Chabot College
2005 Facilities Master Plan
Chabot Las Positas Community College District
July 19, 2005
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- District Sustainability Guidelines
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LETTER FROM THE PRESIDENT

After more than four decades serving the East Bay community, Chabot College is recognized regionally and nationally as among the best community colleges in the country. The Chabot campus was initially designed and constructed in the late 1960s and has changed very little over the years. But thanks to the community’s help in passing the Measure “B” initiative in March 2004 and with the allocation of $280 million, the College is looking forward to renewing the campus’ original luster by renovating and expanding its facilities, while preserving its traditional character.

Because we believe that this bond measure is a once-in-a-lifetime opportunity, we began an extensive planning process early on that not only looked at the College’s immediate needs but also at future use. The excellent facilities and equipment that will result from the needed renovation and construction program will support the high-quality academic programs required of a premier college such as ours. Our students will achieve more in quality programs supported by first class facilities and equipment.

As a result of this planning, the Facilities Committee has outlined its ideas for developing and restoring the campus, which includes the construction of sustainable and highly adaptable buildings to meet a variety of needs for the future. This planning phase is now drawing to a close with the presentation of the plan you have before you.

While this plan emphasizes the renovation of most of the campus facilities while maintaining the feel of the campus, there is also new construction proposed. Key among these new buildings is the Student Success Center which will not only house a variety of student and community services but also provide a prominent “gateway” to the campus, giving a new and more prominent face to our community.

This plan not only discusses the buildings and their design and use but also the infrastructure, traffic, security, landscaping, design parameters, and construction schedule. This planning document will serve as our guide over the ten-year construction program. With this plan in place, the community and College are assured that the facilities at Chabot will be capable of housing quality programs that fully accomplish the College’s mission of education, service, and leadership for generations to come.

Dr. Robert Carlson
June 2005

COLLEGE VISION AND MISSION STATEMENT

Vision
Chabot College is a learning-centered institution with a culture of thoughtfulness and academic excellence, committed to creating a vibrant community of life-long learners.

Mission
Chabot College is a public comprehensive community college that prepares students to succeed in their education, progress in the workplace, and engage in the civic and cultural life of the global community. The college furthers student learning and responds to the educational needs of our local population and economy. The college serves as an educational leader, contributing its resources to the intellectual, cultural, physical, and economic vitality of the region. Recognizing that learning is a life-long journey, the college provides opportunities for the intellectual enrichment and physical well-being of all community members who can benefit.
Introduction

**PURPOSE**

The purpose of the Facilities Master Plan is to provide a guide for future campus development. The plan describes how the campus will be improved to meet the educational mission of the College, serve the changing needs and address the projected enrollment.

This Facilities Master Plan is based on the Chabot College Educational Master Plan that was developed in 2002. It serves as the foundation for the development of the Facilities Master Plan Recommendations. The Facilities Master Plan is intended to accommodate a potential growth of up to 17,500 students on the Chabot College campus.

**PLANNING PROCESS**

The planning process has been a highly participatory one involving the many constituencies of the College. The Planning Team worked closely with the Facilities Committee, comprised of key faculty, staff and administrators. The Committee reviewed the Analysis of Existing Conditions, evaluated a series of Development Options, and made decisions that led to the development of the Master Plan recommendations.

The planning process included a series of Facilities Committee meetings as well as presentations and discussions with the College, the community, and Board of Trustees to broaden the plan’s perspective and to enhance the acceptance of proposed developments.

**DOCUMENT ORGANIZATION**

The Facilities Master Plan describes a plan for site and facilities improvements that will support current and future needs at the College. This document is organized into the following sections:

- **Facilities Master Plan**
  The Facilities Master Plan section of the document describes the overall Master Plan recommendations for the College. Proposed projects are identified and described.

- **Design Guidelines**
  The Design Guideline section includes a framework to guide the successful design of future physical development of the Chabot College campus. The guidelines address the key issues that create campus character: campus plan, architectural vocabulary and landscape treatment.

- **Existing Conditions**
  The Existing Conditions section includes a comprehensive site analysis, including the facilities, the landscape and vehicular and pedestrian circulation.

- **Development Options**
  This section includes illustrations and discussion of the options that were reviewed and evaluated during the planning process.

- **Appendix**
  This section includes information that was used to support the planning process.
Project Schedule

CHABOT COLLEGE
Facilities Master Plan
Schedule

2004
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER

STRATEGIC REVIEW
- Meet to define project scope
  - Tour Stanford GFI
  - Introduce Team, Present Qualifications
  - Collect and review information

TOUR & INTRODUCTIONS
- Tour Stanford GFI
- Introduce Team, Present Qualifications

CONVOCATION WORKSHOP (8/19/04)
- Define Project Goals

COMMITTEE MEETING (August 26)
- Review Process and Schedule
- Define Key Planning Issues
- Review Landscape Analysis

ANALYSIS OF EXISTING CONDITIONS
- Meet with key facility personnel
- Analysis visiting campus

ADMINISTRATIVE REVIEW (Sept. 22)
- Review and Validate Physical Analysis
- Define Key Planning Issues

COMMITTEE MEETING (Sept. 23)
- Review and Validate Physical Analysis
- Define Key Planning Issues

EDUCATIONAL PLANNING
- Space Inventory Assessment
- Forecast Data Collection
- Forecast Capacity/WKSCH/SF
- Stakeholder Meetings (Nov. 9, 10 & 23)
- Translat ASF to Divisions

COMMITTEE MEETING (Oct. 26)
- Review Space Program for Master Plan

OPTION DEVELOPMENT
- Develop Planning Options
- Review of Options (Dec. 23)
- Board Progress Review (Dec. 23)
- Administrative Review (Dec. 23)
- Committee Meeting (Dec. 23)
- Review Options
- Admn Review (Jan. 23)
- Committee Meeting (Jan. 23)
- Review Options
- Committee Meeting (Feb. 1)
- Select Preferred Option

SOLUTION DEVELOPMENT
- Review Planning Criteria (Feb. 9)
- Develop Master Plan Recommendations
- Identify Primary and Secondary Effects
- Develop Design Guidelines
- Flex Day Presentation (Feb. 17)
- Committee Meeting (Mar. 10)
- Review Recommendations
- Review Design Guidelines
- Review and Validate Project Budgets
- Develop Planning and Implementation Plans
- Board Review (Apr. 6)

COMMITTEE MEETING (Apr. 6)
- Review Plans and Guidelines
- Board of Trustees (July 2005)

CHABOT COLLEGE COUNCIL
- Prepare Draft Report

PUBLIC PRESENTATION EIR
- Review Draft Report w/ Committee

LEGEND:
• DEVELOPMENTAL MEETINGS WITH FACILITIES COMMITTEE, ADMINISTRATION AND USER GROUPS
⭐ KEY REVIEWS WITH PUBLIC AND BOARD OF TRUSTEES
Facilities Master Plan

The Facilities Master Plan for Chabot College presents an overall picture of the future developed campus and includes proposed sites for new facilities, recommendations for renovations of existing facilities, and site development projects.

While drawings in the Plan appear specific, the forms are conceptual sketches that highlight the location and purpose of improvements. The final design of each site and facility project will take place as projects are funded and detailed programming and design occurs.

This Facilities Master Plan is based on the Chabot College Educational Master Plan that was developed in 2002. It serves as the foundation for the development of the Facilities Master Plan Recommendations described in this section.

The Facilities Master Plan is intended to address the proposed "build-out" needs of the College which has been identified to serve approximately 17,500 students. The projects identified in this section are based on a translation of the educational planning data, in order to forecast the types and amount of space that will be required as the campus is developed.

It is important to understand that, for planning purposes, the exact year in which projected "build-out" is achieved is not critical. What is critical is that the trend in student enrollment will be recognized and instructional programs, support services, facilities and staffing master planned to be responsive when that level of enrollment is ultimately achieved.

PROJECT GOALS

The Facilities Master Plan for Chabot College addresses the primary goals identified during the planning process.

- Campus entries and edges are articulated to create welcoming gateways to the College.
- Sustainable design principles are incorporated.
- Outdoor courts are developed to create unique people-scaled places enhancing the campus atmosphere; one that encourages students, staff and the community to spend time "on campus".
- Landscaped pedestrian paths tie the campus together, orient to the central Grand Court, and improve way-finding.
- Student Services are consolidated into a new Student Access Center; creating a student and visitor hub tied to the heart of the campus, the Grand Court.
- Renovations to existing facilities provide "right-sized" space to accommodate instructional programs.
- Overall campus safety and accessibility are improved.
- Parking lot access, capacity and safety is improved.
- Opportunities to create a learning-centered Campus are created.
MASTER PLAN PROJECTS

This section describes the building, renovation and site projects identified in the Facilities Master Plan. Categories of projects include New Construction, Renovation and Site Projects. Note that some new construction projects provide the opportunity to renovate existing spaces for re-use by other programs (called "Secondary Effects").

NEW CONSTRUCTION

Instructional Office Building

A new two story Instructional Office Building is recommended to replace outdated and inefficient facilities. Building 400 is removed and the new building will be located in its place. Its prime location will enhance the image of the campus along Hesperian Boulevard as well as provide an important collaborative learning and teaching environment. The building will house offices, and associated support space and will encourage interaction between students and faculty.

Secondary Effects
Vacate Buildings 600 and 700

Student Access Center

A new Student Access Center is recommended to consolidate Student Services on Campus. The building will be developed as part of the new welcoming gateway portal to the campus. It will be highly visible from the Campus core and Hesperian Boulevard. Building 600 and 700 are removed as functions move to the new Instructional Office Building and a gateway space is created for the new Center. The placement of this facility provides the opportunity to create an outdoor activity space engaging the arcade and activating the Grand Court as well as creating a strong visual link across to the Planetarium. It is important to coordinate the architectural design of the Student Access Center with the adjacent Instructional Office Building.

Secondary Effects
Library Building 100
Administration Building 200
Student Center, Cafeteria Building 2300
Assessment Center in Building 1800

Physical Education Building

A new PE Locker and Team Facility will provide men’s and women’s locker rooms, team rooms, trainer equipment and storage rooms with easy access and visual ties to the athletic fields and existing PE buildings.

Secondary Effects
PE 2700, 2800 and 2900

Broadcast Center and Performing Arts Center Expansion

An addition to the south end of the Performing Arts Center allows for expansion of Theatre support spaces and a new Broadcast Center. The adjacency allows easy access for videotaping performances and post performance interviews and opportunities for shared resources. TV studios, radio station, production and practice studios along with administrative space make up the new two story facility.

Expansion of the Performing Arts Center lobby along the new Arts Court creates a new entry ‘gateway’ to the PAC appropriately sized to the large capacity theatre. Access from the parking lot is clear, safe and direct for the first time theatre patron.

Secondary Effects
Buildings 100 and 900
**Maintenance Building**

Consolidation of maintenance facilities includes moving the shops out of the existing Butler Building and locating them off the existing maintenance yard. Large item storage will be moved off Campus into a District facility.

*Secondary Effects*
- Butler Building

**General Classroom/Office Building**

A new two story office and instructional facility is proposed to house machine, automotive, welding and other technology classrooms. It is recommended to be constructed as a replacement and expansion of the existing Building 1500. Offices and support space will also be provided.

*Secondary Effects*
- Vocational Technology 1400

**Science Math Instructional/Office Building**

A new single story Instructional Office Building is recommended to replace outdated and inefficient facilities in Building 2000. Its location will allow development of a Science Court creating a unique open space for the science and math quad, emphasizing a visual link to the Student Access Center and Grand Court.

*Secondary Effects*
- Building 1800
- Building 2100

**RENOVATION PROJECTS**

The majority of the existing buildings are original to the Campus built in the mid-1960’s. Few, if any improvements have been made to the original buildings which require a multitude of improvements including replacement of building HVAC, lighting and electrical systems, technology upgrades for state of the art teaching and office facilities. Improved building envelope for energy conservation would include window and door replacements, thermal protection at the exterior walls and cool replacement roofing.

**Building 100 - Admissions & Records; Learning Resource Center/Library (1965), *1999, **IPP**

As programs are moved out of the facility (Student Services, ITS); the ground level will be converted to provide academic support space, faculty resource center, open computer lab, foreign language lab and computer assisted learning facilities. These new active functions will spill out to a new ‘cyber’ café on the south side into the Grand Court. Visual links created through the LRC between the Student Center (Cafeteria), main Campus entry gateway and the new Student Access Center energize the Grand Court, the heart of the Campus. A strong relationship between the two levels; LRC and Library will benefit both spaces and accessibility is met by a new elevator. Library improvements include new study rooms and library collection upgrades (books, video, DVD, media).

**Building 200 - Administration (1966)**

Student services and switchboard functions are moved out of the facility; the President’s Office, Academic Services, Business Office, Foundation, Board Services and Research functions are reconfigured.

**Building 300 (1965) - General Classrooms, *1998**

Expanded technical services and media services will move to the lower level and instructional space will remain on the upper level. District Information Technology Services will move to Las Positas College.

**Building 500 (1965) - General Classrooms**

Modernization will include integration of artifacts storage for specialized labs and appropriate laboratory and computer space for the social sciences.
Building 800 (1965) - General Classrooms, **FPP
State and Measure B funding for this building will replace archaic classroom and lab configurations improving efficiency.

Building 900 - Humanities (1965), **FPP
State and Measure B funding for this building will improve efficiency for instructional space and reconfigure for existing and new instructional programs. The radio station will move to the new Broadcast Building.

Building 1000 - Art (1965), *2002
Art studios and classrooms will remain requiring general building modernization.

Building 1100 - Humanities Offices (1965)
Building 1100 will be renovated and will be part of a double ‘gateway’ into an improved Arts Court.

Building 1200 - Music Skills Center; Little Theatre (1965), *1996
The Music Skills Center is a relatively new addition but would benefit from carefully considered instrument storage and updated technology for electronic music. The two hundred seat black box theatre requires renovation.

Building 1300 - Performing Arts Center (1967)
Prominently placed at the end of the Campus, the 1,500 seat Performing Arts Center serves the many needs of the college and community. Several improvements are needed to maintain the highly utilized PAC. Increasing the lobby space for support facilities including accessible and adequate restrooms, ticket offices and provision for concessions will allow additional performance opportunities. The concession facility may also serve as a food service area during times when there is no performance. Back of the house support, dressing rooms, costume storage, theatre staff offices and rehearsal space needs will be added as part of the Broadcast Center/Performing Arts Center expansion. Lighting and sound system improvements and code required accessibility upgrades will touch all aspects of the existing PAC. Special attention to the quality and the durability of the interior finishes will maintain the PAC’s position as a first rate theatre space.

Building 1400 - Vocational Technology Center (1965), *1996
Moving the classroom functions out of the building into the new Technology Building will provide much needed space to improve the safety of the lab spaces where equipment clearances are critical. Additional yard space will be provided for these popular programs. Automotive bays will remain with equipment upgrades and modernization of facilities.

Building 1600 (1965) - General Classrooms, *1996
Remodeling of this facility will support the instructional program needs, maximize shared resources between programs and improve supervision.

Building 1700 (1965) - General Classrooms, **FPP
State and Measure B funding for this building will modernize inefficient classrooms into much needed flexible lab spaces. Lecture space is enhanced with optimized layouts accommodating technology improvements.

Building 1800 - Physical Sciences and Engineering (1965), **FPP
State and Measure B funding will assist with the lab and lecture renovations for this building. Removal of obsolete equipment and storage rooms will increase efficiency.

Building 1900 - Science Lecture Halls; Planetarium (1965)
The Planetarium is a unique building form easily identifiable on Campus with its copper domed roof. The three original tiered classrooms have been untouched and will be replaced with four technology enabled classrooms with easy access. Replacement of planetarium equipment and seating will reinstate the planetarium as a focal point on Campus.

Building 2100 - Biological Sciences (1965), *1994, **IPP
Instructional space modernization will be geared to serving the sciences with the latest technology.

Building 2200 - Health Sciences/Dental Health (1965), *1994
Renovations to provide new technology (media), as well as general building system improvements.
Building 2300 - Cafeteria; Student Center; Campus Security (1966)
As tutorial and placement services programs move out of the second floor; additional space will be available for midsized (200-500) convention and academic space. A better connection with the outdoor eating court would be created by adding glazing along the north wall of the Cafeteria. Campus Security moves from the temporary building into the ground level. Security vehicle parking is immediately outside with easy access to the service road and center of Campus.

Building 2400 - Disabled Student Resources Center (1965), *1998
Proximity to the Student Center and cafeteria is desired by the DSRC. The building was recently refurbished placing its modernization priority later in the building program.

Building 2500 - Gymnasium (1965)
The Gym is due for a major renovation including new lighting, HVAC, bleachers and associated improvements.

Building 2600 - Physical Education Faculty Offices; Classroom (1965)
A renovation will accommodate new building systems and technology.

Building 2700 - Women's Shower and Locker Rooms; Classroom (1965)
Moving the Women’s Shower and Locker Rooms to new construction will allow for reconfiguration of instructional space for physical education and disabled student physical education center.

Building 2800 - Men's Shower and Locker Rooms (1965)
Renovate and reconfigure the building into instructional space for the PE Department following the completion of the new PE Building.

Secondary Effects
Remove Building 3200

Building 2900 - Physical Education Classrooms (1965)
Create an opening between the pool area and the new PE Building improving access. Renovate for indoor activity spaces.

Building 3000 - Maintenance Building and Warehouse (1965)
Major renovation required for code compliance and building system upgrades.

Specialized instructional space will be modernized.

Building 3400 - Reprographics Center; Print Shop/Graphic Arts (1993), *1995
The functions provided will remain unchanged except technological innovations will be accommodated with future modernization.

This relatively new building will require modernization later in the building program. Classroom space will be available in the new Technology Classroom Building expanding child centered space. Yard area will meet state guidelines per child served.

Building 3800 - Bookstore (1998)
Minor renovation is envisioned for this newer building to meet future demands.

Building 3900 - Chemistry/Computer Science (1999)
The newest building on the Campus, its improvements would be minor and would occur towards the end of the building program. Technology and hazardous material handling improvements are envisioned in the future.

*Date of Last Renovation
*State Funding in Progress

Building Demolition Projects
The following buildings have been identified for demolition. The list includes temporary/portable facilities and older buildings with systems that have outlived their useful lives and have numerous access and code compliance issues. Replacing undersized, inefficient space with code compliant, energy efficient space will help create a fully realized Master Plan. All temporary buildings are replaced with permanent building space.

Building 400 - Business Education Faculty Offices (1965)
Demolition of this older building will make space for the new Instructional Office Building providing an inviting outward gesture to the community along Hesperian Boulevard. Faculty offices will be moved into the new Instructional Office Building.
Building 600 - Business Lecture Hall (1965), *1996
The existing tiered 110 seat capacity lecture hall will be replaced in the new Student Access Center. Its removal will open up the Grand Court to the transparent Student Access Center lobby portal with a view out to Hesperian Boulevard.

Building 700 - Social Sciences and Language Arts Faculty Offices (1965)
Faculty offices will be moved into the new Instructional Office Building.

Building 1500 - Technology and Engineering Faculty Offices (1965)
Additional classroom and office space is provided with a two story replacement building in Building 1500’s present location.

Building 2000 - Science and Mathematics Faculty Offices (1965)
Removal of this building allows the development of a Science Court promoting interaction between staff and students in the sciences. Faculty offices will be moved into the new Instructional Math/Science Office Building.

Building 3200 - Disabled Student Physical Education Center
Temporary/Portable building will be replaced with permanent space in Building 2700.

Building 3300 - The Annex (Security)
The security services will be moved out of this temporary/portable building into the ground level of Building 2300 and the new Student Access Center.

Building 3600 - Warehouse (the Butler Building)
Moving the Butler Building to related maintenance functions allows the development of a Broadcast Facility adjacent to the Performing Arts Center.

Press Box
The poor condition of this existing building requires its replacement.

SITE PROJECTS

Campus Signage
The development of a campus-wide signage program is recommended to improve vehicular and pedestrian wayfinding. Monument signage at the corner of Hesperian and Depot is proposed to increase visibility of the College within the community.

Hesperian Boulevard
Working with the City of Hayward, an inviting median strip will be developed with colorful banners announcing the approach to Chabot College, the Performing Arts Center and special events. Existing mature trees and new accent trees along the perimeter create a buffer between the parking lots and Hesperian Boulevard.

Perimeter Road
In order to address safety concerns and improve parking lot access, a new perimeter road with drop off and bus zone is added along the new Instructional Office and Student Access Center buildings.

A landscaped entry drive and perimeter road will provide visitors to the campus with a clear arrival, and entry experience. A drop-off for cars and vans will be located along the entry drive, which will lead directly to the new Student Access Center. The bus zone will continue to be at the front door of the Campus encouraging the use of public transportation.

Accent trees and existing mature trees are used to buffer the college from the street, providing an entry feature as well as creating a softer more informal edge to the boundary of the campus. The trees will be a mix of existing and new types that will be repeated throughout the campus and thus serve as an introduction to the landscape theme of Chabot College.
Parking
Pedestrian pathways begin in the parking lots leading pedestrians safely through the parking lots on defined paths improving way-finding into the Campus. Accent trees and paving define safe and direct access into the Campus center. Parking lots are linked by the perimeter road eliminating trips out into Hesperian. Staff parking is clearly identified without disrupting vehicular flow. Accessible parking is located near building entrances at each lot.

Athletic Fields
A series of improvements are proposed in order to address aging infrastructure, fields and support facilities. A new entry "gateway" creates a clear and direct access point to the PE facilities for staff, students and the community. A new informal pathway works its way from the Grand Court weaving behind the Student Center to the PE facilities linking the campus core to the outlying athletic fields.

Grand Court
The Grand Court will be designed to support a variety of outdoor activities. Formal and informal events will assist in reactivating the "heart" of the campus. Turf reinforced for large vehicle access, is added at the center along with new planting and pruning of existing mature trees creating a garden like feel and opportunity for student and staff relaxation. Sufficient space is preserved for graduation and similar large events.

Arts Court and Gateway
The community is a primary user of the Performing Arts Center taking advantage of the large 1,500 seat capacity theater throughout the year. Parking Lot G accommodates the theatre patrons and also visitors to the Art Gallery. The new pedestrian path which initiates in Parking Lot G takes the visitor through a new 'gateway' arcade and to the highly visible Arts Court.

LANDSCAPE RECOMMENDATIONS
The Landscape Master Plan for Chabot College combines features of the alternatives explored during the planning process. This plan includes a number of distinct landscape zones, each with a different treatment and approach.

The park-like landscape setting for this campus is an asset and should be protected and nurtured where possible. Any new construction should be sited to preserve specimen trees. Courtyards formed by new buildings provide an opportunity to create new landscape settings that emphasize the indoor/outdoor relationship to a greater degree than currently exists on campus.

Zone A - Vehicular and Pedestrian Entries
The plan creates a family of entries marked by special paving, planting, signage and lighting. These entries become the symbolic gateways into the campus. Each could have its own landscape identity and become gathering places themselves.

Recommendations:
- Create hierarchy of vehicular and pedestrian entries.
- Utilize special paving, planting, signage and lighting to create identity at gateways.
- Utilize flowering trees to highlight entries.
- Incorporate seating areas into pedestrian entry gateways.
- Utilize art, architecture or other special features to highlight main entries.
- Provide campus directory or informational kiosks at or near entrances.
- Frame views into campus core at pedestrian entries where possible.
- Define pedestrian right-of-way in vehicular areas with bollards, signing or change in paving material.
Zone B - Primary Circulation Paths
Primary circulation paths are identified as pedestrian routes leading from parking areas to the center of Campus. These directly connect to the pedestrian entries and set the tone and character for the Campus landscape. Each path utilizes a different flowering tree species to give a unique character to each entry. Trees are in formal arrangements at the main entries to further distinguish main circulation routes from secondary circulation routes.

Recommendations:
- Define primary circulation routes with formal arrangements of flowering trees.
- Utilize special paving on primary circulation routes to distinguish from other paths.
- Incorporate seating areas into main circulation routes.
- Define service road access in order to discourage service vehicles travelling through Campus on pedestrian routes.
- Utilize removable bollards to separate vehicular areas from pedestrian areas.
- Provide path width hierarchy:
  - Primary entry paths - 15-20' minimum width.
  - Primary interior circulation paths - 10-15' minimum width.
  - Secondary circulation paths 10' minimum width.

Zone C - Secondary Circulation Paths
Secondary circulation paths connect internal campus areas and buildings. The landscape in these areas retains the park-like character of the campus. Curved or meandering paths should be utilized where possible. Informal arrangements of trees, shrubs and groundcovers define the pathways. Seating should be provided where possible.

Recommendations:
- Retain park-like character along circulation routes.
- Utilize curved or meandering paths where possible.
- Plant in informal arrangements native and non-native trees, shrubs and groundcovers.
- Provide seating where possible.
- Use lighting that is subtle yet meets adequate safety standards.
- Create outdoor seating areas that encourage small collaborative gatherings or quiet study spots.
Zone D: Vehicular Circulation and Parking Lots
Parking lots and internal streets and drive aisles are defined with flowering and non-flowering trees. New parking lot trees provide shade for parked cars. Flowering trees identify pedestrian walks that connect the parking areas to the main campus. Bioswales are proposed to handle stormwater runoff from parking areas.

Recommendations:
- Highlight pedestrian paths with flowering trees.
- Use flowering trees to identify primary vehicular drive aisles.
- Provide canopy trees to shade parked cars.
- Utilize bioswales where possible.
- Plant street frontages with trees and shrub plantings to create an identity from the street and screen parking areas from surrounding neighborhoods.
- Maintain site lines in parking areas for security. Maintain shrub plantings no higher than 2-1/2’ and tree canopies no lower than 8’ where possible.
- Provide a strong and defined street edge to the campus through consistent plant materials.
- Provide bus shelters, smoking shelters, lighting and other site furniture where needed.

Zone E: Courtyards - Grand Court
The Grand Court is the primary open space on the Campus. It serves as the campus heart and visual icon. The design must provide flexibility for programmatic use of the space while creating a more inviting campus center.

Recommendations:
- Redesign amphitheatre to improve accessibility by incorporating ADA accessible ramps, new egress stairs and modified stage design.
- Create central lawn area as main gathering space.
- Replace pollarded trees with new tree bosque spaced adequately to allow set-up of booths and seating between trees.
- Add new flowering specimen trees for seasonal color.
- Enhance connection from the terrace to the Grand Court.
- Remove and thin magnolias to open up views.
- Provide infrastructure for special events including power grid, power to stage area, lighting and water.
- Maintain fire access through center of court.
- Provide moveable tables, umbrellas and chairs for seating.
- Evaluate drainage to incorporate permeable paving or bioswale drainage where possible.

Zone F: Courtyard - Drama Court
The Drama Court is the area between buildings 1200, 1100, 900 and 1000. It is a large open space that also serves as one of the primary entrances to the campus for students and visitors to the theatre. This area is designed to accommodate outside performances as well as serving as a daily gathering area. A large circular central plaza is flanked by two rows of flowering trees and flower gardens. Two specimen trees mark the entrance. A small circle contains a rose garden and seating area.

Recommendations:
- Create multi-use area capable of being utilized for outdoor performances as well as daily gathering.
- Incorporate a flower garden with seating.
- Include two major specimen trees which can serve as memorial trees.
- Replace pollarded trees with bosques of flowering trees to frame space.
- Consider incorporating outside dining areas.
- Include inscribed theatrical quotes and/or sculpture.
**Zone G: Courtyard - Classics Court**
The Classics Court is located between buildings 800, 900 and 1000. This area is off one of the primary entrance paths to the campus. It is an opportunity to create a collaborative gathering space that recognizes the adjacent uses of the buildings. The design incorporates a central rose garden for color and scent. It also includes poetry or quotes from famous literary works etched on seatwalls or inscribed in special paving. The primary entrance walk can serve as a rotating sculpture exhibit area.

**Recommendations:**
- Incorporate a rose garden and central seating area.
- Inscribe poetry or literary quotes in paving or on walls.
- Include outdoor art displays along major walk.

**Zone H: Courtyard - Oak Court**
The Oak Court is located between buildings 300 and 500 and adjacent to the proposed new social sciences and language arts building. A number of existing oaks and specimen trees should be retained in the new design where possible. A new central seating area should be created that incorporates a bed of seasonally changing native perennials that attract hummingbirds and butterflies.

**Recommendations:**
- Retain existing large trees where possible.
- Create central seating area.
- Create perennial garden of native plants that attract hummingbirds.
- Incorporate memorial trees where possible.

**Zone I: Courtyards - Food Court**
The existing food court contains one of the most attractive groves of pollarded sycamores. The large expanse of asphalt paving, however, precludes any sense of containment or special function. Incorporating new paving to define the area as well as new site furniture and lighting will make the food court more inviting.

**Recommendations:**
- Utilize special paving to define the area.
- Reinvigorate pollarded trees.
- Add new site furniture and lighting.
- Develop perennial garden to define the edge of the space.
- Incorporate planting bed along Building 2500 to 'green' space.

**Zone J: Courtyards - Science Court**
A new science court will be formed by the proposed building 2000 and the existing buildings 3900, 2100, 3100 and 1900. The science court contains a green lawn area flanked by planting beds. A low seatwall forms one end of the lawn.

**Recommendations:**
- Create large central lawn with seating areas surrounding it.
- Inscribe linear seatwall as science feature.
- Incorporate special paving to define zone.
- Create botanically interesting gardens surrounding lawn.

**Zone K: Courtyards - Technology and Palm Court**
The area outside the theatre and building 1500 has been developed as a palm garden with a collection of different palms and a large lawn. This area has a distinct character and is attractive. Enhancing the palm garden with additional plantings will add to its appeal. The area to the north of building 1500 has large areas of asphalt paving that detracts from its overall character. Some significant live oaks are located in this area. Reducing the amount of paving, adding seating and creating a new oval lawn area with flowering trees will create a new campus gathering area. Art features with a technology focus will bring additional interest.

**Recommendations:**
- Create shade garden and retain existing oaks.
- Retain existing palms and supplement with new palms.
- Create new oval lawn area with flowering trees and/or palms.
- Add art with technology focus.
- Incorporate memorial trees where possible.
- Consider incorporating outdoor dining areas.
Zone L: Science Walk
Science Walk is the pathway connecting the science and technology buildings. It is an opportunity to create an educational walk that incorporates the park-like landscape of the area.

Recommendations:
- Incorporate art feature relating to the sciences as part of the walk- ie. quote, geological timeline, etc.
- Provide seating along walk where possible to encourage small group gatherings.
- Highlight walk with special paving.
- Incorporate botanically interesting plant palette.

Zone M: Courtyards - Student Services Plaza
The new student services plaza is one of the primary entry and gathering points on campus. The proposed new student services building allows views from the entry through the building to the central campus. Highlighting this area with special paving and bosques of flowering trees creates a welcoming environment. Incorporating a quote about the value of education as part of the entry feature will further enhance the area.

Recommendations:
- Utilize special paving to create a high quality plaza.
- Add bosques of flowering trees at the entry.
- Incorporate a quote about education as part of the entry design, fountains, sculpture and group seating arrangements with a variety of detail that can be appreciated at close range.
- Incorporate memorial trees where possible.

Zone N: Athletic Field Entrance
The new entry to the athletic fields creates a strong identity for the athletic area. It provides seating, areas for congregating and an opportunity to create a garden setting. The plan incorporates a native plant perennial garden with native trees, shrubs, grasses and perennials that can provide an attractive garden setting as well as an educational environment. A new entry court with seating and special paving creates a node at the entrance.

Recommendations:
- Create native plant garden with native trees, shrubs and groundcovers.
- Utilize special paving in entry.
- Provide seating throughout entry and garden area.
PHASING AND IMPLEMENTATION

The Facilities Master Plan for Chabot College will be implemented in a series of phases. These phases will be based on the logical sequencing of projects to address the priority needs of the college. Considerations for limiting disruption, and need for swing space has been incorporated.

The Sequencing Diagram illustrates project linkages which lead to the practical order in which projects should occur.

Sequencing information is used to develop project groupings which lead to the preliminary phasing plans that follow.
Diagram 1. BUILDING PROJECTS AND RELATED SITE IMPROVEMENTS

Legend:
- Demolish Building
- Construct new Instructional Office Building
- Construct new Student Access Center
- Renovate Building 1900 - Planetarium
- Construct new PE Building
- Construct new Maintenance and Operations Swing Space in Butler Building for Vocational
- Construct Perimeter Road, Improve Lots A, B, E, F, G, H
- Construct Student Access Court
- Improve Grand Court
-Construct Broadcast Center (PAC Expansion)
-Renovate Building 1300 Performing Arts Center
-Renovate Building 1200 Drama/Music
-Renovate Building 1100
-Renovate Buildings 100 Library/LRC
-Renovate Buildings - 800/900
-Renovate Buildings 2000
-Renovate Buildings 2300 Student Center
-Renovate Building 2000
-Renovate Buildings 1400 Voc. Technology
-Demolish Butler Building
-Renovate Building 1200
-Renovate Building 1100
-Renovate Buildings 1600, 1700, 1800 and 2100
-Demolish Building 1500
-Demolish Building 1500
-Renovate Buildings 1600, 1700, 1800 and 2100
-Renovate Building 1000
-Renovate Building 2500, 2700, 2800
-Construct new PE Building
-Construct new PE Building 2500, 2700, 2800
-Demolish Portable Building 3200
-Construct new Science Math Building
-Construct Science Court
-Modernize Buildings 500, 2200, 3100, 3400, 3900, 3400, 1800, 3500/3700 and 3800

SEQUENCING DIAGRAM
PHASE 1

The Implementation of the Facilities Master Plan will begin with Phase 1. The graphic to the right illustrates what the campus will look like after Phase 1 projects are completed. Phase 1 projects include:

**Tennis Courts**
- Reorient courts
- Road realignment to Lot J
- Improve Parking Lot J

**Pool**
- Repair pool/Replace Deck
- Move Building 400 offices to swing space
- Demolish Building 400

**Construct New Instructional/Office Building**

**Construct New Physical Education Facility**

**Construct New Maintenance Building**
- Renovate Building 3000 - Maintenance and Operations
- Coordinate renovation with construction of new M & O Building at Las Positas College

**Renovate Building 1900 - Planetarium/General Classroom Building**
PHASE 2

The graphic to the right illustrates what the campus will look like after Phase 2 projects are completed. Phase 2 projects include:

Renovate Buildings 800/900 - General Classrooms
- Improve building systems with State and Measure B funding
- Move Building 600 assembly space to new location
- Demolish Building 600
- Demolish Building 700

Construct New Student Access Center
- Student Access Center Court
- Internal Loop Road
- Parking Lots A, B and G, H
- Demolish Building 1500

Construct General Classroom Building
- Create swing space in Butler Building

Renovate Building 1400 - Industrial Technology
- Expand outdoor space and shops

Renovate Building 1600 - General Classrooms

Renovate Building 1700 - General Classrooms

Renovate Building 1800 - General Classrooms

Renovate Building 300 - General Classrooms

Renovate PE Office Building - 2600

Renovate PE Buildings - 2700 and 2800
- Demolish 3200

Renovate PE Buildings - 2500 and 2900

Improve Athletic Fields
- Improve drainage, lighting and bleachers

Reconstruct Field House
- Improve restroom facilities

Reconstruct Press Box

Reconstruct Baseball Press Box
CHABOT COLLEGE FACILITIES MASTER PLAN

PHASE 1 AND 2

LEGEND
- Existing Facilities
- Renovated Buildings
- New Construction

- General Classroom/Office Building
- Student Access Center
**PHASE 3**

The graphic to the right illustrates what the campus will look like after Phase 3 projects are completed. Phase 3 projects include:

- Parking Lots D and E
- Move student services to new Student Access Center
- Move ITS/Media Services to Building 300
  (Coordinate with District ITS project)
  Renovate Building 100 - Library/LRC
- Move student services to new Student Access Center
  Renovate Building 2300 - Central Services
- Eating Court improvements
- Move student services to new Student Access Center
  Renovate Building 200 - Administration
- Move tutorials, WRAC to new Student Access Center
  Renovate Buildings 800/900 - Classroom Building
- Minor changes for new uses

**Improve Grand Court**

Renovate and Expand the Performing Arts Center (PAC).

Renovate Building 1200 - Drama/Music

- Demolish Butler Building
  Construct New Broadcast Building

Renovate Building 1000 - Arts Studios

- Renovate Building 1100*
  Construct New PAC Entry and Arts Court

- Demolish Building 2000
  Construct New Science/Math Instructional Office Building

Renovate Building 2100 - Biological Sciences
- General building upgrades

Develop New Science Court

* Alternate solution would be to remove Building 1100, relocate functions to the new Instructional Office Building and develop a larger Performing Arts Quad.
PHASE 4

The graphic to the right illustrates what the campus will look like after Phase 4 projects are completed. Phase 4 projects include:

Renovate Building 500 - Classroom Building

Renovate Building 2200 - Health Science

Renovate Building 3100 - EMS

Renovate Building 3400 - Print Shop

Renovate Building 3900 - Chemistry/Computer Science

Renovate Building 3400 - DSRC

Renovate Building 1800 - General Classroom Building

Renovate Building 3500/3700 - Child Development Center

Renovate Building 3800 - Bookstore
Phase 1, 2, 3, and 4 - Facilities Master Plan
**POTENTIAL MASTER PLAN ZONING**

The master planning process included a discussion of potential future zoning of functions as new buildings are constructed and existing buildings are renovated. The following diagrams illustrate what was discussed.

**LEVELS OF REMODEL**

The diagram of the existing campus is color coded to illustrate the proposed levels of renovation that will occur as the Facilities Master Plan is implemented. Major remodels include areas where a function will move out and the space will be remodeled for a new use. Minor remodels include areas where the space will be improved, but will not have a change of use. Facilities that will be removed and their functions will move to new facilities are identified along with areas that the College could consider moving (Moves?).

**CURRENT ZONING**

The diagram of the existing campus is color coded to illustrate the current zoning of campus functions. This was used to illustrate the potential shifts that could occur as the Facilities Master Plan is implemented.

**POTENTIAL ZONING**

The diagram of the Facilities Master Plan is color coded to illustrate potential future zoning of campus functions. This will be used to assist the College as programming decisions are made for both new and renovated building projects.
Current Zoning  CHABOT COLLEGE
Design Guidelines

The purpose of the Design Guideline section of this document is to communicate the design guidelines for future physical development of the Chabot College campus. These guidelines are broken down into the key issues that create campus character: campus plan, architectural vocabulary and landscape treatment.

Woven through these guidelines as a common thread, is a consistent approach to the challenge of creating new design within an existing campus. This approach is based on identifying the essential elements and visual themes of the Chabot tradition. The Design Guidelines are focused on these key traits and developed to assure that they become integral to all future development. New design at Chabot College will be developed to reinforce and enhance the existing character of the campus.


**CAMPUS PLANNING CONCEPTS**

“Seen from the air, the beautiful Chabot College campus in Hayward, California presents a geometric appearance with classroom buildings radiating outward from a three-acre Grand Court which serves as the center of activity. The elliptical design provides convenient access to all buildings and encourages students to avail themselves of educational opportunities outside their major field of study. Small courts and walkways offer opportunities for after school discussions by student and faculty.”

1967 quote from original Campus Designer

The following points include observations and recommendations for developing the campus plan.

- Unique courts create an open space hierarchy and help with Campus way-finding.
- Strengthen curved secondary paths with landscaping, lighting and visual termini.
- Soften the building edge at residentially scaled Depot Road.
- Create a clear public gateway entrance to the Arts Court/Performing Arts Center.
- Provide a ‘Gateway’ to the Grand Court.
- Shift inwardly focused campus out towards the Community.
- Monumental building provides a new campus image at Hesperian.
- Maintain rhythm and scale of buildings along Hesperian Boulevard.
- Emphasize campus entries.
- Connect parking lots with internal perimeter road.
- Open visual links/transparency between buildings and courts.
- Develop Athletic Fields ‘Gateway’.
- Develop pathway from central campus to athletic fields.
- Buildings terminate axial relationships.
- Respect architectural character of original inner Campus defined by the arcade.
- Develop distinct activity areas at Grand Court.
- Build upon the strong Campus geometric relationships.
- Develop pedestrian nodes/pathways from parking lots into the Campus.
- Create strong visual links between buildings, gateways and courts.
- Eliminate "Fresh and Natural" truck and determine a permanent location in a building.

- Integrate vending machines into the architecture of the campus.
- Eliminate or screen mechanical equipment from major pathways and views.
- Locate new equipment to the least used sides of buildings, away from view and traffic.
- Provide discrete locations for smoking shelters away from building entries, windows, or HVAC air intakes.

**ARCHITECTURAL GUIDELINES**

The architectural guidelines describe recommended characteristics of architectural features. Together, the guidelines suggest a unified image for the Chabot College campus. They are to be used by the campus to guide the design of all projects on the campus. Guidelines are general and are broken down into the following categories: architectural framework, design elements, gateways and paths, transparency and sustainability.

**Architectural Framework**

A strong architectural framework defined by the elliptical arcade which encloses the Grand Court defines all the building relationships on the Chabot Campus. This right geometry served the original intent of encouraging student and faculty interaction regardless of academic discipline. In keeping with the precept of "form follows function" the classroom, library and theatre are defined by simple building forms expressing their underlying function. The original designers referred to the Chabot College architectural style as "Mediterranean West" borrowing the classical language of arches, expressed columns, and decorative elements merged with the distinctive Bay Area flavor of the 1960's.

- Campus Character: Future buildings should balance the existing formal geometric vocabulary with the informality of student life.
- Buildings and court placement are arranged with the existing Campus spatial geometry.
- Buildings along the Grand Court should retain their original architectural character and scale.
- Retain the scale of the Campus - do not exceed two stories.
DESIGN GUIDELINES

CHABOT COLLEGE FACILITIES MASTER PLAN

Campus Planning Concepts

CHABOT COLLEGE
Design Elements
Chabot’s architectural character is created with a simple collection of design elements arranged in a strong spatial geometry. The main entry introduces a gentle arch which is expressed in the buildings and arcades structural framework. Reinforced concrete takes on many forms; tilt-up panels with exposed aggregate, smooth integral colored concrete structural elements and limited use of decorative forming creating pattern and texture. Scale is reinforced with a regular rhythm of columns along the arcade and in the expressed column structure of the buildings. Deep roof overhangs project well beyond the building faces and extend over the arcade at two story buildings defining entries. Decorative elements are used sparingly; metal grille sunshades at windows, light fixtures shades and balcony balustrades maintain a language of simple repetitive circular patterns. There is an adherence to simple details and forms creating a unified architectural expression.

- Consider material/color/texture alternatives compatible with the existing exposed aggregate concrete panels and integral colored concrete structural elements.
- Develop color and material studies developed in conjunction with the Campus/Building Aesthetics & Sustainability Sub-Committee.
- Concentrate design elements on major facades to heighten their impact emphasizing building entries.
- Continue the use of simple roof forms with deep overhangs developed in conjunction with site specific daylighting and shading studies.
- Articulate building structure.
- Reinforce the scale and rhythm of existing buildings.
- Provide uniform accessible signage incorporating color and clear graphics.
- Maintain circular forms as a campus theme.
**Gateways and Paths**

Strengthen the 'sense of arrival' along pedestrian paths with appropriately scaled gateway elements.

- Create a monumental entry celebrating Chabot College.
- Paths and visual links orient the pedestrian on Campus.
- Articulate campus entries with gateways, portals, arcades and trellises.
**Transparency**

The existing Campus design utilizes transparent building lobbies to connect pedestrian paths visually and to demarcate building entryways and passageways. Continuing this tradition, there is an opportunity to enhance connections between interior and exterior spaces, aid in way-finding and shift the inwardly focused Campus outward to the Community.

- Carefully placed glazing optimizes natural daylighting and ventilation improving energy efficiency and building occupant comfort.
- Decorative semi-transparent materials add visual interest and provide screening at equipment enclosures.
- Transparent entry lobbies assist in way-finding, accenting building entries and improving safety.

**SUSTAINABILITY**

Chabot Las Positas Community College District is committed to design principles using the LEED™ (Leadership in Energy and Environmental Design) Green Building Rating System as the standard for developing high performance, sustainable buildings. Specific sustainable design goals on the Chabot Campus have been identified by the Campus/Building Aesthetics & Sustainable Design Sub-Committee in keeping with the District Sustainable Guidelines. Additional District Sustainable Guidelines have been developed and should be referenced as a supplemental document.

**GOAL 1. Design and build all major new projects at Chabot College to achieve a performance level equivalent to a Certified Rating or Silver Rating as defined by LEED™.**

**BACKGROUND:**

The work of the design teams and builders for new facilities need a system for evaluating the incorporation of sustainable design into the overall campus. “The LEED™ (Leadership in Energy and Environmental Design) Green Building Rating System is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. Members of the U.S. Green Building Council representing all segments of the building industry developed LEED™ and continue to contribute to its evolution.”

All new buildings and major renovations should achieve a performance level equivalent to a LEED™ Certified project.

“LEED™ was created to:
- define “green building” by establishing a common standard of measurement
- promote integrated, whole-building design practices
- recognize environmental leadership in the building industry
- stimulate green competition
- raise consumer awareness of green building benefits
- transform the building market
LEED™ provides a complete framework for assessing building performance and meeting sustainability goals. Based on well-founded scientific standards, LEED™ emphasizes state of the art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED™ recognizes achievements and promotes expertise in green building through a comprehensive system offering project certification, professional accreditation, training and practical resources.

LEED™ Projects are rated based on points. Bronze, Silver, Gold and platinum ratings are awarded. This college goal should be to achieve the equivalent to a certified rating or a silver rating for all projects.

**RECOMMENDATIONS:**

a) The project team for each building should be selected with the ability and expertise to implement sustainable design standards. They should have team members with experience, a belief that sustainable design is an integral aspect of design, a ability to model energy and day lighting behaviors of any design proposed, that sustainability is an essential component of design from project initiation through construction.

b) Life cycle costing should be as important an economic factor as first cost. Sustainable design and building practices often cost more up front, but are more economic over the long term.

c) LEED™ design standards must be incorporated into the specifications.

d) Operations and maintenance must be factored into the design.

e) All major building projects should include the option for third-party commissioning to ensure sustainable design principals are incorporated into the designs.

**GOAL 2. Maximize the energy efficiency of all buildings.**

**BACKGROUND:**
Maximizing energy efficiency is a sound strategy for reducing a building’s impact on the environment, reducing operating costs for the district, and making the building more pleasant to use. Energy efficiency requires a holistic approach to building design affecting all aspects of the structure. Solar orientation, building envelope design, glazing placement and design, HVAC system design, lighting control, even landscape design, all of these and many other factors must be carefully considered to make a building efficient.

While a carefully considered energy efficient structure takes more time (and thus money) to design, it does not need to incorporate expensive, exotic systems.

**RECOMMENDATIONS:**

a) Integrate energy analysis tools into the design process. Require design professionals to simulate energy and day lighting patterns with various computer modeling software from the earliest design stages.

b) Take advantage of passive solar heating including:
   i) Coordinate the development of building orientation, glazing design, thermal mass

   c) Take advantage of cooling opportunities. Large buildings typically over heat from lighting, equipment and occupants. This can be minimized by:
   i) Developing heat absorbency that occurs during evaporation. One method of achieving this is to cool with evaporative cooling towers.

d) Design building envelopes to optimize thermal control by:
   i) Specifying appropriate insulation levels,
   ii) placement of overhangs and sun shading devices
   iii) selection of glazing, particularly to reduce heat gain.

e) Provide multiple light switches in large rooms to control light levels.

**GOAL 3. Design buildings to take advantage of our sunny climate: incorporate natural day lighting; harvest energy from the sun.**

**BACKGROUND:**
Orientation of the building is critical to the success of day lighting.

**RECOMMENDATIONS:**

a) Avoid east or west orientations; where possible, orient buildings along the east-west axis for maximum north-south building exposures.

b) incorporate photovoltaic technology into shading devices and rooftops when economically feasible.

c) utilize overhangs, shading devices.

d) use photovoltaic power for site lighting.
GOAL 4. Encourage low maintenance, ecological, self-sustaining landscaping designs.

RECOMMENDATIONS:

a) Xeriscapes.
b) Preserve top-soil at sites used for new construction.
c) Limit grass/lawns which require high levels of water and care.
d) Tree survey (location genus and species).
e) Maximize irrigation system efficiency.
f) Use of native vegetation.
g) Planting of deciduous trees; create shade.
h) Where possible, use broadleaf evergreens.
i) Emphasis on low maintenance planting.
j) Aesthetics vs. conservationism; should we minimize lawn areas?
k) See Landscape Master Plan for additional information.

GOAL 5. Manage water resources on campus by reducing consumption, recycling waste water and minimizing run-off.

RECOMMENDATIONS:

a) Investigate use of reclaimed water from wastewater treatment plant.
b) Use of grey water for vegetation grey water from sinks and showers.
c) Minimize storm-water run-off by minimizing impervious surface areas.
   Incorporate previous concrete, asphalt and open-cell pavers.
d) Incorporate vegetated buffers to treat storm-water run-off from parking lots and rooftops to minimize point-source pollution from reaching the Bay.
e) Rainwater harvesting.
f) Specify waterless urinals. Some high profile installations include Liberty Island, New York; Petronas Towers, Malaysia; The Jimmy Carter Library, Georgia; Alameda County; City of Santa Monica; Kaiser Permanente; UC Santa Barbara.
g) Minimize impervious surface areas.

GOAL 6. Promote links to mass-transportation, carpooling, pedestrian and bicycle commuting.

RECOMMENDATIONS:

a) Encourage bicycling to campus by providing safe racks and/or bicycle lockers and showering and changing facilities.
b) Provide methods for encouraging carpooling by making preferred parking available for high-occupancy vehicles (HOV’s).
c) Provide easy public transportation connections.

GOAL 7. Minimize waste through integrated recycling, composting and the salvage and reuse of existing materials.

RECOMMENDATIONS:

a) Campus recycling:
   i) Incorporate recycling bins/containers with trash containers; harmonize with buildings, provide throughout campus
   ii) Provide ample and integrated staging areas for recycling, compactors and balers
   iii) Work with recyclers for the most labor-efficient method of gathering recycled materials, including levels of co-mingling vs. individually separated collection systems
b) Composting
   i) Incorporate composting of landscaping debris and organic waste on either on-campus or off campus
   ii) Incorporate composting of landscaping debris and organic waste on either on-campus or off campus
   iii) Incorporate composting of landscaping debris and organic waste on either on-campus or off campus
   iv) Recycle mineral fiber acoustical ceiling tile. See Armstrong Ceilings Reclamation Program for recycling options. Recycle carpeting through various reclamation programs run by DuPont, Monsanto, and BASF
d) New construction and demolition recycling.
GOAL 8. **Promote the selection of resource-sensitive materials.**

**RECOMMENDATIONS:**

a) Document minimum recycled-content requirements for building materials. See various national organizations such as the National Recycling Coalition.

b) Document environmental requirements in the specifications; monitor adherence to these standards through the submittal process.

c) Avoid use of finish materials where not absolutely necessary for performance or aesthetics.

d) Dimension buildings using standard-sized modules to minimize generation of waste.

e) Apply the Summary of Material Recommendations from The HOK Guidebook to Sustainable Design, organized by CSI Masterformat sections, for sustainable material-specific guidelines.

GOAL 9. **Protect occupant health and well-being through better indoor air-quality (IAQ), access to daylight, thermal comfort, quality acoustics, and a connection to nature.**

**BACKGROUND:**

“The USA EPA ranks indoor air pollution among the top five environmental risks to public health. Unhealthy indoor air is found in up to 30% of new and renovated buildings.” (*Sustainable Building Technical Manual*, Washington DC, Public Technology, Inc. 1996) Sources for indoor air pollution are found in a multitude of common building products including plywood and particle board, carpeting, paints and sealants, and resilient flooring products.

**RECOMMENDATIONS:**

a) Protect Indoor Air Quality (IAQ):
   i) Specify maximum low-level volatile Organic Compound (VOC) off-gassing levels for all building materials.
   ii) Incorporate easily maintained and durable surfaces where traffic is greatest to minimize use of harsh cleaning chemicals
   iii) Avoid the interior use of engineered wood products with high emission levels of formaldehyde.
   iv) Minimize use of materials with significant quantities of toxic, flammable, corrosive, or carcinogenic material
   v) Sequence construction so wet and/or odor-emitting materials are installed well in advance of “dry ‘sink’ materials, such as carpet, ceiling tile, fabric wall covering, and upholstered furnishings, that can absorb contaminants.” (The HOK Guidebook to Sustainable Design)
   vi) Provide pre-occupancy flush-out ventilation with 100% outside air prior to occupancy
   vii) Avoid bake-out procedures to preemptively accelerate VOC emissions.
   viii) Where possible, continuously ventilate areas undergoing remodeling to minimize residual airborne VOC concentrations
b) Provide managed natural daylighting without glare.

GOAL 10. **Utilize biological controls to manage pests.**

**BACKGROUND:**

“What is IPM? Integrated pest management (IPM) is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.”

**RECOMMENDATIONS:**

a) Implement Integrated Pest Management (IPM) for the campus.
GOAL 11. Design for the Cliff Swallows.

BACKGROUND:
Chabot College has a mixed attitude toward the Cliff Swallows - a vestigial remnant of our natural environment. Swallow guano can pose a potential health hazard and mud nests can fall off buildings. Nest have been water blasted off the buildings and vast nets are installed to keep these birds away. Simultaneously, many faculty staff and students celebrate their arrival from South America. The design process should analyze how to work with these birds, not just treat them as an issue of vector management.

RECOMMENDATIONS:
a) Allow for nesting in designated areas. Protect people from bird guano by planting the base of these walls with plants that would be naturally fertilized.

b) Attenuate nesting in areas where the birds can cause a nuisance.

LANDSCAPE GUIDELINES

Landscape Framework
The landscape and open space framework provides the structure for the campus plan. Key concepts such as the Grand Court as the central iconic space, primary circulation paths leading from campus entries to the campus core and themed internal courtyards set the foundation for the plan. The plan emphasizes the pedestrian experience and stresses the development of a distinct character for the outdoor spaces to provide an interesting campus experience while increasing educational opportunities in the outdoor environment. The design guidelines provide a general approach to future landscape development that will establish a cohesive campus landscape identity. Detailed landscape decisions will be made when designing and siting new buildings.

Planting
• Evaluate existing trees and retain large and unique specimens where possible.
• For all new plantings, provide high quality topsoil amended to optimize soil fertility.
• Provide drainage for all planting areas and raised planters where necessary.
• Provide adequate planting area for all tree root zones. Use deep root planters where necessary to prevent damage to paving areas.
• Select disease and pest resistant plants.
• Select plants that require minimal maintenance. Landscape improvements should be designed to be consistent with realistic projections of future maintenance budgets.
• Incorporate the use of native plant materials where possible.
• Remove trees in poor health or in incompatible locations.
• Provide plants with seasonal color change.
• Use flowering trees to accent entries and other key site areas.
• Limit turf to high visibility and use areas.
• Use ground covers to substitute for turf in areas where lawn serves no practical function and in areas that are small, complicated or non-contiguous.
• Locate shrubs higher than 3’ in areas well away from pedestrian pathways and use areas for security.
Avoid planting trees within 10’ of underground utility lines, within 10’ of building walls and under overhead power lines.

Follow sustainable principles when locating trees. Provide deciduous trees along south building faces to allow sunlight to penetrate in the winter.

Create educational opportunities with plant materials. Create botanical species groupings for study.

**Irrigation**

- Provide centralized irrigation system following guidelines provided by maintenance staff.

**Paving**

- Develop common palette of paving materials and hardscape elements to unify campus character.
- Utilize special paving in key site areas.
- Utilize concrete paving for proposed pedestrian walkways within the campus core. In feature areas, utilize special paving such as integrally colored concrete with sawcut score joints, concrete pavers and permeable concrete.
- Meet all current ADA codes for paving.

**Site Furniture**

- Provide bicycle parking in association with each site zone.
- Utilize sturdy, vandal-resistant site furniture.
- Provide uniform furniture vocabulary throughout campus.
- Provide disabled access seating in all areas to meet current codes.
- Screen dumpsters from view with walls and planting. Enclosures should have gates that are easily accessible.
- Provide drinking fountains throughout campus as part of architecture.

**Signage**

- Provide uniform sign system for identity, informational, directional and regulatory signage.
- Harmonize sign design with architectural vocabulary.
- Locate signs to be viewed from key directions of travel.

**Lighting**

- Provide adequate lighting outside building entrances and exits, along pedestrian routes, in parking lots and at other key areas to meet standards for public safety and security.
- Use lighting to enhance the aesthetic qualities of the campus and highlight special features.
- Coordinate lighting locations and pole heights with tree and landscape locations.

**Art and special features**

- Include works of art and special features in developing courtyards and major outdoor spaces.
- Use a variety of art options including sculpture, inscribed quotes and images, seating and site furniture design, lighting, murals and water elements.
- Select art to relate to adjacent building uses to enhance learning experience.

**Sustainability**

**Stormwater Management**

- Provide bioswales for on-site water filtration and ground water recharge (also reduces impact on sewer system).
- Increase permeable surfaces on the site by maximize planting areas and permeable paving.

**Water Conservation**

- Use low water-use and drought tolerant trees and plants, preferably native species.
- Use recycled gray water for irrigation, toilets and urinals where possible.
- Minimize lawn areas that have high maintenance and fertilizer needs.
**Solar/Light**
- Provide tree cover for shade in parking lots and plazas. Tree-lined streets and sidewalks reduce solar exposure, glare and heat.
- Specify light fixtures that minimize night time light pollution and glare.
- Choose plant materials to work in concert with building heating/cooling needs. For example, use deciduous trees adjacent to building elevations that would benefit from additional solar exposure in fall/winter. Use evergreen trees/plants for the opposite effect.

**Materials**
- Specify locally manufactured, recycled and/or sustainably harvested (i.e. certified forest products) landscape materials and products.

**Transportation Planning**
- Provide access to alternative transportation (bus shelter, bike lanes/parking, carpool parking, provisions for alternative fuel vehicles).
Existing Conditions

The Existing Analysis phase of the planning process involved a study of the existing conditions on the campus in order to identify key planning issues to be addressed in the Master Plan Recommendations. The information was obtained from discussions with the Facilities Committee, interviews with college staff and campus tours. The findings are summarized in a graphic that illustrate patterns and characteristics to guide future development.
General Comments
The following is a summary of the discussion with the Facilities Master Plan Committee.

- The campus presents a "back-door" image along Hesperian Boulevard.
- There are few opportunities to "see into" the campus from the exterior.
- Few edges of the campus present an inviting atmosphere to the community.
- Access points into Parking Lots aren’t obvious from Hesperian.
- Parking lots are confusing and difficult to navigate.
- The main entry to the Campus terminates in a blank wall giving no indication of the Grand Court beyond.
- Location of the Performing Arts Center is not obvious.
- Athletic Fields have no distinct access point-finding Lot J impossible.
- Uniformity of buildings and the elliptical primary circulation arcade make way-finding challenging.
- The key signature buildings are the Library, Performing Arts Center and Planetarium which all engage the arcade.
- The ground level of the Library Building doesn’t encourage activity at the Grand Court.
- The palm tree court along the Performing Arts Center is memorable aiding in way-finding.
- The Grand Court’s expanse of concrete can be overwhelming.
- Signage is inconsistent and confusing.
- The original campus buildings present a uniform architectural style.
- Public transportation is utilized by students with three bus lines.
- The campus has some beautiful specimen and dedication trees.
EXISTING CAMPUS ZONING

Campus zoning of building and site functions are illustrated on this graphic. Colors indicate the current assigned functions of buildings and identify the general zoning of uses on the campus.

The following key issues were identified:

- The campus is clearly zoned, with the majority of instructional areas grouped together.
- Faculty office buildings are distributed throughout the campus.
- Most of the parking is located along Hesperian with limited parking along the service road.
- Student service functions are located in different buildings.
- The Student Center is centrally located, but not easily identified by the first-time visitor, or from the center of campus.
- Vocational programs are located adjacent to Child Development.
- The Administration Building has both administrative and student services functions.
- A large part of the campus is zoned for athletics.
Existing Campus Zoning  CHABOT COLLEGE
EXISTING VEHICULAR & PEDESTRIAN CIRCULATION

Vehicular and pedestrian circulation patterns are illustrated on this graphic. Campus entry points and major vehicular circulation routes are shown, along with areas allocated for parking. Pedestrian circulation patterns are illustrated on this graphic, along with underutilized outdoor spaces. Pedestrian paths from parking lots, drop-offs and bus stops are illustrated along with the major pedestrian circulation routes through campus.

The following issues were identified:

- Signage announcing Chabot College is inadequate along Hesperian Boulevard.
- The campus does not have a clear "front door".
- The campus is inwardly focused.
- Accessing the parking lots is unclear.
- Navigating the parking lots is confusing.
- There is limited directional signage on campus for first-time visitors.
- A clear pattern of pedestrian circulation exists on campus.
- The elliptical circulation path is disorienting without clear landmarks and uniform buildings.
- Some outdoor areas are actively utilized, while others are under-developed and under-utilized.
- The Grand Court is underutilized for daily activities and the large expanse of concrete is uninviting.
- Signage for pedestrians is limited, and some signs are confusing.
- There is conflict between pedestrians and vehicles at the road connecting Lot B and Lot J.
- The bus drop off area needs to accommodate three buses simultaneously; the 97 to Union City BART, the 92 and the M San Mateo Bridge Express Bus to Hillsdale Caltrain via Foster City.
Existing Vehicular and Pedestrian Circulation

CHABOT COLLEGE  FACILITIES MASTER PLAN
**EXISTING LANDSCAPE ANALYSIS**

The campus is divided into 15 zones for the purposes of the landscape analysis. Each zone has unique opportunities and constraints associated with it. The following summarizes the key opportunities for each site zone.

**Zone A - Grand Court and Library**
The existing character of this space is a large, almost entirely unbroken expanse of paving. Pollarded sycamore trees separate the turf amphitheatre from the paved plaza area. Two groves of Magnolia grandiflora create dense shade on either side of the library. This zone is one of the key landscape identity areas for the campus. It is desirable to make this area more attractive, inviting and accessible on a day to day basis while maintaining the flexibility of the space to be used for many functions.

*Opportunities:*
- Enhance the Grand Court as a campus focal point.
- Strengthen the landscape identity of the space.
- Provide human scale and places that invite use on a day to day basis.
- Update amenities and provide additional seating.
- Reduce large expanses of paving and inconsistent paving treatments.

**Zone B - Covered Walk**
The covered walk is the main circulation route within the campus. It provides protection from the sun and rain while connecting to centrally located buildings. The covered walk creates narrow, shady planting areas adjacent to some buildings including the library and the central services building. These are difficult to plant and maintain with any success.

*Opportunities:*
- Enhance and differentiate paving from adjacent uses.
- Update site furniture, lighting and signage and incorporate additional seating.
- Enhance connections with adjacent plazas.
- Raise height of adjacent planters to provide additional soil depth. Plant with appropriate shade tolerant plants that provide color and texture in shaded areas.

**Zone C - Social Science / Business Education**
The Social Science and Business Education courtyard has large expanses of paved area, some significant specimen trees, little to no interest in the understory planting and limited places for seating. While the specimen trees are attractive, the area does not invite day to day use.

*Opportunities:*
- Maintain specimen trees where possible.
- Add seating and site amenities.
- Create understory of shrubs and groundcovers to add seasonal color and interest.
- Utilize special paving in key areas.
- Incorporate grade changes into overall design.
- Reduce the amount of non-permeable paving by increasing planting areas and/or adding permeable paving.

**Zone D - East Entry Corridor**
The East Entry Corridor provides a pleasant entrance to the campus from Parking Lot N. The corridor currently has some specimen trees, a small planter with a rose garden and large areas of turf planting.

*Opportunities:*
- Improve identity and directional signage.
- Enhance landscape identity through formal tree planting and/or shrub and groundcover planting.
- Add seating and site amenities.
- Create sense of campus gateway through special paving, seating and flowering trees.
Zone E - Arts and Theater Courtyard

The Arts and Theater Courtyard serves as a secondary entrance to the campus on a day to day basis and is one of the primary entrances during theatre performances. The courtyard is primarily paved and has a bosque of pollarded sycamores.

Opportunities:
- Reduce amount of paving and add planting and/or permeable paving.
- Evaluate pollarded trees for replacement.
- Create attractive entrance to campus.
- Provide outdoor art display.
- Provide outdoor informal performance area.
- Add special paving in key areas.
- Add seating and site amenities.

Zone F - Maintenance Areas

Zone F includes the landscape area surrounding the maintenance yard.

Opportunities:
- Screen maintenance areas with shrub planting where possible.

Zone G - Child Development, Palm Court and Technology Courtyard

The landscape around the child development center and the palm garden near the theatre is some of the most developed on the campus. The area north of the theatre has an extensive palm garden and a large turf area that creates a sense of place in the area. The child development center, as a relatively new structure, has a developed landscape that includes flowering trees and shrubs. This area can be a model for future landscape development around the campus. The Technology Courtyard has some significant specimen trees but also has large areas of asphalt paving.

Opportunities:
- Maintain palm plantings at theatre and add additional palms where possible.
- Use as a model for other areas of landscape development.
- Enhance secondary circulation connection to Math and Science courtyard with paving and tree plantings.
- Reduce amount of paving in technology courtyard and add additional planting areas and/or permeable paving.
- Add seating and site amenities.
- Add understory plantings.
**Zone H - West Entry Corridor**

The west entry corridor leads from Parking Lot E to the central campus area. This corridor has some significant specimen trees. It serves as an emergency entrance for vehicles as well as a pedestrian entrance. The interface of the pedestrian circulation and vehicular drive at the parking area lacks clear designation and entry features.

**Opportunities:**
- Improve identity and directional signage.
- Resolve pedestrian/vehicular conflicts.
- Add site amenities.
- Create a sense of campus gateway with special plantings and paving.

**Zone I - Science and Math Courtyard**

The area adjacent to science and math buildings has a developed landscape with some specimen trees. It has few benches and no clear congregation area.

**Opportunities:**
- Enhance secondary circulation routes with tree planting and paving.
- Reduce amount of paving and increase planting area.
- Evaluate path widths and layouts.
- Provide outdoor gathering space.
- Increase amount of outdoor seating.

**Zone J - Administration and Central Services**

The landscape areas surrounding the Administration and Central Services buildings front onto the covered walkway. In some cases, planters are empty or contain only a dense planting of ivy. The area is shady and has little outdoor seating.

**Opportunities:**
- Add seating and site amenities.
- Reduce amount of paving where possible.
- Study planters for replacement, raised planter beds.
- Utilize special paving to define key areas.
- Add color and textural planting suitable for shady situations.
- Add directional signage and informational kiosks.

**Zone K - Main Entry**

The main entry connects the central campus to the bus stop and vehicular entry from Hesperian Boulevard. The entry consists of a wide walk with a bosque of elms. The area serves as the primary pedestrian entrance to the campus.

**Opportunities:**
- Improve identity, informational and directional signage.
- Add additional seating.
- Unify site furniture.
- Reduce amount of paving.
- Retain specimen trees where possible.
- Evaluate lighting and increase lighting where necessary.
- Extend allee of trees toward covered walkway.
- Enhance sense of gateway with special paving, signage and planting.
Zone L - Athletic Fields
The landscape areas surrounding the athletic fields are planted with large expanses of turf and scattered specimen trees. There is a lack of a clear formal entrance to the athletic area.

Opportunities:
- Enhance sense of connection with main campus.
- Create entry/identity gateway.
- Improve directional and informational signage.
- Decrease amount of paving where possible and replace with planting and/or permeable paving.

Zone M - Campus Perimeter
The campus perimeter landscape fronts Hesperian Boulevard and Depot Road. Planting is currently inconsistent and varies from broad swathes of green lawn and specimen trees to narrow planting strips with no trees or shrubs.

Opportunities:
- Improve landscape identity from surrounding streets with consistent planting treatment.
- Improve identity and directional signage.
- Screen views into parking lots with low hedges and tree planting.

Zone N - Parking Areas
The parking areas currently lack a strong landscape approach. Parking drive aisles are not clearly defined by landscape. Pedestrian walks and connections to the main campus access points are poorly marked.

Opportunities:
- Improve directional signage.
- Study vehicular and pedestrian circulation.
- Define major circulation routes with landscape treatments.
- Create landscape identity.
- Improve pedestrian access to provide clear and direct connections to campus.
- Utilize sustainable approaches to parking lot drainage.

Zone O - Hesperian Boulevard Frontage
The landscape along Hesperian Boulevard is some of the most attractive currently existing on campus. It is however, the least used for recreation and gathering. Large areas of turf and specimen trees create a lush green character.

Opportunities:
- Evaluate extensive use of turf and reduce where possible.
- Create strong landscape identity from Hesperian Boulevard.
- Retain specimen trees where possible.
Development Options

During the planning process, a series of options were developed and discussed with the Facilities Committee. This section includes illustrations and descriptions of these showing different ideas for improving buildings, landscaping and other site amenities in order to meet the objectives of the Facilities Master Plan. The options were used to stimulate discussions that ultimately led to the development of the Recommended Facilities Master Plan.
OPTION 1

Option 1 is an illustration of the Report of the Facilities Committee developed for the Measure B Bond Effort. The existing Campus Plan is largely retained in its current layout.

- Building 400 is razed and replaced with the new Student Services Center.
- Butler Building 3600 is razed making way for the new Broadcast (AV) Building, a stand alone facility adjacent to the Performing Arts Center.
- Athletic Field Improvements limited to tennis court reorientation and Field Building renovations and replacements.
- Business Lecture Hall 600 is expanded and a second story added for additional classrooms.
- Performing Arts Center lobby is expanded.
- Single story Building 1500 is demolished and replaced with a two-story building.
- PE Building 4100 relates to the athletics fields and is a discrete building.
- Maintenance functions, formerly located in the Butler Building 3600, are moved to District facilities and a new Maintenance Building off the Maintenance and Operations yard.
- Temporary Buildings 3200 (Disabled Student Physical Education Center) and 3300 (Security) are demolished and services relocated.
**Option 2**

Option 2 shares several elements with Option 1.

- The Student Services Building becomes the “gateway” to the Campus, providing a strong relationship to the existing Library - Building 100. Business Education - Building 300 and Business Education Faculty Offices - Building 400 are demolished.
- Broadcast (AV) Building connects with Performing Arts Center.
- PE Building 4100 shaped to accommodate additional tennis courts and improve orientation.
- The access road between Lot B and Lot J is straightened for pedestrian safety and improved vehicular access.
- Office Building 700 and Lecture 600 is razed and replaced with a new Social Sciences and Language Arts Building.
**OPTION 3**

- The Student Access Center becomes a "gateway" building linking the community via a transparent lobby creating a portal to Hesperian from the Grand Court.
- Locating the Student Access Center at the mid-point of the Campus bridges the two ends of the Campus and creates a synergy with the Planetarium Building across the Grand Court.
- The Broadcast Building and PAC expansion presents a soft edge to the single story residential street at Depot.
- The athletic fields and PE Complex receive an entry gateway with a clear relationship to vehicular circulation at the parking lot.
- Pedestrian paths are initiated in parking lot and lead into the Grand Court strengthened with landscaping and articulated gateways.

This Option generated a lot of enthusiasm with the Facilities Committee and led to the development of the Preferred Option which follows.
LANDSCAPE ALTERNATIVES

Two landscape themes were developed during the alternatives phase of the master planning process. Alternatives differed in landscape plant palette and approach to planting design.

Alternative 1 - Campus as Arboretum
Alternative 1 explored the landscape development of the campus open spaces as an arboretum with a collection of different trees and plant materials from around the world. Districts were identified that would include species from specific continents or representative plant types.

Flowering trees and shrubs marked campus entry points. Primary circulation and pedestrian entries into the campus were highlighted by gateways and special features. Flowering trees and shrubs in formal allee plantings marked pedestrian entries. These entries included an entry between Buildings 200 and 300, the main entrance at the new Student Access Center, an entry between Buildings 800 and 900 and an entry between Buildings 900 and 1200. Also highlighted were entrances to the athletic fields, the gym and the theatre.

Secondary and interior pedestrian circulation routes were also formalized with flowering trees and shrubs. Vehicular and street planting would be marked by alternative groves of evergreen and flowering trees. Courtyards would contain seasonal color plantings, special paving and themed landscape character that relates to adjacent buildings such as a sculpture garden next to the art building, quotes in paving next to the language arts building, etc.

Alternative 2 - Campus as a Reflection of the California Landscape
Alternative 2 developed the campus as a reflection of the native California landscape. Native trees and shrubs were predominantly used throughout the campus. Circulation routes were marked with informal planting arrangements of native trees, shrubs, grasses and groundcovers. Flowering trees and shrubs in formal allee plantings marked pedestrian entries. These entries included an entry between Buildings 200 and 300, the main entrance at the new Student Access Center, an entry between Buildings 800 and 900 and an entry between Buildings 900 and 1200.

Courtyards reflected the native landscape zones of the California landscape including the redwood forests, chaparral, bay edge, etc. Special features in the courtyards were related to adjacent building uses.

Recommendation
The proposed recommendations for the Landscape Master Plan combines features from each of these alternatives with an emphasis on the ‘Campus as Arboretum’ theme.
Appendix

This section of the document includes information that was generated during the planning process and used in the development of the Facilities Master Plan Recommendations.

The following are included:

- Educational Planning Quantification
- Master Plan Alternate
- Circulation and Parking - Analysis & Study
- Suggested Plant Species List
- Building Mechanical Systems
- Building Electrical Systems
- Security Guidelines
- Chabot College IT Master Plan

**Educational Planning Quantification**

The Chabot College Educational Master Plan was developed in 2002 and serves as the foundation for the development of the 2005 Facilities Master Plan Recommendations. As part of this planning process, educational program forecasts were developed and planning data was quantified in order to forecast the types and amount of space that will be required as the campus is developed. This section includes a summary of the material that was developed as part of this effort.

The Facilities Master Plan is intended to accommodate a potential growth of up to 17,500 students on the Chabot College campus. It should be emphasized that, for planning purposes, the exact year in which a projected student enrollment is achieved is not critical. What is critical is that the trend in student enrollment will be recognized and instructional programs, support services, facilities and staffing master planned to be responsive when that level of enrollment is ultimately achieved.

Title 5 of the California Administrative Code prescribes standards for the utilization and planning of space for public community colleges. These standards, when applied to the total number of students served, assist in the quantification of space needs for facilities master planning. Using the College’s Existing Space Inventory, needs were identified to address the projected growth.

The Facilities Master Plan Recommendations include a translation of projected space needs into renovated and newly constructed facilities. As spaces are programmed and designed, it is critical that the maximum degree of flexibility be incorporated in order to accommodate future needs as they arise. Of particular interest, is the College’s desire to incorporate Learning College principles throughout the campus. These will be explored further as the Facilities Master Plan is implemented.
Following the preliminary approval of the Facilities Master Plan, an alternative for one area of the campus was explored. The area involved the Performing Arts proposed entry and Building 1100.

The Facilities Master Plan drawing indicates that Building 1100 will remain and be incorporated as part of the development of the Performing Arts entry and courtyard. An alternative approach would be to remove this facility and move the functions to the new Instructional Office Building. The Master Plan Alternate on the following page illustrates this alternative approach.
CIRCULATION AND PARKING - ANALYSIS & STUDY

Circulation and Parking Analysis

Background and Design Objectives

The Chabot College Campus is located on the south side of Hesperian Boulevard, west of Depot Road in the City of Hayward, California. Chabot College was constructed in 1965, and is currently undergoing a major facilities revision, of which this Circulation and Parking Design is an integral component.

Chabot College currently accommodates approximately 15,250 students, and this is forecast to increase to a capacity of 17,500 students. This increase in enrollment and activities at Chabot College will increase demand for parking and will add to campus traffic and circulation issues. At the same time, the changes to the campus’ parking and access envisioned in the Facilities Master Plan may eliminate some parking spaces and will reduce the total number of driveways from the College to adjoining streets. The Facilities Master Plan, from a transportation perspective, focuses on the Plan’s accommodation of future parking needs, improvements to site access and circulation, safe pedestrian and bicycle access, and convenient public transit service to the future Chabot College.

The following design objectives were applied as measures of the effectiveness of the design features of the Facilities Master Plan:

- **Parking capacity in the Facilities Master Plan should maintain or improve on current conditions.** In a March, 2004 study, Sandis Humber Jones estimated that current campus parking facilities provide approximately 1 space per 6.2 students. As a design objective, this ratio of 1 parking space per 6.2 students was used as a measure of the Facilities Master Plan’s effectiveness in addressing future campus parking demand.

- **Campus parking lots should make the most efficient use of available space.** The Facilities Master Plan envisions a more intensive use of the Chabot Campus site, and those areas set aside for parking will need to be used efficiently to provide the maximum number of spaces if the goal of maintaining or improving on current conditions is to be achieved. As a design objective, the most efficient application of industry standards to achieve adequate future parking capacity was used as a goal for the Facilities Master Plan.

- **Campus access to the surrounding street system should provide acceptable traffic levels-of-service for students, staff and the surrounding community with the anticipated addition of increased College traffic.** Increased enrollment at Chabot College can be expected to increase daily and peak period traffic to and from the Campus. The Facilities Master Plan also changes the configuration and total number of campus access points. As a design objective, level-of-service (LOS) “D” at all campus driveways was used as the measure of the Plan’s effectiveness in addressing future access needs.

- **Connectivity between Chabot College’s parking lots should be improved.** Currently, connectivity between the ten campus parking lots is poor. In many cases, students and staff must exit the campus to Hesperian Boulevard or Depot Road to travel to another campus parking lot. This increases the impact of college traffic on the surrounding street system, and is inconvenient for the campus community as well. As a design objective, improved connectivity between campus parking areas was used as the measure of effectiveness for the Facilities Master Plan.

- **Pedestrian safety and parking lot security should be emphasized.** The safety of pedestrians, disabled persons, bicyclists and drivers is a primary design objective for the Facilities Master Plan, and the plan’s design was based on an uncompromising commitment to providing the safest possible conditions in the campus’ parking areas and circulation facilities. This emphasis is expressed in recommendations relative to sidewalks, crosswalks, visibility, signing and striping, and lighting.
**Existing Campus Access and Circulation Facilities**

Access to Chabot College is provided via five driveways on Hesperian Boulevard and four driveways on Depot Road. Two of the campus’ driveways on Hesperian Boulevard accommodate both entering and exiting traffic, with left-turns permitted to northbound Hesperian Boulevard. Two of the Hesperian Boulevard driveways are exit-only, and one is entry-only. The intersection of Hesperian Boulevard, Turner Court and the Chabot College driveway is signalized. All other campus driveways on Hesperian Boulevard are controlled by STOP signs on the driveway approach. All four of the campus driveways on Depot Road allow "full-access" with left and right-turns permitted to and from the driveways, and all are controlled by STOP signs on the driveway approach. All-way STOP signs are provided at the intersection of Depot Road, Dodge Street and the campus driveway.

While Chabot College is blessed with numerous access points to the surrounding street system, internal circulation at the campus is poor. No connections are provided between many of the parking lots, and vehicles must exit to the street to go to another lot if their first choice is full. This is inconvenient for the Chabot College community, and adds to campus traffic on Hesperian Boulevard and Depot Road. Access to parking lots A, B and J is provided via a signalized driveway on Hesperian Boulevard at Turner Court. Access to lots F, G, and H is provided via un-signalized driveways on Hesperian Boulevard and Depot Road. Access to lots C, D and E is provided via un-signalized driveways on Depot Road. As previously noted, there are no internal roadways connecting lots A/B/J to lots F/G/H, and likewise no connection to lots C/D/E.

**Existing Campus Parking Facilities and Occupancy**

Parking at Chabot College is provided in ten surface lots, totaling 2,495 spaces. (Sandis, Humber, Jones. March, 2004) Parking occupancy at Chabot College was surveyed in April, 2005. The surveys were conducted on a Wednesday and a Thursday to account for class scheduling patterns. The parking occupancy counts were taken from 8:00 AM until 12:00 PM to capture peak daytime demand, and from 5:00 PM until 7:00 PM to measure evening demand.

**Forecast Enrollment at Chabot College**

Forecasts of future enrollment at Chabot College are important for campus parking and transportation systems. Demand for on-campus parking and college traffic generation are directly affected by the number of students, faculty and staff who attend classes or work at Chabot College. In this analysis of future traffic and parking conditions at Chabot College, enrollment (and staffing levels) are used as the "predictor variable" for estimates of campus traffic generation and changes in parking demand.

Based on information provided by the Chabot-Las Positas Community College District (CLPCCD), Chabot College is forecast to increase enrollment from 15,249 in 2005 to a maximum enrollment of 17,500.

**Facilities Master Plan Campus Access and Circulation Facilities**

The Chabot College Facilities Master Plan includes significant improvements to circulation and access, targeted at some of the problems of the existing campus. Most importantly, the Facilities Master Plan proposes a "ring road" through the campus’ parking areas, addressing the existing deficiencies of on-campus connectivity between parking lots. The "ring road" can be seen on the draft Facilities Master Plan, extending from Lot B at the north of the campus through lots A, B, G, H, F and E to the southwest corner of the campus. This will allow vehicles to travel between the campus’ parking areas without having to exit to Hesperian Boulevard and/or Depot Road. This will reduce the effects of Chabot College traffic on the surrounding street system, while being much more convenient for the campus community.

Also improved is the road connecting Lot B northward to Lot J. This one-way (northbound) connecting roadway improves on the geometric design features of the existing road, removing some of the inconvenient left-right turn sections.

In combination with the on-site circulation improvements, the Facilities Master Plan proposes changes to the access points to the Chabot campus. On Hesperian Boulevard, the "ring road" allows the consolidation of driveways, resulting in the removal of one exit-only driveway from the current public transit stop and drop-off area adjacent to Lot A. The bus stop area will be relocated to the west side of the "ring road" near the proposed Instructional Office Building. On Depot Road, the Facilities Master Plan proposes to remove the most easterly campus driveway (near Hesperian Boulevard), but
maintains the remaining three driveways in their current locations. Removal of the most easterly driveway will reduce turning-movement conflicts near the intersection of Hesperian Boulevard and Depot Road.

**Facilities Master Plan Parking Facilities**
The Facilities Master Plan proposes major revisions to the Chabot campus parking areas. As previously noted, the Plan envisions a "ring road" connecting the campus parking lots. While this improves connectivity and on-campus circulation, it also allows for an increase in on-site parking capacity. The improvement of parking capacity by re-striping will result in a gain of 338 new parking spaces.

To create this increase in campus parking capacity, the Master Planning Team conducted a design effort for the planned campus parking areas, guided by the following design targets:

- Make the most efficient use of parking areas to maximize the number of available spaces. The Master Plan applied traffic engineering standards to the design of campus parking areas to ensure that the maximum number of spaces could be provided for the Facilities Master Plan. The design effort used a standard parking space "template" of 8-foot 9-inch width by 18-foot length. This standard specification is recommended by the Urban Land Institute (ULI) in their publication "The Dimensions of Parking, Fourth Edition".

- Emphasize Safety and Security in campus parking areas. The safety and security of all people using the Chabot College parking areas was given the highest priority in the Master Plan. Parking lot safety includes both traffic safety concerns and personal safety/security issues. The Master Plan addressed the traffic safety aspect by developing standard, formal signing and striping plans for pedestrian crosswalks, STOP signs and other traffic management features.

The parking lot design emphasizes visibility from the campus "ring road" as well as from Hesperian Boulevard and Depot Road. The "radial" arrangement of the parking aisles is explicitly aimed at the security of parking lot users. Good visibility in campus parking areas equals enhanced security for Chabot’s students, staff and visitors.

- Improve connectivity between campus parking areas. The "ring road" is an important improvement to the Chabot campus, and addresses an existing deficiency. The Master Plan applied traffic engineering principles and standards to the design of the "ring road" to develop recommendations for STOP signs and other traffic control features to manage traffic and minimize potential conflict points.

The resulting parking lot plan as shown in the reflect these design goals, as shown in Figure 3. The Facilities Master Plan will provide a total of 2,833 spaces in the campus’ parking lots. Based on the design goal of 1 space per 6.2 students, the forecast enrollment of 17,500 students at Chabot College would create a need for 2,823 spaces. The planned 2833 parking spaces would represent a ratio of 1 space per 6.18 students, which exceeds the design goal.

**Alternate Parking Study**
The parking study shown on the following page depicts a maximum parking alternative for Chabot College. The parking areas would be re-surfaced and re-striped to allow for a mix of compact and standard parking spaces while maintaining the interior connecting road that is a keystone feature of the parking re-design.

Parking for Chabot College currently accommodates an enrollment of approximately 15,250 students, and this is forecast to increase to 17,500 students over the next ten years. This increase in enrollment and activities at Chabot College will increase demand for parking and will add to campus traffic and circulation issues. At the same time, the changes to the campus' parking and access envisioned in the Facilities Master Plan will increase parking spaces while reducing the total number of driveways from the College to adjoining streets. The Facilities Master Plan, from a transportation perspective, focuses on the Plan's accommodation of future parking needs, improvements to site access and circulation, safe pedestrian and bicycle access, and convenient public transit service to the future Chabot College.

This alternative parking study maximizes faculty, staff and student parking while maintaining appropriate ratios for accessible parking. The alternate plan provides 2,833 parking spaces which accommodate a future enrollment of 17,565 students at a ratio of 1 space per 6.2 students.
SUGGESTED PLANT SPECIES LIST

The following plants are recommended for use as campus master plan projects are implemented. They have been selected because of their low water and maintenance needs.

ACCENT TREES

Aesculus x carnea  Deciduous  30’-40’ Sun  Horse Chestnut

Acer Rubrum 'Autum Blaze'  Deciduous  40’-60’ Sun/Pshade  Red Maple

Arbutus unedo  Evergreen  30’-40’ Sun  Strawberry Tree

Cercis occidentalis  Deciduous  15’-20’ Sun  Western Redbud

Chitalpa tashkentensis  Deciduous  20’-30’ Sun  Chitalpa

Fraxinus 'Fan West'  Deciduous  40’-60’ Sun  Ash Tree

Gleditsia triacanthos 'Sunburst'  Deciduous  40’-60’ Sun  Honey Locust

Koelreuteria paniculata  Deciduous  20’-35’ Sun  Goldenrain Tree

Lagerstroemia indica 'Muskogee'  Deciduous  15’-20’ Sun  Crape Myrtle

Liriodendron tulipifera  Deciduous  60’-80’ Sun  Tulip Tree

Lyonothamnus floribundus  Evergreen  20’-40’ Sun  Catalina Ironwood

Magnolia grandiflora  Deciduous  60’-80’ Sun  Southern Magnolia

Magonlia x saulangiana  Deciduous  30’-40’ Sun  Saucer Magnolia

Pistacia chinensis  Deciduous  30’-60’ Sun  Chinese Pistache

Pyrus calleryana 'Aristocrat'  Deciduous  35’-40’ Sun  Ornamental Pear

Robinia x ambigua 'Idahoensis'  Deciduous  30’-40’ Sun  Idaho Locust
### LARGE SCALE TREES

<table>
<thead>
<tr>
<th>Tree Type</th>
<th>Common Name</th>
<th>Size</th>
<th>Sunlight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calocedrus decurrens</td>
<td>Incense Cedar</td>
<td>Evergreen</td>
<td>75'-90'</td>
</tr>
<tr>
<td>Cedrus atlantica</td>
<td>Atlas Cedar</td>
<td>Evergreen</td>
<td>40'-60'</td>
</tr>
<tr>
<td>Lysiloma microphylla</td>
<td>Feather Bush</td>
<td>Deciduous</td>
<td>20'-30'</td>
</tr>
<tr>
<td>Olea europaea 'Swan Hill'</td>
<td>Olive</td>
<td>Evergreen</td>
<td>25'-30'</td>
</tr>
<tr>
<td>Platanus x acerifolia</td>
<td>London Plane Tree</td>
<td>Deciduous</td>
<td>30'-40'</td>
</tr>
<tr>
<td>Platanus racemosa</td>
<td>California Sycamore</td>
<td>Deciduous</td>
<td>30'-80'</td>
</tr>
<tr>
<td>Quercus agrifolia</td>
<td>Coast Live Oak</td>
<td>Evergreen</td>
<td>20'-70'</td>
</tr>
<tr>
<td>Quercus douglasii</td>
<td>Blue Oak</td>
<td>Deciduous</td>
<td>40'-70'</td>
</tr>
<tr>
<td>Quercus lobata</td>
<td>California White Oak</td>
<td>Deciduous</td>
<td>40'-70'</td>
</tr>
<tr>
<td>Quercus suber</td>
<td>Cork Oak</td>
<td>Evergreen</td>
<td>30'-60'</td>
</tr>
<tr>
<td>Sequoia sempervirens 'Los Altos'</td>
<td>Redwood</td>
<td>Evergreen</td>
<td>70'-90'</td>
</tr>
<tr>
<td>Schinus molle</td>
<td>California Pepper Tree</td>
<td>Evergreen</td>
<td>25'-40'</td>
</tr>
<tr>
<td>Zelkova serrata</td>
<td>Sawleaf Zelkova</td>
<td>Deciduous</td>
<td>40'-60'</td>
</tr>
</tbody>
</table>

### LARGE SCALE SHRUBS

<table>
<thead>
<tr>
<th>Shrub Type</th>
<th>Common Name</th>
<th>Size</th>
<th>Sunlight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alyogyne huegelii</td>
<td>Blue Hibiscus</td>
<td>Evergreen</td>
<td>6'-10'</td>
</tr>
<tr>
<td>Anisodonta x hypomandarum</td>
<td>Cape Mallow</td>
<td>Evergreen</td>
<td>6'-8'</td>
</tr>
<tr>
<td>Arctostaphylos desifloar 'Sentinel'</td>
<td>Manzanita</td>
<td>Evergreen</td>
<td>6'-8'</td>
</tr>
<tr>
<td>Carpenteria californica</td>
<td>Bush Anemone</td>
<td>Evergreen</td>
<td>6'-8'</td>
</tr>
<tr>
<td>Ceanothus griseus var. horizontalis</td>
<td>Ceanothus</td>
<td>Evergreen</td>
<td>6'-10'</td>
</tr>
<tr>
<td>Choisyta ternata</td>
<td>Mexican Orange</td>
<td>Evergreen</td>
<td>6'-8'</td>
</tr>
<tr>
<td>Dodonaea viscosa</td>
<td>Hopseed Bush</td>
<td>Evergreen</td>
<td>6'-12'</td>
</tr>
<tr>
<td>SHRUBS</td>
<td>1-1/2 - 4 FEET</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acanthus mollis Bear's Breech</td>
<td>Evergreen 2’-4’ Sun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artemisia californica California sagebrush</td>
<td>Evergreen 3’-5’ Sun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buddleja davidii Butterfly Bush</td>
<td>Evergreen 4’-6’ Sun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calamagrosis foliosa Reed Grass</td>
<td>Evergreen 1’-2’ Sun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cistus x skanberi Rockrose</td>
<td>Evergreen 2’-3’ Sun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deschampsia cespitosa Hair Grass</td>
<td>Evergreen 1’-2’ Sun</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SHRUBS**

<table>
<thead>
<tr>
<th>Evergreen 6'-8' Sun</th>
<th>Pride of Madeira</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grevillea banksii Red Silky Oak</td>
<td></td>
</tr>
<tr>
<td>Evergreen 10'-12' Sun</td>
<td>Heteromeles arbutifolia Toyon</td>
</tr>
<tr>
<td>Evergreen 12-18' Sun</td>
<td>Keckiella antirrhinoides Yellow Penstemon</td>
</tr>
<tr>
<td>Evergreen 6'-8' Sun</td>
<td>Lavatera thuringiaca Tree Mallow</td>
</tr>
<tr>
<td>Evergreen 6'-8' Sun</td>
<td>Leptospermum rotundifolium Tea tree</td>
</tr>
<tr>
<td>Evergreen 6'-9' Sun</td>
<td>Photina x fraseri Fraser's Photinia</td>
</tr>
<tr>
<td>Evergreen 10'-15' Sun</td>
<td>Pyracantha coccinea Firethorn</td>
</tr>
<tr>
<td>Evergreen 10'-12' Sun</td>
<td>Rhus glabra Sumac</td>
</tr>
<tr>
<td>Evergreen 10'-10' Sun</td>
<td>Rhus ovata Sugar Bush</td>
</tr>
<tr>
<td>Evergreen 15'-20' Sun</td>
<td>Tibouchina urvilleana Princess Flower</td>
</tr>
<tr>
<td>Evergreen 8'-15’ Sun</td>
<td>Vitex agnus-castus Chaste Tree</td>
</tr>
<tr>
<td>Evergreen 15'-25’ Sun</td>
<td>Vitis agnus-castus Chaste Tree</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Type</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Dietes bicolor</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Encelia californica</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Epilobium canum</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Festuca californica</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Gaura lindheimeri</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Lavandula angustifolia</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Lavandula dentate</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Nassella cernua</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Penstemon centranthifolius</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Penstemon clevelandii</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Phormium tenax 'Jack Spratt'</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Polystichum munitum</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Rosmarinus officinalis 'Prostratus'</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Salvia greggii</td>
<td>Evergreen</td>
</tr>
<tr>
<td>Sidalcea malviflora</td>
<td>Evergreen</td>
</tr>
</tbody>
</table>

**CHABOT COLLEGE  FACILITIES MASTER PLAN**
BUILDING MECHANICAL SYSTEMS

Infrastructure Analysis

Analysis of the existing campus utility infrastructure including fire water, sanitary sewer, storm drainage, gas and electrical systems is included in the document, Chabot Las Positas Community College District; Chabot College Campus - Utility Study dated April 13, 2005. Recommendations for repairing and upgrading underground utilities are addressed as well as new systems and relocations required for implementation of the Recommended Facilities Master Plan.

Parking Lot and Road Conditions

- Analysis of the existing parking lot and site roads including surface condition and drainage is described in the document, Chabot Las Positas Community College District - Chabot College Campus Parking Lots and Site Roads Study.

Building Mechanical Systems

On Wednesday, May 4, 2005 a Mechanical Survey was performed for the Chabot College. The intent of the survey was to evaluate the existing mechanical systems as it applies to the Campus master plan. The evaluation focused on the Heating, Ventilation, and Air Conditioning (HVAC) of the Campus. The evaluation consisted of visual observation of the mechanical systems. It should be noted that the evaluation did not consist of any destructive demolition, performance testing, calculations, etc. Also, equipment life expectancies noted within this evaluation are based on industry standards and can vary based on uses and level of maintenance.

Generally, buildings on Campus were found to be self-contained from a HVAC viewpoint. Some buildings are provided with mechanical cooling (air conditioning) and some are not. Additionally, while a couple of buildings have been recently remodeled, most of the air-handling equipment appears to be original equipment and has outlived its useful life. Most boilers and chillers within the buildings have been replaced (or added) since original building construction; however, some of this equipment will require replacement depending on the extent of its respective building’s renovation. It should also be noted that many of the building’s original boilers have been replaced within the last ten years. Generally, as boilers where replaced, heating hot water piping within the respective mechanical room was also replaced; however, the original building distribution piping, valves, etc. was retained. In many buildings where we recommend "total replacement of the mechanical systems", the newer boilers may be retained.

The Campus has an existing Alerton Apex 2 building automation system. Generally, mechanical equipment (fans, pumps, etc.) has start/stop capabilities but the mechanical systems are not fully automated. Most buildings have retained the original thermostats, valves, etc. Our recommendation is to upgrade any new systems to be fully controllable/compatible via the building automation system.

Our mechanical assessment generally did not investigate the plumbing systems of each building. In general, each building houses its own water heater. Some heaters are gas fired and a few are electric. As buildings are renovated, we recommend that these systems be upgraded and replaced to meet each building requirements.

Fire protection systems within the buildings are limited. Typical buildings have fire sprinklers within mechanical rooms and custodial rooms. Other areas are not provided with fire sprinklers (this is typical of 1965 construction). Note, several of the new buildings (such as building 3900) are the exception to this and are provided with a fully sprinklered building.
Building Mechanical Systems

**BUILDING 100: ADMISSIONS & RECORDS; COUNSELING; STUDENT PERSONNEL SERVICES; FINANCIAL AID; INFORMATION TECHNOLOGY SERVICES; LEARNING COMMUNITIES; MEDICAL SERVICES; BROADCAST CENTER**

Building 100 was originally constructed in 1965. The building is provided with mechanical cooling and heating from a ducted HVAC system. The building is equipped with a boiler and chiller located in the first floor mechanical room and a remote cooling tower located within an enclosure under the stairs. Air handling systems are located within the first floor mechanical room and on the 2nd Floor within a mechanical mezzanine. It should be noted that the mechanical spaces within this building appear to be inadequate and not allow proper maintenance clearances. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system and a dedicated split system air-conditioner.

**BUILDING 200: ADMINISTRATION**

Building 200 was originally constructed in 1966. The building is provided with mechanical cooling and heating from a ducted HVAC system and fan coil units that were installed approximately 4 years ago. The building is equipped with a new chiller located at the outside of the building. The building also has a newer boiler in the first floor mechanical room. Building 300 also houses the Campus data racks. This room is provided with a raised floor air distribution system.

It appears that the mechanical systems serving this building have been recently replaced and are in good condition. The fan-coil HVAC design should be capable of being retained/added to for future renovations of this building (depending on its future use).

**BUILDING 300: BUSINESS EDUCATION**

Building 300 was originally constructed in 1966. The building is provided with mechanical heating from radiators and baseboard heaters. Heating hot water is provided from a (newer) boiler located in the first floor mechanical room. The building is not provided with mechanical ventilation.

This building is scheduled to be razed. The owner may want to retain the boiler within this building for spare parts.

**BUILDING 400: BUSINESS EDUCATION FACULTY OFFICES**

Building 400 was originally constructed in 1965. The building is provided with mechanical heating from radiators and baseboard heaters. Heating hot water is provided from a (newer) boiler located in the first floor mechanical room. The building is not provided with mechanical ventilation.
BUILDING 500: SOCIAL SCIENCES
Building 500 was originally constructed in 1965. The building is provided with mechanical heating from baseboard heaters. Heating hot water is provided from a boiler located in the first floor mechanical room. Building ventilation is via operable windows and a central building exhaust fan.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 800: LANGUAGE ARTS
Building 800 was originally constructed in 1965. The building is provided with mechanical heating baseboard heaters (with the exception of a computer lab). Heating hot water is provided from a boiler located in the first floor mechanical room. Building ventilation is via operable windows and a central building exhaust fan. Several ductless split system air conditioning units have been retrofitted to serve a first floor computer lab. With the exception of this computer lab, air conditioning is not provided to this building.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 900: HUMANITIES
Building 900 was originally constructed in 1965. The building is provided with mechanical heating from baseboard heaters. Heating hot water is provided from two boilers located in the first floor mechanical room. Building ventilation is via operable windows and a central building exhaust fan. It should also be noted that the boilers within Building 900 also provide heating hot water to Building 1000.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 1000: ART
Building 1000 was originally constructed in 1965 and has recently been expanded. The building is provided with mechanical heating and ventilation from a ducted HVAC system located in a ground floor mechanical room. Heating hot water is provided from building 900.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.
BUILDING 1100: HUMANITIES FACULTY OFFICES

Building 1100 was originally constructed in 1965. The building is provided with mechanical heating from radiators and baseboard heaters. Heating hot water is provided from a boiler located in the first floor mechanical room. The building is not provided with mechanical ventilation.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 1200: MUSIC SKILLS CENTER, LITTLE THEATRE

Building 1200 was originally constructed in 1965, and an addition was constructed at a later date. The building is provided with mechanical heating, cooling, and ventilation from multiple ducted HVAC systems located in an attic mechanical room. Access to mechanical equipment is inadequate. Chilled water is provided to the building via a cooling tower (located outside of mechanical room) and chiller (located within first floor mechanical room). Heating is provided from a boiler located in the first floor mechanical room.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 1300: AUDITORIUM

Building 1300 was originally constructed in 1967. The building is provided with mechanical heating, cooling, and ventilation from multiple ducted HVAC systems. A large built-up multizone unit is located above the balcony that serves the public areas (seating, entrance, etc.) of the Auditorium. Multiple HVAC systems are located in the back of the Auditorium in a mezzanine mechanical room. These systems serve support areas (offices, stage production, etc.) of the building. Chilled water is provided to the building via a cooling tower (located outside of building 1200) and chiller (located within first floor mechanical room). Heating is provided from a 3 boilers located in the first floor mechanical room.

The boilers and chillers serving this building appear to be relatively new (4-5 years old) and do not require replacement; however, any renovation of this building should include a replacement of the air-handling units and associated ductwork systems. Note that replacement of the large built-up multizone unit could consist of fan, motor, controls, etc. replacement while the unit enclosure could be retained.

BUILDING 1400: (INDUSTRIAL) TECHNOLOGY CENTER

Building 1400 contains both technical/vocational classrooms and shops. No mechanical ventilation is provided in the shops (heat is provided by gas fired unit heaters); however, this would be expected. Fan coil units provide heating, cooling, and ventilation to the classrooms within the building. Chilled water is provided to the building via an air-cooled chiller located on the ground just outside the building. Heating is provided by an outdoor boiler located adjacent to the chiller.

It appears that this building is scheduled for a major renovation. Any renovation of this building should include a total removal and replacement of the entire mechanical system.
BUILDING 1500: TECHNOLOGY AND ENGINEERING FACULTY
OFFICES, CLASSROOMS

Building 1500 was originally constructed in 1965 and has had some minor renovations. The building is provided with mechanical heating and ventilation from a ducted HVAC system located in a ground floor mechanical room. Some rooms are also provided with baseboard heaters. Heating hot water is provided from a boiler located within the ground floor mechanical room.

This building is scheduled to be razed. The owner may want to retain the boiler within this building for spare parts.

BUILDING 1600: TECHNOLOGY/ENGINEERING/GRAPHIC ARTS

Building 1600 was originally constructed in 1965. The original building was provided with mechanical heating from baseboard heaters; however, this building has been retrofitted with mechanical cooling within the last 10 years. This retrofit included the addition of an air-cooled chiller and fan coil units. Heating hot water is provided from a boiler located in the first floor mechanical room.

While this building has been retrofitted with cooling, any major renovation of this building should consider a total removal and replacement of the entire mechanical system. As currently designed, any major renovation may have issues with controllability, access to mechanical equipment, and flexibility of modifying the mechanical systems.

BUILDING 1700: MATHEMATICS, PHYSICS, GEOLOGY

Building 1700 was originally constructed in 1965. The building is provided with mechanical heating from baseboard heaters. Heating hot water is provided from a boiler located in the first floor mechanical room. Building ventilation is via operable windows and a central building exhaust fan.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

BUILDING 1800: CLASSROOM BUILDING AND TESTING CENTER

Building 1800 was originally constructed in 1965 and was previously used as a chemistry building. The building has since been converted to its current use as a classroom and testing center. The building is provided with a ducted heating/ventilating unit located in the building’s mechanical room. Heating hot water is provided from 2 boilers located in the first floor mechanical room.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

BUILDING 1900: SCIENCE LECTURE HALLS, PLANETARIUM

Building 1900 was originally constructed in 1965 and houses the Planetarium and three lecture halls. The lecture halls are provided with heating, ventilation, and air conditioning via a single large fan coil unit located above the ceiling. This unit is largely inaccessible. The planetarium is provided with its individual ducted HVAC unit. The building is equipped with a chiller located in the first floor mechanical room and a cooling tower outside the building. A single boiler located in the first floor mechanical room provides heating hot water to the building.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.
BUILDING 2000: SCIENCE AND MATHEMATICS FACULTY OFFICES
Building 2000 was originally constructed in 1965 and has had little to no improvements. Heating and ventilation are provided to this building by a ducted heating/ventilation system. Heating is also provided to some areas with radiant wall heaters. Heating hot water is provided by a newer boiler located within the first floor mechanical room.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building. It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 2100: BIOLOGICAL SCIENCES
Building 2100 was originally constructed in 1965 and has been retrofitted with air conditioning (about 2 years ago). The building renovation provided a new packaged chilled water skid unit, fan coil units (above ceilings), and an air-handling unit (located within mechanical room). This building is also equipped with a packed DX air conditioning unit located on the roof that serves a small computer room. Heating hot water is provided by two newer boilers located within the first floor mechanical room.

While this building has been retrofitted with cooling, any major renovation of this building should consider a total removal and replacement of the entire mechanical system. As currently designed, a renovation may have issues with controllability, access to mechanical equipment, and flexibility of modifying the mechanical systems. Additionally, depending on the extent of a renovation, additional mechanical spaces may be required.

BUILDING 2200: HEALTH SCIENCES, DENTAL HEALTH
Building 2200 was originally constructed in 1965 and has had little to no improvements. Heating and ventilation are provided to this building by a ducted heating/ventilation system (located on a platform). Heating hot water is provided by a newer boiler located within the first floor mechanical room.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building. It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 2300: CAFETERIA, STUDENT CENTER, CAMPUS SECURITY
Building 2300 was originally constructed in 1966 and has had little to no improvements. Heating and ventilation are provided by various ducted HVAC units located in multiple mechanical rooms (located on the first and second floor). Multiple exhaust fans are on the roof serving the kitchen hoods. An older boiler located in a ground floor mechanical room provides heating hot water to the building and a second newer boiler provides 140°F hot water to the kitchen area. It should also be noted that the boilers within Building 2300 also provide heating hot water to Building 2400.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

BUILDING 2400: DISABLED STUDENTS RESOURCES CENTER
Building 2400 was originally constructed in 1965 and has been recently renovated. The renovation of this building included the HVAC systems. This building is provided with heating, ventilation, and air condition via multiple fan coil units located throughout the building. Chilled water is provided via an air cooled chiller. Heating hot water is not produced within the building but is provided from a boiler located in Building 2300.

It appears that the mechanical systems serving this building are relatively new and only minor renovations are scheduled for this building. Any renovation of this building should include minor renovations to the mechanical system.
BUILDING 2500: GYMNASIUM
Building 2500 was originally constructed in 1965. This building is provided with heating and ventilation from 4 elevated fan coil units, which are difficult to access (one in each corner of the gym). Heating hot water is not produced within the building but is provided from Building 2700.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 2600: PHYSICAL EDUCATION FACULTY OFFICES, CLASSROOM
Building 2600 was originally constructed in 1965. This building is provided with heating and ventilation from fan coil units located in the ceiling spaces. Heating hot water is not produced within the building but is provided from a boiler located in Building 2700.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 2700: WOMEN'S SHOWER AND LOCKER ROOMS, CLASSROOM
Building 2700 was originally constructed in 1965. This building is provided with heating and ventilation from a heating/ventilating unit located in a mechanical room. Two newer boilers located in a ground floor mechanical room provides heating hot water to the building and a second newer boiler provides domestic hot water to the building. It should also be noted that the boilers within Building 2700 also provide heating hot water to Buildings 2500 and 2600.

It should be noted that the mechanical spaces within this building appear to be inadequate to accommodate a building renovation. Additional mechanical spaces should be programmed into any renovations of this building.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 2800: MEN'S SHOWER AND LOCKER ROOMS
Building 2800 was originally constructed in 1965. This building is provided with heating and ventilation from a heating/ventilating unit located in a mechanical room. One boiler located in a ground floor mechanical room provides heating hot water to the building and a boiler provides domestic hot water to the building. It should also be noted that the additional boilers, filter, etc. are located within this mechanical room for the pool.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.

BUILDING 2900: PHYSICAL EDUCATION CLASSROOMS
Building 2900 was originally constructed in 1965 and was originally designed as "mini-gyms". This building houses racquetball courts, a fitness center, weight room, and assessment center. The building is provided with heating and ventilation via fan coil units within the space. Some of these units are inaccessible (~30 feet above finished floor with no permanent access). Two new boilers have been installed within this building. The boilers appear to have inadequate space for maintenance.

It appears that the mechanical systems serving this building have outlived their useful life. Any renovation of this building should include a total removal and replacement of the entire mechanical system.
BUILDING 3000: MAINTENANCE BUILDING AND WAREHOUSE
Building 3000 is the maintenance building and warehouse. This houses several offices for the maintenance and operation staff. Packaged DX air conditioning units serve the office space and unit heaters are located within the warehouse. Systems associated with this building are small in nature and if this building is renovated, a total removal and remodel of the various systems would be recommended.

BUILDING 3100: EMERGENCY MEDICAL SERVICES
Building 3100 was originally constructed in 1993. The building is provided with heating, ventilation, and air conditioning from fan coil units located within the ceiling space of the building. Hot water is provided via a boiler in the mechanical room and chilled water is provided by an air-cooled chiller.

It appears that the mechanical systems serving this building are relatively new and only minor renovations are scheduled for this building. Any renovation of this building should include minor renovations to the mechanical system.

BUILDING 3200: DISABLED STUDENT PHYSICAL EDUCATION CENTER
Building 3200 is a portable building that has been on campus for about 16 years. The building is self-contained and heating, ventilation, and air conditioning is provided by a wall mounted heat-pump unit.

This building is scheduled to be removed from Campus. Mechanical systems will be removed with the building.

BUILDING 3300: THE ANNEX
Building 3200 is a portable building. The age of the building was not determined. The building is self-contained and heating, ventilation, and air conditioning is provided by a wall mounted heat-pump unit.

This building is scheduled to be removed from Campus. Mechanical systems will be removed with the building.

BUILDING 3400: REPROGRAPHICS CENTER / PRINT SHOP / GRAPHIC ARTS
Building 3400 was originally constructed in 1993. The building is provided with heating, ventilation, and air conditioning from fan coil units located within the ceiling space of the building. Hot water is provided via a boiler in the mechanical room and chilled water is provided by an air-cooled chiller.

It appears that the mechanical systems serving this building are relatively new and only minor renovations are scheduled for this building. Any renovation of this building should include minor renovations to the mechanical system.

BUILDING 3500: EARLY CHILDHOOD DEVELOPMENT CENTER
Building 3500 was originally constructed in 1995. The building is provided with heating, ventilation, and air conditioning from fan coil units located within the ceiling space of the building. Hot water is provided via a boiler in the mechanical room and chilled water is provided by an air-cooled chiller.

It appears that the mechanical systems serving this building are relatively new and only minor renovations are scheduled for this building. Any renovation of this building should include minor renovations to the mechanical system.

BUILDING 3700: EARLY CHILDHOOD DEVELOPMENT CENTER
Building 3700 is a portable building. The age of the building was not determined. The building is self-contained and heating, ventilation, and air conditioning is provided by a wall mounted heat-pump unit.

No apparent renovations appear to be scheduled for this building. Mechanical systems appear to be good shape and do not require replacement.

BUILDING 3800: BOOKSTORE
Building 3800 is a relatively new building; however, the exact construction date was not determined. The building is provided with heating, ventilation, and air conditioning from fan coil units located within the ceiling space of the building. Hot water is provided via a boiler in the mechanical room and chilled water is provided by an air-cooled chiller.

It appears that the mechanical systems serving this building are relatively new and only minor renovations are scheduled for this building. Any renovation of this building should include minor renovations to the mechanical system.
BUILDING 3900: CHEMISTRY / COMPUTER SCIENCE

Building 3900 is a relatively new building; however, the exact construction date was not determined. The building is provided with heating, ventilation, and air conditioning from roof mounted air handling units. Hot water is provided via a boiler in the mechanical room and chilled water is provided by an air-cooled chiller.

It appears that the mechanical systems serving this building are relatively new and only minor renovations are scheduled for this building. Any renovation of this building should include minor renovations to the mechanical system.

Recommendations

For the majority of the mechanical systems, the equipment has outlived its expected useful life and is in need of replacement. Also, the majority of the buildings on campus are self-contained from a HVAC viewpoint. This means that each building is equipped with its own boiler and chiller (for buildings with air conditioning). From a maintenance and operations standpoint, this is a highly inefficient way of serving the campus.

Additionally, existing mechanical spaces generally are inadequate for proper maintenance of the mechanical equipment. Renovation of most buildings should include additional mechanical spaces programmed into each building.

It is our recommendation that the Campus consider building two mini Central Plants which would house central Chillers and Boilers. From these Central plants, chilled water and heating hot water would be circulated around the campus and serve each building. This approach would provide centralized maintenance, fewer pieces of equipment to monitor and maintain, and a more efficient equipment (less energy consumption). Assuming that the Campus build-out will house approximately 700,000 FT2 of space, typical heating cooling spaces for a College Campus in the area are as follows:

- Cooling ~ 1 ton / 400 FT2 x 700,000 FT2 = 1,750 tons
- Heating ~ 30 BTUH / FT2 x 700,000 FT2 = 21,000 MBH

Assuming that two small Central Plants are installed, the Campus could reduce the number of chillers from ~15 to having just a couple (2-4 depending on size chosen). Additionally, the number of boilers could be reduced from ~42 to just a handful (2-10 depending on type and size chosen). This approach will reduce the quantity of equipment for maintenance and provide greater operating efficiencies.
From a fire protection viewpoint, the Campus Buildings have limited fire protection which is typical of buildings constructed in the 1960s. As buildings are upgraded, Code requirements may require for each building to become fully sprinklered.

From a plumbing viewpoint, Buildings have limited plumbing features (required restrooms, drinking fountains, etc.). As buildings are renovated, it should be expected to replace existing plumbing fixtures with new fixtures with features such as: low flow fixtures, automatic flushing features, waterless urinals, etc. Note that the Campus has recently upgraded/replaced building drinking fountains to meet ADA requirements and that some of these fixtures could remain.

BUILDING ELECTRICAL SYSTEMS

SECTION 1 Overview

On Tuesday, May 10, we visited the Chabot campus for a general evaluation of the electrical systems including interior and exterior lighting. We were able to open a few of the equipment enclosures but this evaluation is not based on a detailed inspection or any testing of transformers and panelboards. At Chabot, the major components of the building systems including the main circuit breaker and major feeder circuit breakers are located outdoors in assemblies known as "Unit Substations." This arrangement has the advantage of conserving building floor space but it has the considerable disadvantage of exposure of the electrical equipment to moisture, heat, and contamination. The original site distribution system had no means of isolating the individual unit substations so very little maintenance was done in the early years. Recently, the Facilities Department added isolation switches that, at least, made the equipment accessible. Despite these efforts, most of the outdoor equipment is as old as the buildings themselves and is in generally poor condition. Two exceptions are the new 12,000 volt Main Substation and the new padmounted equipment at the Bookstore.

One result of obsolete electrical equipment is the risk of unplanned outages that can disrupt the operations of the College. A more serious concern is the risk of electrical fire and explosion than can result from the failure of the devices, such as circuit breakers, that are intended to interrupt high fault currents. We understand there have been several such failures in the past and the Facilities Department feels this equipment should be replaced as soon as possible.

Our other findings are typical of similar installations from the 1960’s and 1970’s. In most cases there is sufficient capacity in the site system and in the individual building systems for the present loads. There may be a shortage of branch circuits and of space in existing panelboards to add additional circuits, especially in areas that have become computer intensive. In many areas, the panelboards are improperly located, such as in janitor closets, and they lack the operating clearances required by current codes. In addition, there is a lack of security at a number of electrical, data and telephone distribution panels.
Replacement of existing unit substations is relatively simple when major remodeling is under way because it is now possible to isolate each one. There are, however, no existing points of connection to the site distribution system for new transformers serving new buildings. This deficiency is addressed more thoroughly in the Site Utility Master Plan. It is important that new infrastructure be provided in advance of the need to connect new buildings.

In the older buildings, where major renovations are contemplated, the existing systems lack capacity for significant increases in load, especially where air conditioning (AC) is proposed. AC will approximately double the building electrical load including load increases associated with new programs.

The interior lighting, generally fluorescent, is also typical of the years in which it was installed. This equipment has low energy efficiency and lacks energy saving controls such as dual level switching and occupancy sensors. New and remodeled buildings will be required to meet California Title 24 Energy Efficiency Standards which will result in the replacement of most lighting.

There has been some effort to retrofit the exterior lighting with more efficient sources but, overall, the lighting is inconsistent across the campus. This will probably be addressed slowly as landscaping and parking lots are improved. The California Building Code has special requirements for outdoor and parking lot lighting at Community Colleges.

### SECTION 2 Summary Recommendations

In general, we recommend replacement of the Unit Substations with sealed padmounted transformers. Modern transformers are much smaller than the existing units and the high voltage (12,000 volt switches and fuses) are protected within the sealed tank. Aside from cleaning, painting, and occasional testing of insulating oil, very little maintenance is required. We suggest discontinuing the practice of installing the lower voltage distribution equipment outdoors and, instead, provide dedicated electrical rooms, with proper clearances and security, inside each building. Padmount transformers and dedicated rooms should also be provide for new buildings.

The existing old panelboards should be replaced for safety, reliability, and added capacity. New panelboards with sufficient circuit breaker spaces and with space for future additions should be provided and should be located in secure areas with adequate working clearances.

Since most building services are 480 volts for lighting and building equipment, transformers for the 120 volt receptacles can be located in the dedicated rooms. Specially constructed transformers for high harmonic loads such as found in computer labs should be provided where required.

Central Cooling Plants centralize the heavy electrical loads away from the building electrical systems and provide some economies from lower building demand load. This can be especially useful for providing air conditioning to existing buildings that do not otherwise require major interior electrical upgrades.

Lighting retrofits of existing buildings are usually cost effective and are recommended. Title 24 compliance will result in considerably better efficiency in new buildings.

The cost of energy for improved outdoor lighting will generally offset savings associated with more efficient sources. Energy costs can also be reduced by control systems that reduce lighting, especially parking lot lighting, to minimal levels at time when the lots are not used.
SECURITY GUIDELINES

A campus Security Master Plan has been developed and the primary intent is to define security mitigation standards that integrate efficiently with new building construction and building improvements, saving upgrade costs today by planning for the campus of tomorrow. By first prioritizing the identified campus risks, and then using a multi-faceted approach from the key areas of physical environment, security staffing, and feasible technology, the Security Master Plan presents a clear security philosophy to guide the selection and implementation of campus security upgrades. The Security master Plan addresses long-term system compatibility, communication infrastructure, product obsolescence, and growing demands on the security staff.

While the Security Master Plan uses vulnerability and risk analysis as a foundation for developing guidelines, the Master Plan is not simply a report of current problems on campus. The objective of the Master Plan recommendations and guidelines is to systematically address the following issues:

- Prioritize the identified risks on campus, and thus the budget requirements for mitigation.
- Use risk prioritization to plan mitigation measures systematically, without undisclosed expectations.
- Establish clear security goals that guide the level of implementation over the long-term.
- Provide a standardized approach to security systems to retain compatibility, knowledge basis, and functionality.

Based on this approach, the Security Master Plan will be a central document, used by the District and design teams, to establish the scope and placement of all security equipment during the planning stages of new construction or retrofit upgrade work. Using the concepts presented in the Security Master Plan and working with the Chabot Campus and District Security, the design teams will identify security system architecture and device locations for electronic hardware, access control, intrusion detection, CCTV, and security communications equipment. It is further the intent for the Security Master Plan to address risk mitigation opportunities utilizing environmental design of lighting, pathway visibility, and landscaping. The Security Master Plan will evaluate the potential threats and vulnerabilities to the Chabot College campus, and develop a security program incorporating electronic, programmatic and physical security measures as required to achieve acceptable levels of risk mitigation that can function in harmony with students, campus employees, and District service providers.

CHABOT COLLEGE IT MASTER PLAN

INTRODUCTION

As part of the development of a facilities master plan for Chabot College, a process is underway to identify the requirements for new Information Technology infrastructure and systems, and the impact they will have on the new campus design. The primary goal of this IT Master Plan is to increase the capability of the campus to service the current and future needs of its community. The first step in the Facilities Master Plan will be the renovation of most of the existing facilities and the construction of a few new buildings. This will only address physical capacities on campus. To properly achieve functional expansion, the plan must also address the increased requirements of the systems that support the new campus environment and its users. IT systems are a crucial element.

The provisioning of IT services to this new environment, and the manner in which these services are accessed by the users, will also undergo change. For each new building proposed in the Chabot College Facilities Master Plan, the installation of additional fiber and copper to service them is mandated. As an initial step, a program to evaluate the state of the existing underground cabling pathways was undertaken to assess their reuse in this new environment. Additional conduits will be required to meet the needs of the new environment; however, the reuse of current infrastructure and rerouting of certain conduit segments would minimize additional costs.
Presently the Chabot College Facilities Master Plan documents show conflicts with existing underground cabling infrastructure in areas where new construction is proposed, and the possibility of service outages needs to be evaluated. Proper coordination of the design plans is essential to minimize impact, reduce the costs of later mitigation and eliminate the possibility of service outages during the construction process. A comprehensive approach which addresses all these elements will assure that the end product is achieved effectively, efficiently, and through the most constructive course available.

**Establishment of Campus Infrastructure Standards**

Evaluation of the current state of the IT infrastructure and technology system standards is an essential part of the Master Plan process. These can then be evaluated against comparable educational facilities and those established by accredited national organizations. The information developed through this evaluation will provide the criteria to perform a gap-analysis, which during any phase of the project will help define necessary changes to existing standards. Implementing these changes will assure that the Chabot College campus standards meet the highest levels of performance, and the long-term goals of the campus and community.

From this evaluation process, a new standard for state-of-the-art infrastructure can be developed. As the baseline for the campus standard continues to evolve over the life of the project, continued enhancements to the campus-wide system standards can be made. CLPCCD District ITS has already issued a first draft of Cabling Infrastructure standard that define the new infrastructure for TCP/IP based connectivity. This document is being enhanced for use by Architect and Engineering teams in the design and engineering new and renovated buildings.

**New Construction**

Under the current Chabot College Facilities Master Plan, the proposed construction of new buildings will require the implementation of the new Cabling Infrastructure standards. Cost-effective implementation will require coordination with a number of disciplines during the early stages of the design plan for each facility.

While the new IT standards addresses initial planning requirements for the new facilities, the success will also be dependent on its ability to adapt to the future of technology. Setting guidelines for the implementation of infrastructure and services that offer extended life expectancy is an important design goal. Assuring that these new facilities can easily adjust to changes in technology without impacting bottom line costs will allow the campus to avoid early obsolescence of the infrastructure.

The high level considerations for the new cabling standards can include:

- Redundant fiber backbone connectivity (Single mode and 50 micron Multi-mode fiber)
- Category 6 voice/data station cabling
- Voice-over-IP (VOIP) ready configuration
- Wireless ready configuration
- Standard classroom/office/lab designs
- Technology Enabled” classroom design standard
- Flexible infrastructure designs for multi-purpose room usage
- Support of building automation systems, such as security, CCTV, and other network-based control systems

**Renovated Facilities**

The renovation of existing facilities requires the same set of considerations than those of newly constructed facilities. The current Chabot College Facilities Master Plan proposes the renovation of most of the existing buildings, each currently servicing either students, faculty, or staff. The intention of these renovations is to remodel these buildings so that they can be used in the most appropriate manner to serve the campus student, faculty and administrative population. Traditionally, renovations make use of very little except the structural elements of a building. As a general design directive, the infrastructure in buildings with major renovations will be brought into compliance with new cabling standards and construction codes as part of the construction project.
New Data Backbone Infrastructure
The Data Backbone infrastructure at Chabot College is based on multimode fiber that was installed in the early 1990s. This cabling extends from each Building to either Building 3100 or Building 300. At Building 3100, fiber patch cords are used to extend each building connection back to Building 300. This fiber infrastructure needs to be replaced with new cabling that conforms to the design guidelines included in the Cabling Infrastructure Standards document. The key design elements are:
- 50 micron, laser optimized multimode fiber backbone cabling
- single mode fiber backbone cabling
- each building provisioned with two sets of backbone cables which route back to the network switching centers through diverse paths.

Corollary to the provisioning of new fiber backbones is the expansion of the outside plant conduit system. An analysis is underway to evaluate the capacity and usability of the existing conduits. As indicated in the Facilities Master Plan, the new Student Access Center and Performing Arts expansion will impact key routes for production data and voice cables. The conduit analysis information, coupled with the rerouting required to accommodate the new buildings, will allow specific engineering activities which will design the capacities and routing needed for the new fiber backbones. The most cost effective approach is to use the existing infrastructure wherever possible.

District Data Center Migration
Currently, Chabot Campus hosts the District Data Center which provides the data services for Chabot College, Las Positas and the District office. This structure will change as part of the Campus redevelopment plan, transferring the District Data Center functions to the new Information Technology Building at Las Positas campus. Coordination of renovations to Chabot College Building 100 and 300 is critical, so that those renovations can be scheduled after the District ITS functions and equipment are relocated to the new Information Technology Building. Likewise all construction activity should be very protective of power and data connectivity, to ensure that service disruptions are minimized.

EVALUATION OF NETWORKING EQUIPMENT AND ARCHITECTURE
Critical to the success of the network connectivity is a clear definition of future requirements based on present understanding of the students and faculty. Once collected, this information can be used to develop a core network design plan that services the needs defined. An assessment of future needs should be undertaken that addresses data, voice and video requirements and support for converged systems. The outcome will be a comprehensive IT network infrastructure design that will address the needs of the environment as it continues to expand.

The recommendations made in the categories to follow are life-cycle based. This means that based on current technology life expectancy set by the manufacturers, the replacement of equipment or applications may be warranted more then one time during the life of this project.

Core Switching and Routing
The successful performance of all network systems is based on the capability of the core devices that control transmission and pathways. Core switches and routers define the parameters for all network traffic, setting prioritization and dictating how information gets from one point to the other. These core system designs can have several topologies, generally dependent on the type of information they handle and the capability of the systems they support. Core systems must be robust, inter-dependent, and designed to meet the capacity and criticality of the information that travels through them.

For the Chabot campus, it is essential that the plan for the core system address capacity issues first. The changes proposed in the Master Plan will put great demands on existing systems, and this impact must be included as part of any existing core systems assessment. These systems may address the needs of the campus at present, but planning is required to assure that they capable of expanding current provisioning as the environment expands. Defining these elements is critical for the IT Master Plan to meet its goal.
Initial considerations include:
- Installation of new core switching/routing equipment to address immediate and future needs
- Increased capacity at port level for greater throughput
- Reallocation of existing core switching/routing equipment for use in distribution/access layers
- Expansion of distribution capabilities through installation of additional fiber and retermination or replacement of existing problems
- Multiple routing capabilities supported by a diverse core system configuration

**Firewalls and Security**
The inherent nature of today's College campuses increases the requirements for protecting the systems and applications that run them. Open environments for learning while directed at eliminating restrictions to students and faculty, also promotes unauthorized traffic. Securing these environments while maintaining open access and performance levels, can be a difficult task. The integration of appropriate firewall appliances and/or applications that control access and restrict unauthorized traffic is crucial to providing secure and uninterrupted service on the network. This plan includes the enhancement of current firewall technology and subsequent upgrades to support new functions.

**Desktops and Laptops**
The immediate plan for Chabot College is to replace existing desktops and laptops with newer, more capable equipment, and establish the District standard four-year equipment life cycle. In conjunction with the rollout of new desktop systems, the capability of the users to access and utilize these services must also be enhanced. To properly address the service requirements of the students and faculty it is essential that the equipment they use meet minimum educational standards.

The District has established standards for equipment configurations and replacement life cycle. As Chabot College grows, so will the demands of the faculty and student body, driving the need to create more robust educational services. Providing the proper tools to allow the users to transition this period of growth will greatly impact their experience at Chabot College. To assure that the users are provided with the broadest level of capabilities it is essential that new campus standards for PC’s and laptops are enacted.

**Server Technology**
The data server environment that is currently provisioned at Chabot College, while adequate to meet present day requirements, needs to be enhanced to be prepared for the future. The District ITS and CC Computer Support staff are presently defining new standards for this environment which will establish a foundation for future server technology planning.

The servers in this environment presently distribute and manage enterprise applications and support the storage requirements of the administrative users, students and faculty. The expansion of this environment will drive broader requirements for performance and provisioning, which will put greater demands on those who manage it. The Chabot campus is expected to expand enrollment over the course of the redevelopment project and a plan is required to assure all growth considerations are addressed. It will be critical to create appropriate levels of redundancy and use load-balancing and clustering to create failover capability. Consolidation of equipment where appropriate, should also be a consideration, reducing the environmental impacts on the facility and creating stability within the new core system configuration. Where high capacity storage is required, investigation and standardization on the appropriate storage technology and backup solution will be pursued.

**Wireless Networking**
Chabot College would like to utilize wireless networking to augment the existing wired environment, applying industry best practices and standards. Wireless capabilities enhance any environment where the demand for access to the web and data continues to expand. The deployment of wireless networking is becoming more mainstream in educational environments, though at present there are still serious concerns about security and performance. The use of wireless connectivity to access stored information and web sites has increased the capability of schools to service their rapidly expanding requirements. The infrastructure of many educational institutions today cannot immediately service the demand for access, and deploying a wireless LAN environment provides them with a short-term expansion option.
As access to networks for day-to-day use increases, so will the demands on existing capacities. The deployment of secure, robust wireless access systems can mitigate the need for immediate infrastructure improvements. As an adjunct to existing wired access, wireless networking can expand the service capabilities with limited financial impact.

**External Network Connectivity**

Internet connectivity is provided through a CENIC DS-3 connection. This provides robust bandwidth for support of instructional data access and videoconferencing.

When the District Data Center moves to the Las Positas Campus, it is essential that high-capacity bandwidth be available, so that excellent performance to the Administrative Enterprise computer system will be maintained. This connectivity is reliant on the implementation of a separate CENIC DS-3 connection to the LPC site, or other high-speed connectivity alternatives. This improved infrastructure will allow transparency of connectivity to the remote Data Center systems, with comparable services to what Chabot College users are accustomed to in the current topology.