability targets** and metrics then measure and extend CSUSB leadership and commitment to stewardship of its natural resources into the future on the basis of **water conservation, energy independence and community resiliency**. Employing features such as greatly expanded use of **photovoltaic systems**, high-performance **building envelopes** and **bioswales**, and **drought tolerant landscapes**, these bold sustainability initiatives will make the campus more resilient to environmental impacts and help **cultivate environmentally-responsible future generations**.





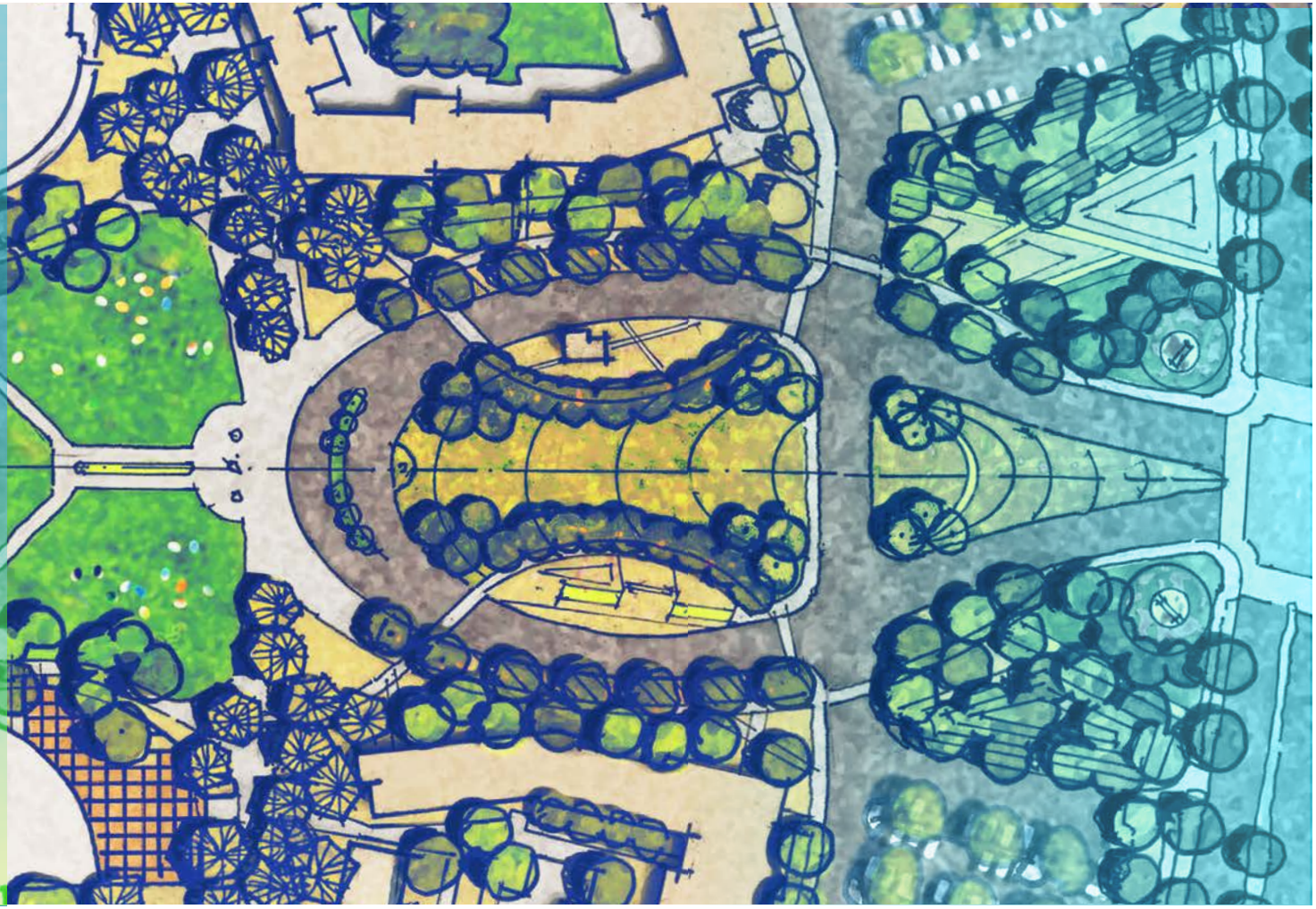


REDUCED DEPENDENCE ON UTILITY RESOURCES THROUGH LANDSCAPE AND INFRASTRUCTURE STRATEGIES

MEASURABLE BENEFITS SUSTAINABILITY AND RESILIENCY MEASURES IN THIS MASTER PLAN

THEME 4

DIVERSE LANDSCAPE



CULTIVATE A DIVERSE LANDSCAPE THAT IS RESILIENT AND STUDENT FRIENDLY

The 2016 Master Plan will create a series of **campus corridors and outdoor spaces** framed by buildings and protected from extremes of sun and wind by **climate appropriate trees and plant materials**. These spaces will facilitate student gathering, learning, passive recreation and **graceful access across the campus**. As a major theme, the Master Landscape Plan r**einforces pedestrian connective corridors** and plazas along Coyote Walk made user-friendly through the introduction of shade devices, landscaping, benches, tables and effective evening lighting.

The Landscape Plan promotes and fosters a more holistic setting that **protects CSUSB's valuable "Land Lab"** natural area and learning resource on the north side of the campus. Alternatives to water consuming turf provide a more **varied composition of drought tolerant and native floral communities** while at the same time recognizing and **respecting the campus heritage**. The plan updates and establishes **proactive guidelines** for campus planting, irrigation, site elements and furnishings.

LEGEND

Campus Heritage Landscapes
Gateway Commons
Habitat Conservation Area

Plazas & Promenades
Arrival Plazas
Coyote Walk
Major Plazas
Minor Plazas
Major Pedestrian / View Corridor
Minor Pedestrian / View Corridor
Sycamore Walk

Quads & Green Corridors
Residential Quad
Athletic Fields
Athletic Areas
Collaboration Quad
Campus "Urban" Trails
Key Avenues + Pedestrian Lanes
Tree-Lined Streets

Key Signage & Public Art
Key Public Art Opportunity
Key Signage Opportunity

Potential Community and "Farm-to-Table" Edible Gardens

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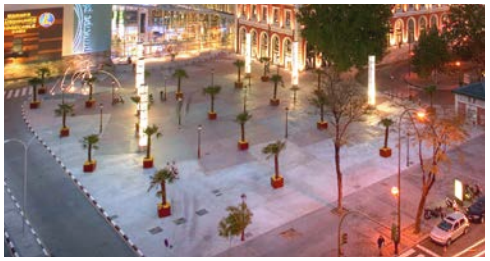
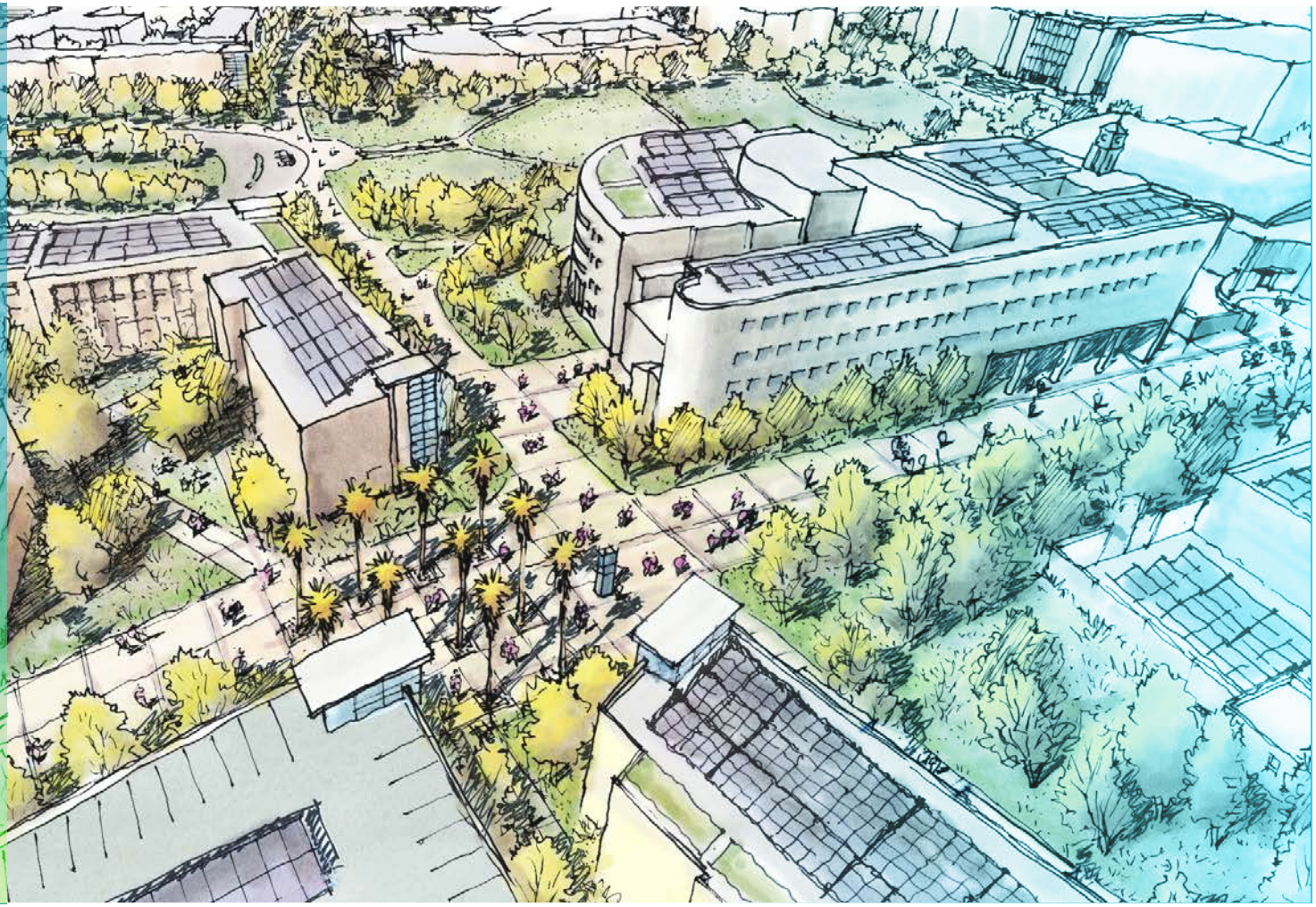
LANDSCAPE + OPEN SPACE FRAMEWORK PLAN



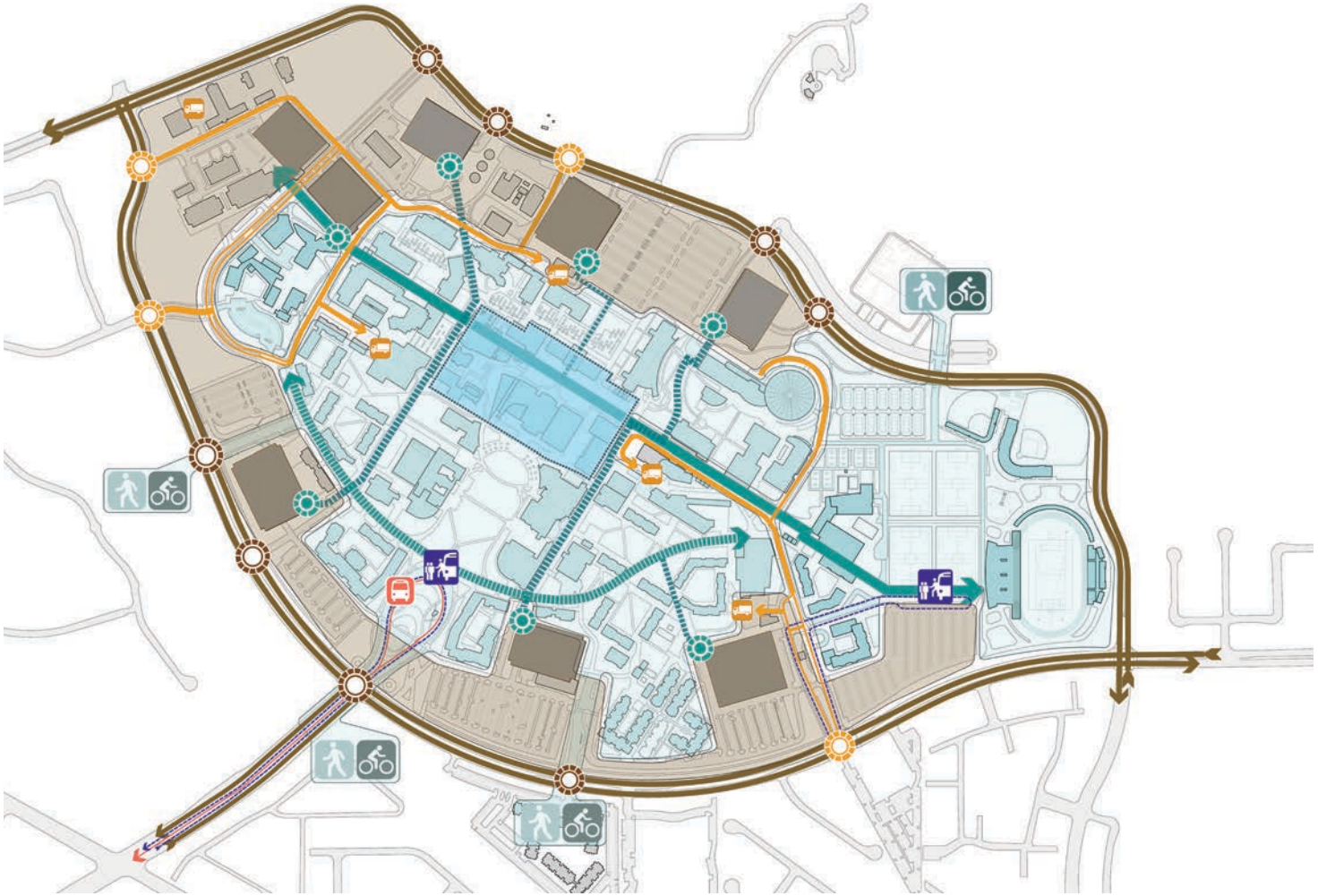
THEME 5

MULTI-MODAL CAMPUS



ENHANCE PEDESTRIAN ACCESSIBILITY AND SUPPORT ALL MODES OF TRAVEL

As the CSUSB campus continues to grow and mature, its transportation system must also evolve. Preparing for the future means more than increasing roadway and parking capacity. It means **ensuring support for a more broadly utilized range of transportation modes** and with that diversification, a **safer more organized interaction between pedestrians, cyclists, private vehicles** and public transportation. It also means that to achieve better sustainability in the future that CSUSB must take measures today to **encourage the use of alternative modes** of transportation. Specifically the 2016 Master Plan recommends the following: Strategically **link future parking structures to major pedestrian pathways** into the campus; redefine the main campus entry as a **gateway garden welcoming to pedestrians** that preserves the iconic view of Pfau Library; and **reduce vehicle intrusion** into the campus academic core. This plan offers ways to **exercise traffic demand management strategies** that enable auto commuters to **seamlessly opt for transit and bicycle use** on and through campus.



TRANSPORTATION + CIRCULATION FRAMEWORK PLAN

THEME 6

INTERNATIONAL HUB

ENHANCE THE CAMPUS AS AN INTERNATIONAL ENTREPRENEURIAL + CULTURAL HUB

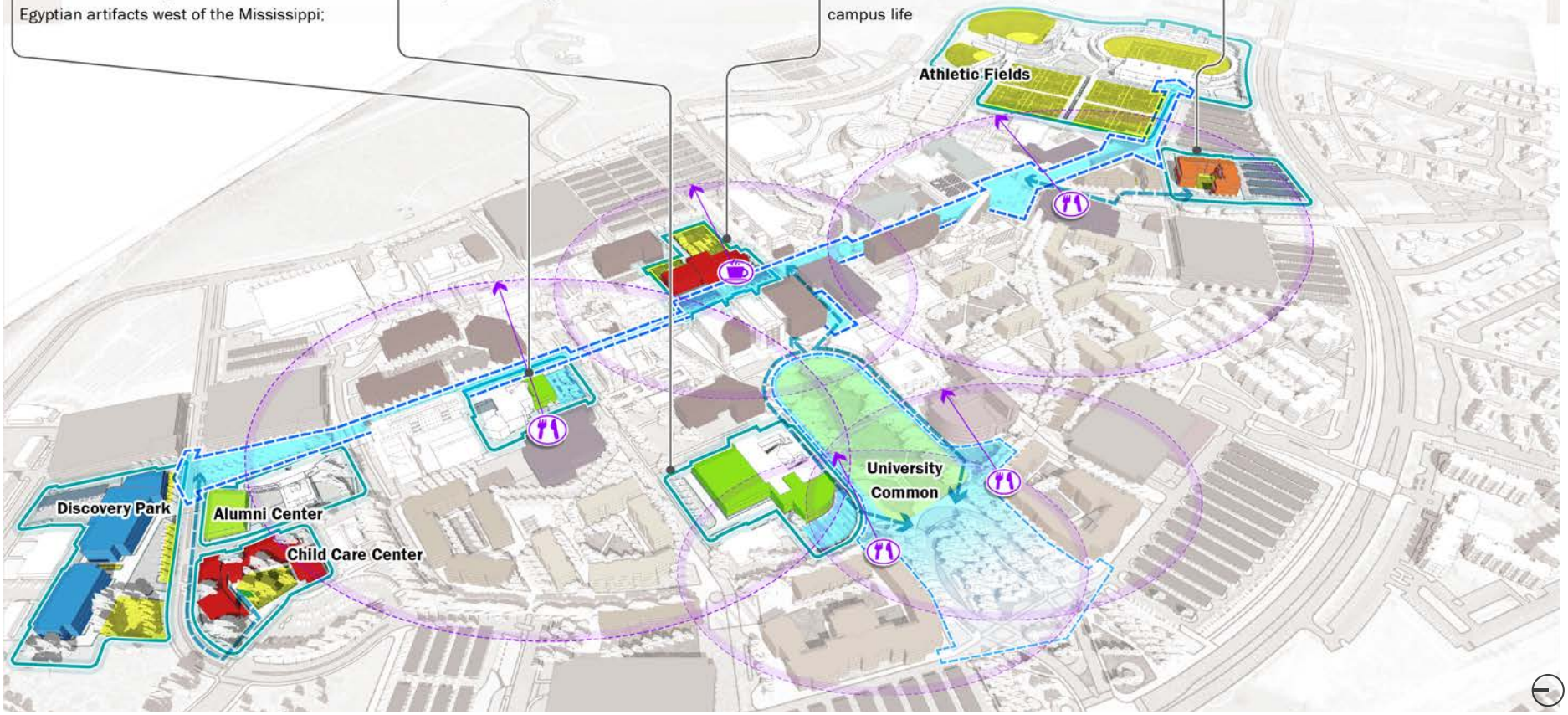
As one of two 4-year institutions of higher education within the Inland Empire, CSUSB has a responsibility to play an important role in the enhancement of the intellectual, cultural and personal development of **regional students and neighbors**. Part of that role is connecting the region with **national and global communities** - offering them the same high quality education. This means **more than classrooms** and dining halls. It requires a **collection of distinctive facilities** that serve as a **high caliber stage for cultural exchange and intellectual perspectives** from around the world. In support of this obligation, the 2016 Master Plan recommends a series of new venues as well as the enhancement of valuable existing facilities. Inherent to these proposals is the idea of integration and collaboration. This includes: 1) support for an expanded constituency that is **physically intersperse throughout the campus**, and 2) **connected to existing campus programs** and public spaces in ways that **encourage human interaction** in locations that **frame key campus open spaces**.

Expansion of the Robert & Francis Fullerton Museum of Art (RAFFMA) to meet its growing needs and further promoting the Museum and its collection as the largest collection of Egyptian artifacts west of the Mississippi;

Addition of a new theater appropriately sized for a campus of 25,000 students (750-1200 seats) that can sponsor cultural events for both the campus and the region

Locating the proposed College of Extended Education (CEL) building in the heart of the academic core along Coyote Walk to better integrate the international and non-traditional student experience into campus life

A Hotel/Conference Center to further support short-term cultural, athletic, visiting scholars and business programs.



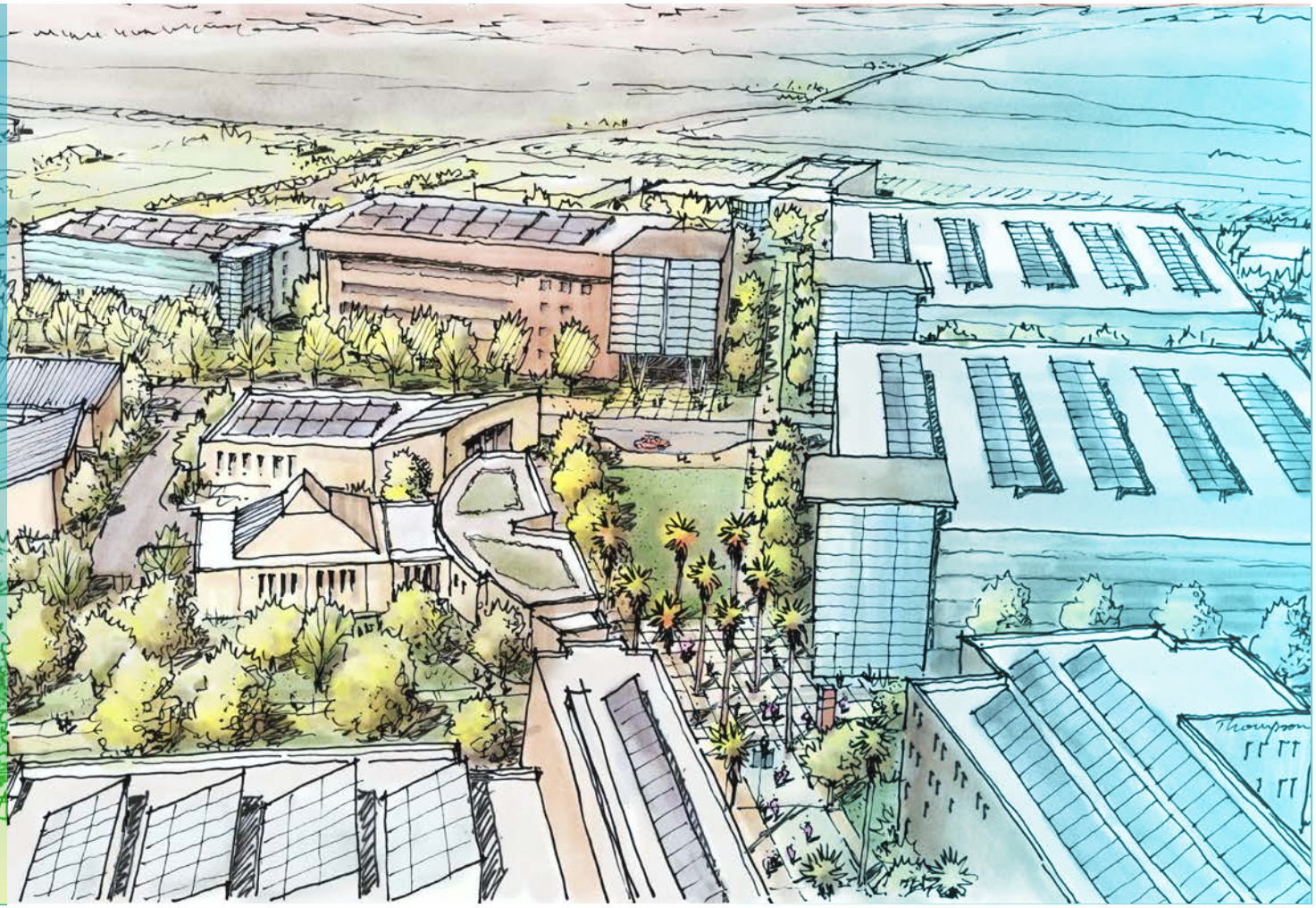
INTERCONNECTED ENTREPRENEURIAL + CULTURAL INFRASTRUCTURE IN THE MASTER PLAN

LEGEND

- Library, Media & Collaborative Facilities
- Lodging Facilities
- Discovery/Innovation Park Facilities
- Assembly & Exhibit Facilities
- University Common (Major Event Area)
- Athletic Fields (Major Event Area)
- Amenity / Convenience Proposed
- Key Campus Cultural Areas / Linkages
- Campus Cultural Facility Project Vicinity

THEME 7

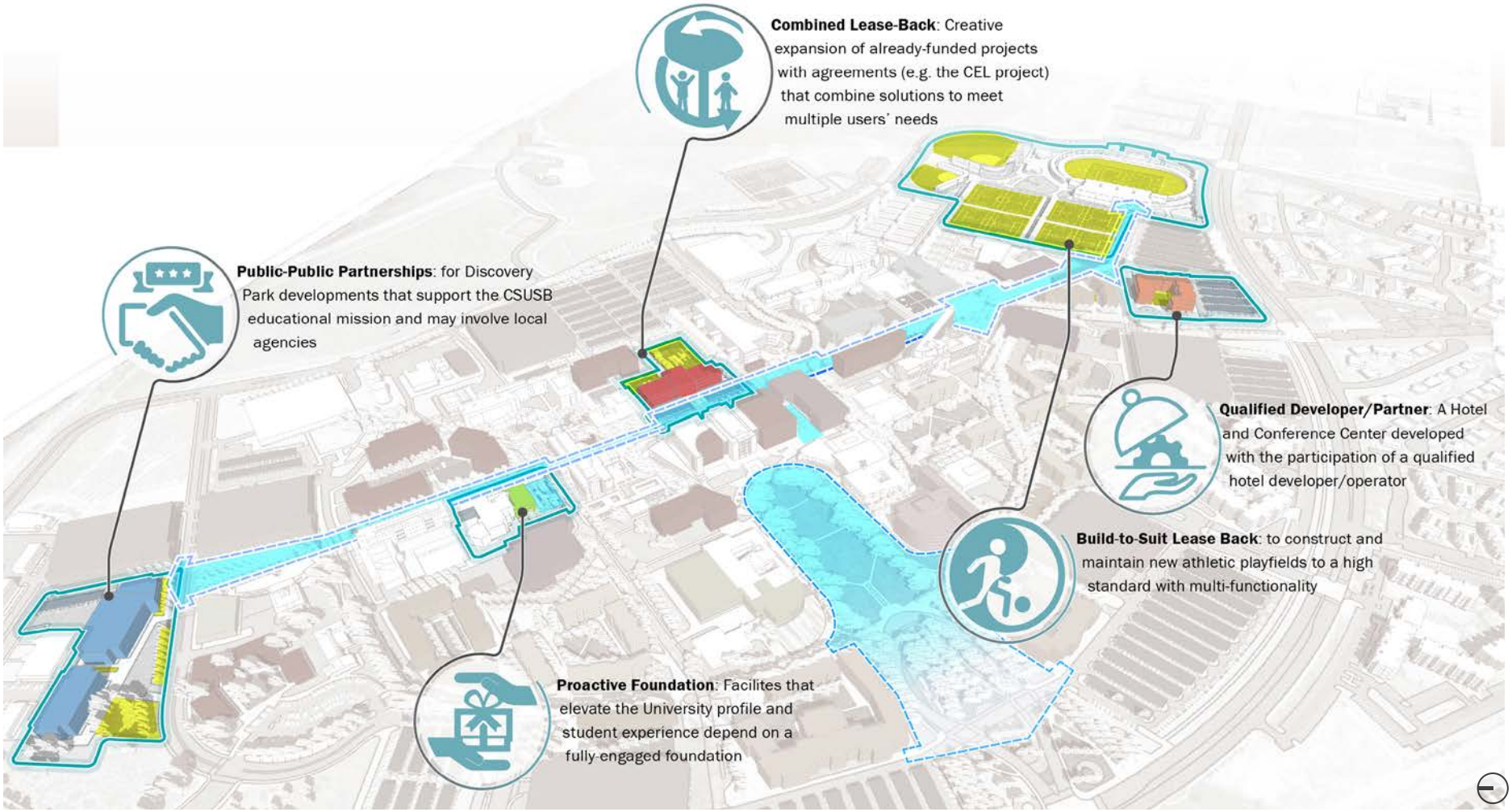
INNOVATIVE PARTNERSHIPS



CULTIVATE PARTNERSHIPS AND INNOVATIVE STRATEGIES TO IMPLEMENT THE PLAN

The 2016 Master Plan challenges the University to **cultivate a system for entrepreneurship and innovation** to become an incubator of **business and social enterprises** as well as a create potential **sources of both revenue and talent**. In advancing this strategy, the campus may **seek partnerships** with the greater business, public, and institutional community through **Public Private Partnerships (P3s)** and **Public-Public Partnerships**.

An example of Public-Public Partnership could include a possible off-site campus center established in downtown San Bernardino through an acquisition agreement with the City. These kinds of collaborations are worth the effort as they will serve and engage a variety of institutions in a **cooperative arrangement** to foster educational, social, economic and cultural opportunities of **direct benefit to CSUSB and the wider community**.



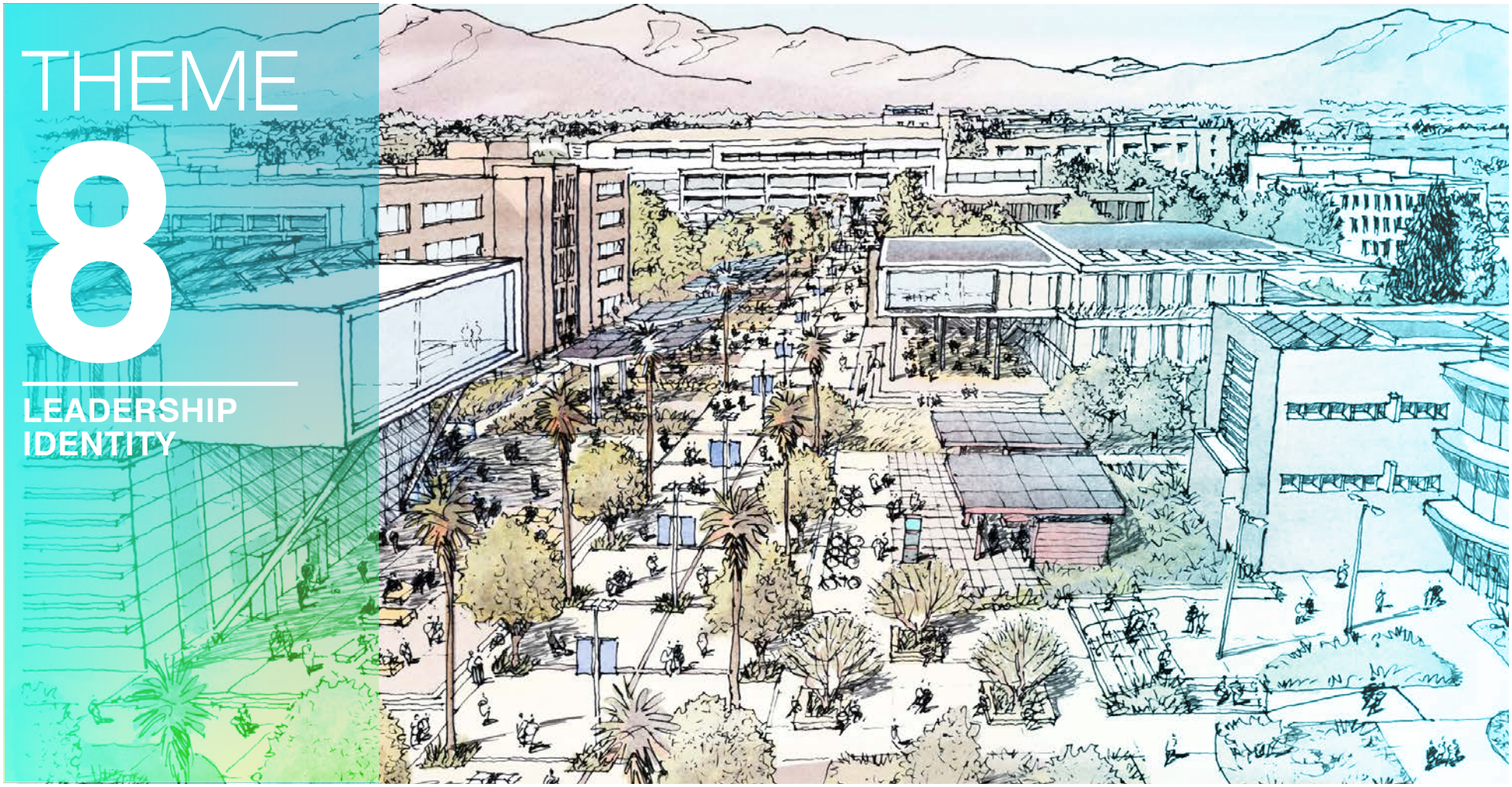
CREATIVE FUNDING AND INNOVATIVE PARTNERSHIP IDEAS EXPLORED IN THE MASTER PLAN

LEGEND

- Library, Media & Collaborative Facilities
- Lodging Facilities
- Discovery/Innovation Park Facilities
- Assembly & Exhibit Facilities
- Athletic Fields (Major Event Area)

THEME 8

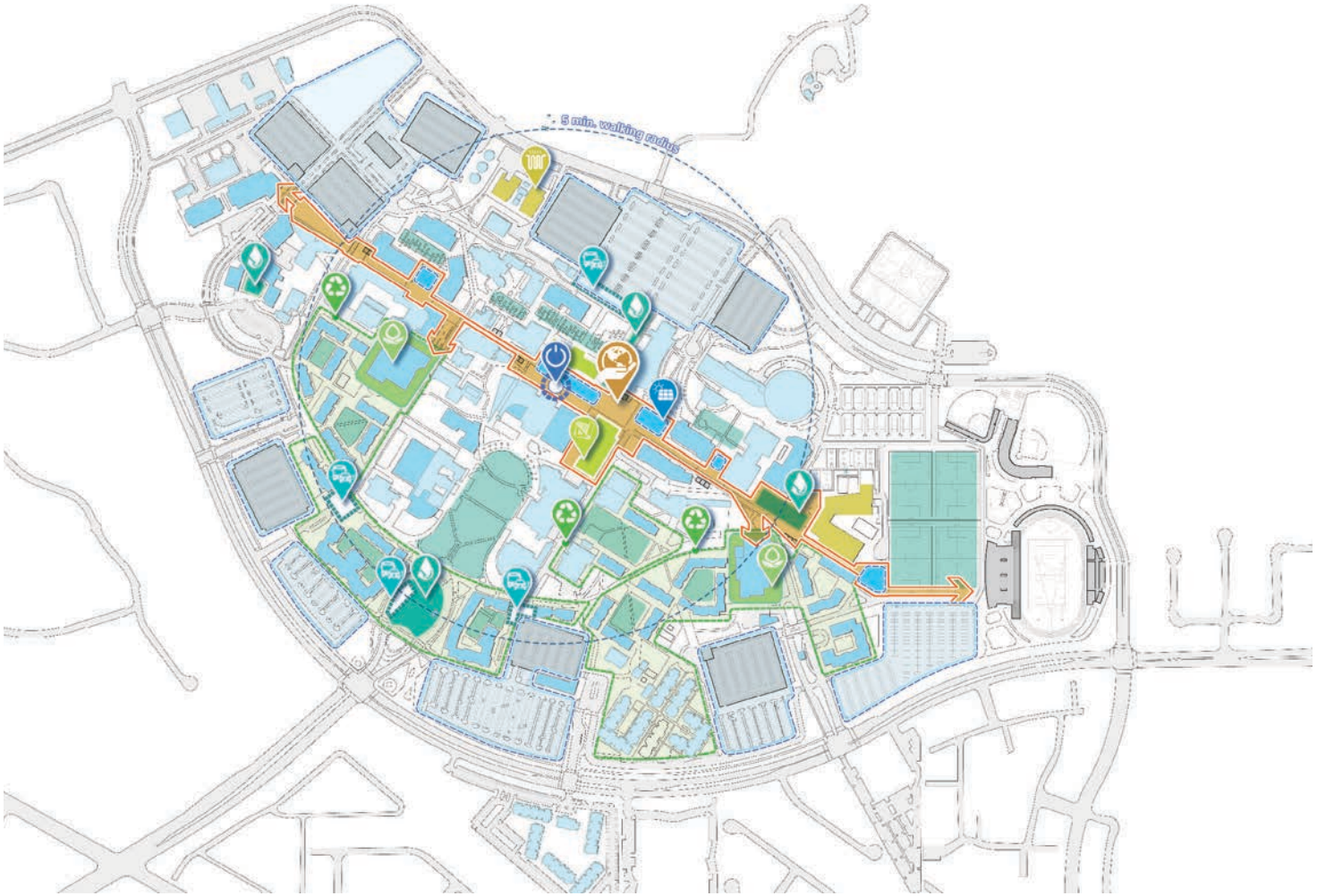
LEADERSHIP IDENTITY



CONTINUALLY ENHANCE THE CSUSB BRAND AS A SUSTAINABILITY LEADER

The 2016 Master Plan is designed to support the growth of the University that has a **vibrant and active campus life** and demonstrates **cutting-edge environmental stewardship**. Increased housing opportunities, dining options, cultural amenities and athletics venues that provide a **desirable, healthy, and safe 24/7 campus lifestyle** will create a community that belongs to the students, one with **a defined sense of place** that students can call **a home away from home**. Accomplishing these things will vastly enhance the University's identity and celebrate the coyote spirit.

Using the Master Plan as a vehicle, the University is encouraged to **strategically promote this new unique and coherent university brand** across the region and beyond to attract students, scholars, partnerships and prestige. CSUSB is also encouraged to take advantage of **cross-promotional opportunities** with the **city and other regional partners** to position the University within the community and the CSU system **to be renowned for leadership in environmental resiliency**.



LEGEND

Sustainability Leadership
Interpretive Signage Focus Area

Energy Conservation
Performance Dashboard / QR Code
EUI Goals for New Buildings
EUI Goals for Renovated Buildings

Energy Independence
Solar PV Shade Canopy
Solar PV Cover Focus Area

Climate Action
Transportation Options Support

Water Conservation
Smart Water Demonstration Gardens
Gray Water Irrigation Focus Area

Waste Management
Resident Waste Diversion Program

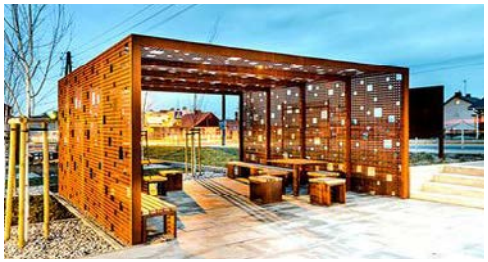
Sustainable Procurement
Reusable Tableware Program

Sustainable Food Services
Farm-to-Table On-Campus Food Program

Sustainable Building Practices
LEED Gold Initial Precedent Project

Facilities Operations
Heat Recovery Chiller Project Sites

TEN THEMATIC DIMENSIONS OF CSUSB SUSTAINABILITY ON CAMPUS



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PLEASE REFER TO THIS DOCUMENT, UNDER SEPARATE COVER, FOR SUPPORTING CHARTS AND TABLES

APPENDIX D: TECHNICAL REPORT: CSUSB UTILITIES MASTER PLAN

PLEASE REFER TO THE LIST OF FIGURES + TABLES WITHIN THIS DOCUMENT UNDER SEPARATE COVER

PART 1

PROJECT BACKGROUND & FRAMEWORK

INTRODUCTION + PURPOSE

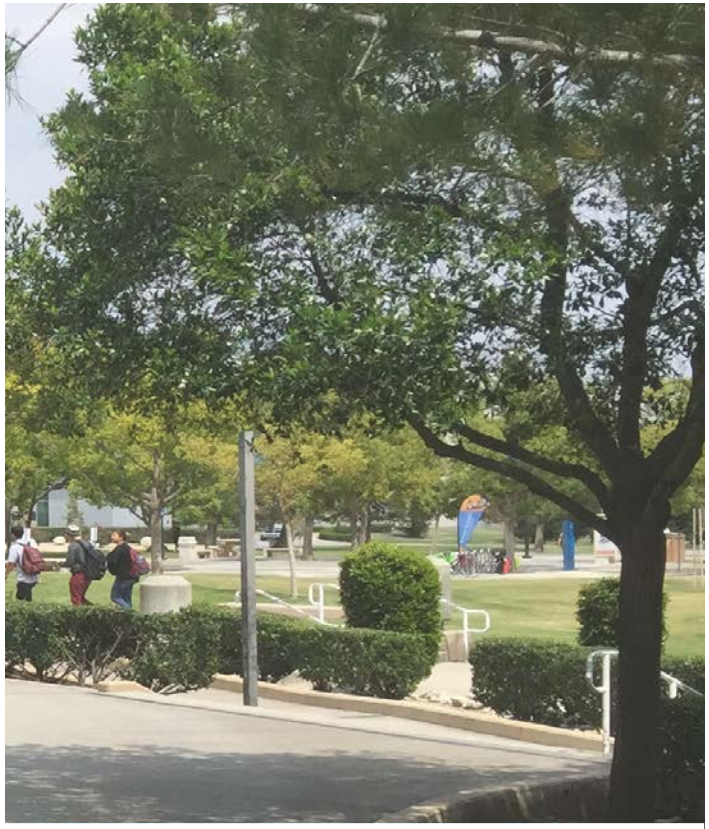
EXISTING CONDITION

OUTREACH + ALTERNATIVES EVALUATION

VISION, PRINCIPLES, OBJECTIVES + STRATEGIES

CSUSB 2016 MASTER PLAN FRAMEWORK

1 INTRODUCTION + PURPOSE



1.1 INTRODUCTION + PURPOSE

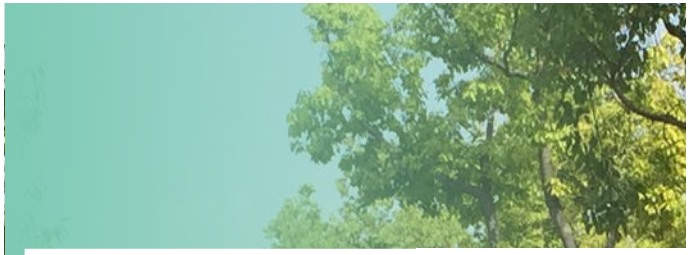
California State University, San Bernardino is a preeminent center of intellectual and cultural activity in Inland Southern California. Opened in 1965 and set at the foothills of the beautiful San Bernardino Mountains, the University serves more than 20,000 students each year and graduates about 4,000 students annually. This 2016 CSUSB Master Plan will prepare the campus to accommodate up to 25,000 Full Time Equivalent students.

INTRODUCTION

In 2015 as California State University, San Bernardino celebrated fifty years of service to regional, national, and international communities, it faced two new challenges: rapidly growing student enrollments were poised to push the campus beyond its physical capacity to accommodate those students; and the educational demands of the 21st century Inland Empire required an updated suite of campus facilities that adequately addressed new technologies, new learning modes and the other new support infrastructure needed by students, faculty and staff to achieve student success. The original master plan for CSUSB had been developed in 1965 and had planned for a maximum campus enrollment of 20,000 Full-Time Equivalent (FTE) students. Rapidly escalating student enrollments in the Fall of 2014 moved the California State University Chancellor's Office to authorize the campus to develop a master plan that could accommodate 25,000 (FTE). At the same time the record student enrollments also threated to outstrip the near-term capacity of the university to accommodate student demand. This overall picture of limited campus capacity was further complicated by the severely limited State of California funds available for the construction of new or renovated facilities within the CSU system. Therefore, all these factors were to be analyzed and addressed in a new master plan for CSUSB: the 2016 CSUSB Master Plan.

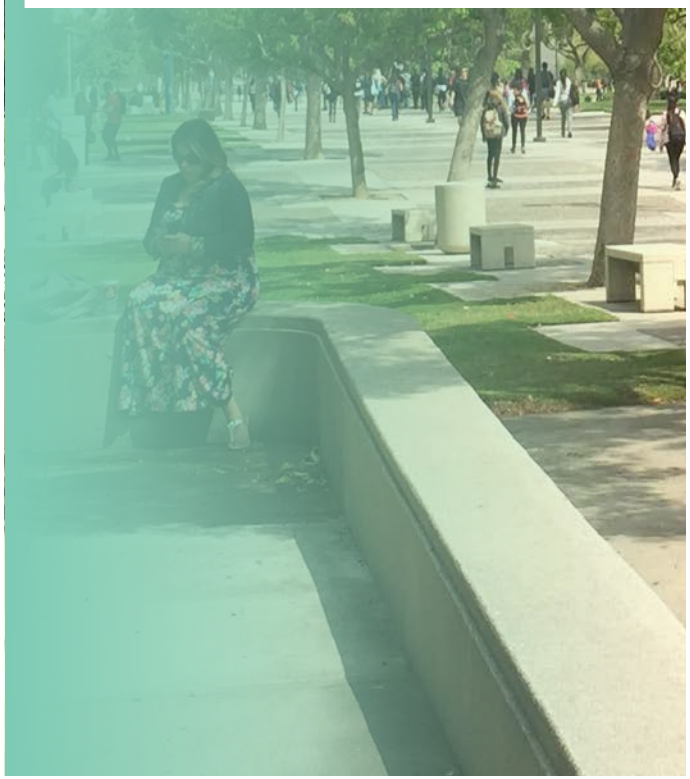
PURPOSE

The purpose of the California State University San Bernardino 2016 Master Plan is to support and advance the University's educational mission by providing a guide to the development of the physical campus and its facilities over the next twenty to twenty five years in order to accommodate a projected enrollment of 25.000FTES. This includes a description of specific components of the physical campus, its buildings, grounds, fields and support infrastructure. This plan provides a comprehensive description of all of the specific components of the physical campus: its buildings, grounds, fields and support infrastructure. As a new plan it increases the campus' student capacity providing new and expanded facilities while at the same time providing renovated and updated facilities that address the ability to provide enhanced student learning opportunities, faculty support, operational efficiencies and environmental sustainability. In general, the new plan represents a major update to the earlier the official Master Plan last amended in 1999 and as a general view is designed to guide the campus for the next ten to fifteen years.



25,000
24/7

THE 2016 CSUSB MASTER PLAN IS A ROADMAP THAT GROWS THE UNIVERSITY TO 25,000 STUDENTS AND FOSTERS A 24/7 VIBRANT LIVE-WORK-LEARN-PLAY ENVIRONMENT.



Specifically, the 2016 CSUSB Master Plan provides plans for facilities needed by the all academic programs including **lecture halls, laboratories and faculty offices**; for campus life facilities including **student housing, student recreation and athletic facilities**; for community interface facilities such the **Performing Arts facility**, the nationally notable **Robert & Francis Fullerton Museum of Art (RAFFMA)** and a planned **'Discovery Park'** for new Public-Private partnerships that support student-faculty-community training and research; and for the array of **campus support facilities** including those for maintenance, vehicular circulation, parking and utilities. The 2016 Master Plan campus contains separate plans for the campus grounds, the **campus Landscape Plan**; a concept plan for campus **wayfinding and signs; Sustainability Guidelines; Design Guidelines and Plant Palette** to help guide the execution of the Master Plan recommendations over the life of the plan. Detailed technical information concerning campus utility and infrastructure plans are included in an Appendix. Additionally by reference, the 2016 Master Plan **integrates plans for the area surrounding the university** developed by the City of San Bernardino as well as other community initiatives. Importantly in this last category is the proposed CSUSB Downtown Center to be created in partnership with the City of San Bernardino as a community center for education, community service and community outreach.

1.2 CONTEXT OF THE MASTER PLAN

The 2016 CSUSB Master Plan is the first major comprehensive campus plan update since the founding of the University in 1965. This plan comes as a number of significant funding, demographic, and environmental challenges face the CSU system offering a way forward as the University celebrates its 50th anniversary.

STATE OF CALIFORNIA MASTER PLAN FOR HIGHER EDUCATION

Opening for instruction in 1965, California State University, San Bernardino is part of the California State University system, the largest system of higher education in the country. Its 23 campuses and four off-campus centers, serve more than 400,000 students across the state. The CSUSB Palm Desert Campus is one of the system's off-campus centers serving the rapidly growing Coachella Valley areas of Riverside County.

The State of California Master Plan for Higher Education was adopted in 1960 to help guide the expansion of California's public higher education system. The Plan represents a pact between the government of California

and its citizens to support higher education through tax dollars. The Plan seeks to guarantee that all California high school graduates who qualify have access to higher education through a tripartite system:

- University of California – Open to the top 12.5% of statewide high school graduates, it is designed as the primary academic research institution in the system, covering undergraduate, graduate and professional education. It also holds exclusive jurisdiction within the public higher education system for instruction in law, medicine, dentistry, veterinary medicine, and doctoral programs.
- California State University – Open to the top 33.3% of statewide high school graduates, its main mission is to provide undergraduate education and graduate education through masters' degree programs. Doctorates can only be awarded jointly with UC.
- California Community Colleges – Open to everyone capable of benefiting from instruction, the mission of the community colleges is to provide academic and vocational instruction through the first two years of undergraduate education, and to provide remedial

FIG 1–1: AERIAL VIEW OF CSUSB SAN BERNARDINO CAMPUS IN 2015, FACING NORTHEAST

instruction such as language courses, workforce training, and community service courses.

As the population of California has increased exponentially over the past 45 years, the state systems have worked to keep pace by expanding existing campuses and establishing new ones. The pressure from population growth and the demands placed on higher education for a well-trained workforce, as well as the significant economic pressures on state resources over the past eight to ten years, have strained the state's educational systems, prompting all campuses to re-evaluate their resources and potentials.

The first campus buildings ca. 1965: The Chaparral Hall/Sierra Hall/Administration complex

Responsibility for the California State University is vested in its Board of Trustees, whose members are appointed by the governor of California. The trustees appoint the chancellor, who is the chief executive officer of the system, and the presidents, who are the chief executive officers of their respective universities.

The CSU offers more than 1,800 bachelors and masters degree programs in some 240 subject areas. A number of doctoral degrees are now offered by several campuses including CSUSB, as well as some offered jointly with the University of California and with private institutions. The system offers about half of the bachelor's degrees and a third of the master's degrees granted in California. Nearly 2 million people have been graduated from California State University campuses since 1960.

HISTORY AND CURRENT STATUS OF THE CAMPUS

The California Legislature authorized the establishment of the State College for San Bernardino and Riverside counties in 1960. The California State College system's board of trustees selected a 430-acre site in north San Bernardino in 1963 to build the campus, and the college's official name was changed to California State College at San Bernardino.

The original three-building campus, consisting of the Administration, Sierra Hall and the Chaparral Hall facilities, opened to its first 293 students. In 1967, California State College, San Bernardino celebrated its first graduating class of 59 students. In 1970 the

campus added a five-story library (Pfau Library) and its first dormitories in 1972. Growth and building continued on the campus with the addition of the student union and children's center.

The state colleges system changed its designation in 1972, becoming "The California State University and Colleges" system. After having met criteria established by the board of trustees and the Coordinating Council for Higher Education, 14 campuses were designated as "universities," while five campuses remain "colleges." The San Bernardino campus earned university status in 1984, officially becoming California State University, San Bernardino.

On a headcount basis the combined main and Palm Desert campuses of CSUSB currently provide education to over 20,000 students with 18,860 of those students enrolled at the main campus (Fall 2015). Over 1,800 students are enrolled in graduate programs on a combined campus basis. Approximately 85 percent of CSUSB students come from San Bernardino and Riverside counties, 7 percent from other California counties, 7 percent from other countries, and 1 percent from out-of-state. As a highlight of some other recent student characteristics (Fall 2014): 82 percent attend on a full-time basis, 80 percent are first generation college students (parents without a bachelor's degree); 55 percent are Hispanic, 17 percent White, 7 percent African American, 7 percent non-resident foreign students, and 6 percent are Asian. Twenty-three percent of CSUSB students are freshmen, 13 percent sophomores, 24 percent juniors, 24 percent seniors, 2 percent post-baccalaureate students, 9 percent masters, and 1 percent are doctoral students. Sixty-three percent of CSUSB undergraduates are low-income students (Pell Grant recipients). Current student success measures are as follows: the first-to-second year retention rate of first time full-time freshmen is 88 percent–the third highest among all CSU campuses; the four year graduation rate is 12 percent and the six-year graduation rate is 5 percent.

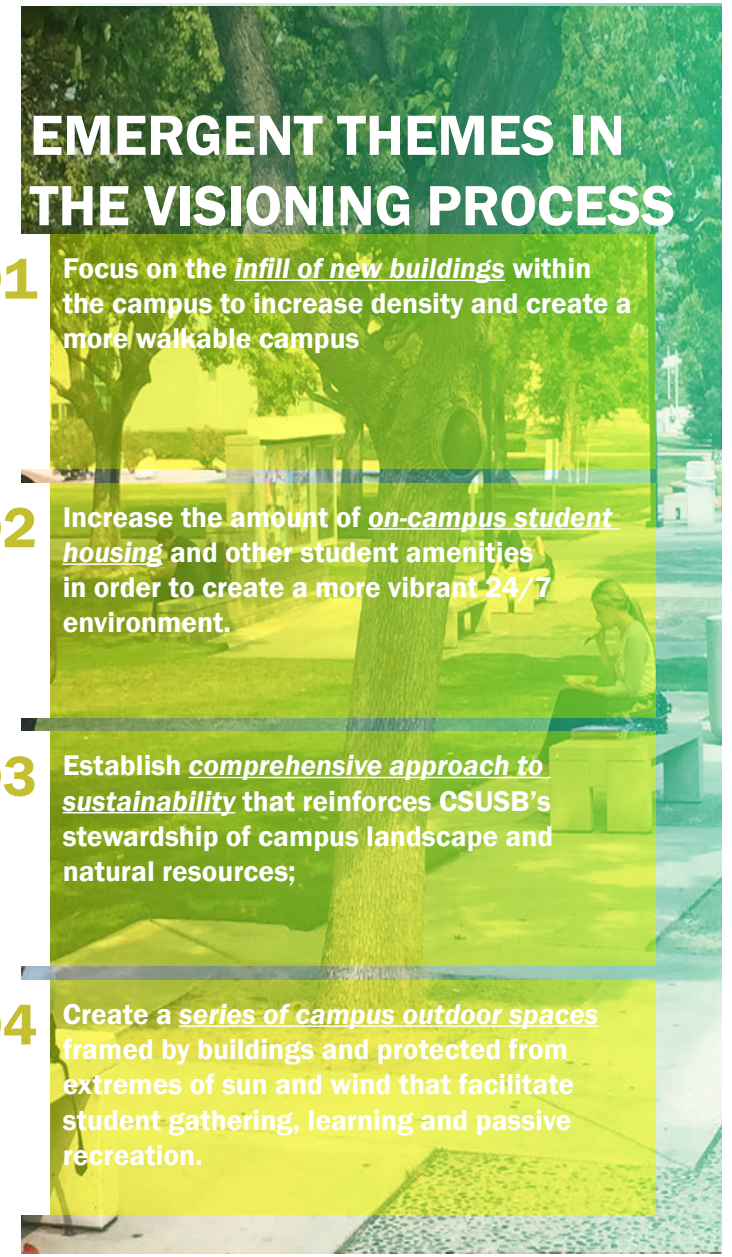
The benefits of California State University, San Bernardino's economic, technological, social and environmental impacts can be felt throughout the region and all over California. Annual spending related to Cal State San Bernardino generates an impact of more than half a billion dollars on the statewide economy with the university directly or indirectly sustaining more than 2,000 jobs in the region and 4,700 statewide.

MISSION OF THE UNIVERSITY

The campus—its buildings, grounds and facilities—acts as a physical platform from which CSUSB fulfills its mission and transmits its values to its students, faculty, staff and the wider community.

Vision Statement: CSUSB aspires to be a model for transforming lives.

Mission Statement: CSUSB ensures student learning and success, conducts research,



EMERGENT THEMES IN THE VISIONING PROCESS

01 **Focus on the *infill of new buildings* within the campus to increase density and create a more walkable campus**

02 **Increase the amount of *on-campus student housing* and other student amenities in order to create a more vibrant 24/7 environment.**

03 **Establish *comprehensive approach to sustainability* that reinforces CSUSB's stewardship of campus landscape and natural resources;**

04 **Create a *series of campus outdoor spaces* framed by buildings and protected from extremes of sun and wind that facilitate student gathering, learning and passive recreation.**

scholarly and creative activities, and is actively engaged in the vitality of our region. We cultivate the professional, ethical, and intellectual development of our students, faculty and staff so they thrive and contribute to a globally connected society.

ENROLLMENT TRENDS

Over the fifty-year history of the campus student enrollments have risen steadily, with only short periods of slowing marked by a leveling (1992-1995) and a decline (2010-2022) owing to national economic recessions. Although the enrollment figures used to calculate campus capacity are measured in Full-Time Equivalent (FTE) students, as noted above in terms of total students enrolled (headcount), the campus now attracts over 20,000 students. This major growth surge started to reveal itself only recently.

As CSUSB has grown, its role as a community hub for both the students and surrounding neighborhood has developed considerably.

1.3 MASTER PLAN GOALS + PROCESS

This comprehensive Master Plan includes the development of new land uses; new, remodeled and repurposed facilities; revised vehicle, pedestrian and bicycle circulation and parking systems; enhanced open space and landscape; new and renewed housing; new student support facilities, athletic and recreation facilities; all overlaid with a series of sustainability initiatives.

THE PHYSICAL CAMPUS: THE FOCUS OF THE 2016 MASTER PLAN

The 2016 CSUSB Master Plan offers ways to implement and translate the university's vision into physical space. It is a guide for long-term land and building use while also serving to provide guidance for near-term decisions on program planning and implementation, resource allocation, setting priorities and other university administrative matters which influence the student educational experience at CSUSB. These daily decisions collectively set a course for the long-term future of the university. The 2016 CSUSB Master Plan will help ensure that such decisions are consistent with the university's stated Vision, Mission and Core Values.

GOALS OF THE 2016 MASTER PLAN

The intent of the 2016 CSUSB Master Plan is to map out a trajectory for growth and change that will enhance the physical campus, reinforce the university's strengths, ameliorate its weaknesses and support the university's mandate to provide high-quality education to a large student body. Specifically, the 2016 Master Plan facilitates the CSUSB's ability to:

- **Support students**, faculty and staff with appropriate teaching, research and administrative facilities;
- Serve as a regional **center for intellectual, cultural** and life-long learning
- Reinforce the university's **active learning focus** by providing opportunities for interactions and collaborations among students, faculty, staff and the greater community;
- Support the creation and maintenance of **residential and non-residential learning communities** on the campus including the accommodation of smaller learning communities within a variety of campus spaces such as the Pfau Library, classroom/lab buildings, the Santos Manuel Student Union and the Commons;
- Support the creation of a range of **student learning/ research/incubator type spaces** on CSUSB property through public-private and public-public partnerships;
- Where appropriate offer student learning and **community-oriented/outreach programs** in university-controlled centers off the main CSUSB campus;
- Reinforce positive intrinsic features of the CSUSB site including **views to the San Bernardino Mountains**,

I know that 92% of our students come from Riverside and San Bernardino counties, and I'm so proud of them. This is a special chance to think about our University as a world class institution that brings together students from our immediate region and scholars and students from all over the globe.

- DR. TOMÁS D. MORALES, PRESIDENT OF CSUSB, CAMPUS FORUM ADDRESS, JUNE 2015

the signature campus gateway/quad lawn and physical connections with surrounding neighborhoods and facilities;

- Make efficient use of **developable campus land** and preserve a balance between built-up areas and open space;
- Create a series of **campus outdoor spaces** framed by buildings and protected from extremes of sun and wind that facilitate student interaction, student learning and passive recreation.
- Provide appropriate facilities for **informal and organized** recreation and intercollegiate athletics;
- Provide facilities for campus-based and **campus controlled student housing** to support the campus life and learning experiences for the full range of university students
- Serve as an accessible, **safe and attractive campus** for students, staff, faculty and the community;
- To promote **social and economic equity**, provide for a range of ways for students and the community to access the campus and its facilities including access to public transportation and distance learning;
- Through a comprehensive approach to sustainability, maintain **CSUSB's stewardship of campus landscape** and natural resources;
- Conserve **natural resources** while creating and fostering an environmentally, socially and economically sustainable physical and operational campus
- Create and otherwise foster **campus facilities** that efficiently utilize university human, natural and financial resources;
- Correctly size, orient and otherwise conceive of the **Teaching Resource Center (TRC)** to accommodate the range of faculty needs.

SCOPE OF THE 2016 MASTER PLAN

To achieve these goals, the 2106 CSUSB Master Plan provides the university with a framework for development that updates the 1999 Master Plan. The 2016 Master Plan is a strategic approach to the development of the physical campus that provides support for both immediate and long-term decision-making by:

- Document and evaluate **existing campus conditions**;
- Assess the implications of enrollment and **enrollment growth** as the fundamental basis for the expansion of campus facilities;
- Assess and document future **campus needs** and requirements;
- Identify appropriate **sites for development** of new facilities;
- Specify safe and functional **pedestrian and vehicle circulation** patterns;
- Quantify **parking requirements** and identify sites for adequate parking facilities;
- **Incorporate facilities** currently under development and construction into the 2016 Master Plan;
- Incorporate **landscape concepts** into the campus Master Plan;
- Specify and recommend **design guidelines** to govern height limits, setbacks, building area, connections with campus open space, building materials for new structures, pedestrian pathways, and vehicle access roads.
- Recommending **a phasing strategy** for new facilities that preserves campus functions during construction and that recognizes funding cycles.
- Specific **objectives and strategies** that emerged from the CSUSB Strategic Plan are detailed in Chapter 3, Vision, Principles, Objectives + Strategies.

Led by the university's Master Plan Steering Plan Committee, with the support of the President and his cabinet, the planning process for the 2016 CSUSB Master Plan extended over an 18-month time period. The process involved full collaboration with the university and all its constituent stakeholder communities, and was accomplished in four sequential phases:

Phase I: Understanding the Campus (Data Collection, Planning Analysis and Visioning);

Phase II: Development of Alternate Campus Plan Concepts

Phase III: Development of a Consensus Plan;

Phase IV: Final Master Plan Document

Aligned with the university's commitment to be an active participant in the larger Inland Empire community, each phase included a public outreach component so that input from campus and community stakeholders would continuously inform development of the Master Plan.

The Master Plan Steering Committee consisted of faculty and staff, along with student, alumni and community representatives. The task of this committee was to guide the development of the 2016 CSUSB Master Plan, provide feedback, and evaluate proposals at various stages of the planning process. The Master Plan Steering Committee, led by Deputy Provost Jeffry Thompson and facilities Director Hamid Azhand, served as the nucleus for campus feedback as a whole and to the master plan architects.

The Master Plan Steering Committee was actively involved in the public outreach and communications components of the master plan throughout the process. After a thorough evaluation and selection process, the university contracted with a professional planning team, led by Assembledge+ in association with CallisonRTKL, to serve as Master Plan architects to assist it in the development of the 2016 CSUSB Master Plan—the first comprehensive update to the CSUSB Master Plan since initiation of the campus under the master plan adopted in 1965.

Hamid Azhand (left), AIA, Director of Facilities Planning, Design & Construction, and Dr. Jeffery Thompson (center), Associate Provost, served as Co-Chairs to the Master Plan Advisory Committee. Dr. Douglas Freer, VP and CFP, (right) served as liaison to the Executive Planning Committee, which included President Morales.

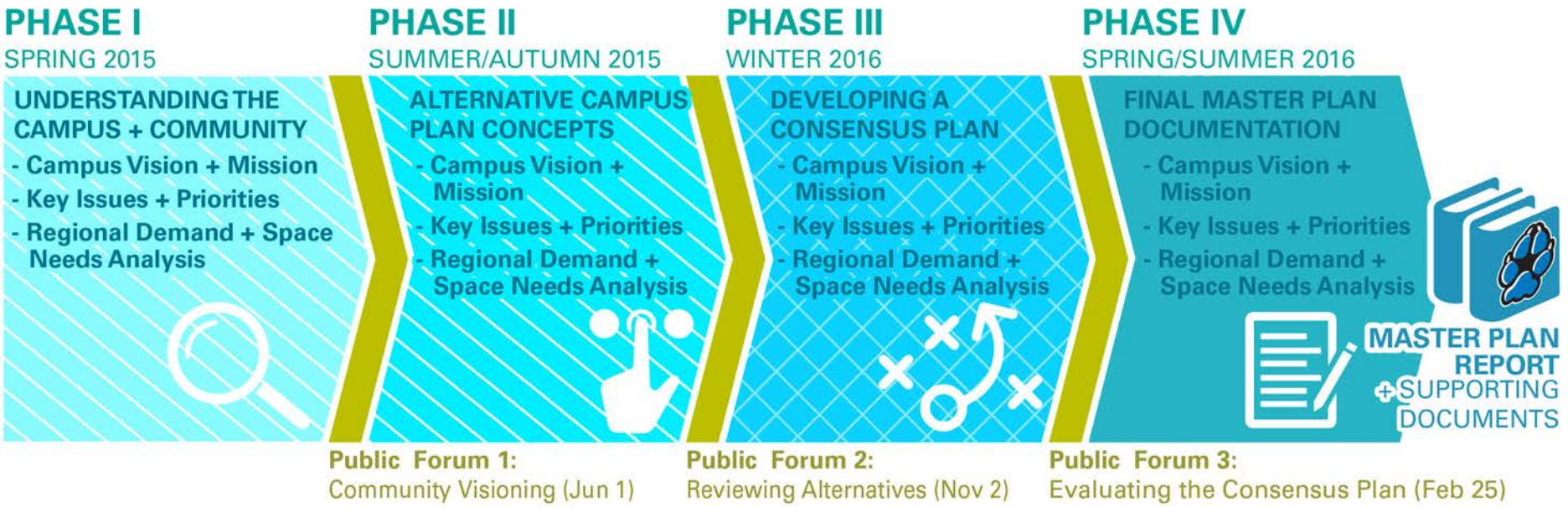


FIG 1–2: THE 2016 CSUSB MASTER PLANNING PROCESS

The 2015/2016 school year marks on the 50th anniversary of CSUSB - making this master plan especially timely.

The Master Plan architects were responsible for leading the planning process, helping the university to create and refine a campus vision, identifying planning goals, and illustrating and articulating master plan proposals. As Master Plan architects the CallisonRTKL-Assembledge+ team were also responsible for coordinating the efforts of a larger team of professional consultants: Paulien & Associates, Inc., enrollment forecasting and university space needs consultants; Fehr & Peers, transportation and parking engineers; Bennitt Design Group, landscape architects; Integral Group, sustainability consultants, P2S Engineering, infrastructure engineers; and MGAC, Inc. cost plan budgeting consultants. The Master Plan architects were also responsible for incorporating input from campus and community stakeholders into the final Master Plan proposals and projects.

Primary Guiding Document for CSUSB:
The Strategic Plan was developed before the start of this plan, and guides all academic, programming, and finding priorities for both campuses. It is the primary source for priorities and directions expressed in this campus plan.

Establishing the Approach for Campus:
Part I presents a hierarchical array of concepts and priorities for the future of the physical campus, documents in the design development process, and connects those intentions to a planning framework in diagrams.

Enriching the Plan in All Dimensions:
Expanding on the Master Plan Framework, these chapters provide topic-specific guidelines that support the main ideas for campus. Some analysis and technical details build a clear picture of how this campus will evolve.

Guidelines for Implementation:
Proposed phasing, project grouping, and cost estimate information are featured in Part III, where technical and supporting documentation are provided to ensure that this Master Plan is grounded in a realistic and achievable implementation scheme.

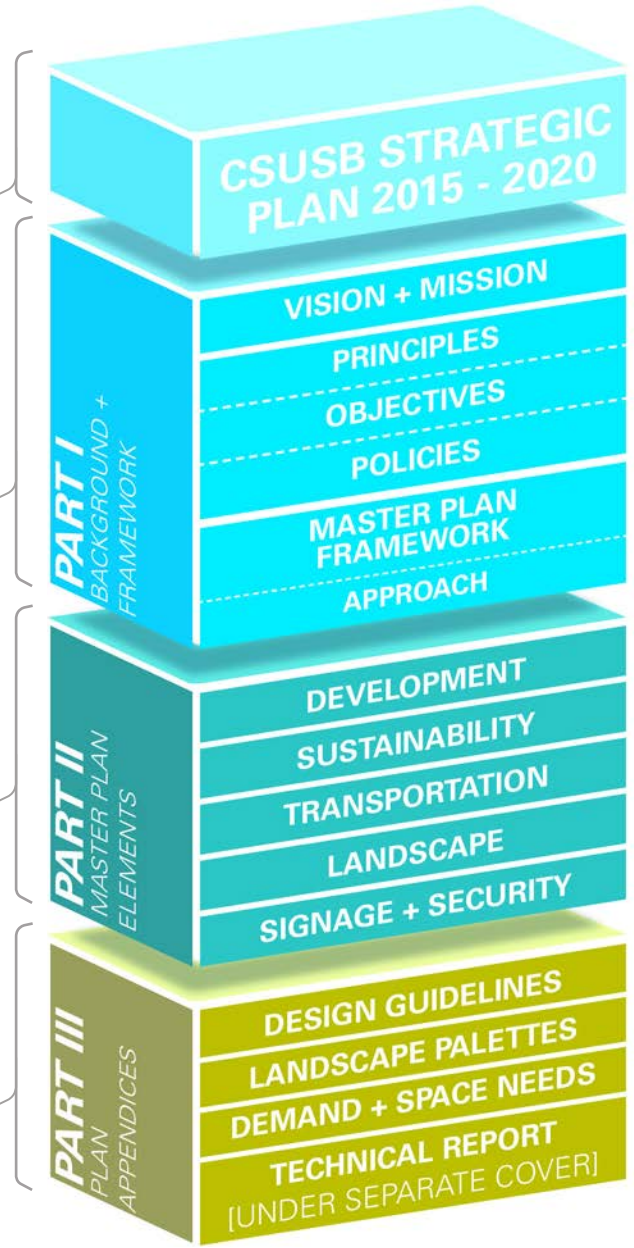
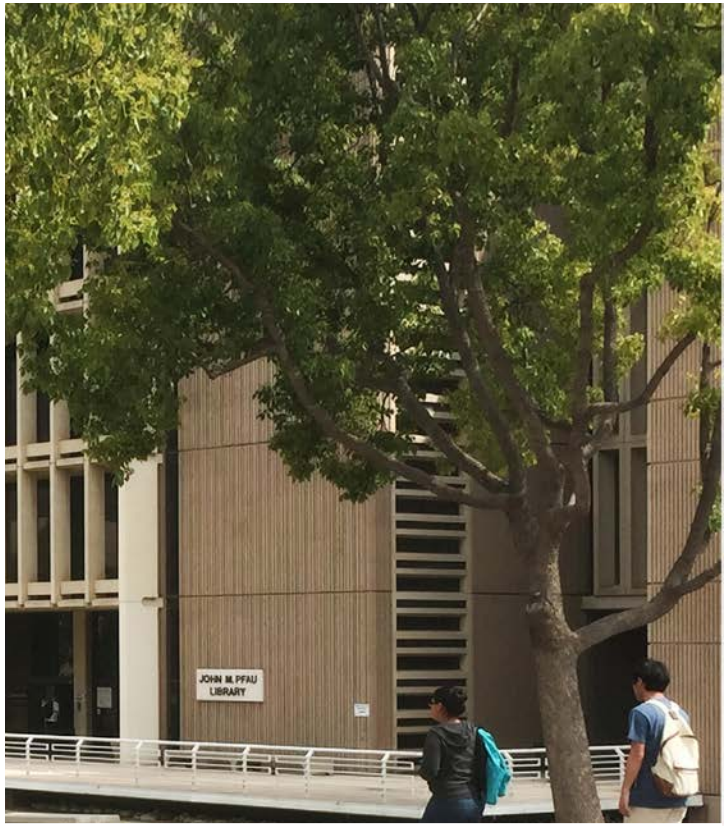


FIG 1–3: MASTER PLAN HEIRARCHY + DOCUMENT ORGANIZATION

2 EXISTING CONDITIONS



2.1 EXISTING CONDITIONS

CSUSB serves as a beacon of learning and opportunity to a large swath of the Inland Empire. The University is, for many regional families, the primary gateway to careers and the global economy in and beyond San Bernardino and Riverside Counties. A thorough study of the existing campus shows a future need for significant development new and upgraded facilities with enhanced services, and outdoor comfort measures.

REGIONAL AND COMMUNITY SETTING

Although CSUSB serves the entire Inland Empire, the State and the international community, some 85 percent of it students reside in San Bernardino and Riverside counties. According to the California Department of Finance the population of the area was about 4.4 million people in 2015 and expected to grow to over 5.3 million by the year 2030: representing a 21 percent increase over the next fifteen years. These counties trail California in terms of household median income and include larger percentages of unemployed persons.

Reflective of this situation, CSUSB reports that 63 percent of its students are considered low-income students (as a reflection of students receiving Pell Grants). A parallel statistic indicates that persons of San Bernardino and Riverside counties have a rate of holding bachelors degrees approximately 10 percent below that of the average Californian. As is true for Southern California in general, the population is becoming more Latino/Hispanic in composition with current levels approaching 50 percent of the population. CSUSB reports that over 57 percent of its students are Latino/ Hispanic.

The CSUSB campus is located at the base of the San Bernardino Mountains, which slope rapidly upward reaching 5,000 feet in 4 miles. This dramatic incline is in part, formed by the San Andreas Fault Zone located less than a mile to the north of the campus and which passing to the northwest has created the Cajon Pass, the gateway to the Mojave Desert for much of Southern California. To the immediate northwest of the campus lie the Devil Canyon percolation basins built on the sloping alluvial fan areas along the mountain front. These basins help recharge local aquifers with water received from the California State Water Project.

CSUSB lies within the City of San Bernardino, which has developed University District Specific Plan to plan for the areas around the university. To the south and east the campus the plan incorporates the largely existing built-up urban areas consisting predominantly of single-family neighborhoods with some multi-family residential neighborhoods located nearer the university. Added to these residential areas are a series of lower intensity commercial areas existing and planned along University Parkway and Northpark Blvd. For the areas north of the campus, consisting mainly of foothills covered with native vegetation with some areas subject to flooding, the University District Specific Plan generally calls for maintenance of low intensity open space

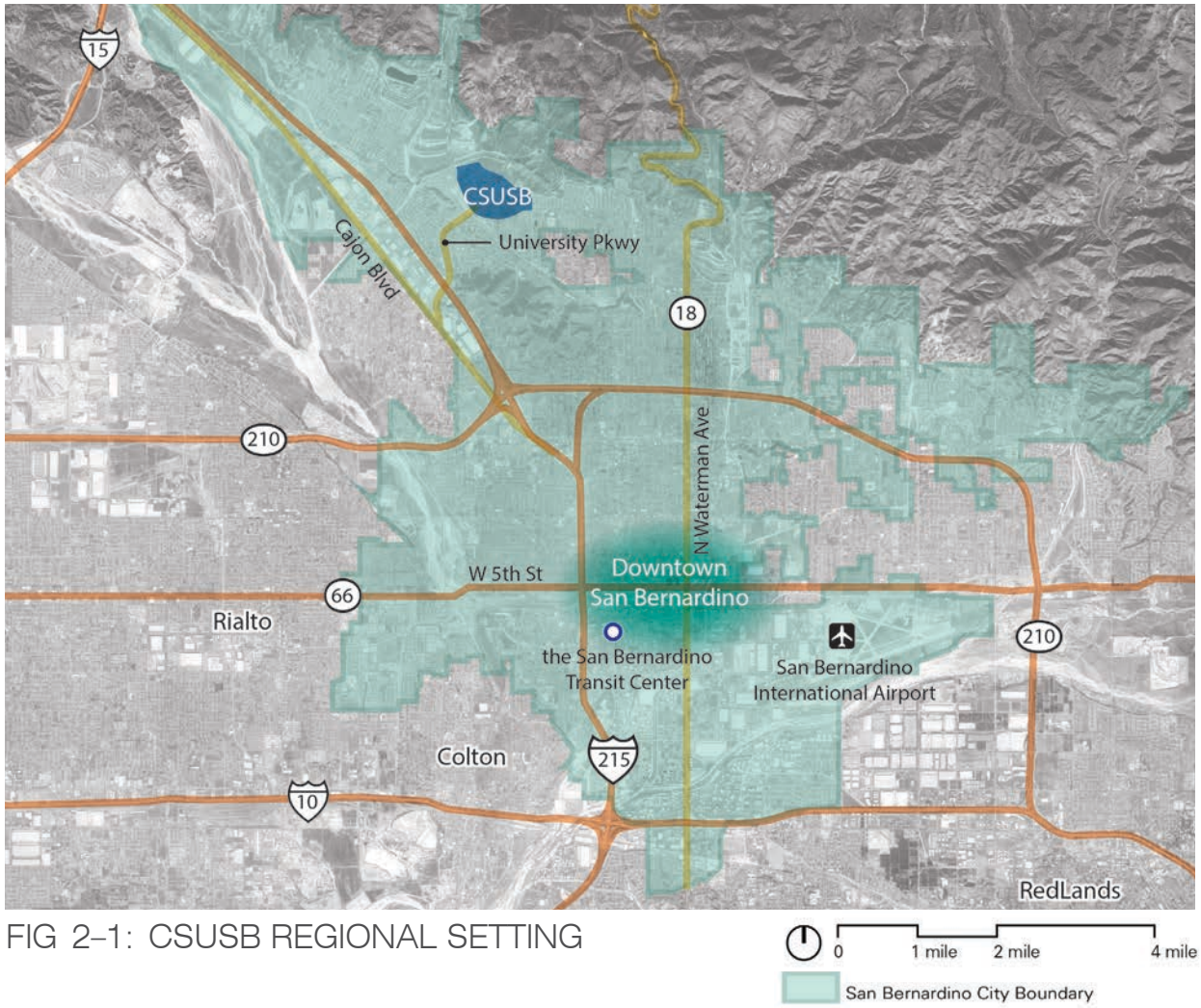


FIG 2–1: CSUSB REGIONAL SETTING

uses permitting parks, golf courses and some limited low-density housing development. Large portions of these areas to the north and west are designated as "Devil's Canyon Multiple-Purpose Open Space" and more generally with a City of San Bernardino General Plan land use designation as "Public Facility/Quasi-Public." To connect the northwestern foothill areas of the city through this open space, the University District Specific Plan shows a "Regional Multi-Purpose Trail" which passes along the hillside areas at the north edge of the campus. The plan also calls for and acknowledges the need for multiple pedestrian connections between the campus and adjacent residential and commercial areas. These connections include linkages with the proposed Regional Multi-Purpose Trail. Finally, the plan acknowledges the importance of the existing vehicular connection to the campus via the I-215 Freeway and University Parkway route as well as the future extension/completion of North Campus Circle to connect it with Campus Parkway and the future construction of a full on/off-ramp at Campus Parkway and the I-215.

PREVIOUS MASTER PLANS + PRECEDENTS

Conceived as a state college campus serving San Bernardino and Riverside counties as early as 1960, the first long-term Master Plan for California State College at San Bernardino was officially approved in January of 1965 having laid the groundwork for the opening of the campus that year. The Master Plan envisioned an

ultimate campus capacity of 20,000 Full-Time Equivalent Students (FTE) for the 430-acre campus site located along the foothills of the San Bernardino Mountains. This original plan developed by the Los Angeles architectural firm AC Martin Partners represented a simple and functionally elegant layout of core facilities surrounded by surface parking that has, with minor deviations, served the campus well up until the present day.

CSUSB Service Area Population Characteristics			
	San Bernardino County	*Riverside County*	*California*[1]
Population, 2015[1]	**2,128,133**	**2,361,026**	**39,144,818**
Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014[1]	**18.8**	**20.8**	**31.0**
Median household income (in 2014 dollars), 2010-2014[1]	$54,100	$56,592	$61,489
Persons in poverty, percent[1]	20.4%	17.1%	16.4%
Latino / Hispanic, 2015[2]	50.8%	47.0%	38.6%
White, 2015[2]	31.9%	38.0%	38.5%
Black, 2015[2]	8.3%	6.0%	6.5%
Asian, 2015[2]	5.9%	5.9%	14.4%
American Indian, 2015[2]	0.44%	0.51%	1.7%
Native Hawaiian and Other Pacific Islander[2]	0.3%	0.3%	0.5%
Other[2]	2.2%	2.2%	3.7%
CSUSB Student Participation Rate, percent, 2014 (Headcount/ Population)[2]	0.50%	0.25%	-

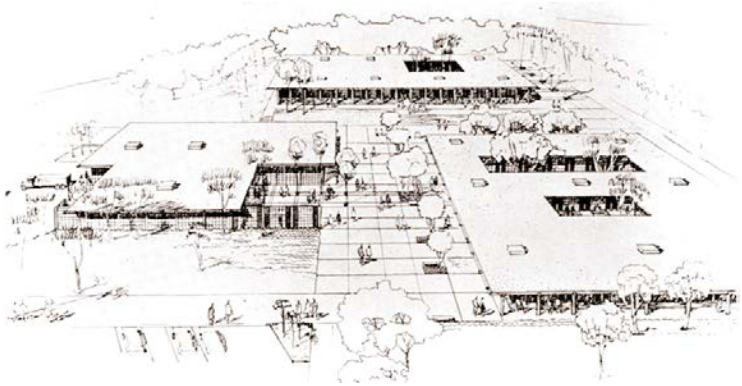
1 - United States Census Bureau, QuickFacts, California (*http://www.census.gov/quickfacts/table/EDU685214/06.06065.06071*; Accessed April 2016); CA ethnicity percentages from US Census Bureau do not add to 100 percent.

2 - Paulien & Associates, "Student Demand Overview for the Campus Master Plan, California State University, San Bernardino." September 14, 2015; Population Estimates CA Department of Finance; 2010-2060;

Important features of the plan included the library at the geographic center of the campus visible from a large open entry plaza that later became the gracious entry lawn. From the library a northwest-southeast walkway was indicated as well as a series of identified major buildings connected by an orthogonal matrix of pathways defining a pedestrian-oriented academic core for the campus.

THE 1965 MASTER PLAN

The 1965 Master Plan indicated three groupings of "Residential halls" radiating out in spoke like manner from the academic core area. Surface parking areas, which encircled the academic core on all sides except where interrupted by the residential hall precincts, were generally laid out with parking rows radiating from the campus core thereby directing straight walking routes inward towards the academic core. The large amount of parking reflected the idea that he campus was in large part to be served by the private automobile. To facilitate auto access the plan provided a loop road system around the campus perimeter. As the campus was built this loop road remained intact along the south as Northpark Blvd. and at the north border with the adjacent West Badger Percolation Basin facility but the actual roadway along the northern side of the campus became the major circulation facility separating the main campus from the northern less easily developed and environmentally restrictive hill areas.



The 1965 Master Plan included three mid-century modern buildings in an initial development phase.

As stated, the 1965 Master Plan in general worked well as a guide for development of the campus up until the present. At the time of the preparation of the current 2016 CSUSB Master Plan, several minor changes had been made to the original campus master plan concept. Significantly among these were: 1) the limited development of residential areas with only the southerly of the originally indicated three residential areas built; 2) the northern loop road placed to separate the northern hillside areas from the main campus facilities: 3) the development of two parking structures which eliminated the need for some of the originally delineated surface parking areas.

FIG 2–2: ORIGINAL CSUSB CAMPUS MASTER PLAN, ISSUED 1965

Existing Building

Proposed Building (1999 Plan)

Temporary Building

Existing Building (Not in Use)

Existing Lot

Proposed Lot (1999 Plan)

Existing Structure

Proposed Structure (1999 Plan)

Lodging

1A Administration Complex
3A University Distance Learning Center
29 Conference and Faculty -
33 Theater Arts Building
39A Student Rec. and Fitness Ctr. Addn.
41A University Enterprises Building Addition
44 Student Residences No. 3
45 Auditorium
46 Children's Center Addition
50 University Land Laboratory Preserve
53 Social and Behavioral Sciences Addition
54 Engineering
57 College of Education Addition
58 Business and Public Administration Addn.
59 Alumni Center
60 Extended Learning Addition
61 John M. Pfau Library Addition
63 Central Plant Addition
64 Soccer Field Complex
65 Arena
66 Alternative Student and Faculty Housing
67 Grandstands for Baseball
68 Grandstands for Track
69 Experimental College
70 Information Services Building No. 3
73 Facilities Services Greenhouse
76 Parking Services Building

FIG 2–3: PREVIOUS CSUSB MASTER PLAN FOR 20,000 FTE, AS REVISED 1999

THE 1999 MASTER PLAN

In 1999 the campus Master Plan was again modified to reflect the state of the then current campus that included the acquisition of a multifamily housing project south of Northpark Blvd. roughly adjacent to the campus' southern residential area. This acquisition brought the total campus acres to 411. In the early 2000's, when the campus had attained a total headcount enrollment exceeding 16,000 students, Rosetti Architects developed a campus capacity study assuming growth to 30,000 FTE. To accommodate this expanded enrollment target several new 'infill' classroom buildings were laid out within the campus core both along the central northwest-southeast walkway ('Coyote Walk' in the current Master Plan) and to the north of the Pfau Library. Similarly three additional parking structures were indicated clustered between the Parking Structures 1 and 2 but shown north of North Campus Circle. Clearly this concentration of parking facilities did not distribute parking around the campus backbone perimeter 'loop road' circulation system and therefore instead reflected a simplistic capacity analysis for the campus.

By the Fall of 2014 the main campus was experiencing rapid student enrollment increases whereby student Full-Time Equivalent enrollment exceeding 15,000 FTES was beginning to surpass the capacity of the campus building inventory of 13,562 FTE. Internal campus projections pointed to the possibility that if those enrollment trends were to continue that within a few years the campus headcount enrollment could actually reach 20,000 students. Motivated by this situation, CSUSB leadership in conjunction with the CSU Chancellor's Office called for the development of a revised campus master plan that could accommodate an expanded numbers of students. The new campus master plan was to be set for an enrollment of 25,000 FTE. In 2014 campus leadership chose a master planning team of consultants headed by RTKL/Assembledge+ to develop the new master plan with the planning process involving the campus-wide community commencing in early 2015. Given the recent rapid rates of student growth coupled with the concomitant pressure placed upon the availability of campus instructional facilities and a climate of limited state funding for the construction of new CSU facilities, the RTKL/Assembledge+ team was also asked to recommend ways of addressing the near-term needs for academic space.

The master plan for this campus must satisfy the need for shaded outdoor study and gathering space.

Building Code and Name

#	ID	Building Name
01	AD	ADMINISTRATION
02	SH	SIERRA HALL
03	CH	CHAPARRAL HALL
04	FM	FACILITIES MANAGEMENT
4A	ES	ENVIRONMENTAL HEALTH AND SAFETY
4B	UP	UNIVERSITY PUBLIC SAFETY
4C	AF	AUTO FLEET SERVICES
4D	PW	PLANT/CENTRAL WAREHOUSE
4E	FS	FACILITIES SERVICES STORAGE
05	HA	HVAC CENTRAL PLANT
06	AH	ANIMAL HOUSE/VIVARIUM
07	BI	BIOLOGICAL SCIENCES
08	PS	PHYSICAL SCIENCES
09	PL	JOHN M. PFAU LIBRARY
09A	PL	PFAU LIBRARY ADDITION
10	PE	PHYSICAL EDUCATION
11	TR	TOKAY RESIDENCE HALL
12	SMR	SAN MANUEL RESIDENCE HALL
13	JR	JOSHUA RESIDENCE HALL
14	MR	MOJAVE RESIDENCE HALL
15	MRR	MORONGO RESIDENCE HALL
15A	SV	SERRANO VILLAGE
16	WTR	WATERMAN RESIDENCE HALL
17	BR	BADGER RESIDENCE HALL
18	SHR	SHANDIN RESIDENCE HALL
19	CO	COMMONS
20	PA	PERFORMING ARTS
21	HC	HEALTH CENTER
22	SU	SANTOS MANUEL STUDENT UNION
23/23A	BK	COYOTE BOOKSTORE & ADDITION
24	CC	CHILDREN'S CENTER
25	FO	FACULTY OFFICE BUILDING
26	UH	UNIVERSITY HALL
28	JB	JACK H. BROWN HALL
30	YC	YASUDA CENTER FOR EXTENDED LEARNING
31	AV	ARROWHEAD VILLAGE A & B
32	VA	VISUAL ARTS CENTER
32A	VA	ROBERT & FRANCES FULLERTON MUSEUM OF ART
34/34A	HP	HEALTH & PHYSICAL EDUCATION A & B
36	SB	SOCIAL & BEHAVIORAL SCIENCES
37	CS	CHEMICAL SCIENCES
38	CE	COLLEGE OF EDUCATION
39	RF	STUDENT RECREATION & FITNESS CENTER
41/41A	UE	FOUNDATION BUILDING & ADDITION
43	AS	ADMINISTRATIVE SERVICES
47	IC-1	INFORMATION SERVICES BUILDING NO.1
49	HBC	HANDBALL COURTS
50A	OB	MURILLO FAMILY OBSERVATORY
51	IC	INFORMTION SERVICES BUILDING NO.2
72	UC	UNIVERSITY CENTRAL STORAGE
74	GF	GEOLOGY LAB FACILITY
75	UV	UNIVERSITY VILLAGE HOUSING
101	PK1	PARKING STRUCTURE
102	PK2	PARKING STRUCTURE
115	DD	UNIVERSITY CENTER FOR DEVELOPMENTAL DISABILITIES
216	TK	TEMPORARY KINESIOLOGY ANNEX
301-302	TC	TEMPORARY MODULARS - FACULTY OFFICES/CLASSROOMS
500	-	UTILITY - GROUND PHOTOVOLTAIC

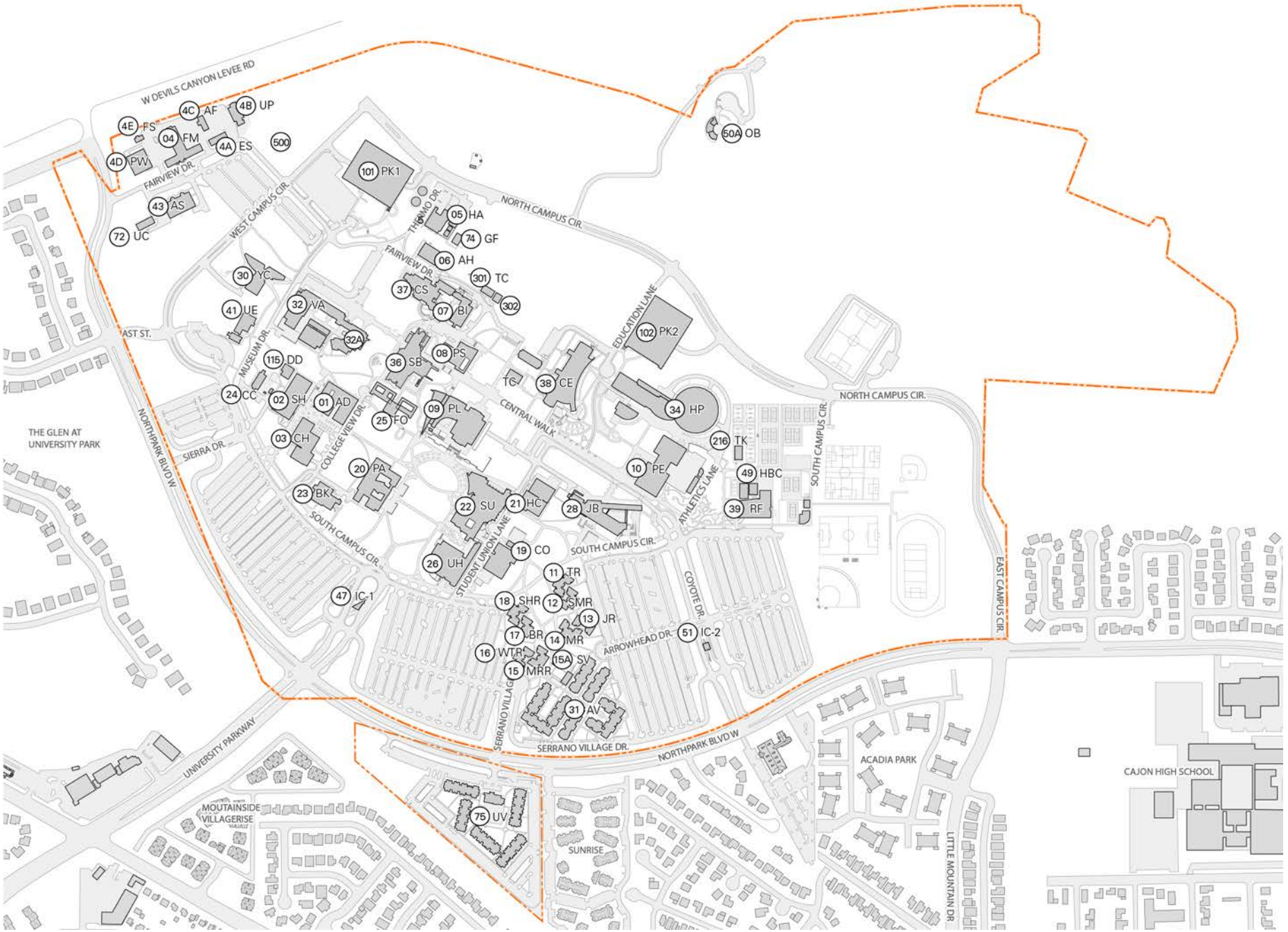


FIG 2–4: EXISTING CAMPUS FACILITIES, AS OF 2015

2.2 CAMPUS GROWTH + SPACE NEEDS ANALYSIS

Across the CSU System, demand continually intensifies for the quality and caliber of education provided at its 23 campuses. The fiscal capacity of the system will be stressed as individual campuses strive to meet the needs and mandates of their communities. CSUSB is expected to add around 10,000 students in the course of a few decades.

BACKGROUND AND CONTEXT

By the Fall of 2014 accelerated growth in students attending CSUSB pushed the campus enrollment above 14,000 Full-Time Equivalent (FTE) students, signaling both that the enrollments exceeded the current campus classroom and laboratory capacity of 13,562 FTE (based on the 2016/2017 CPDC 1-2) and the possibility that the trend in rising student enrollments could rapidly grow the campus beyond its originally planned Master Plan capacity of 20,000 FTE. The latter need to increase the Master Planned capacity of the campus was the impetus behind the development of this 2016 CSUSB Master Plan, which increases the main campus capacity to 25,000 FTE. The immediate pressures placed upon the needs for academic space to accommodate the near-term growth in student enrollments was addressed by the consultant team in a parallel exercise, some of the recommendations of which also informed the development of the Master Plan. See Appendix C for the analysis of near term campus needs.

STUDENT ENROLLMENT GROWTH

In the 2014 to 2015 period, CSUSB experienced a period of rapid student enrollment growth estimated at a rate of between 2 and 3 percent per year. This dramatic growth significantly exceeds the rate assumed for the campus by the CSU Chancellor's office of 1 percent per year. To better understand the enrollment situation, an analysis of regional trends among the college-age population was conducted by Paulien & Associates (See Appendix C). This study suggests that trends in student participation rates may continue to drive higher rates of student enrollments at CSUSB. Although the study found that the percentage of college age and college-bound students (ages 15-24) in San Bernardino and Riverside Counties where CSUSB draws some 85 percent of its students is projected to fall slightly, the participation rate of various student sectors of the population is expected to rise based on the following trends:

Fig 2–5: Depiction of Coyote Walk with Increased Student Population to 25,000 FTE. Outdoor spaces at CSUSB currently show room to accommodate new students; this will change as the on-campus population nearly doubles from its 2015 capacity.

- Steadily **rising numbers of high school students** meeting UC/CSU application requirements;
- Greater numbers of, and **increasing university participation** rates among, **non-white students**, in particular Latino students;
- Increasing numbers of **international students** enrolling in the CSU system, especially international undergraduate students who now exceed international graduate students entering the system.

It is believed that these trends are contributing to the recent up-surge in student growth at CSUSB and that they will continue to help drive campus growth into the future. The accompanying chart "Campus Enrollment Growth Scenarios" illustrates the impact of various enrollment growth rates and assumptions upon future total student FTE enrollment for the campus. The current campus physical facility capacity of 13,562 FTE as well as the planned 25,000 FTE campus capacity are also illustrated as benchmarks.

SPACE NEEDS ASSESSMENT

As the campus student enrollment grows, the campus will need to add an array of facilities to support the needs of future students, faculty, staff and community. The preparation of the 2016 CSUSB Master Plan, which set as a target an ultimate campus physical capacity of 25,000 FTE, was based upon analyses conducted by campus staff utilizing the Space and Facilities Database (SFDB)

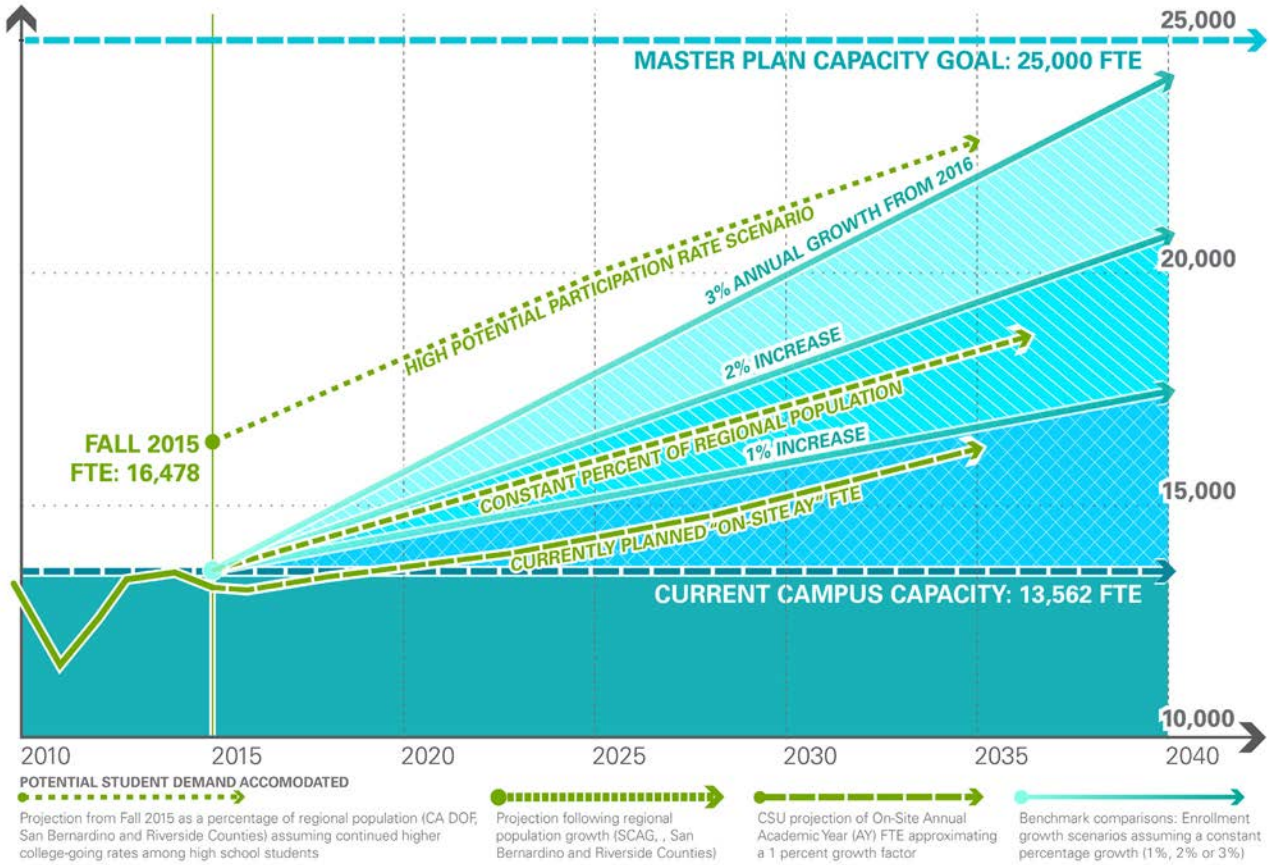


FIG 2–6: CAMPUS PROJECTED FTE GROWTH RATE SCENARIOS

and by Paulien & Associates, Inc. a national academic planning consultancy based in Denver. The campus provided an analysis of the needs for state-supported space needs expressed as Assignable Square Feet (ASF), for the space categories: Instructional (lecture, laboratory and faculty office), General Administration, Library, Media and Plant Operations. This analysis was based upon the campus ASF/FTE Model (generated on 10-20-2015) for the main campus set to a Master Plan ceiling of 25,000 FTE and assuming a level of summer-term responsibility as well as the campus providing some of its FTES off-site. These calculated future space needs fall below those average CSU campus space needs based upon the 1998 ASF/FTE Model developed by the CSU contained in the report, "Restructuring Campus Capacities, a report from the Task Force on Facilities Planning and Utilization." Therefore to accommodate an additional amount of potential space based on the earlier CSU system analysis an additional allowance for Instructional space was made.

SPECIALIZED SPACE NEEDS

In particular, this additional allowance for future academic space would accommodate the potential development of an Engineering program at CSUSB. The possibility of an Engineering program for the campus had been discussed in the past and a location for an Engineering facility was indicated on the most recent CSUSB Master Plan (as revised in January of 1999). While the creation of an Engineering program at CSUSB has several merits, these benefits have also been viewed within the context of academic program availability within the region—as the comprehensive and nationally ranked engineering programs offered at Cal Poly Pomona College of Engineering currently serve the Inland Empire.

Estimates for the space needs for non-state supported facilities such as campus centers and student recreation facilities that fall into the category of Student Support, were developed by Paulien & Associates based upon national guidance. Paulien & Associates also developed space need estimates for Physical Education space based upon CSU standards and for "Other Spaces" (Assembly and Exhibit) based upon a mix of CSU and national guidance. All of these space need estimates that were used to model the target CSUSB campus Master Plan Enrollment capacity of 25,000 FTE are summarized in the accompanying table, "Long-Term Space Needs Estimate." Space area estimates given in the table are for gross square feet (GSF) of building by facility category based on the derived ASF estimates assuming a building efficiency of 65 percent. The building footprints and configurations used in the 2016 CSUSB Master Plan reflect these projected future space needs.

Facility and space needs for student housing and for parking are addressed in the Housing Villages and the Transportation Management, Vehicle Circulation and Parking sections, respectively.

LONG TERM SPACE NEED ESTIMATE:

Major Campus Space Categories	Gross Square Feet
Instructional	600,000
Library & Collaborative	398,000
Physical Education	116,000
Student Support	189,000
Administration	95,000
Assembly & Exhibit	168,000
Physical Plant	15,500
TOTAL	**1,581,500**

Fig 2–7: Official 2016 CSUSB Major Master Plan Revision for 25,000 FTE Space Need Estimate

2.3 CURRENT PROJECTS

Like many CSU campuses, capital projects at CSUSB are continually under development. Several projects were in the planning or early construction stages while the 2016 CSUSB Master Plan was being developed. Recently, emphasis has focused on enhancing student support services and facilities such as increasing student housing and expanding Extended Learning capacity. Concurrently, the Palm Desert Campus is also being planned for future growth.

ON-GOING CAMPUS PROJECTS

There are currently a number of specific projects that are in various stages of programing, planning and design for the CSUSB campus that have been incorporated into the overall campus Master Plan. The Master Plan consultants have worked with each of the separate project teams who are planning and designing these projects to insure that they conform appropriately to the long range vision for the campus and that their proposed locations reinforce the goals and objectives of the overall plan. Some of these projects are currently in development and for purposes of the documents in preparation under the California Environmental Quality Act (CEQA) are considered existing facilities. These specific projects include: Phase 1 Housing, New Dining Commons, College of Extended Learning (CEL) Expansion, Parking Lot N, New Campus Entry.

Fig 2–8: Map of Current Projects

1. Phase 1 Housing
2. New Dining Commons
3. College of Extended Learning (CEL) Expansion
4. Student Union Expansion
5. Student Recreation and Wellness Center Expansion
6. Playfields Master Plan
7. New Campus Entry
8. Proposed Parking Lot N

1. PHASE 1 HOUSING

Concurrently with the development of the 2016 CSUSB Mater Plan, SCB Architects developed a long-range Housing Master Plan for the campus. Based upon the broad comprehensive vision for campus development, the CSUSB Master Plan helped inform the Housing Plan specifically guiding the location and configuration of the first Phase of planned new student housing (400 beds) on Parking Lot E. For the purposes of the documents in preparation under the California Environmental Quality Act (CEQA) these are considered existing facilities.

2. NEW DINING COMMONS

As part of the Phase 1 housing project, a new dining commons is also planned and a site location has been selected on parking lot E adjacent to the new Phase 1 student housing. This project, designed by SCB Architects, is in the final stages of architectural design with a near term projected date for the start of construction. For the purposes of the documents in preparation under the California Environmental Quality Act (CEQA) these are considered existing facilities.

3. COLLEGE OF EXTENDED LEARNING (CEL) EXPANSION

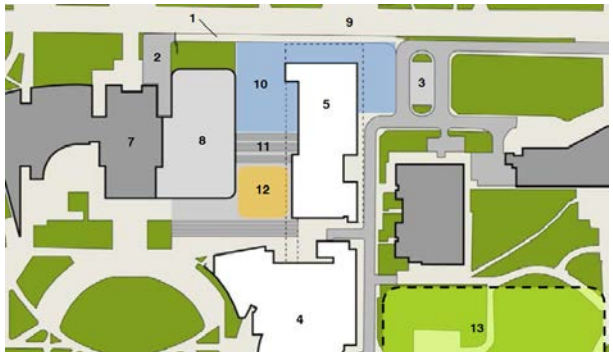
A new College of Extended Learning (CEL) building will consolidate all administrative functions in one building and include instructional space that will accommodate a significant portion of the courses offered by the college. The master plan team recommended that this CEL expansion be enlarged to include additional instructional space that could be leased back to the University to meet pressing near term space needs identified in the research phases of the master planning process. This project is under development and for purposes of CEQA is considered a completed project.

To best serve the University's long term goals the new CEL building has been strategically located within the heart of the academic core along Coyote Walk northeast of the Pfau Library. This project provides a central, signature location for the College of Extended Learning and with the ground floor devoted to shared classrooms and lecture halls to serve the entire campus functions that can be easily accessed

from the Library, the expanded SMSU and other academic disciplines (Natural Sciences, COE, College of Business and Social and Behavioral Sciences) thereby creating a concentrated center of activity at the heart of the campus.

The recommended CEL location also provides easy access for non-traditional and/or working adults coming to the campus in the evenings and on weekends from the new Parking Lot N just northeast of the site. At the same time, this location will address the needs of its international student population to be nearby other campus resources to help these students better integrate into campus life. For the purposes of the documents in preparation under the California Environmental Quality Act (CEQA) this is considered a project already under development.

4. STUDENT UNION EXPANSION



The existing Santos Manuel Student Union (SMSU) has been experiencing space shortages for some time, particularly in light of increasing enrollments, and engaged LPA Architects to prepare a program and preliminary plan for expansion. The project will be subject to a successful student referendum approving this expansion that would include additional banquet rooms, student meeting rooms, the bookstore, lounge areas and other related functions being determined by students and Student Union management.

The campus master plan team has recommended that the SMSU expansion extend north east of the current Student Union so as to engage the proposed central spine of the campus along Coyote Walk. Placement of the relocated bookstore along this edge of the building, along with other recommendations, will help to activate Coyote Walk. The existing campus bookstore will be relocated from its current location in a free-standing building just northeast of Parking lot C and is being evaluated for repurposing for on-campus institutes, centers or other possibilities.

5. STUDENT RECREATION AND WELLNESS CENTER EXPANSION

The existing Student Recreation & Fitness Center has also been experiencing space shortages for some time, particularly in light of increasing enrollments, and student interest in personal wellness. In light of this, the campus engaged LPA Architects to prepare a program and preliminary plan for its expansion. This project will also be subject to a successful student referendum to fund the expansion and will include additional exercise rooms, multipurpose gymnasium type facilities, a jogging track and other related functions being determined by students and Recreation Center management. The master plan consultant has recommended placing this expansion strategically so that it serves as a visual terminus to Coyote Walk and along with the new dining commons encloses a new open space at the southern end of campus.

6. PLAYFIELDS MASTER PLAN

Currently the University's athletic playfields and outdoor recreation areas are woefully inadequate to the needs of a growing 4-year public university. The Athletics and Recreation Department engaged Parsons/Brinkerhoff and ICG, Inc. (Landscape architects) to create a long term master plan for enhancement of these campus facilities. American Sports Centers (ASC) provided an analysis of potential funding options given the lack of funding availability within the CSU System. The plan will be accomplished in phases, but at full build-out, it will include college level baseball and softball fields (with approximately 3,250 and 840 seats respectively), 6 soccer fields, expanded tennis courts, basketball courts and a football stadium (with approximately 6,000 seats). After campus review and approvals this new plan has been incorporated into the final 2016 Master Plan.

7. NEW CAMPUS ENTRY

The University has recently installed new signage at the front entry and is upgrading the landscape in the immediate area around this new signage as the 1st phase of an enhanced gateway plan. Additional phases will add palm trees and additional landscaping to create an attractive entrance to the campus.

8. PROPOSED PARKING LOT N

In light of increasing campus enrollment and to provide replacement parking for the 593 spaces that will be lost with the construction of the Phase 1 Housing and Dining Commons on Parking Lot E it was deemed necessary to create a near term parking solution. It was recommended that a new surface parking lot for 1,300 spaces (Parking Lot N) be constructed on approximately 14.9 acres of vacant land south of North Campus Circle and West of the College of Education. This location will not only provide replacement parking for Parking Lot E but also address the parking needs of the projected student population, provides needed parking in the northern portion of the campus and will also avoid disturbing sensitive habitat north of the project site. This surface lot has been incorporated into the 2016 Master Plan as a completed project.

9. CSUSB PALM DESERT CAMPUS

As part of the overall Master Plan consultant team's responsibilities, a Master Plan has also been prepared for the Palm Desert Campus (PDC) under separate cover. A similar planning process was conducted under the guidance of a PDC Master Plan Steering Committee to develop consensus around a final plan to accommodate continuing campus enrollment growth from the current enrollment of 1,164 HC/987 FTE to an ultimate enrollment capacity of 8,000 FTES.

2.4 ENVIRONMENTAL SETTING

Understanding and planning around the environmental setting at CSUSB is important as the intensification of campus activity will increase interactions with, risks from, and demands on, that environment. Stewardship of the natural land areas of the northern parts of the campus is a key responsibility of the University.

Environmental Conditions and Constraints

Figure 2-12 , "Environmental Conditions and Constraints" summarizes the major environmental characteristics of the main campus.

Most of the total acreage of the main campus located to the north of North Campus Circle drive lies in natural open space. Representing roughly 35 percent of the campus's 441 acres this hilly area is covered by natural vegetation and is accessible by a series of overland trails. Comments received at the Campus Forums highlighted two important features of these open space areas: 1) their important use as an academic learning resource and area programmed for student activities; and 2) their inherent danger as a fire hazard. These features as well as other important characteristics of the main campus are described in more detail below.

The CSUSB Land Lab The open space areas comprising most of the north portions of the campus property are used for a variety of student academic and student programs. Informally called the "Land Lab" the open space areas are used to support instruction in a number of CSUSB courses conducted by the departments of Biology, Geology, Geography, Kinesiology and Anthropology as well as serving as an educational resource for the community at large. Additionally the areas are used by both the CSUSB ASI (Associated Students, Inc.) and ROTC programs.

These areas have intrinsic scientific value providing on-campus natural laboratories for the study of local topography, soils, geological formations, vegetation and animal life. Further, these areas have and continue to support scientific research. A population of the rare and endangered plant Plummer's mariposa lily (Calochortus plummerae) was discovered on the campus property in 2004 and subsequently CSUSB faculty and students co-authored a study of the plant's ecology that was published in a professional journal (Williams, K., D. Coffey, Y. Osorio, K. Maher, A. Meyer, K. Myers, H. Contreras, and K. VinZant. 2006 "Habitat correlates of Calochortus plummerae, a rare mariposa lily, on the campus of California State University, San Bernardino", Crossosoma 32(2): 75-82.) Also located on the campus northern open space is a scientific Global Positioning System (GPS) instrument designed to monitor changes in the configuration of the earth's surface over time. One of some 1,100 instruments nationwide, his instrument designated as P612 is part of the EarthScope program of the National Science Foundation (NSF)[http://www.earthscope.org]. Of related interest, the main campus lies within one-quarter mile of the San Andreas Fault Zone, a major and closely watched fault that threatens much of California.

Used by the Department of Anthropology and the ASI is the Fairview School historic site located north of Martin A. Matich Roadway (up the road to the Murillo Family Observatory 500

The CSUSB campus, residing at the northeastern corner of Southern California, adjoins a natural setting. The University's responsibility for ecosystem stewardship is mainly situated in the Land Lab portion of campus. Image Source: http://dsa-online.dialogedu.com/csusb (Scott).

Fire resiliency has, and continues to be, a key concern at CSUSB. Above, the 1980 Panorama Fire damaged campus buildings.

feet from the intersection with North Campus Circle). An early 'one-room school' dating to the 1887-1898 period, the site was studied and excavated as part of CSUSB student field work projects yielding an array of insights adding to student understanding and serving as a training ground in archaeology. Notably, a series of olive trees planted as a windbreak surround the square shaped site. Dating to earlier periods, a few Native American stone tools have also been found on the CSUSB campus site.

In addition to the northern campus open spaces, one area located on the southern side of the campus is also used heavily as a field study site for Biology and Geography students. Located south of the Administrative Services Building and west of the streets Ash Drive and West Campus Circle, the site contains the highest natural biological diversity of the entire CSUSB campus site—it is believed that the diversity is related to the area's underlying geology as it sits upon on a previous intermittent stream course with its attendant unique soils and hydrologic characteristics.

In all the 'Land Lab' natural areas located on the CSUSB campus represent an almost unique academic and learning resource within the California State University system of 23 campuses statewide that should be protected whenever possible. See also the Land Lab section of the Chapter 9 Landscape and Open Space Master Plan (Section 9.6).

Cal Fire-Fire Hazard Severity Zone The entire CSUSB campus lies within the Cal Fire—Very High Fire Hazard Severity Zone

Fig 2–9: Existing Campus Major Facilities and Features

1. Murillo Family Observatory
2. Badger Percolation Basin
3. Athletic Fields
4. Coyote Garden
5. Jack H. Brown Hall
6. Coussoulis Arena
7. Camphor Walkway
8. Central Walkway ('Coyote Walk')
9. John M. Pfau Library
10. Robert and Frances Fullerton Museum of Art (RAFFMA)
11. Library Mall
12. SBX Bus Stop
13. Performing Arts Center
14. Admin Quad
15. Yasuda Center for Extended Learning
16. Facilities Management
17. Solar Panels
18. On-Campus Housing

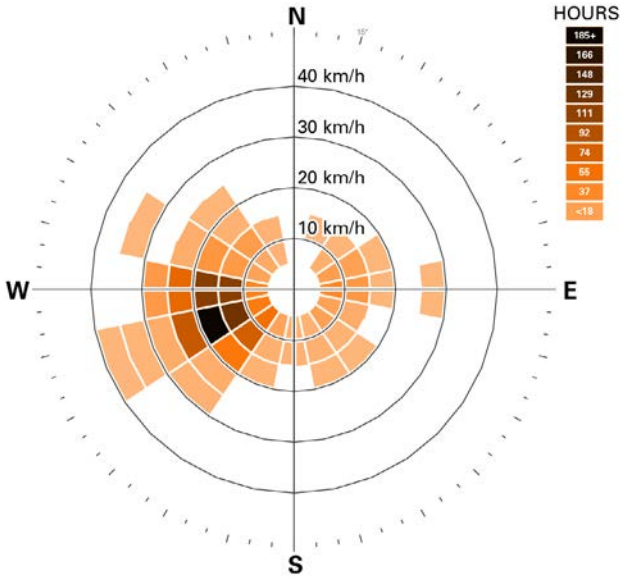


Fig 2–10: CSUSB San Bernardino Campus Summer Wind Speed and Frequency

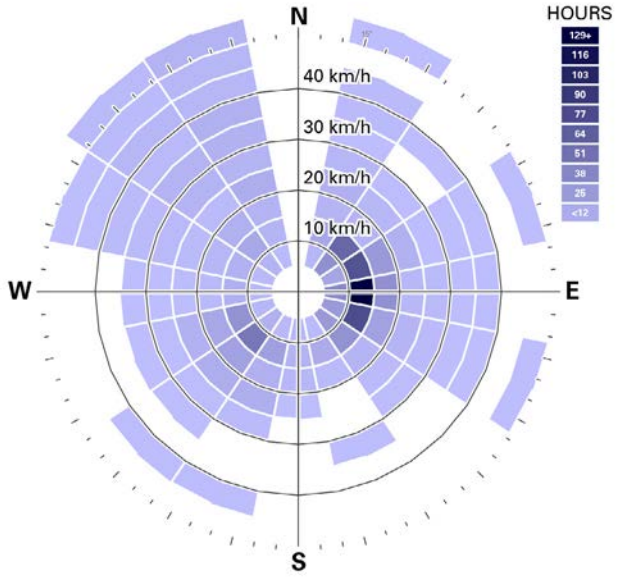


Fig 2–11: CSUSB San Bernardino Campus Winter Wind Speed and Frequency

Above, the campus flagpole on January 21, 2017, when campus officials opted to cancel classes due to strong northeasterly downslope Santa Ana Winds, which can gust over 80km/hr (Youtube).

designating it as subject to severe fire danger (http://frap.fire.ca.gov/webdata/maps/san_bernardino_sw/fhszl_map.62.pdf). This condition is particularly acute in the northern areas of the campus in contact with areas of natural vegetation and during times of the strong and dry Santa Ana winds that descend from the mountains often gusting in excess of 50 mph. These areas in fact have been subject to historic fires such as the noted Panorama Fire of 1980, which burned to the edges of the campus and which in total scope resulted in 4 deaths, the burning of 23,800 acres and destruction of 280 homes. Comments received from long-time faculty members of the campus at the CSUSB Master Plan Campus Forums stressed the danger that the historic fires posed to the campus recommending that student housing not be located adjacent to such areas.

Site Topography and Drainage The CSUSB campus site is in large part located on the surface of an alluvial fan/apron that before the construction of the protective drainage channels along the north side of North Campus Circle and the Devil Canyon Levee system at the north campus boundary, had been subject over long periods of time to storm water run-off through a series of shifting channels and rivulets across the site. These natural drainage pathways followed the natural topography and can be discerned on historic photographs of the site. These historic traces and the exiting topography suggest the general drainage direction of today's campus surface. The surface alluvial materials that underlay the CSUSB site consist of fine to coarse-grained silty sand and gravely sand gradually leading to more gravel, cobbles and boulders with depth. Ground water has been reported in the general area at a depth of about 200 to 300 feet. The university maintains a water well for irrigation purposes located east of Coyote Drive and Northpark Blvd., which when first drilled, encountered a static water level of 164 feet below the surface. The Devil Canyon and Sweetwater percolation basins located to the northwest of the campus are used to recharge ground water and may affect the campus ground water depth.

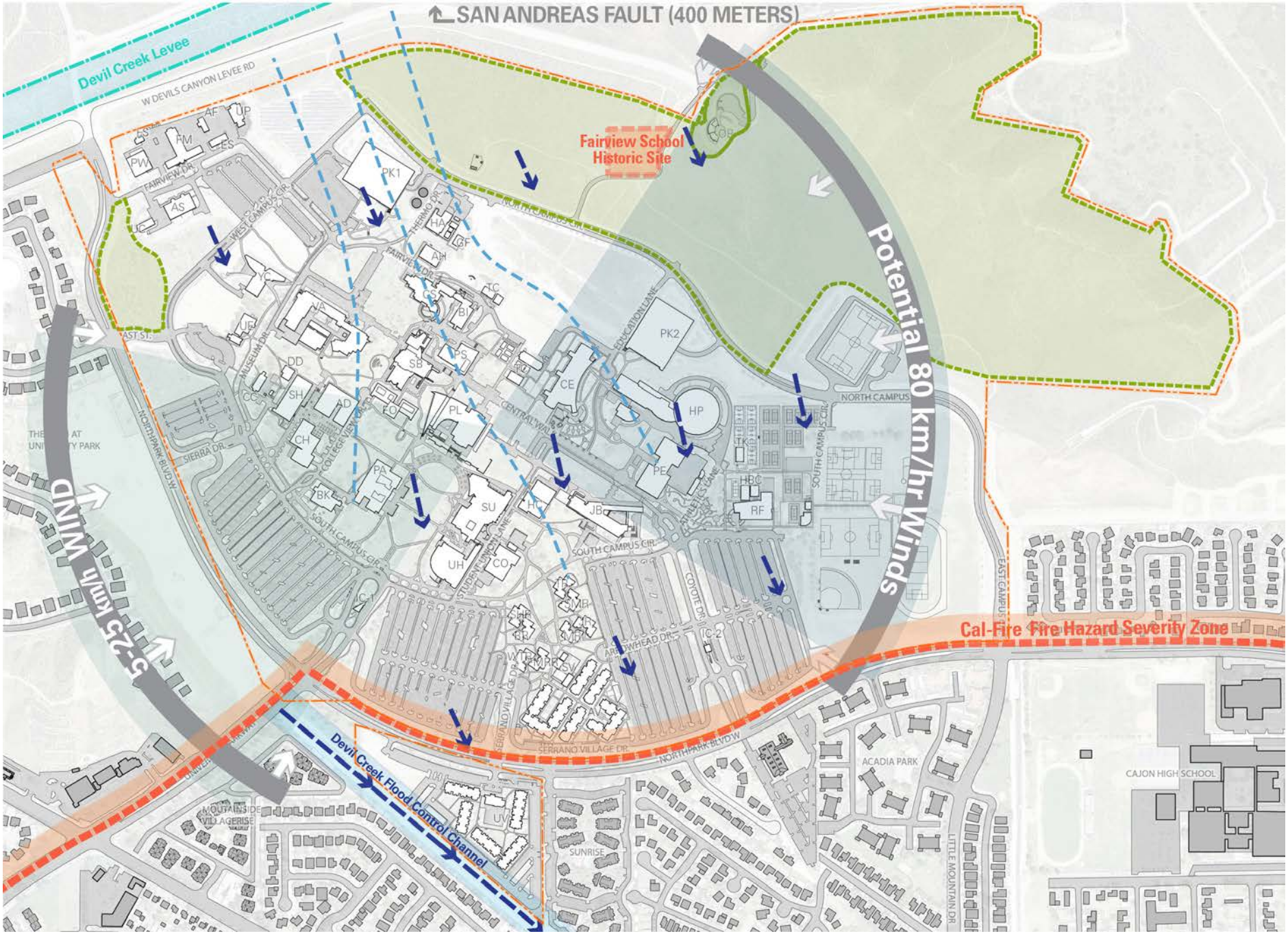


FIG 2–12: CURRENT ENVIRONMENTAL CONDITIONS AND CONSTRAINTS

2.5 EXISTING PROGRAM, ASSETS + AMENITIES

CSUSB was originally designed as a series of academic clusters, all grouped within an apron of parking lots. This mid-century planning approach has evolved as student services, facilities, and housing have been placed into the various academic clusters. The result is a campus of functional districts.

OVERVIEW OF EXISTING CAMPUS BUILDING USES

Stemming both from the original plan for the campus and the subsequent concentration of facilities based upon functional affinities, the CSUSB campus facilities are grouped into a series of functionally related land use areas or districts of the campus. As an overall structure, the original organizational plan called for a campus core encircled with parking facilities and within the core area at the geographic center of campus, the library was seen as the hub of campus learning activity. This general organizational framework remains and is expressed as the overall land use pattern of today. Radiating outward from the central library a series of classroom/lecture and teaching laboratories were built that when considered as a group, together comprise a true academic core for the campus. Adjacent to the east of this academic core and as an extension of it, lie the Kinesiology/Physical Education facilities and further eastward the related outdoor Physical Education, athletics and recreational fields and facilities. Also adjacent to the academic core to the west lies a district also academic in nature but differentiated by its orientation to continuing education and international students. It is called and considered here a zone of Extended Learning and Support. Immediately adjacent to the academic core lies a small district largely devoted to administration. Also adjacent to the academic core are two districts devoted to student activities largely administered by the Associates Students Incorporated (ASI) including the Santos Manuel Student Union (SMSU) and Health Center located near the Pfau Library and the Student Recreation and Fitness Center lying further to the east. Other large land use areas of the campus include the extensive parking areas that surround the campus core and the open space areas to the north discussed below in the “The CSUSB Land Lab” section of the report. The next largest campus land use district is devoted to student housing which forms a band of student residential facilities reaching from the campus core southward across Northpark Blvd. to include the University Village student housing area. Finally a series of facilities districts to the western end of the campus house the variety of Facilities Services buildings, the ground-mounted solar photovolataic arrays and the Central Plant.

Many recently built facilities are already under-capacity. Above, the student recreation center will need to be expanded as the University builds more on-campus housing.

Functional Areas

- Academic / Instructional Core
- Student Support
- Physical Education
- Administration
- Student Housing
- Athletic Facilities
- Facilities
- Center Walk

Current Facilities

- Academic / Instructional Facilities
- Library
- Continuing Education Center
- Admin / Faculty Facilites
- Recreation Center
- PE Facilities
- Campus Facilities & Plant
- Student Support Facilities
- Student Housing

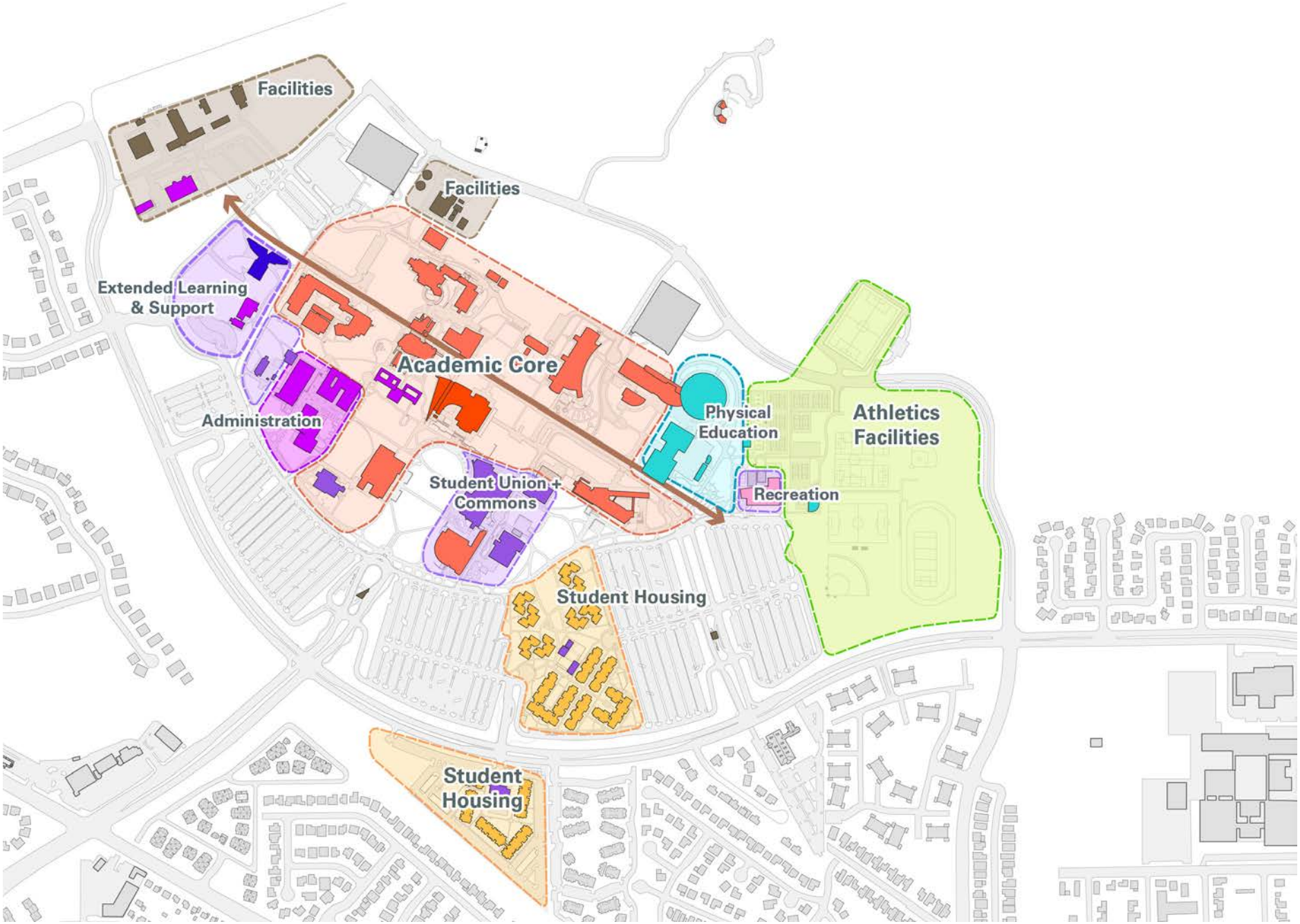


FIG 2–13: EXISTING CAMPUS FUNCTIONAL PRECINCTS

Campus Museum (RAFFMA)

Student Union (SMSU)

John M. Pfau Library

MAJOR ACTIVITY CENTERS, AMENITIES AND POINTS OF INTEREST

Within the CSUSB campus are a large number of facilities that because of their attraction to students, faculty, staff and/or the larger community can be considered as 'destination' locations. These are identified on the accompanying map. Although all of importance, three important facilities will be elaborated upon here.

John M. Pfau Library

At the center of the campus and academic cores of the campus, the John M. Pfau Library provides a concentration of learning resources and spaces for student learning and interacting. In addition to the traditional stacks and learning carrels, the library offers individual study areas, computer workstations/self-study areas, access to on-line archives, group study rooms, lounge study, an 'Innovation Lab' allowing students to explore the use of 3-D printers and virtual reality headsets, a few traditional small classrooms, a café (Café au Lib) and a series of offices including those of the CSUSB Division of Information Technology Services (ITS).

The Santos Manuel Student Union (SMSU)

The center of student social activity as well as the primary site for campus conferences, special presentations, large meetings and meetings of the Associates Students Incorporated (ASI), the student union was renamed the Santos Manuel Student Union (SMSU) in the 2003 in appreciation to the San Manuel Band of Mission Indians who made a sizable gift to CSUSB to help expand and maintain on a long-term basis the student union facility. The SMSU hosts a food court, lounge areas, game rooms, a Starbucks coffee and tea concession, rooms for student meetings and study, and rooms for special programs including the Cross Cultural Center, the Women's Resource Center, the Pride Center and the Osher Adult Re-Entry Center.

Robert and Frances Fullerton Museum of Art (RAFFMA)

Unique within the twenty-three campuses of the California State University System, the Robert and Frances Fullerton Museum of Art (RAFFMA) hosts a rich collection of ancient and contemporary cultural art objects including a world-class collection of Egyptian antiquities that combine to make RAFFMA a regional community resource and destination. Specifically, the ancient Egyptian holdings cover the Predynastic to the Greco-Roman periods while RAFFMA's other notable collections include representative examples of ceramic vases from ancient Italy, Korea, China, Southeast Asia and pre-Columbian America. The museum also has several smaller study collections such as a selection of West African art from the regions of Burkina Faso, Congo, Ivory Coast, Mali and Nigeria. In 2008, RAFFMA received national accreditation from the prestigious American Alliance of Museums.

Academic Facilities of Greater Public Interest

a RAFFMA -Robert Frances Fullerton Museum of Art
b Murillo Family Observatory
c Performing Arts Theater
d Coussoulis Arena
e Yasuda Center for Extended Learning
f Anthropology Museum
g Water Resources Institute (in Pfau Library)

Health and Public Safety

h Student Health Center
i University Police
j Emergency triage site

Open Space Features

k San Bernardino Valley Water Conservation Demonstration Garden (Coyote Garden)
l Neighborhood Park (Live Oak Park)
m Amphitheater
n Fairview School Historic Site

Other

o Teaching Resource Center (TRC) - Faculty Media Center (in Faculty Office Building)
p Solar PV Array
q Student Recreation & Fitness Center
r Daycare

Dining

s The Den (Food Pantry)
t Student Union Food Court
u The Commons
v John M. Pfau Library Cafe
w Jack Brown Hall Coyote Express

Bookstore

Emergency Phone

Information

Housing Office

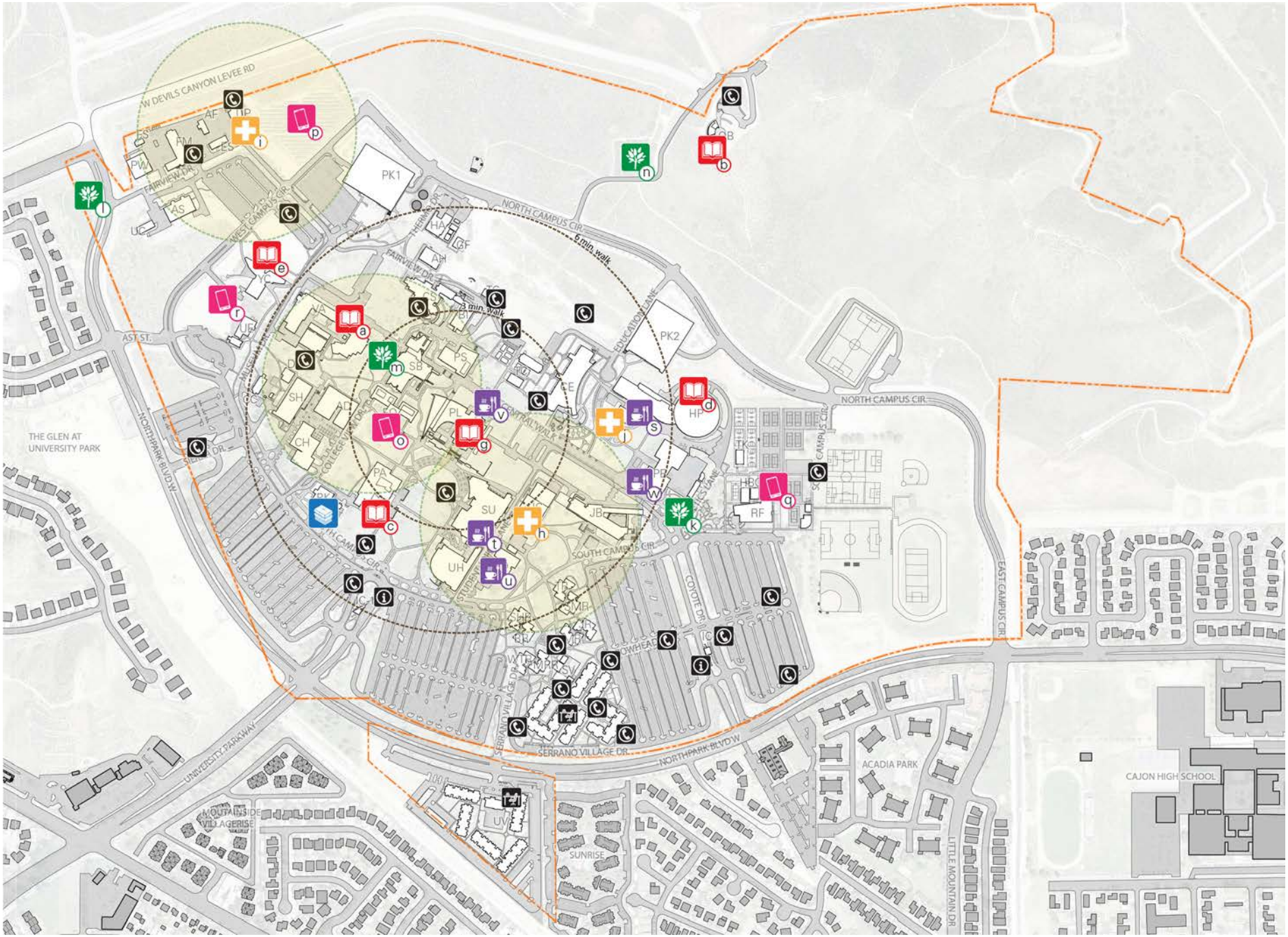


FIG 2–14: EXISTING MAJOR ACTIVITY CENTERS

2.6 EXISTING PROGRAM, ASSETS + AMENITIES

Campus facilities assessments show that the fundamental condition of CSUSB facilities is good. Several facilities have been renovated in recent years. The campus administration buildings are among the oldest and present an opportunity for their replacement with more modern and efficient facilities.

FACILITY CONDITIONS

To support the baseline facilities condition analysis needed to guide the development of the 2016 CSUSB Master Plan, the RTKL/Assembledge+ consultant team conducted a facility condition study integrating two major parameters: a facility condition assessment and 'year-structure built'. The building conditions assessment classified the existing facilities into five condition categories ranging from a "New or Excellent Condition" assignment to a designation as "Total Renovation or Replacement." A "No Data" category was also used to designate those few facilities that had insufficient data to make a judgment. The year structure built criteria was an important determinant of facility condition because the older facilities dating the 1960s period of initial campus construction are generally inefficient in terms of functionality for their designated uses and they are inefficient in terms of operation and maintenance--generally representing higher levels of deferred maintenance and ongoing heating and cooling costs. For instance, the Paulien & Associates classroom utilization analysis conducted as part of the Master Plan preparation (See Appendix C) found that Chaparral Hall constructed in 1964 was only utilized to 45 percent of the state standard for classroom utilization, an apparent reflection of the difficulties of instructing lecture classes in that facility. Similarly the facility condition study recommended that the entire cluster of related facilities—Chaparral Hall, Sierra Hall and the Administration Building totaling over 66,000 GSF of space should be replaced. The first Gym/PE buildings dating to 1967/1968 totaling over 43,000 GSF are also recommended for total renovation or replacement. Major renovation or expansion of facilities was recommended for several facilities some of which were the in the design process for renovation and/or expansion at the same time that the 2016 Master Plan was under development. These facilities included: the Pfau Library (Major renovation and Expansion Plan complete and pending), the Commons (1972, updating/reconfiguration of space desirable), Performing Arts (1977, undersized for today's demands), the Student Union (1977, undersized for today's demands; architectural design in-process) and University Hall. University Hall although of fairly recent construction (1991) is viewed as a space that could simultaneously be upgraded and infilled with administration functions a part of a move to create a future communications-digital arts academic complex and the replacement of the Chaparral Hall/Sierra Hall/ Administration Building group identified above.

Chaparral Hall, Sierra Hall, and the current Administration building are among the oldest structures on campus and are the only buildings in this plan proposed for long-term replacement.

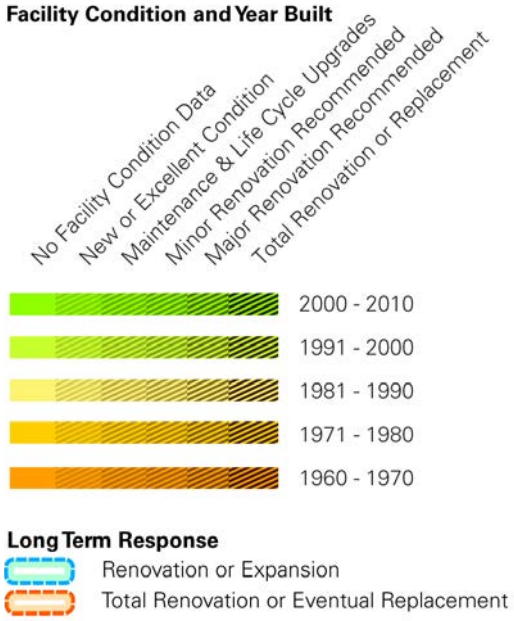


FIG 2–15: EXISTING CAMPUS FACILITY CONDITIONS AND YEAR BUILT

2.7 BASELINE CAMPUS TRANSPORTATION

Campus transportation facilities are among the most crucial assets to the functionality of any campus. Existing facilities are configured to support a commuter campus dependent upon single occupant vehicles and extensive surface parking lots.

TRANSPORTATION NETWORK ASSESSMENT

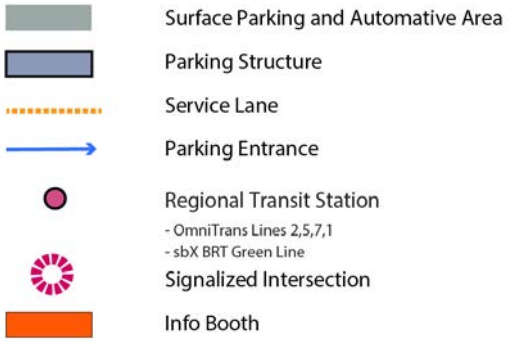
A majority of stakeholder participants in outreach meetings expressed concerns about parking supply adequacy and accessibility as the campus grows. This, paired with frustration over morning and afternoon traffic on University Parkway through the main campus entrance, are the two predominant transportation constraints apparent on campus.

Other issues relate to pedestrian and multi-modal access viability such as vehicle intrusion, support for public transit and bicycles, and orderly management of parking access during peak hours. Vehicle intrusion on the San Bernardino campus is caused when service vehicles and private automobiles access the campus core among pedestrians. As campus population densifies, this will become a safety and image hazard. Additionally, many drivers will search for parking along the sycamore-lined walkway fronting campus – conflicting with pedestrians entering along foot-trafficked service lane inroads.

Traffic data analysis of the intersection of Northpark Blvd. and University Pkwy. deonstrate the worst peak period performance. This is due to the fact that University Pkwy is the primary high-volume access route through the community into a gateway which connects to more than one parking facility. The 1.3 mile segment of University Pkwy leading from I-215 to campus will be a significant constraint to sustainable growth on this campus.

The urban design and transportation planning team project that a strategy which creates support for multi-modal transportation along more approach routes into campus, with better coordination and separation from service access will improve the safety and imageability of the campus transportation situation.

Surface parking lots dominate the arrival experience of campus; moreover, the University's physical interface with the community are the main parking lots.



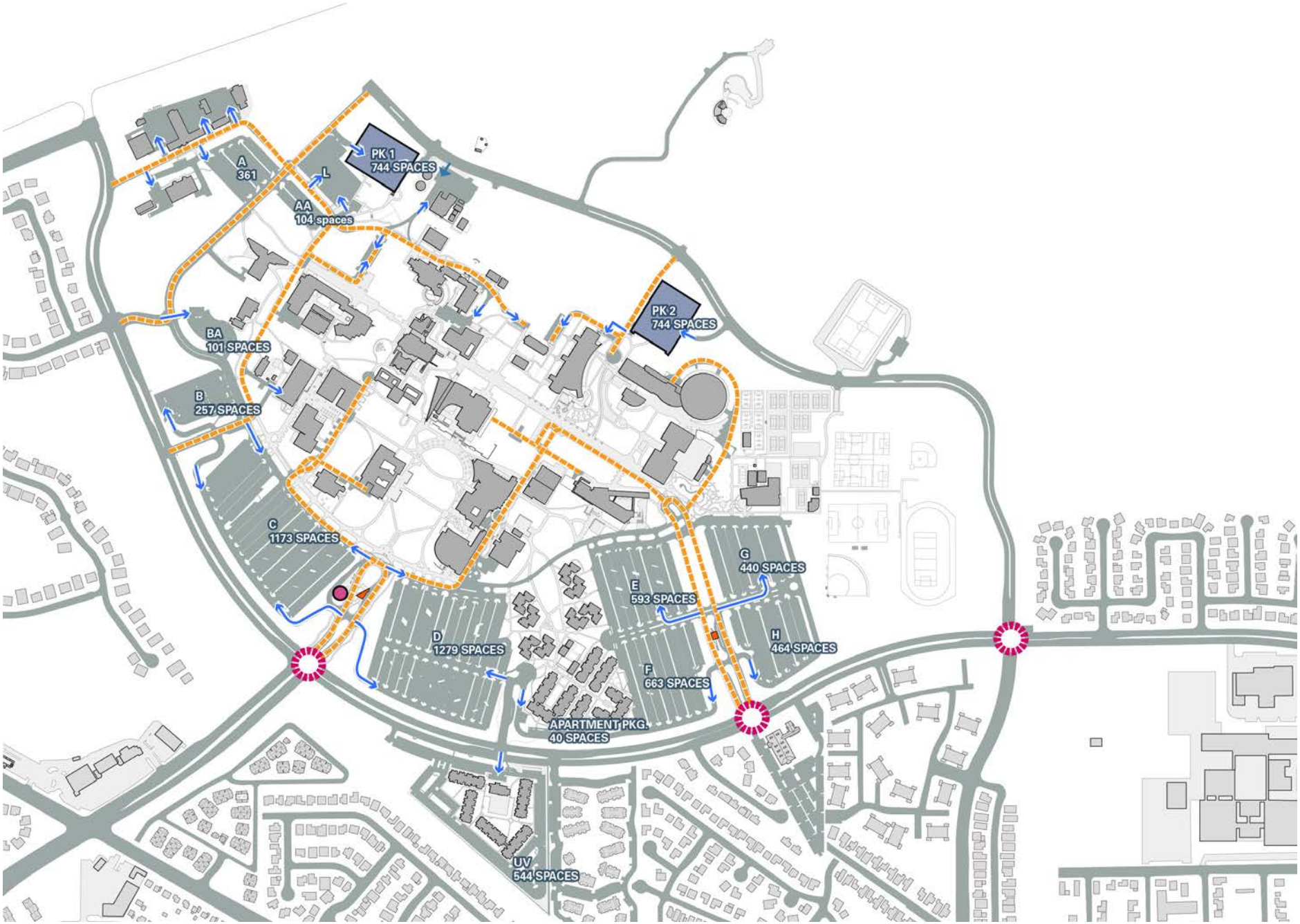


FIG 2–16: EXISTING ROADWAY AND SERVICE NETWORK

PRIMARY CAMPUS PEDESTRIAN PATTERNS

During a typical day at the university, students generally spend most of their time in class, studying, eating or in some type of social, rest or recreational activity. Most of this activity occurs in the various academic classroom, laboratory and Pfau Library facilities in the campus academic core or within the adjacent student activity centers consisting primarily of the Santos Manuel Student Union (SMSU), the Commons and Student Recreation and Fitness Center. When not physically within these central facilities, students walk between buildings or weather permitting, may sit in campus open space areas. When the main activity centers and the intervening pathways are placed inside a model framework of the campus a kind of activity pattern can be discerned. This 'model view' is depicted on the accompanying plan where primary student activity centers are identified and the least distance pathways between them are shaded in. Campus academic building are given a color value depending on the range of FTE capacity contained in each building. This FTE capacity value represents a reflection the total potential for academic use or activity of the building assuming that the buildings are scheduled near their potential utilization factor. In fact the background utilization analysis performed by the master plan team firm of Paulien & Associates confirmed that most campus classroom/lecture buildings are used at a high utilization factor achieving an overall 88 percent average utilization with some facilities even surpassing the standard utilization target. The emergent pedestrian pattern from this model focuses on Coyote Walk—the campus spine. Other heavily used pathways include Student Union Lane and the campus quad walkways connecting the Pfau Library with the SMSU and University Hall, which at a 2,547 FTE capacity generated from 1,122 student stations translates to the highest FTE capacity facility for the campus. Notable in its current configuration and use pattern, some pedestrian pathways are also simultaneously used and/or crossed by service vehicles, a situation to be addressed in the 2016 Master Plan.

A majority of campus pedestrian activity occurs along Center Walk (proposed as 'Coyote Walk') in the 2016 Master Plan.

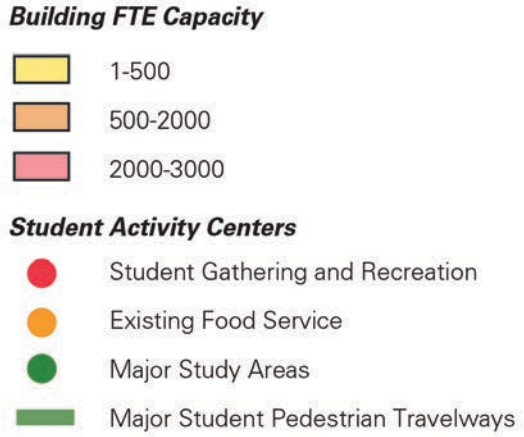


FIG 2–17: EXISTING CAMPUS OBSERVED PEDESTRIAN ACTIVITY PATTERNS

0 200′ 500′ 1000′ 2000′

3 VISION, PRINCIPLES, OBJECTIVES + STRATEGIES

3.1 DEFINING THE MASTER PLAN VISION

Prior to developing a plan for the physical campus there must be a clearly stated vision. The primary source for the CSUSB vision and plan principles underlying the 2016 Master Plan was the campus CSUSB Strategic Plan (2015-2016) which was further developed to focus on the physical elements of the campus through an extensive process of consultation with the Master Plan Steering Committee.

INTRODUCTION

The primary purpose of the physical campus is to serve the mission of California State University San Bernardino and its educational processes. The educational experience in its fullest sense takes place not only in classrooms, but at meals, in residential areas, in the course of recreational activities, and through informal and casual encounters. The physical campus provides the setting for these experiences to be shared by students, faculty, staff and campus visitors and can be a powerful tool in the educational process. To truly create a supportive and vibrant 24/7 campus, all of these factors must be considered.

The Campus Vision Statement outlined on the following pages was developed to reflect primary intent and ethos for the physical transformation of the University. It is further translated into Physical Planning Principles/ objectives to guide the 2016 CSUSB Master Plan process and serve as benchmarks for measuring success during the development of the physical master plan for the campus.

The resulting Vision statement and planning principles for the Master Plan targets and supports the continued development of the University as an exemplary CSU campus recognized for its excellent academic programs and unique student-centered learning experience taking place within a comfortable campus environment. The Vision focuses on supporting the University as an academic pillar within the Inland Empire, emphasizing campus and community connectivity and partnerships, highlighting CSUSB's brand and identity. The 2016 Master Plan is designed to support CSUSB in becoming a global learning center of opportunity and enterprise for the Inland Empire and the Southern California Region.

3.2 CAMPUS MASTER PLAN VISION + MISSION

2016 CAMPUS MASTER PLAN VISION STATEMENT

Cal State University San Bernardino will serve as a global learning center of opportunity and enterprise for regional, national, and international communities.

2016 CAMPUS MASTER PLAN MISSION STATEMENT

As a healthy environment enabling diverse lives to grow and prosper, the campus will provide a setting in which the intellectual and creative pursuits of the University and general community are activated, interconnected, and sustainable.

This is a special opportunity to be aspirational. In this Master Plan, we can provide a framework to guide future development of a vital, sustainable, and pleasing environment that promotes learning, teaching, research, and student engagement.

- DR. TOMÁS D. MORALES, PRESIDENT OF CSUSB, CAMPUS FORUM ADDRESS, JUNE 2015

3.3 PLAN PRINCIPLES

The 2016 Master Plan Vision and Mission statements boldly declare a chosen direction for this campus and are embodied by five essential Principles aligned with the Strategic Goals of the University's Strategic Plan. These five Master Plan Principles will be fulfilled by meeting twelve clear Objectives and their supporting Policies which will establish this campus as a leader among the rest.

STUDENT SUCCESS

The Master Plan will support the University to be an outstanding and inspirational academic institution that emphasizes **community engagement, collaboration and shared discovery**, and balances student life, arts, academics, and athletics. Through a focus on preparing students for resilient and prosperous lives, the university will take its place as a leader in ensuring a brighter future for the region.

FACULTY + STAFF SUCCESS

The Master Plan will reinforce **faculty and staff success, diversity, academic rigor and applied research programs, and with effective and innovative governance and administration**. Doing this with an eye toward regional purpose and global reach will further establish this University as a preeminent and recognized institution. University resources will further enable faculty and staff to deliver a high-caliber learning environment that will be the pride of the state.

RESOURCE SUSTAINABILITY + EXPANSION

This campus will accommodate expected growth while becoming an inspiring exemplar **and community hub for sustainable growth and resilient living**. Achieving this through resource optimization means leveraging existing campus assets, strategic partnerships, and community relationships in addition to adding new facilities, technologies, and programs. The university will demonstrate how to optimistically meet future challenges with knowledge, efficiency, and collaboration.

COMMUNITY ENGAGEMENT+PARTNERSHIPS

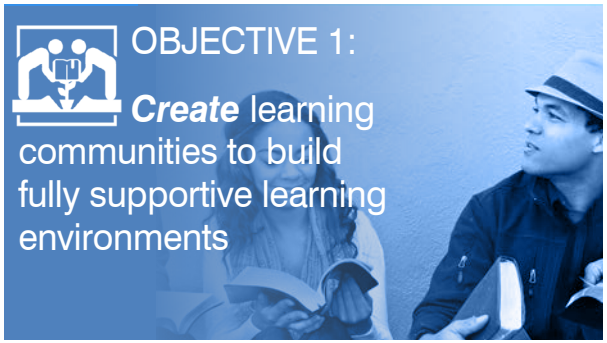
The Master Plan will support the growth of the University as an innovative Regional economic engine, center for community interaction, **source of diverse social engagement**. Strengthening ties to alumni and groups will bolster long term University health while partnering with industries will open doors for **more entrepreneurial and connected graduates**.

IDENTITY

The Master Plan will support the growth of the University as a recognized destination for intellectual and cultural activities, for an active campus life and **for environmental stewardship**. Increased housing opportunities and amenities that provide a desirable, healthy, and **safe 24/7 campus lifestyle** will create a community that belongs to students and can call the university a home away from home. Doing this will vastly enhance University identity and celebrate coyote spirit.

3.4 PLAN OBJECTIVES AND POLICIES

LEARNING

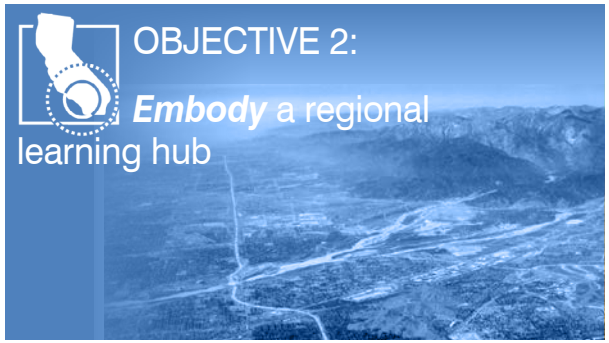


POLICY 1.1: Provide a dynamic and **agile physical environment** with instructional spaces that efficiently respond to evolving pedagogies.

POLICY 1.2: Increase **student, faculty and staff housing options** in residential communities that enable positive interaction among diverse groups and a supportive growth environment.

POLICY 1.3: Continue to enhance **academic and research opportunities** at all levels.

POLICY 1.4: Emphasize a state-of-the-art environment that captures the advantages of new and **progressive ways of learning and communicating,** and supports those connections in a flexible physical realm.



POLICY 1 .1: Attract and retain diverse and **qualified students**

POLICY 1.2: Support and promote student and faculty **academic exchanges**.

POLICY 1.3: Create a campus that **serves as a "living lab"** for regional sustainability, local education, and community discovery.

POLICY 1.4: Provide a welcoming setting to engage the Inland Empire community with **special events, academic programming, and facilities** that serve as a shared asset.

LEADERSHIP

POLICY 1.1: Provide a dynamic and agile physical environment with instructional spaces that efficiently respond to **evolving pedagogies.**

POLICY 1.2: Increase student, faculty and staff housing options in residential communities that enable positive interaction among **diverse groups** and a supportive growth environment.

POLICY 1.3: Continue to enhance academic and **research opportunities** at all levels.

POLICY 1.4: Emphasize a **state-of-the-art environment** that captures the advantages of new and progressive ways of learning and communicating, and supports those connections in **a flexible physical realm.**

LEVERAGE

OBJECTIVE 4:

Attain a regionally and globally recognized institution

POLICY 4.1: Attract and retain diverse and **outstanding faculty and staff,** and comfortably host equally inspiring guests on campus.

POLICY 4.2: Build a campus world renowned for leadership in achieving, teaching, and inventing demonstrable **environmental sustainability** and resource resiliency.

POLICY 4.3: Develop around learning communities and knowledge centers which focus **interdisciplinary collaboration** and serve as the foundations for broad-ranging, integrated, globally-renowned research, academic, and entrepreneurial programming.

OBJECTIVE 5:

Grow fundamentally sustainable and resilient

POLICY 5.1: Direct campus growth to respond directly to FTES projections while **emphasizing maximization, flexibility**, and communication technology

POLICY 5.2: Apply a landscape and plant materials program that centers on **water conservation** and open space prioritization.

POLICY 5.3: Provide a mix of land uses on campus that increases **economic and environmental resiliency** by reducing vehicle miles travelled.

POLICY 5.4: Find and **exploit synergies** between environmental sustainability and financial resiliency

POLICY 5.5: Reduce the campus carbon footprint and water use through **demand reduction, renewable energy generation**, and efficient systems.

POLICY 5.5: **Maximize resource recycling** to retain and reuse water, divert garbage from the waste stream, and productively exploiting the water and energy nexus where possible.

OBJECTIVE 6:

Instigate greater environmental resilience in the region

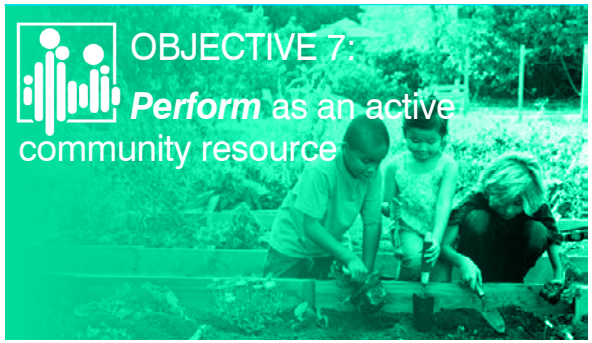
POLICY 6.1: Influence individual practices to reduce energy use, water use, and waste generation in buildings and on campus.

POLICY 6.2: Strengthen and streamline **transportation alternatives** to single occupant cars – focusing on transit, bicycle, and car sharing systems.

POLICY 6.3: Exceed established sustainability standards while measuring and broadcasting those achievements through **signage and online media.**

POLICY 6.4: Leverage academic programs and partnerships with industry and the community to broaden the expansion of **green industries** and practices in the region.

LEVERAGE



OBJECTIVE 7:
Perform as an active community resource

POLICY 7.1: Create more programs and opportunities to **engage with the larger community**, on and off campus.

POLICY 7.2: Operationalize campus grounds as a shared community learning and healthy living resource that also **fosters social integration, food security**, and opens minds to resilient ways of living.

POLICY 7.3: Configure campus access to guide and curate community access to campus public assets that include the mountains, **key view corridors, and key** program locations.

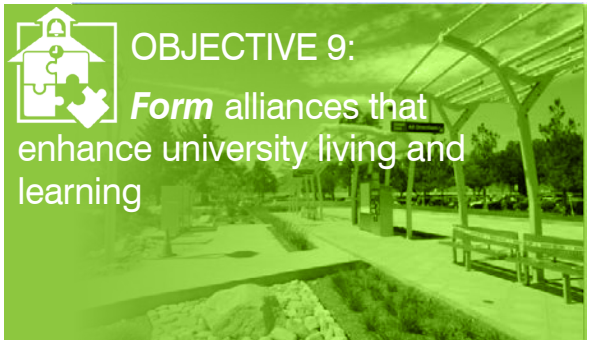
OBJECTIVE 8:
Provide a safe haven

POLICY 8 .1: Apply concepts of **community-based security** by increasing interaction and human presence in common areas that have clear identity and purpose.

POLICY 8.2: Strategically and efficiently **upgrade lighting and communication** systems to enhance security and visibility

POLICY 8.3: Create a clear, consistent, and **legible wayfinding system** that emphasize clear paths of travel and access to services.

LINKAGES



OBJECTIVE 9:
Form alliances that enhance university living and learning

POLICY 9.1: Establish and capitalize on the University's preeminence in the Inland Empire to **develop partnerships** with local regional and global governments, private industry, and non-profit entities.

POLICY 9.2: Arrange to provide amenities and services including **retail, a range of food services, child care, recreation, and entertainment** on campus.

POLICY 9.3: Develop academic and training programs with **industry partners** to help make CSUSB students uniquely competitive in the global marketplace.

OBJECTIVE 10:
Accommodate productive entrepreneurial partnerships

POLICY 10.1: Build settings for **research & development**, internship and entrepreneurial opportunities that bring industry and students together.

POLICY 10.2: Explore the potential to **diversify financial resources** and enhance economic resilience by increasing community activity on campus.

POLICY 10.3: Prepare cutting edge facilities to host **memorable events** that inspire the alumni community, financial supporters, and potential partners.

OBJECTIVE 11:
Build a vital urban campus environment

POLICY 11.1: Create recognizable, navigable, and comfortable pedestrian settings to enhance **studying, socializing, and participating on campus**.

POLICY 11.2: Develop **ample housing options** that enable a diverse range of students to integrate academically and socially to create life-long bonds.

POLICY 11.3: Cultivate an attractive and livable campus through a range of **public spaces** and a critical mass of **mixed uses that include more retail, services, entertainment**, and food options, access, and popularity.

POLICY 11.4: Expand and equip athletics and recreation facilities to **support competitive teams and healthy lifestyles**.

OBJECTIVE 12:
Promote coyote spirit

POLICY 12.1: Strategically promote a unique and **coherent university brand** across the region and beyond to attract desired people, partnerships, prestige

POLICY 12.2: Take advantage of cross-promotional and messaging **opportunities with city and regional partners**

POLICY 12.3: Position the University within the community and CSU system to be renowned for maximized opportunity through **leadership in sustainability**.

4 OUTREACH + ALTERNATIVES EVALUATION

4.1 PARTICIPATION IN THE PLANNING PROCESS

The most important aspect of a successful Master Plan is that it reflects the hopes, aspirations, and objectives of the community which it accommodates. In essence, this document must be the voice of the students, faculty, and staff on their behalf. The planning process was staged to engage as many as possible - to ensure that these collective choices are 'baked into' the 2016 CSUSB Master Plan.

ESTABLISHING A SHARED DESTINY

The planning process was designed to encourage the participation of students, faculty, staff and community individuals and groups. Three campus-wide town hall style meetings were held at specific points in the planning process designed to engage campus and community stakeholders in the process to identify needs, obtain their input, concerns and questions and provide feedback on the alternative master plan approaches prepared by the master plan consultants.

The University coordinated these campus-wide meetings with CSUSB's academic calendar and scheduled them to ensure that students, staff and faculty had sufficient opportunity for input into the planning process. Each Campus Forum consisted of 2 meetings, typically one in the afternoon and another in the evening in order to provide multiple opportunities for the various campus constituencies to participate. The Campus Master Plan Steering Committee provided guidance on the specific format, scheduling and arrangements for these meetings.

The consultant team worked with the University to post all planning materials used in the campus town hall meetings on the campus web site to provide a readily accessible avenue for input via e-mail.

The Master Plan team successfully engaged the University community in a vigorous conversation about the direction of the CSUSB campus.

CAMPUS TOWN HALL FORUM #1: ASCERTAIN PRIORITIES

The first Campus Forum was designed to introduce campus stake-holders to the Master Plan project, encourage their participation in the planning process, and begin gathering and identifying campus needs, issues and information needed for subsequent tasks. Key presentation components included:

- Objectives and context of the Master Plan;
- Scope and goals of the CSUSB Master Plan and process;
- Master Plan project schedule;
- Existing Conditions Analysis as base line information to assist campus
- Constituencies in identifying and understanding issues;
- Draft Campus Communication Plan for sharing the Master Plan process with the university community.
- Methods to engage participants and elicit their ideas, comments and concerns pertaining to the campus and its facilities.

CAMPUS TOWN HALL FORUM #2: REVIEW ALTERNATIVE PLANS

Based on the input and experience gathered from Campus Town Hall Forum #1, the consultant team worked with the Campus Master Plan Steering Committee to prepare, present and facilitate a second series of campus meetings to present and gather feedback on three alternative master plan scenarios. This included:

Campus community engagement efforts were equal parts informative gathering, collaborative design, and robust presentation of facts about campus issues.

- Review campus master scenarios with the wider campus community
- Present description of scenarios' strengths and weaknesses;
- Receive and record campus constituents' comments for evaluation by the Campus Master Plan Committee;
- Prepare scenarios to be placed on the Master Plan project web site with a time frame noted for submitting comments.

Based on input from Campus Town Hall Forum #2, the consultant team worked with the Campus Master Plan Steering Committee to select a preferred alternative scenario. The preferred or consensus scenario represents a combination of the best elements from several scenarios.

CAMPUS TOWN HALL FORUM #3: REVIEW THE CONCENSUS MASTER PLAN

Based on input from campus constituents and the Campus Master Plan Steering Committee, the consultant team refined components of the preferred scenario in preparation for developing the Draft Master Plan. A final campus-wide planning forum, Town Hall Forum #3, was held to review this Draft Master Plan. The consultant team prepared materials to facilitate the meeting, using a 3D campus model to illustrate the plan, elicit comments, record comments for incorporation into Final 2016 CSUSB Master Plan; and to prepare and make available materials to post on CSUSB web site.

Everyone's participation is critical to identifying the most important issues in our current physical environment as we collectively achieve the vision and mission of our great University.

- DR. TOMÁS D. MORALES, PRESIDENT OF CSUSB, CAMPUS FORUM ADDRESS, JUNE 2015

The master planning team sought to develop a consensus plan crafted from the input, needs, concerns and instructions of those who have the most experience using this campus -- the faculty, staff, administration, and students. The consensus approach was determined through an outreach process that included:

VISIONING SESSIONS

Several steering committee meetings have taken the form of an interactive visioning session - where constructive feedback on Vision, Mission, Principles, and Goal recommendations are gathered and tested against master plan programming assumptions to be taken by the project design team.

INTERNAL WORKSHOPS

Internal workshops between master plan core team members and supporting consultants provided opportunities for experts to share guidance in their respective consulting technical capacities to ensure that even the preliminary alternative and consolidated schemes are realistic, implementable, effective, and innovative.

COMMUNITY WORKSHOPS

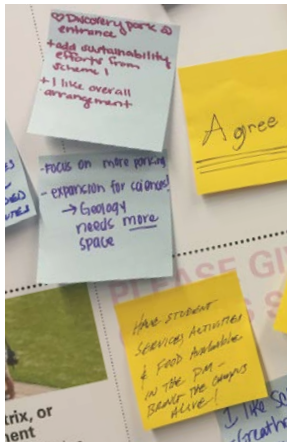
Two community workshops, each consisting of a morning and afternoon session, have allowed the CSUSB community to provide input on a vision for the campus and reactions to the three alternative schemes. Voting on preferred alternative elements occurred in the November 2nd Community Workshop; those results are summarized on the following pages.

FIG 4–1: LISTENING TO THE CSUSB COMMUNITY

4.2 FIRST FORUM RESULTS ON PRINCIPLES + OBJECTIVES

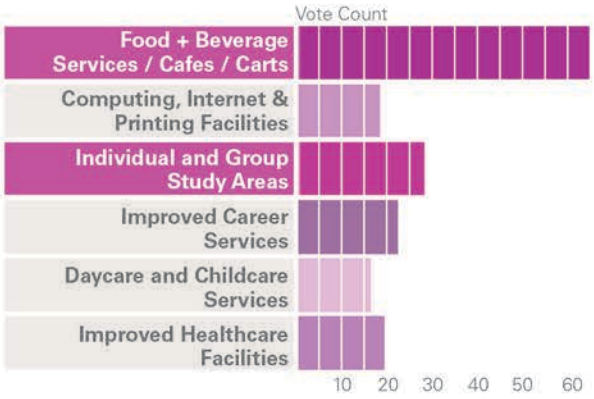
ASCERTAINING PRIORITIES

The first steps in the development of master plan alternatives was to reach out to the campus community through the first Community Forum, wherein principles, objectives, and various issues were vetted by students, faculty, and staff. There were six boards on which participants could help us focus on the most critical concerns and prioritize facilities improvements. The campus community input at this forum highlighted the tremendous need for food and beverage options on the growing CSUSB campus; also important was the need for student services access and for a better outdoor study and social interaction environment.



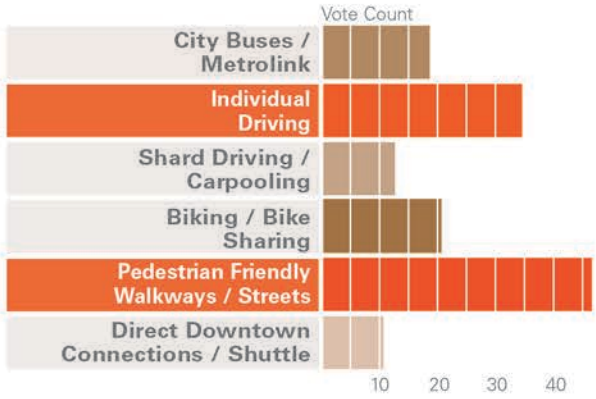
WHAT ON-CAMPUS SERVICES AND FACILITIES NEED TO BE UPGRADED?

38% of the outreach votes favored food + beverage services / cafes / carts. 17% of the outreach votes favored individual and group study areas. 3% of the outreach votes favored career services.



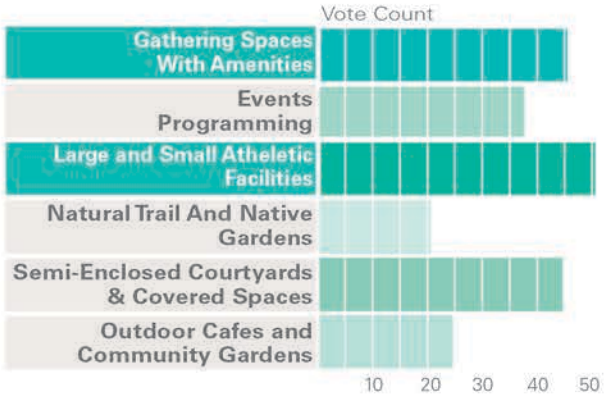
WHAT MODES OF TRANSPORTATION TO AND FROM CAMPUS WOULD YOU PREFER?

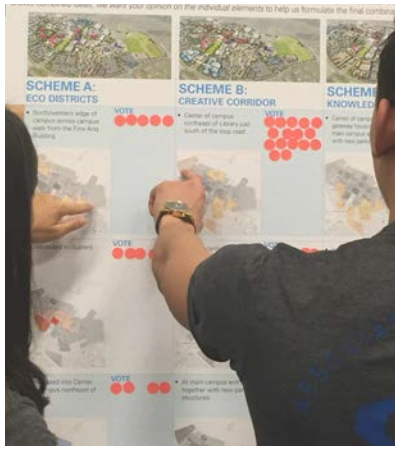
32% of the outreach votes favored pedestrian friendly walkways / streets. 4% of the outreach votes favored individual driving.

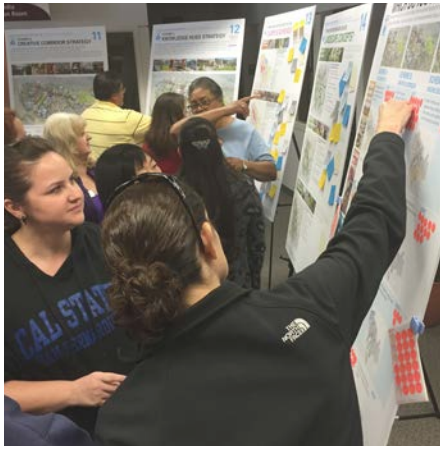


HOW WOULD YOU UPGRADE THE OPEN SPACES ON CAMPUS?

23% of the outreach votes favored large and small atheletic facilities. 20% of the outreach votes favored gathering spaces with amenities.

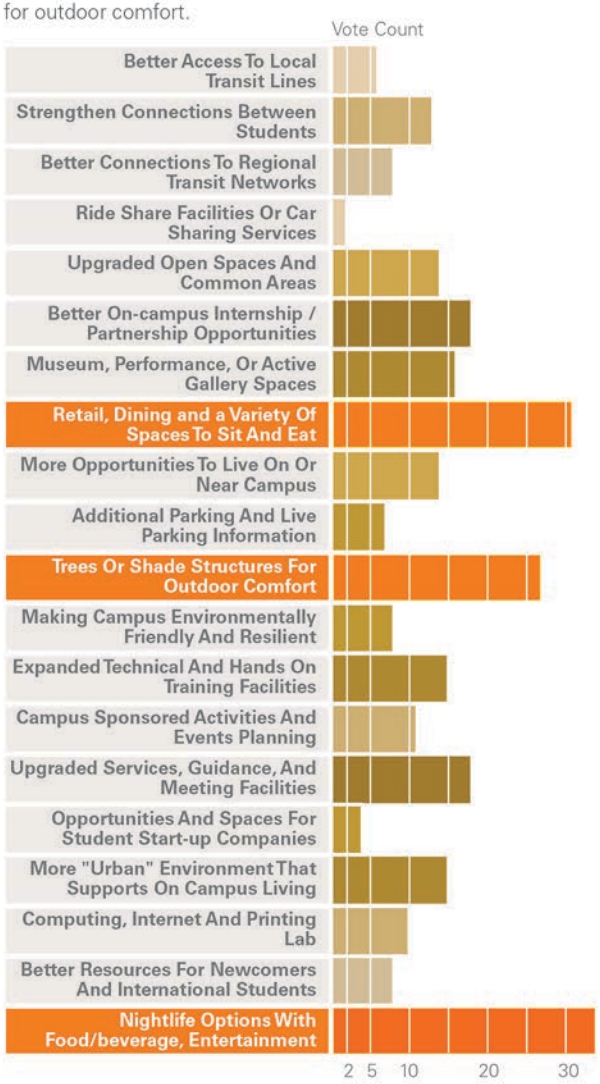






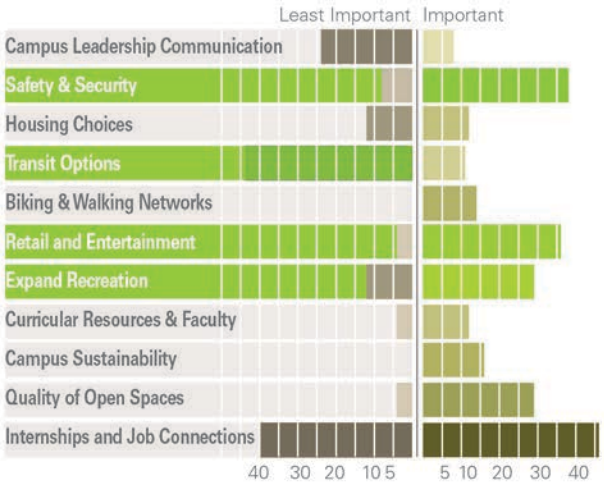
WHAT BIG IDEAS FOR YOUR CAMPUS HOLD THE MOST INTEREST TO YOU?

12% of the outreach votes favored nightlife options with food/beverage & entertainment. 11% of the outreach votes favored better retain & dining with a variety of spaces to sit and eat. 10% of the outreach votes favored trees or shade structures for outdoor comfort.



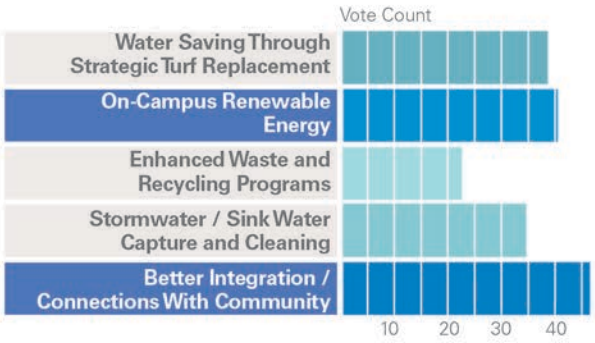
WHAT ARE THE MAJOR ISSUES AFFECTING YOU ON CAMPUS?

18% of the outreach votes favored internship & job connections. 15% of the outreach votes favored safety & security. 14% of the outreach votes favored adequate retail & entertainment opportunities.



HOW SUSTAINABLE DO YOU WANT YOUR CAMPUS TO BE?

25% of the outreach votes favored better integration / connections with community. 2% of the outreach votes favored on-campus renewable energy.



4.3 PLAN ALTERNATIVES AND CONCENSUS DESIGN PROCESS

Three equally viable campus master plan alternatives were developed in response to three prevailing trends expressed in the Steering Committee Visioning Sessions and the Campus Forum on Master Plan Vision:

1. A concern for a comfortable campus environment in-tune with its natural setting,
2. A campus that encourages social interaction and collaborative engagement in an active public realm, and
3. A continued emphasis on departmental and academic excellence.

The result were three respective options:

- Eco-Districts, emphasizing sustainable design and maximum outdoor environmental comfort; Creative Corridor, and Knowledge hubs.
- The Creative Corridor, emphasizing public spaces along upgraded pedestrian thoroughfares; and,
- Knowledge Hubs, emphasizing efficiently clustered academic developments that concentrate learning resources for each department.

Alternatives ranked highest by the participants were studied for their layout benefits and combined into a composite “Consensus Plan” which covered as many of the expressed concerns and preferences as possible. The result is a design organically crafted by the University community expressed through the guidance and capability for the planning team.

Fig 4–2: Campus Forum Presentation Board Graphics Used to Present the Plan Alternatives

SCHEME A:
ECO DISTRICTS

EMPHASIZES NET-ZERO ENERGY USE: CREATE DEMONSTRATION DISTRICTS WITH AN ABSOLUTE **COMMITMENT TO ECOLOGICAL SUSTAINABILITY**

This scheme emphasizes shared interdisciplinary buildings in-filled in new precincts to allow flexibility for teaching pedagogies while still reinforcing existing college and departmental clusters. Establishes a net zero goal for the use of resources with the initial efforts focused on building orientation which yields the most potential energy savings at the lowest cost. Campus open spaces are less formal and more organic in character.

KEY FEATURES

- Site design driven by optimized solar orientation moving towards a net zero campus
- Energy & water conservation
- Emphasizes green technology & infrastructure

ADVANTAGES

- Housing Village #2 at the western most end of the campus offers good separation of dining and living areas with good access to the academic core at the heart of the campus.
- Optimizes building orientation (reduces energy use for an average 100,000SF building by 2,000,000 BTUs/yr.)
- Site plan is less formal more organic, sustainable. (Sustainable principles would be applied to all schemes)
- Integrating the "Discovery Park" in the heart of campus offers an opportunity to integrate these public/ private ventures into campus academic and student life. Occupants and tenants could be explored as potential partners in the joint development of future campus support space.

DISADVANTAGES

- "Discovery Park" is buried in the campus and may not offer enough visibility for private entities.

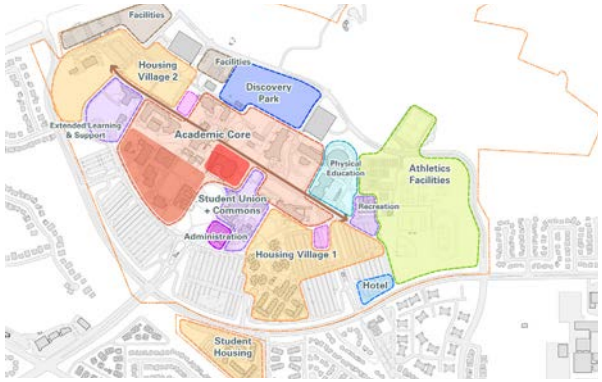


FIG 4–3: DEPICTIONS OF THE ECO DISTRICTS PLAN ALTERNATIVE

SCHEME B:
CREATIVE CORRIDOR

A CENTRAL SPACE FOR COLLABORATION: FOCUS GROWTH IN ACTIVE **MULTI-USE CENTERS** ALONG THE MAIN COYOTE WALK AND NORTH-SOUTH OPEN SPACE

This scheme acknowledges emerging trends in higher education and emphasizes shared interdisciplinary buildings in-filled along the main campus walk as a means to reinforce existing college and departmental clusters. Enhancing the campus walk with solar shade structures, shaded seating areas, sheltered study pavilions together with the entry plazas and lobbies of new buildings will create a vibrant, active link for the campus core – its focus.

KEY FEATURES

- Increased density to reduce pedestrian travel distances
- "Coyote" walk as activated public plaza / promenade
- Integrates campus life & activities
- Encourages multi-disciplinary shared space academic buildings

ADVANTAGES

- Housing Village #2 central to academic core north of Library encourages 24/7 campus life
- Academic buildings in-filled along main pedestrian walkway create more dense, urban campus
- Campus walkway becomes the active link to all precincts
- The "Discovery Park" creates a more urban gateway into campus.

DISADVANTAGES

- Public/private development at the campus entry may detract from University image
- Housing to the north may create safety concerns (increased exposure to fire and/or wildlife)

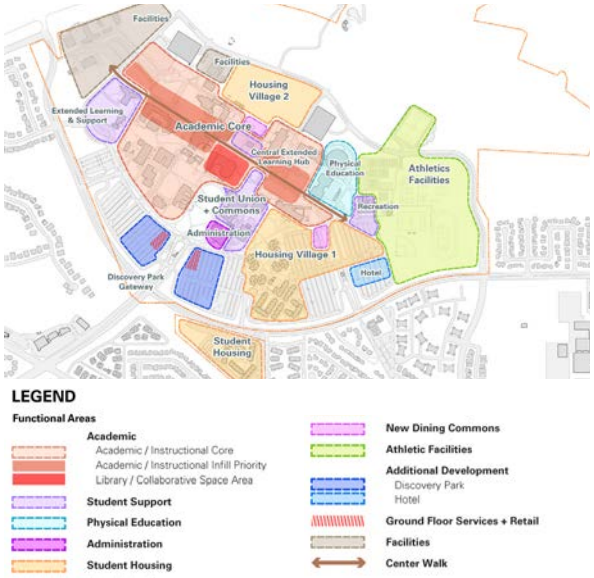


FIG 4–4: DEPICTIONS OF THE CREATIVE CORRIDOR PLAN ALTERNATIVE

SCHEME C:
KNOWLEDGE HUBS

OPTIMIZE UNIVERSITY COLLEGES/ DEPARTMENTS: **CLUSTER NEW ACADEMIC GROWTH** IN "LIKE-MINDED" COURTYARDS AND QUADS WITH RESOURCES APPORTIONED IN EACH

This scheme emphasizes reinforcing and building upon existing college and departmental clustering or precincts with new buildings placed to offer future expansion space for each program. This scheme also incorporates a new housing village and dining commons in the heart of the campus to encourage more 24/7 campus life.

KEY FEATURES

- Increased density to reduce pedestrian travel distances
- Reinforces institutional clusters
- Shares resources by department
- Emphasizes 4 or 5 "knowledge hubs"
- Reflective of campus current trends

ADVANTAGES

- Housing Village #2: central to academic core, replaces existing Administration Quad bring 24/7 campus life to the heart of the campus
- Proposes future student housing and some retail at the entry of the campus to create a more urban campus with a broader sense of community.
- "HUBS" offer opportunities to cluster similar academic programs and share specialized teaching spaces.

DISADVANTAGES

- De-emphasizes trends in higher education towards more collaborative, inter-disciplinary buildings.
- Student housing at the entry of the campus may not present the correct "University" image to the community.

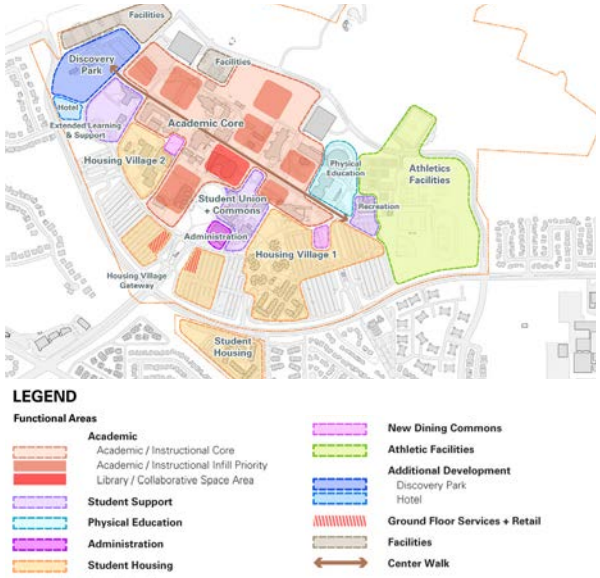


FIG 4–5: DEPICTIONS OF THE KNOWLEDGE HUBS PLAN ALTERNATIVE

SCHEME A:
ECO DISTRICTS

20%

ACTUAL VOTES

- "I like this scheme. The residential areas are nearby, but far enough to support safety and privacy. "
- "Covered solar walkway for center walk like Arizona is very smart"
- "This concept is spot-on. However, the campus entry as all parking lots still gives the visual of a commuter campus"
- "Glad to see the "Land Lab" on the north side of Campus Drive is protected. Land on the south side of Campus Drive should be low use and buffered to minimize edge effect impacts."

- Stakeholder Comments

SCHEME B:
CREATIVE CORRIDOR

53%

ACTUAL VOTES

- "I like an emphasis an sustainability and conservation (A) but I like B's arrangement better overall."
- "Scheme B is the most inclusive to a social/ community campus."
- "I love the concept of really creating a main walkway."
- "Housing at back of campus would be catastrophic for observatory. would ruin ability to use observatory!"
- "Love it!!"

- Stakeholder Comments

SCHEME C:
KNOWLEDGE HUBS

27%

ACTUAL VOTES

- "Have student services, activities & food available in the PM -bring the campus alive!"
- "Academic core is very intimate. May push students to be on schedule & focus more."
- "Having residential structures in front of the school between people coming in academic structures in the back may detract from the privacy residents enjoy."
- "Discovery Park is great but not taking over our core - scheme C"
- "Combine scheme B & C"

- Stakeholder Comments

4.4 LANDSCAPE + OPEN SPACE COMMENTS

SCHEME A:
ECO MATRICES

20%

ACTUAL VOTES

- "Natural elements also bring in more environmental studies majors. Great way to bring in more students."
- "Preserve remnant patches of native habitat within the developed matrix of campus like at Ash St. and within campus circle near Biology Bld."
- "This option makes sustainability efforts very visible, making people more familiar with it as it spreads in communities."
- "Like demarcation between athletics & open space - want incorporate promenade in concept B"

- Stakeholder Comments

SCHEME B:
PROMENADE CONNECTIONS

80%

ACTUAL VOTES

- "In need of social areas outdoor to enjoy and appreciate the camps beauty! But enhanced safety and 24/7 entertainment on campus"
- "Shared walking, great idea. Attracts students to be more involved outdoors!"
- "Develop outdoor spaces for student gathering & programs"
- "Emphasize drought tolerant with color! All schemes"

- Stakeholder Comments

SCHEME C:
COLLEGE COMMONS

0%

- "I like the idea of a grand entrance in BGC but what does that do about traffic?"
- "Combine secondary campus " loop" with main campus walk"

- Stakeholder Comments

4.5 INTERNAL EVALUATION

The master plan team has internally evaluated the plan alterntive schemes, judging how well each scheme can implement or fulfill the master plan Vision on a score of one to four. Each scheme score is summarized by Goal. A grand total average score across all plan proposed policies suggests the appropriateness of each scheme in meeting those Goals laid out by the campus administration and students through the visioning process.

- Excellent
- Good
- Satisfactory
- Poor

			Scheme A "Eco Districts"	Scheme B "Creative Corridor"	Scheme C "Knowledge Hubs"
1	**CREATE LEARNING COMMUNITIES TO BUILD FULLY SUPPORTIVE LEARNING ENVIRONMENTS**	**Issue:**			
1.1	Provide a **dynamic** and **agile** physical environment with instructional spaces that efficiently respond to evolving pedagogies.	**Urban Design**			
1.2	Increase student, faculty and staff **housing options** in residential communities that enable positive interaction among diverse groups and a supportive growth environment.	**Program**			
1.3	Continue to enhance **academic** and **research** opportunities at all levels.	**Program**			
1.4	Emphasize a **state-of-the-art** environment that captures the advantages of new and progressive ways of learning and **communicating**, and supports those connections in a flexible physical realm.	**Urban Design**			
2	**EMBODY A REGIONAL LEARNING HUB**	**Issue:**			
2.1	**Attract** and **retain** diverse and qualified students.	**Program**			
2.2	Support and promote student and faculty **academic exchanges**.	**Urban Design**			
2.3	Create a campus that serves as a "**living lab**" for regional sustainability, local education, and community discovery.	**Resources**			
2.4	Provide a welcoming setting to engage the **Inland Empire** community with special events, academic programming, and facilities that serve as a **shared asset**.	**Public Realm**			

Excellent Good Satisfactory Poor

			Scheme A "Eco Districts"	Scheme B "Creative Corridor"	Scheme C "Knowledge Hubs"
3	**SUPPORT INNOVATION AND SCHOLARSHIP**	Issue:			
3.1	Continue to foster a culture of high-level teaching, academic research, and inquiry with **improved interaction** between faculty, staff and students.	**Urban Design**			
3.2	Maintain all academic programs at competitive levels with an emphasis on **interdisciplinary** interaction and **collaborative** innovation.	**Program**			
3.3	Assist teaching efforts by increasing and coordinating access to on campus **supporting services** and **resources**.	**Urban Design**			
4	**ATTAIN A REGIONALLY AND GLOBALLY RECOGNIZED INSTITUTION**	Issue:			
4.1	**Attract** and **retain** diverse and outstanding faculty and staff, and comfortably **host** equally inspiring guests on campus.	**Urban Design**			
4.2	Build a campus world renowned for **leadership** in achieving, teaching, and inventing demonstrable environmental **sustainability** and resource resiliency.	**Resources**			
4.3	Develop around learning communities and knowledge **centers** which **focus interdisciplinary collaboration** and serve as the foundations for broad-ranging, integrated, globally-renowned research, academic, and entrepreneurial programming.	**Program**			
5	**GROW FUNDAMENTALLY SUSTAINABLE AND RESILIENT**	Issue:			
5.1	Direct **campus growth** to respond directly to FTES projections while emphasizing maximization, flexibility, and communication technology.	**Program**			
5.2	Apply a **landscape** and plant materials program that centers on water conservation and open space prioritization.	**Resources**			
5.3	Provide a **mix of land uses** on campus that increases economic and environmental resiliency by reducing vehicle miles travelled.	**Program**			
5.4	Find and exploit synergies between environmental sustainability and **financial resiliency**.	**Urban Design**			
5.5	Reduce the campus **carbon footprint** and water use through demand reduction, renewable energy generation, and efficient systems.	**Resources**			
5.6	Maximize **resource recycling** to retain and reuse water, divert garbage from the waste stream, and productively exploiting the water and energy nexus where possible.	**Resources**			

			Scheme A "Eco Districts"	Scheme B "Creative Corridor"	Scheme C "Knowledge Hubs"
6	**INSTIGATE GREATER ENVIRONMENTAL RESILIENCE IN THE REGION**	Issue:			
6.1	Influence **individual practices** to reduce energy use, water use, and waste generation in buildings and on campus.	**Resources**			
6.2	Strengthen and streamline **transportation alternatives** to single occupant cars – focusing on transit, bicycle, and car sharing systems.	**Transport**			
6.3	Exceed established sustainability standards while **measuring** and **broadcasting** those achievements through signage and online media.	**Resources**			
6.4	Leverage academic programs and partnerships with industry and the community to broaden the **expansion** of **green industries** and practices in the region.	**Program**			
7	**SUPPORT INNOVATION AND SCHOLARSHIP**	Issue:			
7.1	Create more **programs** and opportunities to engage with the larger **community**, on and off campus.	**Program**			
7.2	Operationalize **campus grounds** as a shared community learning and **healthy living resource** that also fosters social integration, food security, and opens minds to resilient ways of living.	**Public Realm**			
7.3	Configure campus access to guide and curate community access to campus **public assets** that include the mountains, key view corridors, and key program locations.	**Transport**			
8	**STRONG COHESIVE COMMUNITIES**	Issue:			
8.1	Apply concepts of community-based security by increasing interaction and **human presence** in common areas that have **clear identity** and purpose.	**Urban Design**			
8.2	Strategically and efficiently upgrade **lighting** and **communication** systems to enhance security and visibility.	**Resources**			
8.3	Create a clear, consistent, and legible **wayfinding system** that emphasize clear paths of travel and access to services.	**Transport**			
9	**ATTAIN A REGIONALLY AND GLOBALLY RECOGNIZED INSTITUTION**	Issue:			
9.1	Establish and capitalize on the University's preeminence in the Inland Empire to **develop partnerships** with local regional and global governments, private industry, and non-profit entities.	**Program**			
9.2	Arrange to provide **amenities** and **services** including retail, a range of food services, child care, recreation, and entertainment on campus.	**Program**			

Excellent Good Satisfactory Poor

			Scheme A "Eco Districts"	Scheme B "Creative Corridor"	Scheme C "Knowledge Hubs"
9	**ATTAIN A REGIONALLY AND GLOBALLY RECOGNIZED INSTITUTION (CONT.)**	**Issue:**			
9.3	Develop academic and **training** programs with **industry** partners to help make CSUSB students uniquely competitive in the global marketplace.	**Program**			
10	**ACCOMODATE PRODUCTIVE ENTREPRENEURIAL PARTNERSHIPS**	**Issue:**			
10.1	Build settings for **research & development**, **internship** and **entrepreneurial** opportunities that bring industry and students together.	**Program**			
10.2	Explore the potential to diversify financial resources and enhance economic resilience by increasing **community activity** on campus.	**Program**			
10.3	Prepare cutting edge facilities to host memorable **events** that inspire the **alumni** community, financial **supporters**, and potential **partners**.	**Public Realm**			
11	**BUILD A VITAL URBAN CAMPUS ENVIRONMENT**	**Issue:**			
11.1	Create recognizable, navigable, and **comfortable pedestrian settings** to enhance studying, socializing, and participating on campus.	**Public Realm**			
11.2	Develop ample **housing** options that enable a diverse range of students to **integrate** academically and socially to create life-long bonds.	**Urban Design**			
11.3	Cultivate an attractive and livable campus through a range of **public spaces** and a critical mass of **mixed uses** that include more retail, services, entertainment, and food options, access, and popularity.	**Public Realm**			
11.4	Expand and equip **athletics** and **recreation** facilities to support competitive teams and healthy lifestyles.	**Public Realm**			
12	**PROMOTE COYOTE SPIRIT**	**Issue:**			
12.1	Strategically promote a unique and **coherent** university **brand** across the region and beyond to attract desired people, partnerships, prestige.	**Urban Design**			
12.2	Take advantage of cross-promotional and **messaging opportunities** with city and regional partners.	**Urban Design**			
12.3	Position the University within the community and CSU system to be renowned for maximized **opportunity** through leadership in **sustainability**.	**Resources**			
	SUMMARY ASSESSMENT:				

4.6 THE 2016 CONSENSUS PLAN: “CREATIVE CONNECTIONS”

The Composite Consensus Approach is the product of combined input from the Master Plan Advisory Board, University and Department administrators, representatives of the Chancellor’s Office, and of course the faculty, staff, and students. It is not the final plan, but rather a preliminary view of the programmatic layout, organization, and intensity aspects of what will be developed and refined into a final preferred plan. The driving impetus behind this composite strategy is to connect multi-use and some purpose built facilities with linear common spaces that foster chance encounters, interdisciplinary collaboration, and social belonging. Interconnecting disparate campus hubs, concentrating and comingling uses, all while activating those linear open spaces will transform CSUSB Main Campus from a place to “pass through” into a place where everyone will want to be.

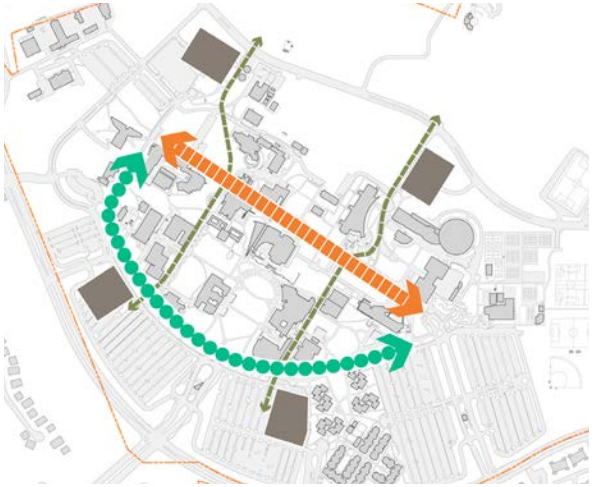
CONNECT

Upgrade open spaces along two major, and two minor corridors to establish clearer routes across campus with a unique landscape character that establishes a unique place along each thoroughfare.

Coyote Promenade (Campus Core)

Sycamore Walk (Residential Villages)

Access Routes / Garages



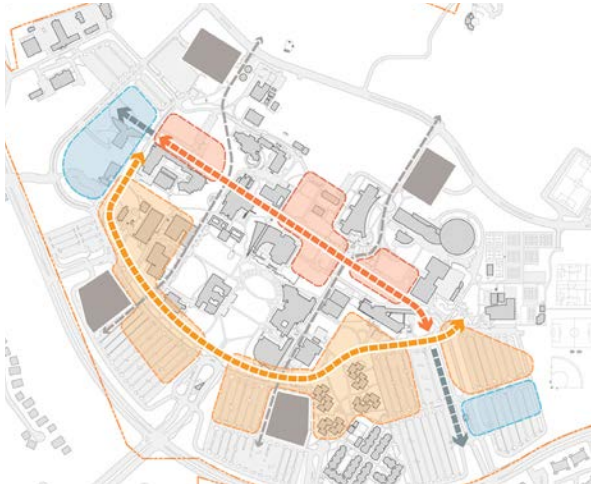
CONCENTRATE

Focus new academic and student support facilities along the Coyote Promenade, while clustering student residential villages along the Sycamore Promenade. Anchor the ends of both with additional development.

Academic Corridor

Residential Corridor

Entrepreneurial Anchors



ACTIVATE

Activate the Coyote Promenade, Sycamore Walk, and the Community Gateway Plazas with ground level program and outdoor amenities that serve students academically and socially, and support commuter / resident interactions.

Services + Amenities

Outdoor Pedestrian Plazas

Community/Commuter Gateway Plazas

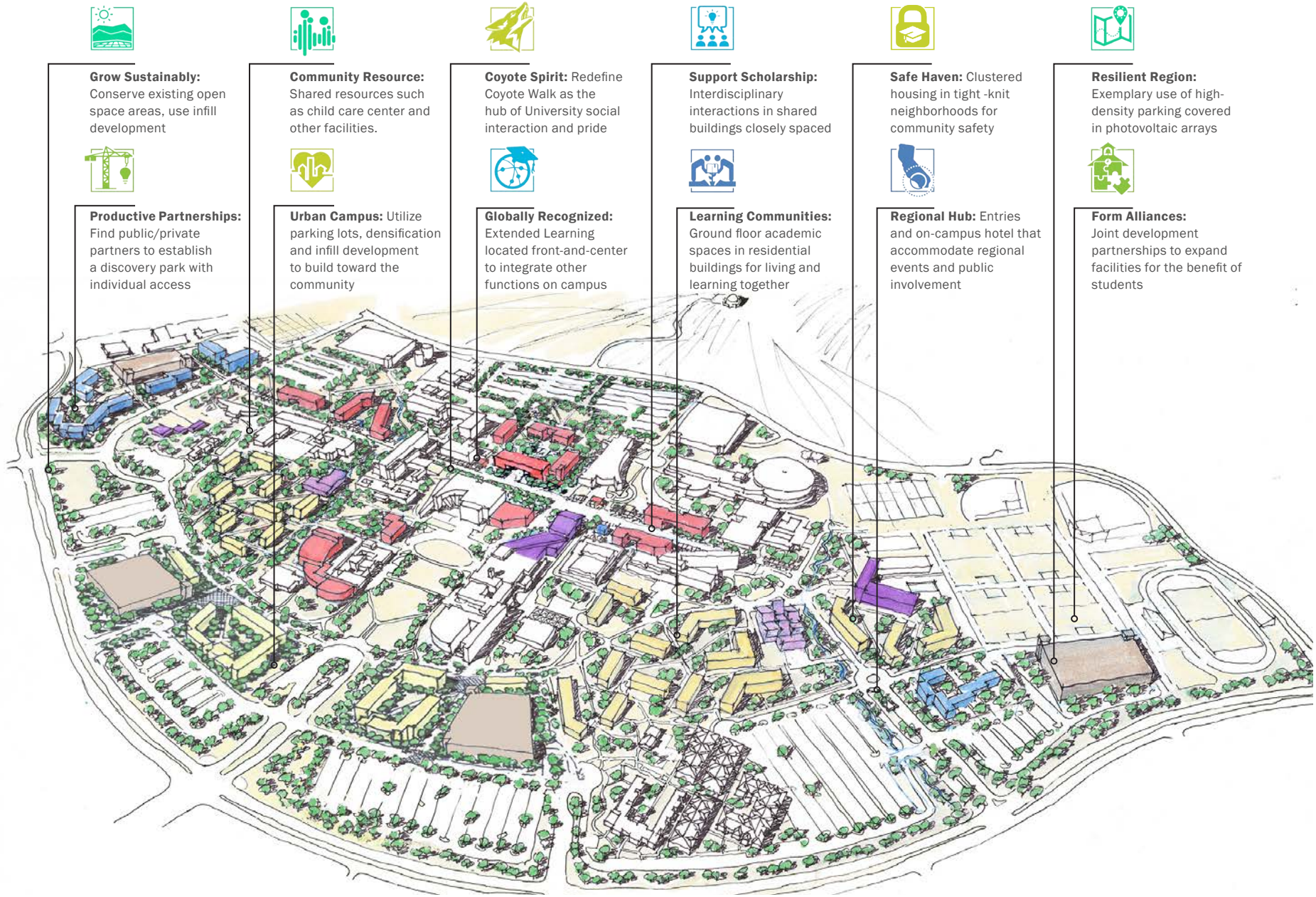
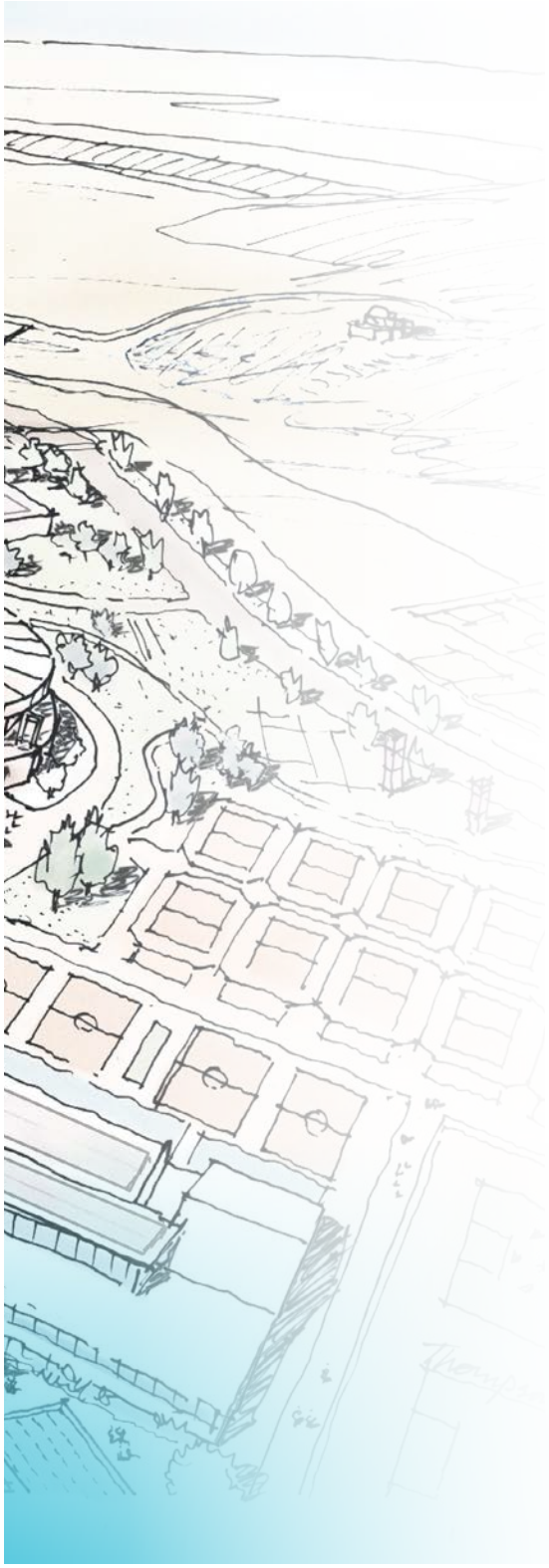


FIG 4–6: CONSENSUS PLAN ILLUSTRATION AND RESPONSIVENESS TO PLAN OBJECTIVES

5 2016 CSUSB MASTER PLAN FRAMEWORK



5.1 THE MASTER PLAN FRAMEWORK

The 2016 CSUSB Master Plan envisions an inclusive, holistic and coordinated series of proposals to provide direction for the future development of the CSUSB. This plan acknowledges the character-defining attributes of the campus and puts forward a strategy of layered improvements that will enable the University to realize its potential as a fully-fledged learning community.

INTRODUCTION AND ASSESSMENT

The 2016 CSUSB Master Plan is an organizational tool to address the needs of a steadily increasing student population; but, it is also a rare opportunity to extend the long term vision for a different and forward looking campus environment that functions wholly differently than the CSUSB of today. Therefore, the plan document provides campus development proposals generally in two ways: first, as a series of layered planning frameworks covering major planning topics: development, sustainability, transportation + circulation, landscape and community positioning; and second, through a series of corresponding specific plans that follow this chapter and which provide detail to each planning framework layer by identifying a number of near and long term projects.

The planning framework layers that follow are introduced in an Approach section followed by a section that outlines a series of Framework Strategies. In turn, the entire set of planning frameworks is introduced by the illustrative plan (following page), which depicts a lucid vision for a CSUSB campus supporting 25,000 full time equivalent students.

Visionary thinking has, and will remain, a touchstone of growth at CSUSB; built in 1968, the Pfau library remains the campus's largest building. Founding President John M. Pfau, Second from left.

5.2 THE 2016 CSUSB CAMPUS MASTER PLAN

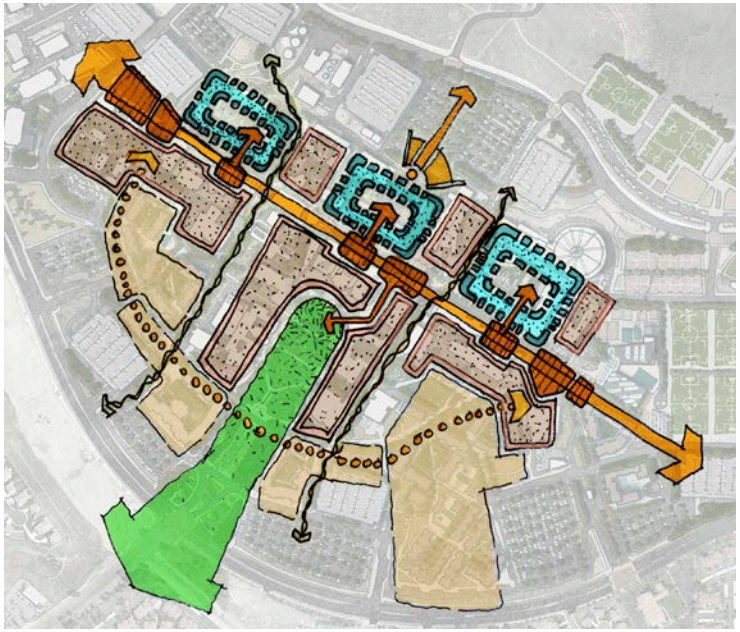
The central precept of the campus proposed in this master plan is a more graceful mixed-use academic setting amenable to pedestrian activity and an active social sphere.

OVERALL PLANNING APPROACH

The illustrative plan shown on the facing page represents the consensus approach to growing the University to meet the established enrollment growth objective, the resultant space requirements and stated goals for the desired character of the campus. It illustrates a plan for development that will result, at full build out, of a cohesive campus setting with a logical distribution of campus functions; appropriate adjacencies of the uses; practical circulation systems (vehicle, pedestrian, bicycle and service) that serve the distributed functions; attractive yet sustainable landscape and open space systems all of which serve the University's mission and objectives into the future.

Over time, variations on this plan may need to be prepared that respond to emerging needs, changing programs and/or new approaches to financing that might include alternative configurations for building footprints; alternative arrangements of buildings, open space and other campus facilities; and changes to the implementation and phasing scenarios shown in Chapter 10. These variations will be acceptable if they adhere to the Vision Statement and Principles, the Master Plan Planning Framework described herein and the Design Guidelines (Appendix A). For the remainder of this report, this illustrative plan will be referred to as the 2016 Master Plan.

Exhibit 5-1 represents the campus at full build out with recommended new facilities in bold outlines. Each of these proposed new buildings is described in detail in Part II of this document.



Key Campus Development Features

1. Pfau Library Expansion + Infill
2. Academic Development on Coyote Walk
3. Theater Complex + Auditorium
4. New Residential Dining Halls
5. Expanded Student Union + Rec Center
6. Residential Gateway Village Housing
7. CEL Hybrid Knowledge Center
8. Discovery Park + Sheriff's CSI Lab
9. On-Campus Hotel and Conference Center
10. Athletic Field + Track Stadia/Seating
11. Physical Education + Kinesiology Facilities

Key Campus Sustainability Features

12. Solar Photovoltaic (PV) Arrays Over Parking
13. Solar PV Canopies Over Pedestrian Plazas
14. Student-Run Edible Grove + Garden
15. Drought Tolerant Turf Replacement

Key Transportation + Circulation Features

16. Proposed Parking Structure + Police Station
17. Enhanced Social Setting on Coyote Walk
18. Transit Plaza + Special Event Drop-Off
19. Pedestrian-Oriented "Urban Trails"

Key Landscape + Open Space Features

20. Expanded + Revitalized Athletic Facilities
21. Interdisciplinary Collaboration Quads
22. Extended Gateway Commons
23. Pedestrian-Oriented Arrival Plazas

Existing Development

Proposed Academic Development

Proposed Campus Housing

Proposed Parking Structures

FIG 5–1: CSUSB ILLUSTRATIVE MASTER PLAN

0 200′ 500′ 1000′ 2000′

5.3 CAMPUS DEVELOPMENT FRAMEWORK

Development will be positioned in distinctive mixed-use precincts. Academic development will be concentrated along the "Coyote Walk" precinct to provide for resource sharing and frequent student and faculty interactions.

DEVELOPMENT APPROACH

The 2016 Master Plan builds upon the current distribution of land uses at the Cal State San Bernardino campus by organizing the campus into eight functional and geographical precincts (Figure 6-6). These precincts are based on functional and geographical adjacencies and effectively concentrate specific land uses within each precinct to provide expansion space for a broad range of programs to meet projected needs. The locations of the Master Plan land use precincts are predicated on several factors including functional adjacencies to other related uses, land availability (potential development sites defined in the Opportunities and Constraints phase of the project) and accessibility (pedestrian, vehicle and bicycle).

CAMPUS DEVELOPMENT FRAMEWORK

Locate All New Academic Infill Along the Main Campus Pedestrian Spine ("Coyote Walk"): to reinforce this as the heart of the University.

Encourage Multi-Disciplinary and Multi-Use Shared Academic Buildings: to accommodate future unknowns in specific program growth and new pedagogies.

Creates Two Campus Housing Villages and a Student Apartment Village: to encourage a more 24/7 campus environment within the campus core to integrate campus life & activities.

Configure "Sycamore Walk" to Become the "Residential Street" Within the Campus: linking all residential villages and the academic core.

Provide New Parking Structures at the Terminus of all Primary Pedestrian Pathways: to facilitate the transition from parking into the campus.

Provide Land for Future Public/Private Partnerships: to advance research and internship opportunities.

Redefines the Main Campus Gateway as a Pedestrian Public Space: by redirecting of parking entries to reduce vehicle congestion; new signage, landscape and housing will enhance the campus identity.

Advance Campus Athletics, Student Recreation and the Kinesiology Program: and include state-of-the-art baseball, softball, soccer, tennis, basketball, and swimming facilities.

Exercise Bold Sustainability Initiatives: that will make responsible use of campus resources and conserve water and energy.

Preserves the "Land Lab" Area Between the San Bernardino Mountains and the Campus: for research and to provide a buffer or firebreak for the threat of brush fires from the mountain environment.

Quickly Addresses Near-Term Space Needs: through more efficient use of existing campus space and promote the acquisition of an off-campus center in Downtown San Bernardino.

Academic Realm
Academic Precincts
Academic Development
Coyote Walk & Green Common
Student Union Development

Student Life Realm
Student Life Precincts
Student Life Development

Athletic Realm
Athletics and Recreation Precincts

Entrepeneurial Realm
Entrepeneurial Precincts
Entrepeneurial Development

Facilities Support Realm
North Campus Precincts

Campus Conservation Realm
Land Lab Precinct (Field Studies and Environmental Preserve)

Student Amenities
Recommended Dining Hall
Recommended Dining Cafe

FIG 5–2: CAMPUS DEVELOPMENT FRAMEWORK PLAN

5.4 CAMPUS SUSTAINABILITY FRAMEWORK

As one of the fastest growing campuses within the large California State University system, CSUSB has a special obligation to conserve resources, and be a demonstration of sustainability for the community.

SUSTAINABILITY APPROACH

CSUSB is a beacon for local and international students and has a tremendous opportunity to educate students, staff and the community about sustainability across the campus, in a community setting and embedded in curriculum. The CSUSB campuses reside in an arid microclimate within a suburban context; the Master Plan will re-envision resource consumption so the campus is an ecologically productive entity with energy conservation, water reuse and renewable energy production in the forefront. Further, by having the foresight and preparing the infrastructure to be adaptable, CSUSB is most prepared for natural disasters and stressors; herein lies the nexus between resiliency and sustainability. Strategic energy sources, water supply, and community support are critical and sustainable solutions embody this self-reliance.

CAMPUS SUSTAINABILITY FRAMEWORK

Sustainability Leadership – Implement this Master Plan in support of CSUSB as a Living Lab. Engage existing initiatives, utilize campus signage, and involve students in analysis and implementation of sustainability measures.

Climate Action – Estimate carbon emissions offsets related to renewable energy generation and energy independence. Emphasize Transportation Demand Management as the primary means of controlling climate impact.

Energy Indepedence – Combine reduced energy demand with extensive on-campus photovoltaic infrastructure. Use this dual strategy to serve most of campus energy needs with on-site renewable energy sources.

Energy Conservation – Adhere to Energy Use Intensity goals as the touchstone of energy conservation in campus buildings. Target energy reduction in existing buildings (conduct ASHRAE audit to establish a baseline).

Water Conservation – Use no potable water for non-potable uses. Capture rainwater and graywater for irrigation. Employ stormwater Best Management Practices using soft and green infrastructure to clean and detain runoff.

Waste Management – Seek to achieve a zero waste campus with near term increases in waste diversion. Engage student body, faculty and staff in achievement of goals, encourage education and friendly competition.

Sustainable Procurement – Require that new building projects come with a building life-cycle and demolition waste diversion plan. Include dish-washing facilities in campus housing to support a reusable tableware program for students.

Sustainable Food Services – Establish a campus-grown food program that is incorporated into the landscape and use this to support sustainable food sourcing curricula and programming.

Sustainable Building Practices – Require all new buildings to be LEED Gold and meet target EUIs for appropriate building typology.

Facilities Operations and Management – Achieve energy savings for HVAC chilled water production with increased storage and heat-recovery chiller installations. Continue facilities and equipment upgrades in conjunction with shared loop system extensions.

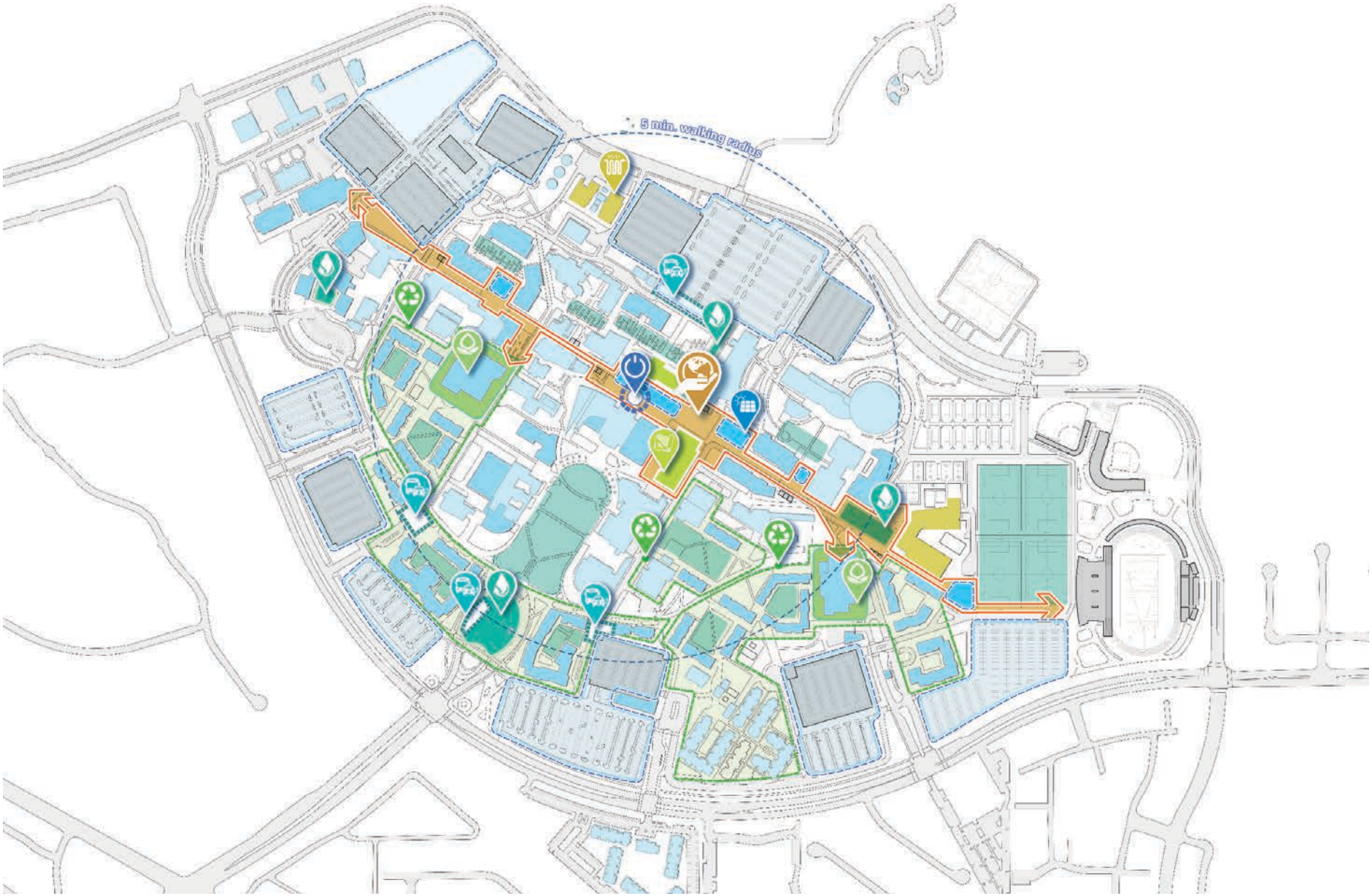


FIG 5–3: CAMPUS SUSTAINABILITY FRAMEWORK PLAN

5.5 TRANSPORTATION + CIRCULATION FRAMEWORK

Circulation functionality and unconstrained accessibility to campus is a priority above others; providing clear separation between different modes of access, with emphasis on cross-campus connectivity will set this state for future growth.

TRANSPORTATION APPROACH

The key for effective campus transportation planning is to minimize mode conflicts in order to provide a safe, comfortable, and efficient transportation system for all campus users. The CSUSB campus is generally set up to do this well, with existing vehicle circulation generally located at the campus periphery and a geographically small core campus area that can promote walking and biking. Additionally, CSUSB is connected to San Bernardino County's first Bus Rapid Transit (BRT) system, known as SBX and is accessible via multiple local bus routes.

TRANSPORTATION + CIRCULATION FRAMEWORK

Vehicle Intrusion: Currently, too many vehicles can penetrate too far into the campus, creating conflicts with pedestrians. As such, the campus should strive to "push" vehicles to the periphery of the campus to eliminate those conflicts.

Golf Cart Culture: The use of golf cars for facility service staff and disabled students around the campus is crucial; however, the extensive use of golf carts at CSUSB create conflicts with bicycles and pedestrians in the core campus area. The campus should work to manage golf cart use in the core campus area.

Bicycle and Pedestrian Culture: Promote a bicycle and pedestrian culture by providing connectivity to and from the campus and within the campus itself. The campus should work to clearly delineate bicycle routes on campus and promote bikes as a viable transportation option for the campus

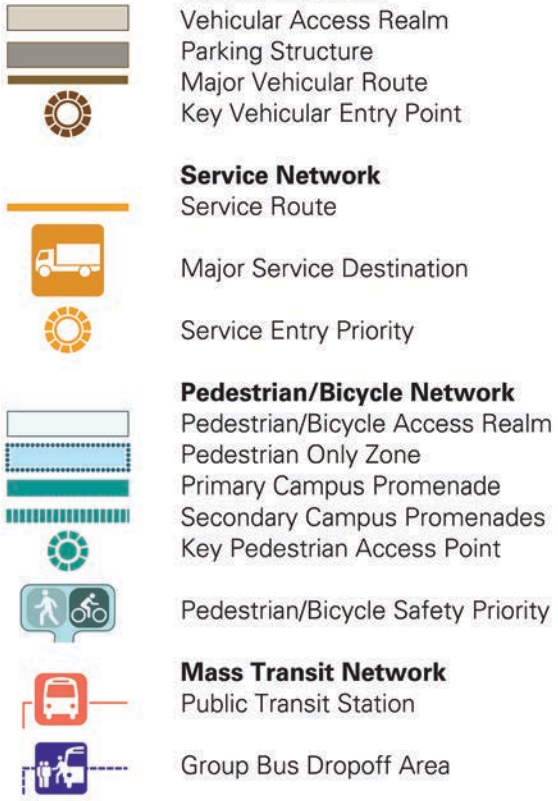
Campus Parkway Connection: Finish the "loop road" around campus and support local and regional agencies in providing a new connection to the campus via Campus Parkway. Additionally, the campus should support the City of San Bernardino, SANBAG, and Caltrans to extend Campus Parkway to the planned I-215 on/off ramp.

Transportation Demand Management: Utilize transportation demand management (TDM) techniques to minimize the need for the single-occupant vehicles and parking infrastructure. The existing campus TDM programs should be expanded.

Right-Sized Parking Facilities: As enrollment grows, so will the demand for parking at the campus. As such, the campus should strategically plan for future parking needs and manage the parking demand and parking supply such that the campus is not over or under parked.

Improving Safety: Collision data from the study area neighborhood around the campus identifies a higher number of pedestrian incidents near the campus, specifically on: Kendall Drive; at the University Avenue/Northpark Boulevard intersection; and at the Campus Circle/Northpark Boulevard intersection. CSUSB should work with the City of San Bernardino to improve safety at these locations.

Improve Campus Entry Access: Provide short-term improvements at the main entry to reduce congestion, pedestrian/auto conflicts and improve parking accessibility.



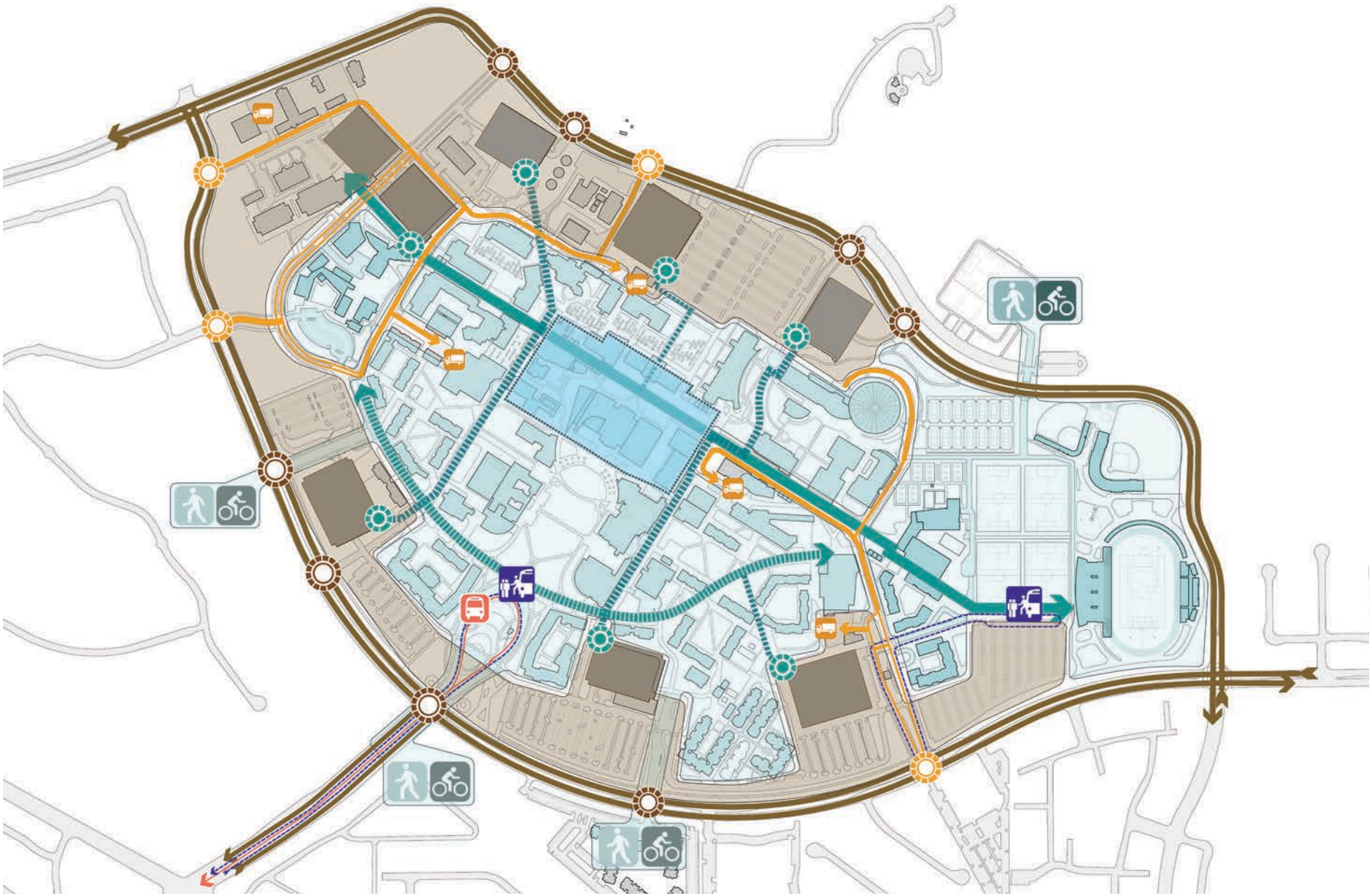


FIG 5–4: TRANSPORTATION + CIRCULATION FRAMEWORK PLAN

0 200′ 500′ 1000′ 2000′

5.6 LANDSCAPE + OPEN SPACE FRAMEWORK

The landscape plan emphasizes connective corridors and plazas along Coyote Walk with zones that help define and differentiate each area. Alternatives to turf, provide a more varied composition of drought tolerant and natural settings.

LANDSCAPE APPROACH

The primary purpose of the Landscape and Open Space Concept is to build upon the existing campus framework by strengthening the seminal components of the original plan, by organizing, by reinforcing and lending clarity to vehicle, pedestrian and bicycle circulation networks and linkages, by incorporating micro-climate interventions, by creating a more resilient and sustainable landscape systems and by reducing long term maintenance needs. The Plan holistically integrates these fundamental objectives to incrementally transform today's campus into a more welcoming, a more vibrant, a more diverse and a more sustainable environment for students, faculty staff and visitors. A campus landscape that will be experientially rich, memorable, functional and resilient.

LANDSCAPE + OPEN SPACE FRAMEWORK

Recognize and Respect the Campus Heritage: Capitalize upon and enhance the unique landscape attributes of the campus.

Formulate a Thoughtful and Purposely Ordered Landscape Framework: Build upon the existing campus framework while making strategic recommendations to evolve a more coherent and cohesive organizing framework of open spaces.

Promote and Facilitate a More Activated, Engaging and Inviting Pedestrian Realm: Campus crossroads and courtyards will be revitalized, repurposed and re-imagined to foster and to encourage vital collegiality and social interaction.

Articulate and Reinforce a Clear Hierarchy for Campus Circulation: Proposed landscape plans should seek to better balance the needs for parking, service and pedestrians by eliminating redundant facilities and by articulating a circulation hierarchy that reduces conflicts and that establishes a more welcoming and safe walking and bicycling environment.

Edit, Protect and Expand the Campus Forest/Tree Canopy: Visually organize spaces between and amongst buildings and bring nature to and complement the built form of the campus.

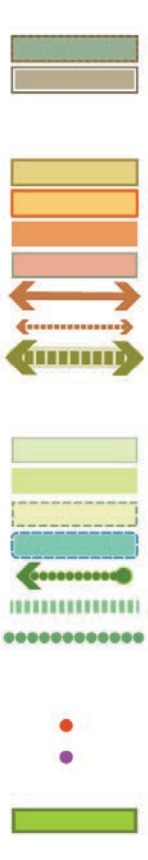
Promote, Foster and Realize a more Sustainable Campus Landscape Infrastructure: Prioritize existing campus landscape areas and make strategic recommendations to evolve a more sustainable, drought tolerant plant palette for the campus

Promote and Facilitate a More Activated, Engaging and Inviting Pedestrian Realm: Link landscape designs to resource conservation, environmental education and research imperatives by incorporating and implementing sustainable practices.

Consider the Implications of Maintenance and Life Cycle Costs of Site Design Elements: Maintenance practices will need to be adapted and the continuing education and training of staff will be imperative.

Update and Establish Proactive Guidelines for Campus Planting and Irrigation: Foster a more unified and sustainable campus landscape by holistically updating guidelines and practices.

Adopt. implement and Manage Consistent Guidelines for Campus Site Elements and Furnishings: Encourage a more unified campus and a stronger identity or "brand".



Campus Heritage Landscapes
Gateway Commons
Habitat Conservation Area

Plazas & Promenades
Arrival Plazas
Coyote Walk
Major Plazas
Minor Plazas
Major Pedestrian / View Corridor
Minor Pedestrian / View Corridor
Sycamore Walk

Quads & Green Corridors
Residential Quad
Athletic Fields
Athletic Areas
Collaboration Quad
Campus "Urban" Trails
Key Avenues + Pedestrian Lanes
Tree-Lined Streets

Key Signage & Public Art
Key Public Art Opportunity
Key Signage Opportunity

Potential Community and "Farm-to-Table" Edible Gardens

FIG 5–5: LANDSCAPE + OPEN SPACE FRAMEWORK PLAN

PART II

MASTER PLAN ELEMENTS

CAMPUS DEVELOPMENT PLAN

SUSTAINABILITY + COMMUNITY RESILIENCE

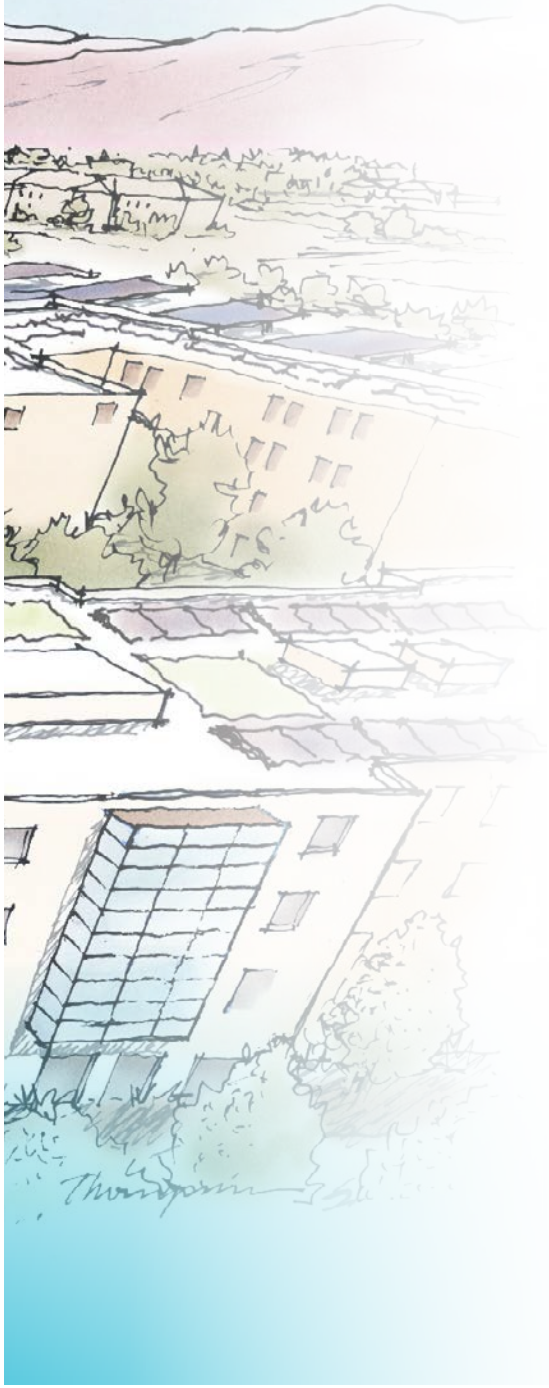
TRANSPORTATION + CIRCULATION

LANDSCAPE + OPEN SPACE

SIGNAGE, WAYFINDING + SECURITY

IMPLEMENTATION + PHASING

6 CAMPUS DEVELOPMENT PLAN



6.1 INTRODUCTION + APPROACH

The development schemes proposed in this 2016 Master Plan represent a fundamental shift in how CSUSB evolves. Emphasis on better utilization of the campus interior through denser infill projects along Coyote Walk will create a central corridor lined with shared use facilities, bustling with collaborative interactions and social activity.

INTRODUCTION

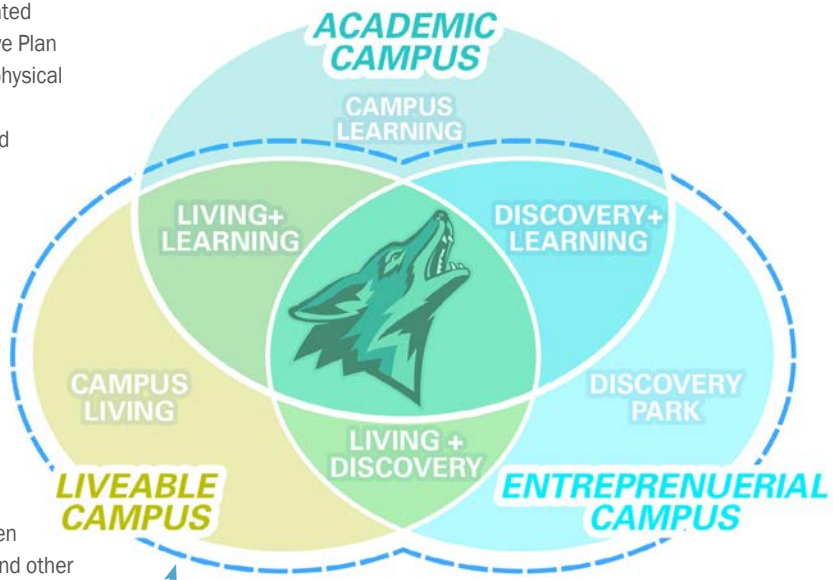
The basic master plan framework underlying the 2016 Master Plan was described in Chapter 5 as delineated through a series of Framework Plans, the Illustrative Plan and summary tables. These articulate the overall physical planning concepts of the 2016 Master Plan. This Chapter and those that follow, focus on the detailed elements of the 2016 Master Plan.

This Chapter through a series of development plans describes in more detail proposed building locations and uses, academic districts, a summary of overall campus development programs and defines recommended development projects by precinct.

These detailed specific plan elements represent a consensus within the campus community as to the most appropriate way in which buildings, open spaces, pedestrian pathways, roadways, parking and other facilities can be built or arranged on the CSUSB campus to fulfill the University's needs in growing the campus to a capacity goal of 25,000 FTE. The Master Plan's building arrangements shown in the Illustrative Plan (Exhibit 5-1) and the other exhibits provide general guidelines for the planned new facilities on campus. The exact size and arrangement of new, remodeled, and renovated facilities will be determined at the time of their development.

Other specific aspects of the 2016 Master Plan are further described in a Sustainability Plan (Chapter 7), a Transportation and Circulation Plan (Chapter 8), a Landscape Plan (Chapter 9) and a Security and Signage Plan (Chapter 10).

A series of Appendices include a schematic approach to the campus infrastructure needed to implement the 2016 Master Plan proposals and Campus Design Guidelines to insure consistency and harmony in the design of future buildings within the campus context.



The 2016 CSUSB Master Plan will expand and integrate these elements.

6.2 PROPOSED USE FOR NEW BUILDINGS

The 2016 Master Plan proposes the use of existing campus land to develop all needed facilities while preserving campus open space. As the plan unfolds over time, these proposed uses may change or adjust to allow for changes in enrollment patterns, pedagogy or other unknown factors - adaptable building design is, therefore, essential.

BUILDING USE

The plan envisions the strategic infill of required new buildings to frame smaller, more intimate courtyards and open spaces and ultimately create a denser, more walkable and collegial campus environment while at the same time reinforcing existing land uses. The Master Plan also makes use of some existing surface parking lots for new building sites (which will require replacement parking in the form of parking structures to make more efficient use of land) and proposes through building removal, the reuse of building sites that are currently occupied by facilities that have reached the end of their useful lives or will do so within the 2016 Master Plan's planning horizon. Figure 6-1 indicates planned uses for all new buildings included in the 2016 Master Plan. Acknowledging that growth in specific academic programs cannot necessarily be accurately predicted, the 2016 CSUSB Master Plan proposes a flexible approach to the development of new academic buildings.

As the campus grows this will allow for changes to specific building programs that respond to fluctuating enrollment patterns, changes in pedagogy or other unknown factors. This approach corresponds to trends in higher education throughout the United States that emphasize shared interdisciplinary academic spaces on University campuses.

LONG TERM CAMPUS BUILDOUT

Using the projected enrollment growth and space needs assessments as described in Chapter 2.2, the 2016 Master Plan provides all necessary facilities to accommodate a student population of 25,000 FTES at full long-term build-out. Table 6-1 summarizes the gross square footage requirements to meet the defined space needs by major space/facility category: Academic and Instructional Space, Campus Life and Student Support Space, Entrepreneurial Space (Discovery Park and Public-Private-Partnership or P3) and Parking Facilities.

Major Campus Space Categories	Estimated Need	Master Plan Proposed
Instructional	600,000	510,430
Library & Collaborative	398,000	398,850
Physical Education	116,000	117,000
Student Support	189,000	191,685
Administration	95,000	130,860
Assembly & Exhibit	168,000	169,635
Physical Plant	15,500	20,400
TOTAL	1,581,500	1,538,860

TABLE 6–1: Long Term Academic Buildout Summary Yields

FIG 6–1: CAMPUS PROPOSED BUILDINGS AND THEIR OVERALL USES

FIG 6–2: ACADEMIC DISTRICTS: A COLLEGE ZONES PROPOSAL

ACADEMIC DISTRICTS

Exhibit FIG 6-2 illustrates Academic Districts defined by discipline or College that have been planned to be expanded in the 2016 Master Plan to accommodate new infill building sites within those districts. Infill has been planned to provide opportunities for program expansion for each College or discipline subject to actual enrollment growth in each specific program.

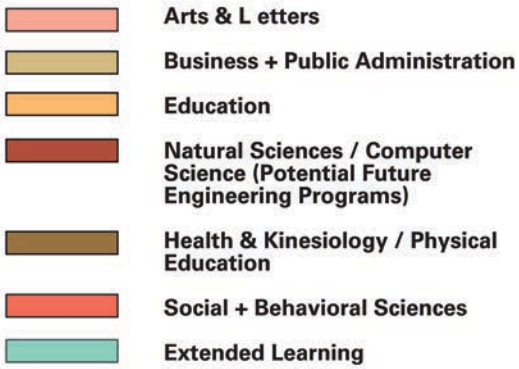


TABLE 6–2: CSUSB 2016 MASTER PLAN DEVELOPMENT YIELD SUMMARY

ACADEMIC SPACE CATEGORIES	PROPOSED		
Instructional	485,430	GSF	
Library & Collaborative	321,480	GSF	
Physical Education	117,000	GSF	
Student Support	129,435	GSF	
Administration	106,060	GSF	
Other Spaces	123,095	GSF	
Physical Plant	20,400	GSF	
ACADEMIC SPACE TOTAL	1,302,900	GSF	

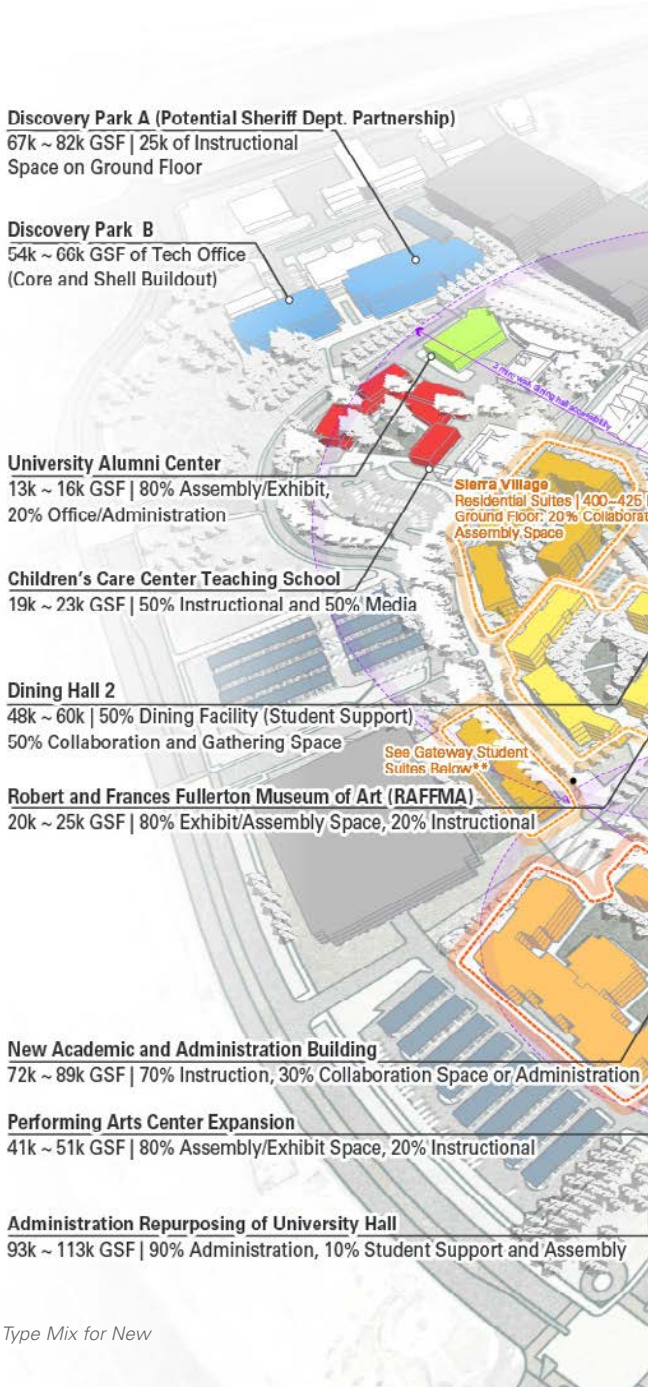
STUDENT LIFE FACILITIES YIELD SUMMARY	PROPOSED		BEDS	
Residential Halls	468,160	GSF	1,431	Beds
Residential Suites	360,620	GSF	1,085	Beds
Apartments	342,760	GSF	802	Beds
Library & Collaborative (Student Housing and Dining Halls)	77,370	GSF		
Student Support (Included with Dining Halls)	62,250	GSF		
Administration (Police Station adjoining Parking Garage)	24,800	GSF		
Other Spaces (Student Housing and Dining Halls)	46,540	GSF		
CAMPUS TOTAL NEW HOUSING GSF	1,171,540	GSF	3,317	Beds
STUDENT LIFE FACILITIES SUBTOTAL GSF	1,382,500	GSF		

ENTREPRENEURIAL FACILITIES	PROPOSED		KEYS	
Instructional (Ground Floor of CSI Laboratory)	25,000	GSF		
Discovery Park (Excludes Ground Floor of CSI Laboratory)	110,000	GSF		
Hotel and Conference Center Total	65,700	GSF	80	Keys
CAMPUS TOTAL ENTREPRENEURIAL DEVELOPMENT	200,700	GSF		

TOTAL CAMPUS PROGRAMMED DEVELOPMENT PROPOSED	2,886,100 GSF

6.3 CAMPUS DEVELOPMENT SUMMARY VIEW

An overview of the proposed CSUSB campus for 25,000 FTE shows the intricate weaving of new and existing facilities that, together, build a coherent learning environment. Follow-through on this plan, building the right amount of floor area and mix of uses in each project, will secure the long-term large-scale balance of needed facilities.



LONG TERM CAMPUS DEVELOPMENT OVERVIEW

The Campus Development Overview (at right) illustrates the campus at the full 25,000 FTE buildout with each project defined by its projected use (color designation) and projected size (GSF-gross square feet). The number of floors of various proposed buildings is also illustrated. The Campus Development Overview exhibit shows all of the major planned facilities required for a complete and functioning 4-year University campus of 25,000 students. The final determination of the exact size and arrangement of new, remodeled, and renovated facilities will be determined at the time of their development.

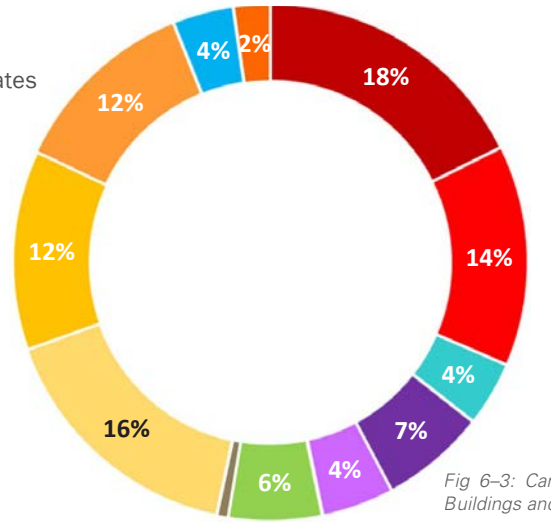


Fig 6–3: Campus Development Space Type Mix for New Buildings and Major Re-Use Projects

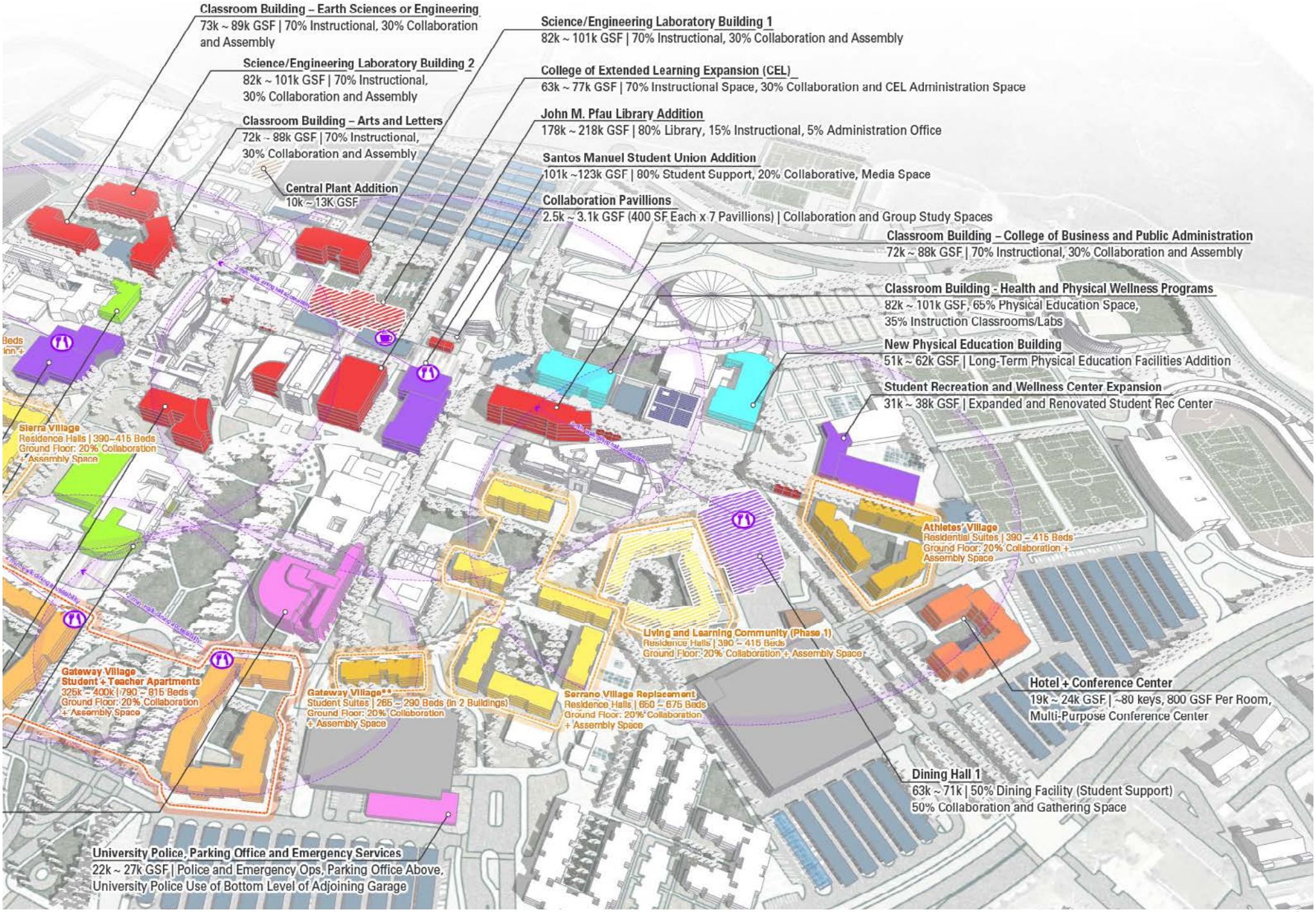


FIG 6–4: CAMPUS DEVELOPMENT OVERVIEW

6.4 PRECINCT PLANS

Each campus Precinct reflects a different inherent character, and will fulfill unique roles for the University. This organizational approach builds upon existing major functional precincts observed on the current CSUSB campus.

CAMPUS PRECINCT PLANS

The 2016 Master Plan builds upon the current distribution of land uses at CSUSB by organizing the campus into eight functional and geographical precincts (seen at right). These precincts are based on functional and geographical adjacencies and are formed around a series of smaller, more human scaled open spaces which in turn are linked by an enhanced pedestrian/bikeway path network.

The precinct plans effectively describe proposed building programs and sites that provide expansion space for a broad range of programs to meet projected needs. Configuration of the 2016 Master Plan land use precincts are predicated on several factors including functional adjacencies to other related uses, land availability (potential development sites defined in the Opportunities and Constraints phase of the project) and accessibility (pedestrian, vehicle and bicycle).

The development sites shown in the precinct plans have been chosen to achieve the following Master Plan goals:

- Increase campus density and reduce walking distances by infilling new buildings to create new smaller, more human scaled open spaces;
- Efficiently make use of University-owned land including land currently occupied by facilities that have reached the end of their useful life cycles;
- Avoid using culturally and functionally significant campus open spaces for new building sites;
- Reinforce the pedestrian pathway system (Coyote Walk) by siting all academic buildings along this primary pedestrian pathway and ensure that all building entrances are oriented to campus walkways.
- The Master Plan precincts should be linked by an enhanced pedestrian pathway system that focuses on Coyote Walk and Sycamore Walk and that incorporates major open space and pathway elements of the landscape/open space plan.

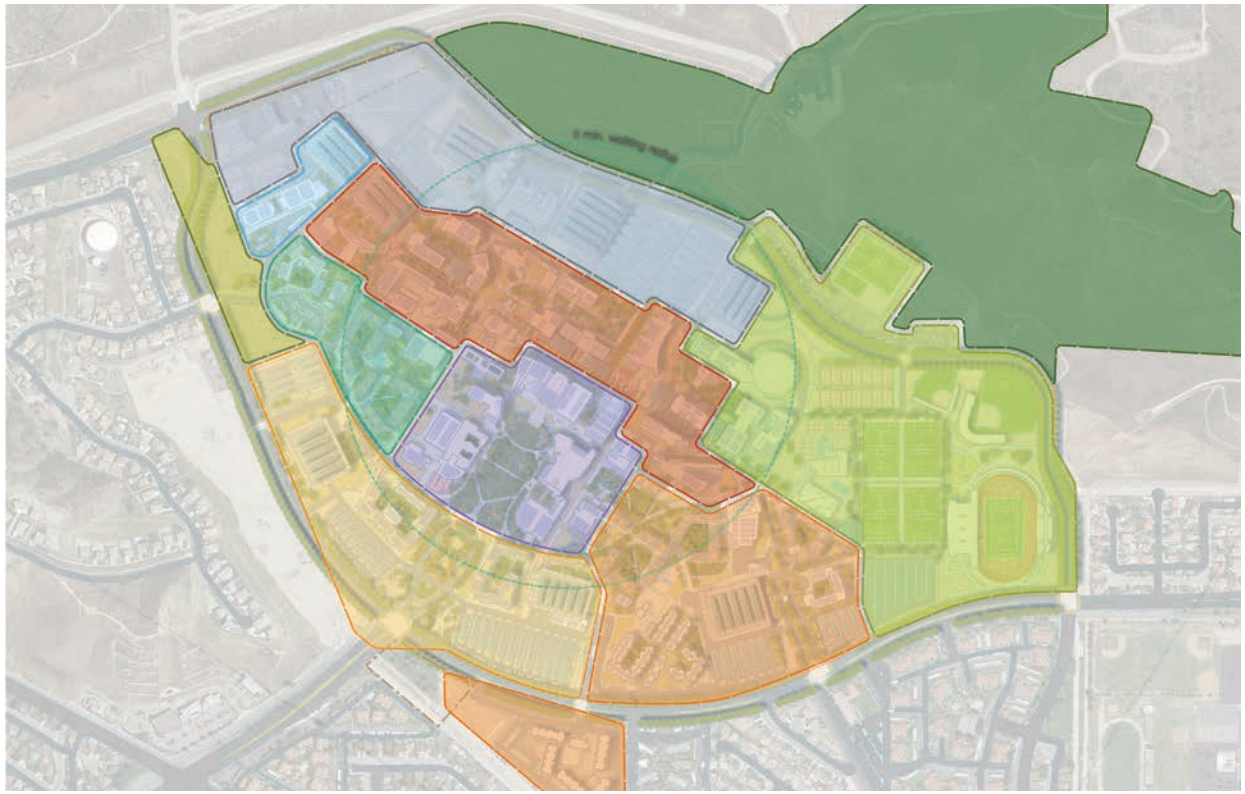


FIG 6–5: PROPOSED CAMPUS PRECINCTS

6.5 UNIVERSITY COMMONS PRECINCT

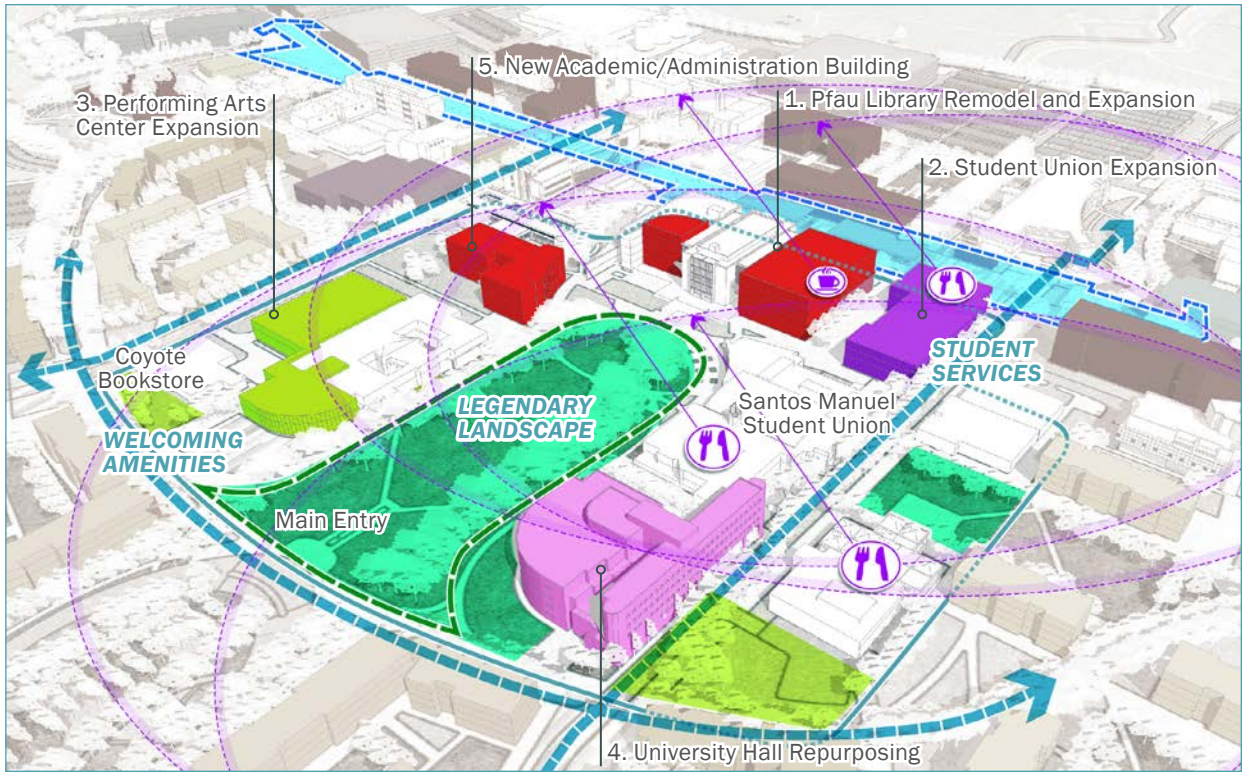


FIG 6–6: UNIVERSITY COMMONS PRECINCT LAYOUT

Major Landscape areas
Long Term Landscape Preservation
Major Turf Area
Note: Buildings colored by predominant use

Major Access Route
Coyote Walk Central Corridor
Precinct Boundary

Major Amenity Proposed (5 min. walking radius)
Minor Amenity Proposed (5 min. walking radius)

ACADEMIC SPACE CATEGORIES	PROPOSED	
Instructional	86,100~105,250	GSF
Library & Collaborative	177,750~217,250	GSF
Physical Education	-	GSF
Student Support	85,450~104,450	GSF
Administration	92,750~113,400	GSF
Other Spaces	45,500~55,600	GSF
Physical Plant	-	GSF
ACADEMIC SPACE TOTAL	487,550~595,850	GSF

TABLE 6–4: University Commons Precinct Development Summary

This precinct is located at the main entry to the campus and includes those buildings that surround the signature central quadrangle. These buildings serve the larger campus and the overall community of San Bernardino and represent the public face of the University.

The 2016 Master Plan recommends a series of building remodels, repurposing and new buildings within this precinct:

1. PFAU LIBRARY REMODEL AND EXPANSION

- general administration | 8,950~10,900 GSF
- instructional | 26,800~32,750 GSF
- library, media, collaborative | 143,000~174,750 GSF

TOTAL | 178,750~218,400 GSF

Originally constructed in 1971 with a major addition completed in 1994, the John M. Pfau Library has been and remains the signature building on the campus. Located in the center of the campus and in many ways acting as the center of campus life, the Pfau Library represents a unique facility that can drive and shape near-term and long term solutions to the envisioning of campus academic spaces.

Due to funding limitations, the initial concept developed for the 1994 addition was never completed. The original intent of the 1994 effort was to create two new additions to the building, one on the east and one on the west, in addition to the renovation of the original building. Only the west addition was realized. The 2016 Master Plan envisions completion of the east wing on the library as well as a second addition that would infill the existing "swoop" or curve of the 1994 west wing as well as renovation of the original building.

This project will achieve two key strategic goals:

1. Consolidation of the Learning Resource Center, Teachers' Resource Center, and Academic computing and Media;
2. Upgrades to the existing campus central data center;

Both functionally and technologically this comprehensive project will transform this forty-year old library facility into the 'Library of the Future' and reassert its position as center of the campus.

To accommodate near-term space needs and those of a maturing campus with an increasingly residential component creating a 24/7 campus, the Pfau Library will need to reconfigure some of its existing spaces into more student-to-student as well as technology assisted study spaces. Near-term initiatives are recommended as follows:

- Efficiency-oriented renovation of library spaces to address activity layout, lighting, and access to technology
- Consolidation of some stack areas through the use of compact shelving and selective off-site storage to increase new spaces to be devoted to student study and academic/learning uses;
- Better utilization of current carrel space through the use of linear wall and row carrels;
- Reclaimed library spaces for expanded academic use including spaces for temporary classrooms and/or offices; and graduate student study cubicles;
- Creation of a 24-hour student study area on the first floor through the integration of the existing west side study area and Wedge computer labs into an interconnected space sealed off by a glass partition/ access door from the other portions of the first floor;
- Reconfiguration of and consolidation of related functions into the Library basement;
- 'Reclaiming' of two outdoor areas on the first floor (adjacent to north and south sides of the building) as enclosed spaces for student study.

2. STUDENT UNION EXPANSION

- library, media, collaborative | 20,200~24,700 GSF
- student support | 80,800~98,750 GSF

TOTAL | 101,000~123,450 GSF

The existing Student Union has been experiencing space shortages for some time, particularly in light of increasing enrollments, and has initiated programing and preliminary planning studies for expansion. The project will be subject to a successful student referendum to authorize funding and will include additional banquet rooms, student meeting rooms, the campus bookstore, lounge areas and other related functions being determined by students and Student Union management. The existing campus bookstore will be relocated from its current location in a free-standing building just west of the existing performing arts facility--the existng bookstore building will then be evaluated for repurposing (See "Bookstore Repurposing" below).

The campus master plan team recommends that the student union expansion extend north of the current student union so as to engage the proposed central spine of the campus along Coyote Walk. Placement of the relocated bookstore along this edge of the building, along with other recommendations, will help further activate Coyote Walk.

3. PERFORMING ARTS CENTER EXPANSION

- instructional | 8,400~10,250 GSF
- other spaces | 33,550~41,000 GSF

TOTAL | 41,950~51,250 GSF

The existing Performing Arts/Theater/Recital Hall facility has been identified as inadequate for some time and a proposal to rectify these programmatic deficiencies and physical facility obsolescence has been a part the approved campus Master Plan for a number of years. The current proposed project calls for the construction of a 500-seat little theater with a main stage and support spaces, a 78-seat interdisciplinary lecture classroom, a dance studio and a theater arts teaching lab. After consideration of academic program needs, projected enrollment growth, the responsibility of the University to enhance the intellectual, cultural and personal development of its students as well as the role of the University in the cultural life of the community, the 2016 Master Plan recommends that this project proposal be expanded to include a larger little theater of 750-1200 seats together with the other aforementioned academic spaces.

The 2016 Master Plan recommends that the new Performing Arts expansion be added to and integrated with the existing Performing Arts facilities at the entry to the campus. The plan envisions a public lobby and classrooms facing onto the central quad with the theater component located behind the existing theater. This provides a new public face for the facilities at the campus front door near parking and the existing transit center.

4. UNIVERSITY HALL REPURPOSING: UNIVERSITY ADMINISTRATION

- student support | 4,650~5,700 GSF
- other spaces | 4,650~5,700 GSF
- general administration | 83,850~102,450 GSF

TOTAL | 93,150~113,850 GSF

University Hall is currently occupied by student service functions primarily on the first floor with classrooms and faculty offices on the upper floors and on the lower level. For the most part these academic spaces are occupied by College of Arts and Letters (CAL) programs. This mix of uses creates continuous circulation conflicts between students trying to access various student services and students trying to get to and from classes. Furthermore, these academic spaces are disconnected from the academic core and other CAL program functions.

The 2016 Master Plan recommends that ultimately all administration functions be relocated into University Hall with the ground floor occupied by a one-stop student support area. This repurposing project would place administration and student support functions at a highly visible and easily accessible location at the entry to the campus with ample nearby parking. To accomplish this will require prior construction of an academic building to house CAL programs that would be relocated out of University Hall to allow renovation for administration uses.

5. NEW ACADEMIC/ADDITIONAL ADMINISTRATION BUILDING

- other spaces | 7,250~8,900 GSF
- library, media, collaborative | 14,550~17,800 GSF
- instructional | 50,900~62,200 GSF

TOTAL | 72,700~88,900 GSF

In later phases of development, subject to continuing enrollment growth and the University's ability to successfully find appropriate funding sources, the 2016 Master Plan envisions the infill of an academic building to the southwest of the Pfau Library in the last vacant space facing onto the central campus commons.

BOOKSTORE RE-PURPOSING

Once the expansion of the Student center has been completed and the bookstore has been relocated into this new facility, the existing campus bookstore building will be available for other campus uses. Subject to further analysis and campus consultation, potential uses might include a combination of veterans' outreach programs, selected research institutes/centers of study, faculty offices and/or innovative teaching laboratories.

6.6 COYOTE WALK ACADEMIC PRECINCT

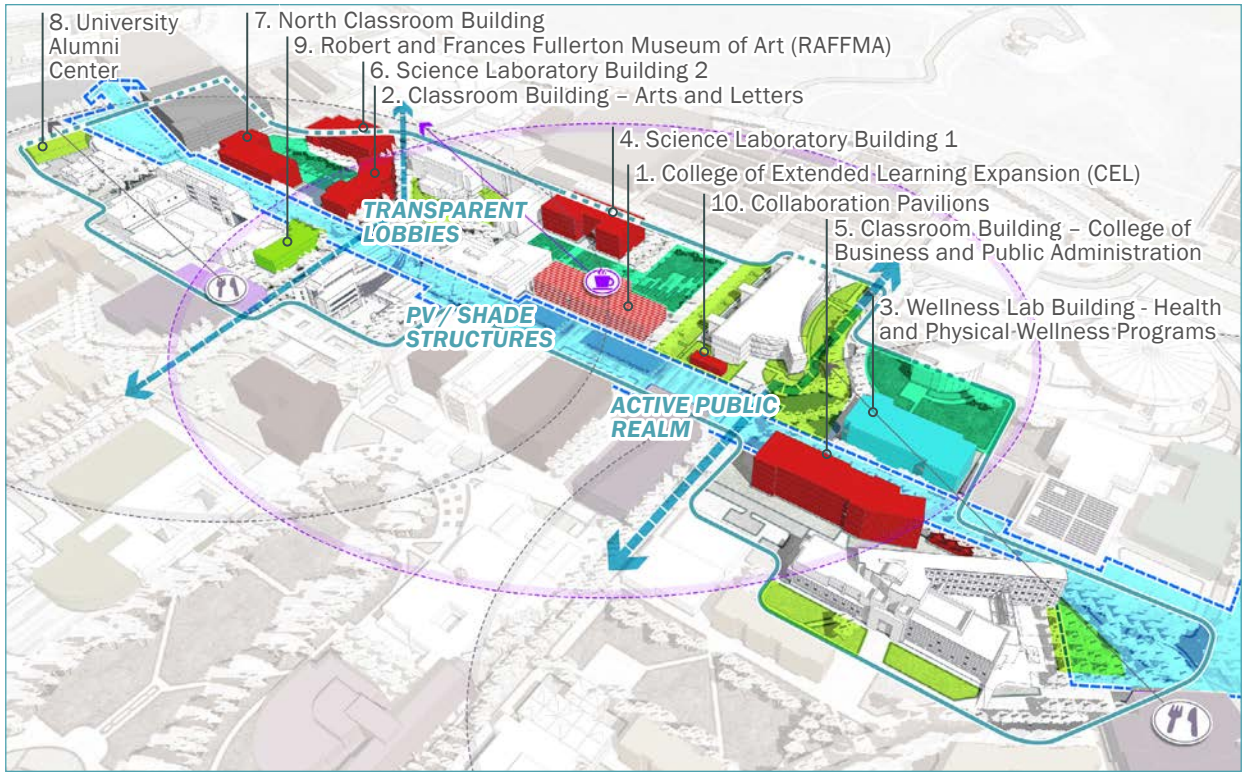


FIG 6–7: COYOTE WALK ACADEMIC PRECINCT LAYOUT

ACADEMIC SPACE CATEGORIES	PROPOSED	
Instructional	341,350~417,200	GSF
Library & Collaborative	102,150~124,850	GSF
Physical Education	53,800~65,800	GSF
Student Support	-	GSF
Administration	2,700~3,300	GSF
Other Spaces	65,300~79,800	GSF
Physical Plant	-	GSF
ACADEMIC SPACE TOTAL	565,300~690,900	GSF

TABLE 6–5: Coyote Walk Academic Precinct Development Summary

The Coyote Walk precinct encompasses the academic core of the campus and is envisioned to include all of the academic buildings within the University--aligned along both sides of Coyote Walk, the organizing 'spine' of the campus. The 2016 Master Plan by calling for the infill of all new academic buildings along Coyote Walk, will increase building density, reduce pedestrian travel distances and reinforce existing college and departmental clusters. The plan envisions enhancing Coyote Walk with a variety of pedestrian oriented amenities such as solar shade structures, sheltered study pavilions, enhanced landscape, periodic food carts or venues, shaded seating areas and Wi-Fi which, together with the entry plazas and lobbies of new buildings, will create a vibrant, active link thru the campus core.

NEW ACADEMIC BUILDINGS

In order to address projected student enrollment growth and corresponding space requirements, the master plan calls for the ultimate development of seven (7) new academic buildings to be placed within the core area along Coyote Walk in order to create a denser, walkable campus.

The 2016 Master Plan acknowledges emerging trends in higher education throughout the United States that emphasize shared interdisciplinary academic spaces infilled in close proximity to existing single purpose academic buildings within the University. Although certain programs may make predominate use of a particular building, all classrooms would be available for campus-wide scheduling. This approach offers wide ranging flexibility for the University to adapt to unpredictable future changes in both program offerings and pedagogy. Each building is envisioned to have a mix of uses that would include classrooms, laboratories (where appropriate), faculty offices, collaborative and media spaces and other uses that would be finalized at the time each building is programed and designed.

1. COLLEGE OF EXTENDED LEARNING EXPANSION (CEL)

- library, media, collaborative | 18,950~23,150 GSF
- instructional | 44,250~54,050 GSF

TOTAL | 63,200~77,200 GSF

The planned expansion of the College of Extended Learning (CEL) is the first example of this new academic space planning approach and will not only allow the CEL to locate all of its administrative functions in one building as well as a significant amount of new CEL instructional space but also will include additional lecture instructional space that would be shared by the entire University to help meet pressing near term space needs identified in the research phases of the master planning process. Although this project was included in the master plan process, it is now well along in the design process with preliminary approval for bond funding in place. Because of its advanced development status, for the purposes of CEQA this project is being considered as a completed project.

The 2016 Master Plan recommends that the CEL building be located within the heart of the academic core along Coyote Walk north of the Pfau Library in order to best serve the University's long term goals. This provides a central, signature location for the College of Extended Learning and with the ground floor devoted to shared classrooms and lecture halls to serve the entire campus, the facility would be easily accessible to the Library, the expanded Student Union and other academic disciplines (Natural Sciences, College of Education, College of Business and Public Adminstration and College of Social and Behavioral Sciences) thereby creating a concentrated center of activity in the heart of the campus. It is also recommended that a small food/coffee venue be located on the ground floor to serve this concentration of student population and activity.

The recommended CEL location also provides easy access for non-traditional and/or working adults coming to the campus in the evenings and on weekends from the new Parking Lot N just north of the site. At the same time, this location will address the needs of CEL's international student population to be nearby other campus resources and to better help these students access and integrate into the centers of campus life.

The 2016 Master Plan envisions a pedestrian portal through the center of the ground floor of the CEL building on axis with the north entry of Pfau Library in order to provide a gateway into campus from the north and Parking Lot N. The Master Plan also recommends the placement of the statue of the University Mascot--the Coyote--at the intersection of the center lines of Coyote Walk and the north/south axis thru the CEL. This would be the premier location for this campus symbol at the absolute center of campus with thousands of students passing by each day.

2. CLASSROOM BUILDING – ARTS AND LETTERS

- other spaces | 7,250~8,850 GSF
- library, media, collaborative | 14,450~17,700 GSF
- instructional | 50,650~61,900 GSF

TOTAL | 72,350~88,450 GSF

This academic classroom building would be located on the north side of Coyote Walk near the existing Fine Arts Complex and is envisioned as the first building in a future academic complex to be located in this currently undeveloped northern area of the campus. This building is planned to house much of the College of Arts and Letters (CAL) programs (mainly communications disciplines) currently housed in University Hall as part of a long term strategy that will ultimately allow backfilling all administration uses into University Hall once the CAL functions have been relocated to this new classroom building. This will, in turn, allow the University to demolish the three older inefficient one-story buildings (Administration, Sierra Hall and Chaparral Hall) which currently house CSUSB administrative functions. These buildings are part of the original campus buildings constructed in the early 1960s, are constructed at a very low site density and are well past their useful service lives.

3. LAB BUILDING - HEALTH AND PHYSICAL WELLNESS PROGRAMS

- instructional | 29,000~35,400 GSF
- physical education | 53,800~65,800 GSF

TOTAL | 82,800~101,200 GSF

This academic classroom building nearby the existing Health and Physical Education Complex (including the Coussoulis Arena) is planned to house the rapidly growing space needs for Health and Physical Wellness programs, in particular Kinesiology. Located on the north side of Coyote Walk north of Jack Brown Hall this building furthers the concept of academic infill along the central pedestrian spine of the campus. Adhering to the master plan concept of shared academic space this classroom building is not intended to be exclusively dedicated to Health and Kinesiology programs, but may also have shared classrooms and lecture halls to serve the entire campus. Its central location along Coyote Walk would be easily accessible to other nearby academic disciplines and thereby support a denser, concentrated academic core.

4. SCIENCE LABORATORY BUILDING 1

- other spaces | 8,300~10,100 GSF
- library, media, collaborative | 16,550~20,250 GSF
- instructional | 57,950~70,850 GSF

TOTAL | 82,800~101,200 GSF

Located just east of the existing Biological Sciences building, this new Science Laboratory Building is intended to address the current and future space needs of the Physical Sciences. By being positioned adjacent to the existing Biological Sciences building would allow the two buildings to be connected by an enclosed corridor or bridge which would be particularly advantageous for science and laboratory functions. Although not located directly on Coyote Walk, the 2016 Master Plan envisions that this building would face onto a contained courtyard north of the existing Physical Sciences building with a direct connection to and from Coyote Walk. This courtyard would be an extension of the existing science quad to the west and would be a part of the open space directly north of the proposed College of Extended Learning building.

5. CLASSROOM BUILDING – COLLEGE OF BUSINESS AND PUBLIC ADMINISTRATION

- other spaces | 7,200~8,800 GSF
- library, media, collaborative | 14,400~17,600 GSF
- instructional | 50,400~61,600 GSF

TOTAL | 72,000~88,000 GSF

This proposed Classroom Building is located on the south side of Coyote Walk just north of Jack Brown Hall (College of Business and Public Administration). Although not exclusively designated for the College of Business this new classroom building is intended to address future space needs for their growing programs such as criminal justice, cyber security and computer sciences as well as their rapidly growing international student population.

In keeping with the shared, multi-disciplinary concept for new academic buildings, the 2016 Master Plan envisions that this building may also have shared classrooms and lecture halls to serve the entire campus. Its central location along Coyote Walk would be easily accessible to other relatively nearby academic disciplines such as the College of Education, Physical Sciences, Social and Behavioral Sciences, the Pfau Library and the expanded Student Union, all combining to supporting a denser, concentrated academic core.

6. SCIENCE / ENGINEERING LABORATORY BUILDING 2

- other spaces | 8,300~10,100 GSF
- library, media, collaborative | 16,550~20,250 GSF
- instructional | 57,950~70,850 GSF

TOTAL | 82,800~101,200 GSF

Located just west of the existing Chemical Sciences building, this new Science / Engineering Laboratory Building is, at present, intended to address future space needs of the Physical Sciences. Envisioned as the second building in a future academic complex configured around a courtyard on the north side of Coyote Walk north of the existing Fine Arts Complex, the building is positioned to allow a potential enclosed corridor or bridge connection to the adjacent Chemical Sciences building should that be appropriate. Although not located directly on Coyote Walk the 2016 Master Plan envisions this building would face onto a contained courtyard with a direct connection to and from Coyote Walk. This facility could also accommodate future to-be-determined engineering programs.

7. CLASSROOM BUILDING 1

- other spaces | 7,300~8,950 GSF
- library, media, collaborative | 14,600~17,850 GSF
- instructional | 51,150~62,500 GSF

TOTAL | 73,050~89,300 GSF

Located on the north side of Coyote Walk north of the existing Fine Arts Complex this academic classroom building is

envisioned as the third and final building to complete the future academic quad in this northern portion of campus. Since this building is planned as part of the final phase of development in the 2016 Master Plan no specific academic programs have been designated at this time. In keeping with the 2016 Master Plan concept of shared interdisciplinary academic spaces this classroom building would provide needed space to meet the goal of 25,000 FTES but all classrooms would be available for campus-wide scheduling offering wide ranging flexibility for the University to adapt to unpredictable future changes in both program offerings and pedagogy.

8. UNIVERSITY ALUMNI CENTER

20% 80%

- general administration | 2,700~3,300 GSF
- other spaces | 10,750~13,100 GSF

TOTAL | 13,450~16,400 GSF

The University does not currently have a physical facility for alumni on the campus. As the campus continues to grow, adding more graduates and, as new athletic facilities increase the potential for expanded sports programs, the University needs to provide space on campus for alumni gatherings and events. Given the current lack of funding for many University projects it is all the more important for the University to cultivate its alumni base, not only for their potential assistance in fund raising but also to better connect CSUSB to the Inland Empire region and the State.

The 2016 Master Plan has designated a location for an Alumni Center just north of Yasuda Hall. This site is easily accessible to off campus visitors and would have ample nearby parking. It has a highly visible presence at the northern entry to Coyote Walk and would contribute to the Master Plan concept of activating the northwest end of Coyote Walk.

9. ROBERT AND FRANCES FULLERTON MUSEUM OF ART (RAFFMA)

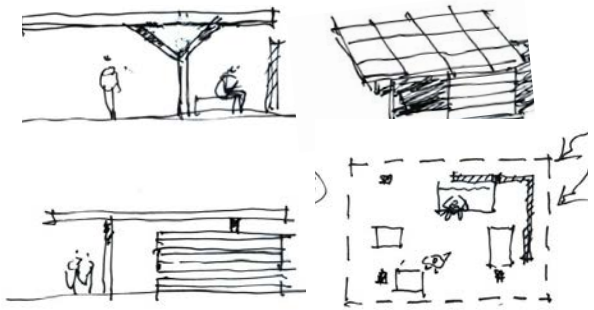
20% 80%

- library, media, collaborative | 4,050~4,950 GSF
- other spaces | 16,250~19,900 GSF

TOTAL | 20,300~24,850 GSF

The RAFFMA Museum contains one of the finest collections of ancient Egyptian Art west of the Mississippi yet it is an often overlooked campus asset. A part of the Visual Arts Center, the Museum serves not only as a repository for rare and priceless artifacts but also a valuable educational component of the Fine Arts programs. The 2016 Master Plan proposals for the RAFFMA facility were prepared in consultation with RAFFMA representatives who had identified a series of functional improvements and space needs summarized in the following 2016 Master Plan findings:

- The main entrance, facing onto Coyote Walk is drastically undersized and additional exhibit space is needed. The 2016 Master Plan recommends expanding this area to become an open public reception space featuring a museum shop and small coffee shop. This public area of the museum would serve as a student gathering area and help to further activate Coyote Walk.



The Collaboration Pavilions will enhance the Coyote Walk environment with creative solutions that should come from student involvement; a strong environmental graphics concept should help rebrand the campus.

- There is also a need for more exhibition space as well as classrooms and labs for the museum's curation, education and training-related activities. The 2016 Master Plan recommends expanding the western part of RAFFMA to add these classrooms and labs which could also be shared with the College of Social and Behavioral Science's museum program as well as providing a better location and facility for its anthropology museum.
- It is also recommended that the southern part of the RAFFMA facility be expanded to create more storage and office space. There is also a need for a loading dock for shipping and receiving art and a driveway connection leading to the existing roll-up door to allow truck deliveries.

10. COLLABORATION PAVILIONS

100%

- library, media, collaborative | 2,500~3,100 GSF

TOTAL | 2,500~3,100 GSF

The 2016 Master Plan includes recommendation for a series of prefab or light construction pavilions that serve to activate Coyote Walk by providing casual study space. These can be made from recycled shipping containers, or other unique and environmentally meaningful architectural approach. This will serve to enhance the University brand as having a campus that is inventive, resourceful, and creative.

6.7 NORTH + SOUTH HOUSING PRECINCTS

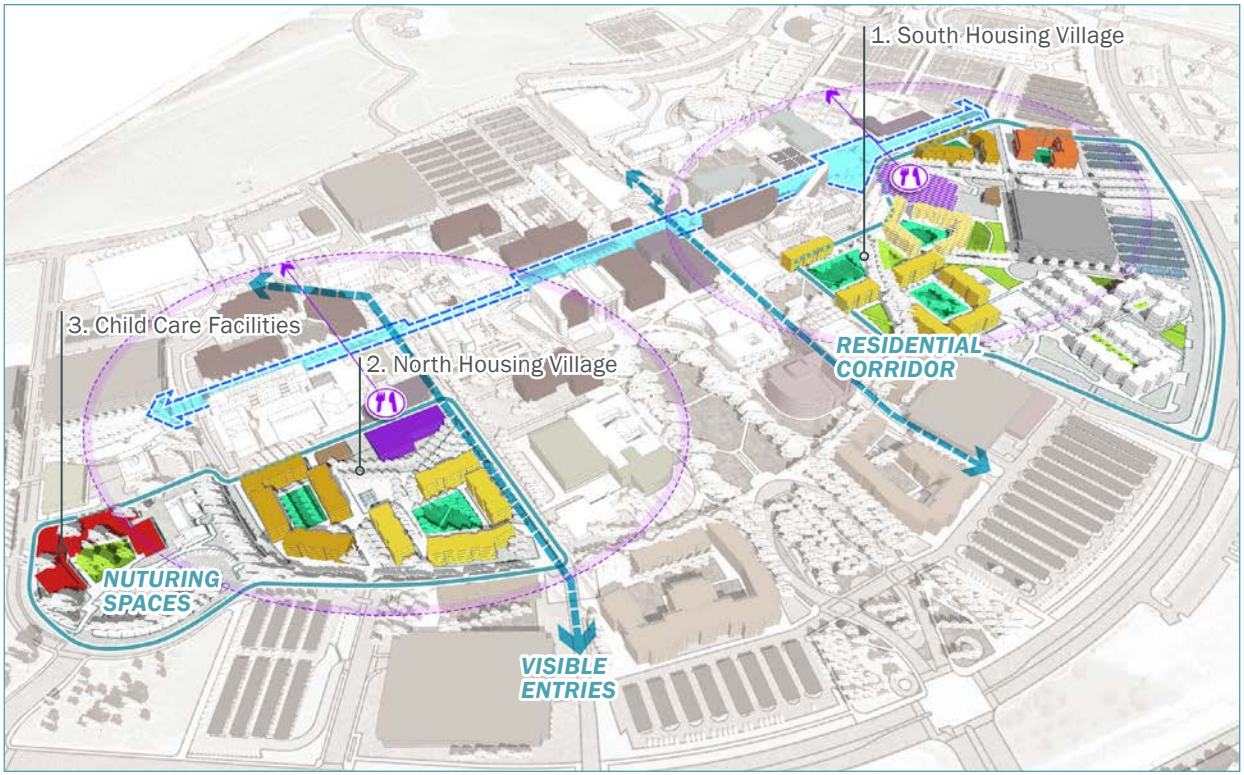


FIG 6–8: NORTH + SOUTH HOUSING PRECINCTS LAYOUT

Major Landscape areas
Major Turf Area
Note: Buildings colored by predominant use
Major Access Route
Coyote Walk Central Corridor
Precinct Boundary
Major Amenity Proposed (5 min. walking radius)
Under Development

ACADEMIC SPACE CATEGORIES (not include student life facilities in residential buildings)	PROPOSED	
Instructional (Children's Center)	9,450~11,550	GSF
Library & Collaborative (Children's Center)	9,450~11,550	GSF
Physical Plant (Supporting for Dining Halls)	7,550~9,250	GSF
ACADEMIC SPACE TOTAL	26,450~32,350	GSF

PRECINCT STUDENT LIFE FACILITIES YIELD SUMMARY	PROPOSED	
Residential Halls	1,430	Beds
Residential Suites	813	Beds
Library & Collaborative of Ground Floor Housing	54,250~66,300	GSF
Student Support (Dining Halls)	56,050~68,500	GSF
Other Spaces (Assembly, Exhibit)	36,750~44,900	GSF
PRECINCT TOTAL NEW BEDS	2,243	Beds
PRECINCT TOTAL NEW HOUSING (not include library & collaborative, student support and other spaces)	664,500~812,150	GSF
PRECINCT STUDENT LIFE FACILITIES SUBTOTAL (include library & collaborative, student support and other spaces)	147,000~179,700	GSF
PRECINCT STUDENT LIFE TOTAL	811,500~991,850	GSF

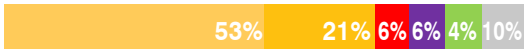
ENTREPRENEURIAL FACILITIES	PROPOSED	
Hotel and Conference Center Total	59,150~72,250	GSF
Hotel Total Rooms	82	Keys

TABLE 6–6: North + South Housing Precincts Development Summary

In order to encourage a more 24/7 campus, to expand opportunities for more students to connect with campus life, to better attract international students and to contribute to a sustainable campus, the master plan envisions the addition of 3,300 new student housing beds over the next fifteen to twenty years. Two housing precincts or villages have been envisioned one in the south, built around the existing campus housing and a future housing village in the north central portion of the campus. Each village would have its own dining commons and would be planned around a series of landscaped courtyards for student gathering and recreation. A third component of housing is also planned to be located in the Gateway Precinct. The Gateway Precinct includes student apartment type housing to be located on both sides of the main campus entry, framing this gateway into the campus.

The existing pedestrian walkway along the northeast edge of parking lots C and D (Sycamore Walk) will become the pedestrian-oriented connection between all campus housing. The existing mature sycamore trees along this walkway provide a gracious frame for creating it as an active link between the campus residential neighborhoods.

1. SOUTH HOUSING VILLAGE



- residence halls | 306,100~374,100 GSF
- residential suites | 119,000~145,450 GSF
- library, media, collaborative | 32,700~39,950 GSF
- student support | 31,800~38,850 GSF
- other spaces | 21,500~26,250 GSF
- physical plant | 3,500~4,300 GSF
- entrepreneurial | 59,150~72,250 GSF

TOTAL | 573,750~701,150 GSF

The South Housing Village is planned around the existing campus housing, some of which (Serrano Village) will be replaced with newer more appropriate housing types. Additional new beds are also planned for this extended South Housing Village as well as a new dining commons.

A site has been selected for Phase 1 (400 beds) of student housing in the South Housing Village located on parking lot E. This project has started construction and for the purposes of CEQA is being considered as a completed project. This Phase 1 project also includes a new dining commons adjacent to the new Phase 1 student housing. Together with the expansion of the Student Recreation and Wellness Center these new buildings will frame a new plaza or courtyard at the southern terminus of Coyote Walk. The dining commons project is also under construction and therefore is being considered as a completed project for CEQA purposes.

2. NORTH HOUSING VILLAGE

- residence halls | 115,250~140,850 GSF
- residential suites | 124,150~151,750 GSF
- library, media, collaborative | 21,550~26,350 GSF
- student support | 24,250~29,600 GSF
- other spaces | 15,250~18,650 GSF
- physical plant | 4,050~4,950 GSF

TOTAL | 304,500~372,150 GSF

In the future, a second housing precinct or village is planned in the north central part of campus replacing the older single story administration building as well as Sierra and Capistrano Halls which have reached the end of their useful life. A second dining commons would also be located in this housing complex to serve student residents as well as the nearby northern portion of the academic core.

Future student apartment type housing is also planned to be located in the Gateway Precinct on both sides of the Main campus entry, framing this gateway into the campus.

3. CHILD CARE FACILITIES

- library, media, collaborative | 9,450~11,550 GSF
- instructional | 9,450~11,550 GSF

TOTAL | 18,900~23,100 GSF

The existing Children's Center child care facility, just west of Sierra Hall is currently in need of expansion in order to serve student, faculty and staff demand for child care services. This demand will continue to increase as student enrollment increases over the coming years. The 2016 Master Plan recommends relocating these facilities to a larger site west of the University Enterprises Building and expanding the program facilities to accommodate approximately 200 students. Program requirements have identified 35 square feet minimum indoor space per child and 70 square feet of outdoor program space per child. In addition to classrooms, this facility will have shared spaces such as restroom facilities for children, a meeting room, kitchen and classroom. Interview and observation rooms as well as administrative and support spaces will also be included as a part of program requirements.

6.8 GATEWAY PRECINCT

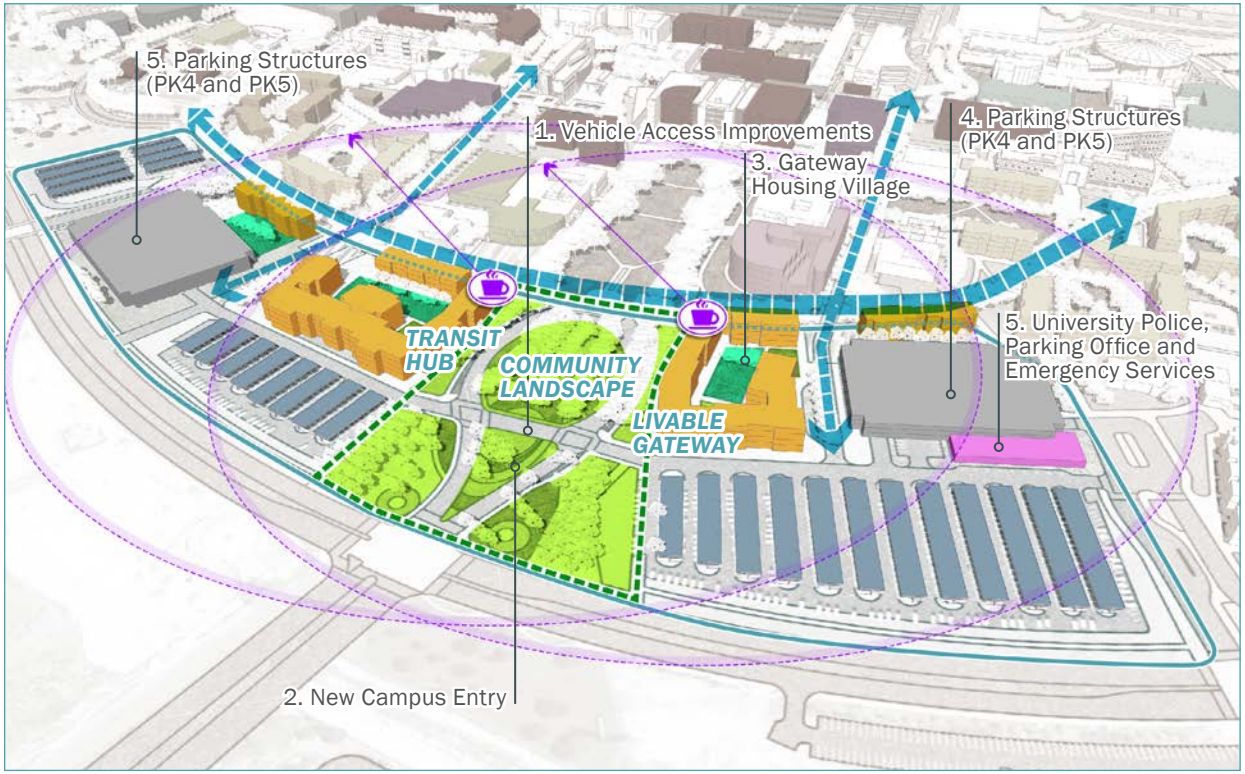


FIG 6–9: GATEWAY PRECINCT LAYOUT

Major Landscape areas
Long Term Landscape Preservation
Major Turf Area
Major Access Route
Precinct Boundary
Minor Amenity Proposed (5 min. walking radius)
Note: Buildings colored by predominant use

PRECINCT STUDENT LIFE FACILITIES YIELD SUMMARY	PROPOSED	
General Administration (Police Station)	22,300~27,300	GSF
Residential Suites	272	Beds
Apartments	802	Beds
Library & Collaborative of Ground Floor Housing	15,400~18,800	GSF
Other Spaces (Assembly, Exhibit)	5,150~6,250	GSF
PRECINCT TOTAL NEW BEDS	1,074	Beds
PRECINCT TOTAL NEW HOUSING (not include general administration, library & collaborative and other spaces)	389,900~476,500	GSF
PRECINCT STUDENT LIFE FACILITIES SERVING ACADEMIC NEEDS (general administration, library & collaborative and other spaces)	42,850~52,350	GSF
PRECINCT STUDENT LIFE TOTAL	432,750~528,850	GSF

TABLE 6–7: Gateway Precinct Development Summary

The Gateway Precinct encompasses the main vehicle entry to the campus and the existing surface parking lots flanking this entry. The 2016 Master Plan envisions a number of projects to enhance this primary gateway that will improve vehicle access, eliminate current conflicts between pedestrians, automobiles and buses, increase on campus parking as the campus grows enrollment. In the future this main gateway to the campus will be visually framed as student apartments are constructed on either side of the entry drives.

1. VEHICLE ACCESS IMPROVEMENTS

At the present time vehicle access at the primary gateway into the campus has some serious deficiencies. The turn-around and drop-off area creates potential pedestrian and vehicle conflicts (pedestrians, automobiles and buses). Vehicles arriving to the campus entering the loop road at the northern most area where drop-offs typically occur must turn either left or right to access adjacent parking lots C and D. Buses also traverse this area to access the transit center on the western edge of this loop road.

The 2016 Master Plan recommends several relatively simple changes to circulation in this area to resolve these conflicts which could be implemented in the near future at relatively little expense. First, it is recommended that the two parking access entries at the northern end of the loop road be closed and new access roads be provided at the mid-point of the loop road to both parking Lots C and D. This will eliminate the conflict with pedestrians trying to reach the transit center and simplify parking lot access.

2. NEW CAMPUS ENTRY

The University has recently installed new signage at the front entry and is upgrading the landscape in the immediate area around this new signage as the 1st phase of an enhanced gateway plan. Additional phases will add palm trees and additional landscaping to create an attractive and inviting entrance to the campus.

3. GATEWAY HOUSING VILLAGE

- residential suites | 81,400~99,500 GSF
- apartments | 308,500~377,050 GSF
- library, media, collaborative | 15,400~18,800 GSF
- other spaces | 5,150~6,250 GSF

TOTAL | 410,405~501,600 GSF

As the campus continues to grow, it is recommended that additional student housing be provided for upperclassmen in the form of student apartments. The 2016 Master Plan recommends that this housing be located on the northern portions of Lots C and D on both sides of the campus entry loop, facing onto Sycamore Walk. The concept calls for two courtyard type complexes to be constructed with additional housing structures located along Sycamore Walk to screen the proposed new parking structures and ensure that this pedestrian walkway is lined with attractive student housing. It is also recommended that the ground floor of the housing facing onto Sycamore Walk be dedicated to more public type spaces such as academic classrooms, student meeting rooms and other uses that would help to activate this primary pedestrian pathway within the campus. At the two corners of the housing facing Sycamore Walk and the entry loop would be ideal locations for small retail activities such as a coffee shop, café or campus public information area.

4. PARKING STRUCTURES (PK4 AND PK5)

In order to provide additional parking as student enrollment increases and to provide the replacement parking required when new student apartments are constructed on existing surface parking lots, two new parking structures are envisioned (PK4 and PK5). Two access points are provided for each of these structures to facilitate ingress and egress. Parking structure PK4 envisions a new right turn in and right turn out entry off Northpark Blvd. and a second access point to the east from the existing Sierra Drive entry. Access to parking structure PK5 would be via a right turn off the existing main campus entry loop and from Serrano Village Drive. Both structures have been setback from Northpark Boulevard to allow for ample landscape screening.

5. UNIVERSITY POLICE, PARKING OFFICE AND EMERGENCY SERVICES

- general administration | 22,300~27,300 GSF

TOTAL | 22,300~27,300 GSF

In order to provide a more visible presence at the entry to the campus the 2016 Master Plan proposes locating the campus police, parking offices and the Emergency Operations Center at the south eastern corner of parking structure PK5. This location also provides easy access for police to the overall campus in the event of emergencies and would have ample adjacent parking available for police vehicles.

6.9 PHYSICAL EDUCATION + ATHLETICS PRECINCT

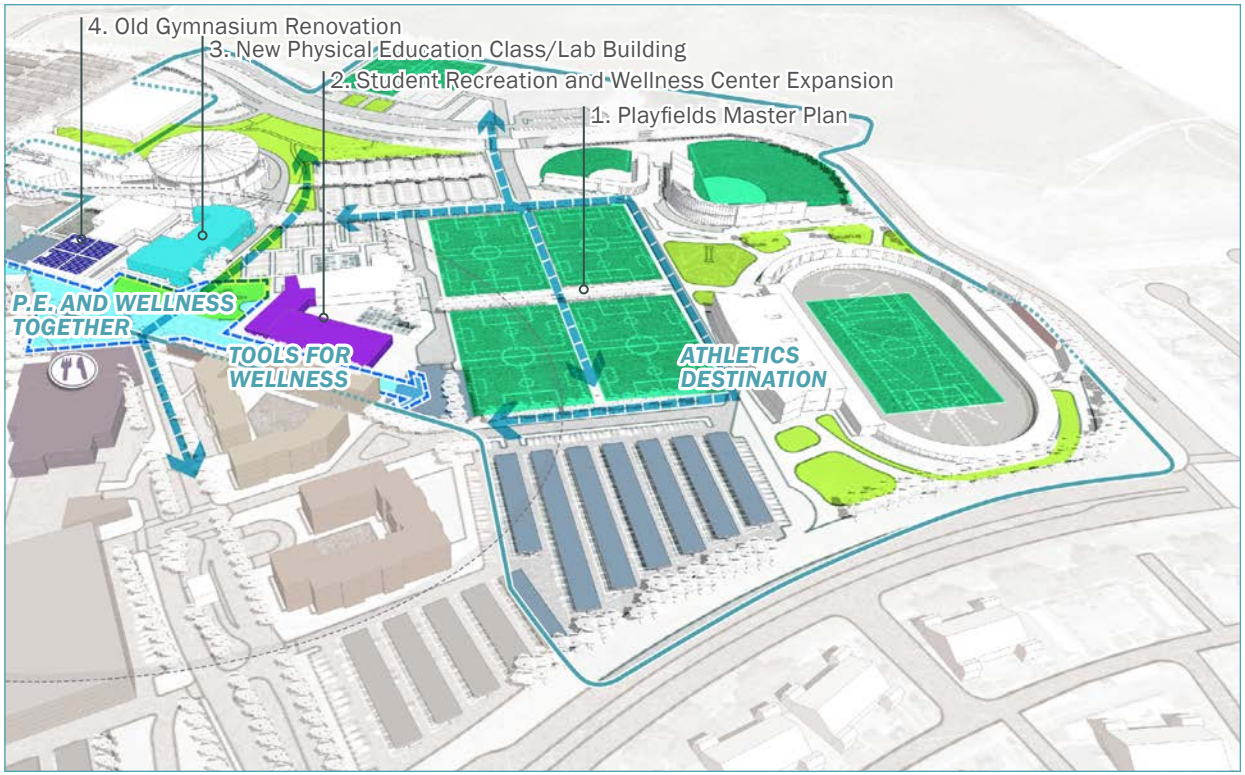


FIG 6–10: PHYSICAL EDUCATION + ATHLETICS PRECINCT LAYOUT

Major Landscape areas
Major Turf Area
Note: Buildings colored by predominant use
Major Access Route
Coyote Walk Central Corridor
Precinct Boundary
Major Amenity Proposed (5 min. walking radius)

ACADEMIC SPACE CATEGORIES	PROPOSED	
Physical Education	51,500~62,900	GSF
Student Support	31,050~37,950	GSF
ACADEMIC SPACE TOTAL	82,550~100,850	GSF

TABLE 6–8: Physical Education + Athletics Precinct Development Summary

At the southern end of campus, the Physical Education and Athletics Precinct includes all physical education and athletic functions for the University such as the Health and Physical Education complex (including the Coussoulis Arena), the original gymnasium and outdoor pool, the Student Recreation and Fitness Center as well as all outdoor playfields. The 2016 Master Plan recommends a series of enhancements including the following:

1. PLAYFIELDS MASTER PLAN

Currently the University's outdoor physical education facilities, athletic playfields and outdoor recreation areas are woefully inadequate to serve the needs of a 4-year public University of its current size. This will only be exacerbated as the University continues to grow to its target enrollment of 25,000 FTES. The replacement of the current baseball and softball fields are of high importance as they have become deteriorated over time and do not meet current standards and codes. This forces the University to lease fields off-campus which is costly, creates potential liability issues and depresses student attendance at baseball games. New fields on campus will allow for greater focus on academics, health, nutrition and player development as well as alleviate any liability involved in using fields off campus. The addition of Title IX facilities will create opportunities for new women student athletes and new recruitment opportunities to attract top level student athletes as well. The new facilities also have the potential to become a hub for regional games, tournaments, camps and clinics on campus. Student success starts with creating facilities that are directly related to recruiting, education, and support--facilities that will improve learning and enhance student satisfaction.

The University under the leadership of the Intercollegiate Athletics program and the Kinesiology Department engaged the consulting firms of Parsons/Brinkerhoff and ICG, Inc. (Landscape architects) to create a long term master plan for enhancement and expansion of the campus PE, athletics and recreational facilities. American Sports Centers (ASC) provided an analysis of potential funding options given the lack of funding availability within the CSU System. The plan will be accomplished in phases, but at full build-out, will include college level baseball and softball fields (with approximately 3,250 and 840 seats respectively), 5 soccer fields, expanded tennis courts, basketball courts and a football stadium (with approximately 6,000 seats). After campus review and approvals this new plan was incorporated into the final 2016 Master Plan.

2. STUDENT RECREATION AND WELLNESS CENTER EXPANSION

student support | 31,050~37,950 GSF

TOTAL | 31,050~37,950 GSF

The existing Student Recreation and Fitness Center has been experiencing space shortages for some time, particularly in light of increasing enrollments and student interest in personal wellness. A preliminary program for its expansion has been initiated but its implementation will be subject to a successful student referendum to fund the expansion. Subject to final discussions with students and Recreation and Wellness Center management, the preliminary expansion program will likely include additional exercise rooms, multipurpose gymnasium type facilities, a jogging track and other related functions. As a strategic move, the 2016 Master Plan has recommended placing building components of the proposed Student Recreation and Wellness Center expansion along with the new planned dining commons around a new open space/plaza at the eastern terminus to Coyote Walk. This cluster of student activity in attractive new facilities will both activate and provide a handsome visual focus at this side of the campus.

3. NEW PHYSICAL EDUCATION BUILDING

physical education | 51,500~62,900 GSF

TOTAL | 51,500~62,900 GSF

In the future, as enrollment nears the goal of 25,000 FTES, additional classrooms, labs and other spaces for Physical Education and Kinesiology will be required in order to serve this larger student population. A site for a new Physical Education Classroom/Lab building has been reserved in the 2016 Master Plan adjacent to the original Gymnasium. This site would also encompass and replace the existing outdoor pool, which has reached the end of its useful life.

4. OLD GYMNASIUM RENOVATION

One of the original buildings on campus, this facility is more than 50 years old and while some improvements were made several years ago, is in need of substantial renovation including the HVAC systems (there is currently no air conditioning), lighting and other upgrades. The 2016 Master Plan recommends this renovation be accomplished in the relatively near future as the facility will only continue to deteriorate and hinder the facility from continuing to serve the student body.

6.10 NORTH CAMPUS PRECINCT

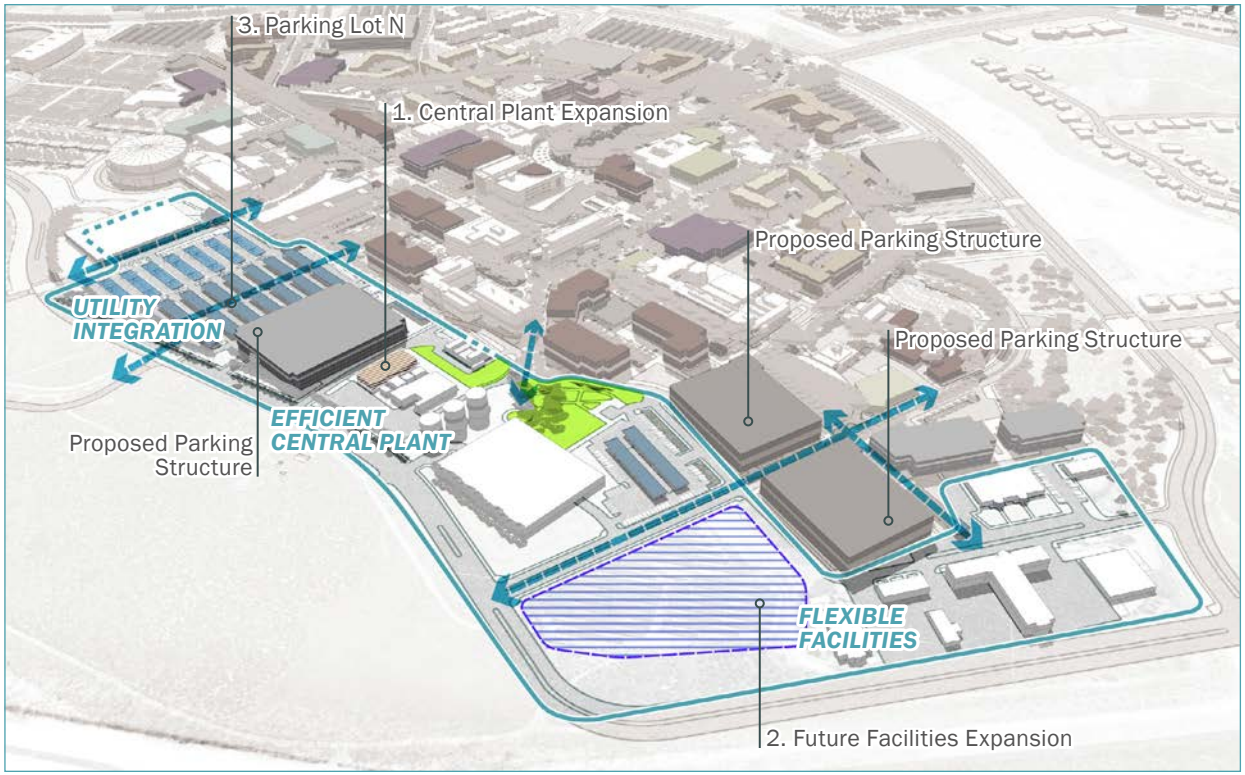


FIG 6–11: NORTH CAMPUS PRECINCT LAYOUT

Major Landscape areas
Potential Facilities Expansion Under New Solar PV Cover
Major Access Route
Precinct Boundary
Under Development
Note: Buildings colored by predominant use

ACADEMIC SPACE CATEGORIES	PROPOSED	
Physical Plant	10,800~13,200	GSF
ACADEMIC SPACE TOTAL	10,800~13,200	GSF

TABLE 6–9: North Campus Precinct Development Summary

The North Campus Precinct encompasses the northern and northeastern peripheral areas of the campus and in many ways serves to support the physical facilities of the University as a whole. Functions located in this precinct include the Facilities Management offices, maintenance facilities, yards, shops, various storage facilities, the Central Plant, the existing campus solar farm, surface parking and parking structure PK1 West.

1. CENTRAL PLANT EXPANSION

physical plant | 10,800~13,200 GSF

TOTAL | 10,800~13,200 GSF

An expansion of the Central Plant has been proposed and funded that will essentially double its capacity. Located directly adjacent to the existing central plant facilities, this new expansion can be accommodated within the area currently designated for these functions.

2. FUTURE FACILITIES EXPANSION

Although no specific program for expansion of the Facilities Management functions has been defined, the 2016 Master Plan acknowledges that as the campus grows over time additional space will also be required for maintenance and support in order to maintain an appropriate level of service to the campus. It is envisioned that new Facilities functions can be provided on the site of the existing solar farm adjacent to the existing Facilities Management shops and storage areas. This recognizes that the existing solar panel array is quite old and should be replaced with new more efficient photovoltaic panels. The 2016 Master Plan calls for new photo-voltaic panels to be installed on most surface parking lots which will more than offset the loss of this existing panel array.

3. PARKING LOT N

In light of increasing campus enrollments and to provide replacement parking for the 593 spaces that will be lost with the construction of the Phase 1 Housing and Dining Commons on Parking Lot E, it was deemed necessary to create a near term parking solution. It was recommended that a new surface parking lot for 1,300 spaces (Parking Lot N) be constructed on approximately 14.9 acres of vacant land south of North Campus Circle and north and west of the College of Education. This location will not only provide replacement parking for Parking Lot E but also address the parking needs of the projected student population, provide needed parking in the northern portion of the campus and will also avoid disturbing sensitive habitat north of the project site. This proposed surface lot has been incorporated into the 2016 Master Plan and the project is currently under construction and is therefore considered a completed project for purposes of CEQA.

6.11 DISCOVERY PARK PRECINCT

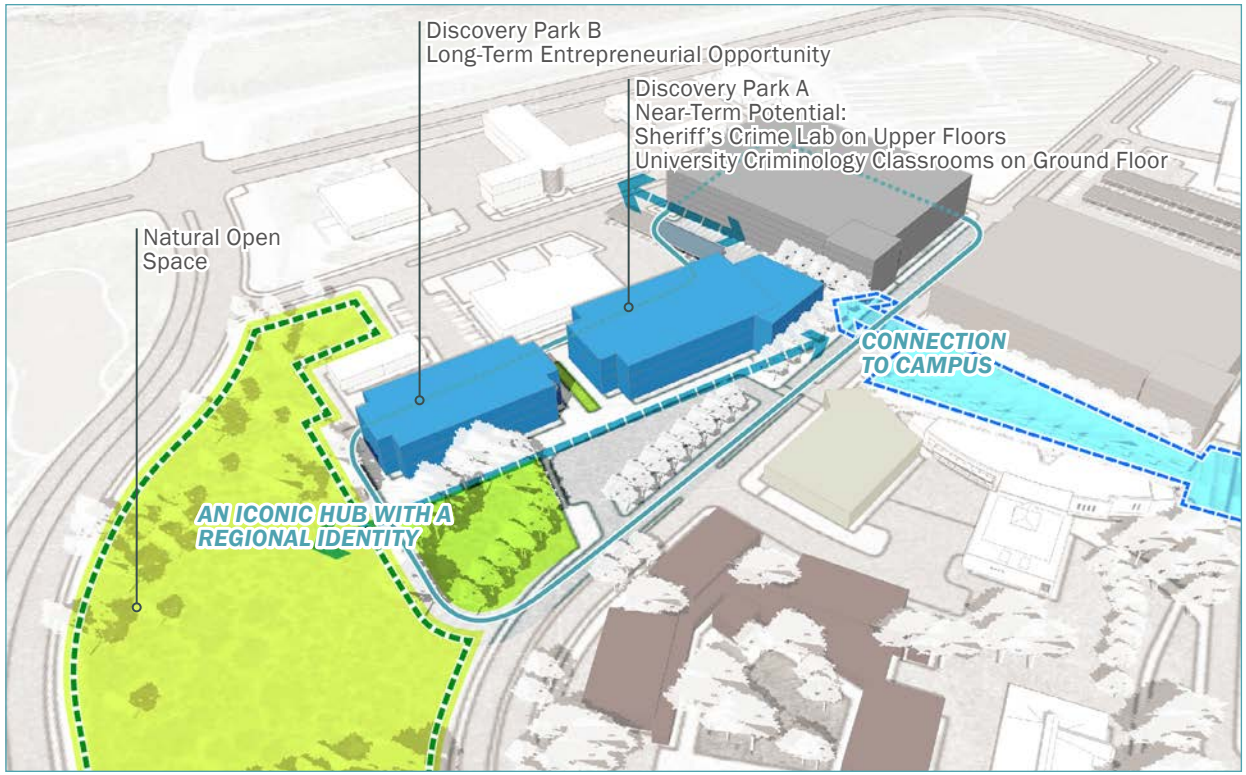


FIG 6–12: DISCOVERY PARK PRECINCT LAYOUT

Major Landscape areas
Natural Open Space
Major Turf Area
Major Access Route
Coyote Walk Central Corridor
Precinct Boundary
Note: Buildings colored by predominant use

ENTREPRENEURIAL FACILITIES	PROPOSED	
Instructional (Ground Floor of CSI Laboratory)	22,500~27,500	GSF
Discovery Park Partner Space	99,000~121,000	GSF
ENTREPRENEURIAL FACILITIES SPACE TOTAL	121,500~148,500	GSF

TABLE 6–10: Discovery Park Precinct Development Summary

The 2015 Strategic Plan calls for the University to cultivate an ecosystem for entrepreneurship and innovation as a source of talent for innovation and as an incubator of business and social enterprises. In keeping with this strategy the campus seeks to partner with the greater business, public and institutional community through Public Private Partnerships (P3s) that will serve and engage communities (local, regional/state, national, global) to foster educational, social, economic and cultural opportunities.

The 2016 Master Plan recommends the creation of a "Discovery Park" on campus land that promotes and supports technology transfer, student and faculty professional advancement, employment and economic development. The objective is to support the creation of enterprises that further the University's educational mission and generate potential revenue by forming partnerships with public and private organizations.

6.12 LAND LAB PRECINCT

The selected site for the Discovery Park is planned for incremental development with public-private partnerships with business, industry and/or governmental entities that will enhance the synergy between education and private and/or public sector research and development. The plan anticipates a mini campus of three-story office/research buildings with courtyards and on grade site parking at the perimeter (with the potential for the development of parking structures in the future if necessary).

A near-term potential has been identified with the County of San Bernardino Sheriff's Department for the development of a crime lab at CSUSB. This arrangement is envisioned much like that which created the California Forensic Science Institute located on the grounds of California State University Los Angeles (CSULA). This full service crime lab facility serves the entire Los Angeles County region and houses crime labs of both the Los Angeles County Sherriff and the Los Angeles City Police Department. Importantly, the facility directly supports CSULA's School of Criminal Justice and Criminalistics programs allowing students to observe real-world crime lab activities while taking coursework in the facility's lecture halls and laboratory facilities.

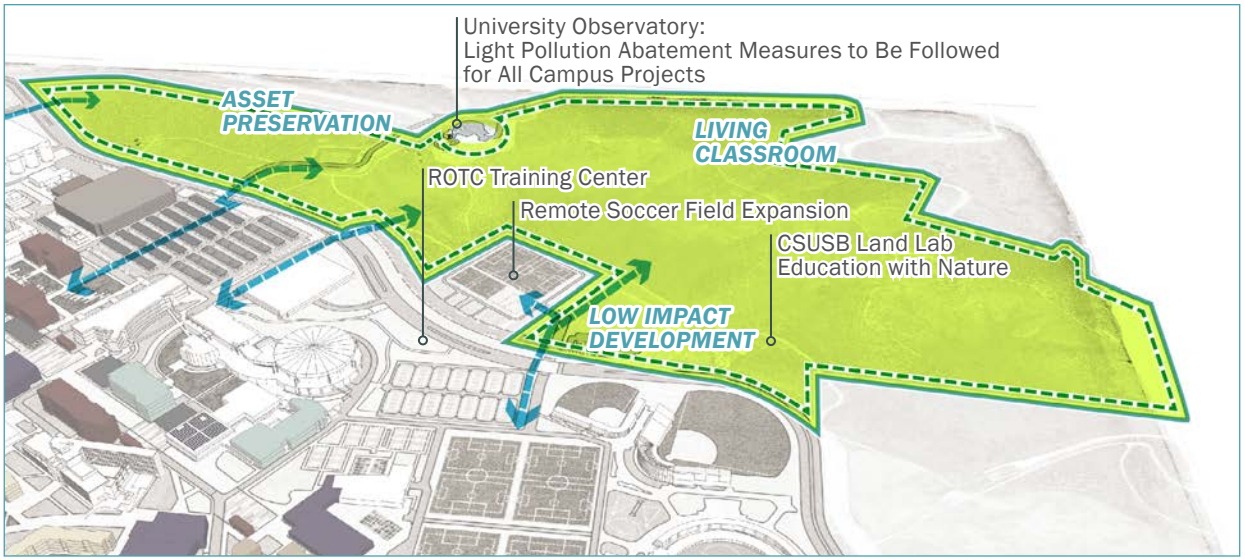


FIG 6–13: LAND LAB PRECINCT LAYOUT

The 2016 CSUSB Master Plan calls for preservation of the open space areas north of North Campus Circle. This area - a significant but sometimes overlooked campus resource – is used by a variety of campus academic departments and programs principally as an outdoor lab area for teaching and research. The 2016 Master Plan recognizes its educational value to the campus as well as its use by other student programs including ROTC and the Kinesiology cross country program. Faculty using these open spaces for instruction refer to the area collectively as the "Land Lab." These areas, covered with chaparral vegetation, contain one endangered plant species that was researched by faculty and students who then co-authored a study published in a well-known scientific journal.

No less important is the fact that this large open space also serves to provide a buffer or firebreak for the threat of brush fires potentially extending into the campus from the San Bernardino mountain environment.

7 SUSTAINABILITY + COMMUNITY RESILIENCE

7.1 INTRODUCTION + ASSESSMENT

CSUSB has an unparalleled opportunity to lead-by-example with an appropriate response to threats of climate change while simultaneously engaging and educating the student body and the community. CSUSB has adopted several policies and practices for sustainable development and operations of the campus. This 2016 Master Plan aims to confirm these policies as well as establish new goals and benchmarks for improved performance.

INTRODUCTION

Sustainability is a very strongly-held value as universities shape young minds as stewards of our collective future. CSUSB is no exception and has developed and implemented policy focused on a sustainable campus since 1978. Early policy impetus came through a CSU system-wide approach and over the years CSUSB has developed campus-specific policies and practices to address the unique setting of the region and conditions of the campus' built environment, infrastructure, operations and social capital. The 2016 CSUSB Master Plan aims to establish sustainability targets and metrics to extend CSUSB leadership and commitment sustainability into the future, all of which are described thoroughly below: "The Case for a Sustainable & Resilient CSUSB Campus".

THE CASE FOR A SUSTAINABLE & RESILIENT CSUSB CAMPUS

Climate change due to the use of power generated from burning fossil fuels is changing our economy, our health and our communities. The economic effects are globally important and locally visible. California has been leading energy code policy since the introduction of the California Energy Code in 1977. Since that time, California energy consumption per capita has been generally flat. This in contrast to the rest of the United States which has steadily increased.

California Energy Code is aiming toward a Zero Net Energy requirement by 2020 for residential, and by 2030 for non-residential. The market transformation already realized through the energy code cycles has made ZNE-ready technologies and practices available to many building types close to cost-neutral with a high upside on lifecycle benefits. Ongoing energy costs can be significantly reduced using a ZNE-ready approach. Given challenging operations budgets for many campuses, this investment in high performance built environment is a key strategy to future-proofing campus budgets as well as reducing climate change impacts.

With respect to water, 2013 was the driest year on record and California is in an intensifying drought with 95% of the state in a severe drought or worse. Water use by municipalities has created a risk of reservoir depletion. State water allocations are greater than available supply. The groundwater table is overdrawn which has negative ecological and economic impacts on California. CSUSB is home to the the Water Resources Institute, which is an academic partnership with the Southern California communities driven by the vision that sustaining water resources rests on sound research, analysis and public policy collaboration.

Due to severe drought and increasing temperatures, fire has become a serious risk in the state of California. CSUSB is surrounded by areas that have experienced devastating fires in the recent past. Sustainability and resilience strategies at the campus level can help to protect the built environment against these impacts such that the campus can continue to operate and even be a safe-haven for the community should similar events occur in the future

In addition to the system- and campus-wide efforts, CSUSB is sympathetic to national commitments to sustainability such as the American College and University Presidents Climate Commitment (ACUPCC). Over 650 schools have joined this commitment calling for developing climate action plans and carbon neutrality goals and reporting on progress towards these goals. Five CSU campuses have become signatories to this commitment.

CSU SUSTAINABILITY POLICY

The California State University (CSU) system set forth their first Energy Policy in 1978 and it continues to guide the sustainable practices at the campuses. In 2006, Executive Order No. 987 Policy Statement on Energy Conservation, Sustainable Building Practices, and Physical Plant Management for the CSU was adopted requiring the installation of clean cogeneration, renewable energy generation, a Renewable Portfolio Standard of 20% by 2010; and all new construction to outperform Title 24 standards by at least 15% and major renovations by 10%. In 2014, the CSU Sustainability Policy was revised to include specific performance metrics, target additional facility operations and expand the policy to include procurement and food operations.

ANALYSIS SUMMARY

CSUSB has made tremendous strides in specific areas of sustainability, primarily in building energy metering, efficient energy production, and water conservation demonstration. Current sustainability highlights include:

- The San Bernardino Valley Water Conservation Demonstration Garden—just over an acre of plantings and displays that showcase water conservation through a series of themed gardens and exhibits
- 91% of the indoor space on campus and 100% of the parking lots and structures are metered for electricity at the building or service area level.
- Multiple buildings employ Monitoring Based Commissioning (MBCx), which utilizes advanced computer controls to run

TABLE 7–1: 2014 CSU SUSTAINABILITY POLICY GOALS + TARGETS SUMMARY

GOAL 1 + 2	**ACADEMIC PROGRAMS AND INSTITUTES**
TARGET 1	The CSU will seek to further integrate sustainability into the academic curriculum.
TARGET 2	The CSU will develop employee and student workforce skills in the green jobs industry, promote the development of sustainable products and services, and foster economic development.
TARGET 3	The CSU will pursue sustainable practices in all areas of the university including business operations and self-funded entities.
GOAL 1 + 2	**ENERGY INDEPENDENCE AND CLIMATE ACTION PLANNING**
TARGET 1.1	Reduce GHG emissions to 1990 levels by 2020
TARGET 1.2	Reduce GHG emissions to 80% below 1990 levels by 2040 (Ca AB32 says by 2050)
TARGET 1.3	Promote the use of alternative transportation and/or alternative fuels.
TARGET 2.1	Increase on-site generation from 44MW to 80 MW by 2020
TARGET 2.2	33% Renewables by 2020
GOAL 3	**ENERGY CONSERVATION AND UTILITY MANAGEMENT**
TARGET 3.1	Operate all CSU buildings/facilities in the most energy efficient manner possible.
TARGET 3.2	Identify energy efficiency improvement measures to the greatest extent possible.
TARGET 3.3	Cooperate with all federal, state and local governments to accomplish energy conservation and utilities management objectives and inform /create awareness to entire campus community.
TARGET 3.5	Monitor monthly energy and utilities usage and provide the Chancellor's Office the necessary data.
TARGET 3.6	Develop and maintain a campuswide integrated strategic energy resource plan.
GOAL 4	**WATER CONSERVATION (AGAINST 2013 BASELINE)**
TARGET 4.1	Reduce 10% by 2016 and reduce 20% by 2020. Use recycled/reclaim water where possible
GOAL 5	**WASTE MANAGEMENT**
TARGET 5.1	Reduce per capita landfill 50% by 2016
TARGET 5.2	Reduce hazardous waste to the extent possible.
GOAL 6	**PROCUREMENT**
TARGET 6.1	Promote use of environmentally preferred vendors. Use recycled/reusable/refillable products
TARGET 6.2	Move toward Zero Waste. Reduce or use recycled packaging. Participate in CalRecycle "Buy Recycled" Program
TARGET 6.3	Report on all recycled content product categories and improve tracking and reporting procedures.
GOAL 7	**FOOD SERVICE**
TARGET 7.1	Purchase 20% "sustainable" food by 2020 (local, organic, free trade). Follow Real Food Challenge guidelines
TARGET 7. 2	Create public awareness and training on sustainable food service operations for campus community.
GOAL 8	**SUSTAINABLE BUILDING PRACTICES**
TARGET 8.1	Design all future and current building projects to consider energy efficient and sustainability.
TARGET 8.3	Design and build all new buildings to meet or exceed LEED "Silver."
GOAL 9	**PHYSICAL PLANT MANAGEMENT**
TARGET 9.1	Operate and maintain a comprehensive energy management system that will provide centralized reporting and control.
TARGET 9.2	Consolidate academic and non-academic, if possible, to achieve highest building utilization.

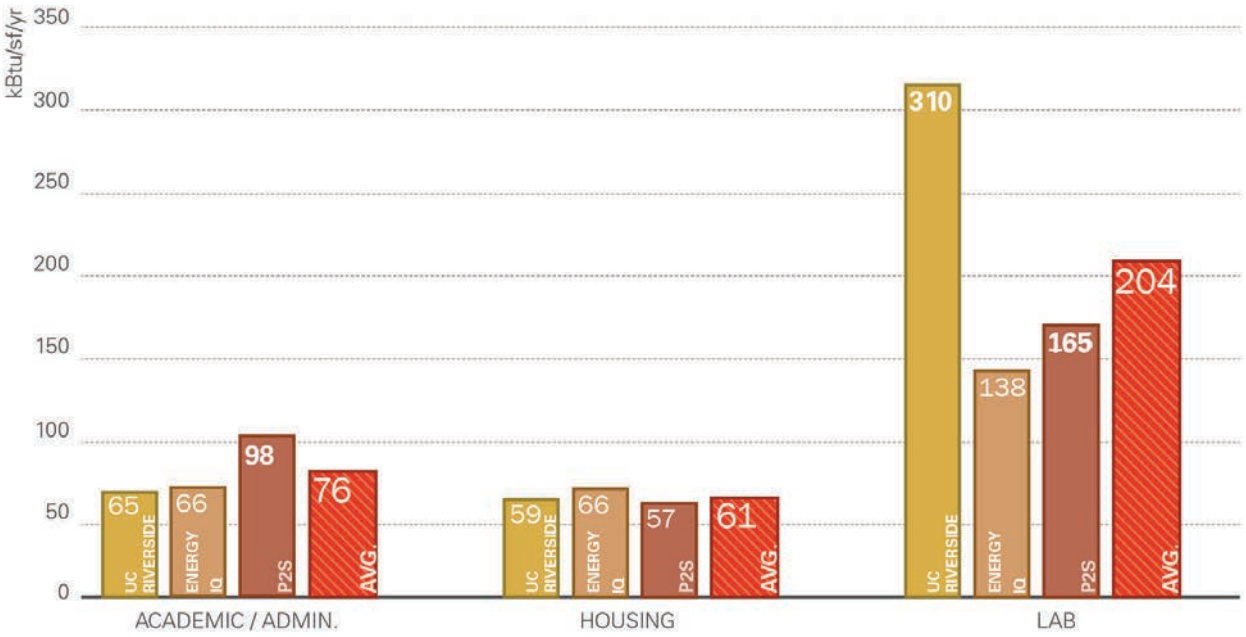
Abbreviations: GHG = Green House Gas; MW = Megawatts; LEED = Leadership in Energy & Environmental Design, a green building certification program that recognizes best-in-class building strategies and practices

HVAC equipment more efficiently by taking advantage of existing equipment such as variable speed fans, which deliver only the amount of air needed to heat or cool a particular room.

- A 1.4 MW Direct Fuel Cell 1500 cogeneration power plant owned and maintained by Southern California Edison. Fully operational in October 2013, this site showcases local power technology that provides clean, more efficient generation, with a less vulnerable and costly infrastructure to maintain. By locating the fuel cell adjacent to the CSUSB central plant, the campus is able to utilize its waste heat to supplement baseload heating and hot water needs, significantly reducing related fossil fuel combustion by an average of 18,600 therms per month.
- 2020 Targets developed with this study include:
  - 88% reduction in Greenhouse Gas Emissions from 2012 baseline
  - Building energy use intensity reduction of 54% from 2000 baseline
  - 30 MW potential on-site generation towards CSU Renewable energy target
  - 14% reduction in water consumption from 2013 baseline

As the campus grows with the 2016 Master Plan, there is opportunity to develop and implement visionary strategies for sustainability so that CSUSB can be a leader in the CSU system as well as the community. There is opportunity in building design and construction and target EUIs for new buildings and renovations. In an arid microclimate, water strategies and stormwater management can be prioritized to ensure the longevity of the well water supply and also help future-proof the campus from flash flood threats.

FIG 7–1: CAMPUS ENERGY USE INTENSITY (EUI) PRECEDENTS W/ AVERAGE BENCHMARK



7.2 PROPOSED 2016 CAMPUS SUSTAINABILITY POLICY + GOALS

Through curriculum design, planning of campus facilities and operational practices focused on sustainability, resource conservation and cost-effectiveness, CSUSB will set a high standard for performance within the CSU system.

CSUSB PROPOSED 2016 CAMPUS SUSTAINABILITY POLICIES

Holistic strategies with integrated solutions independent from existing infrastructure should be considered as the CSUSB campus considers sustainability, resiliency, and the ability to recover from external stressors or disasters. With significant solar energy potential, the campus area has ample opportunities to incorporate resilient strategies into the Master Plan and long term planning initiatives. Resource conservation measures should continue to be explored to decrease the campus's reliance on fossil fuels, regional water supplies, waste diversion infrastructure, and overall consumerism.

SUSTAINABILITY LEADERSHIP + EDUCATION GOALS

Overall CSUSB through its various administrative and academic departments sets a number of policies that guide the campus towards achieving greater levels of sustainability. Ultimately campus leadership must come together to identify, formulate and implement a wide range of sustainability initiatives touching on most aspects of campus development and life. Several of these initiatives, particularly those related to physical facilities are outlined in this chapter.

CLIMATE ACTION GOALS

As a major sector of activity, transportation—the way in which all CSUSB campus users arrive, move through and leave the University—represents a large area where sustainability initiatives can have an impact on saving non-renewable resources and reducing carbon emissions. As a traditional commuter campus, CSUSB students, faculty and staff have been highly dependent upon the use of single occupancy vehicles as the primary way to access the campus. Ways of reducing those single occupancy trips to the campus are outlined in Chapter 8.

ENERGY PRODUCTION GOALS

Estimated building carbon emissions were calculated by using a Tons of CO2/kWh or Tons of CO2/therm factor that was applied to the energy use Benchmark and Target kWh/therm for each building type. Then the results from the on-campus energy production analysis were used to estimate the approximate amount of carbon emissions that could be offset with on-site renewable energy generation that leverages a maximized, distrtributed, campus photo-voltaic (PV) array. Further development and explanation is described in the climate impact analysis portion of section 7.3.

- Benchmark Design carbon emissions: 19,320 Tons CO2eq/yr
- Target Design carbon emissions: 10,511 Tons CO2eq/yr
- Maximum site PV carbon offset: 8,712 Tons CO2eq/yr

Fig 7–2: The Ten Dimensions of Full-Spectrum Sustainability in the 2016 Master Plan , relating to 10 categories of the 2014 CSU Sustainability Policy

ENERGY USE GOALS

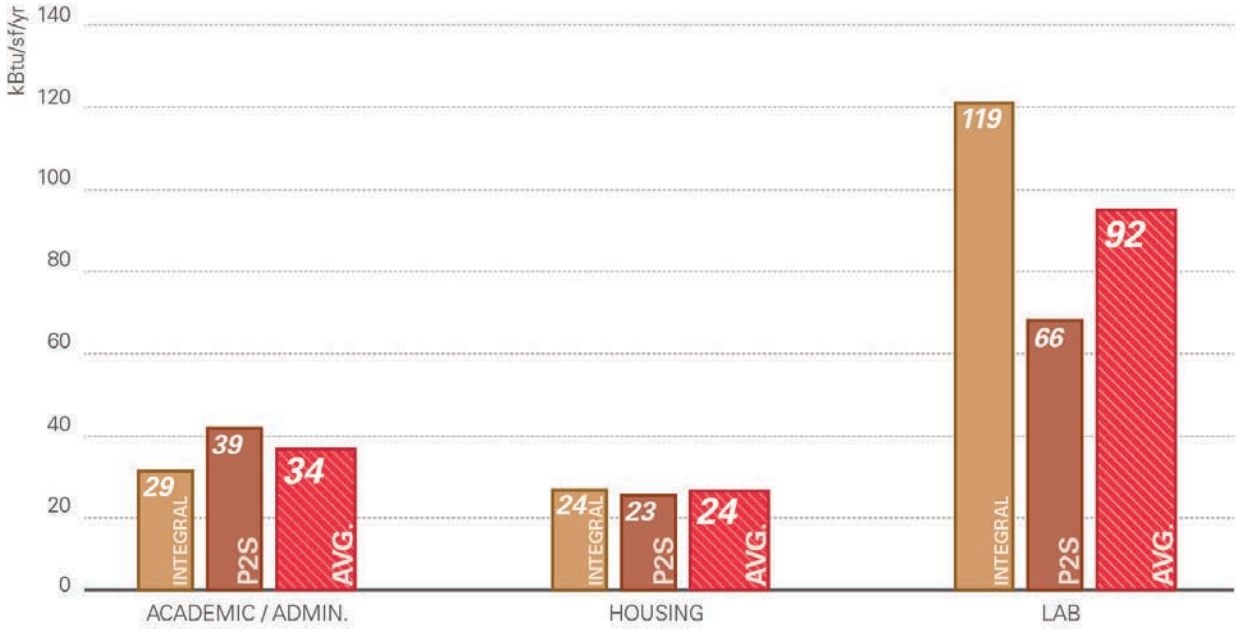
In Figure 7-1, there are three different sources of benchmark EUI (Energy Use Intensity) data for three building program types. The first set of benchmark data comes from the Benchmark-based Whole-building Energy Performance Targets for New Buildings study done by Rashmi Sahai on eight UC and CSU campuses using measured energy use. The UC Riverside campus data was used as a benchmark for this study due to it being located in a similar climate. The second set of benchmark data comes from the EnergyIQ benchmarking tool which uses data collected from the Commercial Buildings Energy Consumption Survey of existing buildings. The same building types used in the previous campus study were entered into EnergyIQ to get another set of benchmark EUIs. The last set of benchmark data comes from P2S Engineers, whose EUI's were formulated from an existing database of metered data available for each of the functional spaces. An average of these 3 benchmark EUI sources was used for this study. Recommended EUI Benchmarks are:

- Academic: 76 kBtu/sf
- Housing: 61 kBtu/sf
- Lab: 204 kBtu/sf

As part of this exercise, Target Design EUIs were developed as goals for newly constructed and existing buildings (Figure 7-3). By setting a standard EUI target for a building, it does not limit innovation in energy efficiency measures. It allows the designer of the building as well as the future occupants to look holistically at a building to find the most effective energy efficiency measures, with the goal to meet or beat the physical target. Furter explaination of how the Target Design EUIs were developed is discussed in section 7.3. Recommended EUI Targets are:

- Academic: 34 kBtu/sf
- Housing: 24 kBtu/sf
- Lab: 92 kBtu/sf

FIG 7–3: ESTABLISHING MASTER PLAN ENERGY USE INTENSITY (EUI) TARGETS



Note: Integral Group Campus Benchmark and Targets (Integral); P2S Engineering Benchmark and Targets (P2S)

WATER USE GOALS

Below is shown actual measured water consumption for the campus for the year 2013. During that year there were approximately 13,457 FTE (Full-time equivalent students or regular occupants) on campus, this water consumption was then extrapolated to be about 11,356 gallons per FTE in the year 2013. The benchmark water use was calculated using the same amount of water consumption per FTE for the increased number of students that would be added by the campus expansion (Total 25,000 FTE). Of this, 39% was assumed to be used for irrigation and 61% for domestic water consumption (human consumption and other non-irrigation uses) in correlation with the metered data. Recommended water consumption benchmarks for total FTE are:

- Domestic Water: 173,179,000 gal/yr
- Campus Irrigation: 110,721,000 gal/yr

Similar to Energy Use, Target Design water consumption levels were developed as goals for newly constructed and existing buildings. Further explanation and Target Design gal/yr are discussed in section 7.4. Recommended water consumption Targets for total FTE are:

- Domestic Water: 121,225,300 gal/yr
- Campus Irrigation: 44,288,400 gal/yr

WASTE MANAGEMENT GOALS

Essentially CSUSB seeks in the long-term to achieve a near zero waste target for those wastes directed to landfills. A mid-term goal of achieving 80 percent diversion of wastes away from landfills appears appropriate. Recycling will continue to be part of the diversion strategy as it also is a way of conserving natural resources. Recycling of food wastes and composting represent areas of potential for further gains in diversions to landfills at CSUSB.

PROCUREMENT GOALS

CSUSB has made considerable progress in buying recycled content products. Additional gains in purchasing recycled content products are possible as well as adding a new emphasis on buying products that are biodegradable or reusable, which similarly reduce the use of resources and help divert waste from landfills. Some future biodegradable or reusable gains will be possible when implemented as part of food service programs including those built-in to the new student residential environments planned for in the 2106 CSUSB Master Plan. The use of reusable tableware and cups is possible but should also be evaluated for their impact on water and energy use for cleaning.

SUSTAINABLE FOOD SERVICE GOALS

One emerging trend and possibility that holds promise for adding to the overall sustainability of CSUSB is through the use of campus-grown food. The use of campus-grown food might occur through the planting and harvesting of fruit trees and/or the raising of some vegetables in selected campus areas. Typically these types of campus-grown food programs are integrated into student residential areas where some labor may be applied to the maintenance of these systems. Student groups affiliated with the Student Union have expressed significant interest in developing and maintaining these types of gardens. Such interest promises a high level of program involvement and telegraphs positive reception of more holistic educational programs around sustainable food production. Opening selected campus areas to the creation of community gardens is another possibility—where food is produced by community members who share in the profits and/or otherwise utilize the produce. Ultimately, locally grown fresh food produced under such arrangements can promote student health as well as reducing energy costs and carbon emissions associated with food deliveries.

FIG 7–4: CRITICAL PATH FOR SUSTAINABILITY RESEARCH, ANALYSIS, AND GOAL SETTING

BUILDING DESIGN GOALS

The CSU sytem-wide uses LEED as its sustainable building guideline. Buildings are expected to be LEED Silver "certifiable." CSUSB has also adopted LEED as its sustainable building guideline. With this Master Plan, all new CSUSB buildings will target LEED Gold-equivalent using the LEED v4 system (effective October 2016). Projects must satisfy prerequisites and earn points within each of the following LEED credit categories:

- Sustainable Sites- strategies that minimize the impact on ecosystems and water resources
- Water Efficiency- promotes smarter use of water, inside and out, to reduce potable water consumption
- Energy and Atmosphere- p romotes better building energy performance through innovative strategies
- Materials and Resources- encourages the use of sustainable building materials and reducing waste
- Indoor Environmental Quality- promotes better indoor air quality and access to daylight and views

FACILITIES + PLANT GOALS

Facilities and Plant operations and expansion greatly impact the sustainable performance of the entire campus. Primarily, HVAC loads incurred as chilled water production at the central plant constitute the most impactful energy use, and can be reduced with expanded chilled water storage. Additional energy savings should be sought with the introduction of a heat-recovery chiller at the recreation and athletic centers; this will simultaneously meet the larger demands for hot water and chilled air in those facilities.

Overall energy savings from a heat recovery chiller will reduce energy use in these athletics facilities by 30% - this should be adopted as a sustainability objective accompanying renovations and expansion of the student recreation center.

Integrating hybrid-infrastructure (exemplified above at ASU, Solar PV Shade structure) into the environment at Coyote Walk civilizes the public sphere and activates CSUSB as a sustainable brand.

7.3 ENERGY SUSTAINABILITY APPROACH

In order to progress toward energy sustainability and achieve CA code requirements and CSU mandates, the campus will need to execute energy reduction strategies in both new and existing building.

CAMPUS-WIDE ENERGY SUSTAINABILITY

A combination of energy retrofits on existing buildings and energy consumption strategies for new buildings can get CSUSB a substantial way towards achieving net zero energy use. Once conservation measures are maximized, renewable energy systems can be used to offset grid energy. The renewable energy equipment requirement shown on Figure 7-8 depicts the photovoltaic array needed to offset 100% of the campus's energy consumption for the benchmark case and the high-performance case.

The energy analysis conducted identifies energy consumption in 2013 in existing buildings and projects consumption of buildings in the 2016 Master Plan based upon energy use intensities (EUI). This becomes the business-as-usual benchmark case for the

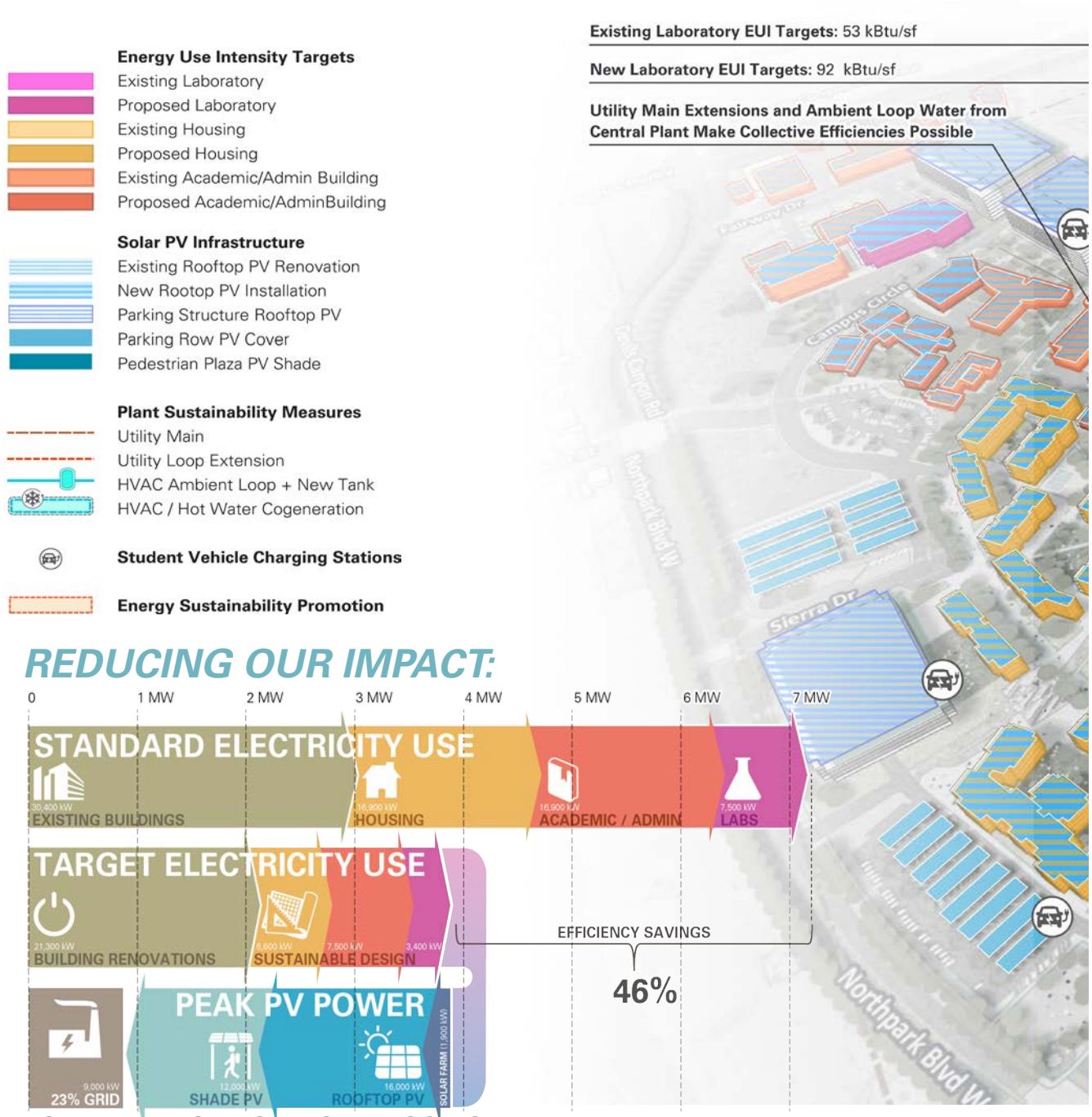


FIG 7–5: ELECTRICITY SAVINGS POTENTIAL

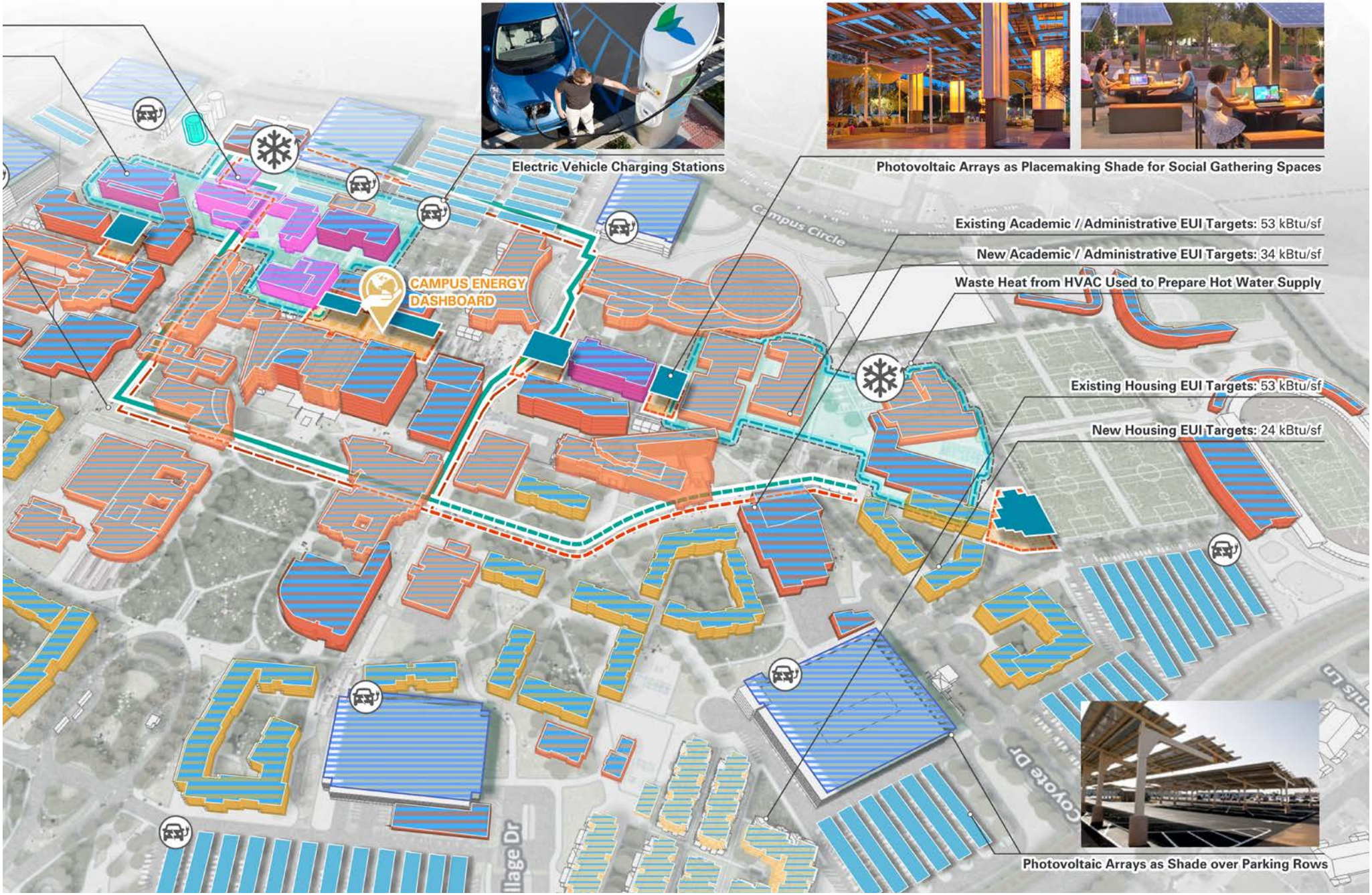


FIG 7–6: CAMPUS-WIDE ENERGY SUSTAINABILITY STRATEGIES

campus. Using reduction factors, energy targets were established for each building type in the programmed Master Plan. There is substantial operational cost savings associated with such efficiency improvements. The renewable energy image depicts the photovoltaic array needed to offset 100% of the campus's energy consumption for the benchmark case and the high-performance case.

ENERGY CONSUMPTION TARGETS IN DETAIL

The amount of energy used by buildings on the CSUSB campus was both measured and predicted to inform the 2016 Master Plan strategies. Using the benchmarking method described in section 7.2, buildings where categorized into three major types: Academic/ Admin, Residential, and Lab. Existing operations of energy use were established and low energy targets were set, informed by best practice engineering and building design.

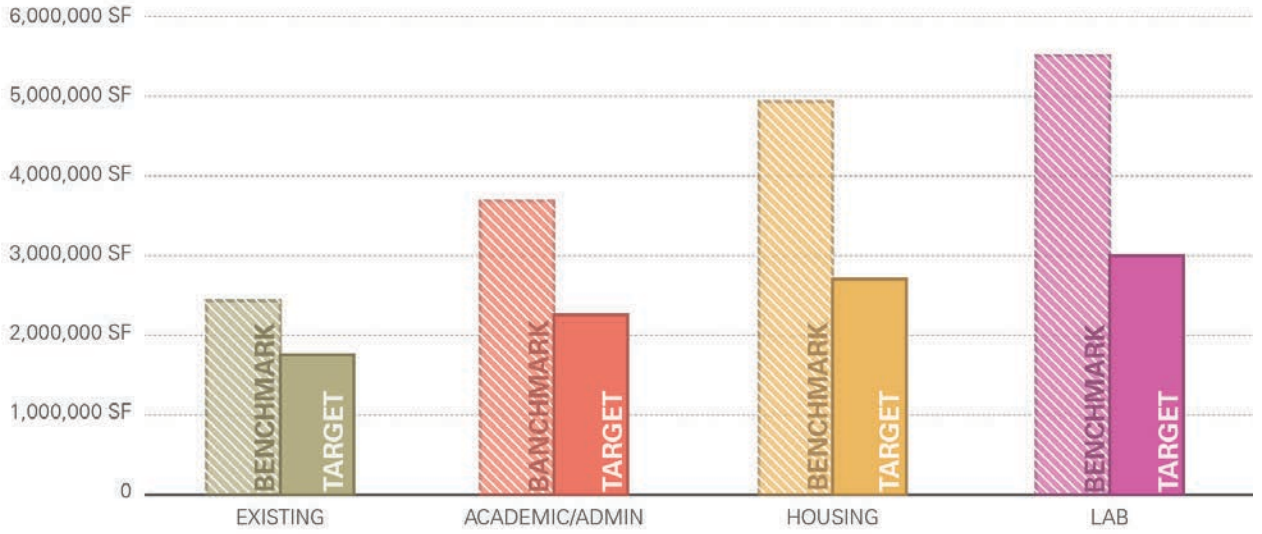
The building measurements are shown in energy use intensity (EUI) values. EUI is a measure of a buildings annual energy use divided by the buildings gross-square-footage. This normalized metric is used primarily in architectural and city benchmarking programs to compare properties across type, region, age and use. The units are presented here in kBtu/sf per year for both electricity and gas.

Figure 7-3 illustrates two different sets of possible EUI Targets. P2S calculated a future and proposed/ targeted EUI's to achieve net zero energy facilities by applying a 60% reduction in overall energy use from their calculated benchmark for standard EUIs per

TABLE 7–2: ENERGY USE INTENSITY (EUI) REDUCTIONS OVER BENCHMARKS

	Annual Elec kWh/sf/yr	Annual Gas therms/sf/yr	Max Power W/sf	Max Thermal therms/hr/ksf	Max Chilled Water tons/ksf
Academic/Admin	*50%*	*30%*	*40%*	*70%*	*80%*
Housing	*50%*	*30%*	*50%*	*70%*	*80%*
Lab	*50%*	*30%*	*75%*	*70%*	*80%*

FIG 7–8: PV AREA REQUIRED TO SUPPORT BENCHMARK + TARGET SCENARIOS



each building type. Similarly, Integral Group engineers decided to apply different reduction factors to the measured UC Riverside data by energy source and by 3 major building types:

Metered utility data from 2015 was used to calculate the overall energy use of the existing campus buildings, this data was not broken down by building or building type. This was used as the benchmark for the existing campus buildings, and a 30% reduction in energy use was assumed as the Target Design for all existing buildings.

ENERGY CONSERVATION ANALYSIS

Using the target EUIs per building type and a 30% reduction in energy use of existing buildings on campus, an overall reduction of 46% in energy use was shown compared to building using the benchmark EUIs. The new buildings alone were shown to reduce energy use by 58% when designed to use the Target Design EUIs compared to the Benchmark.

ON-CAMPUS ENERGY PRODUCTION ANALYSIS

Renewable energy technologies are prevalent and affordable in today's energy supply market, as primarily lead by solar photovoltaic (PV) systems which directly convert solar radiation into electricity. Solar electric systems are the lowest cost systems available today, achieving an approximate efficiency of 20%.

In order to calculate the potential for on-campus energy production through the use of PV, we estimated an availability of 80% roof coverage for new buildings and 50% coverage for existing buildings, as well as canopies to be placed over surface parking lots. This square footage was measured and a standard efficiency panel was used to estimate a campus-wide potential of PV generation to be 30 Megawatts capable of offsetting 77% of all building energy use when using the Target EUIs.

CLIMATE IMPACT ANALYSIS

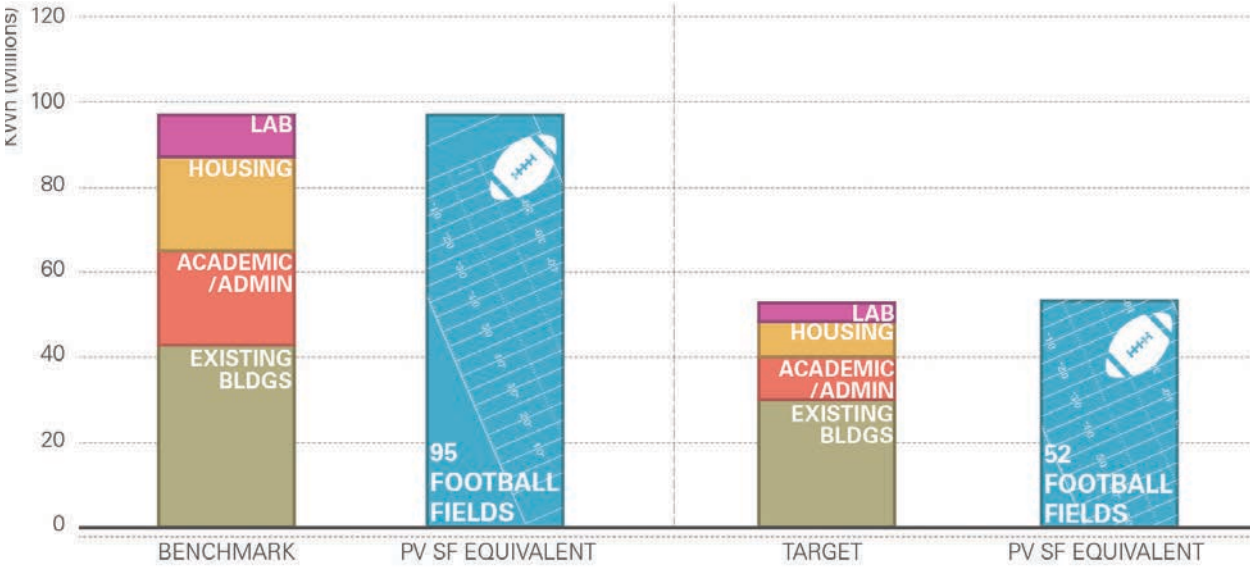
As stated in section 7.2, the estimated carbon emissions were calculated by applying a tons-of-CO2 factor for either electricity or natural gas for both the Benchmark and Target energy use, this was then compared to the amount of carbon emissions associated with electricity that could be offset by the maximum available 30 Megawatts generated with PV found in the on-campus energy production analysis.

After comparing the two, it was found that the PV could offset approximately 82% of the Target building energy use, and 45% of the Benchmark building energy use.

ESTABLISHING THE POTENTIAL FOR A NET ZERO ENERGY ACHIEVEMENT

Building Energy use is the key driver in achieving net zero energy and carbon neutrality because it reduces both electricity and natural gas usage significantly. CSUSB has implemented many

FIG 7–9: PV GENERATION NEEDED TO SUPPORT ENERGY CONSUMPTION



energy efficiency measures and has already realized a reduction in electricity and gas usage. Building energy is rapidly changing as more data becomes available on existing operations, the price of energy increases, and the state of California moves towards realizing Zero Net Energy (ZNE) residential buildings by 2020 and commercial buildings by 2030. These targets are actively being met throughout the state on a handful of projects with market ready technologies and strategies that can be replicated at CSUSB. Through the reduction and renewable generation proposed in this Master Plan, CSUSB will make a significant contribution to the CSU system carbon neutrality goals.

NET ZERO CAMPUS IMPLEMENTATION

As outlined in this section, the CSUSB existing campus with the proposed development has the potential to be a 'Near Zero' energy campus with 77% of all building energy use offset. In order to achieve this, the first step is to reduce building energy use by meeting of the Target EUIs that have been proposed. The second step is through utilizing the maximum on-campus PV generation potential of 30 MW. Standard efficiency panels were used to estimate this percentage offset, by using a high efficiency panel there is potential to get even closer to Net Zero energy or to surpass it. Further discussed are some design guidelines on how to lower building energy use in order to meet the first step of meeting the proposed Target EUIs.

BUILDING DESIGN AND RENOVATION SUSTAINABILITY GUIDELINES

Energy Efficiency in Indoor Building Design and Renovation

- Optimize the active MEP systems through low-energy, Passive building design to reduce loads.
- Passive strategies will harness natural daylight and employ mixed-mode natural ventilation.
- Active system optimization results in reduced lighting power, reduced receptacle loads and more efficient HVAC systems.
- Application of efficient lighting systems and daylighting controls.
- If additional ventilation is required, especially during the heating months, outside air can be pre-heated with exhaust air. Heat recovery systems should be designed to still allow for economizing and preferably with bypasses to reduce fan power when heat recovery is not needed.
- Heating and cooling loads should be met with the moderate temperature systems. This means cooling systems with 55 to 60 F water and heating systems with 110-130 F water. Radiant panels, thermally active building slabs (TABS), chilled sails and chilled beams all take advantage of medium temperature chilled water for low-energy cooling.
- HVAC systems which utilize heat pumps, systems that can transfer heat from the air or from ground coupling. These systems make lower hot water temperatures than traditional HVAC, 100 to 120 deg F compared with 150 to 180 deg F. These heat pumps can be coupled with key technologies such as radiant floors, radiators along windows, or even variable refrigerate flow (VRF) systems.
- Thermally zoned VAV airside systems, fan coils / VRF systems paired with dedicated outdoor air systems, demand control ventilation and underfloor/displacement ventilation systems all provide opportunities for energy efficiency within the building.

Energy Efficiency in Indoor Building Design and Renovation

- Appropriate building massing and orientation to maximize beneficial solar exposure.
- Incorporate Passive, low-energy exterior building design to reduce building loads
- Building envelopes should perform better than code using optimal levels of insulation for the walls and roofs.
- Careful use of glazing area and type, with 40% window-to-wall ratio being the code prescriptive maximum.
- Appropriate external shading for solar heat gain control, while providing an enhanced level of daylight penetration (eg. Vertical fins on the east/west facades and horizontal overhangs on the south façade).

Residential Focused Energy Efficiency Building Design and Renovation

- Design architectural features that provide enhanced insulation to outdoor loads as there is minimal internal loads in residential program.
- Provide enhanced controls and occupancy sensing to ensure systems and equipment are not consuming resources when students are not at their residences.
- Passive strategies will harness natural daylight and employ mixed-mode natural ventilation.

Effective & Efficient Outdoor Lighting Design and Renovation

- Select fixtures that provide total cut-off to prevent light pollution for the night sky, on-campus and across campus boundaries.
- Ensure that campus circulation, while being safely lit, is provided with minimal illumination.
- Control all outdoor illumination with daylight sensing and central scheduling to prevent wasteful daylight illumination.
- Protect the Murillo Family Observatory from light pollution.

HIGHLY EFFECTIVE NET-ZERO DESIGN CONCEPTS

Following will be our approach in designing a typical Net Zero Energy Building. The project will incorporate an integrated design approach involving:

- optimal orientation of building elements to solar and wind effects,

- An efficient envelope and fenestrations confirmed through energy modeling,
- Maximizing passive technologies like solar heat gain on the south side in winter by selecting the right size of overhang (that allows solar heat to come in during winter when the sun is low and shields the south side when the sun is high in summer) and operating the building in economizer mode,
- Maximizing daylighting in spaces to minimize electric lighting during the entire day in all spaces, Bring daylight into the interior center space from above. Effective daylight will also consider interior design (uses, volumes, colors, furniture) and glare control.
- Providing plug load controls,
- Effective control strategies like daylighting and occupancy controls and integrating the same with HVAC (shutting VAV's when spaces are not occupied),
- Promoting task lighting to reduce overhead lighting power densities,
- Thermal mass or PCM (Phase Change Materials) combined with night pre-cooling to lower cooling loads.
- Dedicated Outdoor Air Systems with Demand Controlled Ventilation and heat recovery for the high ventilation load
- HVAC options for sensible cooling and heating would include:
    - Natural Ventilation as applicable
    - VAV with reheat. Reheat would only be needed when heating since the DOAS handles the ventilation load.
    - VRF (no simultaneous heating and cooling)
    - Vertical AHUs for each space (no simultaneous heating and cooling)
    - Heat Recovery Chiller
- Regenerating drives for any elevators/escalators (only hydraulic) for a typical building. When the cab goes up with a light load and down with a heavy load, the system generates more power than it uses. If buildings are not too tall, an analysis would be required, but potentially an elevator could put energy back to the system. A design strategy could be to make stairs attractive so that elevators are seldom used. An elevator can account for 2–10% of a building's total energy consumption. Use of regenerative drives convert the excess energy generated by an elevator into electricity that can be reused elsewhere in the building. Further, conventional drives lift energy is converted into heat, which then needs to be removed from the building by air conditioning systems.
- Once the internal and external loads of the building are reduced with the help of optimal orientation, efficient envelope, and efficient mechanical and electrical systems, renewable energy in the form of photovoltaics/wind (as applicable) will be provided to offset the overall energy usage of the building.
- Water conservation strategies - use of efficient fixtures, aerators, use of gray water, storm water capture, utilizing condensate from air handlers, promoting xeriscaping and effective irrigation control - can be implemented.

PV SYSTEMS ALTERNATIVE DELIVERY METHODS

Power Purchase Agreement (PPA)

Under a PPA agreement, a third party provides, owns, operates and maintains the renewable power system and sells power to the client at a determined kWh rate. The client leases an existing site /roof of a building to the provider and the provider claims a federal tax credit at a current applicable rate of 30% and passes on the credit in the form of a reduced rate to the client. The kWh rate offered by the provider may have a yearly escalation rate and a cost for providing Renewable Energy Credits (REC) over and above the kWh rate offered to the client.

Third Party Ownership & Solar Leases

Solar Leases are similar to Power Purchase Agreements in that a third party pays for and owns the system, but with this financing mechanism a customer pays a fixed monthly fee that is not tied to actual use and is responsible for system performance, operations and maintenance.

P.E. / RECREATION CENTER HEAT RECOVERY CHILLER RECOMMENDATION

Buildings are responsible for 40 percent of total energy consumption. Of the energy consumed in commercial buildings, 43 percent is used for space and water heating. If a more efficient means of providing heat could be implemented it would represent a tremendous opportunity to reduce energy consumption in buildings and thus reduce total energy consumption. There is a more efficient means of generating hot water through the application of chiller systems with heat recovery capabilities especially in facilities where there is a simultaneous need of heating and cooling or in facilities like Athletic and Recreation facilities where hot water is required for showers, pool and other equipment like laundry machines that require hot water. The heat recovery chiller produces chilled water controlled to the necessary temperature while generating hot water as a by-product of the chilled water system thus resulting in an increase in its coefficient of performance. For every 0.35kW of electricity, it produces 1 unit of cooling and 1.35 unit of heating.

7.4 WATER SUSTAINABILITY

The goal of reducing CSUSB's water footprint while implementing a sustainable approach is best met with a three-tiered approach.

CAMPUS-WIDE WATER SUSTAINABILITY

Education and Policy to Drive Conservation

This approach involves educating users by sharing water meter data, holding creative competitions between users (this is often done between student housing buildings), and direct outreach. Making goals and information available to users and larger audiences improves water conservation results. At the policy level, establishing an outdoor water use policy for design and retrofit projects and reviewing landscaping and irrigation operation protocols can assist in lowering future potable water demands.

Heavy Focus on Building Scale Solutions

Utilizing water efficient fixtures in new and refurbished buildings

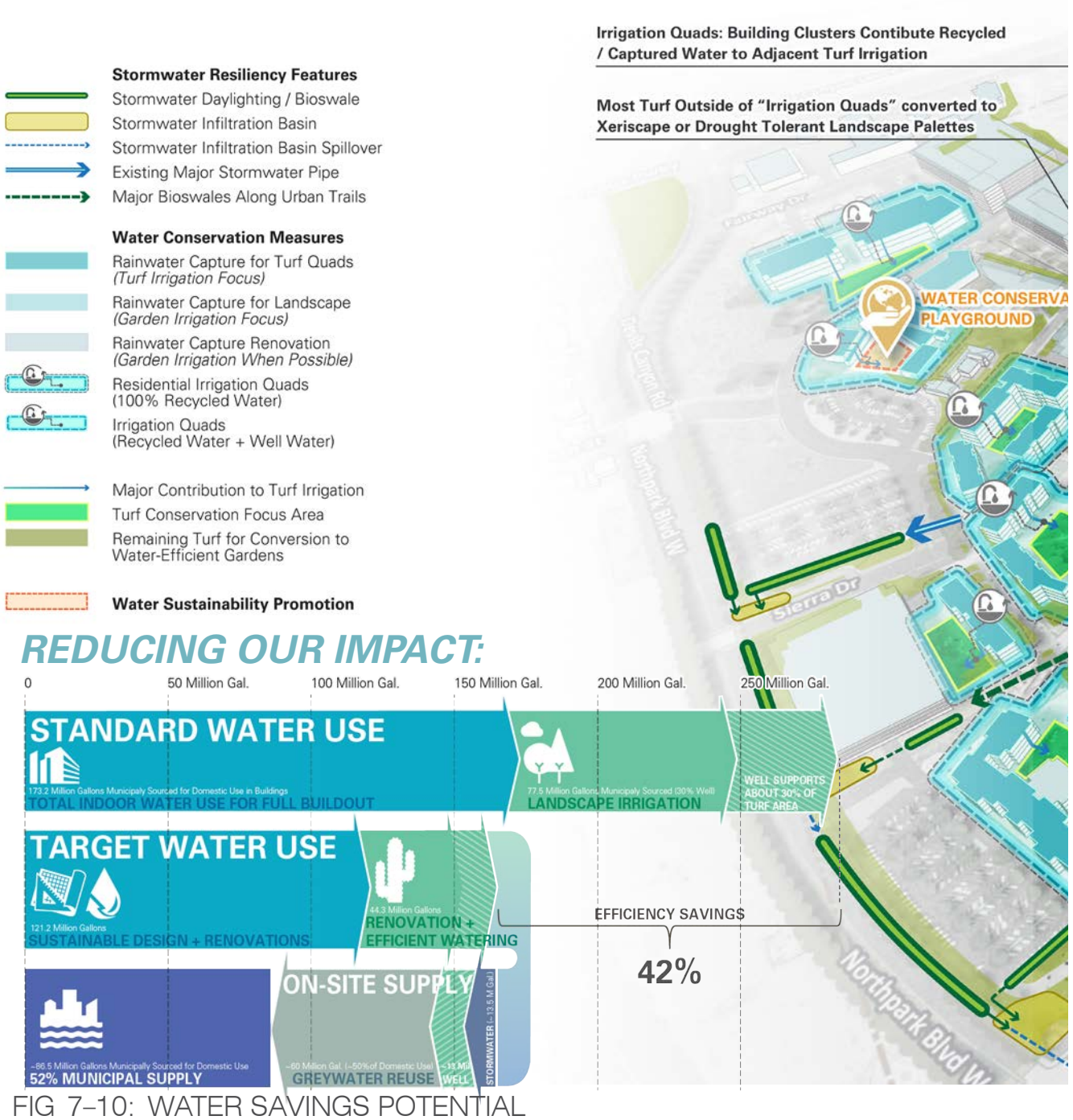


FIG 7–10: WATER SAVINGS POTENTIAL

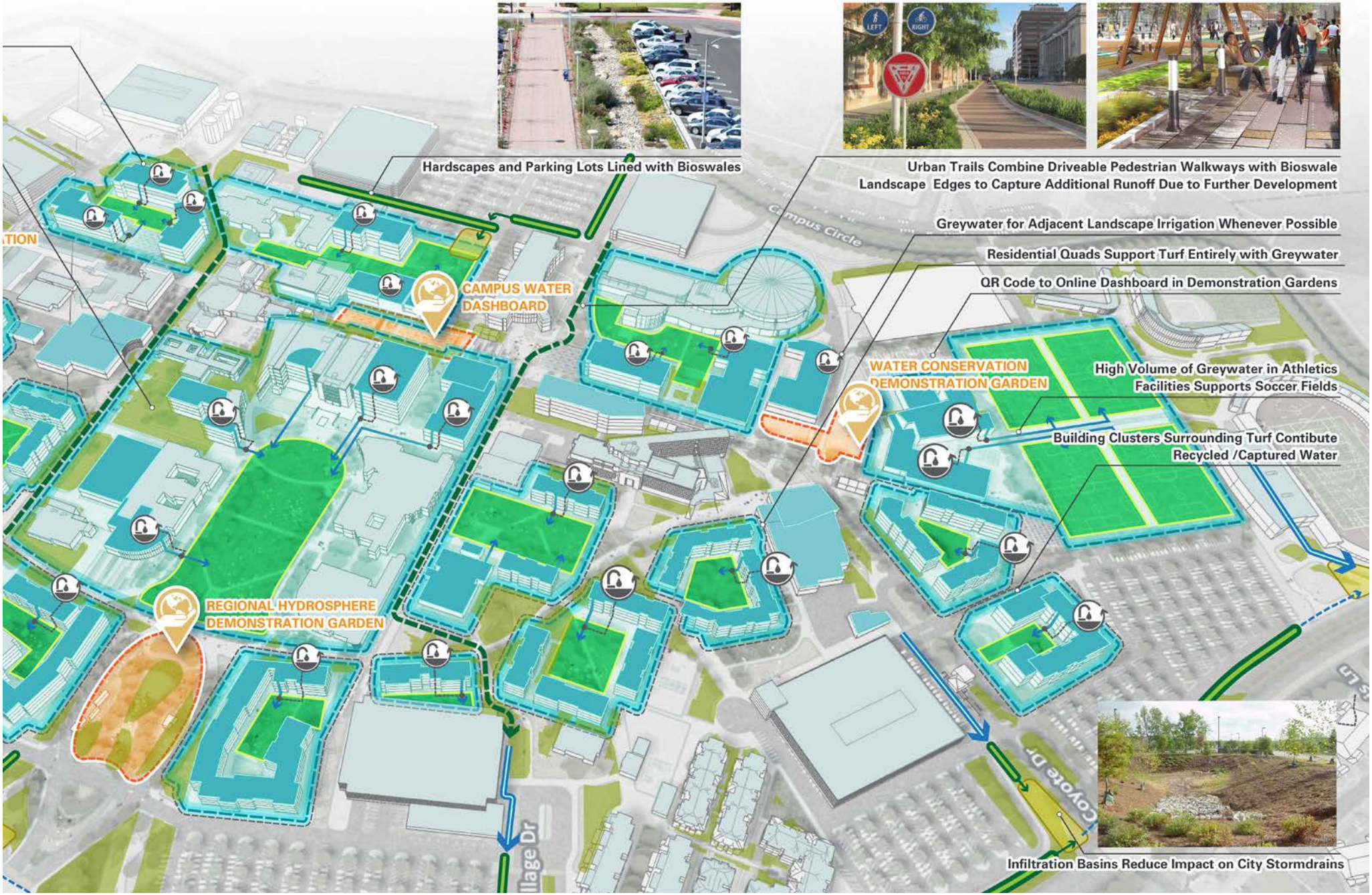


FIG 7–11: CAMPUS-WIDE WATER SUSTAINABILITY STRATEGIES

can also assist with the overall water savings strategy. Laundry to landscape systems for campus residential projects, where greywater is diverted and treated at the building cluster scale to address that cluster's irrigation needs, can be implemented to reduce water use. An additional building scale solution is dual plumbing in buildings to utilize greywater or future recycled water for toilet flushing.

Future Ready for District Scale Non-potable Infrastructure
Future water savings measures should target areas with particularly high water demands, such as residential housing and sports facilities. In addition, infrastructure should be designed for compatibility with future nonpotable water supply, so that future-ready scenarios are feasible when economic analyses can justify the installation of such facilities. One scenario includes the installation of future stormwater retention basins in close proximity to sports fields for irrigation of those high demand campus facilities. A second scenario involves installing sewer collection systems at new student residential housing that can eventually be routed to a water recycling facility on campus for treatment, providing a supply of recycled water for future uses.

WATER CONSUMPTION BENCHMARKING AND TARGETS IN-DETAIL

Using the method described in section 7.2, 2013 metered water use data along with approximate 2013 FTE was used to determine what the benchmark water use would be for the campus expansion with a total FTE of 25,000. Of this, 39% was assumed to be used for irrigation and 61% for domestic water consumption in correlation with the metered data.

A reduction factor of 30% was set against the benchmark domestic water consumption and this was used as the target water consumption. The water use for irrigation was targeted to be reduced by 60% against the benchmark consumption based on xeriscape/drought tolerant estimates.

RESULTS OF THE WATER CONSUMPTION ANALYSIS

Using the benchmark water consumption calculated for the increase number in FTE, the target was shown to reduce water consumption by 42%. Even with the increase in development of the campus and number of people attending, the target was shown to only increase water consumption by 14% from the 2013 metered data.

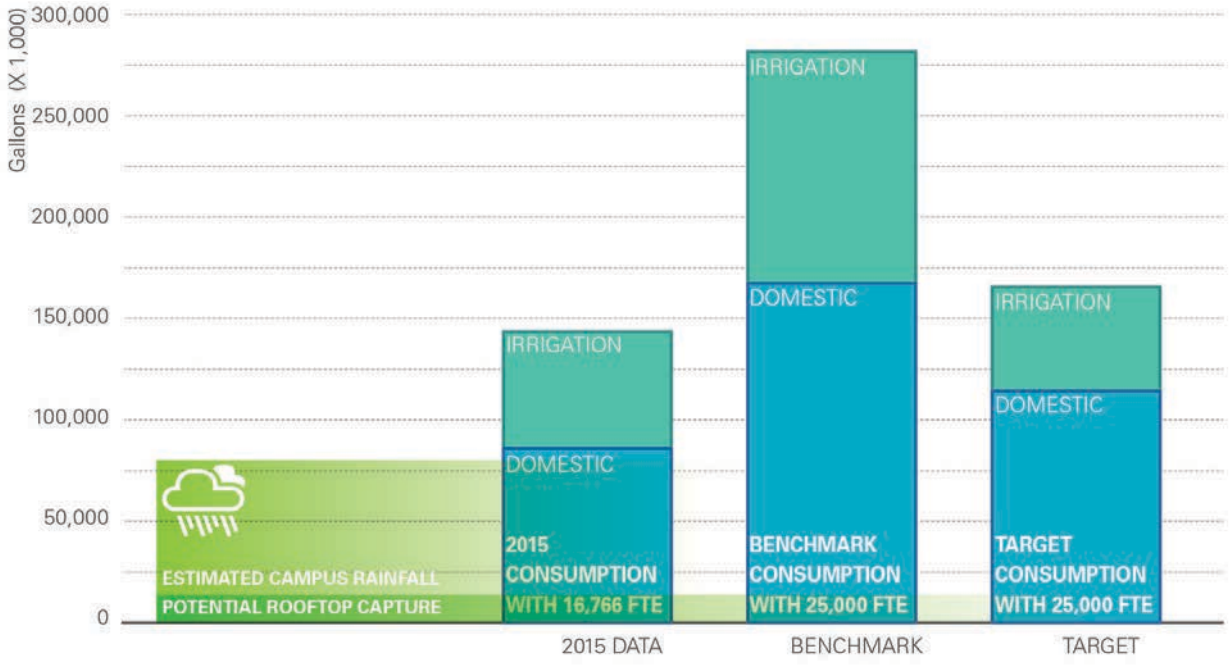
BUILDING DESIGN AND RENOVATION SUSTAINABILITY GUIDELINES

Water Efficiency in Indoor Building Design and Renovation

- Reduce potable water consumption by use of low-flow plumbing fixtures, including but not limited to lavatory faucets, showerheads, toilets, urinals, kitchen faucets, dishwashers, washing machines, and pre-rinse spray valves, and other appliances including those labeled as WaterSense. These fixtures not only reduce water demand, but also reduce energy consumption since lower flow rates and pressures reduce pumping needs.
- Gray water collection from buildings.
- Reduce potable water consumption by use of municipal recycled water for non-potable uses including some mechanical demands.
- Capture rain water from the roofs of buildings, after treatment this water supply can be utilized for indoor non-potable re-use and/or cooling.

Water Efficiency in Landscape Design and Renovation (See Also Chapter 9)

FIG 7–12: WATER CONSUMPTION: EXISTING + PROJECTED



- Landscape elements on campus that require significant water are located within a gray-water rich zone that can supply non-potable for irrigation.
- Replace turf with drought-tolerant and xeriscape landscapes that require little to no irrigation.
- Reduce potable water consumption by use of municipal recycled water for outdoor non-potable uses, including irrigation.
- Capture rain water from the roofs of buildings and site stormwater from hardscape and softscape through open conveyance and piping integrated in the landscape design. After treatment this water supply can be utilized for irrigation.
- Reduce outdoor water demand through the selection of efficient irrigation systems such as subsurface drip irrigation as a site-wide design principle.
- Select planting from drought-tolerant, native species as these plants require less irrigation (See Also, Appendix B Landscape Palette Guidelines).
- Achieve further reductions in outdoor water demand through zoned irrigation management, which allows plants with different irrigation demands to be grouped together for more efficient water management.
- Locate turf areas near gray water sources like new residence halls.
- Incorporate low-impact development (LID) measures into site design to reduce runoff volumes and treat storm and rain water to a higher quality prior to release.
- Minimize hardscape areas, maximize permeability of surfaces, and increase the use of specimen trees to increase interception of rain, and incorporate green street strategies along major rights-of-way and include green roofs in building design. Plant LID treatment measures with native drought-tolerant planting to reduce water usage. If planned and implemented correctly, large scale LID measures can reduce costs and improve local urban ecological systems.

7.5 ADMINISTATIVE EXERCISE OF A SUSTAINABLE ETHOS

The following are examples of how the University administration can act immediately to foster a more sustainable and resilient campus.

Promoting Efficient Resource Management

- Implement mandatory energy and water consumption reporting to establish campus-wide metrics.
- Develop a resource recovery program across campus to promote materials reuse and diversion from landfill.

Improving Community Health and Well-Being

- Ensure green building program includes criteria for healthy indoor air quality, minimize the use of materials which off-gas and promote transit oriented development.
- Develop a “closed loop” food recycling program from restaurants and hospitality to support homeless and poverty stricken neighborhoods and shelters.
- Increase campus density and on-campus housing to promote a more walkable community. Promote alternative transportation solutions to reduce single occupancy vehicle trips to the campus

“A RESILIENT CITY IS ONE THAT HAS DEVELOPED CAPACITIES TO HELP ABSORB FUTURE SHOCKS AND STRESSES TO ITS SOCIAL, ECONOMIC, AND TECHNICAL SYSTEMS AND INFRASTRUCTURES SO AS TO STILL BE ABLE TO MAINTAIN ESSENTIALLY THE SAME FUNCTIONS, STRUCTURES, SYSTEMS, AND IDENTITY.”

- RESILIENTCITIES.ORG

Investing in Water and Energy Infrastructure Improvements

- Develop off-grid district scale energy solutions using renewables.
- Transition from a fresh water for non-potable uses campus by implementing policy which allows treatment of greywater to potable standards on a local level.

Ensuring Adaptability and Future Proofing

- Conduct a climate change vulnerability analysis to understand the climatic impacts and identify potential risks expected 20 – 30 years in the future.
- Establish a Climate Action Plan to link specific short term goals with longer term climate change implications.
- Update building code requirements to withstand extreme weather and other unforeseen events, and ensure the local community has access to a reliable supply of water, energy and food.

7.6 STORMWATER + SEWER UTILITY SUSTAINABILITY

The proposed extensive use of stormwater and recycled water for irrigation purposes along with natural stormwater management features like bioswales and infiltration basins are appropriate and effective ways to sustainably manage the campus' water footprint.

STORMWATER + SANITARY SEWER EVALUATION

The stormwater system capacity and condition for CSUSB were evaluated by Sherwood Design Engineers based on information contained in the Utility Infrastructure Failure Analysis (UIFA) and Impact Assessment report issued by P2S Engineering, Inc., October 2014. According to the UIFA, the capacity of the existing storm sewer system is at 50 percent for a 10-year storm, which adheres to both city and county code. Given the net increase in the amounts of pervious surfaces anticipated along with the use of natural stormwater management strategies (bioswales, infiltration), it can reasonably be assumed that there will be an overall decrease in the overall piped stormwater conveyance requirement to meet the demands of a 10-year storm event. As such the current system should be able to accommodate proposed campus development if the recommendations in the 2016 Master Plan are followed. The P2S recommended actions of monitoring, cleaning and repairing the system remain appropriate. Recommended upgrades to alleviate localized flooding areas are addressed below.

Regarding the sanitary system the UIFA states there is "plenty of capacity" for existing conditions, however it is not apparent that videoing or modeling have occurred to confirm that assessment. It is therefore recommended that a full capacity study be conducted to accurately determine the system's ability to accommodate future campus growth.

A primary concern with the sanitary sewer system is its condition; nine ejector lift stations require upgrades and conveyance pipes are impacted by root intrusion, cracking and pipe displacement according to University Facilities staff. It was recommended that an estimated length of 2,500 feet of old clay pipes be replaced and the pumps upgraded for a significant cost. Prior to funding this work, however, known problem locations need to be isolated and further evaluated to ensure the pipes truly are compromised, and a thoughtful replacement plan with phased funding requests can then be correlated with and executed based on campus development phasing. Recommended maintenance that includes jetting and servicing the systems annually at a minimum is appropriate; staffing needs should also be evaluated in the short term due to a stated shortage of trained personnel.

STORMWATER + SANITARY SEWER SUSTAINABILITY PROPOSAL

Innovative stormwater management entails the following prioritized approach:

- **Preservation & Restoration** – Existing and historic drainage functions are maintained or restored as much as possible and care is taken not to divert flows depended on by onsite or offsite habitat. This includes prioritizing management activities in the areas with higher permeability in an attempt to retain more water onsite.
- **Runoff Reduction Strategies** – Runoff is reduced in three major ways:
    1. Reduce the amount of hardscape and increase permeable surfaces through the implementation of non-structural Best Management Practices (BMPs).
    2. Retain stormwater within the landscape to feed the local vegetation and to infiltrate back into the aquifer. This can occur within the bioswales or adjacent areas prioritizing areas of the campus with high infiltration rates.
    3. Harvest stormwater for use in irrigation systems, mechanical processes, and buildings.
- **Stormwater Management and Facilities** – The remaining stormwater is properly managed through the use of LID BMPs that support the landscape vision while mimicking the site's natural drainage patterns to the greatest extent possible.

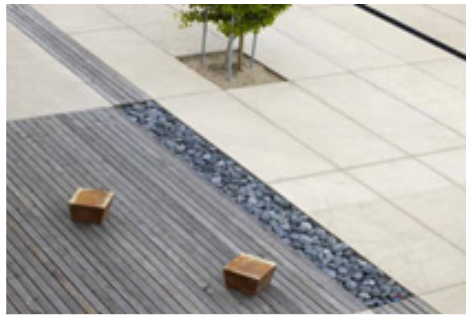
The natural cleansing provided by these controls allows for efficient water quality requirements to be achieved while also helping to move CSUSB towards a smaller water footprint.

As stormwater naturally drains to the south across and through campus, it is logical that infiltration basins are located along Northpark Boulevard. The sizing of these will be critical because they are also situated adjacent to large parking areas and will act as overflow and detention ponds during periods of heavy rain, but the numerous upstream strategies will certainly lessen downstream impacts. They also would assist with the

groundwater recharge efforts at the two local percolation basins. Care should be taken during project phasing to look at each drainage watershed in its entirety to ensure that early, upstream development does not adversely affect the sizing of downstream structures (and therefore the space required) designated for the future.

Along Campus Circle, the existing concrete channel provides reasonable stormwater control of the runoff coming from the San Bernardino Mountains to the north, but consideration should be given to the placement of natural management strategies such as additional bioswales for infiltration/overflow and filtration strips to improve water quality before run-on starts draining through campus. Particularly at the northern and eastern edges of campus, reuse opportunities may exist for irrigation of the adjacent athletic fields by tapping into current stormwater or sanitary infrastructure. Along Northpark Boulevard consideration should also be given to using a permeable surface in the parking lots which would lessen the dependence on the proposed infiltration basins.

One opportunity not examined could be the use of reclaimed sanitary water for additional irrigation needs of athletic fields. Recycled blackwater can offset even more of the University's nonpotable water footprint and is an effective (and can be an attractive) way of holistically addressing the total water needs of the campus. Combined with reducing the stress on an old sanitary system of which much is in need of replacement, the educational value of a water reclamation facility in an academic setting can be a useful tool by providing a living, learning laboratory for students and the community in general. Ideally such a facility could more effectively be used to provide recycled water for critical campus utility operations, however the proximity of the central plant to the logical sewer extraction point along Northpark Boulevard would likely make it cost prohibitive to run distribution piping back through campus to the plant. However, possibly a combination of stormwater and greywater could be harvested near the central plant to serve this purpose.



A good combination of both stormwater capture and building greywater reuse allows nearly the entire campus to contribute to effective on-site stormwater management. The use of urban trails will lend a peaceful yet effective way of handling overflow and otherwise uncaptured rainwater from central areas of campus, and the educational gardens, playground and dashboard neatly tie together the water management efforts in informative and interactive ways.

7.7 A SHOWCASE FOR COMMUNITY RESILIENCY

CSUSB is well positioned to be a regional showcase for best practices and design in full-spectrum sustainability. These recommendations are the intersection of programming and campus. They will reflect positively on the University and lead the region toward a more resilient future.

The CSUSB campus will evolve over time to increasingly look and operate like a 24/7 community – indeed the portion of students living on campus will increase, and the level of daily needs met by student and staff services will also signify a broader role. Just so, a picture of sustainability for the built environment at CSUSB must include measures addressing the resiliency of this community in terms of resources beyond just water and energy. This University's carbon and environmental impact includes the procurement of material supplies, waste streams, food resources, and public knowledgeability to a large degree. Therefore, CSUSB built environment and certain programming activities can do much to improve this environmental disposition, and serve as a showcase for community resilience for the benefit of the Inland Empire.

The 2014 CSU Sustainability policy calls attention to these four topics in its outlay of policies and goals: Academic Programs and Institutes, Waste Management, Sustainable Procurement, Sustainable Food Services. That is why these are included in the 10 dimensions of sustainability for the physical campus Master Plan. Some of the following recommendations are chiefly programmatic, but provide ways to promote more responsible use of proposed built-in tools for sustainability. Special events and volunteers that encourage better use of recycle bins, non-disposable tableware programs based in on-campus residential neighborhoods, and academic coursework related to further analysis of the campus built environment performance, all move CSUSB to a smarter and more resilient campus community.

WASTE MANAGEMENT SUSTAINABILITY

The near-term CSU 2014 Sustainability Policy states a target of 50% waste diversion by the end of 2016, with a long term goal of 80% diversion in an effort to eventually achieve zero waste. The CSUSB campus has come a long way towards achievement of these waste diversion goals – going further begins with building on the success of current measures (http://sustainability.csusb.edu/Performance/solidWaste.html). During calendar year 2013, CSUSB diverted 55% of waste from landfills, and towards paper recycling (34%), inert materials recycling (14%), green waste composting (6%), and metal scrap recycling (1%). A comparison between 2008 and 2013 shows that Dining Services, Student Housing, and Academic/Administrative activities achieved a total reduction of 44 short tons. Only dining services saw an increase of 5 tons between these comparison years. Any reductions in waste from 2009 to 2012 track closely with enrollment declines during the "Great Recession".

In conclusion, the long-term nature of the 2016 Master Plan, zero waste must be considered, with an eye towards the significance of wastes from academic/administrative uses, food services, and, of course, construction. Accordingly, a smart waste management program at any university largely addresses three topics of concern related to physical campus planning: 1) Promotional events, signage, and ongoing campaigns influencing individual decisions, 2) Facilities available for food waste, and 3) landfill diversion and recycling/reuse of construction and demolition wastes.

UC Davis serves as an inspiring precedent for smart waste management, having achieved a waste diversion rate away from landfills of 67% in 2009-2010 (http://sustainability.ucdavis.edu/progress/waste). This and other precedents should be sought in updating the campus waste management facilities and programs as the proposed built environment unfolds. The following are some proposals to further advance waste diversion efforts at CSUSB:

Encourage the Community to Use Recycling Facilities:
An ongoing campaign to promote knowledge of available waste diversion tools is key to actualizing the benefits of expenditures such as recycling bins, on-site composting facilities, bio-degradable supplies, and fuel and time costs incurred by Facilities services in supporting waste diversion.

Some campaign measures might include:

- Promoting efforts to advance Zero-Waste Events for on campus events planning and hosting. Use signage, portable composting bins that coordinate with campus sustainability branding graphics. Include student volunteers as "trash talkers" to encourage guests to use these bins.

- Establish a newly commissioned office, potentially the expanded CEL offices to be built at the center of campus, as a Zero-Waste Office where desk-side recycle bins, printing-discouragement signage, and prominent recycle bin positioning puts waste diversion efforts front and center.

Built-In Recycling/Composting Facilities:
A well-run recycling and campus community-centric waste diversion program means more than blue bins – it means building those waste facilities into the campus

setting in a way that communicates importance. It also means providing dedicated space to manage, sort, and process some of this waste in a way that actually moves CSUSB closer to a closed loop waste ecosystem. Some built campus elements might include:

- Recycling and waste bin clusters that include signage space for example images and displays; that indicate with consistent and bright colors; and are of a high fabrication and material quality to convey permanence and importance.

- Locate and establish or expand an on-campus composting facility to supplement any composting vendor. A student-run composting program can intersect with related academic coursework and further efforts to create a campus showcase for sustainability.

Construction Waste Management:
Building development and renovation, measured as contractor activity on campus waste reports, can generate an extra 200 short tons of waste to landfill in a given year (http://sustainability.csusb.edu/Performance/solidWaste.html). That amounts to 15% of waste landfilled coming from campus contractors; moreover, it constitutes the greatest change in landfill wastes from year-to-year.

The mix of waste generated by campus (recycled or sent to landfill) included 14% “Inert Materials to Recycling” in 2013.

Given that the 2013 portion of waste to landfill was 45%, an additional 6.75% could be diverted from landfills with focused effort to resolve construction material waste and building life cycle concerns. This means that, with a waste diversion rate of 55% is the current benchmark, and a target of 61.75% could be achieved by better construction waste management alone. Construction waste efforts should always include:

- Design consideration for building life-cycle cost and reusability, including a “loose fit, long life” design ethos

- Reuse of demolition waste in landscapes, concrete aggregates, earth fill, and even inventive building finishes

- Balanced cut and fill building design to eliminate off-siting of soil surcharge in major development projects. This begins with program and volumetric thinking early in the design process.

- Communicate with different campus organizations and academic programs to ensure maximum utilization of available campus spaces. Collective decision-making (and sometimes bargaining) will ensure existing state facilities are used most efficiently.

PACKAGING + PROCUREMENT SUSTAINABILITY

CSUSB is strongly encouraged to expand sustainable procurement practices and policies. There are a few things administrators and planners can do to ensure the campus environment is prepared to support sustainable choices in material procurement and waste reduction.

The current 2014 CSU Sustainability Policy directs campuses to invest 50% of all dollars in each product category toward recycled-content products. While the CSU system has lately exceeded this stated goal, achieving nearly 65% purchased recyclables (CSU Sustainability Report 2014), CSUSB can still take measures to further exceed this stated objective. As a benchmark, 65% is established; therefore 80% procured product waste-reduction is achievable through a combination of even more purchasing of recycled/biodegradable products and facilitated use of non-disposable tableware in the on-campus residential community.

The following are some ideas to further support sustainable procurement efforts at CSUSB:

Emphasize Bio-Degradables and Reusable Vessels with Signage:
Focusing on procurement of bio-degradable products will further advance sustainable procurement beyond what has been achieved through emphasis of recyclables purchasing. Verify the suitability of vendor offerings by confirming that compostable plastic products purchased meet American Society for Testing and Materials (ASTM) standards as found in ASTM D6400-04. Partner with on campus food and product vendors and arrange with them to offer discounts reasonable to both parties which can convince students to choose bringing their own beverage cups and vessels, shopping bags, food containers, and supplies to the point-of-sale.

Design for a CoyoteWare and CoyoteKit Program:
Reduce large scale procurement demand and encourage students’ use of non-disposable products through a CoyoteWare program. Similar to the Aggieware program at UC Davis, this proposed program would “eliminate the purchase, use, and disposal of all paper products for programs, which makes

additional funds available for the purchase of sustainable food options for those programs" (http://housing.ucdavis.edu/sustainability/aggieware.asp).

A CoyoteKit program can also support students in their ability to reduce demand at dining halls with reusable products. A CoyoteKit package, provided to on-campus residents and full time students at the beginning of the semester might include 100% post-consumer recycled content washable (non-disposable) napkins, stacking cups, biodegradable flatware, compostable bioplastic sandwich bags, and distributed through Resident Advisors who can be employed to promote the use of washable products.

The Aggieware program at UC David provides students with non-disposable tableware that reduces procurement and helps meet waste diversion objectives.

Involvement of on-campus residents in student halls and student suites requires facilities where students, especially lower classmen and women, can wash their reusable plates, cups, storage containers, and napkins. In addition to ground floor catering areas, galleys and shared kitchens, dishwashing and small food prep areas should be provided on each floor, regularly placed near common areas and on corridors. Sinks, garbage disposals, and even small dishwashers in suite settings, will enable students to participate in these programs.

FOOD SERVICE SUSTAINABILITY

The University must do as other sustainable urban communities do to establish localized food supply sustainability, and look to its land as a resource. Through the master planning process, and especially during Visioning Workshops with the Master Plan Steering Committee, interest was expressed in establishing areas for farm-to-table and community gardens on campus. UC San Diego offers a model program in their community gardens initiative (http://ucsdnews.ucsd.edu/feature/uc_san_diegos_secret_gardens_farm_to_table_comes_to_campus).

Any plot on campus can be used to situate a resident based or student organized based community farm program; however, some basic location and quality guidelines can ensure their effectiveness as a resource for the campus as it promotes food sustainability. The USDA and NRCS provides a Community Garden Guide at http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/mipmcot9407.pdf. See also, the Denver Urban Gardens Best Practices guide for another detailed precedent-based guideline (www.dug.org). See page 23 for siting recommendations.

The following was considered in the mapping of potential locations for on-campus community gardens.

- Guidelines for Community Garden Placement:
- Unimpeded southern and western direct sunlight exposure
- Soil is proven not to have heavy metal or other contaminants
- Off of heavily trafficked roadways and pedestrian paths
- High visibility, especially in view of housing
- Near large dining facilities, children's centers, and athletics facilities
- Included with the proposed donor-named orange grove near the campus center

In a study published from Loyola Marymount University,

Residence hall community gardens at UC San Diego provide food to dining halls across campus and are student run.

"Using Citizen Science to Quantify Community Garden Crop Yields, "(http://digitalcommons.lmu.edu/cgi/viewcontent.cgi?article=1095&context=cate), authors cite in their own sources that "the low end of the range for "bio-intensive" farming is 0.95 lbs per square foot" annual yield. They further explain that, "bio-intensive is the name given to the organic, high production, farming techniques" in community and commercial settings. The study, however, cites among its participating urban community gardens, that 13,000 lbs of produce was yielded over .94 acres – or .32 lbs per square foot. This serves as a likely benchmark metric for community gardens and a target of .5 lbs per square foot is recommended. A few potential locations for about 65,500 sf of community garden have been identified in this report, altogether having the potential to produce 32,750 lbs (16.4 US tons) of fresh produce each year if bio-intensive methods are employed (at .5 lbs per square foot).

SUSTAINABILITY LEADERSHIP

Altogether, the sustainability programs, measures, retrofits, and systems recommended in this chapter will reduce or eliminate the impact CSUSB has on the environment and the community. As a forward-thinking test bed, this campus can inculcate a sustainable know-how and ethos into future generations. As a recognized seat of learning, this will also convince Southern

Californians of the viability and value of these choices.

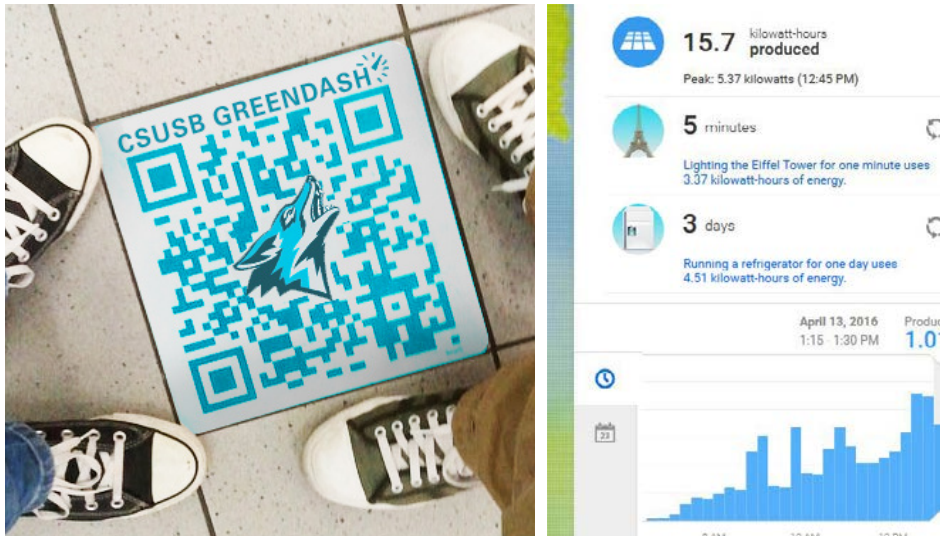
That is why this campus master plan answers the first mandate from the 2014 CSU Sustainability Policy with an expanded imperative of Sustainability Leadership – and recommends that campus be built, detailed, and operated to promote sustainability far beyond the student body. Such a broader sustainability mission is supported by the CSU Campus as a Living Lab Initiative, which offers grants to CSU campuses for curriculum, infrastructure, and programmatic integration.

In terms of campus development and planning, creating and supporting a Living Lab at CSUSB means: 1) Engaging with existing Initiatives and Institutes on campus for an broader role, 2) ensuring that campus signage and environmental design promotes sustainability and resiliency, 3) involving students in understanding, implementing, and promoting CSUSB as a Living Lab for Sustainability Leadership in the community.

Below are three proposals to support these three respective strategic recommendations:

Interpretive signage around campus can be simple or complex - all helping to educate the public how sustainability measures work.

Task Institute with Collaborative Campus Roles:
Ensure that the renowned Water Resources Institute (WRI) is continually engaged in commissioning studies in partnership with third party contractors and commissioning firms to establish and publish water use savings on campus. One major specific area of focus include gains achieved through a long term turf removal strategy that also evidences turf conservation enabled by graywater diversion. Other areas of focus may include partnerships with students and contractors to show students how to perform water audits and develop retrofit recommendations. As the Discovery Park comes on-line, companies who do business in sustainable technologies such as solar and water infrastructure should be sought as potential tenants.



QR Code is a mobile phone pictographic weblink that can lead to an online dashboard that presents live and cumulative data on campus sustainability performance metrics.

Signage and Dashboards for a Live Experience of Sustainability:
Frequently promote and brand the campus with interpretive signs that remind students and visitors of sustainable investments in and around campus facilities. Signage has been used on other campuses nationwide to explain the intricate processes and integrations between utility systems that make life on campus happen. They can be simple, yet still effective, if they are placed frequently and with a consistent graphic design suite to demarcate low-flow fixtures, efficient lighting, and transportation options. Live information is most engaging to students. QR codes are an attractive and architecturally integrated way to bring mobile phone users to an online dashboard. Across the country, universities already use contractor dashboard websites to share instantaneous data that gives students a tangible sense of their impact and their environment.

Courses that put students at the helm of campus carbon audits and retrofits will train a new generation of sustainability leaders.

Student Run Carbon Audit:
This report offers preliminary proposals and a framework for measurement and goal-setting in energy and water savings; however, it does not indicate the resultant carbon footprint impact that should manifest by reaching these targets. In support of the CSU 2014 Sustainability Policy requirement to "Integrate sustainability into the curriculum," CSUSB should challenge students in specific coursework to regularly measure the carbon footprint of their campus, by tonnage, and compare with previous years.

7.8 PICTURING A RESILIENT FUTURE

CSUSB will lead the region by example toward a more sustainable and resilient future. These metrics do not show what is guaranteed to happen, but what is potentially achievable if some of the recommendations in this document are fully implemented. The true value of these measures will come in the inspiration and education of future generations, both on campus and in the community.

FIG 7–13: ACHIEVABLE LONG-TERM SUSTAINABILITY BENEFITS

10% FEWER MILES

175,000 FEWER MILES PER YEAR

THAN WOULD NORMALLY BE TRAVELLED BY A CAMPUS POPULATION SUPPORTING MORE THAN 25,000 STUDENTS DUE TO PLANNED MOBILITY AND HOUSING OPTIONS

77% RENEWABLE POWER

29.8 TOTAL MW OF SOLAR POWER

CAPABILITY ACCOMODATED ACROSS CAMPUS AT FULL BUILDOUT, LEAVING ONLY 9 MW OF SUPPLY NEEDED FROM THE MUNICIPAL GRID

25% MORE RECYCLED

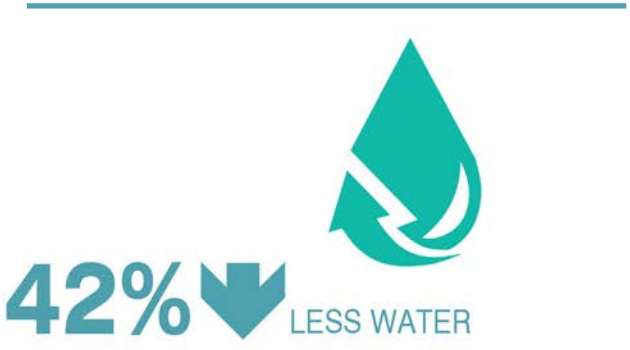
577 MORE TONS RECYCLED

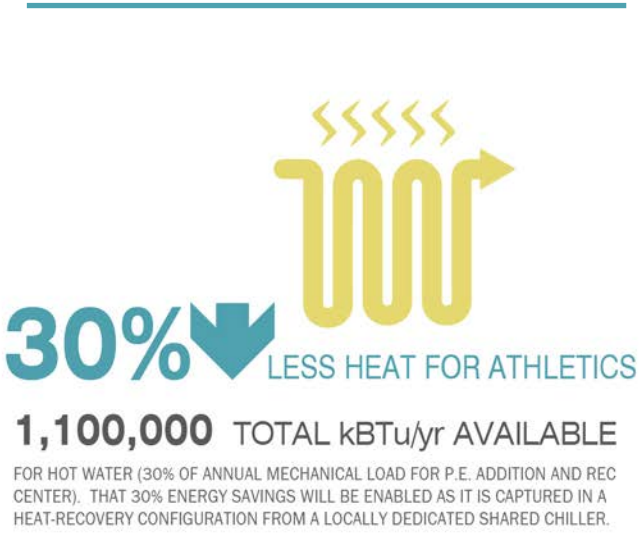
UP FROM 1,271 TONS (55% IN 2013), WITH MASTER PLAN PROPOSED WASTE DIVERSION MEASURES TO REACH THE BENCHMARK 80%, WITH 6.75% COMING FROM 100% BUILDING MATERIALS RECYCLING

16.4 TONS OF PRODUCE

65,500 SQ. FT. OF EDIBLE GARDENS

ON CAMPUS, AS PROPOSED, IF BIOINTENSIVELY CULTIVATED ANNYUALLY AT .5 LBS /SQ. FT.; MOREOVER, AT LEAST .32 LBS/SQ FT IS POSSIBLE IN THIS FARM-TO-TABLE LIVING-LAB PROGRAM



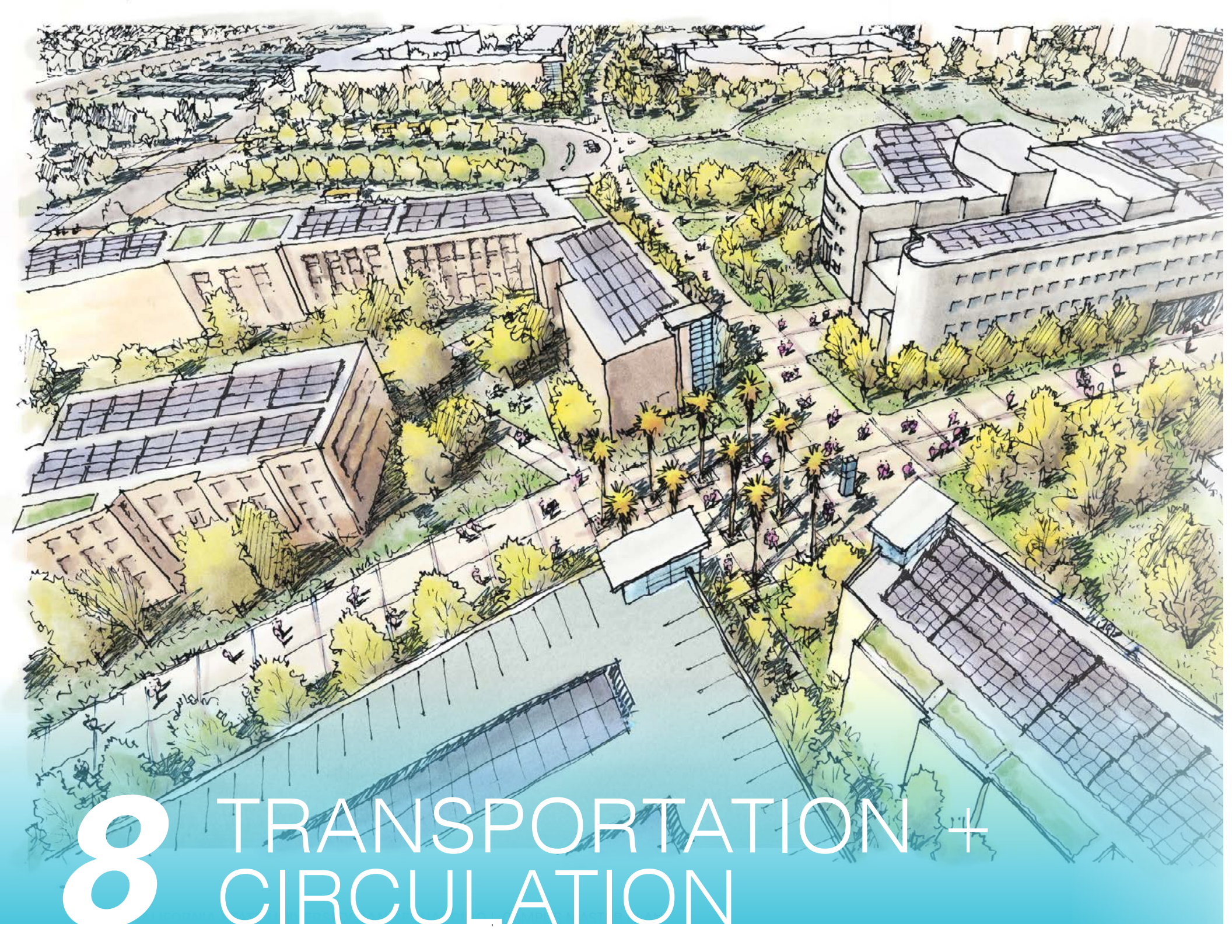


COMMUNITY RESILIENCY BENEFITS

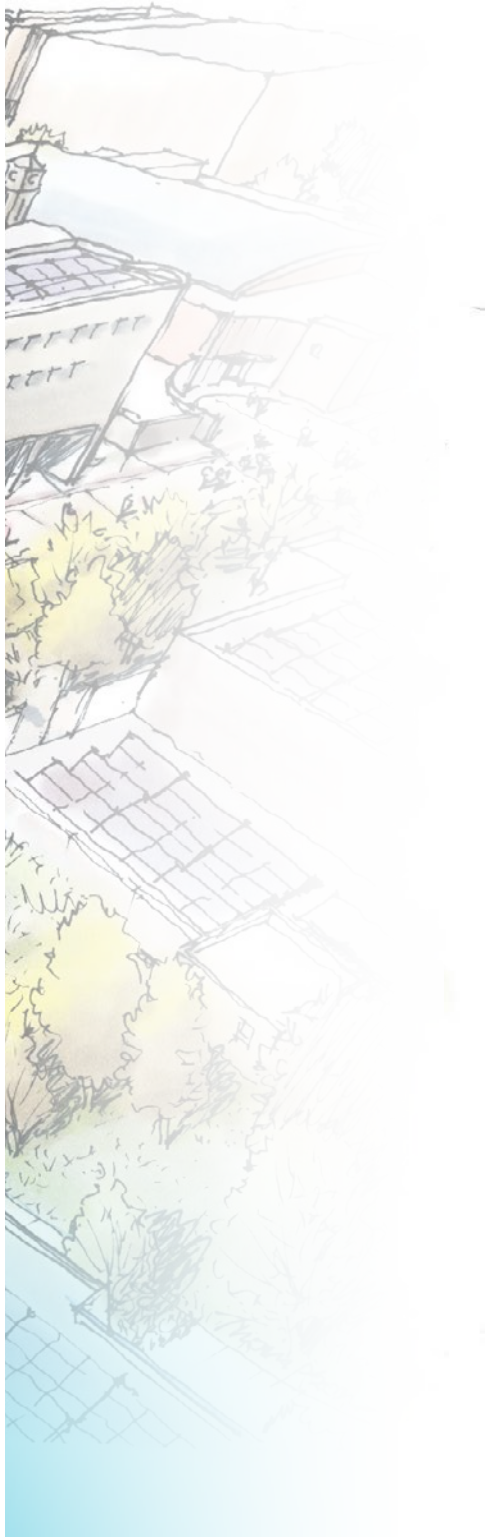
The predicted future number of cars traveling to CSUSB at full buildout is 20,150 off campus students in addition to 2,503 faculty and staff vehicles, totaling 22,653 vehicles. In this master plan, a target is proposed to reduce the number of cars travelling to campus by 10% relative to a standard, unmitigated future condition. That means, **traffic demand management could eliminate as many as 2,265 car trips along neighborhood streets**. Since the EPA 2010 "avoided vehicle" model for greenhouse gas calculations provides that 4.8 metric tons CO2 are emitted per average vehicle per year, this reduction could result in **about 10,000 fewer tons of carbon emitted by campus traffic annually** at full buildout.

As proposed, this campus will be able to support as much as **29.8 peak MW of solar power generation**. According to the U.S. Energy Information Administration, the average American home uses 911 kWh per month, requiring a monthly average of about 1.2 kW (over 730 hours). If off-peak power rates seen through the course of a day reduce that productivity by half, then the future CSUSB campus could still supply **enough solar power for roughly 12,000 homes**.

According to the EPA, the average American family uses 400 gallons of water per day, or about half an acre foot per year. If water savings measures recommended in this Master Plan are implemented, **363 acre feet per year could be saved**. In this way, **CSUSB could save enough water to support roughly 700 typical families in the region.**



8 TRANSPORTATION + CIRCULATION



8.1 INTRODUCTION + ASSESSMENT

As the CSUSB learning community continues to grow and mature, the transportation picture must also evolve. Preparing for the future means more than increasing roadway and parking capacity. It means ensuring support for a more broadly utilized range of transportation modes and with that diversification, a more organized interaction between pedestrians, cyclists, private vehicles and public transportation. It also means that to achieve better sustainability in the future that the University must take measures today to encourage alternative modes of transportation.

OVERVIEW

This section of the Master Plan provides a description of the key mobility improvements recommended for the CSUSB campus. These recommendations are largely based on the goals and strategies identified in this Master Plan and the results summarized in Fehr & Peers Working Paper 1 (Parking), Working Paper 2 (Issues and Constraints), and Working Paper 3 (Existing Conditions) and are focused on providing mobility for users of all ages and all abilities while improving safety by minimizing conflicts between travel modes.

SUMMARY OF CAMPUS WIDE ISSUES

- Too much vehicle intrusion onto the campus core: the 2016 Master Plan limits access and keeps vehicles outside of the core campus area.
- At multiple locations around the campus there are limited delineations of where drive lanes end and pedestrian pathways begin: the 2016 Master Plan reduces the ability for vehicles to intersect with pedestrian paths.
- There is a lack of information booth accessibility to the northwest end of campus: the 2016 Master Plan proposes placement of an information booth at this end of the campus.
- The campus needs to accommodate Americans with Disabilities Act (ADA) accessibility on campus: the 2016 Master Plan contemplates the continued implementation of the campus ADA plan, use of motorized carts on the campus to assist disabled persons and removal of physical barriers to accessibility.
- Current campus policy does not sufficiently support bicycle use: the 2016 Master Plan accommodates the greater use of bicycles for accessing the campus.

SUMMARY OF NEAR-TERM LOCATION-SPECIFIC IMPROVEMENTS

- Museum Drive is used as a vehicle cut through: the 2016 Master Plan proposes to eliminate vehicle circulation on this section of roadway, transforming it into primarily a bicycle and pedestrian use facility.
- Too much vehicle intrusion into the Administration/Sierra Hall/Chaparral Hall area: the 2016 Master Plan limits access into this area to pedestrians, bicycles and service/emergency vehicles.
- Too much vehicle intrusion into the Bookstore area: the 2016 Master Plan limits access into this area to pedestrians, bicycles and service/emergency vehicles.

- Too much vehicle intrusion into the University Hall/Student Union Lane area; the 2016 Master Plan proposes limits access into this area to pedestrians, bicycles and service/ emergency vehicles. A service vehicle free zone will be created at the circular plaza area between the Student Union and the Commons.
- Too much vehicle intrusion into the campus via Coyote Walk at Coyote Drive: the 2016 Master Plan provides a drop-off terminus to Coyote Drive adjacent to the new student housing thus eliminating the access of private vehicles into the campus core.
- Excessive access and parking of service vehicles in the pedestrian areas near the Biological Sciences building: the 2016 Master Plan calls for the reduction of service vehicle access and parking in these areas to 'essential access only' through signage and management restrictions.
- Limited sight distance at the North Campus Circle Drive/ Education Lane intersection: the 2016 Master Plan envisions traffic calming elements on North Campus Circle Drive (potential curb extensions, raised cross-walks, etc.) to slow vehicles. The 2016 Master Plan also envisions the need for a revised traffic control at this location (either a traffic signal or all-way stop).
- Speeding vehicles on North Campus Circle and East Campus Circle: the 2016 Master Plan envisions traffic calming elements along the roadway and potential changes in traffic control along the corridor.
- The drop-off area north of Information Booth #1 presents multiple potential turning movements to arriving vehicles making the area confusing and unclear to drivers and pedestrians: the 2016 Master Plan limits vehicle movements and access to this area by eliminating the existing access entries to adjacent parking areas (Lots C and D).
- Pedestrian crossings at the Northpark Boulevard/Ash Drive intersection warrant better visibility: The 2016 Master Plan recommends that the campus work with the City of San Bernardino to install high visibility crosswalks and a rapid rectangular flashing beacon at this location.
- Pedestrian crossings at the Northpark Boulevard/Sierra Drive intersection warrant better visibility: The 2016 Master Plan recommends that the campus work with the City of San Bernardino to install high visibility crosswalks and a rapid rectangular flashing beacon at this location; and consider creating a mid-block crossing between Sierra Drive and University Parkway.

NEAR TERM MAIN ENTRY IMPROVEMENTS

At the present time vehicle access at the primary gateway into the campus has some serious deficiencies. The turn-around and drop-off area creates potential pedestrian and vehicle conflicts (pedestrians,automobiles, and buses). Vehicles arriving to the campus entering the loop road at the northern most area where drop-offs typically occur must turn either left or right to access adjacent parking lots C and D. Buses also traverse this area to access the transit center on the western edge of this loop road.

The 2016 Master Plan recommends several relatively simple changes to circulation in this area to resolve these conflicts which could be implemented in the near future at relatively little expense. First, it is recommended that the two parking access entries at the northern end of the loop road be closed and new access roads be provided at the mid-point of the loop road to both parking Lots C and D. This will eliminate the conflict with pedestrians trying to reach the transit center and simplify parking lot access.

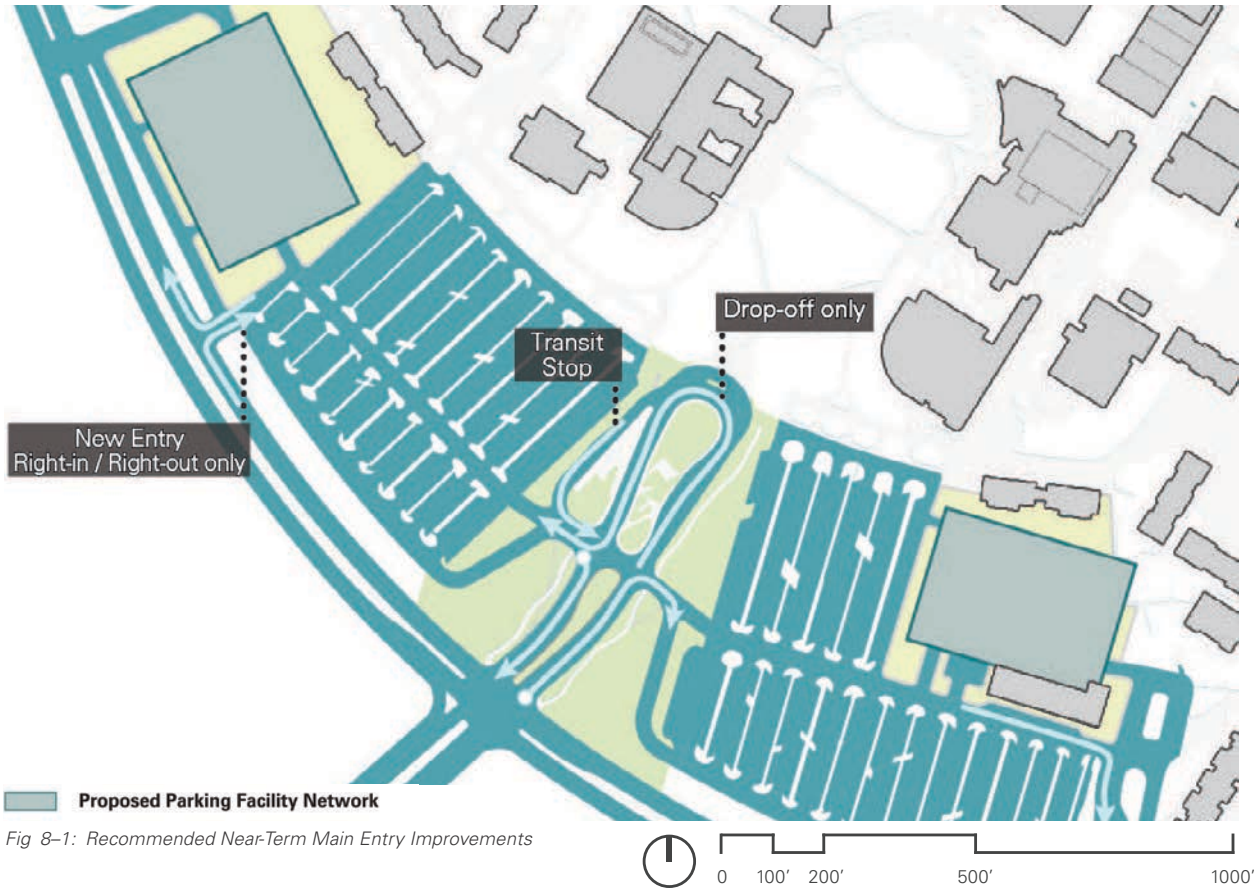


Fig 8–1: Recommended Near-Term Main Entry Improvements

PARKING DEMAND ANALYSIS

Parking is a critical component of the campus transportation picture as many students, faculty, staff, and visitors access and will continue to access the campus via automobile. While the campus should contnue to encourage alternative modes of transportation, the 2016 Master Plan recognizes that the automobile will retain a large share of the total trips to campus into the forseeble future. For perspective, according to a campus travel survey for employees taken during the development of this document (2015), 95% of employees either drove alone or vehicle carpooled to the campus for work. This highlights the critical need for planning for the future provision of vehicle parking in the master plan.

The 2016 Master Plan recommendation for parking supply is based on a variety of factors, and is summarized in the table below.

User Type	Recommended Rate	
Commuter Student	0.43	Per FTE Student
Resident Student	0.37	Per FTE Student
Faculty/Staff/Service	0.41	Per FTE Employee
Visitor/Vendor/Other	0.02	Per Total Parking Supply

TABLE 8–1: Parking Space Accommodation Rate by User Type

These values were calculated based on observed parking demand patterns. This was done by collecting hourly parking occupancy counts on the campus and comparing them to the known number of commuter students, resident students, and faculty/staff/service employees. In this way, parking demand per user type was determined. For each FTE of commuter student, resident, or faculty/staff/service employee the recommended number of parking spaces is shown in the accompanying Parking Space Provision Rates table. These rates were used to estimate the number of parking spaces needed to serve a 25,000 FTE CSUSB campus.

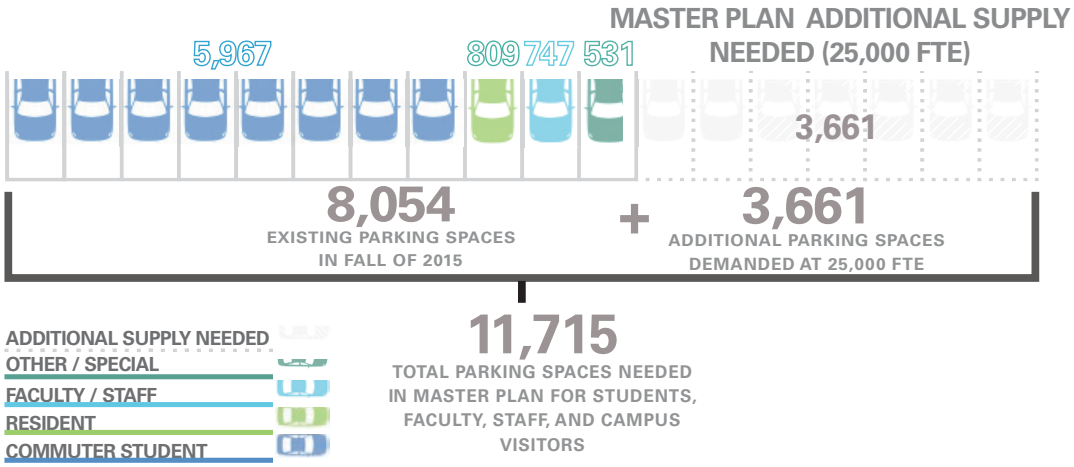


Fig 8–2: Proposed Long-Term Parking Outlay

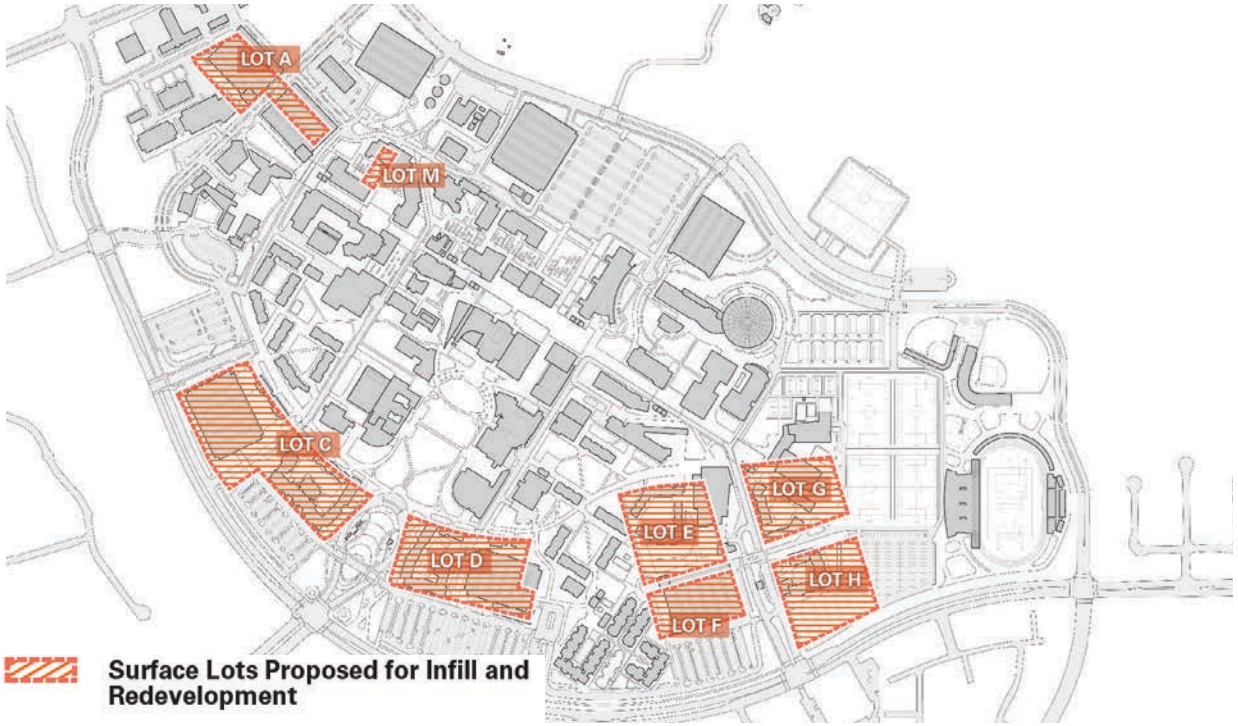


Fig 8–3: Parking Spaces and Lots Lost to Infill and Redevelopment

8.2 VEHICLE / ROADWAY NETWORK

The proposed campus roadway network will ensure reduced vehicular interaction and intrusion into the pedestrian realm. The 2016 Master Plan achieves this by concentrating vehicular access to new and redesigned parking facilities around the perimeter of the campus. Further, the main entry will be reinforced as the primary transit and pedestrian gateway and access point.

OVERVIEW

Several aspects of the 2016 Master Plan effect vehicular access and trips to and from the campus. First, the projected increases in student enrollment, faculty and staff will increase the number of vehicle trips to/from the campus. Second, the provision of on-site student housing has the ability to slightly reduce the projected number of vehicle trips as students will be able to walk/bike to class instead of driving.

To accommodate the 2016 Master Plan projected increased enrolments and their projected effects on vehicular trips and traffic, several major changes to the CSUSB roadway system are envisioned. First, Campus Circle is expected to be completed, providing a direct connection to North Campus Parkway. Second, North Campus Parkway is envisioned to be extended and connected to I-215 with on/off ramps providing an additional campus connection to the regional freeway system. Third, interchange improvements to the I-215/ University Parkway interchange are expected (currently in the Project Approval/Environmental Document phase at SANBAG and Caltrans). Fourth, the 2016 Master Plan calls for new connectivity to be achieved through eliminating non-service vehicle access into the campus core areas and by providing more direct connectivity to future parking structures. Finally, the existing "internal loop road" segments (the one closest to campus) would be restricted to pedestrian, bicycle and service/ emergency vehicle access. The envisioned automotive network is shown on Figure 8-4.

Parking structures provide students convenience, and the campus efficiency.

Automative and Roadway Network

Roadway Network Proposed for Restricted Access

Proposed Parking Facility Network

Vehicle / Roadway network at the Sierra Dr. entrance

FIG 8–4: PROPOSED CAMPUS AUTOMOTIVE NETWORK

0 200′ 500′ 1000′ 2000′

8.3 SERVICE NETWORK

Service access throughout the campus will be restricted to routes and times that limit the potential for conflict with pedestrians. Golf cars and light service vehicles are necessary for defined service tasks but their overall use on the campus can be restricted. Service yards and service vehicle parking should be more strategically positioned and concentrated.

SERVICE ACCESS RECOMMENDATION

One issue on the campus is the mixture of delivery vehicles in areas with high pedestrian travel. As such, the 2016 Master Plan focuses on pushing delivery vehicles out of the core campus area as much as possible and insuring compliance through the installation of controlled access gates, removable bollards and other mechanisms to control the vehicles that do access the campus.

In addition to the proposed service network, the campus will work with delivery vehicles to schedule deliveries outside of peak use of the core campus. This will further assist in minimizing the existing conflict between vehicles and pedestrians.

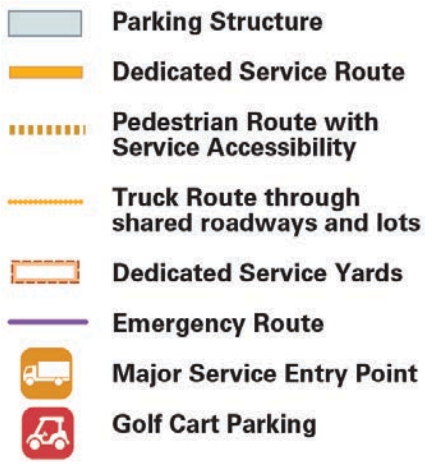
GOLF CART + LIGHT SERVICE VEHICLE ACCESS RECOMMENDATIONS

While it is desirable to reduce the overall usage of golf carts/light service vehicles on campus by students, faculty and staff, the need for golf carts and associated golf cart parking still exists for key service functions. Golf cart parking should be available along key service routes and not conflict with pedestrian and/or bicycle access. Several small vehicle parking lots close to the campus core can be re-purposed and as golf cart parking. As the campus is built out and implementation of the master plan reduces vehicle intrusion into the campus core, a number of small internal parking areas will be disconnected from the outside vehicle circulation network. These are ideal locations to be considered for golf cart parking. Additionally, golf carts should be prohibited from the pedestrian only Coyote Walk zone in the middle of campus.

Formalized light-service vehicle parking with solar shade structures that recharge batteries will help civilize public spaces on campus.

SERVICE YARD RECOMMENDATIONS

Service yards and docks are important facilities to have for delivery, emergency, and maintenance needs of the campus. Their placement should be in key areas such as dining commons, the central plant, the Facilities Management area, the Pfau Library, the Student Union, laboratories or other areas where they are needed. Wherever possible, these locations should be clearly delineated from pedestrian, bicycle and general vehicle circulation facilities and properly screened with walls and/or landscape. Adequate sizing of service yards and docks is needed to ensure that large service vehicles are able to navigate into and through service areas.



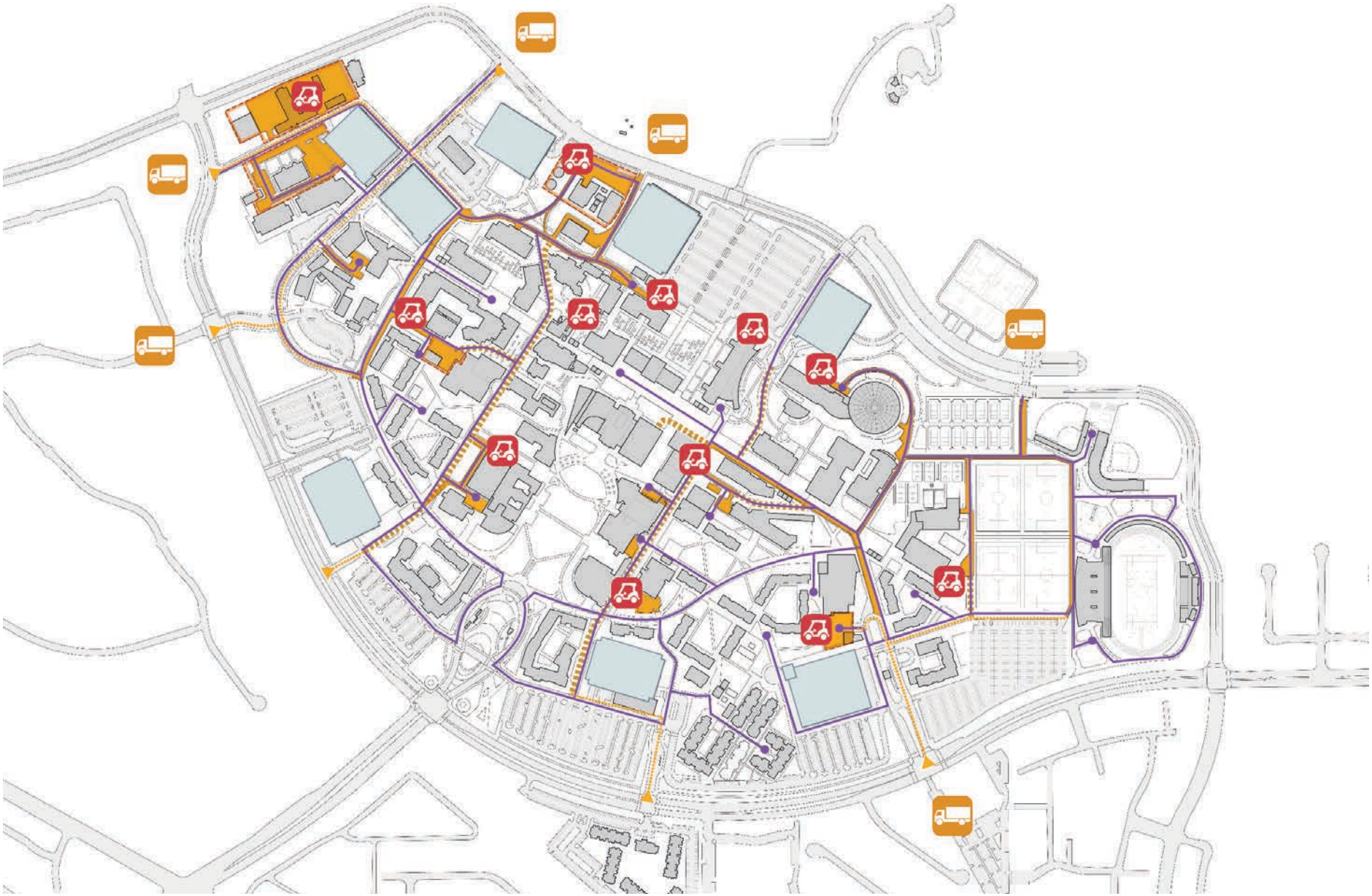


FIG 8–5: PROPOSED CAMPUS SERVICE AND EMERGENCY NETWORK

8.4 BICYCLE + TRANSIT NETWORK

Bicycle use at CSUSB has the potential to increase significantly, adding to campus sustainablity and human health. The designation of bicycle pathways and the provision of appropriate bicycle parking facilities will support that vision. Robust transit connections with the campus are essential to insuring equitable and sustainable access to the campus.

BICYCLE ACCESS RECOMMENDATIONS

Providing bicycle pathways and parking facilities are essential elements supporting a functioning campus multi-modal transportation system. Promotion of bicycle use is also a key strategy to increase campus sustainability, reduce the need and cost for parking facilities, reduce community roadway traffic and maintain/improve personal health. At CSUSB the planned network of bicycle pathways illustrated in Figure 8-6 allows commuting students, faculty and staff to access the campus from surrounding residential areas and for student cyclists to rapidly move between classes and other campus facilities throughout a typical school day. Most of the bikeways indicated in the exhibit are pathways shared by bicycles and pedestrians. The central areas of Coyote Walk and areas around the Pfau Library are designated as “pedestrian zones” closed to bicycle use and permitting only highly restricted access for service vehicles.

Equally important to the promotion of bicycle use at CSUSB is the provision of strategically placed bicycle parking areas, bike racks and bike lockers. In general bicyclists will seek to park as close as possible to their final destination. Bicycle parking should be conveniently placed in a location that is highly visible and as close to the building entrance as possible. Bike parking areas shall be in good visible and accessible areas but not in a very prominent locations. Recommended bicycle parking locations include:

- Near major academic buildings
- Near residential and dining areas
- Near shower facilities
- Near parking facilities
- Near transit stops and facilities
- Near any key destination or attraction

TRANSIT RECOMMENDATIONS

Transit linkages to the surrounding community are an essential feature for the campus transportation network. Providing more frequent service is a common way to improve transit acccess. Similarly, the provision of more bus stop locations on and around campus would also improve linkages to campus. Bus stop locations should be explored at the northwest corner of the campus as this location becomes an increasingly important entry point to the campus. Bus stops should include amenities including but not limited to shade, benches, and real time information about bus schedules and timings. These bus stop amenities should be provided to ensure that the transit experience is as convenient and comfortable as possible.

Bike lockers provide secure overnight storage; they discourage vandalism and theft and can be used to store other items. This can encourage students to use their bicycles, instead of cars, to navigate around campus between classes - even when they do not live on campus.

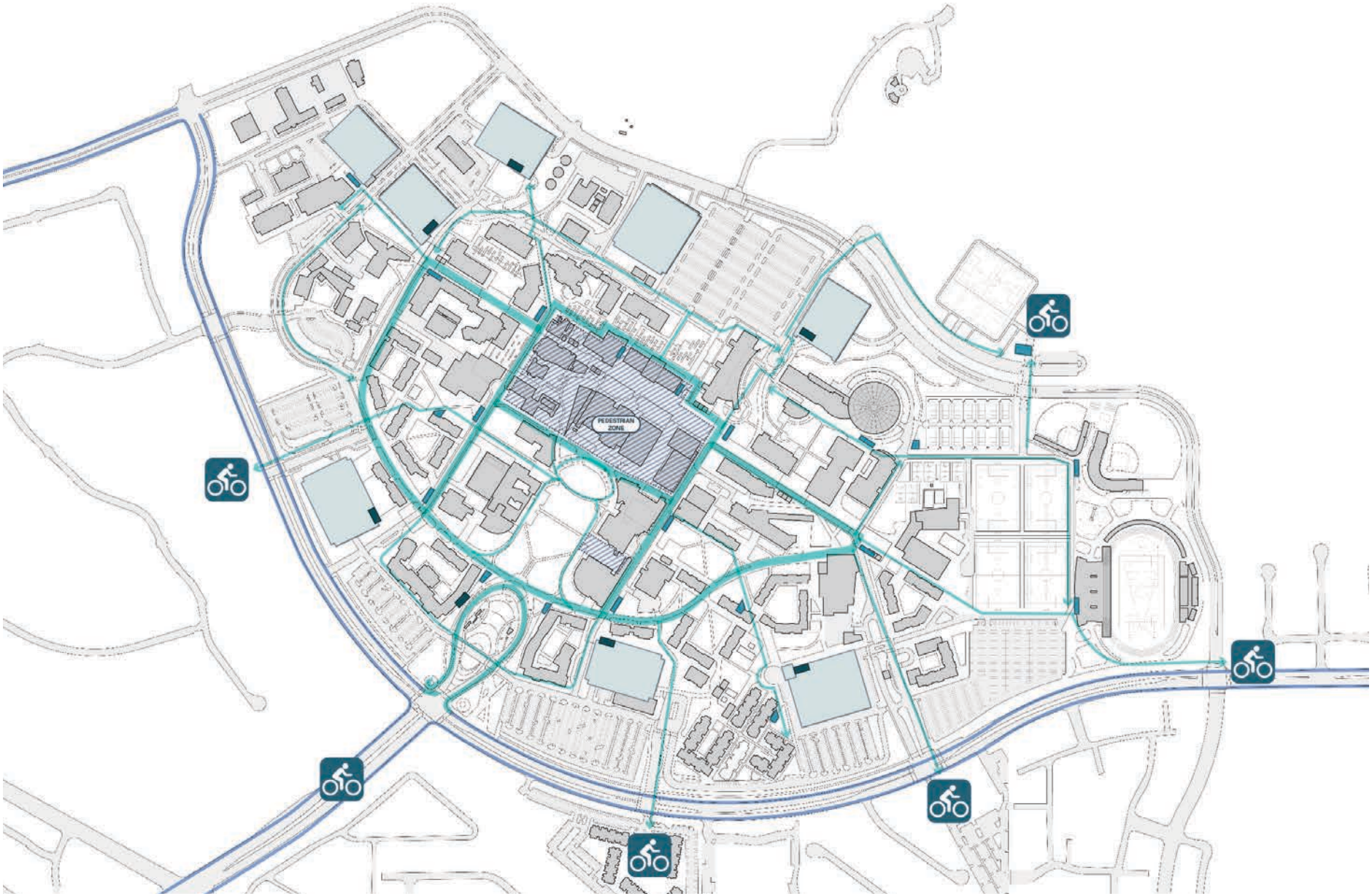


FIG 8–6: PROPOSED CAMPUS BICYCLE AND TRANSIT NETWORK

8.5 PEDESTRIAN NETWORK

The proposed pedestrian network is built upon two major pathway systems: Coyote Walk, the campus 'main street' linking all campus core facilities; and two major pathways orthogonal to Coyote Walk, which extend to four parking structures at the campus periphery. This integrated pathway 'backbone' assists campus users arriving by automobile to park at the campus exterior and then easily walk inward to Coyote Walk from which all points of the campus are accessible.

OVERVIEW

The campus pedestrian pathway network serves several functions simultaneously: it is the primary place where students, faculty, staff and community visitors move from facility to facility and experience the campus environment; it serves as the pedestrian 'conduit' from which persons arriving to the campus by car can easily access campus facilities; it is primarily a pedestrian-oriented zone tying together the campus core that fosters learning, social interaction, congeniality and health. Because of these primary roles in serving the majority of campus users it is imperative that the pathway network be free from major sources of conflict from vehicles, that the pathways provide ample space for pedestrian circulation and that pathways be comfortable and safe places providing pedestrians with a range of amenities such as shade, easy and logical access to adjacent facilities, opportunities to sit, interact with others, relax and/or study, internet access, attractive landscaping and night lighting.

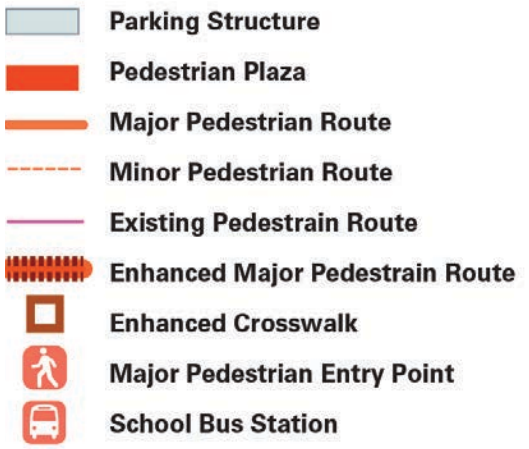
CAMPUS CORE

Within the campus core pedestrian and automobile conflict should be kept to a minimum and vehicles confined to the campus periphery. Vehicles in the campus core should be restricted to service, emergency, or other related functions. Pick-up/drop-off should not occur in the campus core except at designated locations and times. Places were pedestrian and vehicle traffic must occur should be minimized and safety measures provided. In areas where pedestrian and vehicle traffic intersect, clear signing, striping, and delineation of the travel way should be provided.

CAMPUS PERIPHERY

It is reasonable to expect high vehicle flows in the campus periphery, especially during peak hours. Therefore, it is of paramount importance for pedestrian conflicts to be managed at the periphery. Key conflict areas include:

- Pedestrian paths leading to and from parking structures;
- Pathways between dormitories and the rest of campus;
- Pathways serving the athletics area;
- Enhanced pedestrian crossings across Northpark Boulevard, especially serving new student residential areas such as The Glen at University Park.



Campus pathways are currently simple routes between buildings. The 2016 Master Plan envisions these paths as linear social environments lined with bench seating, shade structures, and drought tolerant landscaping.

FIG 8–7: PROPOSED CAMPUS PEDESTRIAN ACCESS AND SAFETYNETWORK

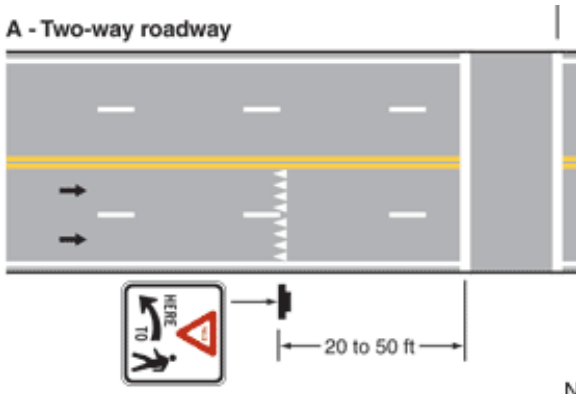
0 200′ 500′ 1000′ 2000′

ENHANCED PEDESTRIAN CROSSWALKS

Enhanced pedestrian visibility in locations where they must cross roadways is desirable in a multi-modal campus setting. There are several design features that can be used to enhance the visibility of pedestrians. While the treatments mentioned here are not an exhaustive list, they do represent a list of commonly used systems and devices that can be employed to increase pedestrian safety in those locations where pedestrian and vehicle conflicts do occur.

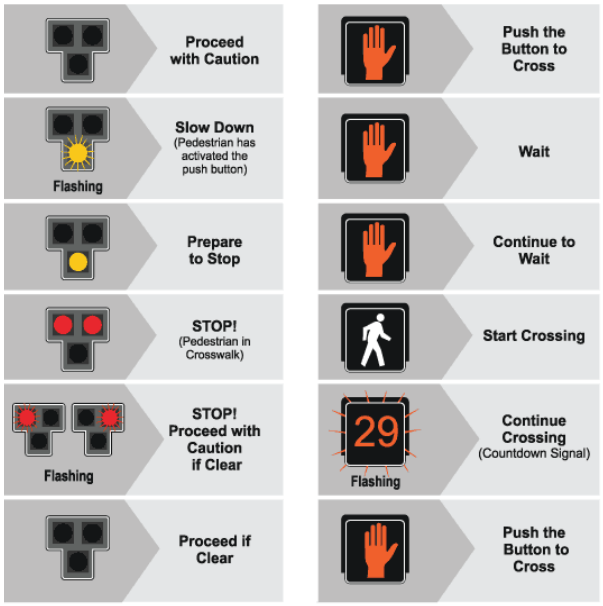
High Visibility Crosswalks: Marked crosswalks guide pedestrians and alert drivers to a crossing location, so it is important that both drivers and pedestrians clearly see the crossings. The campus should consider high visibility crosswalks wherever possible. This includes both intersections internal to the campus and around the campus periphery. High visibility crosswalks include decorative designs, textured materials, and broad-stripe continental striping.

Rectangular Rapid Flashing Beacon: Rectangular rapid flashing beacons (RRFBs) are active warning devices used to alert motorists of crossing pedestrians at uncontrolled crossings. They remain dark until activated by pedestrians, at which point they emit a bright, rapidly flashing yellow light. Studies suggest that RRFBs can significantly increase yielding rates compared to standard pedestrian warning signs alone. Results have shown that motorist yielding can be increased from baselines averaging 5% to 20% using the standard pedestrian warning sign treatment only to sustainable yielding rates of 80% or higher with RRFBs.



Advance Stop/Yield Line: Advance stop or yield lines encourage drivers to stop further back from the crosswalk, promoting better visibility between pedestrians and motorists, and helping to prevent multiple-threat collisions at mid-block or uncontrolled crossings.

Pedestrian Hybrid Beacon: The pedestrian hybrid beacon (also known as the “High intensity Activated crossWalK,” or HAWK) is a pedestrian-activated warning device located on the roadside or on mast arms over



midblock pedestrian crossings. The beacon head consists of two red lenses above a single yellow lens. The beacon head is "dark" until the pedestrian desires to cross the street. At this point, the pedestrian will push an easy to reach button that activates the beacon. After displaying brief flashing and steady yellow intervals, the device displays a steady red indication to drivers and a "WALK" indication to pedestrians, allowing them to cross a major roadway while traffic is stopped. After the pedestrian phase ends, the "WALK" indication changes to a flashing orange hand to notify pedestrians that their clearance time is ending. The hybrid beacon displays alternating flashing red lights to drivers while pedestrians finish their crossings before once again going dark at the conclusion of the cycle.

It is recommended that educational outreach programs be undertaken prior to the implementation of a Pedestrian Hybrid Beacon. Such a traffic control device can be unfamiliar to drivers and could confuse them if pedestrian hybrid beacons are implemented without first educating the campus population.

PEDESTRIAN PATHWAY DETAILS AND CROSS SECTIONS FOR

Pedestrian pathways can be 8 feet wide or up to 20 feet wide depending on the availability of space and desire to share the pathway with other forms of transportation such as bicyclists. Large pedestrian pathways can create an activated setting and sense of place. Pedestrian pathways function as part of a larger circulation and open space strategy that provides pedestrian access to public spaces and key locations on campus and to surrounding areas. Pedestrian improvements are also designed to facilitate community access to the campus linking gateways to the campus core. Pedestrian pathways should be lined with large, canopy trees or architectural elements to create a feeling of shelter and provide protection from the sun.

BICYCLE PATHWAYS DETAILS AND CROSS SECTIONS

Bicycle paths can be 10 feet to up 20 feet wide or larger if shared pedestrian uses are being considered. Bicycle paths can be either be mixed with pedestrians or separated from pedestrians, depending on the location and treatment. Landscape buffers are an effective way of separating bicycle flows from other types of traffic, though this may not always be feasible. Other ways of separating bicycle traffic include bollards and striping. Typical physical profiles for bollard design is 40-inches in height, 4-inches in diameter, with 6 feet spacing in between bollards. Bicycle parking should be placed near bicycle routes and at major destinations and parking facilities. Bicycle pathways should be lined with large, canopy trees or architectural elements to create a feeling of shelter and provide protection from the sun.

SERVICE VEHICLE PATHWAYS DETAILS AND CROSS SECTIONS

Service areas should be separated from pedestrian and bicycle areas to the extent feasible. Major service routes will should be designed to accommodate large trucks will likely be more common for local deliveries and pickup. Emergency fire vehicles should be considered for service routes as well. Physical design requirements should consider height, widths, pavement loadings, and turning radius. Prevalent local and regional guideline jurisdictions should be considered for all service access design requirements.

8.6 PARKING FACILITIES

The 2016 Master Plan envisions the conversion of major existing surface parking areas into areas for new academic facilities, student housing and other facilities. Similarly some of these surface parking areas will be replaced with parking structures. The net effect over time will be a denser campus with parking concentrated in up to eight parking structures. Modern 'smart' parking structures also incorporate features that reduce parking space 'hunting' time, fuel use, air pollution and maintenance.

ANALYSIS OF PARKING NEED

As described in Section 1 of this chapter, a parking demand analysis was undertaken to establish the parking needed to support a CSUSB campus of 25,000 FTE. This analysis was also extended to identify appropriate phases for the construction of the parking needed to accommodate the growing student demand over time. In general, the supply of parking needed was calculated from the number of expected users coupled with the recommended supply rates (See Section 8.1). To this was added an analysis of the number of surface parking spaces expected to be lost and the expected number to be created with the addition of new parking structures (See Figures 8-4 & 8-9). In this way, the surplus or deficit in parking for each phase was determined.

ENSURING PARKING ACCESSIBILITY

The CSU Access Compliance Design Guideline intentionally exceeds California Building Code accessibility minimums and is a clear direction from the system executive management which should be referred with respect to CSU accessible parking standards. It currently provides that the defined parking shall be in accordance with California Code of Regulations, Title 24, Part 2, and Volume 1. Generally, in the aggregate, where parking is provided for the public as clients, or guests of employees, the required number of accessible disabled parking stalls shall be provided.

As further provided in section 1129B-general of the California Code of Regulations, when a parking facility does not serve a particular building, accessible disabled parking shall be located on the shortest accessible route of travel to an accessible pedestrian entrance of the parking facility. In buildings with multiple accessible entrances with adjacent parking, accessible disabled parking spaces shall be dispersed and located closest to the accessible entrances. The defined parking report must consider and be in compliance with Education Code §§ 67301 (c), 67312 (a) (4) and (b), and 67310 (f).

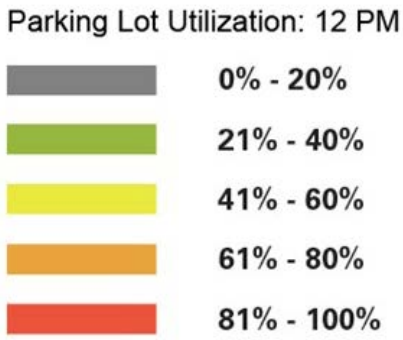


FIG 8–8: EXISTING PARKING FACILITY UTILIZATION - SURVEYED 2015

PROPOSED PARKING OVERVIEW

As the CSUSB campus matures and accommodates more students, surface parking lots will be developed for use as valuable academic, student housing and other University facilities. Secondly, these lost parking spaces are recovered in the form of dense, multi-story structures that park hundreds of more vehicles than a surface lot occupying the same space. Besides being more efficient, parking structures can also require less maintenance as there is no longer the need to maintain the landscaping that might be present with a surface parking lot.

TABLE 8–2: PROPOSED PARKING FACILITIES YIELD SUMMARY

Parking Facility		Levels Above Ground	Approximate GSF	Parking Spaces Counted	SF / Space Assessment
PK 3	**Athletics Parking Structure**	**4**	432,000	**1,324**	326
PK 4	**East Gateway Parking Structure**	**3**	340,000	**822**	310
PK 5	**West Gateway Parking Structure**	**3**	414,000	**1,264**	328
PK 6	**North Parking Structure**	**4**	378,000	**1,135**	333
PK 7	**Discovery Park Parking Structure**	**4**	378,000	**908**	333
PK N	**Lot N Parking Structure**	**4**	448,000	**1,360**	329
Lot N	**Lot N** (Not Including Footprint of PK N)	N/A	332,000	**843**	393
Lot H	**Lot H Restripe and Expansion**	N/A	240,000	**672**	358
	Interim Parking Facilities				
Lot N	**Lot N** (Original Lot N, Including PK N)	N/A	445,000	1,235	361
Lot M	**Lot M Interim Expansion**	N/A	128,000	389	330
Lot A	**Lot A Interim Expansion**	N/A	84,000	255	330

Campus Existing Parking (Fall 2015)	**8,054**
Parking Proposed To Be Built/Rebuilt	**8,328**
Existing Lost To Redevelopment Or Set Aside For Entrepreneurial Development	**(4,669)**
Effective Long-Term Expansion of Parking Supply (Student/Faculty)	**3,659**
Effective Long-Term Supply for Entrepreneurial Facilities (Considered in Total Below)	**(532)**
TOTAL PROPOSED PARKING (Not Including Spaces for Entrepreneurial Facilities)	**11,713**
ESTIMATED TOTAL NEED FOR PARKING SPACES IN MASTER PLAN	**11,715**

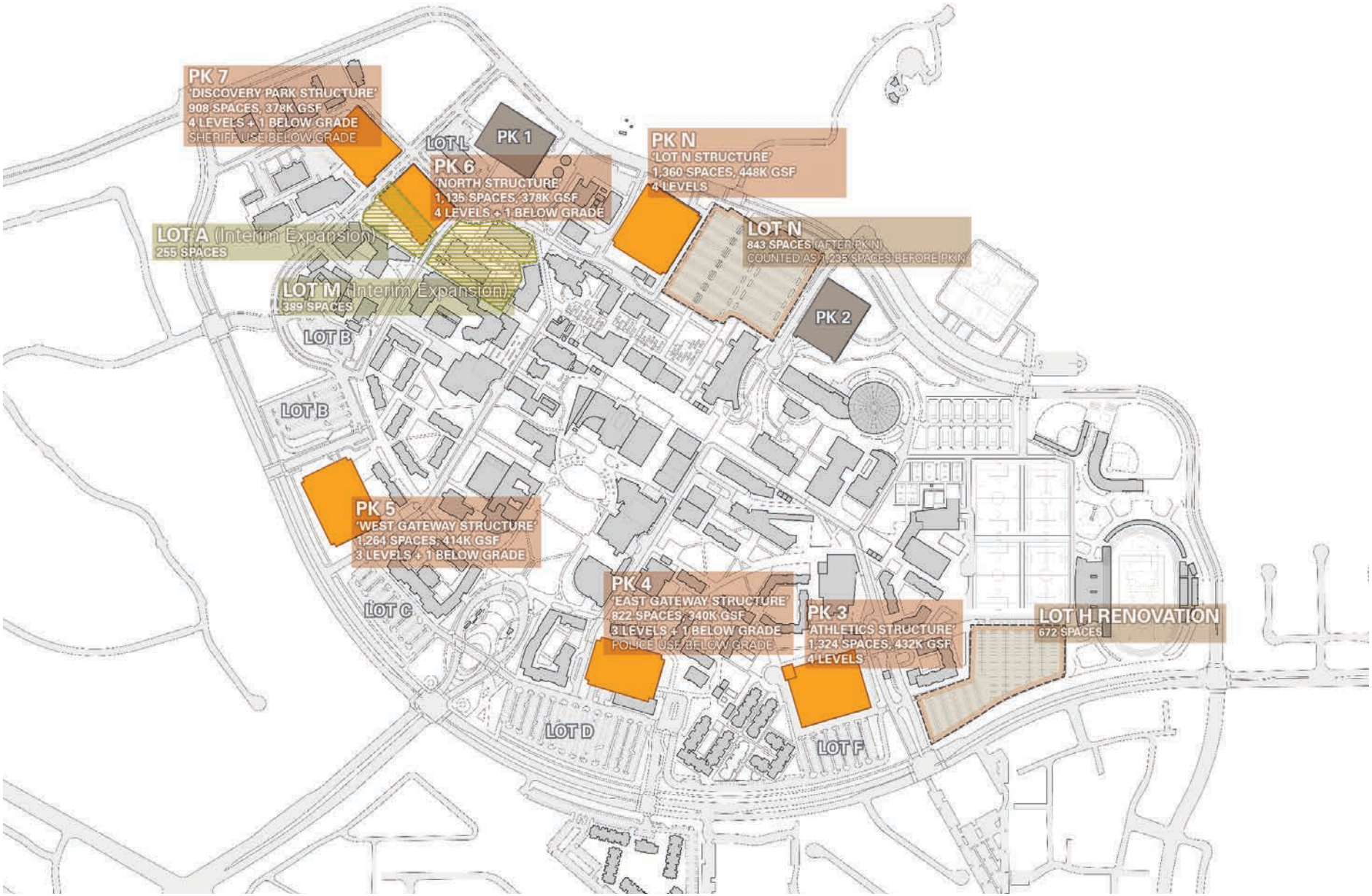


FIG 8–9: PROPOSED CAMPUS PARKING FACILITIES

8.7 TRANSPORTATION DEMAND MANAGEMENT

A robust Transportation Demand Management (TDM) program is an important of the 2016 CSUSB Master Plan: if effectively implemented it will help reduce the demand for costly future parking structures and will reduce traffic congestion and the related negative environmental impacts of air pollution, greenhouse gas emissions, noise and the consumption of nonrenewable resources.

MASTER PLAN GOALS FOR REDUCTION OF TRAFFIC AND PARKING DEMAND

The 2016 Master Plan identifies a series of infrastructure needs to grow the campus based on the projected size and mix of uses for the campus. The identified needs, especially those related to parking and intersection capacity, are based on an assumption that travel to/from the campus is basically static moving into the future. Thus it was assumed that the way students, faculty, and staff travel to/from the campus is the same in the future as it is today.

One way to significantly reduce parking demand and reduce traffic impacts is the implementation of a more robust Transportation Demand Management (TDM) strategy. The CSU Chancellor's office developed the Transportation Demand Management Manual, Final Report (Nelson\Nygaard, November 2012). As noted in that document, the CSUSB campus is considered an "Exurban" location, as defined below:

> *Exurban areas are very loosely associated with an urban area. Exurban areas are located beyond the suburbs, hence the term "exurb," or extra urban. Exurbs are almost exclusively residential and traditionally exurban residents commute by automobile to more urban areas. In fact, exurbs generally have very little non-auto access to the urban core or attraction. These areas have generally been developed in the last 20 years and feature very low population density. Because land uses are spread far apart in exurban areas, walking and bicycling are less attractive transportation alternatives. In some instances, sidewalks may not even be provided along streets. Nevertheless, reducing the reliance on driving alone to these campuses has been achieved with shuttle, vanpool, carpool, and rideshare incentives. Locating campuses in these largely residential fringe areas does present the opportunity to provide campus housing nearby, thereby reducing the distance between the campus and home and associated vehicle miles traveled and greenhouse gas emissions.*

As noted in the guidelines, the top five TDM strategies that should be implemented in exurban areas are noted below:

- Campus Housing and Amenities
- Carpool and Vanpool Incentives
- Ridematching Program
- Parking Pricing
- Shuttle Service

These strategies are described in greater detail below:

CAMPUS HOUSING AND AMENITIES

The availability of campus housing has a dramatic effect on the number of vehicle trips generated by a CSU campus. Surveys completed at Cal Poly Pomona indicate that trips to/from the campus can be reduced by as much as 90% (compared to commuter students) in the AM peak hour and 60% in the evening peak hour. Additionally, on-campus housing reduces the parking demand at the campus by approximately 14% based on surveys collected at Cal Poly Pomona.

The 2016 Master Plan plans for the addition of over 3,200 new beds of on-campus University-supported housing. Additionally, recent market-driven apartment projects located adjacent to the University provide additional off-campus housing for use by students who therefore would not need to commute to the campus.

(Note that the parking demand numbers used to identify the need for future parking include the associated reduction allowance associated with increased on-campus housing).

CARPOOL AND VANPOOL INCENTIVES

The CSU TDM manual identifies CSUSB as a model campus related to implementing this strategy. Currently, CSUSB provides a $2 per day incentive for campus affiliates who walk, bike, carpool or vanpool to the campus. Additionally, the campus provides preferential locations for carpool parking.

It is recommended that the campus continue to implement this strategy moving forward. (Note that the parking demand numbers used to identify the need for future parking include an allowance based upon continuing the existing strategy).

RIDEMATCHING PROGRAM

This program would include online carpool and ridematching services. This would assist campus faculty, staff, and students to coordinate and match potential campus trips.

CSUSB already implements this service through the CSUSB Exclusive Rideshare Matching program, which simply requires an on-line sign up or phone call to participate.

It is recommended that the campus continue to implement this strategy moving forward. (Note that the parking demand numbers used to identify the need for future parking include an allowance based upon continuing the existing CSUSB Exclusive Rideshare Matching program).

PARKING PRICING

The campus currently charges for parking to pay for and manage its parking facilities. However, additional pricing strategies could be developed to further reduce parking demand and trips to/from the campus. These strategies are outlined below:

- Price Parking to Match Parking Demand – This approach involves raising the price of parking at the campus as a way of reducing parking demand. In a typical scenario parking rates would be increased until demand matched the parking supply. To avoid turning away students, implementation of this strategy would require the provision of robust alternatives to the private automobile: extensive transit service to/from the campus, ridesharing etc. to serve the users unable/willing to pay for parking at the higher level. Additionally, such a strategy must be combined with a comprehensive parking permit program in neighborhoods surrounding the University to prohibit students from parking on residential streets. Finally, parking pricing strategies are difficult to apply to faculty and staff given the parking provisions often contained within their employment contracts.
- Restrict Freshman Parking – Typically with this type of strategy, freshman would be prohibited from parking on campus. It usually is utilized on campuses where there is sufficient available and affordable local student housing. In general, implementation of this strategy would also require the provision of robust alternatives to the private automobile: extensive transit service to/from the campus, ridesharing etc.

PARKING PERMIT SYSTEM

Parking permit strategies represent another effective way to manage parking demand and hold promise for implementation at CSUSB. Under this type of system, parking permits would be purchased for specific lots and/or parking structures. Users with a certain type of permit could only park in designated lots associated with their permit. This assigned parking system would prevent users from moving their cars between different lots and structures throughout the day, a practice that creates unneeded vehicle circulation in the campus transportation network. Additionally, this system can be used to manage the spread of parking demand throughout the campus. This can be done by implementing a fee structure by pricing parking facilities closer to the campus core at a higher rate than parking facilities on the campus periphery.

Additionally, such a strategy must be combined with a comprehensive parking permit program in neighborhoods surrounding the University to prohibit students from parking on residential streets. Finally, parking pricing

strategies are difficult to apply to faculty and staff given the parking provisions often contained in their employment contracts. Implementation of this technique could reduce the overall parking demand at the campus by approximately 1,400 spaces or by one to two typically-sized parking structures.

SHUTTLE SERVICE

The campus currently provides shuttle service to/from the Palm Desert Campus. However, there is not a shuttle service providing access between the campus and the San Bernardino Metrolink Station, key areas near the campus, or even to multiple sides of the campus (similar to the Bronco Shuttle at Cal Poly Pomona or the Hornet Shuttle at CSU Sacramento). Expanding shuttle service to connect with other regional transit links and residential areas of student concentration could reduce parking and vehicle trip demand to CSUSB by reducing the need to drive to/from the campus.

It is recommended that the campus consider implementing a shuttle program providing service to local residential areas of student concentration but outside walking distance and poorly served by transit and service to better connect with transit hubs such as the San Bernardino Metrolink Station as a way to reduce the parking demand and trip demand to/from the campus. Identifying the routes for such an expanded shuttle service would need to be coordinated with OmniTrans and could draw upon CSUSB student records to identify areas of student residential concentration.

OTHER TDM MEASURES

Although not identified in the CSU TDM manual as a top five strategy for exurban campuses, the following strategies could be implemented to further reduce parking demand and vehicle demand to/from the CSUSB campus:

- Transit Service – Currently, Omitrans and sbX transit passes are subsidized. Given that this is the only campus in the CSU system served by a true bus rapid transit (BRT) system, the campus should continue this program to maximize use of the system. Additionally, the 2016 Master Plan by increasing the on-campus population by providing significant amounts of student housing makes existing transit serving CSUSB more accessible to more campus residents.

- Bicycle and Pedestrian Amenities – Currently, the campus provides bicycle parking in a variety of areas around campus. However, there are no designated on-campus bicycle facilities. Additionally, although streets surrounding the campus have bicycle lanes and pedestrian sidewalks, the campus does not provide convenient access for these users to directly access the campus and get to their destination in an efficient manner. Improving these facilities, as noted in this 2016 Master Plan, will make these travel modes more viable for the campus reducing demand for vehicle trips to/from the campus.

- End of Trip Facilities – Currently, people commuting to campus by walking or bicycling have limited options to shower and change once they reach their destination. New development on campus should plan for these end of trip facilities to make this a more convenient commute mode to/from the campus.

- Car Share/Bike Share Programs – CSUSB should implement car share/bike share programs such as Zipcar or Decobike (San Diego). These approaches can reduce the need for on-campus residents to have their own vehicle in turn reducing the need for parking at the campus.

- Bike Repair Station – A bike repair station would support student use of bicycles. A location for such a facility--perhaps including it as part of the Student Union Expansion project--should be identified.

GOALS AND EFFECTIVENESS

The CSU TDM guidelines provide a variety of methodologies to measure effectiveness of the TDM program. Although the campus currently administers surveys to faculty and staff related to mode split information, it does not capture mode split information related to students. As such, we would recommend that the campus develop and administer campus-wide commute surveys to evaluate the effectiveness of their system.

Given the universities exurban location and the robustness of the existing program, further enhancement utilizing the additional strategies noted above will decrease demand for parking and for vehicle trips to/from the campus. We expect the associated trip reductions to be in the range of approximately 5%-10%.

8.8 TRANSPORTATION SUSTAINABILITY IMPACT ANALYSIS

Determining accurate trip-based metrics in the analysis of existing and proposed transportation scenarios is essential in order to establish the expected performance of the Master Plan in minimizing vehicular impacts on the local community including traffic, noise, air quality and greenhouse gas emissions.

OVERVIEW

Management and measuring of vehicle miles travelled is applicable to meeting the 2014 CSU Sustainability Policy - Goal 2 for Climate Action Planning. In Goal 1, FO 1.1 and FO 1.2 demand a reduction of greenhouse gas (GHG) emissions to 1990 levels by 2020 and a reduction of GHG emissions to 80% below 1990 levels by 2040 (note that CA AB-32 requires this by the year 2050). FO 1.3 under the same goal required promotion of alternative transportation and/or alternative fuels. Transportation impacts due to commuters coming to and moving about within campus contribute significantly to local GHG emissions and should be considered the primary concern of this campus in reducing its carbon footprint on the environment. Typically, emissions and GHG output estimates can be tied to vehicle miles traveled (VMT) in a given period from a given location. Reducing VMT reduces GHG, other pollutants, traffic impacts, and neighborhood pedestrian safety.

ESTIMATING TRIP GENERATION

Establishing an accurate VMT number and a related GHG quantity tonnage requires statistics that include vehicular usage (trips) and type. Because vehicle user survey data is not available for the CSUSB campus, precise VMT is not a metric that can be accurately determined for the 2016 Master Plan report. Instead, comparable survey data from other recent CSU campuses can be used to provide a general VMT estimate adequate to establish realistic and achievable transportation-related VMT reduction targets for this Master Plan.

The formula for VMT is:

VMT = Total Number of Trips * Average Trip Length

The total number of trips can be estimated for the Master Plan buildout using data from cordon counts collected at CSUSB and a travel survey performed recently at nearby

CSUSB Existing Trip Generation		Trip Generation Estimates		
User Type	2015 Users	Daily	AM	PM
On-Campus Student	1,533	**2,997**	26	76
Off-Campus Student	14,945	**30,948**	2,821	2,707
Faculty/Staff	1,650	**3,027**	531	1,100
Total		***36,971***	***3,378***	***3,883***

CSUSB Master Plan Trip Generation		Trip Generation Estimates		
User Type	Master Plan Users	Daily	AM	PM
On-Campus Student	4,850*	**9,482**	83	240
Off-Campus Student	20,150**	**41,726**	3,804	3,650
Faculty/Staff	2,503***	**4,592**	806	1,670
Total		***55,800***	**4,693**	**5,559**

TABLE 8–3: Campus Trip Generation Estimates

* Estimated from the number of new beds in the master plan plus existing number of residents
** 25,000 minus the number of on-campus students
*** Estimated from the existing ratio between Faculty/Staff and FTE Student

Cal Poly Pomona. The cordon counts taken at CSUSB yield a daily, AM, and PM trips per FTE student; the Cal Poly Pomona survey showed the relative differences between trip generation for user types (for example: between resident generated trips and commuters).

ESTIMATING USER TRIP LENGTHS

Average trip length can be roughly estimated based on Longitudinal Employer-Household Dynamics (LEHD) census statistics. The distances found in this data is "as the crow flies" and not actual travel distance through the roadway system. More accurate commute lengths can be factored if CSUSB campus administration issues a campus travel survey. The LEHD data on average daily trip length is: a local commuter average of 34.7 miles, and a local resident average: of 15.0 miles.

THE IMPACT OF ON-CAMPUS ON VMT

On-campus students (residents) generate vehicle trips differently than off-campus students (commuter students). Therefore, as the campus shifts commuter students to resident students, the number of trips generated will go down. The rate at which this does is: for a 1% shift in the student population from commuter to resident, the daily trip generation decreases by 0.05%, the AM peak hour trip generation decreases by 0.78%, and the PM peak hour trip generation decreases by 0.53%.

In addition to the number of trips decreasing when shifting from commuter to resident students, the average trip length for residents is lower as well. Therefore, VMT decreases as more students live on campus and less students commute. The recommended parking supply for a commuter student is 0.43 spaces per FTE and the recommended parking supply for a student resident is 0.37 spaces per FTE. These rates are based on existing parking demand observed through parking occupancy counts. For every 100 students converted from commuter to resident, 6 fewer parking spaces would be required to serve the campus.

ESTIMATING VMT

Estimating the Vehicle Miles Traveled on a regular basis by faculty, students, and staff helps to paint a clear picture of how campus transportation options influence the collective greenhouse gas emissions of coming from use of this campus. In order to establish a sustainability target for this master plan, the number has been roughly estimated using realistic data. Caution should be taken in assessing the results of this VMT estimation as CSUSB has not issued a full transportation user survey. It is highly recommended that the campus explore opportunities to collect travel survey data if more accurate results are desired. These numbers should be

	Existing 2015		
	Daily Trips	Average Trip Length	VMT
On-Campus Student	2,997	15.0	**44,955**
Off-Campus Student	30,948	34.7	**1,073,896**
Faculty/Staff	3,027	34.7	**105,037**
Total	36,971	33.1	**1,223,888**

	Master Plan		
	Daily Trips	Average Trip Length	VMT
On-Campus Student	9,482	15.0	**142,230**
Off-Campus Student	41,726	34.7	**1,447,892**
Faculty/Staff	4,592	34.7	**159,342**
Total	55,800	31.4	**1,749,465**

TABLE 8–5: Campus Trips and Associated Vehicle Miles Travelled

further evaluated in order to assure accuracy if used in an environmental impact report. With these caveats, the following results can be used to measure the potential performance of a Traffic Demand Management (TDM) program and on-campus housing program on Vehicle Miles Travelled (VMT).

VMT ANALYSIS CONCLUSION

Estimating the Vehicle Miles Traveled on a regular basis by faculty, students, and staff helps to paint a clear picture of how campus transportation options influence the collective greenhouse gas emissions of coming from use of this campus. In order to establish a sustainability target for this master plan, the number has been roughly estimated using realistic data. Caution should be taken in assessing the results of this VMT estimation as CSUSB has not issued a full transportation user survey. It is highly recommended that the campus explore opportunities to collect travel survey data if more accurate results are desired. These numbers should be further evaluated in order to assure accuracy if used in an environmental impact report. With these caveats, the following results can be used to measure the potential performance of a Traffic Demand Management (TDM) program and on-campus housing program on Vehicle Miles Traveled (VMT).

	Basline	Master Plan w/ TDM Program	
User Type	Estimated VMT	Approximate Potential VMT w/ 10% TDM Reduction	Proposed Target VMT w/ TDM
On-Campus Student	142,000	14,200	127,800
Off-Campus Student	1,448,000	144,800	1,303,200
Faculty/Staff	159,000	15,900	143,100
Total	**1,750,000**	**175,000**	**1,575,000**

TABLE 8–6: Establishing a Proposed Target for Reduction in Vehicle Miles Travelled

SPECIAL PARKING DEDICATION RECOMMENDATIONS FOR SUSTAINABLE VEHICULAR USES

Special parking accommodations should be provided for electric and carpool/vanpool vehicles to encourage their use. For example, electric vehicle and carpool/van pool parking spaces should be placed in preference locations as an incentive. Electric charging stations should be provided or even over provided as the electric vehicle becomes a larger share of the vehicle fleet. Each individual parking facility should provide the appropriate ratio of electric vehicle, carpool/vanpool, and compact spaces. The exact ratios may depend on local or regional code requirements and can change from year to year.

9 LANDSCAPE + OPEN SPACE

9.1 LANDSCAPE + OPEN SPACE OVERVIEW

The combined mix of campus landscapes and open spaces represent one of the most important identity-defining and place-making elements of any campus. They play a major integrated role in creating an aesthetically pleasing environment supporting human interaction, learning, human health, human comfort, campus navigability; and environmental, water and energy sustainability.

INTRODUCTION

Today's 441-acre CSU San Bernardino campus reflects over a half century of evolutionary development. In the course of decades the campus has grown incrementally to its current maturation. The expansive verdant setting, the picturesque vistas, the varied terrain, the blustery seasonal winds and the swelteringly hot days, all are indelible characteristics and enduring experiences for generations of students and their families, faculty, staff and visitors. In the coming years, as the campus continues to expand to meet the needs of the University's educational and community missions it is imperative that the preeminent and defining attributes of the campus open spaces and landscape are preserved, enhanced, enriched and made more resilient. Integrated together and complementing the 2016 CSUSB Master Plan, the campus landscape will transition and be transformed, becoming a more collegial, cohesively legible and holistically sustainable environment with a greater focus on water conservation, storm water management and the reduction of maintenance protocols.

Given these overreaching initiatives, the purpose of this Landscape and Open Space Plan component of the 2016 CSUSB Master Plan is to provide qualitative observations and analysis of the existing landscape conditions as a basis for the development of coordinated comprehensive landscape improvement strategies, programs and a set of Landscape Design Guidelines. Collectively, the Landscape and Open Space Plan affirms, aligns and reinforces the vision, the principles, the objectives and the strategies of the 2016 Master Plan, contributing to and fostering a 24/7 vibrant live-work-learn-play environment.

GATEWAY:
PICTURESQUE PRIMARY IDENTITY

CENTER WALK ("COYOTE WALK")
LACK OF DISTINCTION ALONG CENTRAL WALKWAY

LAND LAB:
CONTINUED LONG-TERM CONSERVATION

ASSESSMENT OVERVIEW

Three prominent character defining elements of the existing campus environment are observed as fundamental organizing precepts of the original campus planning vision. These distinctive campus environments are not only embraced for their traditional historical significance, but for their integral and prominent role in a reimagined and Landscape and Open Space Plan.

1. **Gateway Commons**. Respecting the evocative picturesque backdrop of the beautiful San Bernardino Mountains the original planning construct recognized the terminus of University Parkway by dedicating a grand civic scaled open space as the primary University gateway (Gateway Commons). Proposed landscape and circulation improvements reinforce both the iconic nature and the functional arrival experience of this focal space in order to enhance and to elevate the brand and the identity of the San Bernardino campus.
2. **Coyote Walk.** Responding to the varied topographic characteristics of the site and the differential terrain, a clear distinct corridor and pedestrian oriented/ walkable organizing spine was created to link the northwest sectors of the campus, the academic core and the southwest athletic and recreational complexes (Coyote Walk). Proposed landscape enhancements reinforce, reimagine and transform this linear space into the campus "Main Street Experience." A shared connective "urban space" with more activated edges, intensified energy, increased density and multifaceted opportunities for social engagement and collaborative synergies.
3. **Land Lab.** Given the inherent topographic complexity of the terrain north of North Campus Circle, the University has largely preserved this approximate 130-acre portion of the campus in an undeveloped state. Today, with the exception of the well-known Murillo Family Observatory and a modest recreational field site this hilly University terrain remains largely in a preserved semi-natural condition. Moreover, the Fairview School Historic site located adjacent to the road (Martin A. Matich Roadway) leading to the Observatory is a cultural point of interest and represents and important opportunity for reinforcing a network educational hiking trails, habitat conservation and water resource management studies within the area (See Land Lab section below). Two much smaller parcels comprising approximately 10 acres, located adjacent to the intersection of Northpark Boulevard and West Ash Street remain largely undeveloped and are considered additional sites for conservation and preservation plan initiatives.

These three character defining aspects are considered fundamental and historical campus attributes to be acknowledged, embraced and respected in the Open Space and Landscape Plan. Building on these underpinning campus attributes, the landscape framework not only enhances the organizational and environmental aspects of these broadly encompassing ideas but creates integrated linkages and connections that further strengthen, enrich and unify the Collective Campus Landscape.

OPEN INTERSTITIAL SPACES

In addition to addressing these broad scale organizing components, the Landscape and Open Space Plan considers and presents recommendations to reevaluate the extensive amount of open/interstitial spaces that separate buildings with uninterrupted expansive and often un-programmed verdant turf areas. Although these spaces contribute to the overall spatial quality and park-like setting of the academic facilities, at the same time, their expansive planar nature reduces the perception of the campus as a connected cohesive community. In fact, the preponderance and the expanse of these spaces decrease the sense of collegial connection and integration between the University buildings and facilities and are a challenge to promoting a comfortable and accessible walking environment. The predominant groundcover of these open spaces, maintained turf grass significantly adds to the landscape irrigation demands and maintenance protocols.

CLIMATIC REALITIES / EXTREMES

Further assessment of the existing campus open spaces recognizes two significant macro and micro climate influences associated with the CSUSB site. Seasonally, temperatures can be considered uncomfortably warm and passive solar shading is a needed and welcome amenity. Moreover, strong autumn and winter winds from the nearby mountains and canyons create substantial challenges to outdoor social interaction and pedestrian comfort. The Landscape and Open Space Plan addresses these climatic environmental realities by proposing specific physical amenities and natural interventions.

NEED FOR TURF ALTERNATIVES

An analysis of the existing tree canopy, ground plane plantings and the type and extent of impervious paving throughout the campus reveals further opportunities to revitalize, strengthen and embrace a holistic, ecosystem-driven framework for the development of a landscape/green infrastructure. Specific opportunities exist to enrich, increase and enhance the shade tree canopy, to replace turf grass coverage with less water consumptive plantings in strategic locations, to modify plant palette preferences and to reduce the extent of impervious surfaces. In addition, opportunities exist to upgrade and to improve irrigation systems equipment and design to substantially reduce water consumption rates within the campus environment.

9.2 LAND LAB + CONSERVATION

Introduced in Chapter 2 Existing Conditions, the 'Land Lab' open space designation represents large undeveloped portions of the CSUSB campus that are used for a variety of instructional and other student uses.

LAND LAB

Although they had been used for at least twenty years for various academic purposes, identification and categorization of these parts of the campus was undertaken by several faculty members in 2007 and then updated in 2015 for input into the 2016 Master Plan. Most of the Land Lab acreage is located to the north of North Campus Circle drive and lies in natural open space. Other significant land units lie to the far west of the campus. Although all these areas are important for a range of instructional uses including teaching, learning, student research and faculty research, non-academic student use by groups such as the ROTC and Associated Students Incorporated (ASI), and use by the community, the faculty users of the Land Lab have classified each of the subareas based upon a gradated scale of priority as shown in the Figure 9-1. The analysis completed by the 2016 Master Plan team demonstrated that the campus could achieve a projected campus capacity of 25,000 FTE without utilizing the Land Lab areas for campus facilities. Further, as the north areas of the campus in particular have experienced dangerous wildfires in the past and as these areas are classified by Cal Fire as a "Very High Fire Hazard Severity Zone" there are safety reasons for concentrating campus facility development south of North Campus Circle and for keeping the Land Lab as an undeveloped section of the campus.

The area to the far west of the campus carrying a designation as a "High Value Teaching Area" is used frequently by the Biology and Geography Departments because of its high biologic diversity. Considered the most biologically diverse natural site on the campus property, it was deliberately retained as an open space area on the 2016 Master Plan but with the plan allowing for the adjacent development of the proposed Discovery Park uses. It is believed that the diversity of this site is related to the area's underlying geology as it lies upon a previous intermittent stream course expressing related unique soil and hydrologic characteristics.

PBO site P612 at the CSUSB Land Lab. This site is part of a large network of Global Positioning System (GPS) instruments comprising the Plate Boundary Observatory (PBO) component of the EarthScope which precisely measures Earth deformation resulting from the constant motion of the Pacific and North American tectonic plates in the western United States. See: http://www.earthscope.org)

Developed Area

- Campus Entry / Quad
- Campus Park
- Recreation / Athletes Area
- Residential Area
- Educational Garden

Land Lab Natural / Undeveloped Areas

- I. Most Critical Teaching Areas
- Proposed Preserve In Flat Terrain
- II. High Value Teaching Areas
- III. Medium Priority Teaching Areas.
- IV. Medium Low Priority Teaching
- V. Low Priority Teaching
- VI. Lowest Priority Teaching
- VII.Priority Undefined

Future Development

- Future Building / Sturcture

FIG 9–1: PROPOSED LONG TERM LAND LAB + CONSERVATION AREAS

9.3 LANDSCAPE SUSTAINABILITY

A sustainable landscape outcome for CSUSB will involve many aspects of coordination, including design, materials, and construction processes. There are four particular areas that can be addressed now: turf replacement, ground materials, irrigation, and habitat conservation.

TURF REPLACEMENT + CONVERSION PROGRAM

In seeking a more ecologically sustainable campus landscape, the Landscape and Open Space Plan envisions significant removal of managed/maintained ornamental turf grasses in specific areas. Generally located in less intensely used peripheral or interstitial areas of the campus, targeted removal areas will be replaced with more resilient native or regionally adapted grasses or groundcovers or with other permeable materials such as bark mulch or decomposed granite. Horticulturally these proposed groundcover materials will require significantly less water, fertilizers and maintenance. The estimated approximate candidate turf grass conversion area is nearly 2,950,872 square feet, or 68 acres. The consequent potential potable water savings are estimated to be 60% of current water use.

Currently, the CSUSB landscape environment is a featureless monoculture with turf predominating.

A well-considered turf replacement + conversion program brings richness and variety to outdoor spaces - saving water and supporting the regional ecosystem.

TABLE 9–1: SURFACE AREAS

	Map Legend	Existing Condition	Proposed Condition
Surface Condition	Layer Color	Area SQFT	Area SQFT
Natural Preserve		7,460,833	6,567,833
Gateway Garden		0	15,497
Xeriscape		1,048,616	1,072,062
Building Footprint		1,130,260	2,045,821
Drought Tolerant Garden		0	1,543,233
Sport Court		137,661	204,453
Pavement		1,798,000	2,668,625
Parking Structure		161,970	725,468
Athletic Field		1,371,485	627,032
Plaza (Permeable Paving)		0	199,523
Asphalt		3,532,334	3,014,770
Turf		2,638,909	489,668
Trail		0	104,990
Property Area		19,280,068	19,278,975

FIG 9–2: PROPOSED LANDSCAPE MATERIALS

GROUND MATERIAL + STORMWATER RUNOFF IMPACT

Eleven buildings sited within six independent drainage areas were identified in the UIFA as having experienced local flooding conditions. The stated reason for this flooding was a compromised stormwater system affected by suspected root intrusion, broken pipes and/or reverse slope. The current P2S Engineering recommendation of videotaping and repairing zones that are in need of rehabilitation remains the best way to address this condition moving forward. The estimated length of pipe to be replaced is 1,100 linear feet along with the addition of up to 20 new catch basins.

Permeable landscape materials proposed for campus use according to the surface material calculations contained in Figure 9-3 will decrease impervious surfaces by 18 percent. This includes areas around the eleven buildings of concern. Combined with the expected use of natural "detain and retain" stormwater management strategies to increase infiltration and capture rooftop runoff for irrigation purposes, the current issue of occasional ponded rainwater should mostly be alleviated. However, while installing any stormwater Best Management Practices (BMPs) in the local vicinity of the problem areas, care should be taken to evaluate the areas that flood to ensure the ponded water has an engineered connection to the BMPs and that the local catchment is properly engineered.

	EXISTING SQ. FT.	PROPOSED SQ. FT.
Pedestrian Paving	1,798,000	2,973,138
Roadway + Parking	3,532,334	3,014,770
Building Roof + Parking	1,292,230	2,771,289
Structure		
Sport Courts	137,661	204,453
Turf + Atheletic Field	4,010,394	1,116,700
Permeable / Undeveloped	8,509,449	9,198,625
Property	19,280,060	19,278,975

Figure 9–3: EXISITING + Proposed ground material summary

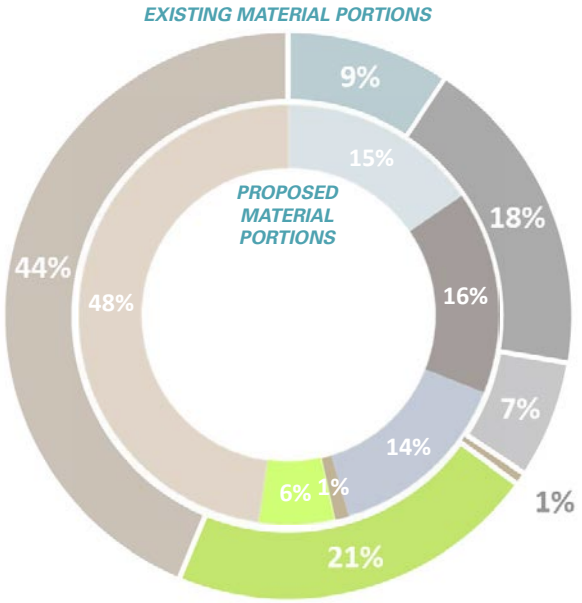
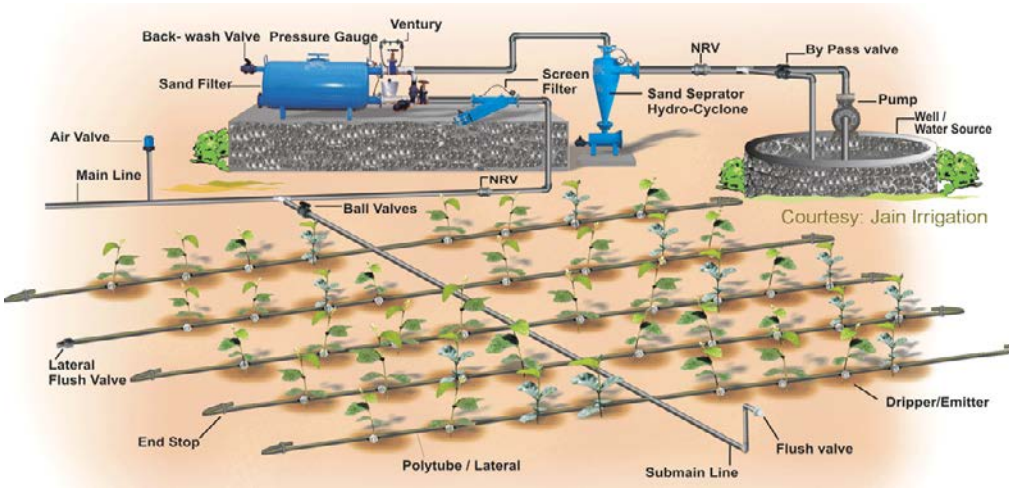


FIG 9–4: PROPOSED LONG-TERM EXTENT OF TURF COVERAGE

EFFICIENT IRRIGATION PROGRAM

It is intended that all new and renovated irrigation systems will meet or exceed the State of California Model Water Efficient Landscape Ordinance requirements. Furthering the goals of sustainability objectives and potable water conservation the following initiatives are encouraged:

- In order to quantify and monitor landscape water use, Install dedicated landscape irrigation water meters at all well or point of service connection locations;
- Install in line flow sensors and master valves at all mainline points of connection
- Establish base line water use numbers for all landscape zones on campus for ongoing evaluation of water consumption;
- Utilize a coordinated “Smart” irrigation controllers that utilize weather based evapotranspiration data (Eto) or moisture based data (soil sensors) in order to automatically update and to adjust irrigation programs/schedules;
- Soil/rain sensors should be installed throughout systems in order to interrupt or suspend irrigation delivery during significant rain events;
- In order to improve efficiency of delivery utilize high efficiency rotor type heads in lieu of traditional spray nozzles or heads;
- Minimize irrigation run off by utilizing soak-and- cycle programs;
- Utilize check or anti -drain valves on all irrigation circuits;
- Regularly monitor and adjust irrigation programming to reduce runoff;
- Monitor irrigation circuits and programs and utilize in line pressure regulating devices to ensure optimum operating pressures for nozzles and heads;
- In smaller or narrow planting areas consider utilizing drip emitter systems (eg. Netafin);
- Deep water trees with dedicated low flow bubbler heads separate from other turf, shrub or groundcover irrigation circuits;
- Utilize less water intensive landscape material palette;
- Utilize minimum 3 in. depth organic mulches in shrub and ground cover areas;
- Aerate and reduce soil compaction in high traffic zones in order to minimize irrigation water runoff.



Subsurface and drip irrigation will make gray water and well water sources more effective in supporting turf.

HABITAT PRESERVATION PROGRAM

Reflecting their intrinsic historical and environmental value these areas should be maintained as assets unique to the CSUSB campus. These areas are not designed landscapes and they are differentiated by the fact that they have not been and are not intended to be extensively managed under typical maintenance protocols. Rather, the plan recommends preservation and conservation so that they are sustained as educational and cultural landscapes representative of their site specific locale.

Preservation and curation of their existing “natural state” suggests minimal human interventions or introductions.

Native flora identification, recovery, and replanting efforts work to enrich the ecosystem surrounding CSUSB and endemic to the natural context. In turn, the CSUSB Land Lab can serve as a teachable laboratory for conservation in inland Southern California.

Within and beyond the campus community acknowledging current plant communities and habitats , these areas embody opportunities for multifaceted biological study, research and educational interpretation.

The two existing sage/scrub areas near Ash Street and the terrain north of Campus Circle Drive should be demarcated by or encircled with appropriate perimeter fencing such as split rail or weathered steel and mesh. Attractive understated and simple identity signage together with interpretative information is envisioned . In order to facilitate accessibility a modest network of informal decomposed granite or bark mulched pathways allow pedestrian circulation within each of these areas. Natural large boulders or wooden logs provide isolated sitting, viewing and small group teaching venues or outdoor study “laboratories”. See also, the discussion of the CSUSB “Land Lab” in its corresponding section.

9.4 LANDSCAPE + OPEN SPACE ZONES PROPOSAL

The 2016 CSUSB Master Plan divides the campus into several functional landscape zones that have similar characteristics and that contribute to the overall functioning of the campus. These zones also are used to direct landscape planning initiatives that will define and reinforce the character of specific campus landscape systems.

INTRODUCTION AND APPROACH

The Landscape and Open Space Plan provides criteria and guidelines for addressing and achieving the objectives identified above. Integrated and coordinated with the 2016 Master Plan recommendations, the Landscape and Open Space Plan provides a landscape/open space-oriented narrative and graphic armature or framework to guide future campus development initiatives. The first component of the Landscape and Open Space Plan defines and clarifies the landscape character (typology), quality and connectivity for various features and zones throughout the campus. These interrelated landscape typologies are described within the campus-wide context and specific recommendations/design criteria are aligned with each feature zone. The Landscape and Open Space Plan emphasizes and prescribes the site open space elements that will become the character-defining elements of each zone.

In addition to articulating and describing these particular precincts or campus zones the second major component of the Plan emphasizes specific campus-wide landscape and open space recommendations and guidelines encompassing ecological resiliency initiatives such as storm water treatment and bioswales, permeable paving, tree canopy, micro-climate controls and water consumption. The Plan also provides guidance on the following landscape/open space topics: detailed plant palettes, turf replacement, campus tree/forest succession, irrigation strategies, and site elements and furnishings including flexible art installations.

The Rogers Community Garden at UCSD exemplifies successful on-campus University student-run edible gardens; these provide fresh produce to campus dining halls, and support field studies.

Featured Landscape Zones

- Gateway Commons
- Coyote Walk
- Sycamore Walk
- Campus "Urban" Trail
- Arrival Plazas
- CQ — Collaboration Quad

Campus-Wide Landscape Zones

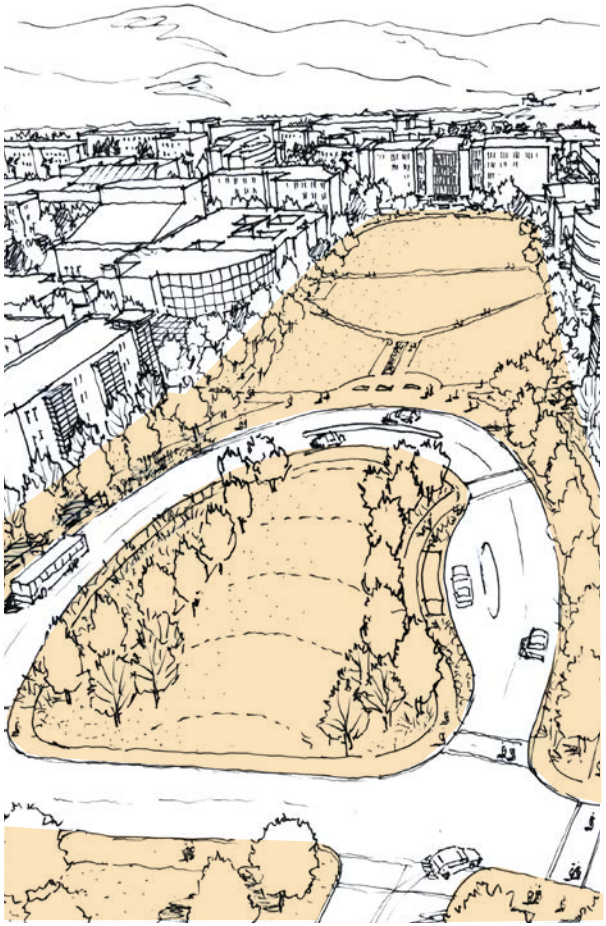
- Campus Avenues
- Campus Edge - Northpark Blvd. Streetscape
- Campus Edge - Campus Circle Streetscape
- Campus Orange Grove and Edible Garden
- Pedestrian Lanes
- Photovoltaic Field
- Surface Parking
- Waterwise Demonstration Garden
- Land Lab/Habitat Preservation
- Athletic/Sports Field
- RQ — Residential Quad

FIG 9–5: PROPOSED LANDSCAPE AND OPEN SPACE ZONES

9.5 FEATURED LANDSCAPE ZONE PROPOSALS

Six major landscape zones are featured as they offer transformative proposals that will play a significant role in redefining the campus as a setting that balances the needs of students' academic, social, and mobile lives. These designs often replace turf with more socially engaging and interactive plazas and corridors.

GATEWAY COMMONS



Existing Condition

KEY TRANSFORMATIONS

- ✓ Greater Pedestrian Access
- ✓ Terminus of University Pkwy as Visitor-Dropoff and Transit Loop
- ✓ Landscape Theme Reflective of Community or Region
- ✓ Landscape Buffer for Proposed Housing

OVERALL CONCEPT

Gateway Commons leverages and celebrates the historic civic nature of the campus gateway legacy space connecting the University and the community. As the most prominent civic space on campus as conceived in the Plan it is recognized, expanded and improved in order to affirm its enduring attributes that set the University's brand and identity. Situated at the terminus of the regional arterial, University Parkway and serving as the primary vehicular Gateway to Campus, this axially organized college green is lengthened and strengthened to create a singular open space stretching from North Park Boulevard to the Library. Framed by informally arranged bosques of large scale canopy trees the impressive uninterrupted open vistas to the Pfau Library and the majestic foothills and mountain ranges are maintained and highlighted. Extending from the Northpark Boulevard intersection to the facade of the Library, the program for the Gateway Commons district reinforces, extends and ensures a continuous, cohesive character for this central organizing space of the campus. Related circulation improvements simplify and more clearly direct arriving and departing vehicular traffic to the passenger drop-off at the commons lawn with some access via a delineated direct driveway to structured and surface parking facilities east of the Commons Gateway. In summary, daily vehicle intrusions impacting the civic nature of this college green are reduced and further enhanced with an elegant new design: a grand elliptical roadway entry loop, connections to the visitor information/parking kiosk and separate more graceful and larger capacity auto and bus passenger drop-off/loading facilities. Similarly, positioned around the ellipse are modest areas of short term convenience parking that allow students and visitors easy access to nearby planned student housing, administration and performing arts facilities.

As the foremost open space of the campus, there is reasonable justification for proposed generous areas of turf grass, balanced by more naturalized areas on the edges of the space in concert with a framework of informal tree groupings. At the intersection of Northpark Boulevard, Gateway Commons features large scale electronic and static signage monuments that further articulate, brand and frame this central campus entry. Complementing these identity elements is well integrated landscaping incorporating modest yet impactful colorful plant accents in combination with more water wise plantings.

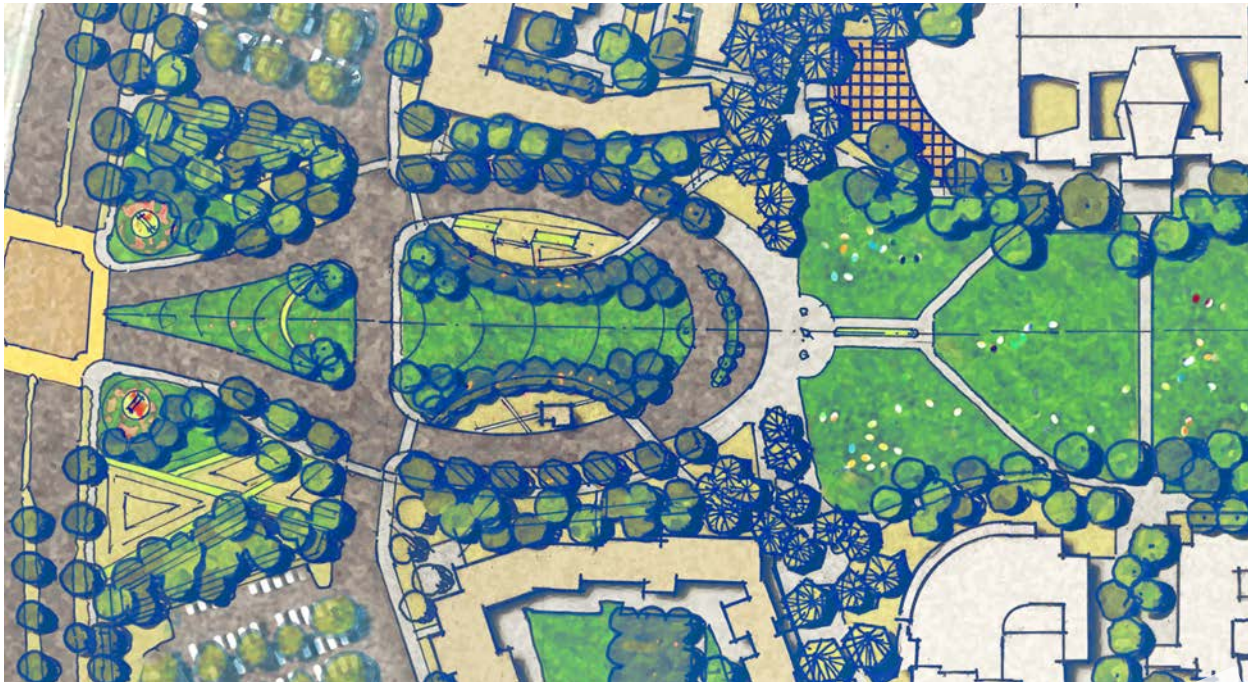
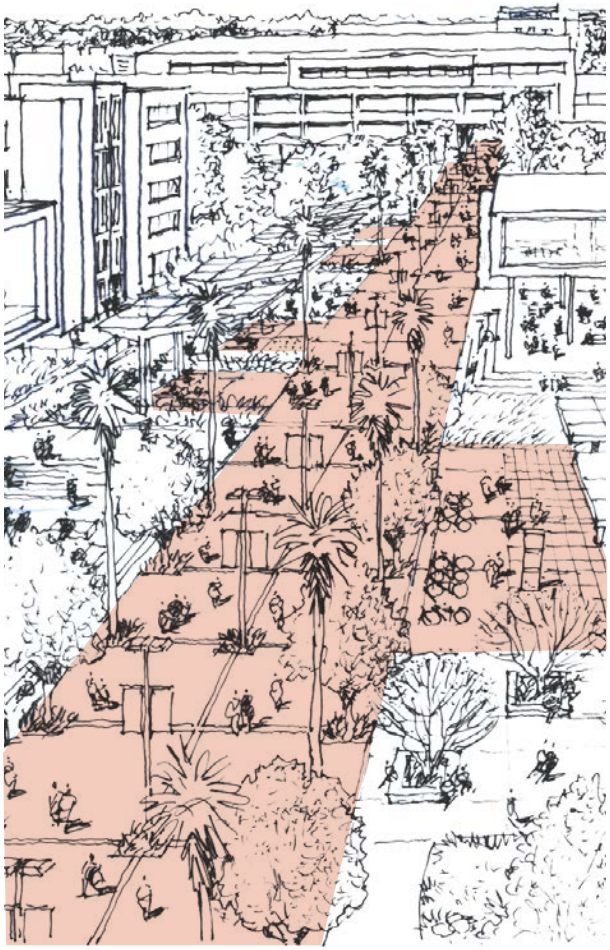


FIG 9–6: PROPOSED CAMPUS GATEWAY LANDSCAPE

Proposed Condition

COYOTE WALK



Existing Condition

KEY TRANSFORMATIONS

- ✓ Extend Hardscape Plazas to Buildings
- ✓ Solar PV Shade Structures
- ✓ Densified Tree Canopy with Interspersed Palms
- ✓ Casual Seating/Tables, Bike Share, and Collaboration Pavilions

OVERALL CONCEPT

The original campus open space and circulation plan designated Coyote Walk as the main pedestrian oriented linear spine connecting the south and north campus sectors with the Pfau Library and central academic core of the University. Nearly fifty feet in width this corridor features patterned concrete, nearly continuous and regularly spaced plantings of Camphor trees (Cinnamomum camphora) and high mast light fixtures. At the same time, this promenade accommodates service and emergency vehicles. Stretching nearly the entire length of the campus, for a total length of approximately 3,600 feet, Coyote Walk is sometimes perceived as unvarying, repetitive and uneventful. In order to address the plain character of this zone and to create an inviting human scaled campus "Main Street" as envisioned throughout the 2016 Master Plan, the Landscape and Open Space Plan proposes several strategic and multifaceted improvement initiatives.

In addition to consistent landscape improvements planned to occur along the entire length Coyote Walk, the the Landscape and Open Space Plan divides Coyote Walk into three zones for focused and zone-specific landscape improvements: Central Plaza/ Coyote Commons, Coyote Walk South and Coyote Walk North Terminus. Each of these three feature zones will be articulated, developed and programmed to create inviting, attractive and energized destinations that inherently mitigate and alleviate perceptions of formidable walking distances. Revitalizing and enhancing each of these zones not only acknowledges the original campus planning vision but significantly creates new vitality, greater accessibility and campus connectivity.

COYOTE WALK CENTRAL PLAZA

The central zone along Coyote Walk, Central Plaza is imagined to become the unifying, inviting and exciting academic/social “living room” for the campus. Together with nearby planned College of Extended Learning (CEL) building and Student Union Expansion a greater spatial density of facilities and student activity is achieved. The Central Plaza/Coyote Commons will become the primary communal urban space of the campus. Amenities will feature shaded casual dining opportunities, individual and group seating alcoves an open spaces for student/faculty/University programmed events, functions and activities. As the primary iconic shared urban space of the campus, dynamic human engagement, collaboration and interaction are cultivated. Specific design guidelines for the planned new adjacent buildings and facilities encourage ground level functional and visual porosities, indoor/outdoor shared spaces and activated edges. Together with appropriately scaled canopy trees, palms and other landscape amenities and furnishings, soaring architectural photovoltaic canopies will create inviting and generous areas of shade. Integrated together with these elements, a well scaled and executed Coyote sculpture well be a prominent point of interest exemplifying and embodying the ”Coyote Spirit”. Coyote Commons is centrally positioned and planned to become the inspirational, spiritual, and distinctively emblematic focal space for the campus community.

FIG 9–7: CENTRAL COYOTE WALK - TYING TOGETHER ALL OF THE LANDSCAPE ZONES

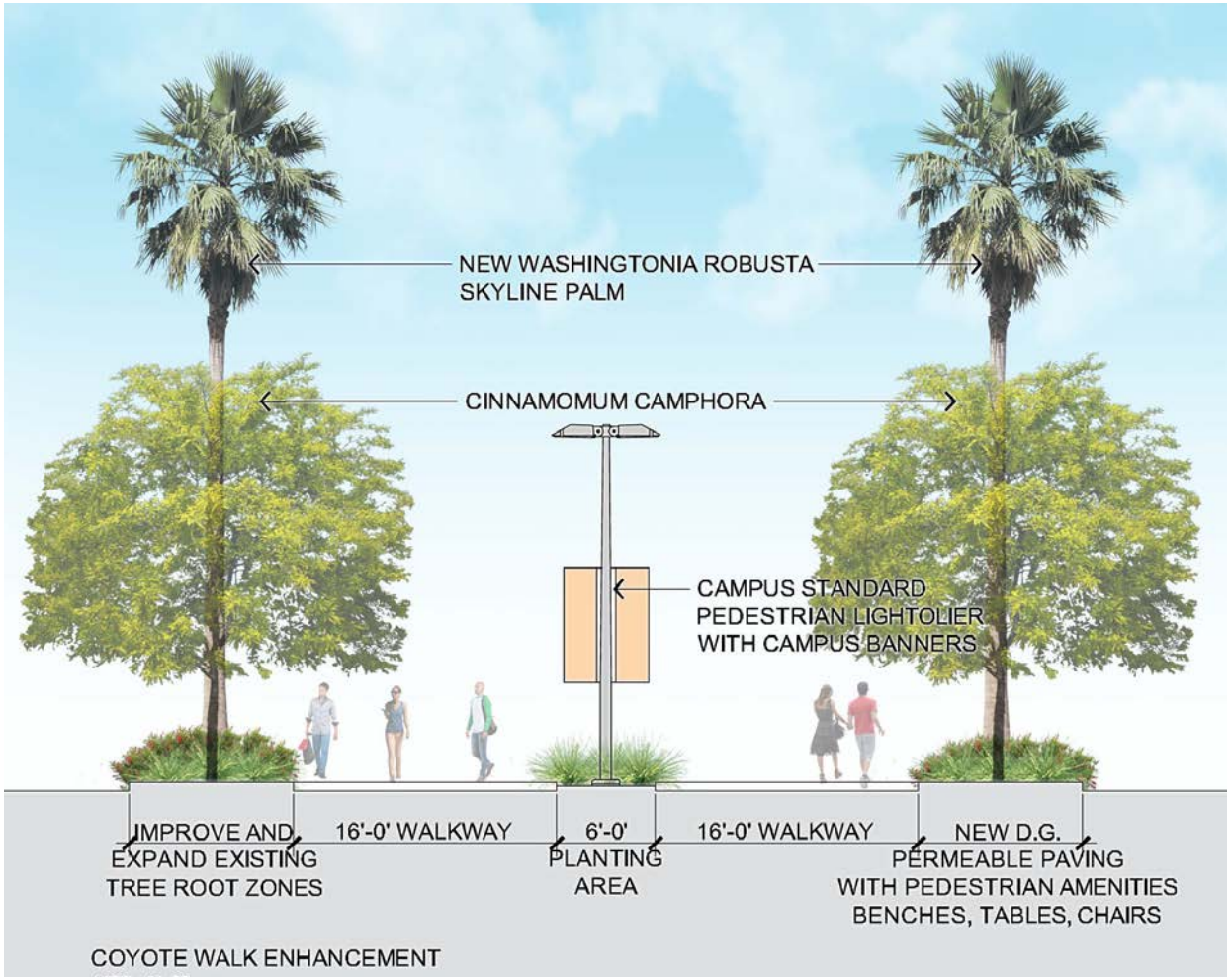


FIG 9–8: PROPOSED COYOTE WALK TREE CANOPY ENHANCEMENT

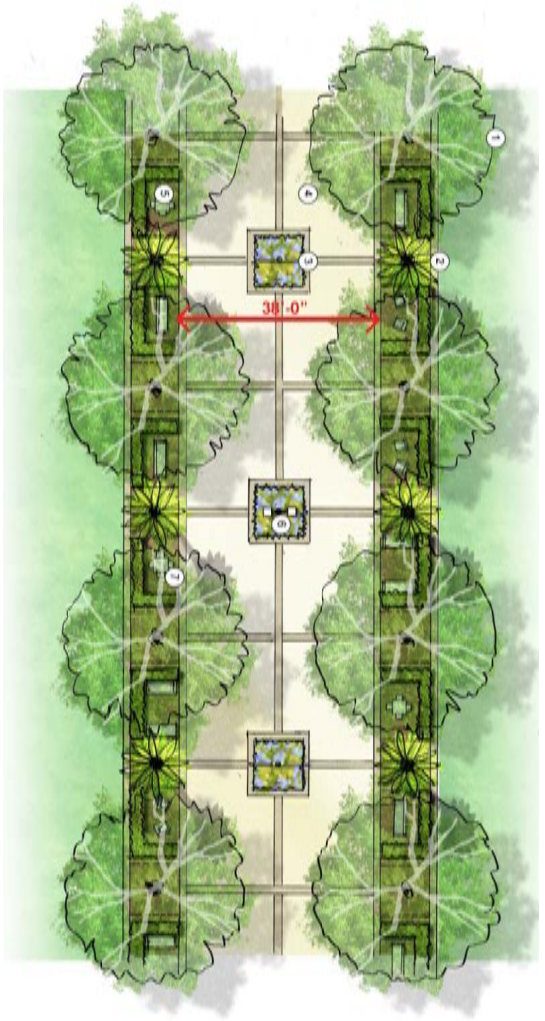


FIG 9–9: PROPOSED COYOTE WALK TREE CANOPY SPACING

COYOTE WALK SOUTH PLAZA

Located at the nexus of the Student Recreation and Fitness Center and the planned new South Campus Dining Commons and Housing Village, the South Plaza district will become the symbolic and operative eastern terminus of Coyote Walk. This new plaza framed by the planned Dining Commons and by an anticipated expanded Student Recreation and Wellness Center will become a clearly articulated destination and orientation space. The geometry, configuration and extent of the plaza accepts and resolves several disparate circulation elements lending clarity to paths of travel and better orienting students and users. Distinctive landscape features include differentiated paving types and patterns together with an exemplary planting of flowering shade trees and skyline-visible palm groupings.

COYOTE WALK NORTH PLAZA

Anchoring the opposite end of the campus , the North Plaza represents the northern terminus of Coyote Walk. This space mediates between proposed parking structures, the planned Discovery Park and the North Student Housing Village. In addition to resolving the varied geometries and building edges , this space clearly delineates vehicle and pedestrian circulation pathways to ensure the inherent safety and security of users.

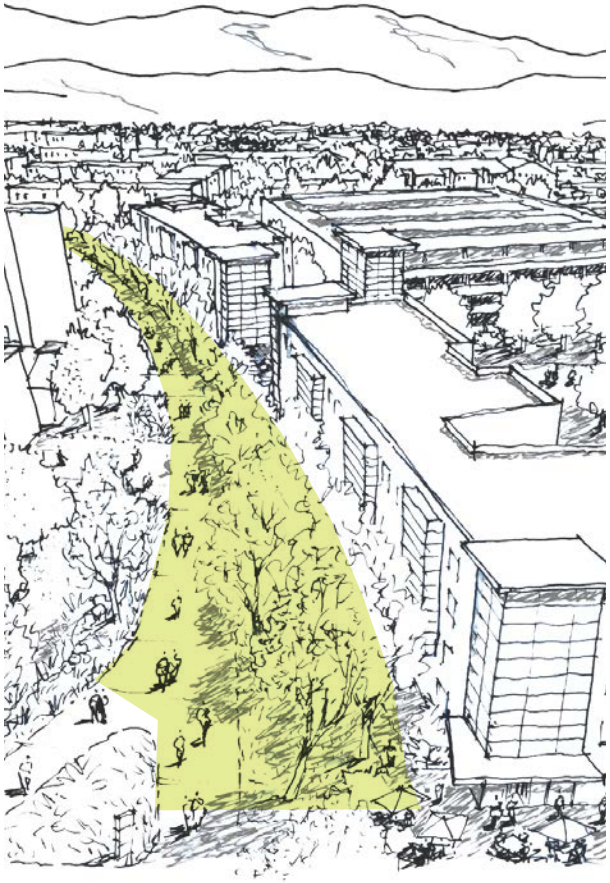
As a destination and as an arrival gateway for pedestrians emerging from nearby parking structures the landscape concept is bold, simple and differentiated. Paving types echo those of the South Plaza and flowering trees combined with iconic clusters of tall palms visually articulate and define the nature of this special destination.

GENERAL COYOTE WALK IMPROVEMENTS

Together with the zones described above, there are specific landscape improvements planned along the entire length of this focal linear spine. In order to make this space more pedestrian friendly and appropriately scaled and to improve the horticultural parameters of the existing Camphor trees, landscape improvements include replacing existing concrete with permeable paving . The concrete around the immediate area of the trees will be replaced with decomposed granite or alternative permeable modular pavers and these spaces will become invitingly shaded individual or group seating areas with a variety of seat and table configurations. In order to more strongly differentiate this corridor and to provide visual reference and continuity throughout the campus , tall palm trees are proposed to be interspersed between each of the camphor trees. Along this corridor in conjunction with planned new academic buildings, opportunities exist for strategic infill of photovoltaic shade structures along with other pedestrian amenities and campus identity elements including specialized lighting, banner poles, kiosks, bicycle and skateboard racks, wayfinding and recycling/trash facilities.

Proposed Condition

SYCAMORE WALK



Existing Condition

KEY TRANSFORMATIONS

- ✓ Housing Facades, an arboreal “Residential Avenue”
- ✓ Native Groundcovers and Grasses Below Sycamores
- ✓ Riparian Edge Bioswales Against Housing
- ✓ Cafe and Amenity Seating Areas

OVERALL CONCEPT

Linking the existing and proposed student housing villages in the southeastern parts of the campus with the planned north campus housing area, this proposed primary pedestrian and bicycle circulation path embraces and preserves one of the more enduring aspects of the campus environment, the major groupings of California Sycamore trees (Platanus racemosa). As one of the most prevalent California natives on campus these large scale deciduous trees not only reflect and recall the natural arroyos of the nearby foothills but provide an abundance of shade and character. As a significant natural asset and one of the primary character defining attributes of the campus the Landscape and Open Space Plan capitalizes and elevates their positive contribution. Stretching for nearly 3,000 feet, Sycamore Walk, links and interconnects the proposed residential precincts and provides an invitingly compelling, informal meandering walk that gently curves to partially encircle the campus core.

Along the length of this path, additional plantings of sycamores are proposed together with informal naturalistic swathes of meadow like groundcovers. The intent is to create a continuous readily discernable interconnected canopy that visually unites and links the two primary campus housing villages. Beneath the sycamores expansive areas of turf grass will be converted to alternative groundcover treatments , including native grasses, mulching or decomposed granite. Where possible, impervious paving will be replaced by permeable alternatives and casual furnishings, such as natural boulder seating will be sited to take advantage of the expansive shade.

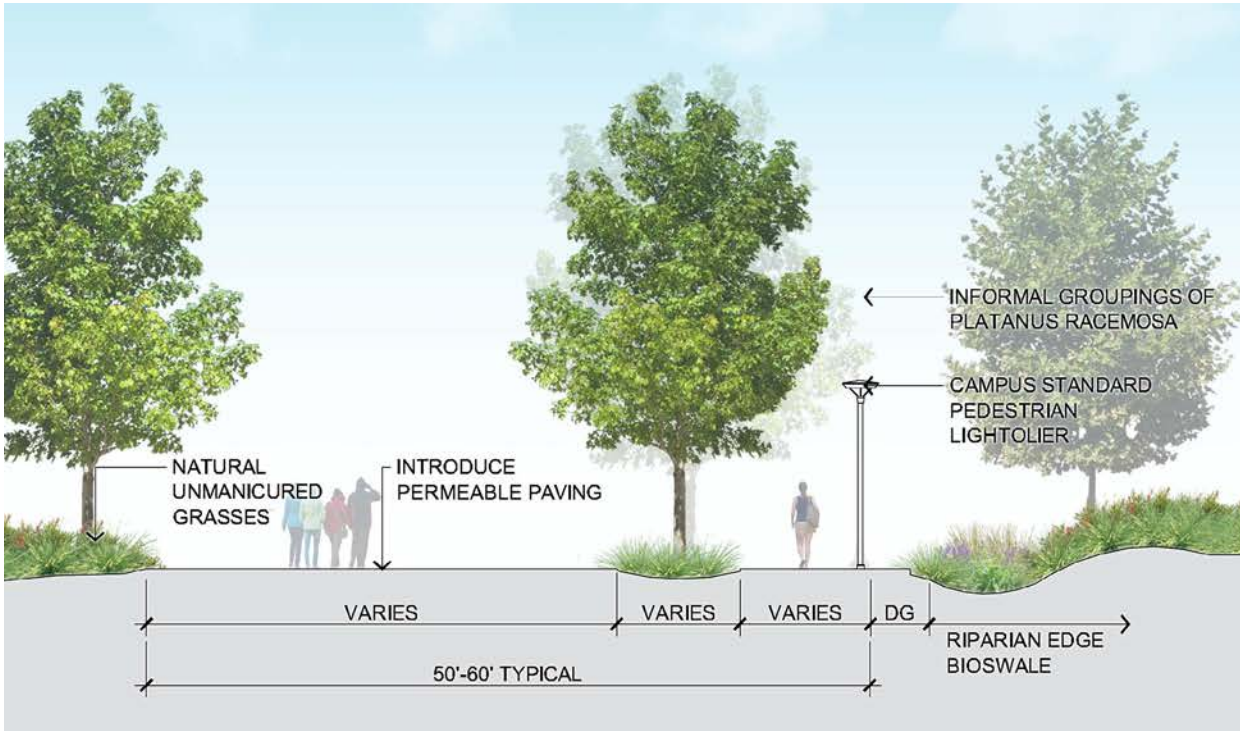
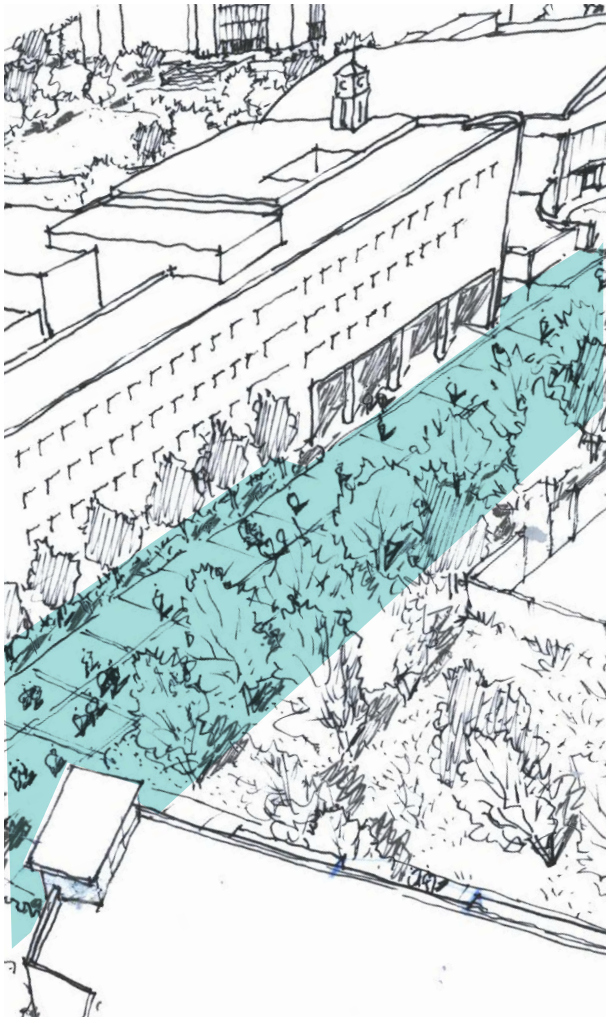


FIG 9–10: PROPOSED SYCAMORE WALK SECTION

Proposed Condition

CAMPUS "URBAN" TRAILS



Existing Condition

KEY TRANSFORMATIONS

- ✓ Prioritize Pedestrian Access with Materials/Bollards
- ✓ Permeable Paving for Stormwater Infiltration
- ✓ Street Trees, Bench Seating, Parkways
- ✓ Stormwater Retention Bioswales

OVERALL CONCEPT

The two proposed Campus Trails, are coordinated with and compliment the two other primary circulation elements of the campus plan, Coyote Walk and Sycamore Walk. Extending in generally north/south orientation, these two pathways or corridors, link existing and proposed parking facilities and provide clearly differentiated pedestrian realms bisecting the campus and interconnecting important destinations. The objectives of creating these trails is to provide inviting, easily navigated, pedestrian-friendly corridors that improve north south connectivity across the campus. Along these routes, design interventions are planned to consolidate and to concentrate pedestrian activity, to diminish and to reduce potential vehicular/pedestrian conflicts and to ensure a safe and secure walking/bicycle environment.

The overreaching design intent is to discernably increase tree densities and shade along these corridors in order to establish two distinctive differentiated north-south linear spaces. Specific tree types will be predominantly utilized along the length of these Trails. At each of the two corridors pedestrian elements are given priority over vehicular traffic. Vertical curbs are minimized in favor of accessible mountable curbs and impervious paving surfaces are reduced. As space permits, stormwater management devices, such as bio-swales and rain gardens are integrated. Furnishings including shade covered benches , information/wayfinding pavilions and waste recycling facilities generously positioned along these Campus Trails.

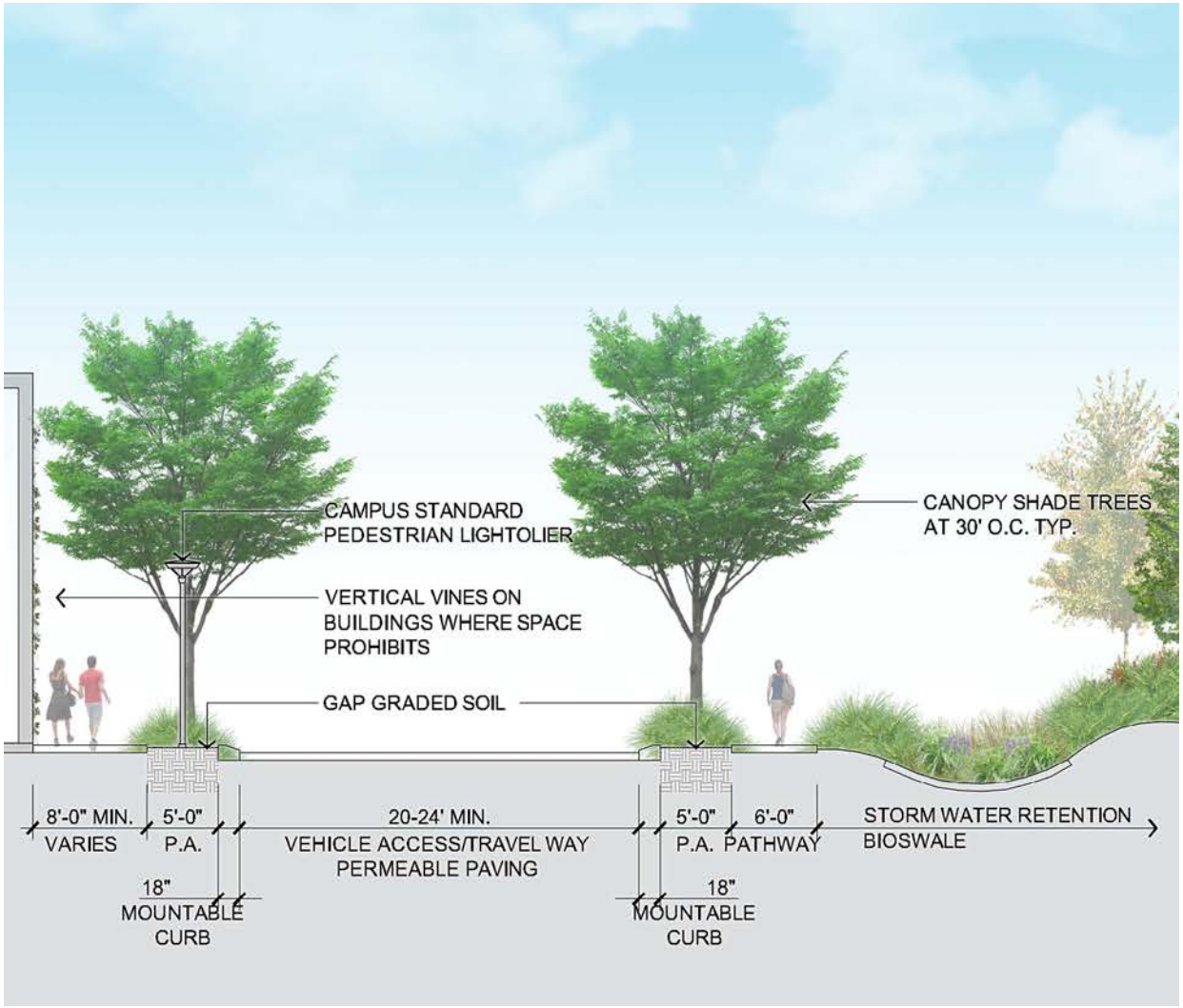
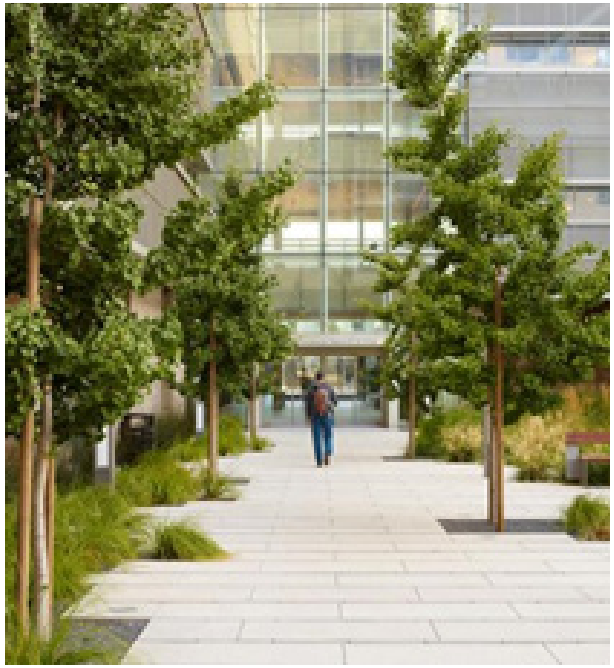
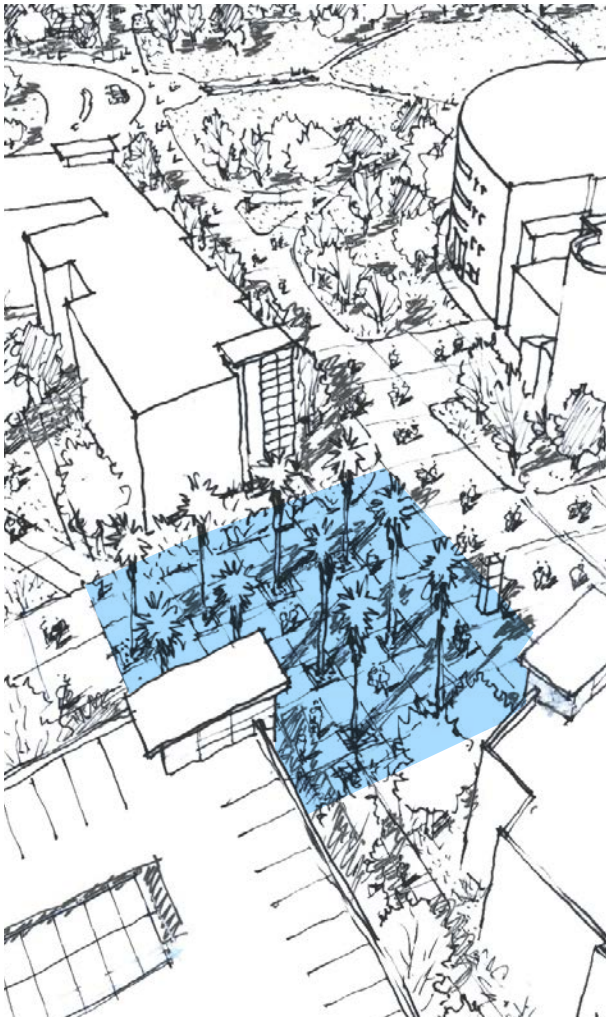


FIG 9–11: PROPOSED CAMPUS TRAIL [SHARED VEHICULAR USE] SECTION



Proposed Condition

ARRIVAL PLAZAS



Existing Condition

KEY TRANSFORMATIONS

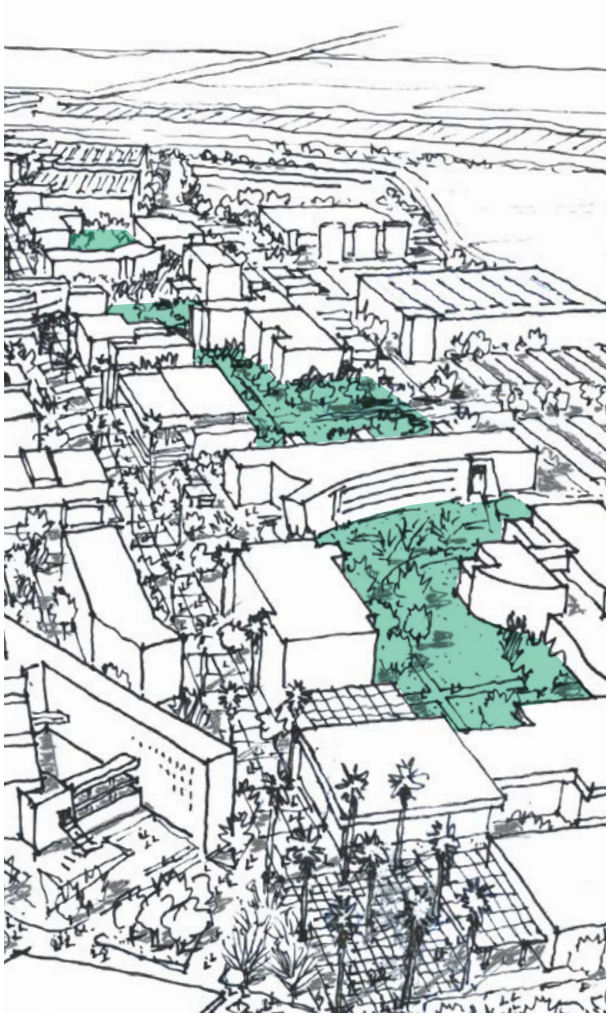
- ✓ Stand-Out Permeable Hardscape Material
- ✓ Well-Illuminated
- ✓ Clustered Wayfinding/Transit Information
- ✓ Bike Lockers and Bike Racks

OVERALL CONCEPT

The Landscape and Open Space Plan envisions four specifically designed spaces that would serve as pedestrian orientation/arrival plazas serving between existing and planned peripheral parking structures and the ends of the two major north-south Campus Trails that lead to Coyote Walk. Students, faculty and visitors who utilize these parking facilities will experience these plazas on a regular basis and they will be distinct and differentiated human scaled welcoming spaces. Reflecting both the nature and the spirit of the institution their character and quality must be consistently integrated. Configured as inviting, attractive pedestrian oriented spaces specific features envisioned include a combination of paved and garden areas together with distinctive flowering canopy trees and clusters of skyline-visible vertical palms. Each plaza will include comfortable shaded seating areas, wayfinding elements and campus information kiosks, waste and recycling containers. In order to ensure a safe and secure night experience, illumination levels for these spaces will be elevated and architecturally coordinated with the adjacent parking facilities focusing on glass-shrouded vertical lift/stair lobbies.

Proposed Condition

COLLABORATION QUADS



Existing Condition

KEY TRANSFORMATIONS

- ✓ Landscape and Flora Variety
- ✓ Collaboration Seating as Major Design Feature
- ✓ Significant Shading from Tree Canopy
- ✓ Unique Character Reflective of Adjoining Buildings

OVERALL CONCEPT

Interspersed throughout the campus landscape these courtyard spaces are distinct and substantially different than the aforementioned broader scaled civic or connective movement spaces. The plan envisions these spaces as richly articulated, individualized with great attractive appeal. These outdoor living spaces and places incorporate an array of comfortable venues for socializing, studying, collaborating or simply enjoying a meal or refreshments in the setting. Each courtyard is envisioned as expressive of its particular location related to the nearby uses of adjacent academic/facilities buildings. Fostering collegiality and social engagement, wide variety of comfortable sitting, congregating and meeting spaces, both large and more intimate are envisioned for each of these spaces. A wide array of furniture including benches and chairs and communal dining tables should be distributed according to functions and programs envisioned for each of these quads. Increasing activity and energizing these courtyards may often include great opportunities for food and beverage offerings and settings. Finally, on occasion, planting design and pallets and themes may be derived from activities and academic programs within adjacent buildings and can include experimental gardens, native plant gardens, pollinator gardens, water wise gardens and/or storm water treatment , rain harvest gardens.

Proposed Condition

9.6 CAMPUS-WIDE LANDSCAPE PROPOSALS

The following landscape proposals were prepared as a network of edges, pathways, and secondary outdoor spaces that constitute the overall character of the CSUSB campus. Here, significant gains in water resource sustainability, pedestrian safety, and environmental quality can be achieved as this Master Plan is implemented.

ATHLETIC FIELDS

Existing Condition

Proposed Condition

The CSUSB campus is fortunate to have a generous allotment and variety of open spaces programmed both for Physical Education, competitive sport and general outdoor recreation and exercise. These spaces serve both the student body and the greater community. Currently comprising approximately 35 acres, an Outdoor Playfields Master Plan completed in 2016 was prepared for the area by a separate team of consultants overlapping in time with the preparation of the 2016 CSUSB Master Plan. The Outdoor Playfields Master Plan anticipates extensive expansion and enhancement of existing fields, courts and sport venues. To address the landscape systems and context that surround these fields the Landscape and Open Space Plan proposes a network of shaded pedestrian and service vehicle pathways that interconnect these expanded sports facilities to provide them with a sense of cohesive spatial organization and clarity. Where space permits, linear tree windrows are positioned within this complex to mitigate and to buffer seasonal winds. Interstitial spaces located within the athletics complex include informal shaded seating and casual meeting spaces. As topographic conditions allow, these spaces also are envisioned to be configured for storm water retention basins facilitating groundwater recharge.

It is further anticipated that as sports and athletic fields are renovated or reconfigured they may be designed as retention basins. The design soil profile will be developed in order to promote storm event water retention and infiltration. Significantly, these extensive open areas, while serving the recreation needs of the students and community at the same time will proportionately provide notable ecosystem benefits.

SURFACE PARKING LOTS

Existing Condition

The original campus plan, acknowledged the importance of tree canopy by allocating landscape areas and tree planters within the surface parking lots. The existing trees within the parking lots should be maintained in

Proposed Condition

order to achieve maximum canopy coverage for shade and for heat island effect reductions. The Landscape and Open Space Plan prescribes regularly spaced canopy tree plantings within new or remodeled surface parking lots at a rate of one tree for every four parking stalls. These trees should be protected within planters of a minimum eight by eight feet with proper irrigation. Suitable parking lot trees should have broadly spreading, high branching canopies and minimally invasive root characteristics. The Plant Material Matrix in Part III provides suggested appropriate species for use in surface parking lots. The 2016 Master Plan also recommends the implementation of solar panel arrays at spacing intervals as shown in Figure 9-12 to not only provide a source of renewable energy for the campus but also provide shade in these surface parking lots.

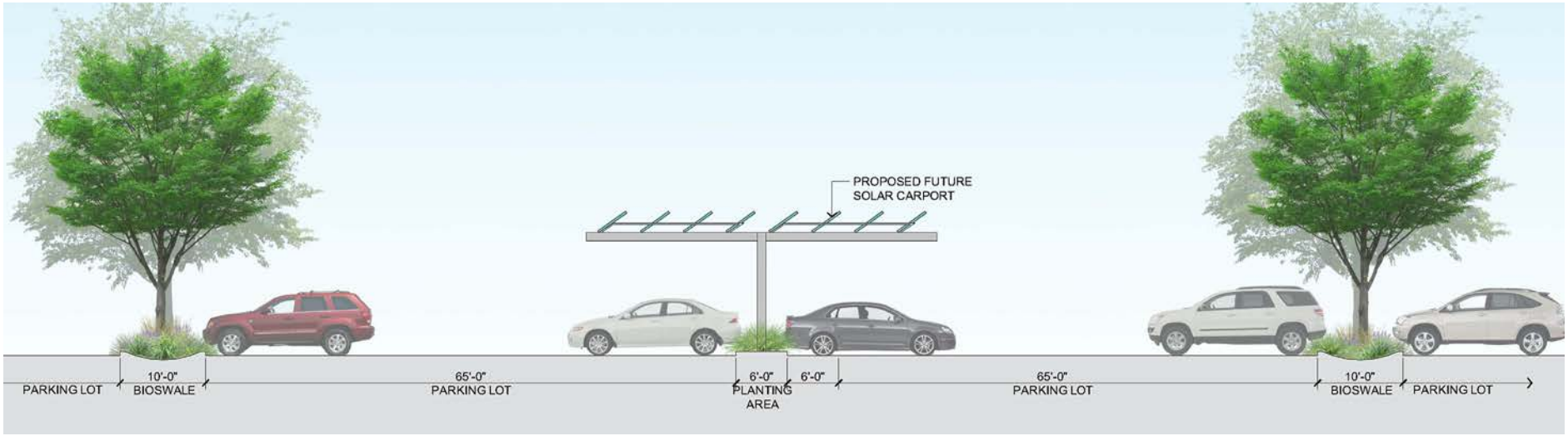


FIG 9–12: PROPOSED PARKING LOT TREE CANOPY OR SOLAR PV STRUCTURE SPACING

TREE CANOPY + SUCCESSION PLANTING

The CSUSB Campus has an extensive existing tree canopy, most of which was planted during the early years of campus development, 30-40 years ago. The extent and the magnitude of this canopy significantly influence the perceptions and the quality of the campus environment. Mature trees establish spatial order, provide human scale and define the informal, naturalistic character associated with the campus. At the same time, tree plantings should be planned to achieve recognized functions and spatial qualities.

- Defining and reinforcing views or circulation corridors
- Visually buffering or screening undesirable views
- Framing and composing outdoor rooms
- Creating microclimate shading and wind protection
- Reducing heat island effect
- Providing canopy and spatial comfort for users

Ongoing considerations should be given to gradually editing and removing less desirable, maintenance intensive trees and trees reaching the end of their life–cycle while at the same time establishing a proactively phased sustainable program for replacement/ succession of key campus plant materials. These programs will ensure a campuswide desirable plant materials age profile and species bio-diversity. It is further recommended that a comprehensive inventory of all campus trees be prepared by an International Society of Arboriculture (ISA) Certified Arborist. This professional assessment, prepared in accordance with ISA promulgated standards will identify species, size and evaluate the age, the health and the structural conditions of all trees. Those trees identified in poor condition, structurally unstable or otherwise in declining health will be gradually replaced with appropriate species. From the tree inventory a Tree Master Plan can be developed to provide a selective matrix of all existing and planned campus trees indicating trees considered to be the predominantly desired species for the campus, including applications for specialized precincts or particular functions.

Specific Landscape Systems and Applications. Some specific landscape systems and applications appropriate for various areas and site conditions of the campus and/or to achieve various functions for the campus are delineated in the sections that follow.

CAMPUS ORCHARD + EDIBLE GARDENS

The CSUSB community has expressed interest in creating urban agricultural opportunities on the campus sometimes referred to generically as “edible gardens.”. These modestly sized plots would be dedicated to the cultivation of edible fruits, herbs and/or vegetables. Such specialized gardens or orchards, though limited in scale and extent, present multidimensional opportunities for student, faculty, staff and community engagement. Managed appropriately they are practical outdoor classrooms and laboratories that demonstrate urban agricultural methods and practices. The benefits and possibilities may include: Sustainability research, curricula, and programs, Community education and outreach programs, Farm to table market exchanges, Student use in conjunction with residential villages

The 2016 Master Plan provides a repurposed location for a modest demonstration citrus or fruit orchard adjacent to the west façade of the College of Education building. As the 2016 Master Plan is implemented, additional opportunities within the proposed residential villages should be utilized.

CAMPUS AVENUES

Existing Condition

Proposed Condition

Campus avenues, secondary circulation elements within the campus circulation hierarchy provide vehicle and pedestrian connections within and throughout University. These circulation corridors should have continuous shade canopies that provide a consistent visual continuity as well as reduce urban heat island effect. While accommodating vehicular, bicycle and pedestrian traffic, pedestrians should be given priority with pathways designed to offer clear and safe paths for pedestrian travel with a minimum of conflicts. Designated bicycle lanes, separate pedestrian sidewalks, regulatory signage and appropriate safe lighting are essential. Specific avenues should be planted with a predominant tree species producing a broad reaching canopy--to create consistent, cohesive and shaded streetscapes. Collectively these avenues, in conjunction with the generously landscaped primary campus circulation roadways, further strengthen the character of the campus as an attractive, pedestrian-friendly and welcoming collegial environment.

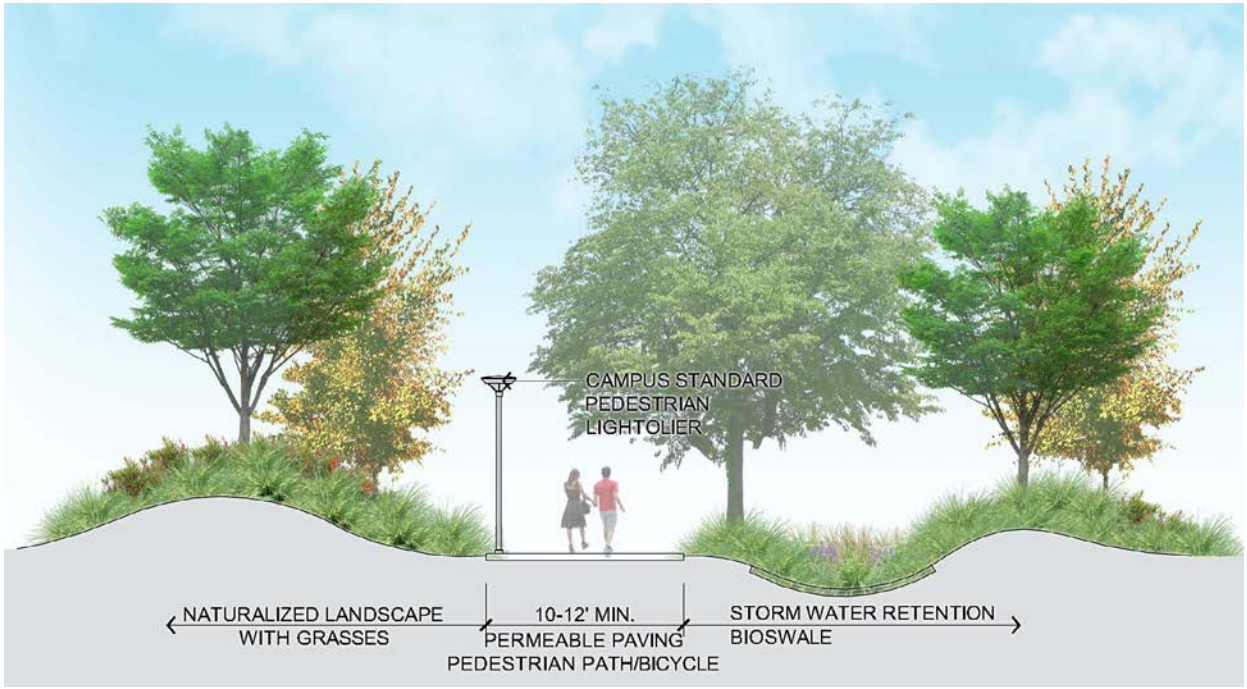
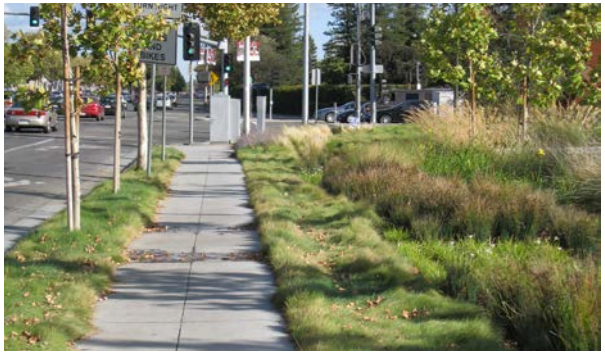


FIG 9–13: PROPOSED PATHWAY / BIOSWALE STANDARD SECTION

CAMPUS PERIMETER EDGES + GATEWAYS

Existing Condition



Proposed Condition

Consistent with the goals of strengthening the identity and the brand of the University, consideration was given to creating a more consistently unified peripheral edge for the campus. The streetscape edges on West Northpark Boulevard, North Campus Circle and East Campus Circle are envisioned to include continuous plantings of a select number of large scale trees. Acknowledging and reinforcing existing patterns, proposed new trees will relate to existing plant material themes and will visually unify and strengthen the campus edges of these streets. On portions of North Campus Circle, especially on the windward campus edge the street tree plantings are expected to be coordinated and combined with windrow/windbreak plantings that may buffer seasonal wind events. Where surface parking lots or parking structures are sited near perimeter public streets the proposed streetscape will include a combination of evergreen trees, earth berms and water wise ground plane plantings or treatments to visually screen views to cars or large scale structures. In addition, at primary entry intersections campus gateway treatments, including identity and wayfinding monuments together with distinct planting treatments will continue to be developed and integrated with existing improvements.

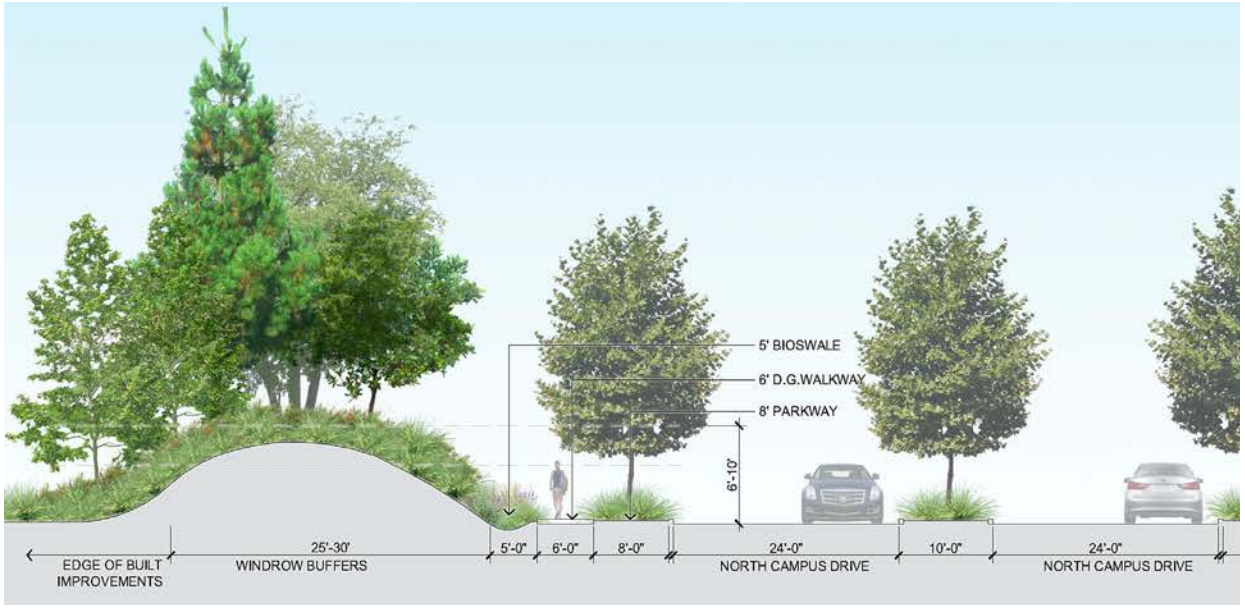


FIG 9–14: PROPOSED CAMPUS PERIMITER AT CAMPUS CIR.

WINDROWS / WINDBREAKS

Where feasible, the uses of windrows or windbreaks are desirable features throughout the campus. Space permitting, these features ideally include a minimum of two rows, triangular spaced, dense, low branching coniferous trees. They are oriented perpendicular to the predominant seasonal wind directions. The Campus Landscape Palette (see Appendix B) for species appropriate for these applications.

Windrows Proposed Condition

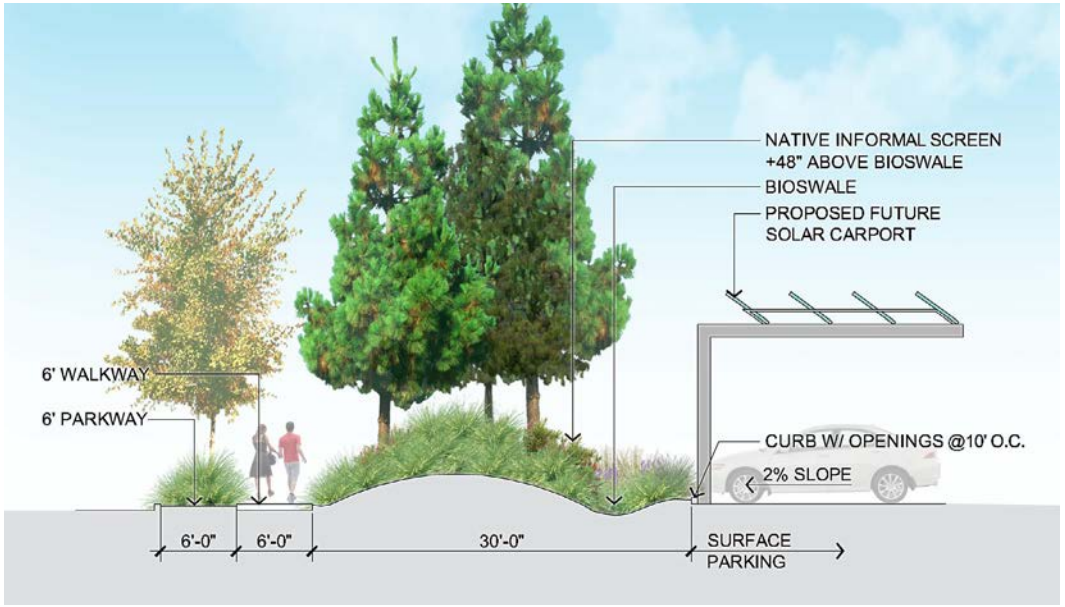


FIG 9–15: PROPOSED CAMPUS PERIMETERS AT NORTHPARK BLVD W.

WATER WISE GARDEN

The Water Wise Garden

The San Bernardino Valley Water Conservation Demonstration Garden was introduced in 2011 and occupies approximately one acre at the southeast end of Coyote Walk. This outstanding model demonstration project represents the collective efforts of the College of Natural Sciences, The Water Resources Institute (WRI), The San Bernardino Valley Municipal Water District and several other groups and members of the Community. As a themed garden, exemplifying various water conservation aspects of landscape selections, compositions and irrigation techniques the garden is a unique teaching and learning laboratory for students and members of the community. The 2016 Master Plan proposes the continued curation of this garden as a hands-on resource for teaching water management, for demonstrating the beauty and utility of water wise plant materials and for general education and training of appropriate maintenance practices pertaining to California native and low water use trees, shrubs and groundcovers. Maintenance and care protocols should be continually examined in order to ensure that the quality of this unique garden is maintained and preserved.

9.7 LANDSCAPE ELEMENTS + FURNITURE GUIDELINES

Key landscape elements such as edible gardens and public art offer students, faculty, and staff specific ways to engage with the campus environment. Careful and coordinated furnishings are essential as they are the most direct interaction the campus community will have with its landscape.

PEDESTRIAN PAVEMENTS

In general all campus walkways should be poured in place natural color concrete with an approved broom finish, perpendicular to path of travel or a medium top cast retardant finish. In order to achieve enhanced richness, variety and contrast, at plazas, courtyards, building forecourts and primary circulation intersections, alternative paving materials such as pre-cast concrete modular pavers may be employed. If appropriate and coordinated with building materials, modular stone or brick may also be considered.

In concert with campus sustainability and storm water management initiatives, permeable paving materials should be utilized when project conditions merit. As a matter of policy, in order to minimize heat island effect paving surfaces should be light colored. Factors influencing the use of pervious paving will be dictated by subsurface soil conditions and anticipated accommodation of vehicle bearing loads. In general, precast concrete modular systems are preferred and the precise type/unit and installation details standardized in order to address long term maintenance/replacement considerations. Other Americans with Disabilities Act (ADA) accessible permeable surface treatments such as stabilized decomposed granite or natural bark and leaf mulching may be employed in less trafficked zones.

ADA site required tactile warning elements shall be standardized for use throughout the campus. A contrast color gray precast concrete modular unit is preferred.

SITE WALLS

Site walls required for retaining grade, visual screening or space/area definition should be consistently coordinated in material selection and detailing. In general, walls should relate to their immediate architectural context and landscape setting. Campus walls shall be constructed of cast-in-place concrete, durable natural stone, pre-cast concrete masonry or architectural finish over masonry. Integrally designed skateboard deterrent details should be incorporated onto wall top surfaces when potentially attractive to skatebaord users. Within courtyards/quads and near building entries low comfortable seating walls of a minimum 16 inches in width should be considered as a feature to encourage informal meeting and gathering.

PUBLIC ART INSTALLATIONS

The 2016 Master Plan envisions and encourages outdoor art and sculpture installations at appropriate locations on campus. It is recognized that permanent and temporary outdoor art installations support campus life in multiple ways: animating outdoor spaces, creating outdoor gallery space for student, faculty and community work, place and spatial landmark creation. Permanent art installations should be recognized as high quality, be appropriate to its setting and sensitively integrated into the architectural/landscape context. Well selected and sited art and sculpture on campus may embody symbolic, historical, spiritual and cultural ideals distinctly associated with the mission and values of the University, the San Bernardino region and the State of California. Furthermore, it is recommended that policies regarding selection, placement and maintenance of public art be developed by an advisory committee with artist/College of Arts and Letters (CAL) representation. Such a committee could also be comprised of representatives from faculty, university museums, campus planning, administrative and facility officials.

LITTER / RECYCLING RECEPTACLES

Litter and recycling receptacles shall be manufactured by Big Belly (www.bigbelly.com), Smart Belly , 50 gal. Capacity. Units are constructed of galvanized steel sheet metal, powder coated and is approximately 26 inches square by 50” high. Positioned in pairs, one for mixed waste and one for single stream recycling, these units can be finished in custom color “Coyote Blue” and are configured to accept suitable graphic panels. Specified units are equipped with polycrystalline silicon cell PV modules for GPRS wireless monitoring of fullness levels and status.

ASH URNS

Ash urns shall be designated in permitted smoking areas. Manufactured by Landscape Forms (www.landscapeforms.com) , Model Humo is 5” diameter by 36” tall stainless steel finished and surface mounted. Each unit has a capacity of 1.25 gal. capacity and is easily emptied for periodic maintenance.

BICYCLE RACKS

Bike Fixtation

Bike Ribbon Rack

The standard preferred bike rack is the ribbon rack manufactured by Brandir International Inc. (www.brandir.com).

These are modular units with the length and size to be determined based on the desired capacity together with specific site size constraints. Standard installations will be surface mounted with cover flanges in order to allow for ease of removal or relocations should conditions warrant. The material for these units is ASTM A53/A500 Schedule 40 Steel Pipe (2.375 in OD. x .154 wall) and the finish shall be hot-dipped galvanized.

Typically, enclosed bicycle lockers may only be located in designated areas within parking structures or buildings.

In order to further promote and encourage bicycle use on campus, bicycle parking areas should be clearly designated in coordination with bicycle routes and convenient to building entrances. In connection with campus areas of high bike usage a limited number of public bike repair work stations equipped with common tools and air pumps may be considered. For example, Bike Fixtation (www.bikefixtation.com) manufactures a number of rugged and serviceable outdoor bike repair and air stands with bolted mounts.

SKATEBOARD RACKS

Lockable skateboard racks are a desired convenience that should be located near entries to primary campus buildings/destinations. The preferred rack is manufactured by Ground Control Systems, with a 10 board/scooter capacity--the Skatedock SM 10x Surface Mounted Series (www.groundcontrolsystems.com). The standard preferred finish of these units is hot dipped galvanized finish and they will be surface mounted according to the manufacturer's recommendations. They should be located in coordination with bicycle racks and positioned a minimum of 24 inches from building or site walls and 48 inches away from street or roadway curbs.

BOLLARDS

The standard campus bollard shall be manufactured by FairWeather Site Furnishings, Model B-4-8A2 (www.fairweathersf.com). These units are nominal 8 inches in diameter (8.625" OD. X .188 wall) and the desired finish is hot dipped galvanized and polyester powder coat, standard silver color (Silvadillo). Bollards are usually 30 inches high as the desirable height and where authorized vehicle ingress/egress is required they should be the lockable removable model. Hydraulically operated bollards are discouraged due to maintenance issues. For back of house areas concrete lined 6 inch diameter galvanized steel pipe may be employed.

BENCHES, TABLES AND CHAIRS

The standard campus bench shall be manufactured by Dumor Site Furnishings Model Series 192 (www.dumor.com). Fabricated from cast iron and steel, these benches are zinc primed and polyester powder coated custom color “Coyote Blue”. Well integrated into landscape settings, typically they will be 6 feet in length, surface mounted and set level.

Fixed tables and chairs on campus shall be the Charlie Picnic Table manufactured by Landscape Forms (www.landscapeforms.com). This 67” ADA compliant steel oval table accommodates 6 users, includes a built in umbrella hole and is surface mounted. The prescribed finish is metallic silver color powder coat.

In the more protected courtyards of campus moveable furniture may be considered. Supplied together with compatible chairs and manufactured by Landscape Forms, The Catena Table, 36” or 42” diameter, perforated steel top with polyester powder coat metallic silver finish is desired. At sunny locations less exposed to strong seasonal winds, shade umbrellas should be Landscape Forms Tuuci Ocean Master series, hexagon shape flush mount or heavy duty 30” diameter base. At special locations on campus, when coordinated with particular aspects of unique architectural additions distinctively appropriate themed outdoor furnishings may be utilized in order to integrate indoor/outdoor spaces and to establish a cohesive sense of place.

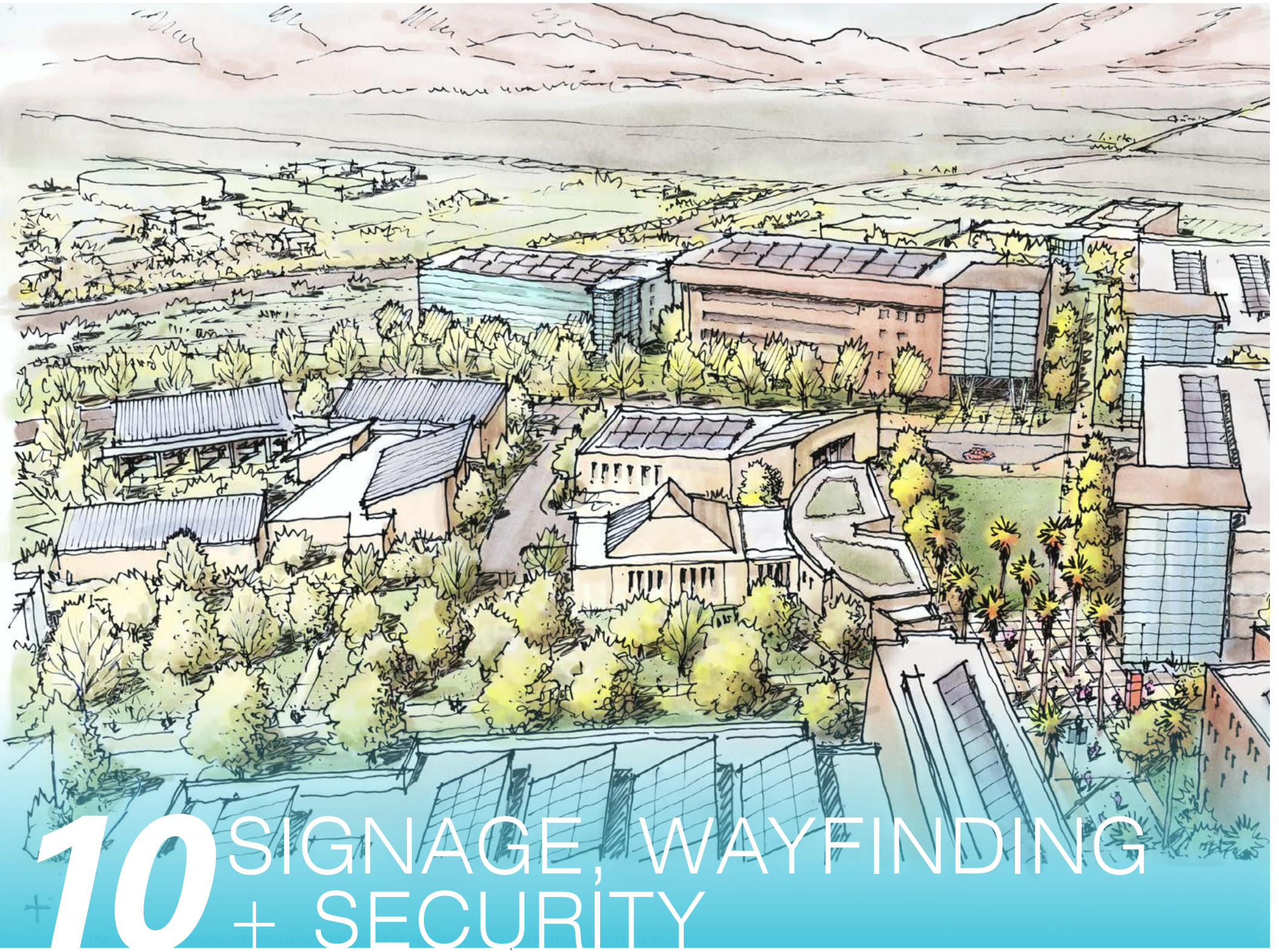
EXTERIOR LIGHTING GUIDELINES

Illumination throughout the campus is generally perceived as acceptable and consistent.

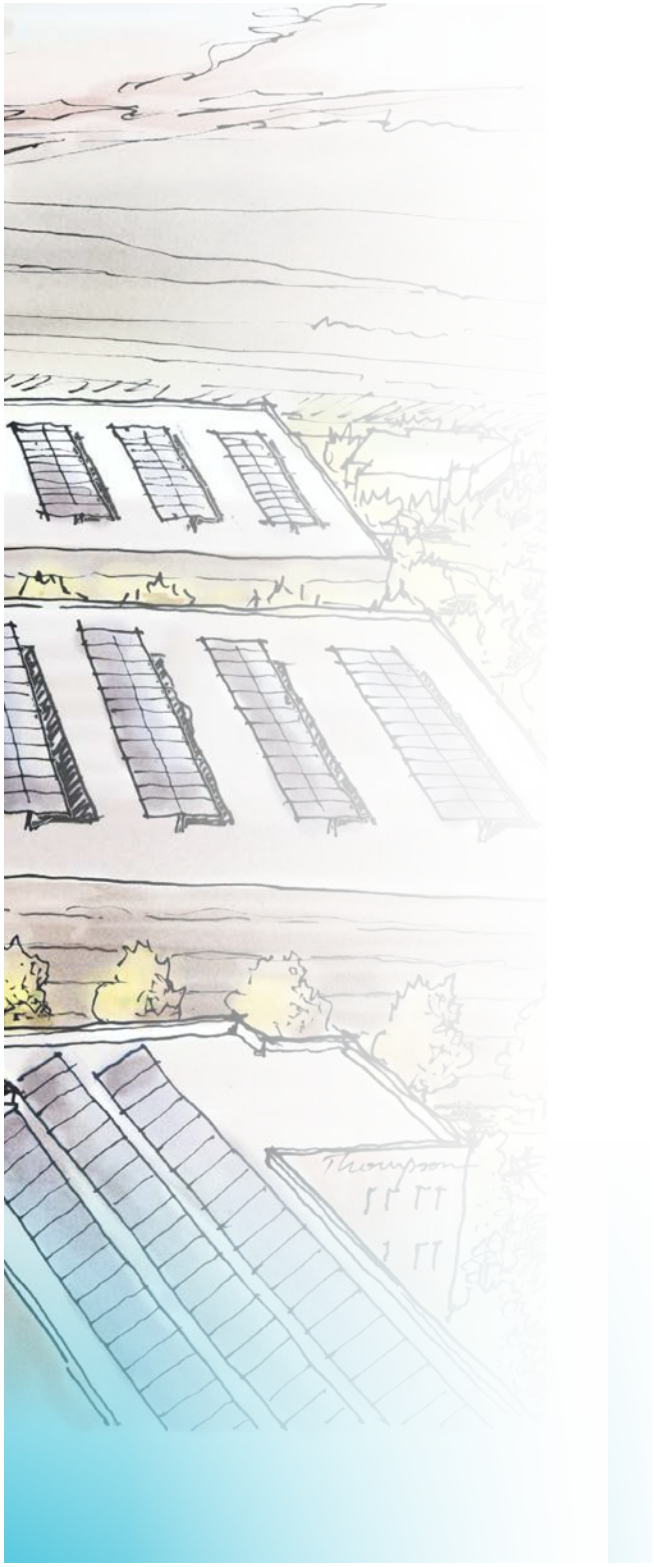
Most if not all exterior fixtures have been retrofitted with current energy standard LED sources. Efforts should be continued to improve energy efficiencies and maintenance protocols for both existing and newly introduced fixtures. Though current IES standards are considered minimal illumination levels, a campus wide goal of .5 average foot-candles in pedestrian areas may be considered generally desirable. All new fixtures shall address primary sustainability goals including dark sky compliance, reduced energy consumption and appurtenant maintenance costs.

In order to establish consistency in character and quality throughout the campus the Master Plan envisions two types of standard light fixtures. The LED technology light sources should fall within a warm and accurate color range of 3000-3500 K. In applications for illuminating larger zones such as roadways, parking lots and major plazas , high mast pole mounted LED fixtures are proposed . Manufactured by Cooper Lighting (www.cooperindustries.com) , the full cutoffs “neutral design appearance” Ridgeview LED Area Luminaire may be mounted in single , double , triple or quadruple configurations on straight round poles ranging from 20-26 ‘ height. Finishes for these poles and fixtures should be a consistently flat black. The other type of fixture, more suitable for high pedestrian traffic areas is the LED technology, and continuing existing use on campus is the post top mounted Visonaire Lighting (www.visionairelighting.com) LED fixture Premier II. This fixture may be installed in single, double or wall mount configurations and the color specified is flat black for both fixture and a round straight aluminum or steel pole. These pedestrian oriented fixtures will be mounted typically on 12-16 feet high poles. Both of the above fixture applications may include mounting hardware for installation of campus event and identity banners.

As a matter of general practice, in accordance with Cal Green Standards and in order to reduce maintenance and replacement costs tree mounted or ground mounted landscape up lights, in pavement ground mounted recessed up lights and bollard lights should be discouraged from use.



10 SIGNAGE, WAYFINDING + SECURITY



10.1 WAYFINDING INTRODUCTION

A coherent and effective Wayfinding Program uniquely will convey CSUSB's philosophy through form, messages, and identity. The following constitutes recommended signage program expansion and upgrades that are adaptable and can evolve with the changing needs of a campus.

OVERVIEW

This section of the Master Plan provides a description of the key wayfinding improvements recommended for the CSUSB campus. These recommendations are largely based on the goals and strategies identified in this Master Plan and the results summarized in the following pages.

SUMMARY OF CAMPUS WIDE ISSUES

- Need to integrate technology into wayfinding system.
- Need to improve overall legibility for vehicular and pedestrian on campus.
- Need consistent nomenclature for signage system and destinations.
- Inconsistent programming of sign messages. Some key locations need signs and some locations have too many signs.
- Inconsistent typefaces and locations for buildings identification.
- Need ADA route identified for disabled users.
- Identify bicycle paths on campus and connecting bike rental stations.

SUMMARY OF NEAR-TERM IMPROVEMENTS

- Removal of duplicated signs and sign parts
- Maintaining landscape surrounding signs.
- Implement campus standard for building identification standards including typeface, size and materials.
- Integrate technology into vehicular wayfinding: real-time spaces available at parking lot entries, designate parking lot to nearest destinations.
- Introduce and implement programs and standards for donor recognition program and sustainable effort by CSUSB.
- Incorporate CSUSB's sustainability data as an integral part of interpretive signage program to promote awareness and pride.

10.2 WAYFINDING + SIGNAGE OBJECTIVES

Wayfinding signage serves many users. Depending on the frequency of use, it is often unnoticed until it is needed. A successful wayfinding plan purposefully addresses the need for each audience including establishing a logical and hierarchical system for the users.

SENSE OF ARRIVAL

Gateways and perimeter banners provide a sense of arrival. These elements help to define the perimeter and identity of the campus

ORIENTATION

Landmarks and directionals are tools to help orient visitors to navigate around campus as vehicular, bike or pedestrian user.

Daily Users
University Students and Staff

Seasonal and event banners are great opportunities reinforce CSUSB branding and for daily users to be informed of upcoming events and celebrations.

Landmarks serves the daily users to orient and navigate around the campus and utilized by the users as a meet-up destination.

Community
Local Residence attending lectures and workshops

Gateways and banners not only welcome the community but also informs the community of the new events and celebrations of CSUSB.

Landmarks, vehicular and pedestrian directionals are important navigational tools for the community user who will need to re-orient as they come on campus.

Visitors
Special event attendees for graduation & campus events.

Gateways and perimeter banners are the first introductory elements that will welcome the visitors and provide a sense of arrival and festive impression.

As a special event visitor, vehicular oriented sign such a parking entry ID with spaces available and navigating quickly will enforce a positive visitor experience.

CONNECTION

All journeys combine multiple modes of travel. The goal for a successful wayfinding program is to encourage a multi-modal experience through access and information.

Encouraging daily users to utilize new infrastructure created for pedestrian and bike. Changing the mode of travel around the campus through bike share program.

Promote awareness of multi-modal solution and encourage community/ residence to experience CSUSB campus differently.

Experience and promote multi-modal connection and sustainability program by CSUSB.

TECHNOLOGY

Real-time technology, support tools and signage/ environmental graphics come together to create an enhanced wayfinding experience. It is a journey that addresses user needs at every stage in navigating the campus.

Space available counters with parking entry ID, real-time bus route arrival schedule and mobile app for class schedule and classrooms streamlines a daily experience.

Support tools such as real-time technology throughout the campus will help the community user to find the destinations with ease.

Real-time support tools will support a seamless transition from the user's home to his/her destination within CSUSB.

INTERPRETIVE & DONOR PROGRAM

Sustainable efforts through interpretive signage encourages participation and ownership for CSUSB students and staff. Donors recognition program is

Daily discovery of sustainability and donor efforts will provide a sense of pride and community for CSUSB. It is important to promote and recognize through signage.

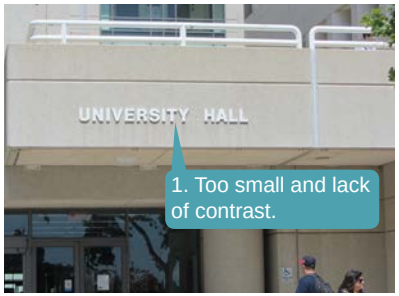
Awareness to sustainability and donor effort shall not go unnoticed for the Community. This is also an opportunity for the community to participate and support CSUSB.

CSUSB's goals in sustainability and its recognition for the generous donors needs to be promoted and celebrated.

10.3 EXISTING WAYFINDING ANALYSIS

INCONSISTENCY

1. Non-Uniform Typeface
2. Building Identity Placement
3. Size of Copy

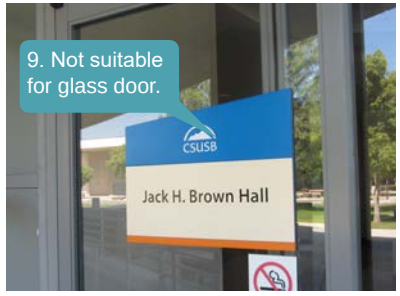


PLACEMENT - VEHICULAR

4. Illegible (Copy too Small)
5. Placement
6. Lack of Visibility

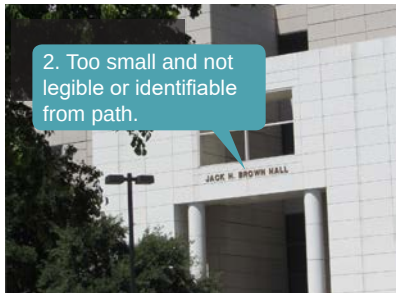
PLACEMENT - PEDESTRIAN

7. Disconnected information
8. Location with Incorrect Arrows
9. Incorrect Placement & Mounting Condition



SCALE

1. Building ID too Small & Blocked
2. Building ID too Small
3. Building ID too Small & Blocked



LACK OF SIGNS

4. Lack of Sign for Vehicular Decision
5. Lack of Sign for Primary Pedestrian Path
6. Lack of Building ID

MAINTENANCE

7. Removal of Obsolete Sign or Relocate
8. Lack of Landscape Maintenance
9. Removal of Old Sign Parts

10.4 WAYFINDING NETWORKS RECOMMENDATIONS

VEHICULAR

The urban environment varies widely between its road conditions, speed, and visual distractions, so much so that functionality of vehicular wayfinding cues must be rooted solidly in functionality. Because of these differing conditions and for different user profiles, a hierarchy must exist between a Perimeter signs that establishes a sense of arrival to Vehicular Directional signs to direct users to the nearest parking lot to their destination. The messages need to be legible and concise depends on the speed of travel and contains no more than four to five destinations. In no other family is it important to have just the right amount of information at the right time.

FIG 10–1: WAYFINDING NETWORK FOR VEHICULAR CIRCULATION

BICYCLE

With the widespread infrastructure of CSUSB's campus and the introduction of bike share program, a wayfinding system is needed to message directly to bike users. Bicyclists' speed and window available to give attention to any signage informs the design to have appropriately sized messages and messages that are formatted for ease of use and information that includes the destination and the distance.

FIG 10–2: WAYFINDING NETWORK FOR BICYCLE CIRCULATION

PEDESTRIAN

A sign system for an university campus is utilized by daily users, frequented by local communities and special event visitors. It needs to address a wide variety of functions across multiple purpose to support a full gamut of user situations. Both a static information system combined with a digital overlay provides for the range of needs while connecting the user to the broader spectrum of messages through the digital platform such as real-time shuttle status update to personal mobile devices.

FIG 10–3: WAYFINDING NETWORK FOR PEDESTRIAN CIRCULATION

KEY DESTINATIONS

DAILY USERS

- A STUDENT RECREATION & FITNESS CENTER
- B STADIUM
- C DINING HALL 1
- D STUDENT HEALTH CENTER
- E STUDENT UNION EXTENSION
- F STUDENT UNION
- G ADMIN. UNIVERSITY HALL
- H CAMPUS POLICE/TRANSPORATION OFFICE
- I CEL BUILDING
- J JOHN M. PFAU LIBRARY
- K CEL OFFICE BUILDING
- L BOOK STORE
- M DINING HALL 2

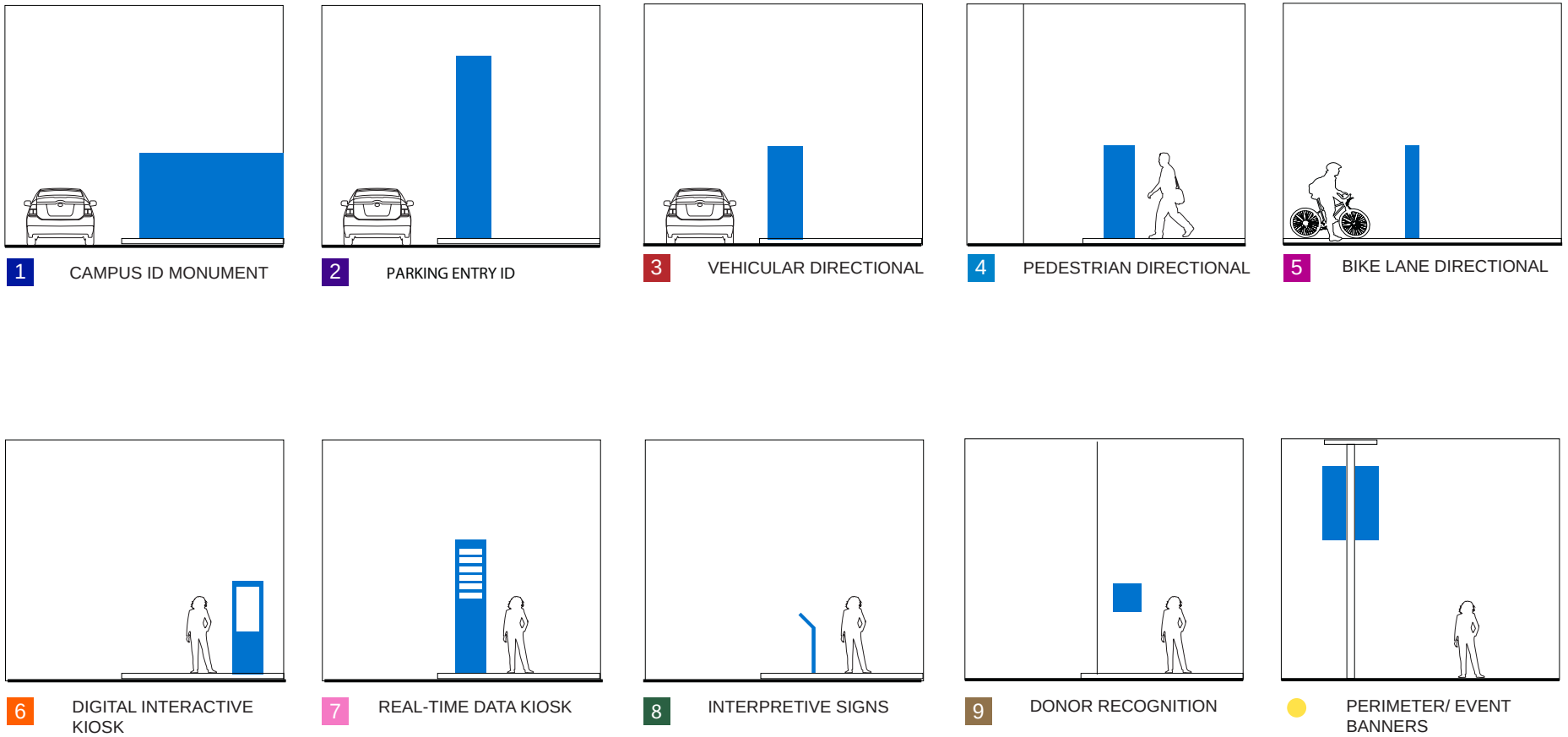
COMMUNITY AND SPECIAL EVENT VISITORS

- 1 CHILDREN CENTER
- 2 RAFFMA
- 3 THEATER
- 4 COMMONS

MAJOR PEDESTRIAN TRAVELWAY

FIG 10–4: WAYFINDING NETWORK FOR KEY DESTINATIONS

10.5 RECOMMENDED SIGN TYPES



Note: Signage background color, materials, color coding, and selected typefaces shall be coordinated with existing signs. Signage design, when incorporated with the existing signage array, should provide a sense of overall directional coherence, aesthetic cohesion, and graphic coordination.

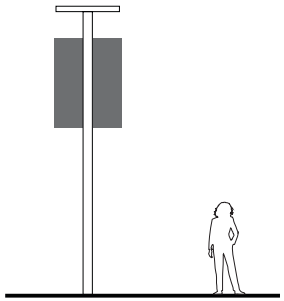
FIG 10–5: ARRAY OF KEY SIGN TYPES RECOMMENDED FOR THE CSUSB CAMPUS

FIG 10–6: KEY LOCATIONS FOR RECOMMENDED SIGN TYPES

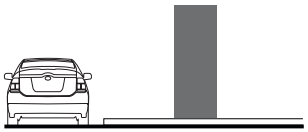
10.6 RECOMMENDATIONS FOR WAYFINDING INTEGRATION

An integrated wayfinding program encompasses static sign elements as well as technology-driven tools that together create a seamless journey addressing user needs at every stage of navigation.

CAMPUS IDENTIFICATION MONUMENT

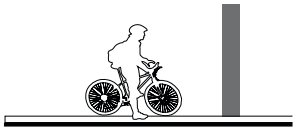


BANNERS



VEHICULAR DIRECTIONAL

PEDESTRIAN DIRECTIONAL



BIKE DIRECTIONAL

EXAMPLE OF SIGN TYPES

Establishes sense-of-arrival.

Defines campus perimeter and events

Vehicular directional with nearby destinations

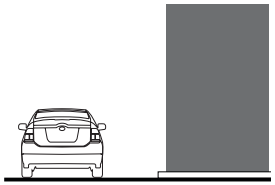
Pedestrian orientation

Bike oriented signs along bike path

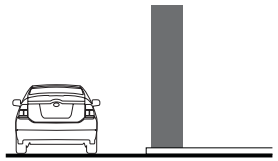
STATIC SIGN TYPES

PLACEMAKING ELEMENTS

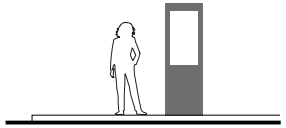
NAVIGATIONAL TOOLS



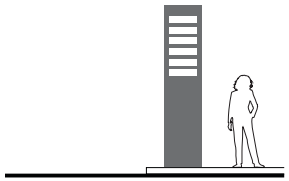
CAMPUS LANDMARK



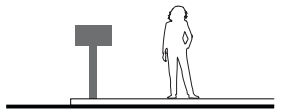
PARKING LOT ID



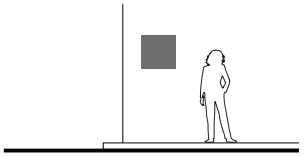
PEDESTRIAN DIRECTORY



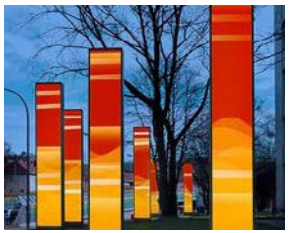
TRANSIT INFO KIOSK



INTERPRETIVE SIGNS



DONOR RECOGNITION PROGRAM



Technology integrated into monument

Real-time info with mobile device

Customized navigational kiosk and mobile app

Transit on-route arrival and departure time

QR code access to real-time sustainability data and information

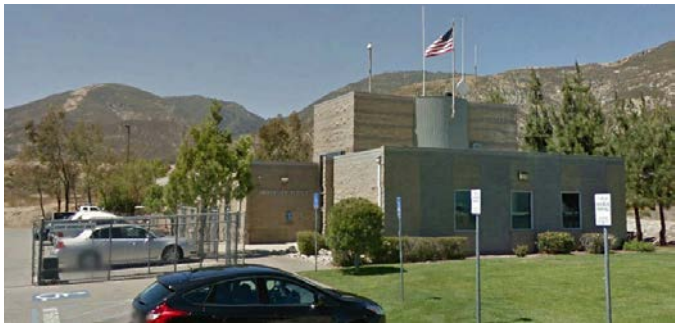
Interactive donor recognition program

INTEGRATED TECHNOLOGY

REAL-TIME / DIGITAL / MOBILE DEVICES

Note: Signage background color, materials, color coding, and selected typefaces shall be coordinated with existing signs. Signage design, when incorporated with the existing signage array, should provide a sense of overall directional coherence, aesthetic cohesion, and graphic coordination.

10.7 LONG-TERM CSUSB SECURITY SYSTEMS PLANNING



Existing CSUSB Campus Police and Emergency Operations Building

Providing appropriate campus security is an evolving topic of our times. The trend is towards establishing comprehensively integrated security and communications systems. California State law and the CSU system will set policies to help guide CSUSB.

INTRODUCTION

The California State University San Bernardino (CSUSB) Master Plan for security technology presented herein evaluates the key elements for long-term upgrade and implementation. This evaluation and recommendation covers video surveillance, access control, intrusion detection and mass notification as well as the related supporting infrastructure. Technologies that will develop over these next few decades have been considered but are unknown. Supporting infrastructure consists of information technology (IT), lighting and power. Campus Police, standard operating procedures and maintenance/support are evaluated as well.

Information presented establishes a foundation for Administrators to plan for expansion and/or replacement of existing electronic security systems with the goal of enhancing the safety of University assets such as persons and property, from existing and perceived threats. An agitated security climate among education facilities requires evaluating and addressing security issues. The findings and recommendations are presented herein. To note, the funding for both construction and support for security systems are currently divided between State (e.g. Administrative, Educational) and Non-State (e.g. Parking, Gymnasium, Student Union, Residential Housing) facilities – this must be evaluated for the Master Plan project's budgeting.

At the time of Master Plan implementation, again, it is likely that today's security systems will have been integrated as one overall system. That being said, recommendations are presented here based upon current knowledge and likely technological advances in the decades to come.

TECHNOLOGY GOALS, OBJECTIVES, RISKS, THREATS + RECOMMENDATION SUMMARY

Assuming the current climate of violence and similar security-related occurrences continues to exist at the time of Master Plan implementation, the key goal for the University is to provide a safe and secure educational environment. Although a determined person, in particular if willing to die in the event, is nearly impossible to stop, m**odern/future security systems can provide deterrence and situation awareness for Campus Police and first responders to quickly assess a situation and plan accordingly to end the event as quickly as possible with the least amount of casualties and/or impact to campus facilities.**

To satisfy this goal, the following objectives and related recommendations have been established. It is very safe to assume that in 30-40 years from now, all electronic security systems will be seamlessly integrated as a single system. As the University grows video surveillance, access control, mass notification (e.g. loudspeakers) emergency phones and other yet to existing systems shall be incorporated into new construction/renovation projects by building off any preexisting platform and established standards. To note, **video surveillance does not provide physical protection, and currently is largely used for after-the-fact forensic investigation**. In the future video surveillance and other related systems likely will have highly effective live interaction with incorporated audio to address situations in real time. This is currently utilized sparingly around the world, e.g. in London. Access control does provide levels of physical protection with a key objective is for remote lockdown of all educational spaces, building main doors, gates/barriers, etc. Other physical protection via access control includes restricted access and audit trails for high risk spaces such as cash handling locations, protected/sensitive records storage, IT rooms and hazardous materials storage. Audit reporting identifies who accessed which spaces and when. **Emergency phones are to be installed**

throughout campus with new projects for real-time communication with Campus Police. These phones will identify which unit the person is calling from, provide a camera view of the caller and allow for easy viewing of adjacent cameras to see the overall area. The University currently has multiple systems providing mass notification to faculty/staff/students. In the future new construction projects unlikely will require modification from the then current existing software-based mass notification system which provides real-time information to subscribers via text message and email. Although new projects will need to incorporate internal and external speakers of which broadcast live or pre-recorded mass notification information.

It is likely that the key risks that exist today will remain throughout the Master Plan implementation. These **risks include terrorism (e.g. bombing), active shooter(s), violence between students/faculty/staff, theft and vandalism**. Security measures or products, regardless of how involved or sophisticated they will be cannot ensure protection against every possible threat. A key intent of any security system is to discourage criminals from perpetrating an incident and also to increase the owner's overall situational awareness.

Risks are categorized as external and internal. External risks consists of persons or items entering the campus and includes terrorism, active shooter, emotionally disturbed person(s), domestic disputes that spill into the school, local gangs/rivalries, criminal activity not by faculty/staff/students and mail/packages. Internal risks consist of persons on campus and includes student-on-teacher and student-on-student violence, theft and vandalism. These risks can be reduced, but never eliminated, through carefully planned, implemented and operated security systems and protocols.

Threats, Likelihood and Consequences

Here references existing studies to properly document relevant areas of concern. The risk management methodology from ISO 31000 and Design Basis Threat that originated under the U.S. Department of Energy, has assessed higher education facilities. Here the definition of "threat" is the potential that persons could knowingly and intentionally target a site. Likelihood defines the chances of the event occurring, e.g. next month, next 5 years. Consequence is the potential results of a successful incident or intrusion by an adversary due to the exploitation of one or more vulnerabilities, e.g. loss of life, disruption to operations. See Exhibit 01 for supporting diagrams.

To further define the key threats:

- **Active Threat:** defined by the U.S. Department of Homeland Security as "an individual actively engaged in killing or attempting to kill people in a confined and populated area; in most cases, active threats use firearm(s), knives or other weapons, and there is no pattern or method to their selection of victims." For example, active shooter(s). Separate analysis conducted by the New York City Police Department and the Pennsylvania State Police indicate that school shootings are in most cases perpetrated by students or former students and to a lesser extent, by current or former faculty or staff.

- **Emotionally disturbed persons:** As the community's focal point for education as an institution of government, higher education facilities are a target for mentally unstable citizens who have contentious or hostile attitudes towards government infrastructure or the community. While most unstable individuals will not act violently, there is the potential for a minority to engage in violent behavior at a school, usually against staff that may challenge their presence.

- **Domestic disputes:** Due to the importance of the schools to family life, there is the potential for ongoing domestic disputes to be brought into the school environment. Potential incidents could include family violence, custody disputes resulting in kidnapping, and confrontations with faculty and staff by parents or child custodians.

10.8 LONG-TERM SECURITY SYSTEM PLAN ELEMENTS

All facilities projects identified in the 2016 Master Plan have security implications and will be addressed during the design phases of development.

CAMPUS, BUILDINGS + FACILITIES

The 2016 CSUSB Master Plan consists of over 30 new or renovated buildings/facilities and parking expansion (5,000 spaces) of existing outdoor lots and parking structures. To be addressed herein are those created/modified for Master Plan projects. Any other existing spaces are assumed have / will have the appropriate electronic security implemented prior to the Master Plan projects.

These locations can differ in terms of security technology implementation and have unique security requirements in the following categories. These categories are presented in this section:

- Perimeter / Neighboring Properties
- Vehicle Access / Parking
- Pedestrian Walkways / Exterior Gathering Spaces
- Educational Spaces (classrooms/labs)
- Residential Housing
- Administrative Spaces
- Campus Police
- High Risk Areas

PERIMETER / NEIGHBORING PROPERTIES

The campus is located in the highly urbanized Inland Empire and is directly adjacent to urban/suburban areas to the South, West and North. To the Northeast are the foothills of the San Bernardino Mountains, part of the San Bernardino National Forest. This area falls under jurisdiction of the United States Department of Agriculture Forest Service, Pacific Southwest Region. Wildlife is abundant, although in particular there is minimal threat to campus from resident Black Bears as the most common species. Wild fires are common in Southern California and present a risk to campus. Coordination with firefighting first responders for notification and communication via electronic security systems should be considered with construction of the new Police Station and Emergency Operations Center.

The perimeter, as typical in higher education, provides relative ease of access from all directions during day and night. University staff have advised that their only security related concern related to construction of new facilities in this regard is to consider fencing to reduce jaywalking as well as funnel pedestrians to choke points where cameras can capture detail of faces for identification. Refer to related sections below for related technical information.

VEHICLE ACCESS / PARKING

Campus driveways and parking lots/structures allow for unrestricted access from the public roads. Master Plan projects must incorporate security systems to match the then current security standards. It is recommended that all vehicle access points have multiple dedicated cameras to capture license plates, the driver and wide angle view of vehicles entering and exiting. Cameras need to be placed at lower than usual heights above finished grade for this purpose – this is especially so where solar canopies are constructed. Lighting is a critical factor due to headlights and brake lights as well as to clearly capture the plate during low light hours. The camera feature 'wide dynamic range' should be selected to increase the visibility.

Parking lots modified and constructed during the Master Plan effort also will incorporate the security standards. Based upon input from University staff and implementations at other similar sites, this includes full camera coverage of the lots from devices mounted high on poles. Since parking lots are currently the largest area of concern for Campus Police due to vehicle theft and break-ins, cameras are also recommended at lower heights on poles throughout the lot in each row. Overall, surveillance provides critical information for accidents and possible related injuries. Access control would be needed for physical gates, in particular for the new Police Station and Facility yards. Loudspeakers will be provided via emergency phone towers which are required to be placed as presented below in the Mass Notification section.

PEDESTRIAN WALKWAYS / EXTERIOR GATHERING AREAS

The projects identified in the Master plan that include pedestrian walkways are University Commons, Coyote Walk and the Gateway area. These spaces will require video surveillance and emergency phones. A key factor here is to have full overall surveillance coverage for situational awareness as well as cameras to cover pedestrian choke points and gathering areas. Refer to related sections below for related technical information.

EDUCATIONAL SPACES

Classrooms, laboratories, lecture halls, library and other areas supporting education are the key spaces that require security systems. Based upon today's expectations, cameras are not installed in classrooms themselves nor in areas considered personal workspaces, e.g. faculty offices. In the future this may change if violent acts continue on an upward trend and the privacy and union concerns become trumped by student/faculty/staff safety. Access control, mass notification and emergency phones are to be included in new projects – see sections below for greater detail on each security system.

RESIDENTIAL HOUSING

As with educational spacers, residential housing has similar privacy requirements for video surveillance. Vehicle entrances and parking lots and pedestrian walkways are to consider the recommendations presented above. Access control, mass notification and emergency phones are to be included in new projects. The relevant project identified in the Master Plan is the North & South Housing Precincts. Refer to related sections below for related technical information.

ADMINISTRATIVE SPACES

As with educational spaces, administrative spaces impacted by the Master Plan are to have security systems. Today, cameras are not installed in areas considered personal workspaces, e.g. cubicle areas. See above regarding how this may change in the future. Access control, mass notification and emergency phones are to be included in new projects. Refer to related sections below for related technical information.

CAMPUS POLICE

The new Police Station, as stated elsewhere herein, requires additional levels of these security systems. As the heart for campus safety management and response, this facility must be well protected. Parking lots, doorways, surrounding spaces all must be considered with the security system design of this critical site. The surveillance room is to be designed with a command and control center (large workstation) operable by one or two operators with a combination of large and small monitors to permit easy viewing of all electronic security systems. See sections below for greater detail on each security system and additional information about the Police Station.

HIGH RISK AREAS

High risk areas are to be identified in Master Plan projects for specific camera coverage and access control. These systems will help to address theft and vandalism. Areas common at higher education facilities are as follows:

- Cash registers
- Free Speech designated spaces
- Facility yard(s)
- Bicycle racks
- Recurring vandalism spots (e.g. graffiti)
- Public events spaces
- Vending machines
- ‘Pay-for-print’ and ‘pay-for-parking’ stations

University Emergency Operations Center - A long term security infrastructure objective for the CSUSB campus.

INFORMATION TECHNOLOGY INFRASTRUCTURE

The main distribution frame (MDF) connects to each building's building distribution frame (BDF) across the campus with fiber optic cable. The current bandwidth is more than satisfactory to support the existing systems, i.e. video cameras require the greatest percentage of security-related bandwidth. At time of the Master Plan projects, the campus network will likely have been significantly upgraded to support what will be a much greater demand for local area network (LAN) and wide area network (WAN) i.e. internet connected devices/ systems, i.e. a guestimate of 10 terabytes per second. For exterior areas, network connectivity will also be required at poles and exterior walls for Wi-Fi and other unknown technologies in the future.

The new buildings must match the then current IT infrastructure for cabling throughout the structure. For horizontal cabling, generally conduit is not necessary above drop ceiling panels but plenum-rated cable is required. In the near future, it is likely that fiber optic cable and low voltage power cable will exist in the same single cable. Devices would accept this connectivity. Fiber eliminates the current 100-meter distance limitation for copper cabling.

Currently wireless transmission for security devices is only utilized when hardwiring is impractical or too costly. In the future this will likely be very different and wireless high capacity bandwidth should be evaluated for use throughout the new projects. There are current efforts and products in wireless low voltage power which may be a reality at this time in the future.

LIGHTING

A very critical design element for Master Plan projects is to coordinate the lighting design with the video surveillance design. On poles, cameras should be mounted below existing lights to avoid a 'blooming' effect on the viewable image. Currently, most cameras have built-in infrared (IR) illumination for night viewing although the range is limited and the clarity is much lower than during daylight hours. Properly dispersed and even exterior white lighting is the best solution for optimum night viewing. The camera IR feature can enhance any white light that is captured. In the coming years the range and clarity from built-in IR illuminators will greatly increase. Where even greater IR light is needed, externally IR source devices can be installed above/below applicable cameras as part of Master Plan projects.

POWER

All information technology network equipment currently is on back-up power via uninterruptible power supplies (UPS), although the University does not currently have emergency generators, i.e. security systems will be useless during any extended power outage. At time of the Master Plan it is likely that the University will already have generator(s) supporting the information technology network – in particular the MDF and potentially small generators for each BDF and intermediate distribution frames (IDF). The backup power is needed for all switch equipment and power over Ethernet (PoE) devices in the supported building.

The new Police Station will require a dedicated generator.

Master Plan projects will require UPS for all network equipment supporting electronic security systems. This ensures the system remains online during short power outages as well as reduces the likelihood of corrupted databases or similar that can occur when servers are not properly powered down. It is recommended that each UPS be sized during design to provide a minimum of 2-hours duration to power all supported security equipment during an extended power outage. These battery systems must be UL listed and match current University IT standards.

10.9 LONG-TERM ELECTRONIC SECURITY SYSTEMS PLANNING

There has been a trend to address security through the increasing use of electronic systems such as video cameras, access control systems and emergency phone systems. These will continue to be part of the security picture at CSUSB.

VIDEO SURVEILLANCE

The University currently has a modern IP-based video surveillance platform by onSSI. The main campus currently has over 100 cameras. The number will have greatly increased by the time of the Master Plan projects. The video is monitored from the Surveillance Room (SVR) as well as from remote locations via mobile phone and the web-based interface. All cameras are managed by Campus Police, although they do not provide maintenance (e.g. repair/replace). Campus Police have identified the ability to clearly capture faces and license plates with high resolution cameras. The current security standard for video retention is 120 days with 24/7 recording. Cameras consist of pan-tilt-zoom (PTZ), fixed view, 180-degree panoramic view; many of which have built-in infrared illuminators for night visibility. In the future there will different and more powerful cameras available of which will be evaluated for selection and installation in Master Plan projects.

Camera placement during the design effort includes selecting the camera field-of-view from a preferred mounting location (building or pole), selecting the mount type and determining conduit penetration to interior of building with goal to have no exposed conduit from the camera to the applicable telecom room/cabinet.

Video analytics will play a large role as security systems mature over the coming years. This feature uses algorithms that 'analyze' the video for particular behaviors / actions. The most common used are object left behind, wrong direction of travel and digital fence line crossing – these events trigger real-time alerts to the operator and when properly designed and utilized is a very powerful tool for law enforcement. See image below including 'red box' around a person attempting to cross a fence line.

ACCESS CONTROL

Currently nearly all doors on campus are locked with traditional keys. Facilities with access control include Campus Police, College of Education, Health Center and student housing. Campus Police have requested that the Master Plan consider upgrading, at minimum, classroom and laboratory doors across campus (assuming this has not already occurred prior to the Master Plan projects). Here, the recommendation is to retrofit doors with a wireless all-in-one card reader and door lever product – see photo below for example. This is the most cost effective design eliminating the need to wire each door for the data and power. In some cases doors would need to be replaced to accommodate this hardware. These products satisfy code requirements for door hardware that can be manually locked from the inside, but not require any additional actions to open the door to exit.

The new projects shall follow the security standards for access control which would have again, at minimum, networked access control for all classroom and laboratory doors. A key desired feature is the ability to remotely lock these doors during an emergency event. It is recommended that other doors be outfitted as well including telecom rooms, high value and hazardous storage, senior administrator offices and building exterior doorways. Less critical doors without access control locks should be outfitted with door contacts where Campus Police desires to be notified if they are left open or forced open. These facilities should deploy the modern equivalent of today's wall-mounted, wired card reader solution which provides significant flexibility to connect other downstream input and output devices such as audible sirens, strobe lights and automatic camera zoom. Doors will require conduit for data and power connections.

It is also recommended to deploy door contacts at new automated external defibrillator (AED) stations to provide a notification to Campus Police that a health-related emergency is occurring and can dispatch an ambulance.

Access control greatly simplifies physical key management which is a current challenge, for example, with the wide range of faculty and staff who need access to multiple classrooms.

The new Police Station will require an extra level of access control. All exterior doors should be outfitted as well as gun storage and other storage spaces, e.g. radios, laptops, ticketing devices, cell phones. Also the public counter shall be separated from the rest of the station by an access controlled doorway.

Access control cards can double as University ID badges. At time of Master Plan projects, it is likely that access control cards will have been merged with the Coyote One card.

INTRUSION DETECTION

The University currently has outdated intrusion detection systems (burglar alarm) with DNP hardware. These disparate systems are all monitored by on-site certified monitoring station software (Manitou by Bold Technologies). The systems consists mostly of traditional keypads for arming/disarming, panic buttons (e.g. cash handling locations) and motion detectors. Each department that funded the installation is responsible for management of their system.

Master Plan projects shall include installation of intrusion detection following the then current security standards. It is recommended to have hardware to alert Campus Police for the following:

- Doors and windows opened after hours (including roof access panels)
- Motion in main corridors
- Glass breaking
- Duress buttons (stationary and mobile)

Mobile phones or similar will be more and more widely used to arm/disarm systems as well as perform other functions for securing facilities during off hours including video pushed to Campus Police of the area where the alarm was triggered.

MASS NOTIFICATION

The District currently uses multiple systems for email/SMS/ voice mass notification. There are existing campus-wide speakers for audible mass notification.

Mass notification is a combination of tools including email, text messaging, phone app messaging and broadcast voice messaging via loud speakers. Considering the proliferation of mobile phones being carried by persons on campus, mass communication is currently in use by the District such that potential lifesaving information can be quickly and easily sent to all who have subscribed to the database.

A few of the key vendors include Everbridge, RAVE, MIR and Cisco InformaCast. For outdoors, the speaker for a particular area can be built into the emergency phone(s) is used and stand-alone speakers should be used in areas not in range of an emergency phone. For indoors, new speakers should be distributed appropriately, e. g. in hallways. It is common now that phones in classrooms double as indoor loudspeakers covering that interior space.

EMERGENCY PHONES

Master Plan projects are to incorporate network-based emergency phones on buildings and in exterior spaces and interior hallways. Phones overall should be distributed with the intent for at least 1 to be visible from anywhere in the vicinity. The phones should be equipped with a blue light for visibility and have the capability to broadcast messages from the mass notification software via built-in speaker, and automatic dial to the Campus Police. Phones can be hard-wired or wireless – solar power is an option but is not recommended due to the large panel size needed and can be less reliable for emergency needs. For newly, constructed or renovated buildings emergency phones should be located within line of site each entrance. Current manufacturers include, Commend, Code Blue – and Talk-A-Phone which is currently in use at the University. A wide range of products are available – in particular towers and wall-mounted emergency phones. Key attributes recommended are 2-way hands free communication, ADA compliance, illuminated faceplate, call status LED light and self-identification of location to the operator, e.g. victim may be unable to describe where they are calling from.

10.10 LONG-TERM OPERATIONS + MAINTENANCE

The CSUSB University Police, Facilities Services, and Environmental Health and Safety work together to insure campus safety in times of emergency. Facilities Services will continue to maintain physical security systems of the campus.

STANDARD OPERATING PROCEDURES

The Universities then current standard operating procedures (SOP) shall be updated by internal staff for any new systems or areas that impact the usage of the systems by the operator. This will also be coordinated with the Emergency Operations Plan. This document would include detailed policies and procedures, for example, step-by-step instructions to the operator during common emergency events, who has access to view recorded video and for what purposes can that video archive be used.

The SOP should be reviewed with the relevant designer(s) prior to the design of electronic security improvements to ensure the final systems are in line with Campus Police current procedures.

MAINTENANCE + SUPPORT

The University shall update the then likely existing maintenance program (and/or 3rd party contract) for maintenance of the new security systems, i.e. University does currently have this in place. Largely this will consist of camera lens cleaning, annual inspection of device mounts and re-positioning of devices of which bolts have loosened and repair/replacement of data connections. Cameras will be repaired/replaced as needed using on-site spares to ensure minimal downtime for that location. Support is to be procured via contractor from the existing video management system vendor as part of the system installation to include software updates for 3 years minimum and full service remote support for technical and operator questions.

This program will also include identification and remediation of landscape that has grown and impacts the view of security cameras and any wireless point-to-point (line of sight) links. See image below for Master Plan landscape planning. Also to be included is identification of applicable malfunctioning or dead light bulbs for replacement.

No significant maintenance is required for access control, mass notification, emergency phones other than cleaning and replacing malfunctioning devices.

Other areas to be maintained, based upon University IT protocols include replacement of UPS batteries and housekeeping of cable management in racks.

Spare parts should be provided by the contractor. Recommended (1) of each camera type although prorated for additional spares for camera models which have been installed in greater quantities.

10.11 SHORT-TERM SECURITY SYSTEMS INTRODUCTION

There has been a trend to address security through the increasing use of electronic systems such as video cameras, access control systems and emergency phone systems. These will continue to be part of the security picture at CSUSB.

SCOPE, LONG-TERM VS. SHORT-TERM RECOMMENDATIONS

The California State University San Bernardino campus (SBC) 'short-term' Master Plan for security technology presented herein evaluates the key systems and provides recommendations for upgrade and implementation. Systems covered are video surveillance, access control, intrusion detection and mass notification. Supporting infrastructure for these systems are vetted as well, consisting of information technology (IT), lighting and power. Campus Police, standard operating procedures and maintenance/support are evaluated as well.

The information presented establishes a foundation for Administrators to plan for expansion and/or replacement of existing electronic security systems with the goal of enhancing the safety of University assets such as persons and property, from existing and perceived threats. To note, the funding for both construction and support for security systems are currently divided between State (e.g. Administrative, Educational) and Non-State (e.g. Parking, Gymnasium, Student Union, Residential Housing) facilities; this must be considered during the budget effort. A rough order of magnitude cost estimate has been prepared.

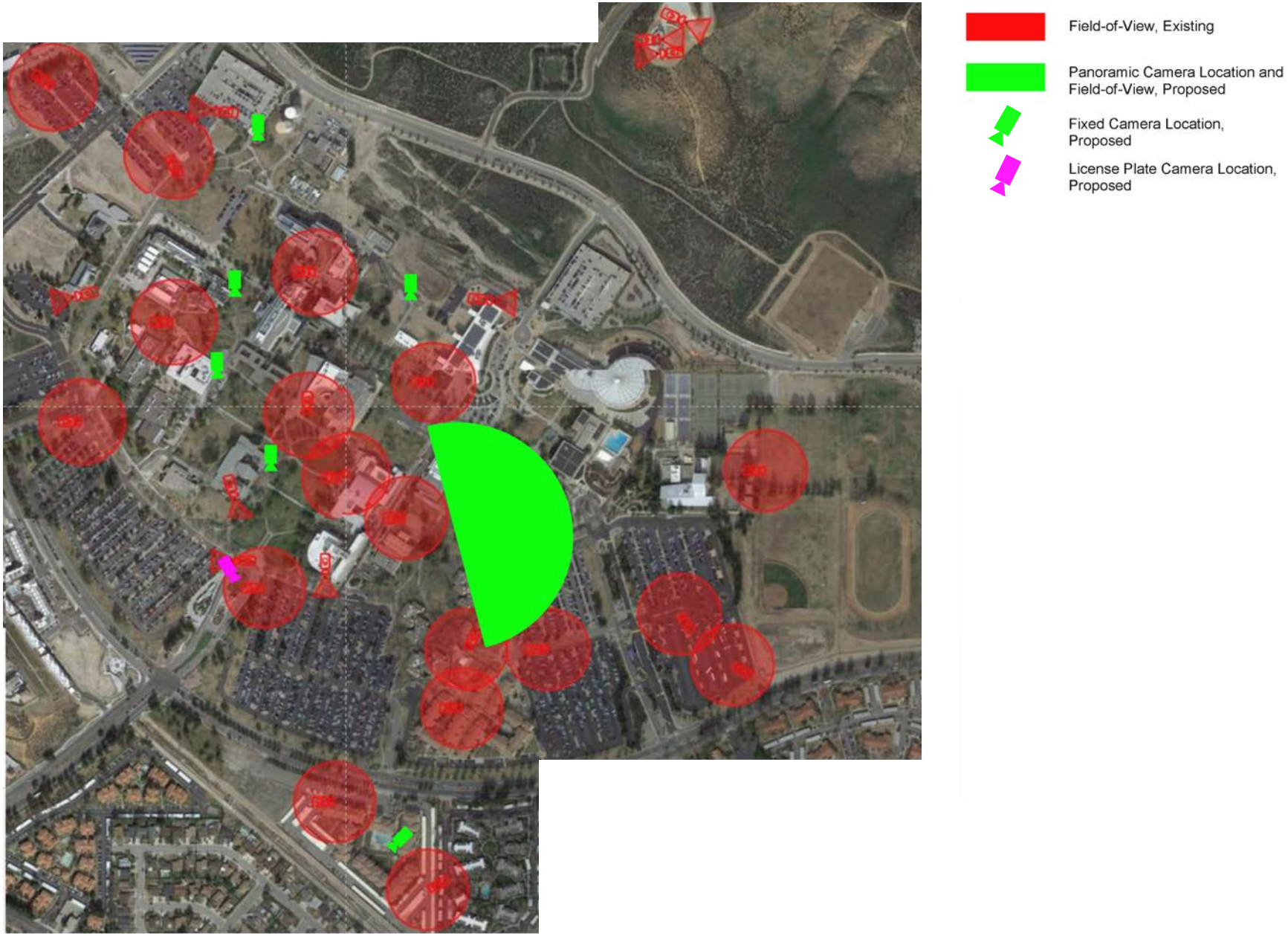


FIG 10–7: DIAGRAM OF RECOMMENDED LOCATIONS FOR SECURITY CAMERAS

10.12 EXISTING CONDITIONS + NEAR-TERM RECOMMENDATIONS

There has been a trend to address security through the increasing use of electronic systems such as video cameras, access control systems and emergency phone systems. These will continue to be part of the security picture at CSUSB.

ELECTRICAL AND INFORMATION TECHNOLOGY INFRASTRUCTURE

Backbone, Datacenter and Cable Pathways

SBC has a data center / main distribution frame (MDF) located in the basement of Building PL Pfau Library. The MDF is connected to all campus buildings via underground infrastructure (conduit/vaults, 2 tunnels: 1 east/west, 1 north/south) and University Village via wireless microwave radio. Existing conduit in tunnels is at capacity and intra-building conduit infrastructure has been recently upgraded and has significant capacity for future growth. These conditions are satisfactory to accommodate new security systems, i.e. use existing fiber optic cabling to MDF. For more information refer to CSUSB Critical Infrastructure report (April 2016 by P2S). At SBC, most BDFs have a total of 2Gb/sec connectivity to the MDF; smaller buildings are generally 1Gb/sec. University Village wireless has 750Mb/sec connectivity. Typically each building distribution frame (BDF) has a total of 2Gb/sec connectivity to PoE network switches in each associated intermediate distribution frames (IDF). At SBC inter-building cable pathways are generally good wherein camera and access control cabling can be installed without major challenges. To support additional high resolution IP cameras connected to IDFs, the BDF to MDF bandwidth as well as Quality of Service (QoS) will need to be evaluated/configured. This is due to the high utilization of bandwidth for megapixel cameras. See Bandwidth / Network section below for further information.

Telecom Rooms

Per the CSUSB Telecommunications Room Assessment project (Feb. 2014 by P2S), telecom rooms were determined to meet CSU TIP standards and are generally in good condition. Key concerns identified were physical space and equipment capacity being reached, e.g. cabling. See report for further detailed information.

At SBC, per CSUSB Facilities Services Building Standards, all telecom closets are on emergency power. This consists of uninterruptible power supplies (UPS). All network equipment is on dedicated power circuits. The SBC data center at Pfau Library is covered by an existing emergency generator. The backup power is for all switch equipment and power over Ethernet (PoE) devices in the supported building (as well as all other network hardware). Security systems on UPS will be out of operation during any extended power outage – batteries are currently sized for 10-40 minute duration. In particular to support new security PoE devices, it is recommended that applicable UPS units be increased in battery capacity to, at a minimum, maintain the 10-40 minute duration. Although, the University should weigh the risks/costs for longer duration (e.g. 1 hour) to power all supported security equipment during an extended/intentional power outage. These battery systems must be UL listed and match current University IT standards.

Bandwidth / Network

SBC's current bandwidth is satisfactory to support the existing systems, i.e. video cameras require the greatest percentage of security-related bandwidth. Currently cameras on the network communicate on dedicated VLANs (126 and 127) and only 50% of the available bandwidth is being utilized. BDFs are connected to MDF with 10Gb/sec and 1Gb/sec switches – the University standard network switch is Alcatel Lucent #OS6450. Additional network switches have been included in the Cost Estimate. Currently wireless transmission for security devices is only utilized when hardwiring is impractical or too costly – this matches with the recommendation. To note, ITS advised that there is some interference from wireless access points (WAPs).

The University standard network switch is Alcatel Lucent #OS6450.

Video Storage

Video surveillance head-end servers are located in the data center at SBC – they are virtualized and supported by ITS. The current security standard for video retention is 120 days with motion-triggered recording (1 camera is 24/7 recording). Dedicated servers, e.g. by Falcon, are managed by UPD. Non-state locations have local storage. It is recommended that the University reduce their retention policy from 120 days to 30 days which is typical for similar higher education installations (120 days used for Cost Estimate). In most cases, within 30 days the operator will know of a crime or other event that requires download of video for further investigation. This will save a large amount of storage (savings not included in Cost Estimate). It is recommended to remain with the existing motion-triggered, as opposed to 24/7, recording. 24/7 recording can be programmed for individual cameras if a concern exists about missing video at night (unrecognized motion). Another consideration is to upgrade to OnSSI's Ultimate platform ($110 per camera, also includes the VideoWall feature; not included in Cost Estimate) which

allows for short-term storage at full frame rate then converts these files to a much lower frame rate (at full resolution) for the remaining duration, e.g. 15 frames per second (fps) for 1-30 days, 4 fps for 31-120 days. This feature is entitled Video Aging.

University Police Facilities

The University Police (UP) building at SBC requires additional levels of the security systems presented herein. As the heart for campus safety management and response, this facility could be targeted at the onset of a hostile event thus must be well protected. Its parking lot, doorways, and surrounding spaces must be considered in any related security system design for this critical site. Building UP also houses 24/7 dispatch which provides service for the campus as well as other local colleges. Currently the Surveillance Room (SVR) at SBC has a dedicated workstation (command center) for operation of the various security systems. It is recommended that 2 or 3 of the existing 5 monitors be removed and replaced with a video wall where multiple systems and user interfaces (windows) can co-exist on a large display and can be moved around across the (typical) 4 monitors that are pieced together to create a cost-effective video wall.

The existing SBC Emergency Operations Center (EOC) currently has access to the camera system. It is recommended that all new security system projects include scope for connectivity to the EOC. Large wall monitors are highly recommended, as during emergency events a large number of people will need to view applicable camera feeds.

INTEGRATION

Currently SBC individual security systems (e.g. video surveillance and access control) are not 'integrated,' wherein they are linked for interoperability. An example of this is a live video pop-up window showing the location where a person has triggered an alarm in the access control system. University Police have stated that integration amongst disparate systems is of interest – thus is recommended for further consideration in the short term. See Video Surveillance and Access Control sections below for further integration information.

A separate software system can be implemented that sits over all systems and integrates them into a single user interface that provides true situational awareness. This is known as Physical Security Information Management (PSIM). For example, Situator by Qognify – from their website "[PSIM] makes sense of all the data coming into your control room. It brings greater awareness of what is happening and it does so sooner. That means you can respond faster and more effectively. You'll know who to send where, how many of them, and make sure they have the right equipment." PSIM collects and presents data from sources such as video surveillance, access control, mass notification, loudspeakers, social media, GIS map data and local news. Operators can be clearly guided on steps to take for common emergency events and have clear information to pass on to first responders. Situator also has a powerful feature where a person can be 'tagged' from one camera view and then other designated cameras' footage is scanned to locate that person and track their movement across cameras. University Police have identified PSIM as a platform that is of interest, but not in the short term. Once new/expanded systems are implemented and users are very comfortable with the operation, PSIM can be further investigated for deployment. To note, the true value of PSIM requires a 24/7 dedicated operator at the security command center.

VIDEO SURVEILLANCE

Video Management System (VMS)

The existing OnSSI Ocularis Enterprise VMS is version 5.2 with 'Stay Current' licensing (ends September 2016). To note, version 5.3 will be released October 2016. It permits restricted web-based access such that any authorized user with LAN access can use the system. UPD is utilizing the map function where existing cameras are shown on a campus map and building floor plans and video can be pulled up via mouse clicks. The video is monitored at the SVR as well as from remote locations via mobile phones and the web-based interface. All cameras are managed by Campus Police, although they do not handle maintenance (e.g. repair/replace). The cameras are documented by UPD in a spreadsheet. It is recommended that UPD remain the end-user of all security sytems where IT and Facilities provide applicable support. This may require documentation to clearly identify for each system the owner (who provided funding), users, maintenance responsibility, and technology support. The goal is for UPD, as the end-user, to have overall responsibility for the operation of the systems and to request support services as needed from the applicable department, IT or Facilities.

It is recommended that the University remain with OnSSI based upon staff familiarity with its use and the strong reputation and capabilities of the platform. OnSSI is a software company, in that they do not manufacture cameras nor other security hardware, and as such is hardware agnostic. They have focused on open architecture and can integrate with nearly all of the 3rd party systems/hardware including access control, emergency phones and license plate recognition software. Also, UPD advised of their satisfaction with this VMS.

OnSSI's VideoWall add-on feature is recommended ($50 per camera) to provide powerful collaboration with off-site operators. Their included Smart Motion Detection feature is recommended where, for example, quick crowd formations can trigger a real time alert. Of great benefit to the University is the easy installation/replacement of cameras to the VMS – this is a benefit whether Facilities is installing cameras or contractors where costs should be accordingly lower. The efficient video storage process can increase the amount of data written to drives and reduce the quantity of drives needed. To note, OnSSI frequently offers up to 30% discounts for education clients. Continuing the existing StayCurrent license is highly recommended such that software updates can be downloaded and installed quickly and easily. One limitation to note with Ocularis is that it currently does not support very

high resolution cameras, e.g. 40MP. Such cameras are not recommended for the University at this time, thus this limitation is not applicable – also this will be addressed by OnSSI in future software releases.

Expanded use of the OnSSI mobile app is desired by UPD and is highly recommended. The app is powerful, providing full screen viewing (see Figure below) of up to 16 camera streams on Apple and Android devices, even for users with older 3G smartphones. Users can pull recorded video as well as well as digitally zoom into the view with the full high-definition resolution and frame rate. To note, heavy mobile/web-based use typically requires a dedicated server.

Cameras

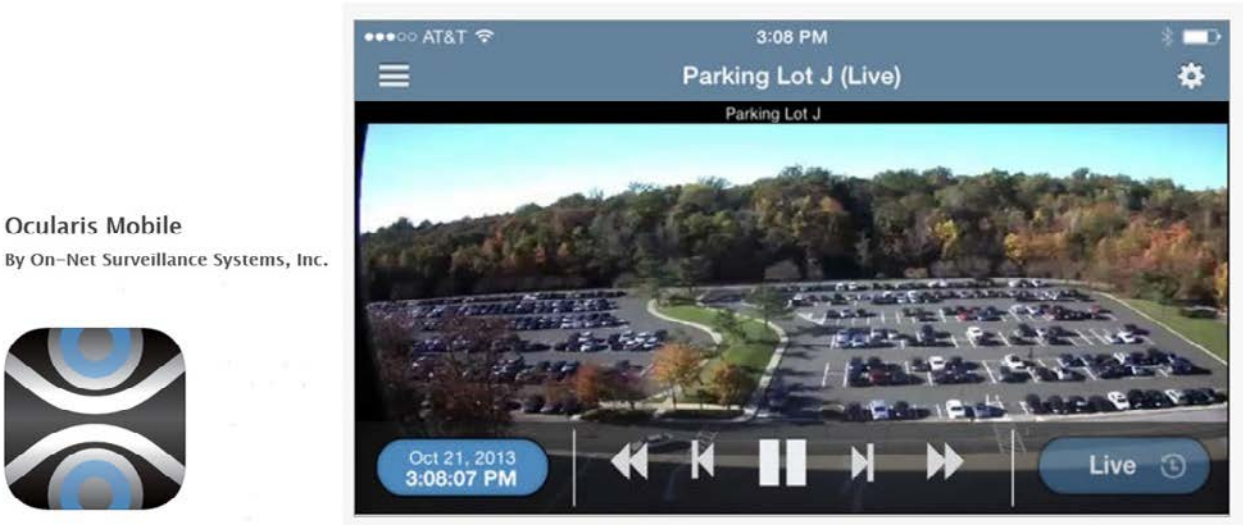
SBC currently has 180 modern IP-based cameras. The model types consist of pan-tilt-zoom (PTZ), fixed view, and 180-degree panoramic view. Most newer cameras have built-in infrared illuminators for night visibility. PTZ cameras are located on many emergency phone towers and at high elevations on buildings. See Exhibit 01 for existing and proposed exterior cameras layout. UPD has advised that most outdoor cameras on buildings are mounted too high for a good field-of view. This is due to overgrowth of trees, angle of view (looking down due to height) and distance being too far from intended viewing area. Also, PTZ cameras are most beneficial for real-time use, i.e. the pan-tilt-zoom functionality provides no benefit with forensic review of video. Cameras are generally between 3 and 6 megapixels (which defines the resolution, i.e. 1080p = 2.1MP). Most units are manufactured by HikVision (Chinese vendor, very cost effective and reliable, #1 in global market share) and a small number are by Axis (well respected Swedish vendor, former global market share leader). UPD advised they would consider other manufacturers.

It is recommended that the University continue to deploy HikVision, and supplement with other products for specific areas/needs – e.g. Avigilon for video analytics, Sony for very high quality images. For surrounding residential sites or similar, it is recommended that OnSSI's privacy masking feature be utilized to block views that could be considered private. Some existing emergency phones have PTZ cameras mounted above, e.g. view parking lots. The Observatory, Parking Structure East, Parking Structure West and Housing Village have unique installation/issues. The Observatory has a three existing cameras, although they do not add much value at night due to the dark surroundings. It is recommended that external IR illuminators be added co-located with these cameras (or replace with camera with built-in IR). Parking Structure East has analog cameras on coaxial cable with encoders to convert signal to IP for integration with Occularis. Parking Structure West has a local DVR of which is accessed independently from OnSSI. Housing Village also has analog cameras on coaxial cable. It is recommended that the cameras in Parking Structure West be encoded and video be sent to OnSSI – this includes removal of the existing DVR.

University Police have identified the ability to clearly capture faces and license plates with high resolution cameras as a critical need. This is recommended, as is a common desire at similar higher education locations. This is recommended at choke points for pedestrian travel and vehicle entrances – which allows for use of 2-6MP cameras instead of 10+MP. License plate recognition software can be deployed and the plate numbers then scanned against existing law enforcement databases (e.g. outstanding warrants). UPD has expressed interest in this feature, although the impact to existing staff workload must be considered for processing of alarms.

Example of a multi-lens panoramic camera

Exterior camera placement during the design effort includes selecting the camera field-of-view from a preferred mounting

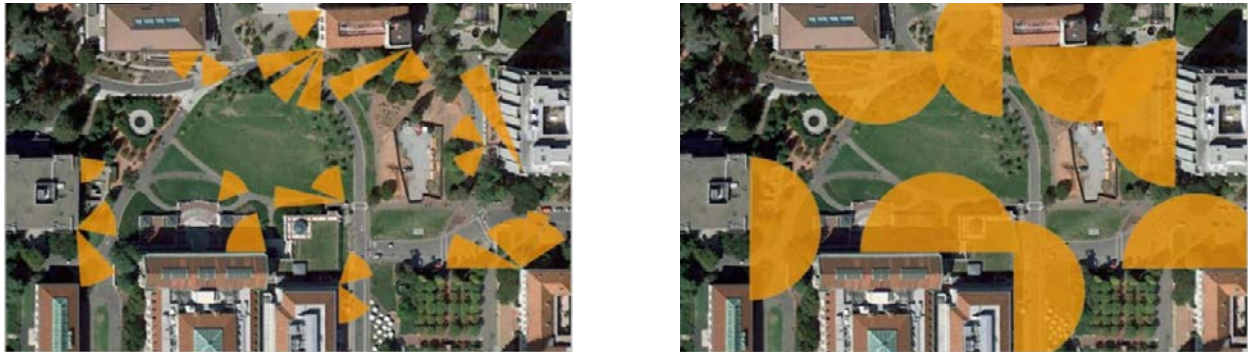


180-degree camera field-of-view in an app interface

location (building or pole), selecting the mount type and determining conduit penetration to interior of building. A goal is to have minimal exposed conduit from the camera to the applicable telecom room/cabinet. It is best to first identify the optimum camera location for the intended field-of-view, then determine the closest spot where conduit can penetrate into an above ceiling space or interior area where exposed conduit can be installed near the ceiling. Cabling needs to eventually reach an existing cable tray/conduit that connects to the nearest IDF.

Beyond those already highlighted above, it is recommended that cameras be added to provide (increased) coverage of the following spaces, based upon similar higher education systems/needs:

- Telecom rooms, interior, fixed lens
- Building main exterior doorways, main corridors/ intersections, interior, multi-lens (see down each corridor)
- Stairwells, elevator 1st floor landings, interior/exterior
- Gates and facility yards, exterior
- Campus Evacuation and Emergency Triage Sites



Example of 24-camera coverage map of public area producing 8,000,000 pixels of video information (left), as compared to a coverage map with 8 panoramic cameras supplying 96,000,000 pixels of video information (right).

TABLE 10–1: CAMERA TYPES RECOMMENDED

Camera Type/Description	Locations	Notes
180-degree panoramic	wide areas with minimal obstructions (e.g. trees)	covers same area as 3-6 fixed cameras, saves significant wiring costs (see Figures below)
Thermal	few key areas where any access should be flagged, e.g. 4am on football field	recommended in future after video analytics have been successfully deployed
Pan-tilt-zoom (PTZ)	wide areas with minimal obstructions (e.g. trees)	ability to move camera FOV around and zoom in, best for use in real-time by operator
Multi-lens	corners or hallways where different FOVs are desired, but not multiple installed cameras	unit has 2 – 4 cameras built into a single housing (see Figure below)
Fixed, wide FOV	wide areas where camera location is near the desired field-of-view	
Fixed, narrow FOV	narrow areas where camera location is near the desired field-of-view	
Box, long lens	long range view where camera location is very far from desired field-of-view	internal IR not available

Signage

The University currently has signage to inform persons that video surveillance is in progress. See sign below:

It is recommended that this protocol continue and that new projects provide additional signage. Also, the University should perform a survey of the existing sign locations to best identify additional locations.

Poles

Existing light poles are a desirable location for installation of security cameras. At SBC there are sufficiently dispersed poles for use, although many poles at SBC are too low for optimum camera field-of-views. A key consideration is available 120-volt power at the light poles. University staff advised that all light poles at SBC and PDC have 24/7 power (not on timers). In most cases, the data cable distance will exceed the 328-foot limitation for copper Ethernet. Fiber is recommended, which requires an underground telecom pathway from the pole to a telecom room of which must have a compatible network switch. At the pole, 120-volt power is required for the fiber media converter and camera power supply. For poles without power, another option is to deploy Ethernet/PoE extenders of which can extend data and low voltage power by hundreds of feet. As camera coverage is added, existing poles should be used based upon the location, clear lines of sight and available conduit space for cabling.

Vehicle Access and Parking

At SBC, currently vehicle entrances/exits do not have camera coverage. It is recommended that all vehicle access points have a dedicated camera for license plate recognition (LPR). The overall access point should have a nearby camera for a wide view. LPR cameras need to be placed at lower than usual heights to best capture the plate characters. Harsh lighting conditions must be accounted for from headlights and brake lights as well as to clearly capture the plate during low light hours. The camera feature wide dynamic range should be selected to increase the visibility. To note, a special LPR camera can be selected although cost can become an issue – high reliability character capture is a complex task. Full camera coverage of the parking lots from devices mounted high on poles is recommended. Since parking lots are currently the largest area of concern for Campus Police due to vehicle theft and break-ins, cameras are also recommended at lower heights on poles throughout the lot in each row. To note, video surveillance here is for forensic analysis after the fact, providing UPD with potential evidence and details of the criminal activity. Overall, surveillance provides critical information for accidents and possible related injuries. Cameras at vehicle choke points can be used after an event to determine when someone entered/exited campus and the direction of the vehicle on the public road.

Lighting is a very critical design element. On poles, cameras should be mounted below existing lights to avoid a 'blooming' effect on the viewable image. Currently, some cameras have built-in infrared (IR) illumination for night viewing although the IR range is limited and clarity is much lower than during daylight hours. Properly dispersed and even exterior white light is the best solution for optimum night viewing. All pole-mounted lights at both campuses are LED by Exergy Controls, of which communicate via wireless signal for

PoE (left) and Low Voltage IR Illuminators

head-end operation. Due to prohibitive installation and electricity costs, full coverage with white light is not practical. IR illumination can enhance any white light that is captured. Where even greater IR illumination is needed, external IR source devices can be installed co-located with the applicable camera. Products available include PoE and low voltage (greater range). At SBC, in particular, areas identified with insufficient light include the Observatory and Athletic Fields adjacent to East Campus Circle are not lit and should be implemented with a large external IR illuminator.

Bullet (left) and Dome Cameras

Pedestrian Walkways and Exterior Gathering Areas

At SBC currently pedestrian walkways and exterior gathering areas have camera coverage, although not complete and with the desired resolution. The goal for these locations is to have full overall surveillance coverage for situational awareness as well as cameras to cover pedestrian choke points and gathering areas.

Educational and Administrative Spaces

Based upon privacy expectations, cameras are not installed in classrooms nor in areas considered personal workspaces, e.g. faculty offices. It is recommended that this protocol remain in force. To eliminate any complaints from occupants regarding a camera that is actually viewing an adjacent area, it is recommended to install a bullet camera such that the field-of-view is known whereas with dome cameras it is difficult to determine which direction they are aiming. See Figure below.

Residential Housing

As with educational spaces, residential housing occupants expect privacy. Vehicle and building entrances/exits, parking, and pedestrian walkways and laundry rooms are recommended for camera coverage.

High Risk Areas

High risk areas not already presented above are to be identified for dedicated camera coverage. Camera coverage will help to address theft and vandalism. UPD advised that the other areas of concern are the Science and Biology labs and bike racks (currently approximately 35 locations).

Other recommended areas for camera coverage include: Cash registers, Free Speech designated spaces, Facility yard(s), Recurring vandalism spots (e.g. graffiti), Public events spaces, Public counters, Smoking areas (University will be 100% smoke-free by 2018), Swimming pool, Retail spaces, Theater / ticket booth, Confidential/ important document storage, Hazardous storage (e.g. laboratories), Child Care, AEDs, Shuttle/Bus stops, Large utility enclosures, Vending machines, Pay-for-print stations, Parking Permit Dispensers (currently Ventek product, University transitioning to cash-only). At SBC:

- Lot E/F
- Lot F/H
- Lot G/H
- Lot C/D
- Lot B
- Lot A
- Lot L
- Lot M
- Parking Structure 1 (West) – multiple stations
- Parking Structure 2 (East) – multiple stations
- University Village

Video Analytics

Video analytics is currently not in use and is not recommended for implementation at this time. This feature uses algorithms to 'analyze' the video for particular behaviors / actions. The most commonly used are digital fence line crossing, object left behind and wrong direction of travel – these events trigger real-time alerts to the operator or others. With appropriate design, product selection and operator involvement video analytics can be a very powerful tool for law enforcement. Cameras should be selected with built-in optional analytics or with compatibility with 3rd party software. In years to come as SVR operator skills mature and dedicated time with monitoring increases video analytics should be evaluated for benefits and feasibility.

ACCESS CONTROL

Currently SBC does not have a campus-wide access control system. It is highly recommended that funding be identified to implement a new platform and hardware, as access control is the most costly of the recommended security systems presented herein.

Based upon experience with other similar higher education facilities, it is recommended to outfit, at a minimum, classroom and laboratory doors with a centralized access control platform. This includes retrofit of existing doors with a wireless card reader and door lever product – vendors include Allegion/Schlage and Assa Abloy. This is the most cost effective design eliminating the need to wire each door for the data and power – see Cost Estimate (assumes phase 1 roll out with 115 classrooms/labs doors and 3 exterior doorways at each of 25 buildings). In some cases doors would need to be replaced to accommodate this hardware. These products satisfy code requirements for door hardware that can be manually locked from the inside, but not require any additional actions to open the door to exit.

A recommended hard-wired card reader is iClass SE R40 by HID. For wireless access control, the Allegion/Schlage AD400 is recommended (see Figures below).

Allegion/Schlage (AD400)

HID iclass (R40)

Another key benefit and labor cost saver is the ability to automatically lock doors on a daily schedule. This eliminates the need for University staff to unlock and lock the vast quantity of doors every day. Other physical protection via access control includes restricted access and audit trails for high risk spaces such as cash handling locations, protected/sensitive records storage, IT rooms and hazardous materials storage. Audit reporting identifies who accessed which spaces and when.

The existing access control software by Schlage should be replaced with a robust IP-based platform such as S2. Here, perimeter doors could be remotely locked for shelter-in-place events – i.e. active shooter in Building X, thus lock exterior doors at all other buildings. S2 is a certified partner of OnSSI and is a recommended web-based (no software to install) and highly flexible platform – see Figure below for user interface and hardware. S2 allows for API integration with existing human resource and student enrollment databases. This is a critical feature whereas existing cards can be automatically deactivated, for example when they are removed from the payroll system. The mobile app encrypts communication and includes the ability to lock/unlock doors and manage evacuations.

Access control (key card control) management user interface, server hardware, and mobile management app examples.

Shelter in Place

Unlike cameras, access control does provide levels of physical protection. A key objective for UPD is remote 'shelter in place' door locking during an emergency event. It is recommended, at a minimum, that an access control platform be selected and that all building free ingress doors be retrofitted with access control hardware.

Existing Locks

At SBC nearly all doors are locked with traditional keys, there are a few buildings currently with access control. The buildings are:

- Campus Police (UP)
- Facilities Management (FM)
- University Hall (UH)
- College of Education (CE)
- Health Center (HC)
- Student housing

One system is by Schlage of which the hardware includes wireless hardware and is opened with a valid key fob or manually entered code. Schlage Security Management Software (SMS) is the head-end for programming the system. These doors are not currently monitored other than unauthorized access is captured by the local intrusion detection system. This hardware can be updated/accessed remotely and is managed by Facilities. Other standalone hardware at SBC includes Locknetics (also by Allegion/Schlage) which consists of mechanical locks and a keypad. Updating these units requires taking a Palm Pilot to each location – in particular this presents a challenge with the frequency of need to add/remove users. At SBC, residence halls have separate access control systems.

A test installation was performed at SBC to permit UPD to access these few doors without needing mechanical keys. It was noted that some doors would need to be replaced to accommodate the hardware that was tested. In general, wood doors can easily accept access control hardware.

Exterior doors at classroom/educational buildings at SBC are mostly metal, the remaining are wood. Interior doors are mostly wood, the remaining are metal. These interior wood doors allow for relatively easy installation of the wireless access control and locking hardware, i.e. openings in doors can be cut for insertion of hardware. Metal doors may need to be wired or be replaced with wood doors – although many typical metal doors can be retrofitted to accommodate the wireless locking hardware. Non-educational buildings (e.g. Student Union) at SBC have exterior glass/slider doors of which require a wired card reader mounted on the mullion or an adjacent wall. Here the locking hardware must be validated for compatibility with the access control system. At PDC all exterior doors and most interior doors are metal. There are no exterior glass/slider doors. Here, it is likely that all doors would need to be wired, i.e. more costly.

Access control greatly simplifies physical key management which is a current challenge, for example, with the wide range of faculty and staff who need access to multiple classrooms. Currently doors at SBC have manual locking hardware with physical keys. Locking hardware at both campuses consist of cylindrical and mortise locksets by Schlage and Sargent. Exit doors typically have push bars or similar by Schlage and Von Duprin. Facilities manages the keys and this task has been challenging, i.e. check-in/out effort, keys not returned. The University uses Simple K software which identifies keys per door and is used to track key requests. The Locksmith cuts new keys as needed. There is no Master Key to open every door on campus – this does provide a level of security but also complicates access for staff. Refer to CSUSB 'Facilities Services Building Standards' pages 4-5 for further information.

Cards and Key Fobs

The current access cards at SBC use magnetic stripe technology. UPD advised that this will be replaced by proximity smart cards as part of the long-term master plan. Access control cards can double as University ID badges. Smart cards can store data within the card to include, for example, the point-of-sale features of the Coyote One card. This implementation of smart cards is highly recommended the elements of the current Coyote One card (point-of-sale). Another critical benefit of smart cards is the superior security of data between the card/key fob and card reader. The relatively easy hacking of prox and mag stripe cards is significantly more difficult with the OSDP standard with AES-128 encryption. Also, smart card systems work with a wide range of manufacturers since it is an open protocol as well as require fewer wires for installation.

Vehicle Access and Parking

Access control is recommended for any physical gates, in particular at the Police Building, Facility yards and faculty/staff parking lots.

Educational, Administrative and Residential Spaces

If full deployment of access control is not implemented across campus, i.e. for shelter in place capability, than access control for Educational Spaces is not applicable. See Shelter In Place section above for further information.

Also other critical doors should be outfitted as well including telecom rooms, high value and hazardous storage, and senior administrator offices. Less critical doors without access control locks, but spaces that Police would desire to know if they are left open or forced open, should be outfitted with door contacts.

High Risk Areas

High risk areas are to be identified for access control. These systems will help to address theft and vandalism. In particular at the SBC Observatory, restrooms currently do not get locked and an access control system would provide automatic locking of doors on a daily schedule.

Other recommended areas for access control include:

- Facility yard gate(s)
- Swimming pool (after hours)
- Retail spaces
- Confidential/important document storage
- Hazardous storage (e.g. laboratories)
- Child Care
- Large utility enclosures

University Police Building

The Police Building will require extra levels of access control. All exterior doors should be outfitted as well as gun storage and other storage spaces, e.g. radios, laptops, ticketing devices, cell phones. Also the public counter shall be separated from the rest of the station by an access controlled doorway. Other protection should be considered such as sirens for doors forced open.

INTRUSION DETECTION

The University currently has 10+ year old intrusion detection systems (burglar alarm) generally only at administrative locations and cash handling locations. Monitored devices also include duress buttons, door contacts and motion detectors. These disparate systems are all monitored by the on-site certified monitoring station software (Manitou by Bold Technologies) which validates the alarm then sends to UPD dispatch. The systems are armed/disarmed via traditional keypads. Each department that funded the installation is responsible for management and maintenance of their system.

It is recommended to deploy door contacts at automated external defibrillator (AED) stations to provide a notification to Campus Police that a health-related emergency is occurring and can dispatch an ambulance.

UPD advised that most alerts result in false alarms. In discussions with University staff there was some initial interest in a centralized system for all intrusion detection hardware – although this can be complicated and costly and is not recommended at this time, i.e. funds should be assigned to other systems presented in this report in part because intrusion detection provides security only when buildings are unoccupied; i.e. protecting property, not persons. Although, it is recommended that the existing alarm policy be updated. Along with this effort, buildings/spaces without burglar alarms should be vetted to determine if any should be added, e.g. hazardous storage.

For existing/new monitored locations, it is recommended to validate/have hardware output alarms for the following:

- Opening/breaking of doors and windows (including roof access panels), via door contacts and motion detectors
- Hallway occupancy during off hours, via motion detectors
- Duress buttons (stationary and mobile)

MASS NOTIFICATION

Electronic Alerts

Mass notification is a combination of tools including email, text messaging, phone app messaging and broadcast of audio messages via loud speakers. Considering the proliferation of mobile phones being carried by persons on campus, mass communication is currently in use by the University such that potential lifesaving information can be quickly and easily sent to all who have subscribed to the database. Currently the alerts from these systems are delivered successfully to those users who opt-in.

The University currently has multiple systems providing electronic alerts to faculty/staff/students. At SBC Informacast announces to Cisco VoIP phone handsets and SBC's exterior loudspeakers. Informacast uses template information from Blackboard Connect which is managed by UPD. Blackboard Connect sends alerts only to faculty and staff. Alertus is used to send window pop-ups to faculty and staff workstations and is managed by ITS. UPD has expressed interest in deploying the Rave Guardian mobile app which provides users with the ability to easily send a panic alarm, send/receive crime tip reporting, and storage of residence and medical information for display to responders – see Cost Estimate ($2 per user per year).

Loudspeakers

SBC has existing exterior campus-wide loudspeakers by Cooper Notification for audible mass notification. The existing exterior emergency phones do not have loudspeakers. It is recommended to add external speakers to existing tower and wall-mounted emergency phones in particular at parking lots, pedestrian walkways and exterior gathering areas. This can provide for audio coverage at these zones without the need to add speakers at other nearby locations (e.g. existing light pole), saving cost. Although staff advised of poor audio

quality and coverage at other colleges/universities, a properly designed system and current hardware output is sufficient to provide clear messaging for the surrounding zone. These and any new units should be considered for loudspeakers, in part to save cost on wiring and avoid additional installation locations.

For new exterior phone installations, Talk-A-Phone's Wide-area Emergency Broadcast System (WEBS®) software is integrated with their Radius Emergency Phone Tower. Radius denotes the built-in loudspeakers at the top of the tower on all four sides – see Figure below under Emergency Phones section. This design provides 360-degree coverage without the need for bulky external horns.

For campus building entrances and applicable interiors spaces including residential housing, new loudspeakers are recommended. For interior hallways where audio notification is desired, the Talk-A-Phone wall-mounted indoor emergency phone with built-in speakers should be distributed appropriately (e.g. 2 per floor of large buildings). With Talk-A-Phone's seamless integration with Cisco's InformaCast, it is highly recommended that existing handsets in selected locations be utilized for broadcast of audio messaging, in particular for classrooms avoiding the cost to install speakers.

Also, it is recommended to consider external speakers on the applicable buildings where interior speakers are installed and loudspeakers to not exist today. This is due to the economy of scale where amplifier and other local hardware is being installed. These exterior speakers can be placed on each of the building exterior walls to provide wide coverage of these surrounding areas.

EMERGENCY PHONES

Emergency phones provide real-time communication with the Police throughout campus. All calls automatically dial to UPD Dispatch Center. Exterior tower emergency phones have been installed at SBC in/near parking lots and some wall-mounted units exist in interior hallways. SBC currently has approximately 24 very well distributed exterior phones – there are locations where a phone is not visible, e.g. entrance to the Social & Behavioral Sciences building and area between the College of Education and the Health & PE Complex. Other than views impaired by trees or similar, there are no locations where a phone is not visible. UPD advised that with the proliferation of cellular phones that emergency phones are not as critical as they once were, but due to unreliable cellular coverage in some areas that there is no plan to cease the installation and operation of emergency phones across campus. These phones have an 'Emergency' button for automatic dial to UPD and 'Information' button. This helps to eliminate non-emergency calls going to UPD (see Figure below). Currently there are no established standards for the hardware, thus new projects should be used to standardize on the desired system/hardware. Currently at SBC the exterior housings are by Code Blue, but the interior components were replaced with products from Talk-A-Phone. As phones are added, it is recommended the feature be included to identify from which unit the person is calling and include the optional built-in camera to provide a view of the caller. These elements allow for quicker response to the location and easy identification of adjacent cameras to view the overall area.

Phones overall should be distributed with the intent for at least one to be visible from anywhere in the vicinity. As with the current units on campus, the phones should be equipped with a blue light for increased visibility and have to 2 buttons as described above. Phone towers can be hard-wired or wireless for data. Solar power is an option but is not recommended due to the large panel size needed and less reliability for emergency needs. Thus, it is recommended that underground conduit be run to each new phone. To note, this conduit will also be used for at least two cameras on the towers and one for the wall-mounted units. At SBC the existing phones are well distributed, no need for additional units until campus is expanded, e.g. new residence halls in the coming years.

Wall-mounted Phone (left) and Tower Phone (right)

10.13 OPERATIONS AND MAINTENANCE

There has been a trend to address security through the increasing use of electronic systems such as video cameras, access control systems and emergency phone systems. These will continue to be part of the security picture at CSUSB.

STANDARD OPERATING PROCEDURES

Under a memorandum of understanding (MOU) with the University, SBC UPD is part of the San Bernardino Sheriff Department. SBC has dedicated sworn officers (qty. 18) as well as security guards and administrative staff.

UPDs applicable standard operating procedures (SOP) shall be updated by internal staff for any new systems or areas that impact the usage of the systems by the operator. This will also be coordinated with the Emergency Operations Plan. The SOP would define who has access to view recorded video and for what purposes they can use video archives. Also, it will contain detailed policies and procedures, for example, step-by-step instructions for the operator to follow during common emergency events. To note, currently all requests for recorded video are submitted to UPD for approval – it is recommended to continue this protocol.

The SOP should refer to the existing PeopleSoft software reports of which lists registered occupants for each campus building, e.g. John Smith is in Building XX on Monday and Wednesday from 9- 10:00am for class. Access to this data is critical during emergency events to determine high density areas of student/faculty/staff for response planning.

A draft SOP should be revised then reviewed with the relevant designer(s) prior to the design of electronic security improvements to ensure the final systems are in line with UPD current and related new procedures.

MAINTENANCE AND SUPPORT

Currently SBC does not have a security maintenance program/contract. As items fail they are to be repaired/replaced by the department that funded the original installation. UPD is pursuing these departments to obtain funding for an annual campus-wide maintenance contract. Occasionally the systems are checked by ITS, Risk Management and UPD. The University should establish a maintenance program (and/or 3rd party contract) for maintenance of new and existing security systems.

Largely the physical efforts will consist of camera lens cleaning (see image below of existing camera with dirty lens), identification of relevant dead light bulbs, annual inspection of device mounts and re-positioning of devices of which bolts have loosened (e.g. poor camera field-of-view) and repair/replacement of data connections. Cameras would be repaired/replaced as needed using on-site spares to ensure minimal downtime for that location. The maintenance program will also include identification and remediation of landscape that has grown and impacts the view of security cameras and any wireless point-to-point (line of sight) links. For video surveillance, the 1-time camera license fees provides lifetime tech support and software patches. The only recurring cost is the StayCurrent plan (currently in place) – see Cost Estimate ($30 per camera per year).

For access control, S2's Software Upgrade Support Plan (SUSP) provides for software patches and full upgrades as well as technical support – see Cost Estimate, $6,000 annual cost for up to 192 doors. To note, the SUSP must be procured through a S2-certified security contractor. It is recommended that the installation contractor provide the first 3 years of coverage. During this time period, any S2-certified security contractor can be engaged for technical support. Any field efforts could be paid as time and material or covered under the recommended 3rd party maintenance contract for all security systems.

No significant maintenance is required for mass notification and emergency phones other than cleaning and replacing malfunctioning devices.

Other areas to be maintained, based upon University IT protocols, include replacement of UPS batteries and housekeeping of cable management in racks.

Spare parts should be provided by the contractor. Recommended (2) of each camera type with installed quantities over (20) and prorated for additional spares for camera models which have been installed in greater quantities. For access control it is recommended to retain (2) of each card reader type for installed quantities over (20).

TABLE 10–2: ROM NEAR-TERM SECURITY UPGRADE COST ESTIMATE

Category	Item	Units	Unit Cost	Total Cost	Notes
Overall	Network Switches (24-port, poe)	25	$5,500	$138,000	Add'l units for added poe devices
	Power (rack-mounted UPS)	25	$4,000	$100,000	Add'l batteries for existing UPS
	Signage	25	$1,000	$25,000	
	SVR Video Wall	1	$22,000	$22,000	
	EOC Wall Monitors	2	$5,000	$10,000	
	Total			$295,000	
Access Control (S2)	Head-end Server	1	$34,000	$34,000	Preconfigured S2 Linux Enterprise Exacta 100 controller w/ database, webserver, S2 application; supports up to 7,100 doors; can add high availability failover; licensed for 128 doors (each add'l 64 doors $4,000)
	Controller / Expansion Blades	1	$65,229	$65,000	Controller (Network Node) 2 doors + 13 expansion blades, 14 doors each; incl. Enclosures and power supplies
	Card Readers (wired or wireless)	190	$2,500	$475,000	Assuming 3 entrances to 25 buildings and 115 Classrooms/labs
	SmartCards/Fobs	1,000	$4	$4,000	
	Burglar Alarm - Duress Buttons	20	$300	$6,000	Expanded coverage for existing systems
	Burglar Alarm - Motion/Glass Break	300	$300	$90,000	Expanded coverage for existing systems
	Burglar Alarm - Door Contacts	100	$400	$40,000	Monitoring of doors that do not require a card reader
	Training	1	$5,000	$5,000	
	Licenses and Software (Year 1)	1	$6,000	$6,000	Software Upgrade Support Plan (for Exacta 100) via security integrator (can use any S2 certified contractor, add'l cost for Site visits)
	Total			$725,000	
Video Surveillance (onssi)	Head-end Server / Storage	200	$1,800	$360,000	600TB total (3TB/camera); assumes 2.1MP cameras, 24/7 Recording @ 7 frames/sec, 1.3Mb/sec bandwidth per camera and 120-day retention
	Licensing - staycurrent (annual)	450	$30	$14,000	Full software upgrades as released
	Licensing-Cameras	200	$160	$32,000	Lifetime; includes tech support and software patches
	Cameras	200	$1,200	$240,000	Incl. Mounting, core through exterior walls, cabling and Conduit
	Pole w/Wired Data & Power	6	$16,000	$96,000	Incl. Trench to nearest telecom vault
	External IR Illuminators	20	$1,300	$26,000	
	Training	5	$1,000	$5,000	3-day off site course, provides certification (avoids reliance On security contractors)
	Total			$773,000	
Emergency Phones (Talk-A-Phone)	Head-end	1	$5,500	$6,000	For expansion of existing system
	Outdoor Tower w/ Loudspeaker	10	$13,750	$138,000	
	Outdoor Speakers (4 sides, bldg. Mounted)	5	$7,150	$36,000	Incl. Amplifier & paging module
	Indoor Wall-mount w/ Loudspeaker	60	$3,000	$180,000	
	Licenses (annual)	2	$2,000	$4,000	Incl. Qty. 200 end points
	Total			$364,000	
Mass Communication	Head-end	-	$105,000	$0	Existing Informacast system
	Rave Guardian mobile app	20,000	$2	$30,000	
	Licenses and Software (Year 1)	1	$0	$0	
	Total			$30,000	
Other	Trenching/Boring	1	Lump Sum	$50,000	
	Door Modification	1	Lump Sum	$20,000	
	Building Cabling Unforeseen Conditions	1	Lump Sum	$25,000	
	Contingency (10%)	1	Lump Sum	$219,000	
	Total			$314,000	
Engineering & Design	Total	1	$ 230,000	$ 230,000	
	Grand Total			$2,730,000	

PART III

MASTER PLAN APPENDICES

APPENDIX A: CAMPUS DESIGN GUIDELINES

APPENDIX B: LANDSCAPE PALETTE GUIDELINES

APPENDIX C: ENROLLMENT DEMAND + SPACE NEEDS ANALYSIS

APPENDIX D: TECHNICAL REPORT: CSUSB UTILITIES MASTER PLAN

APPENDIX

A CAMPUS DESIGN GUIDELINES

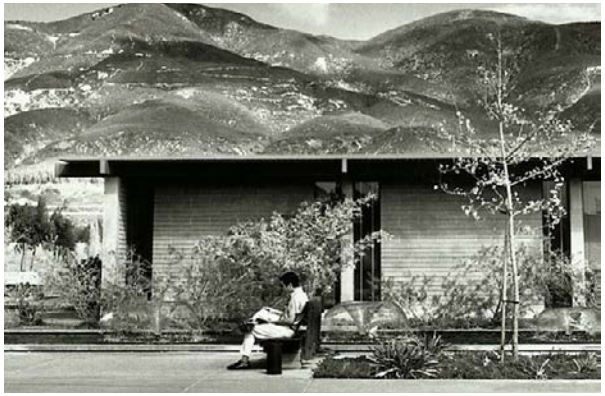
A.1 INTRODUCTION + BACKGROUND ANALYSIS

The goal of the Master Plan Design Guidelines is to establish or reinforce the campus "context," including its architectural character and landscape setting, in order to reinforce the educational mission and fortify the campus sense of place. The guidelines will provide direction to the campus and the architects selected for these future projects to ensure consistency and harmony among campus buildings and their physical setting. Landscape guidelines are also included in the 2016 Master Plan (See Chapter 9) to insure the continued quality of the open space environment while at the same time conserving water resources.

INTRODUCTION

The California State University San Bernardino campus was opened in the middle 1960's with its first structures being a series of one and two story administration and classroom buildings (Administration, Sierra and Capistrano Halls) in the heart of the campus. From this beginning the campus has grown to its current size of over 16,000 FTE students and 43 permanent buildings. Over time as buildings were added to the campus they were designed with the latest in design and construction techniques of their time which has resulted in a wide variety of building styles, some more memorable than others but definitely of varying architectural character. What visitors and students remember, more often is the central quad at the campus entry which focuses attention to the Pfau Library, the signature building on the campus.

As the campus has grown over time and the landscape has matured, less attention is drawn to individual buildings and there often glaring differences. However as we look forward in the 2016 Master Plan as new buildings are constructed to meet the University's projected growth and older buildings are upgraded, a clear and complete set of design guidelines and development standards must be developed to guide this construction in pursuit of a harmonious and collegial campus environment.



CSUSB campus in the 1960s

CSUSB campus in the nowadays

The first question that must be addressed in developing appropriate design guidelines for a specific campus is exactly what is the CSUSB campus "context"? While many campuses have a historical context that is often worthy of imitation or at least reference, as noted above, the CSUSB campus contains a collection of styles built over time that derives its sense of whole or place through its landscape, similar color palette and of course its setting against the majestic San Bernardino Mountains to the north. Guidelines in this type context must rely on establishing a relatively limited palette of colors and materials that, when applied over time create a sense of harmony and consistency. This approach, when used in conjunction with an enhanced landscape setting will meet the University goals for campus character and quality.

There is one characteristic that is shared by most institutions of higher education - a sense of permanence. The CSUSB campus has a definitive landscape that serves to integrate an extensive campus acreage and an inventory of more than forty buildings, both old and new. Design guidelines that apply to architecture, landscape and signage serve to guide the development of the campus and work toward an increasing visual and aesthetic integration. The design guidelines in this chapter set a series of parameters for new and remodeled buildings, and for aspects of the campus landscape and sustainability features that will be addressed in the next twenty years.

THE EXISTING CAMPUS VISUAL ENVIRONMENT

From the establishment of the 441 acre campus located adjacent to in the City of San Bernardino, in each decade CSUSB has added a variety of classroom, laboratory, student services, recreational, housing and support services facilities to the campus.

Existing Buildings

As noted previously, the buildings on the CSUSB campus reflect a wide range of architectural styles, building materials, heights and massing. Varied exterior building colors also contribute to a lack of visual continuity, further adding to the heterogeneous nature of the built environment. Many buildings reflect outdated color schemes and materials choices; some of these more visually-outdated buildings are scheduled to be removed from the campus academic core, but some will remain over the time frame of this 2016 Master Plan. Many of the older buildings have large blank or nearly blank facades or imposing mass that contribute to an uncongenial environment that is not consistent with human scale. The newer buildings tend to incorporate high proportions of glass and some use metal panels as facade materials.

Connections Between Buildings and Site

A visual assessment of the campus shows that the connections between campus buildings and the pedestrian pathway system are poorly defined. Some buildings have their main entries along minor pedestrian pathways, lack clearly delineated entries, or fail in other ways to take advantage of views to adjacent open spaces. Further, some buildings present massive vertical building walls to the pedestrian and typically lack first floor architectural elements such as wall projections,

Existing academic building on campus

Campus building with poor accessibility

Campus landscape as a critical element unifies the building characters and regional context

window patterning, arcades or entries that will provide a more human scale. These design weaknesses serve to negatively affect both the appearance and accessibility of campus buildings and contribute to a somewhat confusing and disorganized campus character.

Campus Landscape as A Unifying Element

In contrast to the varied character of campus buildings and their often problematic relationships to one another, the existing campus landscape tends to serve as a unifying element. The trees and other mature landscaping serve to moderate the appearance of individual buildings, tempering an otherwise diverse set of building types and styles.

As time goes on and a distinctive, sustainable plant material palette is established and implemented, a clear identity will be created for the CSUSB campus which will help to visually tie the campus together.

Another highly visible and unifying element being recommended in the 2016 Master Plan, particularly in heavily trafficked pedestrian areas are a series of trellis, shade structures and/or kiosks. These independent architectural/landscape elements help to define the campus ambiance as perceived from the pedestrian pathway network.

The Design Guidelines provided in this chapter portray ways that new buildings, existing buildings and the landscape environment can work together to form a more cohesive and aesthetically pleasing appearance.

The Design Guidelines are based upon the following major purposes and design goals summarized in the next Section A.2.

A.2 PURPOSES AND GOALS

The overarching purpose of the Master Plan Design Guidelines is to unify the campus visual environment by establishing measurable ways to provide design direction for future architects, landscape architects and/or designers. To this end, the Design Guidelines address the visual aspects of building exteriors and the connections between structures, landscape and both pedestrian and vehicle circulation systems.

GUIDELINE PURPOSES

The Design Guidelines is provided for the following purposes:

- Guide the design of new and remodeled buildings and landscapes in campus development.
- Portray ways that new and existing buildings and landscapes work together to form a cohesive and visually pleasing campus setting.
- Ensure that new development on campus will enhance the experience of its students, faculty, staff and community
- Promote sustainable design on campus; ensure sustainability, energy and water efficiency is being integrated into all new building and landscape design
- Establish benchmarks for campus review; allow flexibility in the implementation of the design guidelines to ensure the best possible solutions for the future development

DESIGN GOALS

The Design Guidelines is based upon the following major goals:

ACHIEVE VISUAL INTEGRATION

- Each individual building should first establish its identity within the greater whole of the campus and then present its individual identity.
- Ensure all new buildings act as supportive components for enriching and activating the public space network.

FOSTER A STRONG SENSE OF URBAN COMMUNITY

- Provide multi-functional outdoor rooms for accommodating events, programs, social interactions, and interdisciplinary collaboration
- The building design should aim to strengthen an urban lifestyle and community through providing ample actives uses on the ground floor

FOSTER A SENSE OF PERMANENCE

- Promote a high quality design in buildings, landscape, signage and wayfinding as well as campus art installations
- Employ enduring designs and materials for campus buildings that evoke a sense of permanence.
- Encourage innovative and sustainable design and construction in all phases of campus development.

STRENGTHEN CONNECTIONS BETWEEN BUILDING & SITE

- Establish a distinguished hierarchy of vehicle routes that can connect and serve campus destinations
- Create a pedestrian- / bicycle-friendly environment through providing tree canopy, street amenities, shade structures and implementing traffic calming measures
- Articulate building entries and entry plazas that can clearly orient occupants into the buildings

ESTABLISH A COMMON VISUAL DESIGN VOCABULARY

- The collection of campus buildings, considering all variations of style, size, function, and age, should share a common visual vocabulary
- New building development should appear related to the overall campus context as well as accommodate architectural innovation
- The remodel of existing buildings should respect the building's authentic character

TREAT LANDSCAPE AS A UNIFYING ELEMENT

- Use landscape to unify the overall character of the campus buildings and to enrich the public spaces
- Introduce a palate of plants which generally contributes to a cohesive and uniform aesthetic in the semi-arid climate setting

BUILD A SAFE AND SECURE ENVIRONMENT

- Integrate actives uses on the ground floor of the academic and residential buildings
- Encourage high proportion of transparent features on the ground floors of the buildings; avoid blank / undifferentiated walls
- Ensure appropriate illumination on pedestrian passages, public spaces, building entries, and parking structure stair towers and elevator cores after sunset

RESPECT NATURAL SETTING

- Reserve the "land lab," protect wildlife/native species habitat/corridors and maintain biological diversity
- Utilize drought-tolerant plants in the landscape design for reducing water consumption and the cost of maintenance
- Integrate low impact design measures on campus for stormwater capture and infiltration

A.3 SITE DESIGN GUIDELINES

The quality of campus master planning and the design of the buildings and landscape in an integrative approach can define and enhance the University's sense of permanence. The following guidance is to ensure that building siting, site planning, and campus improvements all support academic and social interactions.

DESIGN PRINCIPLES

The Site Design Guidelines are based upon the following six major principles:

COHESIVE IDENTITY: The site design should maintain and strengthen the CSUSB campus identity in an integrative approach. Promote the new developments to portray a cohesive character and enhance the overall campus image.

SOCIAL INTERACTIONS: Promote social interactions and collaborations in various types of outdoor rooms. Ground floors of buildings should be articulate and distinct, and where feasible, the interior spaces should be organized as extensions of the public space outside.

SAFE AND SECURE: Integrate active uses at the ground floor of the buildings adjacent to primary pedestrian walkways and public spaces. Promote visual transparency by incorporating clear-glass windows and doors and other openings at the ground floor for adding visual interest and fostering a sense of security.

CONNECTIONS: Developing a roadway network with a clear hierarchy for strengthening the connections between the various campus precincts. Optimizing the pedestrian and bicycle facilities on campus for creating a pedestrian-/ bicycle- friendly environment.

HUMAN-SCALE COMFORT: Buildings and outdoor rooms should contribute to an appealing campus environment. Encourage components that offer a human dimension, such as building elements, decorations and site furnishings. Incorporate rich details, especially at eye-level.

SUSTAINABLE DESIGN: Site design should address energy and water conservation in an integrated approach. Maximize efficiency of orientation, building envelope, glazing, sun-shades, solar roof panels and solar hot water systems for all the campus buildings. Apply low impact development measures where possible for microclimate mitigation.

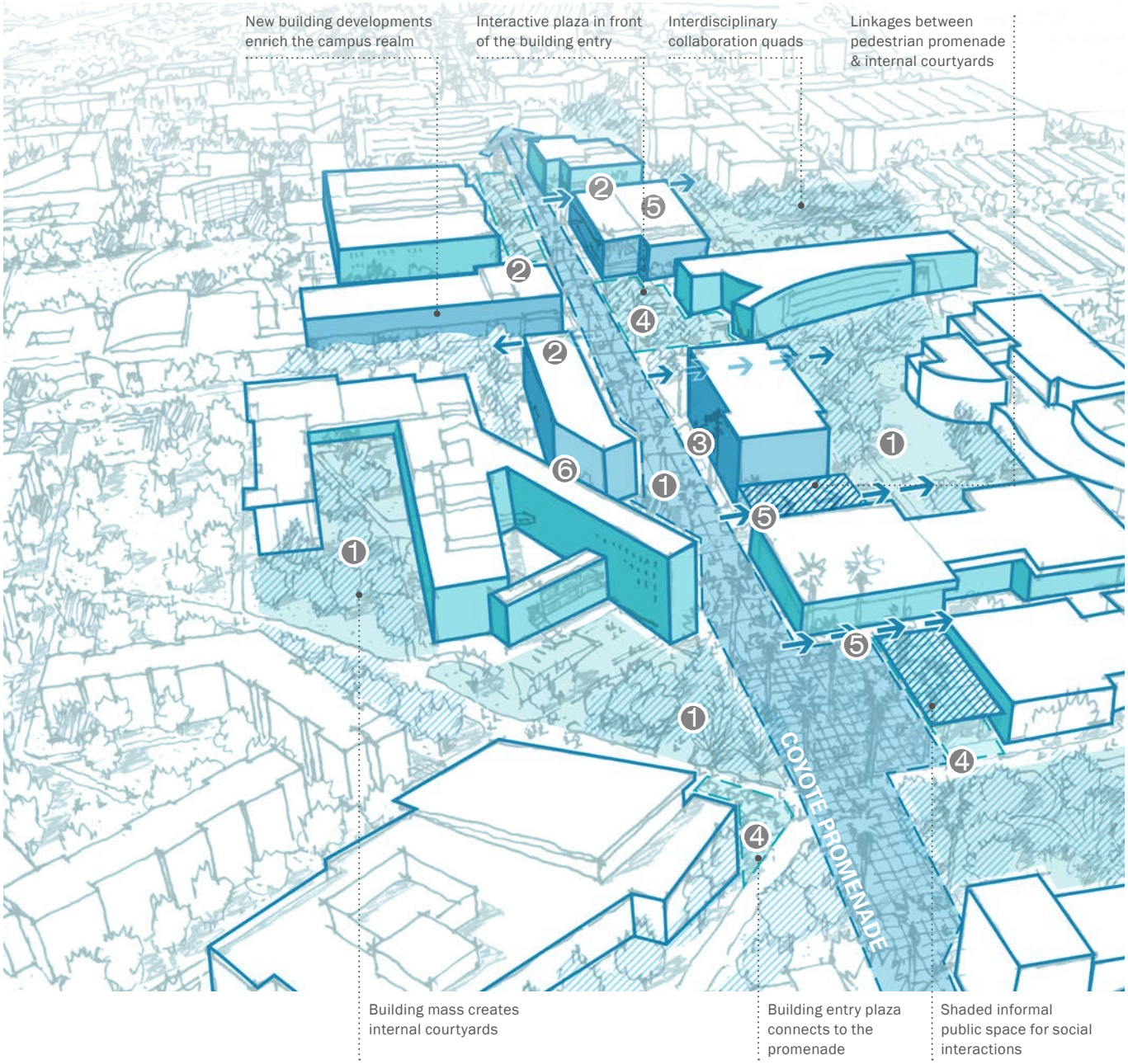
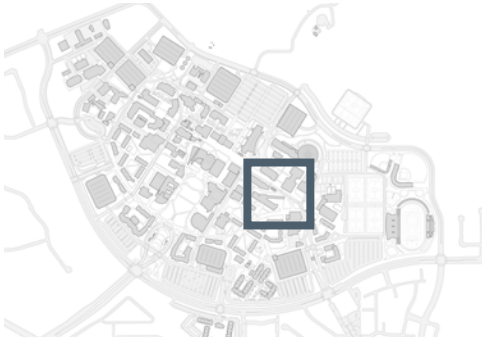
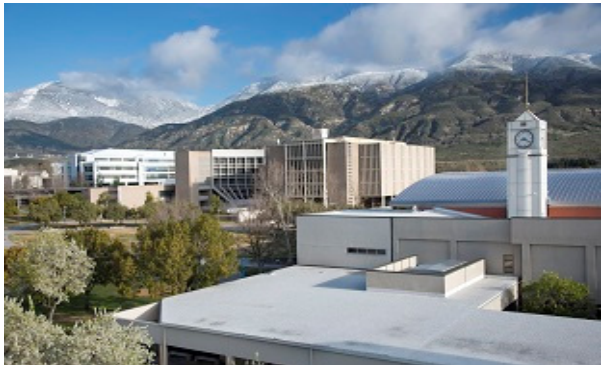


FIG A–1: SITE DESIGN GUIDELINES ILLUSTRATIVE 1



DESIGN RECOMMENDATIONS

1. Manage building massing and orientation to articulate the pedestrian passages and open spaces
2. New building developments along the promenade should contribute to the overall campus feature
3. Orient building major entrances facing pedestrian walkways, interactive plazas, collaboration quads, and courtyards
4. Integrate building and landscape design to delineate various public spaces, public/ semi-public, formal / informal
5. Build linkages between promenades, walkways and courtyards
6. Consider solar angles and wind direction in building sitting for creating a thermally-comfort campus environment



Building siting and orientation should respect the scenic backdrop of San Bernardino Mountains and bring natural views to and complement the campus physical environment

New buildings should be oriented facing the primary promenade and add features to the campus built environment

Establish a clearly-defined roadway network; distinguish pedestrian walkways and passages from vehicular circulation routes

BUILDING SITING & ORIENTATION

Intent

Building orientation is a critical aspect of site designing and planning. The careful siting and orientation of buildings helps define the unique character of a campus. Managing building siting and orientation can help to shape an aesthetically appealing, human-scale oriented, and thermally-comfortable physical environment.

Guidelines

- Use building placement and orientation to form new open spaces, articulate pedestrian walks and activity nodes, and to reinforce existing open spaces.
- Manage building placement and massing to strengthen visual axes and form visual corridors that link the pedestrian walkways, plazas to the adjoining internal courtyards.
- New buildings constructed along the perimeters of Coyote Promenade and Sycamore Walk should have a special responsibility to the development of these campus features, and should be oriented to face these public spaces.
- Visually organize spaces between and amongst buildings and bring nature to and complement the built environment of the campus.
- Consider solar angles and wind direction in building siting and orientation to reduce energy consumption and to create thermally-comfort campus environment.

VEHICULAR CIRCULATION

Intent

The scale at which pedestrians and vehicles function best is not the same. The 2016 Master Plan establishes a separate vehicular and service roadway network distinguished from the pedestrian and bicycle circulation routes. Streetscape design approaches should be taken into account for reducing potential conflicts between automobiles and pedestrians for the purpose of creating a pedestrian safe environment on campus.

Guidelines

- Organize the traffic on campus, and direct vehicles to the periphery of campus, away from the pedestrian-only zone, major pedestrian promenades and passages.
- Articulate the hierarchy of roadway network (e.g., loop roads, service routes, and parking access drives, etc.) through street dimensions, visual identity as well as signage and wayfinding system.
- Apply design approaches to distinguish the primary vehicular entry points from pedestrian gateways as well as the arrival plazas.
- Introduce gateway signage, directional signs and information kiosks at the gateway areas to inform students, faculty and visitors.
- Promote transit linkages to the surrounding communities by upgrading and densifying the bus stops on and around campus. Transit amenities such as shade structure, benches, and real-time information kiosks should also be provided at each bus stop commons to encourage the transit usage.

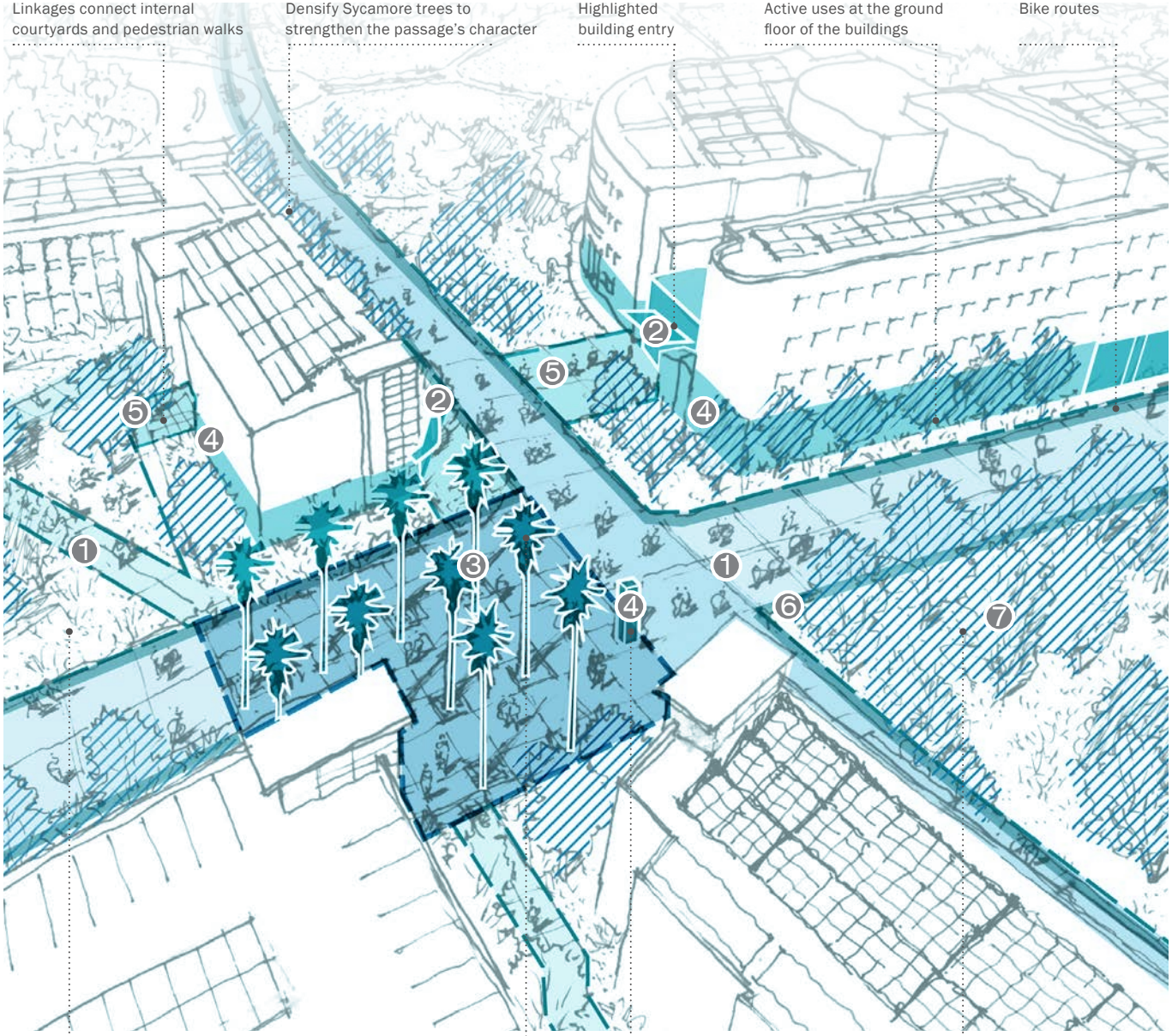
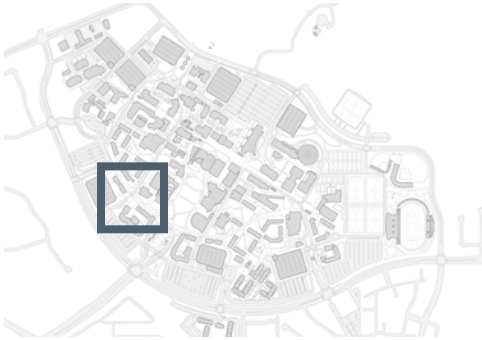


FIG A–2: SITE DESIGN GUIDELINES ILLUSTRATIVE 2



DESIGN RECOMMENDATIONS

1. Delineate a hierarchy of road network via dimension, pavement, landscaping, etc.
2. Define building entries with architectural details and entry plazas
3. Highlight the arrival plaza with palms and information kiosk
4. Incorporate active use at the ground floor along major pedestrian walk to activate the street
5. Apply different materials, patterns and landscaping design approach to distinguish diverse outdoor rooms
6. Introduce bike routes along major pedestrian walk w/ bike storage facilities
7. Utilize trees, plantings, fences, etc to screen parking garages, service entries and loading areas


Integrate transit shelter and information kiosks on and around campus for promoting transit usage and linkages

Use traffic calming approaches to reduce the potential conflicts between automobiles and pedestrians


Apply architectural language, details, or color to articulate the building major entry and ensure it is well-lit after sunset. Integrate ADA access ramp at the major entry of the building

- Improve traffic safety on and around campus. Traffic calming measures (including enhanced crosswalk, curb extensions, speed tables, etc.) should be applied at each key vehicular entry point and major intersections to protect pedestrians and bicyclists.
- Design clear service access routes connecting major service destinations on campus. Provide wayfinding directory signs for truck drivers.

ACCESS, PARKING AND LOADING

Intent

Building entrances help orient students, faculty and visitors to the campus. It is important that entrances should be clearly marked and visible from a distance. Appropriately place parking facilities, loading and service areas to avoid pedestrian/vehicular conflicts and minimize aesthetic distractions from the public realm.

Guidelines

- All building entries should be clearly defined and legible from a distance, and be located along the public spaces. All entries should be designed to feel safe and secure.
- Provide service access to all the buildings on-campus. Use trees, planting, fences, walls, grade separation, or any combination of these to screen the service areas from view.
- Integrate ADA access facilities along sidewalks and at all buildings' major entries as well as service entries wherever possible.
- Locate parking structures on-campus with clear circulation linkages to the academic core and residential zones. The 2016 Master Plan places sites for parking structures at the perimeter of the campus with good access from the campus loop road.
- Integrate tree planting on all surface parking lots to help mitigate runoff, microclimate and shade issues.
- Use landscaping or a low decorative wall to screen surface parking lots from the public right-of-way.
- On-site parking should be placed to the side or rear of buildings so that parking does not dominate the streetscape.
- Place loading facilities, loading docks, and any other maintenance facilities to the rear of the buildings, away from a primary building entrance, pedestrian passages, or outdoor gathering area.

Incorporate bicycle route with pedestrian walkways and passages

Place short-term bicycle parking at buildings' major entries. Integrate bicycle center with cafe / food and beverage establishments.

PEDESTRIAN & BICYCLE CIRCULATION

Intent

Pedestrians are the most important users of the campus; their movement and safety are fundamental to the site design of campus. In addition, the use of bicycles for on/off-campus commuting can reduce the use of private vehicles. Promoting bicycle and pedestrian culture on campus can help to create an inviting and healthier physical environment for students, faculty, and visitors.

Guidelines

- Reinforce the pedestrian-oriented character of the campus environment and organize the pedestrian circulation through pedestrian-only zone, pedestrian walks and campus trails with enhanced paving, shaded tree canopy, comfortable seating facilities, drinking fountains, and pedestrian-scale lighting.
- Establish a vibrant, urban character for major pedestrian pathways such as Coyote Promenade and Sycamore Walk on campus. Strengthen the pedestrian connections between walkways and the adjoining building entries, collaboration quads, and other public spaces.
- Wherever possible, extend the active uses at the ground floor of buildings and bring activities to the adjacent pedestrian plazas and passages.
- Use grade separations, curbs, bollards, special pavement, planters, tree rows to distinguish pedestrian zones from adjacent vehicular zones for pedestrian safety.
- Major pedestrian passages should be no less than eight feet in width to allow walking in groups and to permit wheelchair passage. Integrate ADA compliant curb ramps where possible.
- Integrate bicycle routes on primary pedestrian walkways. Provide ample bicycle amenities such as bicycle racks/lockers, repair stations and changing rooms/showers on campus. Bicycle amenities along major bicycle routes should be well-sited so as to not distract from the aesthetic quality of the campus realm.
- Place short-term bicycle parking in highly-visible locations adjacent to building main entries. Long-term bicycle parking should be located in parking structures or building lobby side rooms for easy access.

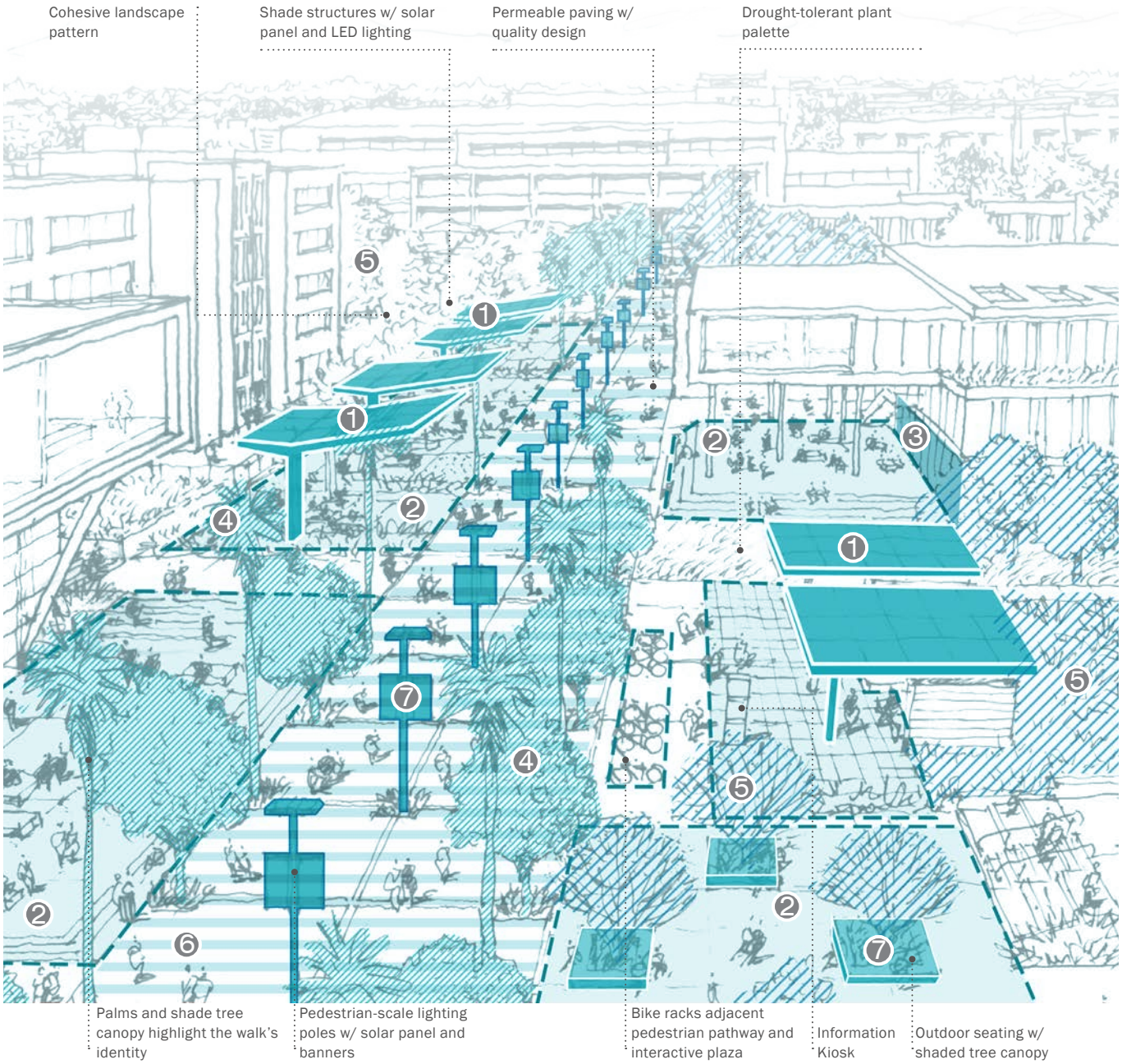
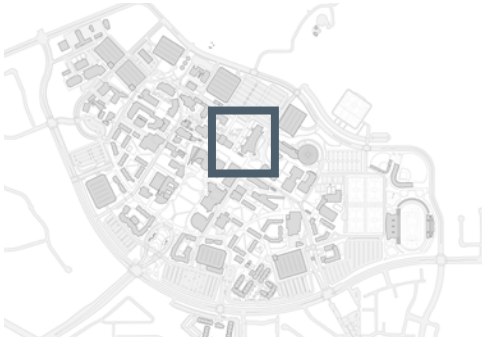


FIG A–3: SITE DESIGN GUIDELINES ILLUSTRATIVE 3



DESIGN RECOMMENDATIONS

1. Introduce shade structure to provide thermally-comfort outdoor interactive spaces
2. Use buildings and landscape to delineate various formal and informal outdoor rooms
3. Integrate active uses at the ground floor of the building, connecting with the outdoor rooms and pedestrian passages
4. Densify the palms and shaded tree canopy along the length of primary pedestrian pathway
5. Introduce a cohesive climate adaptive plant palette to unify the characteristics of the buildings and the environment
6. Apply quality design paving with permeable materials where have heavy pedestrian activities, i.e., passages & plazas
7. Provide ample human-scale amenities throughout the campus

A trellis creates a comfortable transition between indoor and outdoor environment for social interaction.

Shaded seating structures provide thermally-comfort outdoor rooms in the semi-desert environment.

Integrative actives uses on public plazas, providing shaded places to sit and linger.

OUTDOOR SPACES

Intent

Outdoor rooms are a crucial component in campus site design. Use buildings, landscape as well as site furnishings to create featured outdoor spaces on campus for accommodating social interactions and outdoor communications. Shade and wind protection are critical in the CSUSB environment.

Guidelines

- Define and contain outdoor spaces through a combination of building and landscape, providing different types of outdoor rooms such as public plazas, interactive collaboration quads and residential courtyards, etc.
- Introduce diverse architectural elements (e.g., arcades, trellises, sun shade structures, etc.) that will establish a comfortable transition between indoor and outdoor environment. These elements can help to provide a thermally-comfort outdoor environment for pedestrians in the semi-desert climate.
- Make outdoor space comfortable for human occupation and social interaction. Decorative paving, plants, furniture and lighting should shape, embellish, and give purpose to outdoor spaces. A high level of open space amenities is encouraged throughout the campus.
- Provide casual seating amenities such as tables, chairs, and benches in the outdoor interactive spaces. Integrate movable tables and chairs to accommodate flexibility of placement and spatial configuration.
- Design outdoor spaces with safety in mind, allowing for surveillance from the streets. Encourage the presence of active uses, such as cafes, food trucks, and vendors in the public spaces. Provide appropriate illumination in outdoor spaces after sunset for safety and security.

A.4 ARCHITECTURAL DESIGN GUIDELINES: ACADEMIC ZONES

A primary objective of the architectural guidelines for the CSUSB campus is to establish a strong sense of a family among buildings. Academic buildings should be designed to be explicitly collegiate in character and should include good proportions, visible points of entry and well-crafted expression of human scaled elements such as windows, doors, steps, ramps and canopies.

DESIGN PRINCIPLES

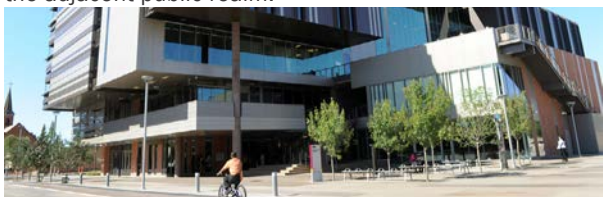
The Architectural Design Guidelines regarding Academic Zones are based upon the following six major principles:

COLLEGIATE CHARACTER: Each individual building within the academic zones should first establish its identity within the greater whole of the campus fabric and then present its individual identity and contribute as components of the network of the public spaces.

SOCIAL INTERACTION: Manage building massing and form to articulate outdoor rooms for accommodating social activities. Maximize ground floor activities, providing opportunities for strengthening social interaction and interdisciplinary collaboration.

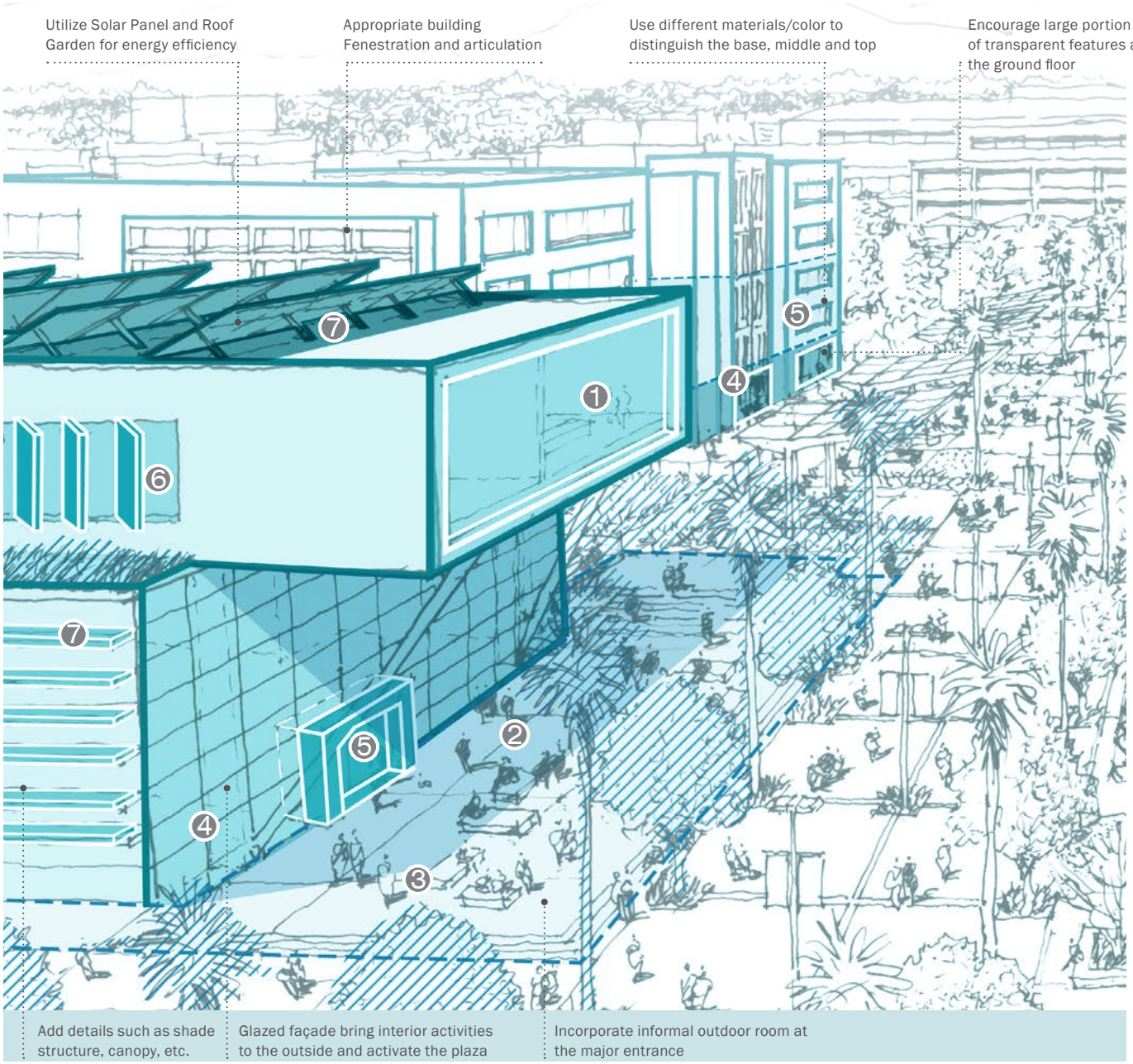
SUSTAINABLE PERFORMANCE: It is essential to promote integration systems in the building design that can minimize energy consumption and maximize occupant health. Integrate sustainable design approaches in all new building developments and existing building remodel.

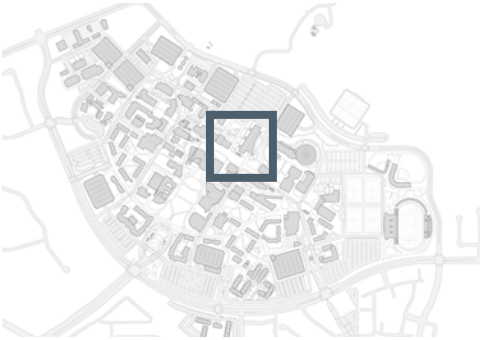
HUMAN SCALE: Encourage components that offer a human dimension, such as canopies, trellis elements, covered entries, and exterior light fixtures. Incorporate rich details, especially at eye-level for adding richness to the adjacent public realm.



ACCESSIBILITY: Buildings should be oriented and designed to make entries obvious and easily accessible for students and faculty from campus promenade, trails and other public spaces.

PERMANENCE: Raise the level of design of campus buildings. Use details, enduring materials, and color in tune with the campus context to exhibit a sense of permanence and quality.





DESIGN RECOMMENDATIONS

1. Take advantage of the scenic views of San Bernardino Mountain in building design
2. Provide a covered entry plaza for creating a shaded informal interactive space
3. Provide outdoor seating/tables for facilitating social interaction and interdisciplinary collaboration
4. Incorporate large proportion of transparent features for extending indoor actives to the outside
5. Use different architectural language, materials, and color to articulate building entrance and façade
6. Design operable windows for bringing in natural breeze for occupants
7. Promote green building performance by integrating solar roof panels, shade structures, and roof gardens for mitigating micro-climate

FIG A–4: ACADEMIC ZONE DESIGN GUIDELINES ILLUSTRATIVE

Campus buildings can be divided into two main categories: “Signature” buildings which occupy the visually and functionally important locations or are in the foreground of the campus; and “fabric” buildings that make up the overall fabric of the campus or occupy the visual and functional background.

“Signature” Building - The Pfau Library.

“Fabric” Building - Jack H. Brown Hall

MASSING & SCALE

Intent

A building’s massing and scale can be articulated through a variety of design techniques which can be used to articulate the facade of a large building to create visual proportion and scale. Building massing, whether for ‘significant’ or ‘fabric’ buildings, should be developed to create a comfortable relationship between the scale of the building and the scale of a person.

Guidelines

- Building massing and form should provide appropriate spatial relationships to their adjacent academic context and comprehensible to human-scale.
- The massing and architectural details of “Signature” or landmark buildings should belong to the campus family but may be more dramatic, more stately and should use more refined materials and detailing in keeping with their function and location.
- “Signature” buildings on the CSUSB campus will include the Pfau Library; the future Performing Arts building, and some student activity buildings such as the expanded Student Recreation and Wellness Center and the Student Union Expansion.
- “Fabric” or background buildings require less detailing, and their massing can be simpler while still being handsome in appearance.
- Academic buildings are typically to be three to five levels. Academic and research buildings less than three levels in height should require special approval by administration, since they consume large amounts of land area and limit future growth.
- Manage building massing and form by articulating individual identity among the collaboration quads. Create distinctive plazas, quads, and other open spaces for facilitating interdisciplinary collaboration and interaction.
- The massing and orientation should also take advantage of the featured views to the campus backdrop of the San Bernardino Mountains.
- Take advantage of the sun’s seasonal movements by properly orienting buildings. Employ flat roofs on all new academic buildings for integrating solar roof panels, assisting buildings to generate self-sustaining energy power.

BUILDING ENTRIES

Intent

The entries of academic buildings help orient students and visitors and should be clearly marked and visible from a distance. Well placed of building entries can help frame and activate the streetscape, assist with ‘wayfinding’, define outdoor gathering spaces, and provide students, faculty, and visitors with a pleasing environment on campus.

Guidelines

- All building entries should be articulated to differentiate primary and secondary entrances.
- Primary building entries should be oriented to major campus pathways and face the major pedestrian passages. Wherever possible, primary building entries should be placed at the end of pathway axes, whereas, secondary entries should access courtyard areas or campus pathways.

Covered building entry forms an informal social spaces and provides a transitional space that extends interior activities to the outside.

Articulation of buildings façade enriches the campus environment and provides human-scale comfort at eye-level.

Incorporate transparent features on the ground floor of the buildings to maximize visible ground-level activities.

- Primary and secondary building entries should receive architectural enhancements as a way of establishing a visual focus and a hierarchy of façade elements. Typically, such architectural enhancements include:

    - The use of accent forms and materials that clearly identify the entry from the building massing;
    - Enhanced materials and/or contrasting colors;
    - Sun shades;
    - Clear glass;
    - Special lighting; and/or
    - Special entry pavement.

- Coordinate the placement of entries as well as the design of the ground floors with the design of the adjacent public spaces.

- Where possible, employ a covered entry plaza for academic buildings along Coyote Walk to create a shaded informal outdoor rooms for promoting social interaction and mitigating climate impacts.

- Service entrances and areas should not be located in the fronts of buildings and should be consolidated where possible, along a shared service corridor. Existing service entrances and loading areas that are fronting streets or the public realm should be appropriately screened.

- All building entries should be designed to feel safe and secure, and be well lit after sunset. Incorporate signage at all building entires to provide building identification.

ARTICULATION & FENESTRATION

Intent

Proper articulation of a building' façade will add richness and variety to the academic architecture of CSUSB. Quality designed façades can help give architectural definition to campus streets, quads, and other open spaces. A clear pattern of building fenestration that unifies the building can strengthen the building identity, articulate the entrances and ground floor activities, provide natural light and ventilation to create comfortable indoor environments for building users.

Guidelines

- Clear delineation of a distinct base, middle and top for academic buildings. Articulate the building façade into constituent parts to create rhythm and interest. Provide visual continuity with neighboring buildings and engage the landscape design of open spaces.

- Research and laboratory building façades should express building function and structure, and scale articulation through reveals, mullions, setbacks, and changes of plane.

- Reinforce the buildings' connection to the public spaces upon which it fronts. Buildings' frontages along Coyote Walk, public plazas, collaboration quads and campus trails should create a welcoming and attractive outdoor environment.

- Incorporate multiple uses in academic buildings where appropriate, placing public functions on the ground floor and less public/more utilitarian functions on the upper floors. The ground-floor uses of buildings should be compatible with windows or glazed entry areas that invite pedestrian traffic, and provide a feeling of safety to pedestrians during the evening.

The building fenestration should consider the semi-arid climate environment where the campus sits. Incorporate elements such as arcades, trellises, canopies to enrich the public realm and enhance energy performance.

Recommended building materials palette include stucco, fiber cement panels, high-performance glass, metal panels and other materials suitable to a warm, arid climate.

- Avoid large blank/undifferentiated walls or an uninterrupted building mass in order to enhance the visual and physical scale of buildings, and to reinforce the feeling of safety.
- Encourage a diversity of window sizes, shapes and depths to creating unique and distinct patterns of shade and shadow at building façades.
- The placement and proportion of windows should consider the climatic features of semi-arid environment and should respect solar orientation, views, natural breezes and daylighting needs.
- Dark tinted, reflective or opaque glazing is discouraged for any required public street level wall opening and are also discouraged in other applications.
- Incorporate operable windows where appropriate for bringing in natural ventilation for occupants in academic buildings and institutional offices.
- Take every opportunity to introduce protected natural light into buildings, particularly into the lobbies, gathering areas and shared spaces within the building.
- Incorporate shade structures (e.g., arcades, loggias, trellises, etc.) as important elements for creating comfortable transitions from building internal spaces to outdoor gathering areas as a beneficial climate response.

MATERIALS

Intent

A major overarching design tool for unifying the campus is through the use of exterior building materials. The following guidelines suggest a specific palette of materials that can be deployed by future architectural designers to acknowledge the ‘signature’ or ‘background’ character of the building being designed. The recommended materials palette is based on the dominant and defining character of CSUSB campus – a semi-arid climate suggesting materials that evoke this semi-desert landscape environment which define this campus and serve as the campus “context.”

Guidelines

- Exterior building materials should be used to unify the collection of campus buildings. Stucco or ‘dryvit’, fiber cement panels, glass and other materials would be considered suitable to a warm, arid climate.
- The newer buildings tend to incorporate high proportions of glass and some use metal panels as facade materials.
- Clear, high-performance glass should be used to introduce natural light into structures as well as allowing true color views into and out of classrooms, offices and other campus buildings.
- Polished/reflective metal materials are not recommended for use on the campus.
- Metal buildings, although appropriate for industrial settings and even as temporary facilities, do not fit on the CSUSB.
- Renewable and recycled materials are highly encouraged to be used in all the new building developments and existing building remodel.

COLORS

Intent

Exterior building colors should be used to unify the collection of campus buildings. New and remodeling projects are opportunities to bring campus colors and materials into better alignment. It is recommended that the campus adopt an official campus color palette to guide the new building developments and existing building remodels. The guidelines and examples below provide directions for this palette.

- Many existing campus buildings are primarily light in color (beige or warm gray). The Design Guidelines recommend a campus color palette that is oriented around light colors with darker, more intense colors used only as accents.
- The hue examples shown on the right page are suggestions for the orientation of the color palette.

  - *Primary colors.* On new and remodeled buildings, a limited palette of light neutral colors should be used as building primary colors. Tans, beiges and other neutral colors should tend toward warm tones.

  - Coordinate with existing campus context by avoiding dark tones for a majority of the building's exterior materials.

  - *Secondary colors.* Secondary colors should be a limited palette of warm neutral earth tones.

  - *Accent colors.* Accent colors should be limited in area or to building details should be warm earth tone hues, include desert sand, green, and blue hues as shown in the exhibit on the right.

- The green and blue hues should be used as accents.
- Colors should be integral to the materials used to the greatest extent possible - emphasizing high quality materials over maintenance-heavy surface treatments.
- The primary color, secondary color, and accent color(s) should be varied by interdisciplinary collaboration quads or department building clusters to enhance the place identity.
- Deviations from the official campus color palette should be approved and reviewed by the campus body, committee or department that administers the campus design guidelines,

  - When possible, colors should be used to further divide building facades into human scale elements at the ground floor level.

  - Warmer neutral colors in light hues are preferred colors.
- CampusPolished/reflective metal materials are not recommended for use on the campus.
- Metal buildings, although appropriate for industrial settings and even as temporary facilities, do not fit on the CSUSB Campus.
- Clear, high-performance glass should be used to introduce natural light into structures as well as allowing true color views into and out of classrooms, offices and other campus buildings.

LIGHT BEIGE C=0 M=1 Y=15 K=5	**DARK BEIGE** C=24 M=24 Y=60 K=0	**PRIMARY LOGO COLOR** **PMS: 300** C=100 M=42 Y=0 K=0
LIGHT EARTH TONE C=5 M=10 Y=25 K=10	**DARK EARTH TONE / LIGHT BRICK** C=30 M=45 Y=50 K=10	**DARK BLUE ACCENT** **PMS: 298** C=100 M=55 Y=10 K=48
LIGHT WARM GRAY C=0 M=0 Y=5 K=12	**DARK COOL GRAY** C=20 M=15 Y=10 K=20	**LIGHT BLUE ACCENT / HIGH IRON GLAZING** C=70 M=15 Y=30 K=0
WARM OFF-WHITE C=2 M=2 Y=5 K=0	**RICH WARM TONE / TERRA-COTTA** C=20 M=60 Y=60 K=0	**ACCENT OCHRE / FINISHED WOOD** C=15 M=50 Y=100 K=0
To be used as Primary Colors, as described in the "Colors" subsection here.	*To be used as Secondary Colors, as described in the "Colors" subsection here.*	*To be used as color accents, as described in the "Colors" subsection here.*

A Good Example: The building exterior uses warm neutral Grey as primary color and warm earth tone colors - desert sand and reflected blue as accent color.

An Undesirable Condition: The building exterior uses a majority of dark tinted blue glazing with metallic paneling.

A.5 ARCHITECTURAL DESIGN GUIDELINES: RESIDENTIAL ZONES

The design of residential buildings requires thoughtful consideration of their scale and massing, and of their relationship to adjacent open spaces, structures, and their connections to the pedestrian and vehicle circulation systems. The following design guidelines for campus residential areas address two categories of structures: the new residence halls along the Sycamore Walk and enhanced student housing in the University Village area.

DESIGN PRINCIPLES

The Architectural Design Guidelines for Residential Zones are based upon the following six major principles:

COLLEGIATE CHARACTER: Housing buildings should portray an individual character, differentiating them from academic and institutional buildings, but still within the greater whole of the campus "context".

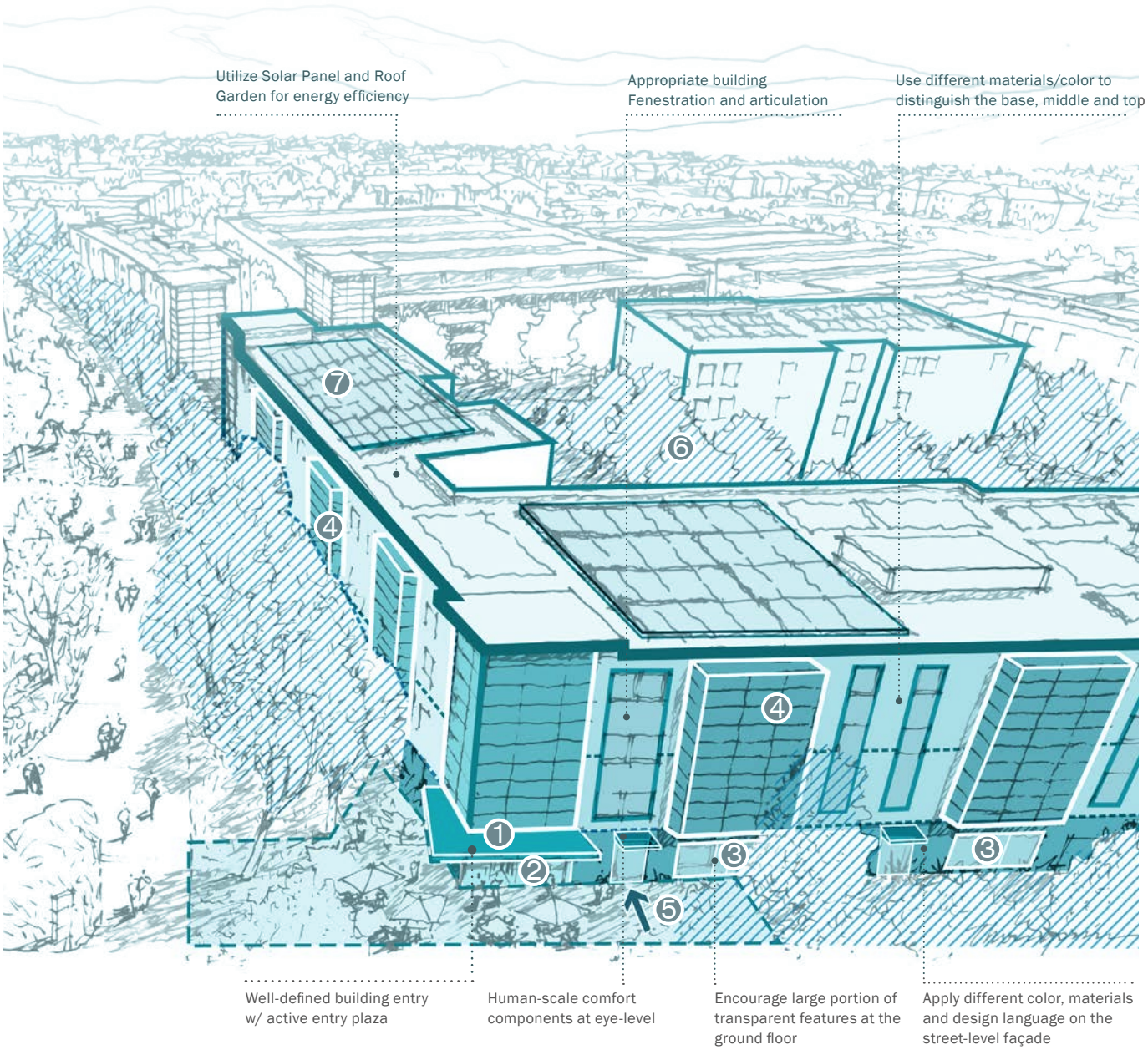
BUILDING STREET RELATIONSHIPS: Orient new residential buildings facing primary pedestrian walks and plazas; encourage active ground floor uses and establish interactive visual connections to animate the sidewalks.

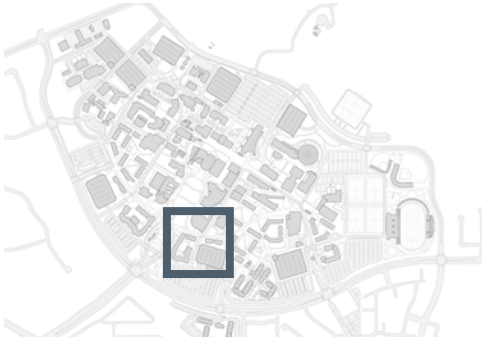
THREE DIMENSIONAL QUALITY: Articulate the building facades so as to introduce shadow lines, provide visual relief, and add richness and variety to the overall campus realm. Utilize a pleasing set of proportions and clear pattern of building openings.

HUMAN-SCALE: Encourage components that offer a human dimension, such as canopies, trellis elements, covered entries, and exterior light fixtures. Incorporate rich detail, especially at eye-level.

OUTDOOR ROOMS: Use building massing and orientation to define different types of outdoor rooms, such as courtyards, plazas, and other open spaces, to facilitate social interaction and passive recreation. Create a vibrant, urban-style living environment for the community.

PERMANENCE: Buildings and landscape can be used to define and enhance the campus's sense of permanence. Developments should make a long-term addition to the campus. Use details, materials, and colors in tune with the campus "context." Raise the level of design with materials that exhibit permanence and quality.



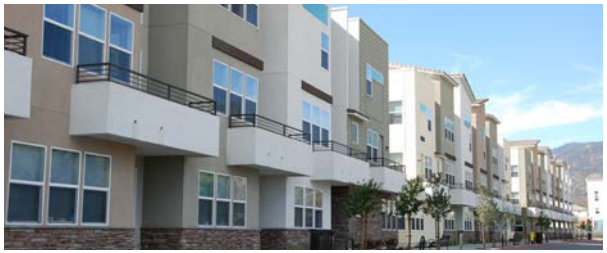


DESIGN RECOMMENDATIONS

1. Define the building entry by integrating human-scale components such as covered canopies
2. Ensure the building entries are designed to feel safe and secure, and be well lit in evening hours.
3. Incorporate large portions of clear-glass doors/windows at the ground floor to allow visual access to the building's interior
4. Articulate building massing and façade through detail, materials and color for distinguishing it from academic and institutional buildings
5. Coordinate the building ground floor design with adjoining walking passage and plaza
6. Use building massing to define semi-public courtyards; create linkages from outside to the internal yards
7. Integrate roof garden and solar panel on the roof of the building for enhancing energy efficiency

FIG A–5: RESIDENTIAL ZONE DESIGN GUIDELINES ILLUSTRATIVE

Existing residential buildings on campus are primarily 2 to 3 levels



New residential development on Northpark Boulevard respects the existing character of residential zone on campus

Manage the building mass and add components to the building facade to break down the apparent mass. New housing buildings will typically be three to four levels.

Highlight the building entry through different architectural language. Use large portion of clear-glass features at the entrance to ensure safety and security at night.

MASSING & FORM

Intent

Attention to residential building massing and scale is important to reinforce the overall character of the campus. Sensitive considerations are required in the building design to articulate the appropriate building volume, respecting the overall campus environment and providing visual interest and human-scale.

Guidelines

- Portray a residential identity in the massing of housing buildings within the greater whole of the campus environment.
- Housing buildings will typically be three to four levels to acknowledge their specific residential function and to be consistent with the scale of other campus buildings.
- Manipulate the scale of buildings to provide visual interest. Recessed wall planes and building off-sets may help to create shadow lines and visual diversity.
- Utilize building massing and scale to articulate semi-public and private gathering areas. Provide transitions to indoor, outdoor spaces, and adjacent buildings. Ensure natural light in these social interacting spaces.
- Articulate elements and add features to help break down the apparent mass of the complex to a more intimate, approachable scale. Incorporate smaller-scale components on lower levels.
- Effective building massing can optimize solar orientation, natural ventilation and passive heating and cooling and thus reduce building energy use.

BUILDING ENTRIES

Intent

The entries for residential buildings should be well marked and easily accessible for residents from campus pathways.

Guidelines

- Establish clear and congenial connections from housing buildings to the adjacent campus. Existing and planned new pathways should be landscaped and incorporate uses that encourage gathering and both organized activities and informal interaction.
- Wherever possible, orient residential building entries toward major campus walkways and primary plazas. For example, the building lobbies of residence halls along Sycamore Walk should be oriented to face the sidewalk.
- Design multiple entries to create a hierarchy (primary, secondary, service, etc.) and differentiate the function of entries. Entries providing a direct visual connection to internal courtyards are also encouraged.
- Coordinate the design of the ground floors of residential buildings with the design of the adjacent walkways, plazas, and courtyards.
- Incorporate diverse active uses on the ground floor of all new housing buildings and the existing housing buildings where possible. Introduce classrooms, faculty offices, innovation spaces, lounges, as well as food, and beverage services to encourage social interaction.
- All residential building entries should be designed to feel safe and secure, and be well-lit in evening hours.

Incorporate active uses at the ground floor of residential buildings.

Recommended building exterior primary colors could include beige, warm grey, warm neutral earth tones, etc.

High saturation colors can be used to articulate the building elements such as entrance, window frame, canopy, etc., to increase visual interest.

Incorporate wood / wood-related materials to express a more residential feeling

- Use landscape to buffer residential buildings away from roadways. Pathways that cross vehicle circulation routes must incorporate multiple layers of warning and notification, through special pavement, change of landscape and signage, that a pathway will encounter a vehicle route.

ARTICULATION & FENESTRATION

Intent

Proper articulation of the building's façade can add visual variety to the residential buildings and in the meanwhile respect the surrounding context. Well-chosen architectural elements in the building fenestration design can reinforce building identity, create human scale comfort at eye-level and activate the adjacent public spaces.

Guidelines

- Employ articulated façades and architectural details to distinguish residential buildings from academic, institutional and recreational buildings.
- Encourage active uses and ample fenestration at the ground floor. Incorporate transparent features (clear glass on windows and doors) in the façades to allow visual access to the building's active interior uses that create interest for pedestrians walking by.
- Minimize blank and/or undifferentiated walls at the ground floor. The building façade at the ground floor should be open to view from adjacent spaces. Incorporate permeable ground floor areas such as arcades or open connections to internal courtyards wherever possible.
- Encourage all the new residential buildings and remodeled existing buildings to incorporate solar panels and roof gardens for climate mitigation.
- Screen unsightly items such as garbage cans, utility boxes, and mechanical equipment from view at ground level of streets and from other buildings where feasible.
- Screening should consist of approved fences or landscape buffers. Roof screens should be compatible and complement exterior materials and color.

MATERIALS & COLORS

Intent

The selection of materials and color palette for residential buildings must conform to the official color and material palettes mentioned previously and be approved by University.

Guidelines

- Exterior building materials should be chosen for their ability to lend texture and visual interest while providing durable, low-maintenance surfaces.
- The materials palette for residential buildings should incorporate wood or wood-like materials to create a more residential environment and help the buildings relate to the campus landscape.
- The colors for residential buildings can be more vibrant than academic buildings, but still should be visually cohesive within the overall campus fabric. Warm tone colors (beige, light grey, warm earth tone colors) are more recommended.
- High saturation colors can provide building identity at entrances or courtyards and can be used to accent building elements to create visual interest and human scale.

A.6 ARCHITECTURAL DESIGN GUIDELINES: PARKING STRUCTURES

Parking structures, although they provide a utilitarian function, are usually the largest structures on a campus and generally visible from major public streets, and therefore, their massing, articulation and design details (stair towers and facades materials) are critical to creating a handsome, congenial, pedestrian-scale campus. The following design guidelines address the design of parking structures in a way that keeps these large facilities sensitive to scale, form and safety in ways that do not detract from the campus image.

DESIGN PRINCIPLES

The Architectural Design Guidelines for Parking Structures are based upon the following six major principles:

CONTEXT COHERENCY: Parking structures should be designed to blend into the surrounding campus environment and not stand out as utilitarian structures that detract from the overall campus image.

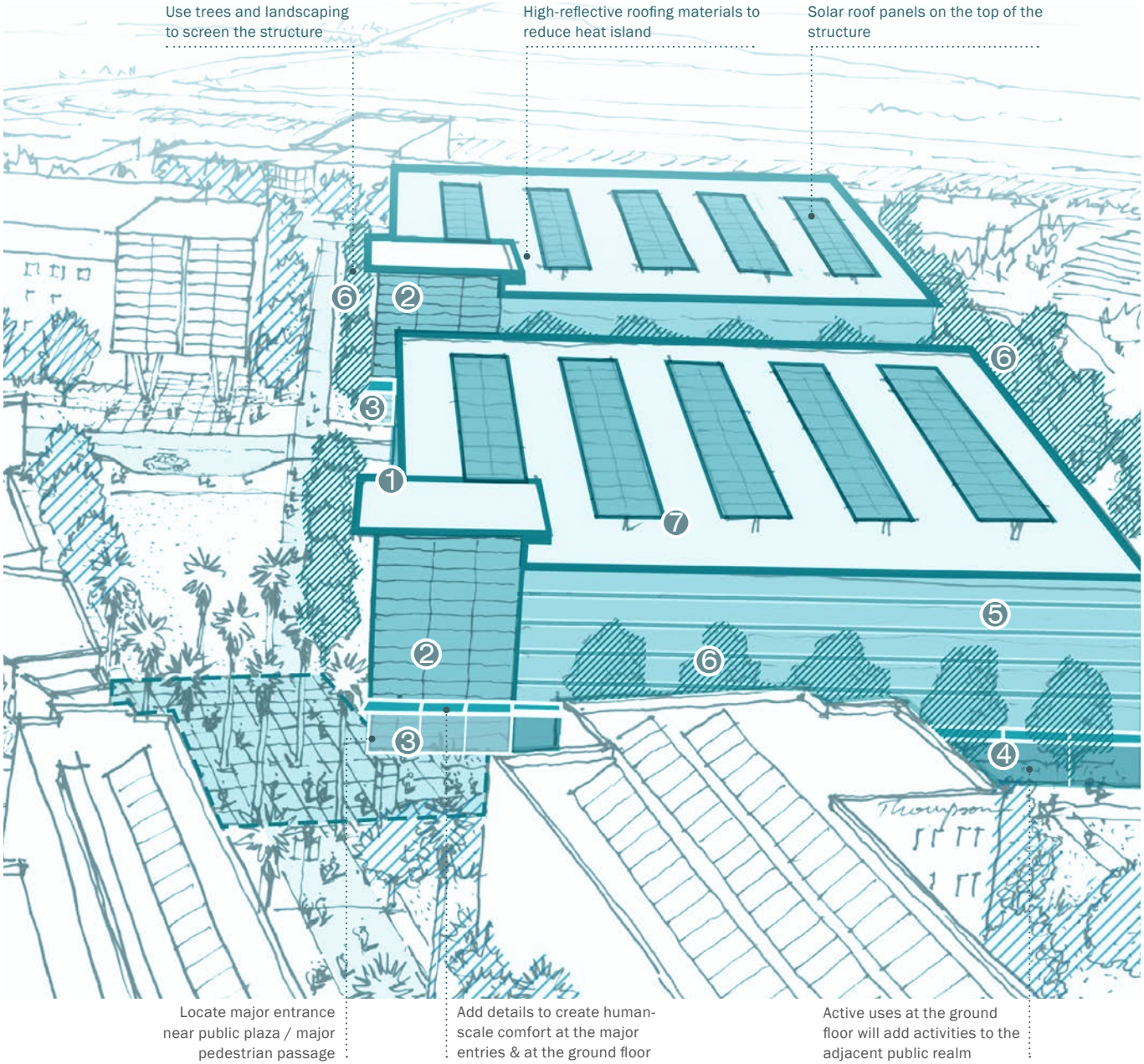
ARCHITECTURAL INTEGRITY: Apply design approaches to articulate the massing, scale, form and details of the parking structures for establishing a strong architectural integrity and reducing their apparent mass.

ACCESSIBILITY: Locate parking structures at the peripheral of the campus adjacent to the campus loop road with clear-marked entries. Elevators and stairs of the parking structures should be highlighted architecturally, so people can easily find and access these entry points.

PEDESTRIAN EXPERIENCE: Locate vehicular and pedestrian entries appropriately to minimize vehicle/pedestrian conflicts. Wherever possible, integrate actives uses at the ground level to add activities to the surrounding public realm.

VISUAL IMPACTS: Minimize negative visual impacts of parking structures on the adjacent buildings and the public realm by disrupting the monotony of its underlying structure systems through wall mass and window opening and through variations in color, material, and/or texture.

SUSTAINABLE PERFORMANCE: Integrate sustainable design approaches in the parking structure design and apply solar roof panels, renewable materials, natural ventilation, and stormwater treatment measures where possible for achieving the goal of green building performance.



DESIGN RECOMMENDATIONS

1. Manage the structure massing, scale and form to reduce its apparent mass and negative visual impact
2. Clearly define the vertical circulation element (stair tower and elevator core); ensure it is glazed and well-lit after sunset
3. Highlight the structure major entrance; integrate components to provide human-scale comfort at eye-level
4. Integrate active uses at the ground floor of the structure, i.e., office, retail, and food and beverage establishments, etc.
5. Increase exterior openings and minimize solid walls for passive surveillance
6. Use trees, plantings to screen the structure and blend it into the surrounding environment
7. Utilize solar roof panels, reflective roofing materials for enhancing energy efficiency and reducing heat island effect

FIG A–6: PARKING STRUCTURE DESIGN GUIDELINES ILLUSTRATIVE

Parking structure stair towers should be glazed and well-lit at night to provide maximum visibility and safety.

The lighting, form, and facades of the parking structure should articulate the entries to both the stairway and elevator - offering spacious and safe entry setting at structure corners.

Parking structure with actives uses at the ground floor

MASSING & FORM

Intent

The massing and form of parking structures exert critical impacts on the surrounding environment. Careful management of the massing, scale and form of the parking structure can help to minimize its apparent mass and help to integrate these large structures into the campus.

Guidelines

- Manipulate the massing, scale and form of the structures proportionally to reduce their negative impacts on the overall character of the campus image and enhance the quality of design for the parking structures.
- Limit the height of parking structures to six levels, including parking on the roof level. It is preferable for parking structures to be no more than five levels.
- Apply architectural design approaches to the design of bulk and scale for decreasing the “visual weight” of structure massing as the height increases.
- Define stair towers and elevator cores to be distinct taller masses that intersect the mass of the main structure.
- Encourage placing Internalized ramping in parking structures to avoid an angular geometry at the perimeter of the structure.
- Where residential buildings are built together with parking structures, efforts should be made to use the buildings to screen the parking structures from shared open spaces created by the arrangement of housing buildings.

ARTICULATION AND DETAILS

Intent

The articulation and design element details (stair towers and facade materials) of parking structures are critical for creating a congenial, pedestrian-scale campus. Other elements such as landscape screening, LED colored panels are encouraged to be integrated in the exterior design for achieving a visually distinctive.

Guidelines

- Clearly delineate the vertical circulation elements (including stair towers and elevator cores) of parking structures and place them close to the main entrances of the structure. Use details, materials and textures to highlight the main entrances and make them visible from a distance.
- Where parking structures and pedestrian areas/ public spaces adjoin, deploy a high level of design language at the exterior edge of the parking structure (e.g., decorative details, overhead trellises, planters/seat walls, pedestrian-scale lighting, etc.) to establish a comfortable and well proportioned human dimension.
- Integrate academic, office or retail uses at the ground floor in the exposed sides of the parking structures to humanize and activate the adjoining passages and open spaces where programs permit.
- Soften the facades of parking structures facing primary pedestrian pathways, residential zones, or major public spaces by incorporating architectural or landscape screening onto the structure.

Use landscape to provide visual perimeter screening onto the structure.

Recommended base material colors should be predominantly very light neutral colors, or a blend of colors when viewed from afar which help decrease the "visual weight" and be compatible with the surrounding context.

- Design the structures for passive surveillance by increasing exterior openings and minimizing solid walls. Avoid large blank walls and continuous sloped strip openings on structure facades.
- Stair towers should be glazed and well-lit for safety and security. Lighting for stair and elevator towers should allow those elements of the structure to serve as a visible beacon to pedestrians at night.
- Minimize the openings on the structure façades which facing the residential areas to avoid noise and lighting impacts.
- Incorporate sustainable design features such as solar roof panels, renewable materials, and stormwater treatments wherever possible for achieving green building performance.
- Natural ventilation and daylighting are also encouraged in order to minimize mechanical ventilation.

MATERIALS & COLORS

Intent

Within the budget constraints, the selection of exterior materials and colors of parking structure should be applied to reduce the overall monotony image of the structure and help blend the structure into the adjacent campus environment.

Guidelines

- Parking structures should be designed to match the vocabulary of color materials and scale of the architecture buildings on campus.
- Recommended material palate for the exteriors of parking structures on campus might include precast concrete, cast-in-place concrete, brick, or similar materials.
- Encourage the use of high reflective roofing materials on the parking structures to minimize heat island effect.
- Encourage the use of white or very light color on the walls and ceilings within a parking structure to increase the perception and reality of safety. This will reflect and distribute light from light fixtures and reduce shadow areas.

A.7 LANDSCAPE DESIGN GUIDELINES

The following design guidelines are aimed to provide guidance for creating a strong landscape framework that can help establish overall landscape identity for the campus site, unify the campus building character, and provide appealing multi-functional outdoor spaces for accommodating diverse events, programs, social interactions, and interdisciplinary collaboration.

DESIGN PRINCIPLES

The Landscape Design Guidelines are based upon the following six major principles:

REGIONAL CHARACTER: Contribute to the authentic character of the regional semi-arid/desert environment through the use of regional adaptive plant species and locally/regional sourced materials.

LANDSCAPE IDENTITY: Apply different landscape design approaches, plants, detail components, materials to establish a distinguished identity for each landscaped zone but still achieve a coherent landscape image that matches with the overall campus building character.

MULTI-FUNCTIONAL: Integrate a range of open spaces with distinctive character and assorted scale that can accommodate diverse programs, events and activities for enriching the campus public realm and adding more interest to the community.

COMMUNAL SPACE: Provide ample outdoor rooms for students, faculty, and visitors as communal spaces encompassing both informal/formal, public/semi-public open spaces for facilitating social gatherings and interactions.

HABITAT ENRICHMENT: Introduce native plant species and natural systems to create a resilient community which can protect and increase biodiversity, reduce maintenance, minimize water and energy consumption and create a positive environmental impact.

LOW IMPACT DEVELOPMENT (LID): LID designs should be considered early on in the site design and development process. Where possible, integrate LID treatments such as native vegetation, permeable pavers, bioswales, rain gardens for stormwater capture and micro-climate mitigation.

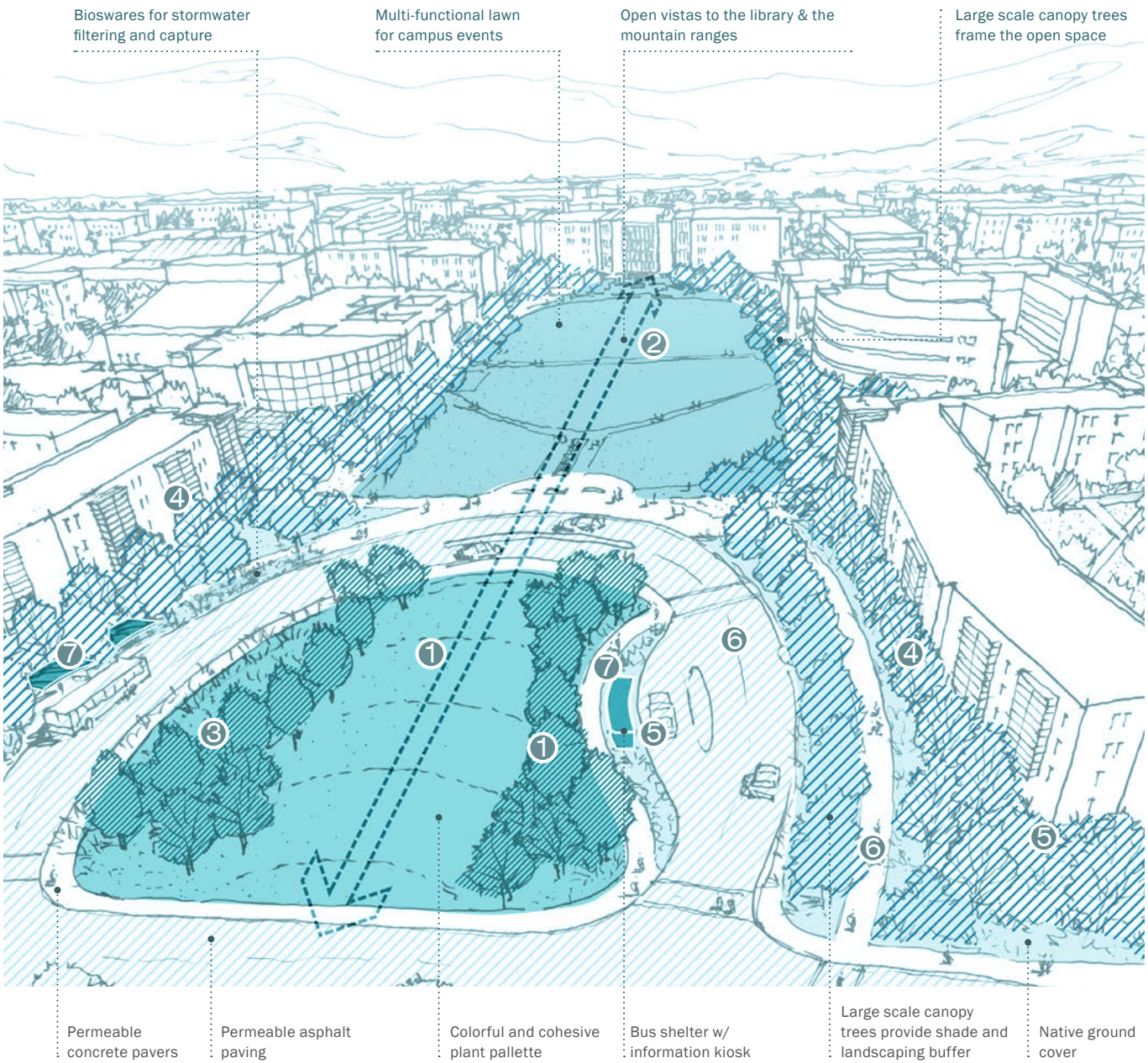
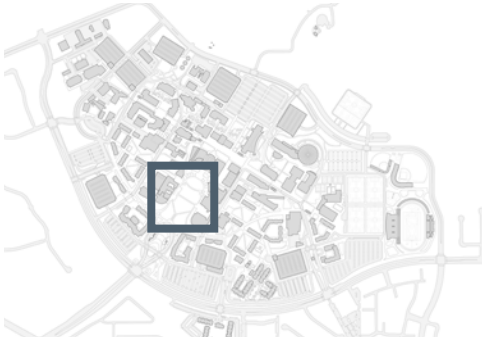


FIG A–7: LANDSCAPE DESIGN GUIDELINES ILLUSTRATIVE



DESIGN RECOMMENDATIONS

1. Reinforce the legacy open space as a visual axis that connects the community and the university, providing open vistas to the Pfau Library & the San Bernardino mountain ranges
2. Preserve the iconic multi-functional open lawns for campus festivals and events
3. Introduce a native/climate-adaptive plant palette and a cohesive landscape theme to highlight the gateway image
4. Use large scale canopy trees to frame the singular open space and to buffer the proposed residential buildings
5. Introduce bioswales, drought-tolerant plants, and native ground cover along pedestrian paths and trails
6. Use permeable asphalt paving material on vehicular routes and permeable concrete pavers on sidewalks
7. Provide information/parking kiosk and bus shelters adjoining auto/bus passenger drop-off point at the entry loop

Conserve and preserve the natural setting of CSUSB in the campus future development

Protect the high-biologic diversity and incorporate educational programs in the "Land Lab" zone

Densify the planting of palms along Coyote Promenade to strengthen the landscape character

NATURAL OPEN SPACES

Intent

The natural setting of CSUSB is a significant component of the campus green infrastructure for protecting and maintaining regional landscape character and biodiversity of the overall landscape environment on campus. Integrative approaches should be taken into account during campus site landscape design for respecting and preserving the natural context at large.

Guidelines

- Reserve the "land lab" area on the north border of the campus as an undeveloped, preserved open space resource.
- Protect and maintain the biologic diversity of the natural habitat in the "land lab" zone. Incorporate outdoor educational programs within the zone where they can be designated as high-value teaching areas.
- Protect wildlife/native species habitat and corridors where possible, maintaining the biologic linkages between these natural reserves and the other landscape zones.
- Restore the biologic habitat/corridors where they have been disturbed or eroded.
- Sensitively locate the sites for any needed-infrastructure facilities within the natural reserves.
- Use native or climate adapted plants on the transitional edges of natural reserves to help attain sustainability goals and blend the campus with the overall natural environment.

LANDSCAPED SPACES

Intent

A range of landscape design approaches should be integrated in the landscape design for all public spaces and outdoor rooms to strengthen their landscape character and create appealing, interactive and safe outdoor environments.

Guidelines

- Maintain and reinforce the landscape theme at the Gateway Commons. Preserve the iconic open lawn in front of the Pfau Library for accommodating campus events and festivals.
- Integrate native flora, drought-tolerant plants as well as large-scale electronic and static signage monuments on the adjoining transit plaza to the enhance the campus central entry identity.
- Introduce wayfinding/signage kiosks, bike lockers and racks as well as pedestrian - scale illumination equipment on the Arrival Plazas (at parking structures) and each Interactive Plaza along Coyote Walk. Promote permeable hardscape materials for stormwater capture.
- Densify the palms and shaded tree canopy along the length of Coyote Walk. Extend hardscape to the buildings along the Walk forming a series of interactive plazas and entry plazas.
- Incorporate solar panel shade structures, collaboration pavilions, bike lockers, casual seating and tables for creating an aesthetically appealing and thermally-comfort walkway that links with the internal collaboration quads.

Incorporate bio-swales, rain gardens, permeable paving, native ground cover along pedestrian pathways and campus trails

Introduce a cohesive climate adaptive plant palette to unify the campus building character. Use drought-tolerant plants on campus for lower maintenance and water conservation especially.

- Strengthen the residential avenue character of Sycamore Promenade by using landscape approaches that unify the adjoining housing façades and the active uses at the ground floor of the residential buildings.
- Preserve and densify the planting of Sycamore trees along the length of Sycamore Promenade to reinforce its authentic landscape character. Incorporate bio-swales, permeable paving, native ground covers and drought-tolerant grasses in the landscape design.
- Densify the street tree planting and identify specific tree types for Campus “urban” trails. Provide street furnishings, bench seating, pedestrian-scale lighting along the trails. Incorporate bio-swales or rain gardens wherever possible.
- Delineate a unique landscape character and flora variety for each interdisciplinary collaboration quad and residential courtyard with regards to its surrounding building clusters. Provide shaded canopy, movable chairs and tables, food and beverage offerings to facilitate social interaction in these outdoor rooms.
- Use structured landscape to soften the transitions of buildings to the adjoining public spaces, screen service/loading areas and blank building façades.
- Incorporate linear tree windrows for seasonal wind mitigation and to buffer athletic/sports fields. Provide storm water retention and infiltration wherever typographic conditions allow.

PLANTS

Intent

Create a plant palette with a variety of plants that grow well and are easily maintained in the CSUSB semi-arid micro-climate.

Guidelines

- Promote the utilization of native or climate-appropriate and drought-tolerant plantings within all the campus landscape zones. Refer to the detailed Plant Material Palette provided in Appendix B for the selection of specific plants that require low water consumption.
- Respect and reinforce the natural and designed planting patterns as well as the intrinsic and recognizable character of each landscape zone on campus. Consider fragrance, sound, color and texture in planting design.
- Locate trees to maximize exposure to winter suns and provide summer shade along the length of pedestrian walks, trails or adjoining to the façades of academic/residential buildings.
- Reduce the area of turf as existing ground cover on campus. Focus the use of turf on areas such as gateway commons, interdisciplinary interaction quads, residential/institutional courtyards that may require a walkable surface. Replace the turf with drought tolerant grasses or native ground cover.
- Promote water conservation by using a computer-regulated irrigation system as well as efficient subterranean drip irrigation systems for water conservation.
- Keep plantings healthy without the use of conventional fertilizers and pesticides. Promote ease of maintenance on campus.

Pathways, plazas where accommondating intense pedestrian activities can use permeable modular pavers; vehicular routes should use permeable asphalt paving

Soft-surface paving materials can be used on campus trails or small paths in gardens and natural reserve area

Different paving patterns with consistent color and materials can create a sense of harmony and define the character of public spaces

PAVING

Intent

Variations of paving textures, color and material selections are intended to be associated with the hierarchy of public spaces on campus, including pedestrian walks, plazas, quads, courtyards, gardens, natural reserves and other open space areas. A high quality of paving design will enrich the public realm identities, improve visual quality, and reinforce the primacy of pedestrian activities throughout the CSUSB campus site.

Guidelines

- Utilize high-quality modular paving units such as precast concrete, brick pavers, cast stone or tile accents on major pedestrian walkways such as Coyote Walk and Sycamore Promenade, public plazas, interaction quads, courtyards and building entries where accommodating high-level of pedestrian and social interactive activities.
- Continue using cast-in-place concrete pavers on the pedestrian pathways throughout the campus. Consider replacing the impervious concrete pavers with permeable concrete pavers gradually on the sidewalks during future campus development
- Use soft-surface paving materials (decomposed granite) on the small paths/trails within the natural environment such as rain gardens and natural reserves to build connections that reinforce the natural environment.
- Use permeable asphalt paving materials on campus for all the vehicular roadways due to its durability and flexibility. Avoid using asphalt paving in the areas with heavy pedestrian activities which are primarily located in the centralized area of the campus.
- Use permeable, porous pavers for surface parking lots. Where permeable surfaces are not feasible, use asphalt and perforated curbs draining into bio-swales that allow rainwater capture and infiltration.
- The color selection of paving materials should be consistent with the surrounding building character and pedestrian activities. Warm colors should be used to provide richness and human scale, especially along primary pedestrian walkways, major intersections, public plazas, collaboration quads, and residential/institutional courtyards, balanced with the use of lighter colors for reducing heat island effects.
- Prohibit the use of dark-tone, petroleum-based paving materials which increase the heat island effect and require high energy consumption in their own production.

SHADE STRUCTURES

Intent

Shade structures, such as arcades, trellises, canopies and solar panel shade structures, either attached to the buildings or freestanding as individual components at the public plazas can help create comfortable shaded areas for accommodating formal/informal social activities by mitigating microclimate within the semi-desert environmental context.

Guidelines

- Integrate arcades, trellises, overhang canopies in the campus building design for providing a transition spaces from the indoor to the outdoor environment as well as shelter from extensive sunshine within the semi-desert environment. .

Design the attached shade structure in a rhythm, proportion, and scale sympathetic to the building

Shade structures on public plazas provide a comfortable outdoor interactive area and act as a landscape art component

- Design shade structures to express the rhythm, proportion, and scale sympathetic to the building to which it is attached.
- Provide various types of shade structures in the public areas for sheltering sunshine and creating a thermally-comfortable outdoor environment for students, faculty and visitors.
- Integrate high-tech elements to enhance the overall design quality of the campus environment. For example, the LED solar PV shade structures on Coyote Promenade can help to create a shaded outdoor room during daylight and an active, illuminated public space at night.

LANDSCAPE ART

Intent

Incorporate art installations within the campus landscape design. The art components can delineate outdoor spaces, add richness to the public realm, strengthen the overall campus identity, or serve as a visual landmark or a focal point within the public spaces throughout the campus.

Guidelines

- Locate sculpture art at campus gateways, arrival plazas, or other important pedestrian gathering and interactive spaces for creating a focal point and reinforcing the landscape character.
- Select the art installations that relate to the associated academic/residential buildings for enhancing the overall learning and social interactive experience.
- Place each art piece to relate to its surrounding immediate context. Encourage interactive art installations for vitalizing the public spaces and providing students and visitors opportunities to directly interact with the art work.
- Integrate art elements in the paving, signage and wayfinding as well as campus furnishing design.
- Promote high quality design of the art components. Use enduring materials to reduce the cost of on-going maintenance.
- Paving materials should be selected
- for durability to withstand wear and
- minimize maintenance

APPENDIX

B CAMPUS LANDSCAPE PALETTE

B.1 INTRODUCTION + APPLICABILITY

The Campus Landscape Palette Table is provided as a resource in order to aid designers and decision makers in the evaluation of planting designs, both for new construction areas as well as for renovations. The overreaching objectives in utilizing the plants from this table are to promote a more cohesively unified landscape that reflects and demonstrates an authentic commitment to sustainability and resilience.

INTRODUCTION

In general, the plants indicated on the following pages are either California natives or regionally adapted indigenous species and therefore may be considered hardy, water wise and resilient in nature, requiring reasonably minimal or modest degrees of maintenance and care. They may be considered generally pest free and noninvasive. This table should be considered as preferred plants but certainly is not exhaustive and does not preclude the selection of other plants that may be suitable for unique or special sites on Campus, providing that they meet the general sustainable ecosystem criteria described within the Master Plan.

APPLICABILITY

The application of plants to specific project conditions will require on-going detailed evaluation in order to match plants to the site specific aspects of use and function, solar orientation, wind exposure, drainage and soil conditions. The Plant matrix incorporates general information regarding plant characteristics, particularly recognized irrigation requirements along with the likely areas of the campus landscape in which the plant may best be utilized.

Employing this Campus Landscape Palette as a guide for diversifying the mix of specimens with each landscape retrofit, rather than a list of restrictions, will create a more engaging campus setting than currently exists. Almost all options presented in this Palette will lead to a more sustainable and resource-sensitive campus environment than the default application of turf seen around CSUSB today.

LEGEND

WUCOLS		FEATURED ZONES			
VERY LOW	GC	1.1 GATEWAY COMMONS	AP	1.5 ARRIVAL PLAZAS
LOW	CW	1.2 COYOTE WALK	CQ	1.6 COLLABORATION QUAD
MODERATE	SW	1.3 SYCAMORE WALK	NH	1.7 NATURAL HABITAT PRESERVES
HIGH	CT	1.4 CAMPUS TRAILS	RAF	1.8 RECREATION/ATHLETIC FIELDS

SMALL TREES : 25FT - 30FT

EVERGREEN

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCY	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Acacia aneura	Mulga Acacia		Yellow										
Callistemon citrinus	Lemon Bottlebrush		Red		GOOD								
Laurus nobilis	Sweet Bay				GOOD								
Leptospermum 'Dark Shadows'	NCN		White										
Leptospermum petersonii	Lemon-scented Tea Tree		White										
Olea europaea'Wilsonii'	Fruitless Olive												
Acacia podalyriifolia	Pearl Acacia		Yellow										
Arbutus unedo	Strawberry Tree		White										
Arbutus 'marina'	Marina Strawberry Tree		Pink										
Eriobotrya deflexa	Bronze Loquat		White										

DECIDUOUS

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCY	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Acacia farnesiana	Sweet Acacia	✓	Yellow		GOOD								
Acacia willardiana	Palo Blanco		Cream										
Aesculus californica	California Buckeye	✓	Cream										
Cercis occidentalis	Western Redbud	✓	Magenta										
Chilopsis linearis	Desert Willow		Pink		GOOD								
Chitalpa tashkentensis	Chitalpa		Pink										
Chorisia speciosa	Silk Foss Tree		Pink										
Prosopis 'Phoenix'	Phoenix Mesquite		Light Yellow										
Psorothamnus spinosus	Smoke Tree	✓	Dark Blue										
Koelreuteria bipinnata	Chinese Flame Tree		Yellow										
Lagerstroemia 'Muskogee'	Muskogee Crape Myrtle		Lavender		GOOD								
Lagerstroemia 'Natchez'	Natchez Crape Myrtle		White		GOOD								
Parkinsonia 'Desert Museum'	Mexican Palo Verde	✓	Yellow										

TABLE B–1: CAMPUS LANDSCAPE PALETTE TABLE

LEGEND

WUCOLS		FEATURED ZONES			
VERY LOW	GC	1.1 GATEWAY COMMONS	AP	1.5 ARRIVAL PLAZAS
LOW	CW	1.2 COYOTE WALK	CQ	1.6 COLLABORATION QUAD
MODERATE	SW	1.3 SYCAMORE WALK	NH	1.7 NATURAL HABITAT PRESERVES
HIGH	CT	1.4 CAMPUS TRAILS	RAF	1.8 RECREATION/ATHLETIC FIELDS

MEDIUM TREES : 30 FT - 40 FT

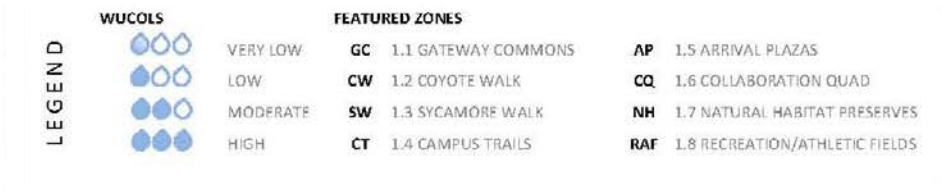
EVERGREEN

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCY	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Brachychiton populneus	Kurrajong Bottle Tree		Yellow										
Quercus douglasii	Blue Oak	✓											
Rhus lancea	African Sumac		Yellow										
Cinnamomum camphora	Camphor Tree												
Eucalyptus ficifolia	Red-Flowering Gum		Red										
Geijera parviflora	Australian Willow		Cream										
Lophostemon confertus	Brisbane Box		White										
Eucalyptus nicholii	Narrow-leafed Black Peppermint				GOOD								

DECIDUOUS

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCY	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Parkinsonia florida	Blue Palo Verde	✓											
Fraxinus velutina 'Rio Grande'	Fan-Tex Ash												
Ginkgo biloba	Ginkgo												
Jacaranda mimosifolia	Jacaranda		Lavendar										
Parkinsonia 'Desert Museum'	Mexican Palo Verde	✓	Yellow										
Pistacia chinensis	Chinese Pistache												
Robinia pseudoacacia	Black Locust												
Robinia x ambigua Idahoensis	Locust												
Zelkova serrata	Japanese Zelkova												

TABLE B-1: CAMPUS LANDSCAPE PALETTE TABLE [CONTINUED]



LARGE TREES-50FT ~ 70FT

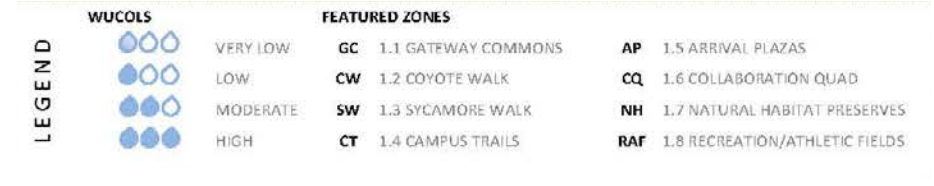
EVERGREEN

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCY	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Eucalyptus cladocalyx	Sugar Gum												
Quercus agrifolia	Coast Live Oak	✓											
Quercus englemannii	Mesa Oak	✓											
Quercus suber	Cork Oak												
Eucalyptus viminalis	Manna Gum				GOOD								
Quercus virginiana	Southern Live Oak				GOOD								

DECIDUOUS

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCY	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Brachychiton acerifolius	Australian flame Tree												
Brachychiton discolor	Queensland Lacebark												
Platanus racemosa	California Sycamore	✓											
Quercus lobata	Valley Oak												

TABLE B-1: CAMPUS LANDSCAPE PALETTE TABLE [CONTINUED]



CONIFERS

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Pinus brutia var. eldarica	Afghan Pine												
Pinus coulteri	Coulter Pine	✓											
Pinus eldarica	Eldarica Pine				GOOD								
Pinus halepensis	Aleppo Pine												
Pinus canariensis	Canary Island Pine												
Cedrus atlantica	Atlas Cedar												
Cedrus deodara	Deodar Cedar												

WINDROW

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Cupressus arizonica	Arizona Cypress	✓			GOOD								
Chilopsis linearis	Desert Willow	✓											
Pinus brutia ssp. Eldarica	Afghan Pine												
Pinus coulteri	Coulter Pine	✓											
Pinus halepensis	Aleppo Pine												
Celtis occidentalis	Common Hackberry												

PALMS

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Phoenix dactylifera	Date Palm				GOOD								
Washingtonia filifera	California Fan Palm	✓											
Chamaerops humilis	Mediterranean Fan Palm				GOOD								
Washingtonia robusta	Mexican Fan Palm												
Jubaea chilensis	Chilensis												

TABLE B-1: CAMPUS LANDSCAPE PALETTE TABLE [CONTINUED]

LEGEND

WUCOLS		FEATURED ZONES			
1	VERY LOW	GC	1.1 GATEWAY COMMONS	AP	1.5 ARRIVAL PLAZAS
2	LOW	CW	1.2 COYOTE WALK	CQ	1.6 COLLABORATION QUAD
3	MODERATE	SW	1.3 SYCAMORE WALK	NH	1.7 NATURAL HABITAT PRESERVES
4	HIGH	CT	1.4 CAMPUS TRAILS	RAF	1.8 RECREATION/ATHLETIC FIELDS

SHRUBS — LOW: 1FT - 5FT

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Agave filifera	Thread Agave		Greenish	1									
Encelia farinosa	Desert Encelia	✓	Yellow	1									
Aloe striata	Coral Aloe		Orange	2									
Anisacanthus quadrafidus var. wrightii	Desert Honeysuckle	✓	White	2									
Artemesia arborescens	Shrubby Wormwood		Yellow	2									
Baccharis 'Starn'	Starn Coyote Bush	✓		2									
Berberis repens	Creeping Barberry	✓	yellow	2									
Dalea bicolor	Silver Dalea		Purple	2									
Dasylirion wheeleri	Desert Spoon		Cream Wht	2									
Echinocactus grusonii	Golden Barrel Cactus			2									
Epilobium Catalina	California Fuchsia	✓		2									
Eriogonum grande var. rubescens	Island Buckwheat	✓	Red	2									
Iva hayesiana	Poverty Weed	✓		2									
Justicia californica	Chuperosa	✓	Orange	2									
Lavandula 'Goodwin Creek Grey'	Goodwin Creek Lavender		Purple	2									
Leucophyllum candidum	Texas Ranger		Purple	2									
Lupinus excubitus	Grape Soda Lupine	✓	Purple	2									
Mimulus aurantiacus	Bush Monkey-Flower	✓	Yellow	2									
Penstemon spectabilis	Showy Penstemon	✓	Blue-purple	2									
Rosa californica	California Wild Rose	✓	Pink	2									
Salvia apiana	White Sage	✓	White	2									
Salvia greggii	Autumn Sage		Pink, Red	2									
Salvia leucantha	Mexican Bush Sage		Purple	2									
Salvia leucantha 'Santa Barbara'	Santa Barbara Mexican Bush Sage		Purple	2									
Westringia f. 'Morning Light'	Coast Rosemary		White	2									
Berberis thunbergii	Japanese Barberry			3									
Dianella tasmanica 'Variegata'	Tasman Flax Lily		Blue-purple	3									
Dietes bicolor	Fortnight Lily		Yellow	3									
Heuchera maxima	Island alum root	✓	White	3									
Kniphophia 'Sunningdale Yellow'	Red Hot Poker Sunningdale Yellow	✓	Yellow	3									
Pittosporum c. 'Nana'	Dwarf Karo			3									
Heuchera 'Santa Ana Cardinal'	Coral Bells	✓	Pink	4									

TABLE B-1: CAMPUS LANDSCAPE PALETTE TABLE [CONTINUED]

LEGEND

WUCOLS		FEATURED ZONES			
VERY LOW	GC	1.1 GATEWAY COMMONS	AP	1.5 ARRIVAL PLAZAS
LOW	CW	1.2 COYOTE WALK	CQ	1.6 COLLABORATION QUAD
MODERATE	SW	1.3 SYCAMORE WALK	NH	1.7 NATURAL HABITAT PRESERVES
HIGH	CT	1.4 CAMPUS TRAILS	RAF	1.8 RECREATION/ATHLETIC FIELDS

SHRUBS — MEDIUM-LARGE: 3 FT - 20 FT

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Agave americana 'Variegata Mediopicta'	Striped Century Plant		Yellow										
Eriogonum arborescens	Santa Cruz Island Buckwheat	✓	White										
Eriogonum giganteum	Saint Catherin's lace	✓	White										
Prunus ilicifolia	Holly Leaf Cherry	✓	Cream										
Romneya coulteri	Matilija Poppy	✓	White										
Acacia cultriformis	Knife Acacia		Yellow										
Abutilon palmeri	Indian Mallow	✓	Yellow										
Acacia greggii	Catclaw Acacia	✓	Yellow										
Ceanothus 'Concha'	Concha Ceanothus	✓	Dark blue										
Hesperaloe parviflora 'Red	Red Yucca		Red										
Hesperaloe parvifolia 'Yellow'	Yellow Yucca		Yellow										
Heteromeles arbutifolia	Toyon	✓	White										
Rhamnus californica	Coffeeberry	✓	Yellow										
Rhus integrifolia	Lemonade Berry	✓	White										
Rhus ovata	Sugar Bush	✓	Pink										
Rosmarinus 'Tuscan Blue'	Tuscan Blue Rosemary		Blue										
Salvia 'Allen Chickering'	Mexican Bush Sage	✓	Blue/Purple										
Salvia clevelandii	Cleveland Sage	✓	Blue										
Chondropetalum tectorum	Small Cape Rush		Pink										

GROUNDCOVER — 1 FT - 3 FT

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Artemesia 'Powis Castle'	Wormwood												
Achillea millefolium	Yarrow		White										
Berberis aquifolium Compacta	Oregon Grape		Yellow										
Bulbine frutescens	Stalked Bulbine		Yellow										
Dalea capitata	NCN		Yellow										
Dalea greggii	Trailing Indigo Bush		Purple										
Lantana 'New Gold'	Trailing Lantana		Gold										
Teucrium chamaedrys x lucidrys	Germander Sage		Purple										
Verbena lilacine 'De La Mina'	Lilac Verbena		Purple										
Chamaemelum nobile	Roman Chamomile		White										
Trachelospermum jasminoides	Star jasmine		White										

TABLE B-1: CAMPUS LANDSCAPE PALETTE TABLE [CONTINUED]

LEGEND

WUCOLS

VERY LOW	
LOW	
MODERATE	
HIGH	

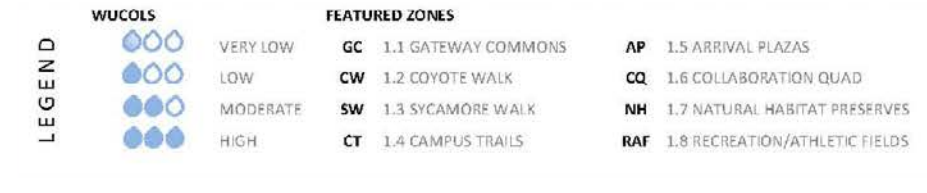
FEATURED ZONES

GC	1.1 GATEWAY COMMONS
CW	1.2 COYOTE WALK
SW	1.3 SYCAMORE WALK
CT	1.4 CAMPUS TRAILS
AP	1.5 ARRIVAL PLAZAS
CQ	1.6 COLLABORATION QUAD
NH	1.7 NATURAL HABITAT PRESERVES
RAF	1.8 RECREATION/ATHLETIC FIELDS

BIOSWALE

	BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
TREES	*Cercis occidentalis*	Western Redbud	✓	Magenta										
	Chilopsis linearis	Desert Willow	✓	Pink		GOOD								
	Quercus agrifolia	Coast Live Oak	✓											
	Platanus racemosa	California Sycamore	✓											
SHRUB	*Baccharis pilularis*	Coyote Brush	✓											
	Heteromeles arbutifolia	Toyon	✓	White										
	Sambucus mexicana	Western Elderberry	✓	White										
	Myrica californica	Pacific Wax Myrtle	✓	Yellow										
PERENNIALS	*Sisyrinchium bellum*	Blue-eyed Grass	✓	Purple										
	Achillea millefolium	Yarrow	✓	White										
	Fragaria chiloensis	Beach Strawberry	✓	White										
	Salvia spathacea	Hummingbird Sage	✓											
	Solidago californica	California Goldenrod	✓											
	Salvia uliginosa	Bog Sage												
GRASSES	*Mimulus aurantiacus bifidus*	Shrubby Monkey Flower		Peach										
	Carex divulsa	European Gray Sedgs												
	Juncus patens	California Gray Rush	✓											
	Leymus condensatus 'Canyon Prince'	Canyon Prince Wild Rye	✓											
	Carex pansa	California Meadow Sedge	✓											
	Carex praegracilis	California Field Sedge	✓											
	Chondropetalum tectorum	Small Cape Rush												
	Juncus effusus	Soft Rush	✓											
	Miscanthus sinensis 'Morning Light'	Silver Maiden Grass												
	Muhlenbergia dubia	Pine Muhly												
	Muhlenbergia rigens	Deer Grass	✓											
	Muhlenbergia lindheimeri	Lindheimer's Muhly												
	Festuca Rubra 'Molate'	Molate Red Fescue	✓											

TABLE B-1: CAMPUS LANDSCAPE PALETTE TABLE [CONTINUED]



GRASSES

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Aristida purpurea	Purple Three-awn	✓		1									
Bouteloua gracilis	Blue Grama/Buffalo Grass	✓		1									
Carex divulsa	Berkeley Sedge			1									
Sporobolus wrightii	Giant Sacaton			1									
Festuca mairei	Atlas Fescue			2									
Lomandra longifilia	Spiny Head Mat Rush			2									
Muhlenbergia lindheimeri	Lindheimer's Muhly			2									
Muhlenbergia rigens	Deer Grass	✓		2									

LAWN SUBSTITUTE

BOTANICAL NAME	COMMON NAME	NATIVE	FLOWERING	WUCOLS CLASSIFICATION	WIND RESILIENCE	FEATURED ZONES GC	CW	SW	CT	AP	CQ	NH	RAF
Bouteloua gracilis	Blue Grama/Buffalo Grass	✓		1									
Carex praegracilis	California Field Sedge	✓		2									
Carex pansa	California Meadow Sedge	✓		2									

TABLE B-1: CAMPUS LANDSCAPE PALETTE TABLE [CONTINUED]

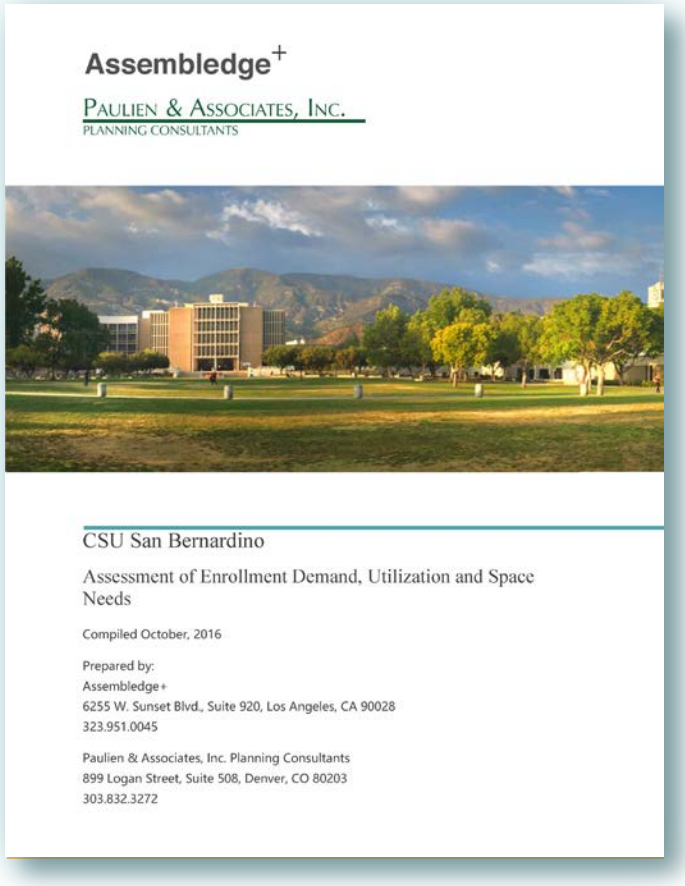
APPENDIX

C ENROLLMENT DEMAND + SPACE NEEDS ANALYSIS

UNDERSTANDING CURRENT DEMANDS

The Master Plan project team performed background research on enrollment and space use trends at CSUSB; that work was used to inform the spatial planning exercises central to this master planning effort. This accompanying appendix constitutes an anthology of memoranda summarizing that analysis.

Please see the following document, under separate cover, for this additional 2016 Master Plan information:



Assembledge+

PAULIEN & ASSOCIATES, INC.
PLANNING CONSULTANTS

CSU San Bernardino

Assessment of Enrollment Demand, Utilization and Space Needs

Compiled October, 2016

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APPENDIX

D TECHNICAL REPORT: CSUSB UTILITIES MASTER PLAN

DETAILING IMPLEMENTATION

An engineering firm brought special expertise to evaluate the utilities currently serving the campus and to provide specific recommendations to upgrade or modify that existing utility infrastructure to support the facilities proposed as part of this Master Plan

Please see the following document, under separate cover, for this additional 2016 Master Plan information: