



LAS POSITAS COLLEGE

3033 Collier Canyon Road, Livermore, CA 94551

INFORMATION AND TECHNOLOGY SERVICES

TECHNOLOGY EQUIPMENT LIFE CYCLE PLAN

February 2005

TABLE OF CONTENTS

PREFACE

Overview.....	i
Standards and Guideline Compliance.....	i
Definitions.....	i - ii

SECTION 1 – COMPUTER SYSTEMS

1.1	Establishing Life Cycle.....	1
1.1.1	System Considerations.....	1
1.1.2	Total cost of ownership.....	2
1.1.3	Does it meet the users needs.....	2
1.2	Standardization and Grouping.....	2-3
1.3	User Groups and Life Cycle at LPC.....	3
1.3.1	High End User Group.....	3
1.3.2	Standard Instructional User Group.....	3
1.3.3	Standard Office User Group.....	4
1.3.4	Single Purpose User Group.....	4
1.3.5	Laptop User Group.....	4
1.3.6	Server Group.....	4

SECTION 2 – PHERIFERAL DEVICES

2.1	Establishing User Groups.....	5
2.1.1	Equipment Considerations.....	5
2.1.2	Total Cost of Ownership.....	6
2.1.3	Does it meet the needs of the user.....	6

2.1.4	Standardization and grouping.....	6
2.1.4.1	Enterprise printer group.....	7
2.1.4.2	Individual printer group.....	7
2.1.4.3	High end scanner group.....	7
2.1.4.4	Standard scanner group.....	7
2.1.4.5	External drive group.....	7-8
2.1.4.6	Audio/video accessories group.....	8

SECTION THREE – DATA NETWORK EQUIPMENT

3.1	Establishing Life Cycle.....	9
3.1.1	Routers, Switches and Firewalls.....	9
3.1.2	Mounting and Routing	9-10
3.1.3	Total Cost of Ownership.....	10
3.2	Standardization and Grouping.....	10
3.2.1	Core Networking Equipment.....	10
3.2.2	Individual Building Networking Equipment.....	10
3.2.3	Mounting and Routing Hardware.....	11

SECTION FOUR – MULTIMEDIA EQUIPMENT

4.1	Establishing Life Cycle.....	12
4.4.1	Projection Equipment.....	12
4.1.2	Audio Systems.....	12-13
4.1.3	Video Players and Recorders.....	13
4.1.4	Screens and Displays.....	13
4.1.4.1	Manual Projection Screens.....	13
4.1.4.2	Electronic Projection Screens.....	13-14
4.1.4.3	Televisions and Monitors.....	14

4.1.4.4	Electronic White Boards.....	14
4.2	Total Cost of Ownership.....	14
4.3	Standardization and Grouping.....	14
4.3.1	Projection Equipment.....	15
4.3.2	Audio Systems.....	15
4.3.2.1	Amplifiers and Mixers.....	15
4.2.2.2	Speaker Arrays.....	15
4.3.3	Video Players and Recorders.....	15
4.3.4	Screens and Displays.....	15
4.3.4.1	Manual Projection Screens.....	15
4.3.4.2	Electronic Projection Screens.....	15
4.3.5	Televisions and Monitors.....	16
4.3.6	Electronic White Boards.....	16

APPENDICIES

Appendix A – Technology Equipment Life Cycle Quick Reference Matrix...	A-1
--	-----

OVERVIEW

Technology by its nature has a volatile life cycle, the ever changing requirements in the classroom, laboratory and the administrative management of the college require that computing systems and related equipment be adequate to meet these needs. This plan has been developed to provide comprehensive standards and guidelines for establishing the service and life cycle of this equipment.

The Dean of Technology is responsible for the overall management, acquisition, replacement and allocation of computing, communications, multimedia and related equipment at Las Positas College. In carrying out these responsibilities the incumbent will follow the guidance provided by insert names of appropriate committee(s) and or administrators here and carefully consider the needs and requirements expressed by the faculty and staff of the college.

The standards and life cycle set forth in this plan are intended to maximize the effective use of available funding, provide the best possible equipment to the user and create a technology environment that enhances the ability of the college to perform its diverse mission.

STANDARDS AND GUIDLINE COMPLIANCE

All equipment specification will meet the established standards and guidelines of the Chabot-Las Positas Community College District, Las Positas College and appropriate Federal, State and local regulation.

DEFINITIONS

This document contains a number of phrases and acronyms, the glossary of definitions below are intended to add clarity and meaning to the contents of this document:

Audio Equipment	Equipment intended to amplify voice or multimedia
Clock Speed	The frequency that CPU operates at
Computer System	The Central Processing unit, Monitor, Keyboard, mouse and required cabling.
Data/Video Projector	A device intended to project Data/Video images for group Presentations

Peripheral	Any device attached to a computer system, such as printers, scanners, external drives etc.
Ram	Random access memory, the amount of memory available to open and run programs on the desk top
Storage	The storage capacity of the Hard drive

1. SECTION ONE – COMPUTER SYSTEMS

1.1 ESTABLISHING LIFE CYCLE

Establishing the life cycle of a computer system can be divided into three major areas; system considerations, the total cost of ownership and does it meet users needs.

1.1.1 SYSTEM CONSIDERATIONS

When establishing the useful life cycle of a computer system, several factors must be considered:

- ❑ The configuration and computing power of the system
- ❑ Would upgrades extend the life of the system and is it cost effective?
- ❑ What software will be operated on the system
- ❑ The length and scope of the manufacturers warranty
- ❑ Are repair parts still readily available for the system
- ❑ Could the system be redistributed to an area needing less computing power
- ❑ Is it becoming a labor intensive to maintain the system?
- ❑ Is it representative of the type of equipment our students will be required to operate in the work place.
- ❑ What are the current and projected trends in the industry for new/ replacement systems

1.1.2 TOTAL COST OF OWNERSHIP

This term is intended to insure that not only the initial purchase cost of the computing system is considered, but all cost that might be incurred during the life of the system be factored. These additional costs are:

- ❑ Training of the users, both hardware and software
- ❑ Training of the support personnel
- ❑ Maintenance, both parts and labor

1.1.3 DOES IT MEET THE USERS NEEDS

A computing system must be of sufficient power and speed to perform the tasks required by the user. A system that's performance is sub-standard defeats the purpose of using technology as a tool to enhance the productivity in the work place. The following areas should be considered when determining the time period a computer system meets the needs of the user:

- ❑ The clock speed, RAM and Storage required to operate all required software efficiently
- ❑ The type and complexity of the software to be run on the system
- ❑ The scalability of the system

1.1.4 STANDARDIZATION AND GROUPING

Minimum Computer system standards have been set by the District Technology Committee to insure that any new system purchased within the district will meet the needs of the average user. Additionally, user groups need to be established to insure that computing systems in service at LPC are rotated/upgraded to achieve the maximum use from each system. When establishing user groups the following should be considered:

- ❑ In general the annual rotation/replacement of systems should not exceed 25 percent of the total inventory, so that the most value for the funds expended can be achieved.
- ❑ What percentage of the inventory can the available technical staff replace/rotate annually
- ❑ What are the needs of the different users on campus
- ❑ What is the amount of available funding available to replace systems annually
- ❑ Are there system needs that can be met by recycling an existing system
- ❑ How long is the manufacturers warranty for the system

1.3 USER GROUPS AND LIFE CYCLE AT LPC

After careful consideration of all factors, it has been determined that six major user groups will be established at LPC with the corresponding life cycle indicated:

1.3.1 HIGH END GROUP:

The high user group is intended to meet the needs of academic programs and selected faculty and staff that require a very powerful computing system due to the type of software required for the mission. These computer systems may have to be replaced as often as every two years, but not more than 4 years to meet the needs of the user. However, these systems should be redistributed to one of the other groups below whenever possible to achieve the most value possible from their purchase.

1.3.2 STANDARD INSTRUCTIONAL GROUP:

This group will consist of the majority of the computer labs and classroom instructor computers on campus. These systems should be replaced every four years. Selected systems may be considered for redistribution to the SINGLE PURPOSE GROUP.

1.3.3 STANDARD OFFICE GROUP:

This group will consist of the majority of staff and faculty computer systems on campus. These systems should be replaced every four years. Selected systems may be considered for redistribution to the SINGLE PURPOSE GROUP.

1.3.4 SINGLE PURPOSE GROUP:

This group will consist of systems required to perform a single computing need, such as student kiosks and student tracking. These systems should be replaced with the best available equipment first from one of the groups above, but only if it does not negatively impact the mission requirements.

1.3.5 LAPTOP GROUP:

This group will consist of the majority of laptop computers on campus. These systems should be replaced every five years.

1.3.6 SERVER GROUP:

Servers are intended to provide services to very large groups, they are very powerful computing systems with scalability factored into the design. These systems should be replaced every five years.

2. SECTION TWO - PHERIFERAL DEVICES

2.1 ESTABLISHING LIFE CYCLE

Peripherals devices can generally be divided into four groups; Printers, Scanners, External Drives and Audio/Video Accessories. The factors in establishing the life cycle of these devices are very similar to those outlined above for computer systems.

2.1.1 EQUIPMENT CONSIDERATIONS

When establishing the useful life cycle of a peripheral device, several factors must be considered:

- ❑ The configuration and computing power of the system it is supporting
- ❑ Will any special software be required to operate the device
- ❑ The length and scope of the manufacturers warranty
- ❑ Is the device designed to repaired or discarded when it does not operate properly
- ❑ Could the device be redistributed to a area to extend its usefulness
- ❑ Will software divers be readily available to interface the device with new operating systems
- ❑ Is it representative of the type of equipment our students will be required to operate in the work place.
- ❑ What are the current and projected trends in the industry for new/ replacement devices

2.1.2 TOTAL COST OF OWNERSHIP

This term is intended to insure that not only the initial purchase cost of a peripheral device is considered, but all cost that might be incurred during the life of the system be factored. These additional cost are:

- ❑ Training of the users, both hardware and software

- ❑ Training of the support personnel
- ❑ Maintenance, parts and labor or is it intended to be discarded when it no longer operates properly
- ❑ Will the computer system it is intended to support need to be upgraded or enhanced to interface properly with the device

2.1.2 DOES IT MEET THE USERS NEEDS

A peripheral device must be of sufficient quality and function to perform the tasks required by the user. A larger or enhanced device should be considered if it can meet the needs of a group of users, rather than just one person. Many times a device that is a bit more costly to purchase initially will result in an over all savings when the cost of purchasing redundant equipment for individual users is factored in. The following areas should be considered when determining the time period a peripheral device meets the needs of the user:

- ❑ Is the device user friendly or will intensive technical support be required to operate the device
- ❑ Does the device produce the quality of product or media needed
- ❑ The scalability of the device
- ❑ Are upgrades to software divers readily available

2.1.3 STANDARIZATION AND GROUPING

Minimum standards have been set by the District Technology Committee to insure that any new peripheral device purchased within the district will meet the needs of the average user. Equipment will be grouped according to functionality as follows:

2.1.4.1 ENTERPRISE PRINTER GROUP

Whenever the mission allows, a larger networkable laser printer should be used to provide printing support to small groups of from 3-12 users. This philosophy of providing printer support will reduce the cost of purchasing individual printers, reduce the amount and type of expendables to be purchased and stocked and hold down the cost of technical support and maintenance significantly. This class of printer will

provide a high monthly product output and stand up to heavy use. These printers should be replaced every five years.

2.1.4.2 INDIVIDUAL PRINTER GROUP

When it is determined that the type of work a users is involved in requires documents of a confidential nature be printed, a smaller individual laser printer should be provided. This printer should also be of a quality to support small groups of 3-5 and networkable. This will allow for maximum flexibility and use, if the mission of the printer changes. These types of printers should be replaced every five years also.

2.1.4.3 HIGH END SCANNER GROUP

These scanners are used to provide very high quality graphic images and usually are interfaced with sophisticated software that provides cataloging, indexing and archiving of documents. The cost of this type of scanners is significantly greater than the standard document/photo quality scanner. These scanners should be replaced every five – seven years, depending on their ability to provide adequate mission support.

2.1.4.4 STANDARD SCANNER GROUP

This class of scanner is intended provide standard office or lab support in the uploading of documents and photos. They are inexpensive and meant to be discarded when they no longer operate properly. These scanners should be replaced every two – three years.

2.1.4.5 EXTERNAL DRIVE GROUP

These devices are meant to provide bulk storage, data back up and produce transportable media. They can range in functionality from a common floppy disk drive to large capacity external hard drives for bulk data storage. The one thing they all have in common is that for the most part they all have mechanical components. These components will wear out from prolonged or heavy use. This factor requires that these devices be replaced every two – four years.

2.1.4.5 AUDIO/VIDEO ACCESSORIES GROUP

This group of equipment consists of desktop powered speakers, headphones, microphones and video/web cameras. All these devices are very low cost, not repairable and have an average life cycle of three to five years.

3 SECTION THREE – NETWORK EQUIPMENT

3.1 ESTABLISHING LIFE CYCLE

Networking equipment can generally be divided into two groups; Switches, Routers and Firewalls, and Mounting / Routing Hardware. The factors in establishing the life cycle of these devices are as follows:

3.1.1 ROUTERS, SWITCHES AND FIREWALLS

These devices are the backbone of the data network and can be a considerable expense to upgrade and keep current. Therefore is extremely important that in selecting these devices that the following factors be considered:

- ❑ Are all such devices in the network 100% compatible and can they be remotely managed using a single management protocol
- ❑ Are they scaleable
- ❑ The length of the factory warranty
- ❑ Can a comprehensive on site maintenance contract be purchased with the device
- ❑ Are they backward compatible
- ❑ Are the remote management tools used with these devices web based so that they can be accessed from a diverse group of locations easily

3.1.2 MOUNTING AND ROUTING HARDWARE

Mounting and routing hardware play the very important role of insuring that your network devices and cabling meet federal and industry specifications. In selecting this hardware the following is important to consider:

- ❑ Is the hardware of the highest quality and manufactured by a first tier company

- ❑ Does it provide the required protection to the equipment and cabling
- ❑ Are replacement components readily available
- ❑ Does the hardware have a utilitarian design

3.1.3 TOTAL COST OF OWNERSHIP

This term is intended to insure that not only the initial purchase cost of a network equipment is considered, but all cost that might be incurred during the life of the system be factored. These additional cost are:

- ❑ Training of support personnel, both hardware and software
- ❑ Possible hardware and software upgrades
- ❑ Maintenance cost that might exceed the factory warranty, such as service subscriptions

3.2 STANDARIZATION AND GROUPING

Minimum standards have been set by the District Technology Committee to insure that any new network equipment purchased within the district will interface with the existing equipment in the district wide area network. Equipment will be grouped according to functionality as follows:

3.2.1 CORE NETWORKING EQUIPMENT

These are Switches, Routers and Firewalls that are the hub of the campus network and control all data communications, both internal and external for the campus. This equipment is operational at all times, to insure reliability, it should be replaced every five years.

3.2.2 INDIVIDUAL BUILDING NETWORKING EQUIPMENT

This equipment consist mainly of switches and is employed in each of the campus buildings and controls data/communications internal to the building and interfaces with the Core Networking Equipment for off campus communications. This equipment is also operational at all times, to insure reliability, it should be replaced every five years.

3.2.2 MOUNTING AND ROUTING HARDWARE

This equipment in general has a long life span, due mainly because it consists of steel rails, brackets and fasteners. The exception to this would be patch panels and patch cords. These two items are vulnerable to dirt, dust and other environmental factors and should be replaced every five years, when the corresponding network equipment that supports a given building or the campus core is replaced.

4 SECTION FOUR - MULTIMEDIA EQUIPMENT

4.1 ESTABLISHING LIFE CYCLE

Multimedia equipment in general is the equipment used in the laboratory, classroom and conference room to enhance instruction or presentations. For the purposes of this plan it is broken down into 4 groups; Projection equipment, Audio systems, Video players and recorders and Screens/Displays. The factors in establishing the life cycle of this equipment are as follows:

4.1.1 PROJECTION EQUIPMENT

- Is the brightness of the system adequate for the room it services?
- The length and scope of the manufacturers warranty
- Are repair parts still readily available for the system?
- Could the system be redistributed to an area needing a less powerful projector?
- Is it becoming labor intensive to maintain the system?
- What are the current and projected trends in the industry for new/replacement systems?

4.1.2 AUDIO SYSTEMS

For the purpose of this plan, audio systems refers to room size sound systems or larger and include, Amplifiers, Mixers and speaker arrays:

- Are the system components compatible from a power-output standpoint?
- Does the quality of the system meet the needs of users?
- Are the amplifiers and mixers of solid-state design?
- Are repair parts still readily available for the system?

- ❑ Could the system be redistributed to an area needing a less powerful system?
- ❑ Is it becoming labor intensive to maintain the system?
- ❑ What are the current and projected trends in the industry for new/replacement systems?

4.1.3 VIDEO PLAYERS AND RECORDERS

For the purpose of this plan, video players and recorder refers to any device that plays back or records a video image; VCRs, DVDs, Camcorders etc. These devices usually are very low cost , not intended to for repaired if they do not operate properly. They are also very vulnerable to environmental issues such as dust, chalk dust and chemical vapors. Spare equipment needs to be a part of the college inventory so these devices can be replaced as needed and not disrupt instruction.

4.1.4 SCREENS AND DISPLAYS

For the purpose of this plan, screens refer to Projection Screens both manual and electric. Displays refer to Video Monitors/Televisions and Electronic White boards:

4.1.4.1 MANUAL PROJECTION SCREENS

Manual projection screens are very low cost items and not intended to be repaired if they do not operate properly. They are very vulnerable to environmental issues such as dust, chalk dust abuse and vandalism. Spare screens need to be a part of the college inventory so they can be replaced as needed and not disrupt instruction.

4.1.4.2 ELECTRONIC PROJECTION SCREENS

Electronic projection screens are vulnerable to the same environmental issues as manual screens, however they are a substantial financial investment. The following should be considered:

- ❑ Are repair parts still readily available for the screen?
- ❑ Is it becoming labor intensive to maintain?

- Is the screen still covered by a warranty

4.1.4.3 TELEVISIONS AND MONITORS

Televisions and Monitors are very durable devices and are used in a diverse group of venues, when establishing their life cycle the following should be considered:

- Is the screen large enough for the venue it is being used in
- Are repair parts still readily available for the system?
- Is it close captioning ready?
- Is it still under warranty

4.1.4.4 ELECTRONIC WHITE BOARDS

Electronic white boards are a fairly recent addition to the instructional environment. Their useful life cycle is extremely dependent on its ability to interface with the generation of computer system and peripheral devices being used in conjunction with it.

4.2 TOTAL COST OF OWNERSHIP

This term is intended to insure that not only the initial purchase cost of the equipment is considered, but all cost that might be incurred during the life of the equipment be factored. These additional cost are:

- Is it user friendly, is extensive training needed to operate it?
- Training of support personnel
- Maintenance cost that might exceed the factory warranty

4.3 STANDARDIZATION AND GROUPING

Minimum standards have been set by the District Technology Committee to insure that any new multimedia equipment purchased within the district will meet the needs of the average user. Equipment will be grouped according to functionality as follows:

4.3.1 PROJECTION EQUIPMENT

Projection equipment is very expensive to repair and institutional data collected reveals that it becomes very maintenance intensive as it reaches five years of service. They should be replaced every five years.

4.3.2 AUDIO SYSTEMS

4.3.2.1 AMPLIFIERS AND MIXERS

These devices are very durable, usually are of a solid-state design and very easy to repair. These devices should be replaced every seven to ten years.

4.3.2.2 SPEAKER ARRAYS

Speaker arrays because of their construction have a tendency for the voice cones to dry out and crack as it reaches seven years of service. They should be replaced every seven years.

4.3.1 VIDEO PLAYERS AND RECORDERS

As stated above, these devices are inexpensive and not intended to be repaired. They are very vulnerable to environmental factors. Because of this, spare equipment to replace a defective device immediately must be a part of the college inventory. Spare devices should be replaced as they are put into use.

4.3.2 SCREENS AND DISPLAYS

4.3.4.1 MANUAL PROJECTION SCREENS

As stated above, these devices are inexpensive and not intended to be repaired. They are very vulnerable to environmental factors. Because of this, spare equipment to replace a defective device immediately must be a part of the college inventory. Spare devices should be replaced as they are put into use.

4.3.4.2 ELECTRIC PROJECTION SCREENS

Electronic projection screens are costly, but can be repaired and are very durable. They should be replaced every ten years.

4.3.5 TELEVISIONS AND MONITORS

Televisions and monitors are extremely durable and in general can be repaired. They should be replaced every seven years.

4.3.6 ELECTRONIC WHITE BOARDS

Electronic White Boards as stated above are fairly new devices, there is little institutional knowledge as to their durability. Much like a data projector it must be compatible with the generation of computer system it must interface with. Subject to revision as more data is available, they should be replaced every five years.

APPENDIX A – TECHNOLOGY EQUIPMENT LIFE CYCLE QUICK REFERENCE MATRIX

LPC TECHNOLOGY EQUIPMENT LIFE CYCLE QUICK REFERENCE MATRIX		
COMPUTER SYSTEMS GROUP		
GROUP	REPLACEMENT CYCLE	REMARKS
HIGH END USERS	EVERY 2-4 YEARS	SHOULD BE RECYCLED TO ONE OF THE GROUPS BELOW
STD INSTRUCTIONAL GROUP	EVERY 4 YEARS	MAY BE RECYCLED TO SINGLE PURPOSE GROUP
STD OFFICE GROUP	EVERY 4 YEARS	MAY BE RECYCLED TO SINGLE PURPOSE GROUP
SINGLE PURPOSE GROUP	EVERY 4 YEARS	MAY BE A RECYCLED SYSTEM
LAPTOP GROUP	EVERY 5 YEARS	
SERVER GROUP	EVERY 5 YEARS	VERY POWERFUL AND SPECIALIZED SYSTEM
PHERIFERAL DEVICES GROUP		
GROUP	REPLACEMENT CYCLE	REMARKS
ENTERPRISE PRINTER GROUP	EVERY 5 YEARS	NETWORKED PRINTER TO SERVE SMALL GROUPS OF USERS
INDIVIDUAL PRINTER GROUP	EVERY 5 YEARS	FOR CONFINDENIAL DOCUMENTS SHOULD BE NETWORKED
HIGH END SCANNER GROUP	EVERY 5-7 YEARS	FOR HIGH CAPASITY DATA ARCHIVING
STD SCANNER GROUP	EVERY 2-3 YEARS	GENERAL LAB OR OFFICE SUPPORT, NOT REPAIRABLE
EXTERNAL DRIVE GROUP	EVERY 2-4 YEARS	MECHANICAL PARTS WEAR OUT, NOT REPAIRABLE
A/V ACCESSORIES GROUP	EVERY 3-5 YEARS	INEXPENSIVE, NOT REPAIRABLE
NETWORK EQUIPMENT GROUP		
GROUP	REPLACEMENT CYCLE	REMARKS
CORE SWITCHES, ROUTERS & FIREWALLS	EVERY 5 YEARS	HUB OF THE COLLEGE NETWORK IN SERVICE 24/7
INDIV BUILD NETWORK EQUIP	EVERY 5 YEARS	CONTROLS ALL DATA COMM FOR THE BUILD IT SERVES
MOUNTING&ROUTING HARDW	EVERY 5 YEARS	PATCH PANELS AND PATCH CORDS ONLY
MULTIMEDIA EQUIPMENT GROUP		
GROUP	REPLACEMENT CYCLE	REMARKS
PROJECTOR GROUP	EVERY 5 YEARS	MAINTENANCE INTENSIVE AFTER 5 YEARS SERVICE
AUDIO SYSTEMS		
AMPLIFIERS AND MIXERS	EVERY 7-10 YEARS	DURABLE, SOLID-STATE REPAIRALBE
SPEAKER ARRAYS	EVERY 7 YEARS	VOICE CONES DRY OUT&CRACK AFTER 7 YRS SERICE
VIDEO PLAYERS & RECORDERS	AS NEEDED	LOW COST, SPARES REPLACED AS PUT IN SERVICE
SCREENS & DISPLAYS		
MANUAL PROJ SCREENS	AS NEEDED	LOW COST, SPARES REPLACED AS PUT IN SERVICE
ELECTRIC PROJ SCREENS	EVERY 10 YEARS	HIGH COST, REPAIRABLE
TVs AND MONITORS	EVERY 7 YEARS	DUARABLE, REPAIRABLE
ELECTONIC WHITE BOARDS	EVERY 5 YEARS	NEW TECHNOLOGY, SUBJECT TO CHANGE W/ MORE DATA