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Information Technology & Infrastructure

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UCSF
University of California
San Francisco

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Financing Information Technology & Infrastructure

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Business Case – information technology

The UCSF Data and Voice Services Advisory Committee (DVSAC) is evaluating an approach to and methodology for funding escalating demand for voice and data services.

Objectives:

- Evaluate potential funding models to address the infrastructure improvement needs identified in the UCSF strategic plan

Questions and Next Steps:

- How much funding is needed to support necessary infrastructure upgrades?
- What is the best funding methodology to apply at UCSF?
- What funding methodologies are employed at benchmark institutions?
- What is the appropriate "price/charge" for access to and usage of IT infrastructure?
- How should the potential charges be phased in?
- How should the plan be marketed and communicated to the UCSF campus?

While the DVSAC has been in place since late October, Huron recently began meeting with select committee members to develop an independent business case and verify the committee's findings.

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DVSAC Charge and Membership

The DVSAC was created to determine how to approach and fund IT needs outlined in the UCSF strategic plan.

Charge:

- Recommend to the Chancellor's Executive Committee a strategic approach and methodology to fund UCSF's escalating demand for voice and data services over the next decade
- The committee studied background information about the current and projected use and costs of voice and data services, possible sources of revenue and methods used by other UC campuses and peer institutions to support these services
- DVSAC recommendations consider the needs and requirements of UCSF faculty, staff and students, and the ability of UCSF's schools, departments, ORUs and other units to allocate revenue to these services

Membership:

Name	Title/Role	Organization
Ronald Arenson, Co-Chair	Professor, Chair	Department of Radiology
Robert Duca, Co-chair	Associate Dean	School of Pharmacy
Opinder Bawa	Director, Information Services Unit	School of Medicine
Karen Butter	University Librarian; AVC	Library
Marie Caffey	Director; Administration	Psychiatry & LPPI Admin
Steven Cheung	Associate Professor	Otolaryngology -HNS
Maye Chrisman	Chief Financial Officer	Department of Medicine
Glenna Dowling	Professor; Chairperson	SON: Physiological Nursing
Thomas Ferrin	Professor	SOP: Computer Graphics Lab
Lynda Jacobsen	Director of Administration	Comprehensive Cancer Center
Clay Johnston	Professor	Department of Neurology
Ken Jones	Chief Financial Officer	Medical Center Administration
James Joves	Assistant Manager	SOP: Dean's Office
Wendy Max	Professor in Res; Co-Director	SON: Institution for Health & Agi
Christine Miaskowski	Professor	SON: Physiological Nursing
Alexis Purcell	Senior Associate Dean	School of Dentistry
David Rein	Acting Vice Dean, Admin and Finance	School of Medicine
John Roberts	Professor	Department of Surgery
James Tran	Programmer/Analyst	SON: Dean's Office
Ex-Officio		
Randy Lopez	AVC, Administration and Co-CIO	OAAIS
Larry Lotenero	CIO, Medical Center Administration	Medical Center Administration
Shahla Raissi	Director, Business and Resource Mgmt	OAAIS
Jonathan Showstack	AVC and Co-CIO	OAAIS
Eric Vermillion	Associate Vice Chancellor	Finance

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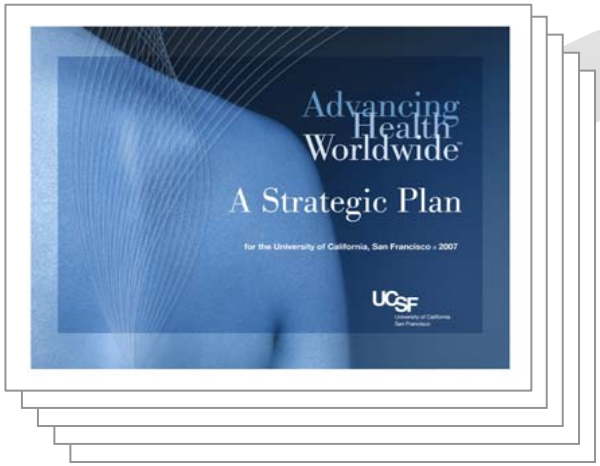
Network Infrastructure - overview

A number of initiatives in UCSF's strategic plan relate to the current state of infrastructure and IT resources.



Opportunity: "The Network as a Strategic Resource"

- UCSF's network infrastructure is a vital tool needed to accomplish the strategic plan as it facilitates communication, coordination and collaboration both internally and externally
- The strategic plan addresses information technology in **Goal #6**, which states:
  - "Optimally deploy information technology for administrative, academic and clinical purposes"
- Other strategies impacted by this initiative include:
  - Goal #1: UCSF must "address the challenges posed by the geographic separation"
  - Goal #2: "improve central information and coordination. . . develop new technological capabilities"

Risks: "The Doomsday Scenario"

- UCSF's IT infrastructure is currently supported by what is effectively a fully-depreciated $25 million network
- Operating without a replacement plan has driven UCSF to a point where daily network performance is analogous to the risk/luck involved with rolling dice
- The primary network attributes/grades as assessed by IT are:
  - Capacity: D
  - Security: C
  - Reliability: D
  - Flexibility: F
  - Ubiquity: D
  - Scalability: D

Accomplishing the vision for a single, integrated and collaborative network requires that UCSF address these risks and develop a comprehensive and ongoing replacement plan complete with financing components.

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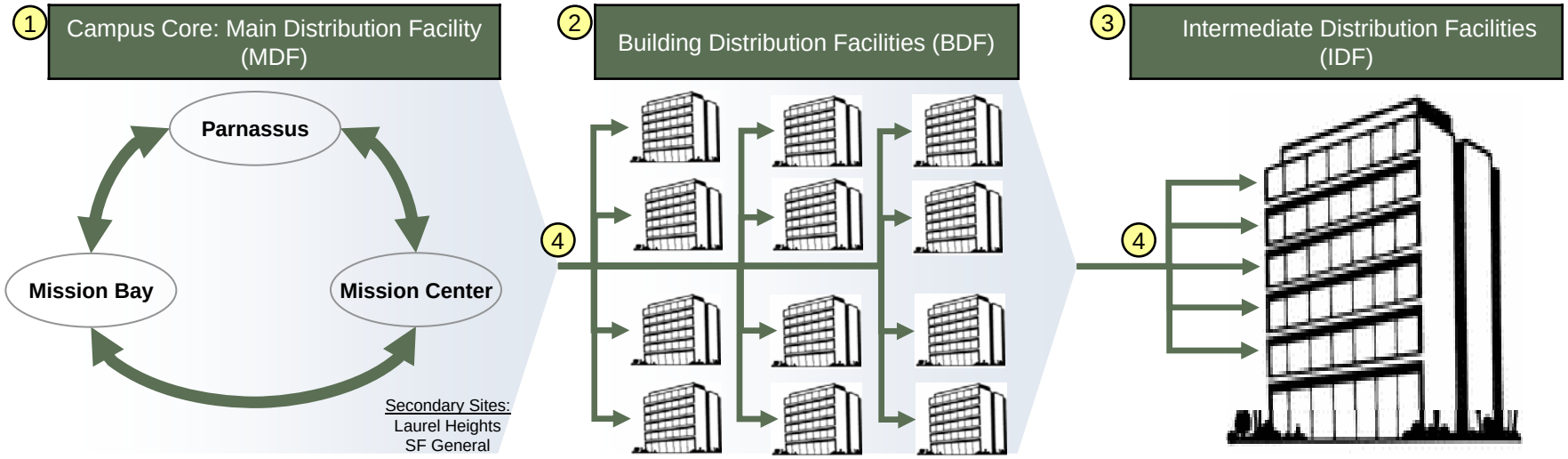
Current Upgrade Plans

Plans require consideration of four components: the MDF, the BDF, the IDF and the wiring and cabling.



Component	Description	Frequency	Initiative	Cost	% Funded
1. Main Distribution Facilities (MDF)	Upgraded to solve “core” needs, but does not address the “last mile” of the infrastructure	Three sites	NGMAN	~$15 million	**66%**
2. Building Distribution Facilities (BDF)	Switches at each building that connect back to the MDF and support the IDFs	Building	DVSAC	~$16 million	**0%**
3. Intermediate Distribution Facilities (IDF)	Switches and routers that connect the end user to the BDF	All floors	DVSAC	~$16 million	**0%**
4. Infrastructure (wiring, conduit, etc.)	Cabling, a/c, power, space, pathways, etc.	Global	n/a	TBD	**0%**

UCSF’s NGMAN initiative addresses the MDF; infrastructure (wiring) is most effectively addressed during facilities construction/renovation; the current focus should fall to the BDFs and IDFs.

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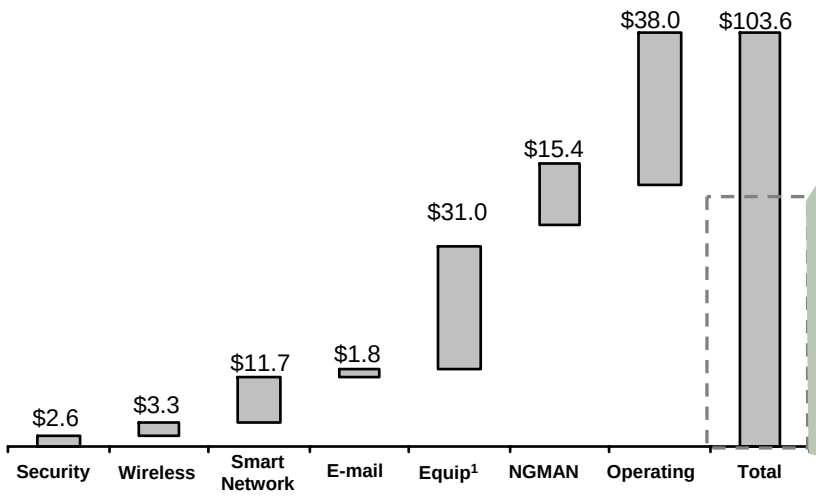
Anticipated 5-year IT Funding Need

Completing the MDF upgrades, undertaking the BDF and IDF upgrades and initiating various other upgrades is estimated to cost UCSF ~$104 million over the next five years.

Estimated 5-Year IT Costs ($MM)



Anticipated Funding Gap

- Of the $104 million, $41.8 million[2] has been committed through the Chancellor's core funds, committed NGMAN funding and OASIS/ENS revenues
- The remaining $61.8 million will be incurred/amortized over the five year period creating an annual funding need of approximately $12.4 million
- The funding estimates include:
  - Sales taxes
  - Implementation costs
  - Capital project management costs
  - Ongoing maintenance costs
- While these estimates provide an indication for planning, it is anticipated that a recharge committee will ultimately approve annual expenditures

The funding gap was created by a sustained under investment in technology; however, on a prospective basis UCSF's aggressive goals require a reliable and consistent funding stream.

Notes: (1) Equipment spend of $31.0 million includes 20% for contingencies of unforeseen costs and excludes some maintenance costs which are captured in operating cost
(2) The Chancellor's core funds also support ~$3.2 million of expenses for the operation of wireless, security and e-mail services

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Common IT Costing Methodologies

Prompted by Goal #6, which stated UCSF should "develop new mechanisms to fund… infrastructure" and the $61.8 MM funding need, five costing methodologies were explored.

	Per Outlet	Per IP Address	Bandwith Usage	Capitated	Service Offering
Benefits	▪ Easy to track and administer ▪ Tangible "plug" associated with cost	▪ Remote tracking ▪ Easily activated and deactivated	▪ Use-based allocation of cost ▪ Familiar charging model (residential)	▪ Allows direct charging of grants ▪ Distributed over broad user base ▪ Simple approach	▪ Full alignment of costs with users ▪ Departments can manage costs
Considerations	▪ "Outlet" does not equal "user" ▪ Difficult to tie users to funding source ▪ Multiple wireless users on outlets	▪ IP address does not equal user ▪ Promotes "shadow" networks ▪ Difficult to tie users to funding source	▪ Resource intensive to implement ▪ Requires equipment to be registered ▪ Current network cannot support	▪ No differentiation among users ▪ Departments cannot manage cost	▪ Cannot manage at user level (only core) ▪ High administrative effort ▪ Premium services may be costly

Capitated Model

- Huron recommends that UCSF adopt a "capitated model" to secure ongoing funds
- This model is consistent with all of Huron's recent budgeting recommendations, as it:
  - Matches costs with the activities that incur the related services
  - Provides transparency to control points regarding the cost and benefits of services

The use of a capitated model acknowledges that the network is a core operating need and it discourages the creation of "shadow" networks, and ultimately will lead to higher service levels.

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Selected Capitated Model Benchmarking

While several UC peer institutions have implemented a network recharge, the variability in service offerings and the peer institutions' scale, makes "price" benchmarking difficult.

Benchmark	Description of Technology Recharge Policy	Per User Charge[1]
	▪ The University of California, Los Angeles uses a capitated model with all FTEs paying for service ▪ The fee includes a technology infrastructure cost, a basic phone charge and port costs ▪ The typical user pays approximately $64.03 a month for all three services ($45.75 data only)	~$45.75
	▪ The University of California, San Diego uses a capitated model based on adjusted FTE, where charges are only applied to "Communication Users" ▪ The standard on-campus rate is $74 a month; however, rates for off-campus, post-docs, graduate students and the medical center FTEs are adjusted and fees range from $19 to $74	~$74.00
	▪ Cornell University uses a capitated model which is focused primarily on users at the main campus and includes port costs, infrastructure costs and IP address costs (students are also billed through campus housing) ▪ Cornell's on-campus fee also includes port costs of $5.20 to $9.80 and data network costs of $62.25	~$69.75
	▪ The University of Southern California uses a "technology connection charge" that is applied to each benefits eligible employee[2] ▪ The charge includes telephone services as well as data network maintenance to the building ▪ An option allows the ITS department to maintain an internal network at a premium of 12% over the standard annual price of $1,074 per FTE	~$100.24

These institutions benefit from scale and use replacement cycles of 4-6 years, which suggests their per user fees will be lower than UCSF's (with limited scale and historical investments).

Notes: (1) Monthly per user charges are estimates and include adjustments for comparability
(2) Part-time faculty pay 50%; research and teaching assistance are charged at a rate of 30%; no charges are applied for non-benefits eligible employees

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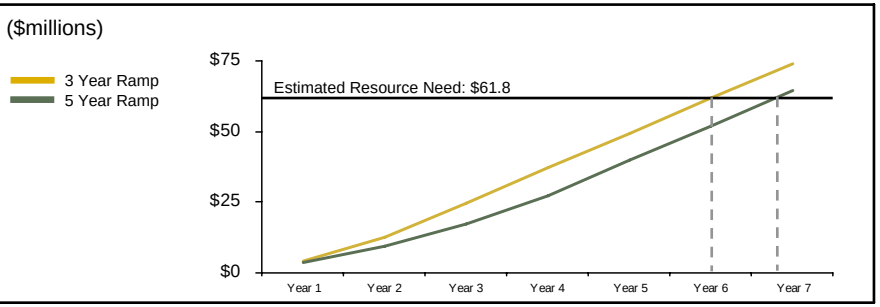
Proposed Funding Model

UCSF's user recharge will be driven by three components: the targeted investment, the number of FTEs charged and the investment timeframe (ramp period & replacement cycle).

Total Resources for Investment

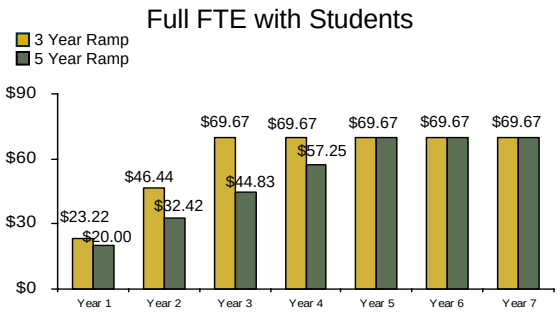
- UCSF's ability to accumulate the needed resources ($61.8 mm) is governed by the speed at which recharges are introduced
- With a three year ramp, the total resources can be accumulated in 6 years, marking 100% equipment replacement
- With a five year ramp period, the same resource target cannot be reached until year seven[1]

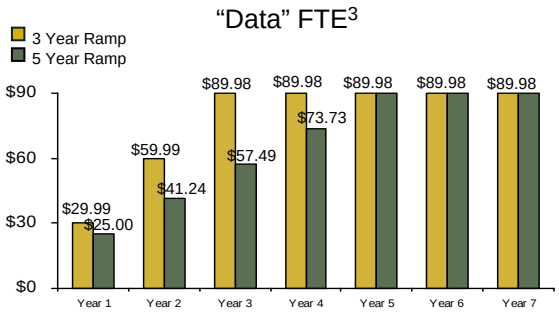


Monthly Rate Per FTE[2]

- The monthly charge per FTE is impacted both by the ramp period as well as the "base" FTE
- Using a full FTE count and including students provides base of 14,795 FTEs and peak monthly charge of $69.67
- Adjusting FTEs to include only "data" FTE[3] results in 11,455 FTEs and a charge of $89.98

Illustrative Ranges





In order to promote an equitable cost distribution, provide control points time to plan and give departments time to reflect costs in grant budgets, Huron recommends using "Data" FTE with a 5-year phase in.

Notes: (1) If the five year phase in is selected, UCSF may be able to internally finance the investment through STIP funds at an approximate rate of 5.05% and a cost of $7.5MM
(2) Adjusted for the 20% contingency, monthly per user rates would decrease by approximately $6.04
(3) Data FTE excludes students, Fresno employees and non-users, such as members of the landscaping team

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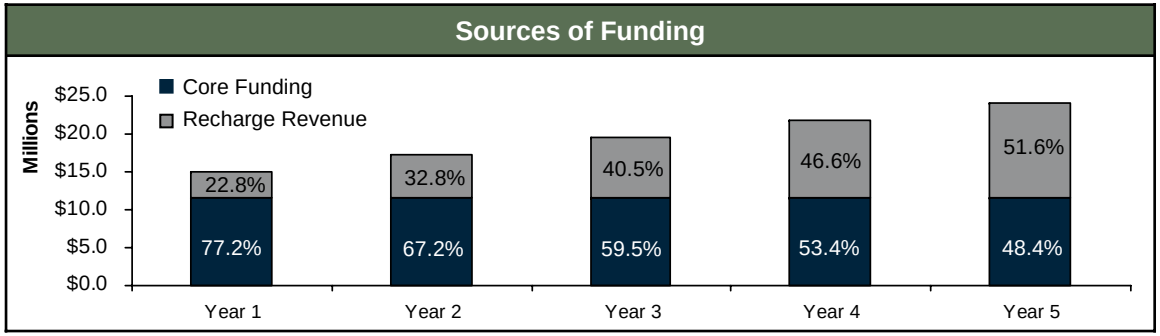
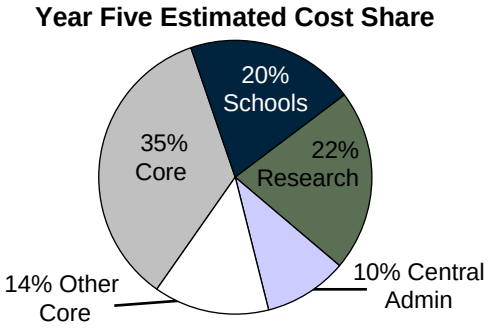
Impact on Academic & Administrative Departments

As the primary recipients of service upgrades, the control points/departments will be expected to cover a significant portion of equipment costs.

	Total FTEs	Adj. FTEs	Total 06-07 Budget[1]	Monthly Data FTE Charge (YR1=$25)	Total YR1 Charge as % of Budget[2]	Monthly Data FTE Charge (YR5=$89.98)	Yr 5 % of Total Budget[2,3]
Executive Vice Chancellor	967.6	954.4	$53,031,581	$278,490	0.53%	$1,002,325	1.67%
School of Dentistry	504.4	504.3	76,121,633	148,320	0.19%	533,825	0.62%
School of Medicine	8,221.9	8,216.6	1,032,770,511	2,321,880	0.22%	8,356,775	0.72%
School of Nursing	395.4	395.4	57,794,672	114,660	0.20%	412,678	0.63%
School of Pharmacy	504.5	504.5	62,335,849	145,890	0.23%	525,079	0.74%
Vice Chancellor of Adv. & Planning	206.4	206.5	21,563,159	61,080	0.28%	219,836	0.90%
Vice Chancellor of Admin. & Fin.	1,564.7	1,177.2	142,492,501	360,720	0.25%	1,298,282	0.81%





It is anticipated that the per user fees will be tied to payroll sources, therefore the above control point impacts will actually impact department level budgets directly.

Notes: (1) Based on 2006-2007 general ledger data
(2) Over the course of approximately three years, departments will be able to reduce the burden of this expense by including the recharges in grant budgets
(3) Year five budgets are assumed to grow by an approximate rate of inflation

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Benefits to UCSF Community

While many of the benefits accruing from these upgrades are intangible, they remain of great importance; some benefits are estimated below as an illustration.

Illustrative and Not Comprehensive: For Discussion Purposes Only

Benefit	Description	Valuation Methodology	Estimated Annual Benefit	
			Low	High
Reliability	Reliability is the measure of the amount of time the UCSF network is properly functioning; most, if not all, recent network failures have been due to equipment failures, with service notes of equipment "10 years old" or equipment is "very old"; approximately 52% of network devices are 11-15 years old	System outages and their duration are tracked by the OASIS team and while there is a general feeling that "luck" is on their side, year to date outages have increased dramatically compared to the same period in 2007; the cost of these outages is based on the assumption that a switch outage impacts 48 FTEs and that the 2008 rate will continue through year end	$842,000	$1,771,000
Consolidation	Approximately 10 departments maintain their own networks, either for service level or security reasons; another seven operate behind separate firewalls	The cost of operating a separate network includes equipment, maintenance, installation, support, etc.; in addition to the independent departments, others bear the cost of the reduced scale	127,000	203,000
Capacity	Departments with at-capacity switches must purchase 48-port switches to increase usage by one user	Switch utilization is not tracked; however, the number of switches doubled from 2004-2006 and five depts. were required to purchase new switches in 2007; the frequency is expected to at least double in the future	60,000	250,000
Service	The time it takes the OASIS department to respond to "customer" needs and system outages; speed of service is driven by fragmentation of equipment (technicians must be experts on each) and the availability of inventory	OASIS currently services and stocks 14 types of equipment; affects upgrades and replacement as the number of different switches would drop to three, allowing OASIS to provide services equivalent to hiring an additional 2-3 FTEs	142,000	213,000
Security	In 2006, reported security issues were up 2.5x over 2005 and 2007 had one month with 28 reports, twice the previous monthly high	Data breaches at other institutions have resulted in the institution offering to pay for credit reports and monitoring and fraud alerts for all community members; does not include lost information	187,000	1,000,000

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Benefits to UCSF Community (continued)

Illustrative and Not Comprehensive: For Discussion Purposes Only

Benefit	Description	Valuation Methodology	Estimated Annual Benefit	
			Low	High
E-mail	As the size and complexity of emails and attached files increases so does the need for increased email storage; intangible benefits include increased email storage, maintaining business-critical information and increasing communication among employees	High/Low valuation is based on estimations of % of users who regularly exceed current space limitations, the size of the overage and the $/MB for a user to purchase additional flash drive space	$6,000	$14,000
Wireless	As the UCSF wired network is upgraded and enhanced, consideration must be given to providing wireless network access points as an additional enhancement to the network infrastructure	High/Low valuation is based on estimations of the % of users who have laptop computers and the cost to users to purchase wireless access themselves	126,000	378,000
Performance & Functionality	Due to the limited capacity of the network, there are several applications that cannot currently be used: video conferencing, telemedicine, high resolution medical imagining, building management systems, global information systems, VoIP, data backup across sites, network access control	Detailed valuation of each additional application would need to be conducted, but these High/Low estimations are based on potential new grants from improvements in IT functionality	53,000	106 ,000

Due to the intangible nature of these benefits, it is difficult to create a direct dollar-for-dollar comparison between the cost and the benefits; however, this list provides ample reason for moving forward.

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Principles & Service Level Expectations

As an integral component of the recharge decision, UCSF should use the DVSAC "Principles and Goals" to set post-implementation service level expectations.

Guiding Principles
▪ Provide a strategic approach and methodology to **fund UCSF's escalating demand** for voice and data services ▪ Take into account the University's **strategic goals** and its capacity requirements over the next decade ▪ **Consider the needs and requirements** of UCSF faculty, staff and students, and the ability of UCSF's schools, departments, ORUs and other units to allocate revenue for these services ▪ Develop a funding model which is **simple, transparent, perceived as fair** and encourages appropriate use ▪ Create explicit measures for success and an **on-going assessment** of progress over time as the funding model is implemented ▪ Include **oversight of expenditures** and revenue collected using the recharge model

Service Level Expectations
▪ With an investment this large, it is simply not enough to promise the UCSF community "improved, faster service;" instead a set of measurable expectations and guidelines should be developed ▪ While a formal service level agreement may not be necessary, standard components of a service level agreement should be utilized to facilitate communication and transparency ▪ The considerations should include: – Timeframe in which all equipment will be upgraded – Performance goals, such as frequency and duration of network outages – Governance structure for the use of revenue derived from recharges (replacement matrix: generational age, criticality of application, etc.) – Feedback avenues so users can weigh in on how priorities, services and costs should change over time

With these principles and service level expectations in place, UCSF should move forward with a communication plan aimed at seeking community feedback and streamlining the implementation phase.

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Communication & Implementation Plan

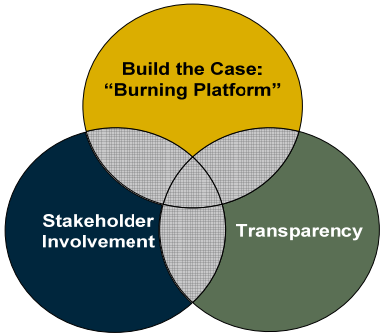
Successful implementation begins with an integrated communication plan and ultimately depends on strong planning, follow through and accountability.

Communication

- With this document, the business case is complete and the next steps include:
  - Increasing transparency past the DVSAC, Resource Optimization Committee and Chancellor's Executive Committee to include key administrators and faculty members within the broader UCSF community
  - Providing an avenue for these stakeholders to contribute to the structure and roll-out of the recharge

Implementation

- The implementation plan for the network recharge model must include the same critical components that were included in Huron's communication strategy for the over-arching resource planning, management and allocation initiative:



Key implementation components:

- Precise, sequential and actionable implementation **plans**
- Strong **project management practices and procedures**
- **Feedback** opportunities for stakeholders
- Strong **support** from UCSF leadership
- Clear **ownership** structure
- Accountability and **deadlines**
- **Communication of** results and progress to the community

Public leadership and vocal support from the Chancellor's Executive Committee will be integral to success.

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Summary

Considerations:

- Technological limitations are reducing UCSF's ability to take on new projects
- Demand for services outstrips the current infrastructure's capacity and capabilities
- Limited core funds currently provide ~$8.36 million per annum
- Many peer institutions (including UC system institutions) use IT recharges

Implementation Considerations:

- Ramp-up time provides an opportunity to ease into direct charges
- Charges represents a small percentage of control point budgets

Benefits

- Recharges can be recovered through sponsored activity budgets (NIH)
- Provides a higher level of service (reliability, productivity, e-mail, wireless, security, etc.)
- Addresses some of the challenges posed by the geographic separation
- Improves central information and coordination

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Summary – decision point

The table below provides a summary of options with a corresponding indication of the sensitivities surrounding each strategy.

1 None/NA
2 Minor
3 Moderate
4 Material
5 Substantial

	Description	Service Enhancement	Risk to University	Difficulty to Implement
Inaction – Status Quo Funding	No replacement plan; equipment is only replaced at time of failure; current revenue sources are used as strategically as possible to fund the outpaced costs	*1*	*5*	*1*
Full FTE with 3-Year Ramp	Equipment replacement is completed in six years and costs are borne by the entire campus, despite network utilization and including students	*5*	*2*	*5*
Full FTE with 5-Year Ramp	Equipment replacement is completed in seven years and costs are borne by the entire campus, despite network utilization and including students	*4*	*3*	*3*
Data FTE with 3-Year Ramp	Equipment replacement is completed in six years, however, costs are borne only by network users so a higher per user fee is mandated	*5*	*2*	*4*
Data FTE with 5-Year Ramp	Equipment replacement is completed in seven years, however, costs are borne only by network users so a higher per user fee is mandated	*4*	*3*	*3*

Regardless of the selected option, the UCSF leadership team must endorse a strategy, promote acceptance and support the implementation of a funding model.

Appendix A:
Working Group List

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Business Case Work Group

To help facilitate communication, contact information for the engagement work group is listed below.

Information Technology Interview List			
Name	**Title**	**Phone**	**Email**
Randy Lopez	Associate Vice Chancellor, Administration	415-476-4285	randy.lopez@ucsf.edu
Jon Showstack	Assistant Vice Chancellor & Co-Chief Information Officer	415-476-4917	jon.showstack@ucsf.edu
Jeff Fritz	OAAIS-Enterprise Network Services	415-476-6863	Jeffrey.Fritz@ucsf.edu
Felicia Silva	OAAIS-Enterprise Network Services	415-502-0505	Felicia.Silva@ucsf.edu
Kamyar Zare	Decision Support Manager	415-476-3006	kamyar.zare@ucsf.edu
Deborah Nikkel	Contracted Project Manger	415.479.9233	Deborah.Nikkel@ucsf.edu
ENS Committee	n/a	n/a	n/a
DVSAC Committee	n/a	n/a	n/a

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Andrew L. Laws	Manager	615-830-3227	alaws@huronconsultinggroup.com
Adam Fennel	Associate	312-375-2962	afennel@huronconsultinggroup.com
Kevin Harward	Associate	801-592-4732	kharward@huronconsultinggroup.com