Telecommunications

Overview of FY11-12 budget and significant near-term projects

The annual expense for the campus voice service is around $7M

Voice		
	Salaries	1,448,112
	Benefits	535,801
	Supplies and Expenses	5,047,844
	Depreciation	28,123
	Voice Total	***7,059,881***

The annual expense for the data network and security areas is around $11M

Network (Including Firewall)

Salaries	2,621,824
Benefits	970,075
Supplies and Expenses	4,068,160
Depreciation	1,163,181
Network Total	***8,823,239***

Security

Salaries	732,924
Benefits	271,182
Supplies and Expenses	382,917
Depreciation	40,000
Security Total	***1,427,023***

Project Costs

ICCS and Riser Projects	
Debt Repayment	430,000
Airbears Expansion	
Estimated project cost from ATT	4,000,000
One-time ATT contribution	(2,000,000)
One-time UCB contribution from available funds (student fees)	(1,400,000)
Projects Costs Total	***1,030,000***

Inter-Building Campus Communication System (ICCS) is a concrete hardened conduit system connecting the buildings and communications vaults on campus for the installation of fiber optic and other low-voltage cables.

ICCS	fy10-11	fy11-12	fy12-13	fy-13-14	fy 14-15	Totals
Boalt ($1.25M contract in place)	$1,250,000					$1,250,000
Substation 6 to Greek Theater	$350,000					$350,000
Hildebrand CV20 to CV71 (Cover IST portion of costs alredy incurred/committed by Athletics)	$300,000					$300,000
Wurster ($1.25M est)	$1,250,000					$1,250,000
Helios/redundant path for Warren/BART connectivity for CENIC redundency	$1,000,000					$1,000,000
Complete core campus loop CV19 to CV 20 & connect Moses & Stephens		$2,000,000				$2,000,000
Barrows zone (formely Sproul zone)			$3,000,000			$3,000,000
Complete core campus loop between Mulford and Doe zones				$1,875,000		$1,875,000
Compete RecSports zone				$3,125,000		$3,125,000
Oxford Cooridor zone					$2,500,000	$2,500,000
Subtotal ICCS	$4,150,000	$2,000,000	$3,000,000	$5,000,000	$2,500,000	$16,650,000

ICCS Projects

- FY 10-11:
  - Boalt Lot Area ($1.25m), Substation 6 to Greek Theater ($350,000)
  - Hildebrand CV20 (Communication Vault) to CV71 ($300,000)
  - Wurster ($1.25m), Helios, redundant path to Warren, BART connectivity for CENIC redundancy ($1m)
- FY 11-12:
  - Complete core campus loop CV19 to CV20 and connect Moses and Stephens ($2m)
- FY 12-13:
  - Barrows zone ($300,000)
- FY 13-14:
  - Complete core campus loop between Mulford and Doe zones ($1.875m)
  - Complete RecSports zone ($3.125m)
- FY 14-15:
  - Oxford Corridor zone ($2.5m)

Riser is a term used for in-building projects that build out modern Telecommunications Rooms (TRs) to house the electronics and pathway (including fire-rated wall penetrations, cable tray and J-hooks) to support cabling necessary for the provision of voice, data, and security needs of the campus. These projects do not include the premise wiring (TR to station jack).

Risers	fy10-11	fy11-12	fy12-13	fy-13-14	fy 14-15	Totals
Kroeber	$700,000					$700,000
CCHEM	$500,000					$500,000
Cesar Chavez	$300,000					$300,000
Giannini		$1,640,000				$1,640,000
Minor Hall Addition		$500,000				$500,000
Wheeler Hall		$750,000				$750,000
Le Conte Annex		$270,000				$270,000
Stephens Hall			$200,000			$200,000
Mulford Hall			$100,000			$100,000
Moses Hall			$400,000			$400,000
1995 University - GBB			$500,000			$500,000
Doe Library				$500,000		$500,000
Moffitt Library				$250,000		$250,000
Hearst Gym					$500,000	$500,000
Hesse Hall					$50,000	$50,000
Tolman West					$1,400,000	$1,400,000
Subtotal Riser	$1,500,000	$3,160,000	$1,200,000	$750,000	$1,950,000	$8,560,000
Total	$5,650,000	$5,160,000	$4,200,000	$5,750,000	$4,450,000	$25,210,000

Riser Projects

FY 10-11:

Kroeber Hall ($700,000), CCHEM ($500,000), Cesar Chavez ($300,000)

FY 11-12:

Giannini Hall ($1.64m), Minor Hall Addition ($500,000), Wheeler Hall ($750,000), Le Conte Annex ($270,000)

FY 12-13:

Stephens Hall ($200,000), Mulford Hall ($100,000), Moses Hall ($400,000), 1995 University Ave-GBB ($500,000)

FY 13-14:

Doe Library ($500,000), Moffitt Library ($250,000)

FY14-15:

Hearst Gym ($500,000), Hesse Hall ($50,000), Tolman West ($1.4m)

AT&T Strategic relationship

AT&T has offered to make several significant investments in the UCB campus to improve our infrastructure, particularly to improve our cellular and WiFi services. UCB anticipates that we will greatly benefit from these investments as they support improving services that all of the campus community uses every day.

AT&T Strategic Projects

Stadium WiFi AT&T will invest $3M for enhanced WiFi coverage for the new Stadium. UCB owns infrastructure improvements and can purchase the WiFi gear at fair market value at the end of the contract.

Cellular coverage improvement Based on a similar deployment at MIT, AT&T expects to spend $20-30M to improve cellular coverage for campus. UCB owns all pathways once installed (buried conduit/fiber and in-building wiring) as soon as they are put in service. This is important because AT&T is willing to run a reasonable number of extra fibers and give them to UCB. This will will be a single system for campus that will cover both the insides of buildings and provide regular outdoor cellular coverage. Providing coverage for the new Stadium is also part of this plan. The system will be carrier-neutral. Other carriers, such as Sprint and Verizon, can access the system for a fee.

WiFi for campus AT&T will invest $2M in infrastructure and WiFi equipment to improve campus WiFi coverage. This is a 5 year agreement with UCB owning all equipment and infrastructure, that is not directly associated with AT&T's internal service delivery, at the end of the contract. UCB matches the $2M put up by AT&T with $2M of campus money. In addition to AirBears being broadcast across the campus, we will also broadcast the “attwifi” SSID. This project will cover both residence halls and core campus. AirBears, including guest accounts, will operate as it does now across the entire deployed infrastructure. The goal is to finish the deployment in 12 months. UCB gets 50% of any revenue from paid AT&T guest accounts that use the campus system to access AT&T WiFi services.

UCB access to AT&T conduit UCB, in the immediate campus area, can apply for access to AT&T installed conduit and be granted that access on terms similar to those offered to competitive local exchange carriers (fairly low cost). UCB will install campus owned fiber in the leased pathways. This has no fixed dollar value, but this is an important deal with considerable value to UCB. For example: it is expected to cost us around $1M to cross Oxford to connect to Helios, BART, and provide a backup link to the Data Center. Our immediate priorities for this access are the Tang Center and Clark Kerr.

Key network infrastructure projects

Campus IP video security IST is working with UCPD to develop a model to run IP camera data over the campus network. The installation of IP-based security cameras (vs. the traditional non-network friendly vintage) is new within the last few years and the coordination between IST and UCPD could potentially save the campus hundreds of thousands of dollars. We are about ready to launch a test case in Barker and NWAF.

Helios West The Helios Energy Research Facility will house the Energy Biosciences Institute (EBI) and the UC Berkeley Bioengineering Program. EBI's primary research will be dedicated to finding solutions to global climate change. The building is located at the SW corner of Hearst and Oxford and is occupying the space of the abandoned state DHS (Department of Health Services) building. Building steel is currently being erected as well as other site work. Occupancy is scheduled for late 2012 or early 2013.

Key network infrastructure projects (continued)

Oxford Corridor expansion We are expecting that a significant portion of campus expansion will happen on the west side of Oxford. It's important to provide voice, data, and wireless connections for the new buildings on the Oxford Corridor which include Helios, Berkeley Art Museum/Pacific Film Archive, School of Public Health Community Health Campus. Helios is currently under construction and other facilities will be constructed as funding becomes available.

Key network infrastructure projects (continued)

Li Ka-Shing Center for Biomedical and Health Sciences Expected completion: September, 2011

SAHPC (Student Athlete High Performance Center) Expected completion: September, 2011.

Memorial Stadium Complete seismic retrofit and gut of facility. Only the exterior wall is being preserved. Expected completion: August, 2012

Key network infrastructure projects (continued)

Lower Sproul Eshleman Hall will be replaced with a new building that engages the activity of the street, with stores and cafes serving both the student body as well as the larger community. The other buildings in the student center complex, Martin Luther King and Cesar Chavez, will be transformed to provide greater openness and connections to Upper Sproul and Lower Sproul Plaza**.** Currently in early schematic design phase. Will probably be a five+ year project.

AirBears

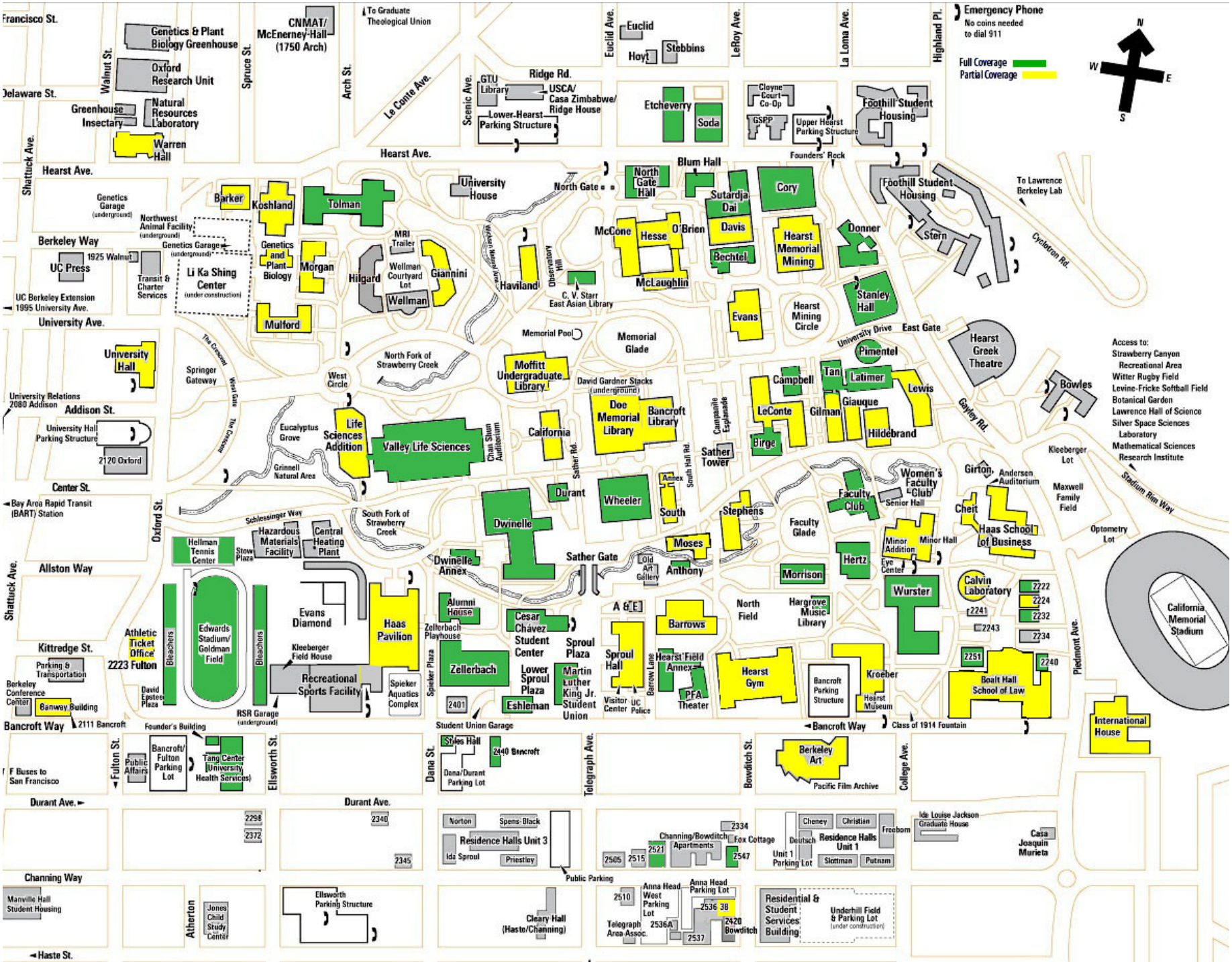
AirBears is the campus wireless network, allowing members of the campus community and authorized guests to connect to the Internet via a CalNet-authenticated wireless service.

We currently have around 70 buildings with full coverage.

50 buildings have partial coverage.

12 buildings have no coverage.

The AT&T contribution to the AirBears deployment should allow us to expand coverage more rapidly than would otherwise be possible, particularly in the residence halls.


Francisco St.
Genetics & Plant Biology Greenhouse
CNMAT/ McEnerney Hall (1750 Arch)
To Graduate Theological Union
Euclid Ave.
Euclid
Hoyt
Stebbins
LeRoy Ave.
La Loma Ave.
Highland Pl.
Emergency Phone
No coins needed to dial 911
Full Coverage
Partial Coverage
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Spruce St.
Arch St.
Le Conte Ave.
Oxford Research Unit
Delaware St.
Greenhouse
Insectary
Natural Resources Laboratory
Warren Hall
Ridge Rd.
Scenic Ave.
GTU Library
USCA/ Casa Zimbabwe/ Ridge House
Lower Hearst Parking Structure
Etcheverry
Soda
Cloyne Court Co-Op
GSPP
Upper Hearst Parking Structure
Foothill Student Housing
Shattuck Ave.
Hearst Ave.
Founders' Rock
Blum Hall
North Gate Hall
University House
North Gate
Sutardja Dai
Cory
Foothill Student Housing
To Lawrence Berkeley Lab
Barker
Koshland
Tolman
Genetics Garage (underground)
Northwest Animal Facility (underground)
Genetics Garage (underground)
Berkeley Way
1925 Walnut
UC Press
Transit & Charter Services
Li Ka Shing Center (under construction)
Genetics and Plant Biology
Morgan
MRI Trailer
Wellman Courtyard Lot
Hilgard
Giannini
Wellman
Haviland
Observatory Hill
C. V. Starr East Asian Library
McCone
Hesse
O'Brien
Davis
Bechtel
McLaughlin
Hearst Memorial Mining
Donner
Stern
Cyclotron Rd.
UC Berkeley Extension 1995 University Ave.
University Ave.
Mulford
Memorial Pool
Memorial Glade
Evans
Hearst Mining Circle
Stanley Hall
University Drive
East Gate
Pimentel
Hearst Greek Theatre
University Hall
Springer Gateway
The Crescent
Westgate
North Fork of Strawberry Creek
West Circle
Moffitt Undergraduate Library
David Gardner Stacks (underground)
Campbell
Tan
Latimer
Lewis
Bowles
Gayley Rd.
University Relations 2080 Addison
Addison St.
University Hall Parking Structure
2120 Oxford
Eucalyptus Grove
Grinnell Natural Area
Life Sciences Addition
Valley Life Sciences
Chan Shun Auditorium
California
Doe Memorial Library
Bancroft Library
Sather Rd.
Campanile Esplanade
LeConte
Giauque
Gilman
Hildebrand
Birge
Sather Tower
Center St.
Bay Area Rapid Transit (BART) Station
Oxford St.
Schlessinger Way
Hazardous Materials Facility
Central Heating Plant
South Fork of Strawberry Creek
Durant
Wheeler
Annex
South
Dwinelle
Stephens
Faculty Club
Senior Hall
Women's Faculty Club
Girton
Andersen Auditorium
Cheit
Haas School of Business
Kleeberger Lot
Maxwell Family Field
Stadium Rim Way
Optometry Lot
Hellman Tennis Center
Stow Plaza
Allston Way
Dwinelle Annex
Sather Gate
Old Art Gallery
Anthony
Moses
Faculty Glade
Minor Addition
Minor Hall
Eye Center
Hertz
Morrison
Wurster
Calvin Laboratory
2222
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2234
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2240
Shattuck Ave.
Kittredge St.
Athletic Ticket Office
2223 Fulton
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Evans Diamond
Haas Pavilion
Alumni House
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Cesar Chávez Student Center
Sproul Plaza
A & E
Barrows
North Field
Hargrove Music Library
Parking & Transportation
Berkeley Conference Center
Banway Building
David Epstein Plaza
Kleeberger Field House
Recreational Sports Facility
Spieker Aquatics Complex
Spieker Plaza
Zellerbach
Lower Sproul Plaza
Martin Luther King Jr. Student Union
Eshleman
2401
Sproul Hall
Barrow Lane
Hearst Field Annex
PFA Theater
Hearst Gym
Bancroft Parking Structure
Kroeber
Hearst Museum
Boalt Hall School of Law
Piedmont Ave.
California Memorial Stadium
Bancroft Way
2111 Bancroft
Student Union Garage
Visitor Center
UC Police
Class of 1914 Fountain
International House
F Buses to San Francisco
Fulton St.
Public Affairs
Bancroft/ Fulton Parking Lot
Tang Center University Health Services
Founder's Building
RSR Garage (underground)
Ellsworth St.
Dana St.
Styles Hall
2440 Bancroft
Dana/Durant Parking Lot
Telegraph Ave.
Bowditch St.
Berkeley Art
Pacific Film Archive
College Ave.
Durant Ave.
2298
2372
2340
2345
Norton
Spens
Black
Residence Halls Unit 3
Ida Sprout
Priestley
Public Parking
2334
Channing/Bowditch Apartments
Fox Cottage
2505
2515
2521
2547
Cheney
Christian
Deutsch
Residence Halls Unit 1
Freeborn
Unit 1 Parking Lot
Slottman
Putnam
Ida Louise Jackson Graduate House
Casa Joaquin Murieta
Channing Way
Manville Hall Student Housing
Atherton
Jones Child Study Center
Ellsworth Parking Structure
Cleary Hall (Haste/Channing)
2510
Anna Head West Parking Lot
Anna Head Parking Lot
2536
38
Telegraph Area Assoc.
2536A
2537
2420 Bowditch
Residential & Student Services Building
Underhill Field & Parking Lot (under construction)
Haste St.
Access to:
Strawberry Canyon Recreational Area
Witter Rugby Field
Levine-Fricke Softball Field
Botanical Garden
Lawrence Hall of Science
Silver Space Sciences Laboratory
Mathematical Sciences Research Institute

Major Data Network Projects

Site to Site VPN Service As UCB evolves to mixing local services with ones provided by vendor partners or other universities, and expands how we use the network, virtualized services will become more important. A significant part of our direction will be configuring the network to allow for secure VPN connections between servers at UCB and other institutions. We are implementing VPN services in the Data Center to support this capability.

Network Virtualization and Segmentation Now that pretty much all communication uses Ethernet and internet protocols for transport, we are faced with the problem of how to manage different traffic profiles on the same network. Our past solution has been to build separate networks to support services such as voice, video, and external connectivity. This is not scalable at a reasonable cost. In the next year or so, we will be moving the campus network to MPLS so that we can more easily segregate traffic and interconnect with external software and hardware service providers.

Major Data Network Projects (continued)

Data Center Network Infrastructure A good deal of our focus in the Data Center will be on providing 10 Gbps access to devices where needed. The other important projects are improving the Data Center switching core, particularly to make sure that we are correctly managing at Layer 2, and improving the load balancing configuration.

Campus Core Network Improvements In the past we have, for the most part, maintained separate routing and switching infrastructure for the campus. Over the next couple of years, we plan to collapse most of the routing and switching on campus to reduce the initial and ongoing expense of operating the campus network. This consolidation is also expected to result in a reduction in the amount of labor needed to manage subnets and VLANs on campus.

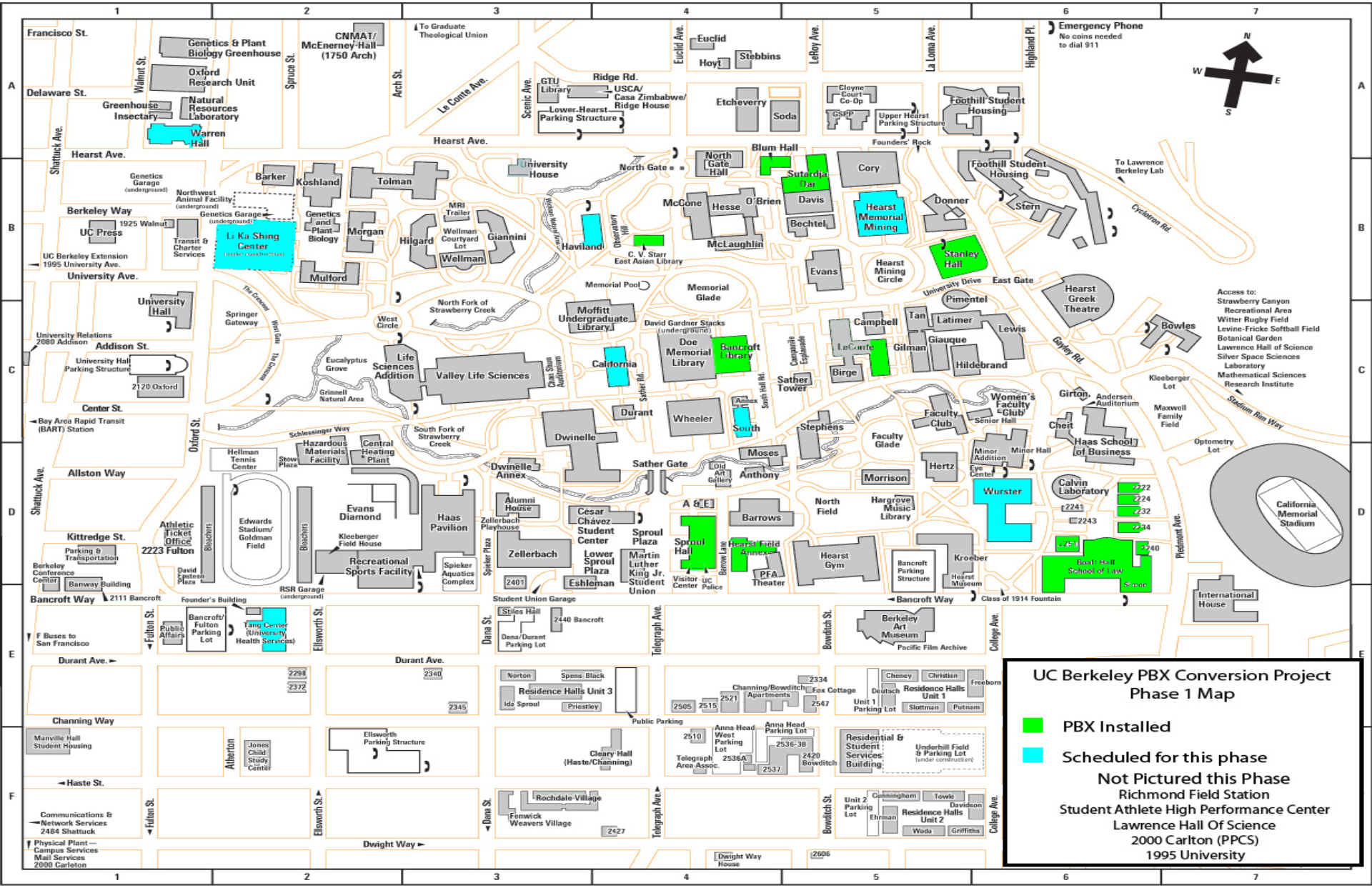
10 Gb/s CALREN-DC and Internet Access Upgrades The amount of bandwidth used between the campus and other networks continues to steadily grow. We are upgrading our external connectivity so that we can handle this growth.

Voice

PBX As part of the long-term campus strategic plan initiated in 2006, we began to convert UC Berkeley's Centrex and stand-alone key and ACD systems UCB owned Private Branch Exchange (PBX). The first building converted was Old Le Conte. Since then, Stanley, East Asian Library, Durant, Sproul, Sutardja Dai and Blum Hall have gone on the PBX. Additionally, the campus e911 system runs on this system. We now have a contract with Altura (an Avaya-certified vendor) to roll out the PBX for the rest of campus over the next two years. The goal is to contain, and hopefully lower, the cost of voice services to UCB. There is also reasonable interest from other UC entities (campuses, lab, UCOP) to join together to reduce costs via economies of scale.

The PBX replacement project includes replacing current service, including digital phones, with similar service at no direct cost to customers.

Information regarding the PBX, deployment schedules, FAQ's, and project contacts will be made available at the PBX website – http://www.calpbx.berkeley.edu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Center St.
Allston Way
Kittredge St.
Bancroft Way
Durant Ave.
Channing Way
Haste St.
Dwight Way
Walnut St.
Spruce St.
Arch St.
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Euclid Ave.
LeRoy Ave.
La Loma Ave.
Highland Pl.
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Shattuck Ave.
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GSPP
Upper Hearst Parking Structure
Foothill Student Housing
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No coins needed to dial 911
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To Lawrence Berkeley Lab
Cyclotron Rd.
Blum Hall
North Gate Hall
University House
North Gate
Sutardja Dai
Cory
Foothill Student Housing
Stern
Donner
Hearst Memorial Mining
Davis
Bechtel
McCone
Hesse
O'Brien
McLaughlin
Haviland
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2515
2521
2547
Fox Cottage
Cheney
Christian
Freeborn
Deutsch
Residence Halls Unit 1
Unit 1 Parking Lot
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Putnam
Manville Hall Student Housing
Atherton
Jones Child Study Center
Ellsworth Parking Structure
Cleary Hall (Haste/Channing)
2510
Anna Head West Parking Lot
Anna Head Parking Lot
2536-38
Telegraph Area Assoc.
2536A
2537
2420 Bowditch
Residential & Student Services Building
Underhill Field & Parking Lot (under construction)
Communications & Network Services
2484 Shattuck
Physical Plant — Campus Services Mail Services
2000 Carleton
Rochdale-Village
Fenwick Weavers Village
2427
Unit 2 Parking Lot
Cunningham
Towle
Davidson
Ehrman
Residence Halls Unit 2
Wada
Griffiths
Dwight Way House
2606
Access to:
Strawberry Canyon Recreational Area
Witter Rugby Field
Levine-Fricke Softball Field
Botanical Garden
Lawrence Hall of Science
Silver Space Sciences Laboratory
Mathematical Sciences Research Institute
UC Berkeley PBX Conversion Project
Phase 1 Map
PBX Installed
Scheduled for this phase
Not Pictured this Phase
Richmond Field Station
Student Athlete High Performance Center
Lawrence Hall Of Science
2000 Carlton (PPCS)
1995 University

PBX Deployment (continued)

Building	Proposed Phase	Proposed Cut Date
Law - Boalt Infill	DONE	5/16/11
Law - Simon	DONE	5/16/11
Law - Boalt	DONE	5/18/11
Law - Boalt North Addition	DONE	5/18/11
Hearst Field Annex-A,B,C,D	DONE	6/13/11
Piedmont Bldgs	DONE	6/15/11
2251 College	DONE	6/22/11
Richmond Field Station (RFS)	DONE	7/8/11 7/9/11
2000 Carlton	DONE	7/14/11 7/15/11
2195 Hearst (Earl Warren Hall)	DONE	7/26/11 7/27/11
California Hall	1	8/3/11
Wurster Hall	1	8/10/11
BLACK OUT PERIOD		8/15/11
SYSTEM MAINT & UPGRADE		9/1/11
Lawrence Hall of Science	1	10/4/11 10/5/11
SAHPC (Part 1)	1	10/18/11
1995 University	1	10/31/11
South Hall and A&E Building	1	11/9/11
Hearst Memorial Minning Building	1	11/15/11
Parking & Transportation	1	12/1/11
Tang Health Center	1	12/27/11 1/3/12

PBX Training

Through the duration of the PBX project, walk-in training sessions will be available on Mondays and Fridays at 2484 Shattuck Avenue. The schedule is:

9:00 to 10:00 – Analog handsets

10:00 to 11:00 – Digital 2410 Handsets

11:00 to 12:00 - Digital 2420 Handsets

Online training videos are available in the UC Learning Center*. To view the training:

1) login to the Blu portal
2) click UC Learning Center at the bottom of the "Self Service" navigation bar on the left
3) type "Avaya" in the search box
4) click start to launch the training
5) *For best performance, we recommend using Firefox 5 or IE8.

Product Manuals & Easy Reference Guides for the handsets, voicemail and ACD are available in the website.

PBX Set Charges

During the conversion only you will not have to pay a monthly rental fee for the Avaya digital 2410 or 2420 sets when switching your existing digital equipment. The PBX implementation project will cover that cost. If you upgrade your existing analog set to digital during the conversion you will pay a monthly lease rate. If you downgrade your existing digital set to analog, you will pay the one-time fee for the set.

All new digital (2410/2420) equipment ordered after the conversion will also be charged a monthly lease rate. If you disconnect a telephone line before the end of the lease, Telecommunications staff will remove the equipment.

Reviewing your current charges

1) Pull up the CNS Shopping Cart @ http://sagebrush.berkeley.edu/cgi-bin/ws515/sc.r

2) Login using your Calnet ID & Pass Phrase

3) Towards the bottom of the page, select “REVIEW”

4) Select “VIEW VOICE SERVICES/MISC SERVICES”

5) Then on the right side of the screen you’ll see Download voice services for CNS Projects Spreadsheet, click on “Centrex-to-PBX Migration”

6) Select your department/building and check off “Prepare data for download”