Ensuring Equal Access To Information and Computer Technology In Allegheny County

Department of Engineering and Public Policy
Department of Social and Decision Sciences
H. John III Heinz School of Public Policy and Management

Carnegie Mellon University
Pittsburgh, PA 15213-3890

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PROJECT PARTICIPANTS

This study was sponsored jointly by the Department of Engineering and Public Policy (EPP), the Department of Social and Decision Sciences (SDS), and the H.J. Heinz III School of Public Policy and Management at Carnegie Mellon University. The students and faculty who participated in this project were:

STUDENTS

Steven S. Burns (MechE/EPP)
John Doan (CivE/EPP)
John Dougherty (ChemE/EPP)
Brendan H. Dunham (ECE/EPP)
Ellen T. Hasenkamp (ChemE/EPP)
Robert Lai (CEE/EPP)
Emmett G. Matthews (ECE/EPP)
Renee A. McFeaters (ChemE/EPP)
Matthew C. Summers (MechE/EPP)
Elizabeth Tucker (Heinz)
Yuzo Watanabe (ECE/EPP)
Christopher E. White (CEE/EPP)

PROJECT MANAGERS

John Chung-I Chuang (EPP)
Kara M. Morgan (EPP)

FACULTY ADVISORS

Dr. Stephen Appold (Heinz/EPP)
Dr. Vallampadugai S. Arunachalam (MSE/Robotics Institute/EPP)
Dr. Mitchell Small (CivE/EPP)

REVIEW PANEL MEMBERS

The project participants and faculty wish to thank the Review Panel members for their advice and encouragement.

Bill Beldham	Allegheny Intermediate Unit - SCOPE
Doreen Boyce	Buhl Foundation
Robin Braun	Allegheny Intermediate Unit - SCOPE
Merrick Furst	CMU - Computer Sciences Dept.
Marilyn Jenkins	Allegheny County Library Administrator
Molly Kinney	Carnegie Library of Pittsburgh
Robert Kraut	CMU - Social and Decision Sciences
Harold Miller	Allegheny Conference on Community Development
Andrea Sardone	Carnegie Library of Pittsburgh
Christopher Shea	City of Pittsburgh - Dept. of City Planning
Richard Wertheimer	Common Knowledge: Pittsburgh

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Paul Fischbeck	Professor, Dept. of Engineering and Public Policy, Dept. of Social and Decision Sciences, CMU
Marilyn Jenkins	Allegheny County Library Administrator
Molly Kinney	Coordinator of Children's Services, The Carnegie Libraries
Robert Kraut	Professor, Dept. of Social and Decision Sciences, CMU
Sonita Petrell	Assistant Coordinator, Knowledge Connection Program
Andrea Sardone	Operations Manager, EIN Project, The Carnegie Libraries
Robert H. Thibadeau	Senior Research Scientist, Robotics Institute, CMU
Rick Wertheimer	Common Knowledge: Pittsburgh and Pittsburgh Public Schools

Additional information or copies of this report may
be obtained by contacting

Department of Engineering & Public Policy
Carnegie Mellon University
Pittsburgh, PA 15213

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Executive Summary

Introduction

The personal computer is a very powerful information and knowledge provider that has recently entered many American homes. In spite of its impressive penetration, many Americans are currently left without access to computers, and this situation is not likely to change very much in the coming years. Currently, community initiatives and libraries are offering people access to the Internet and information technology, but much more is needed to augment these current access points. The object of this program is to find a solution for this need.

Project/Description

This program involved conducting a geographic study of computer accessibility in Allegheny County, a limited telephone survey of potential user requirements, and an assessment of the available technological options. The GIS (Geographic Information System) was used to determine the current access levels in the county and to predict improvement resulting from the placement of more access points. The survey helped to further identify current levels of computer knowledge and access and helped to clarify extent of access on the Internet. A number of computer and kiosk vendors were contacted to find what technological options are currently available, and from these options two models were formed. One model is groups of single computers connected by high speed digital circuitry and set up as kiosks at appropriate locations, while the other model is a number of computers located in a cluster. The level of service, the facilities to learn, and

the extent of accessibility will be determined by the choice of these options and the rules that govern accessibility.

Results

The GIS showed the tremendous increase in computer accessibility as a result of the libraries, and it also showed gaps in computer access in Allegheny County and places where additional access points can be added to increase overall access to information technology. The survey showed that citizens of Allegheny County support such a public computer system. Much interest was shown in the placement of computers in libraries and other public buildings as well as in the inclusion of training programs. Most people also issued a concern that some material on the Internet should be blocked from children. The two models can be strategically placed to accomplish these goals. A single kiosk averages in price near $12,000 while a typical cluster computer costs between $1500 and $2000. These costs, when added to the costs of training, maintenance, and wiring, combine to provide an effective cost model for the program.

Recommendations

The gaps in access need to be filled, and this can be done by effective placement of the kiosks and computer clusters throughout Allegheny County. These technological access points should be publicly owned and located in high traffic areas to give as many people access as possible. The option of site blocking software is also recommended so that children may be shielded from inappropriate sites on the Internet. Personal training supplemented with on-line tutorials is also recommended. Finally, looking at other such programs is recommended to help make this program a success.

1. Motivation

What do voting records of members of Congress, news updates, sports scores, cooking recipes, corporate advertisements, and job announcements all have in common? They each represent a small sampling of the information that is available via the Internet.

What does almost any successful career in today's job market require? Rudimentary computer skills.

Within the past few years, more and more people have been made aware of the power of computing technologies to not only inform and entertain, but to also educate and enlighten. Unfortunately, a significant portion of Americans, particularly those within lower income brackets, do not currently have adequate access to these technologies nor to their greatest asset: the extensive proliferation of information.

Compared to the 65% of nation-wide households that earn over $100, 000 per year who own a personal computer (PC), only 12% of households earning less than $30, 000 per year own a PC (unknown[7]). Coupled with the previously noted demand for computer skills in the workplace, these statistics highlight the irony that is inherent to all of the benefits that access to computers with connections to external information networks provide: the very tool that is going to bring more information and knowledge to more people is also going to be the tool that widens the gap between the have's and have-not's faster than ever before!

However, some public, as well as private, efforts are underway that instead use computers to help close the gap between the have's and the have-nots. These independent efforts range in scope from computers provided by the local Kinko's to placing computer

clusters in housing projects. One of the larger, more recent efforts to enhance the availability of computers here in Allegheny County, Pennsylvania has been the Electronic Information Network (EIN) project which is aimed at equipping libraries in Allegheny County with computers and Internet access.

The EIN Project, while an important component of public access, may not be sufficient to reach all members of Allegheny County who lack access. This is on account of the fact that the mere availability of computers does not necessarily qualify as access. More poignantly, access also includes an awareness of what computers are capable of doing, and the skills needed to take advantage of these capabilities.

Thus, with so much talk of access, a few questions naturally begin to arise. Firstly, what levels of public and private access, across differing socioeconomic levels, have already been established? Secondly, is current public access sufficient in meeting the wants of its users? What can be done to possibly further supplement current public access? Would increasing the number of computers in libraries be a sufficient solution or should an additional approach to the problem be considered? Finally, what types of costs are associated with trying to provide evenly distributed access on a geographic or demographic basis and who would most likely pay the bill?

For the purpose of this research paper, two resources were fundamental to the determination of the present extent of computer use, availability, and awareness within Allegheny County: a Geographical Information System (GIS) model and a survey. The GIS model was constructed in order to illustrate the demographics of Allegheny County. It essentially superimposes census data obtained for Allegheny County over a map of its area for the purpose of presenting visual breakdowns of its population that are based on either race, income, educational level or any combination of the three. Also superimposed onto

the map of Allegheny County were the locations of each of its public libraries which are or will be providing public access to computers. Subsequently, through a combination of population demographics and library locations it was possible to investigate, for instance, the populations who are outside of the range of access that the libraries and other sites provide to Allegheny County.

In an attempt to gain an understanding of public opinion towards computing technology in Allegheny County, a survey was conducted via telephone using random digit dialing. The survey contained questions that pertained to people's knowledge of and experience with computers and the Internet; the range of computer applications that they use or would like to start using; the best possible location for providing free, non-exclusive access; and the extent of access to the Internet. Underlying each of the questions was a desire to determine what the citizenry of Allegheny County would ultimately like to see happen in terms of publicly funded access to computing technologies.

For many reasons, people are starting to look to public policy makers for answers to the problems associated with the utilization of, and access to, computers and information. First and foremost: democracy and equality of opportunity! For inherent to the survival of any democratic entity is a citizenry that is not only free thinking, but also well informed. Thus, with so much talk surrounding the seemingly endless depths of information that can be found via the Internet, it has become necessary to think of how disparities in computer use, awareness, and availability will affect American society in terms of voter knowledge, opportunity, and equality across different socioeconomic levels.

Secondly: economic equity! Access to information technology is essential for the future economic opportunity of individuals. As more and more service oriented jobs

become computerized, basic knowledge and proper training in the usage of computers will be a necessity if one is to ever succeed in today's workforce.

In essence, the main impetus for this report has been the idea of making opportunity for access more equitable through the processes of trying to increase both the public's awareness of computing technologies and the number of public computers that are at their disposal. Therefore, with a focus that is primarily on, but not limited to, supplementing current levels of publicly provided access, this report will serve as a mechanism that can be utilized with equal effectiveness by everyone from community computing advocates, to policy makers, to private investors that are seeking to enhance computer use. Subsequently, regardless of the roles and objectives of its users, this report will retain its universal theme of encouraging the enhancement of non-exclusive access to computing technologies.

2. Access to Computer Technology

The fundamental question addressed by this project is one of access. Access is defined as having awareness of the resources a computer provides as well as having the ability to use them. Access is an issue being tackled by a number of interested groups throughout the country and in Allegheny County. It is important to note the two requirements in the definition: awareness and ability. Just buying more computers does not guarantee access for all. Rather, creating access to computers means not only ensuring that there are computers available for use, but that the desire to become acquainted with the computers is fostered within the users. That desire comes directly from awareness and from creating an atmosphere in which all people will be motivated to use computers, where they will feel it advantageous for them to do so, and where enough computers are available to meet their demands. Thus, the issue of ensuring access becomes one of both building awareness and of providing technology.

2.1 Types of Access

Though computer access comes in a variety of shapes and sizes, all access can be classified in one of two categories: private or public. Private access is by far the most common type of access today, with most computers found in the home or in the workplace. These computers provide extensive access to their owners; but the exclusive nature of privately-owned computers is what has created much of the disparity in the world today between the information have's and have-not's. Private computers alone cannot create universal access: there is a need for non-exclusive public access for those people without computers of their own. Though still a new concept, public computers are starting to come on-line in local libraries, stores, and other public places. Non-exclusive access to

computers, should it be made a universality among Allegheny County residents, would take great steps towards building a common understanding of computers and their many uses. The drawback to such access is that it must be shared, making it difficult to maintain enough computers for everyone to use, even if users are discouraged from monopolizing computer time.

With public computers offered as an alternative to Allegheny County residents, more universal access to technology can be achieved. However, when examining public computers, one issue comes up immediately: Funding. Public computer access today is largely funded by government bodies and charitable donations, though it may also come from profit-seeking ventures like the "Internet Cafes," where customers pay by the hour for access. Such examples of private initiative to offer public computer access are becoming more common, but there still are many Allegheny County residents who will not have access to computers unless they are made widely available, either free of charge or at subsidized rates. If this is the case, a government agency may decide in the interest of public good to intervene and to play a role in helping to provide access, it will be necessary to raise money through both taxes and private donations, which is by no means a small task. Many would claim that the problem of access is solely a private concern, that the government has no role in ensuring equal access to the population. However, the fact remains that many people cannot afford private access to computers, and many others lack the motivation to learn how to use them. To break down these barriers, a public campaign could be conducted and a structure could be created to finance free or subsidized non-exclusive access for those who need it.

2.2 Current Access

Many models and graphical representations of national data were created to characterize trends in computer access in Allegheny County. The models used include: the GIS software package, the county survey, and the Current Population Survey of the US Census Bureau (1993). The GIS software package is explained in detail in Appendix A2. The Current Population Survey is an ongoing survey done by the US Bureau of the Census about once a month. Information in this chapter was obtained in the 1989 and 1993 Current Population Survey. This data was used, along with Allegheny census track data that is available with the GIS system, to calculate and predict computer usage, network usage and computer ownership in Allegheny County. It was done on a primarily percentage basis, factoring in income and race as the main variables of interest.

2.2.1 National Trends

The first step in predicting technological access in Allegheny county was to look at what information was currently available on computer access and computer ownership. Since very little information was found on Allegheny County, extensive national data had to be obtained. Using this data, mostly from the Current Population Survey, a predictive model was derived for comparison between Allegheny County and the national averages.

On a national level, current access is far from equal. To illustrate the significant difference in access, income levels of individuals were looked at and compared to the percentage of those individuals with access to computer and network services. Access for national data is defined as access to a computer anywhere.

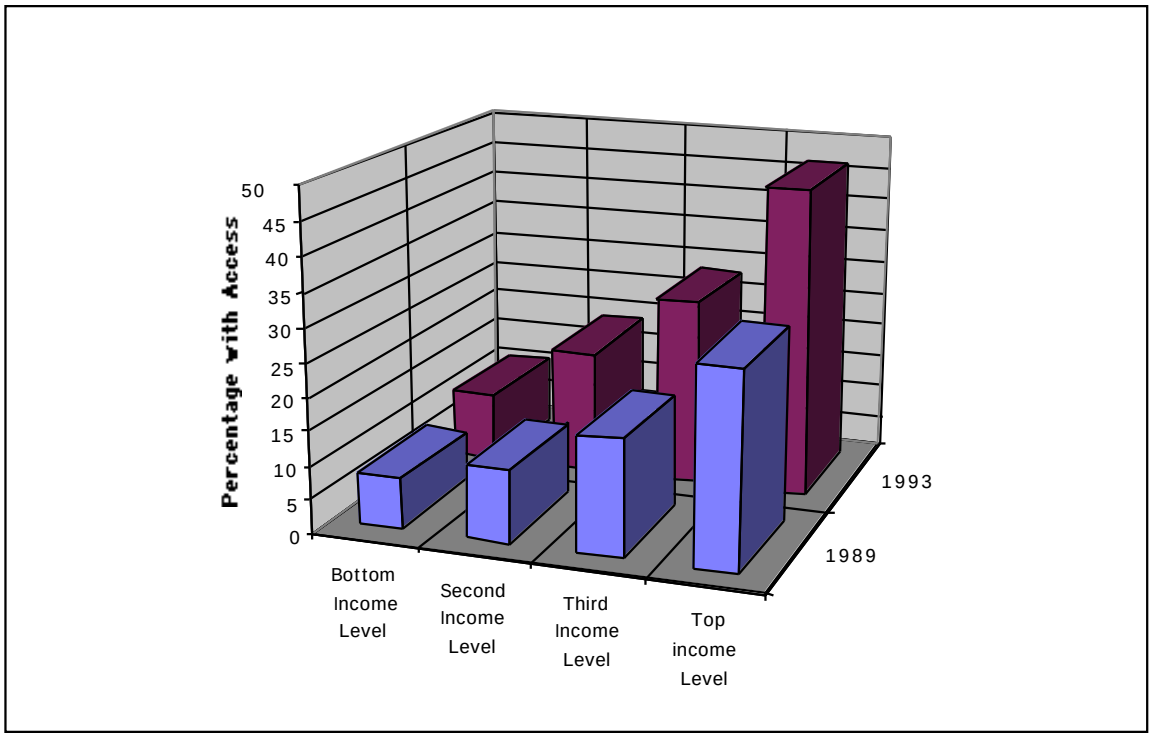

Figure 2.2.1-1 National Access to Computers by Income Level

In Figure 2.2.1-1, the annual household income levels were defined as follows: bottom income level $0-$15,000, second income level $15,001-$30,000, third income level $30,001-$50,000, and the top income level $50,001 and greater. Contrary to what one might suspect, the large disparities in computer access between the top and the bottom income levels have not decreased over time. In actuality, the difference has increased in recent years. For example, from 1989 to 1993, computer access among the poor increased from 7.8% to 10.4%, whereas, among the top income level it increased from 28.9% to 46.3%. As such, only about 2% of the poor who did not have access in 1989 gained access in 1993; conversely, about 12% of those individuals in the top income level who did not have access in 1989 gained it over the four year period. Trends in access to network services were comparable to those of computer access. As shown in Figure 2.2.1-2, only 2% of the individuals in the bottom quartile report having access to network services in

1993. In comparison, 18% of the individuals in the top quartile reported having access to network services.

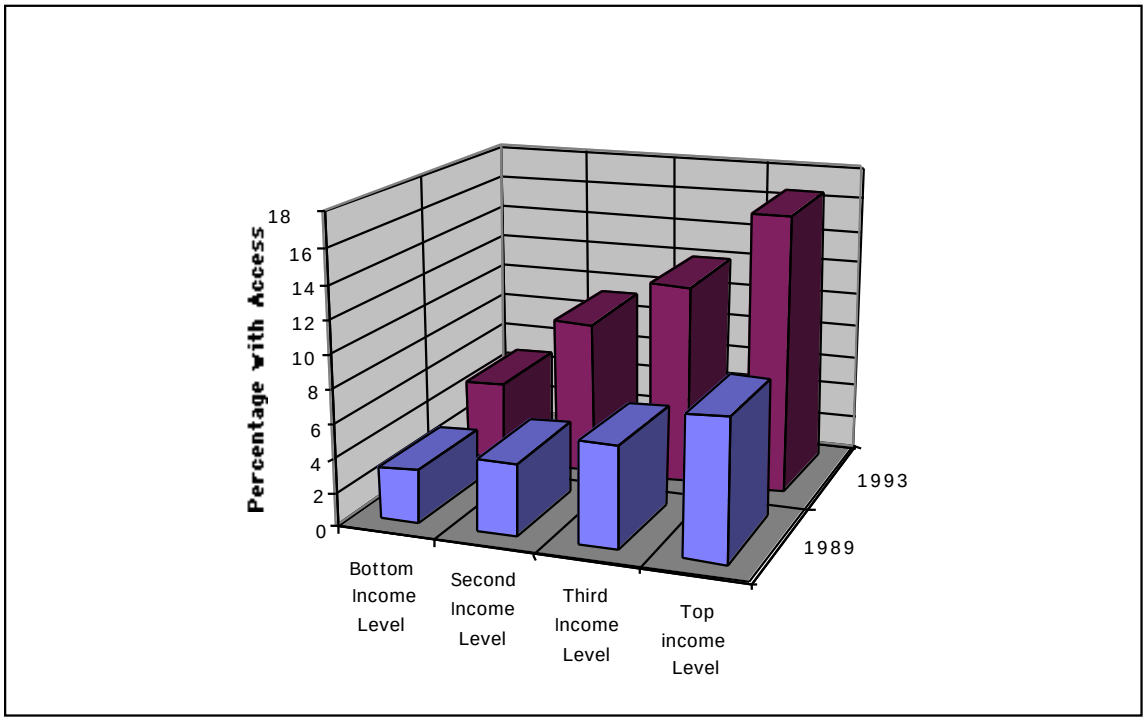

Figure 2.2.1-2 National Access to Network Services by Income Level

Another factor that played an important role in predicting whether or not individuals had access to computers and network services was race. Many of the same disparities exist between the different racial groups as do between the different income levels.

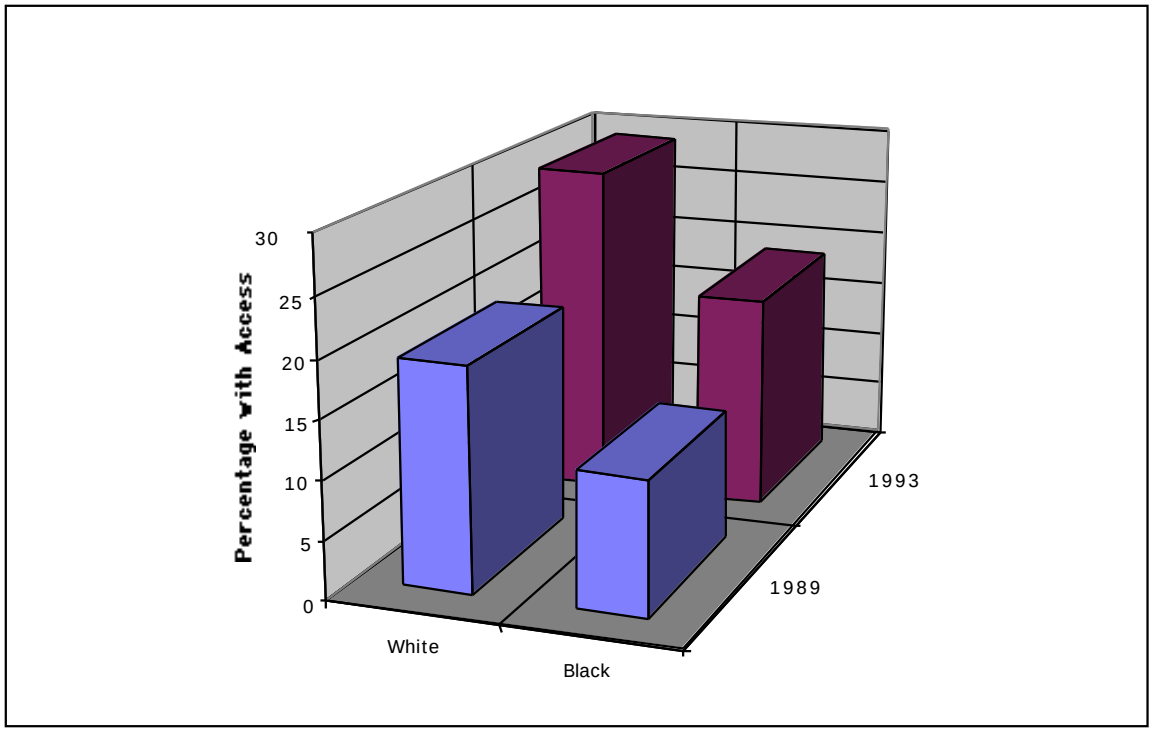

Fig 2.2.1-3 National Access to Computer by Race

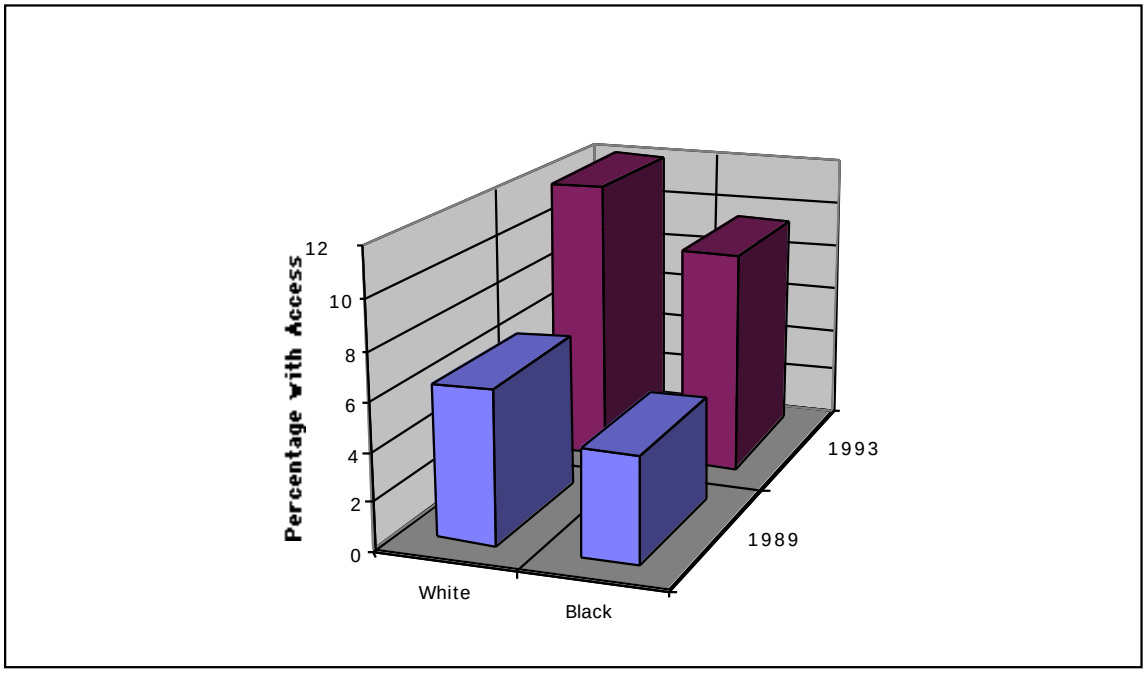

Fig 2.2.1-4 National Access to Network Services by Race

Figures 2.2.1-3 and 2.2.1-4 graphically display the fact that disparity between white individuals and black individuals with access to a computer grew over the four year period. About 20% of white individuals had access to a computer in 1989 compared to only 8% of black individuals. In comparison, in 1993 about 30% of white individuals had access to a computer, while only 13% of black individuals reported having access to a computer. From these graphs it can clearly be seen that race matters.

The final data that was necessary to do a complete analysis was computer ownership. Unfortunately, the 1990 census did not contain a question about owning a home computer, but the CPS data did include some large sample populations that were asked if they owned a home computer. A summary of home computer ownership from the 1993 Current Population Survey is shown in Table 2.2.1-1. In the table, data is characterized by both race and income levels. The table is followed by graphical representations of the same data to further illustrate the difference between the groups surveyed, (see Figures 2.2.1-5 and 2.2.1-6).

Income Level	Number of People Surveyed	People that own a Computer	Percentage with a Computer
$0-$9,999	16,345	942	5.8
$10,000-$24,999	27,183	3,099	11.4
$25,000-$34,999	14,263	3,019	21.2
$35,000-$44,999	10,875	2,936	27
$45,000-$74,999	15,050	6,387	43
$75,000-(+)	7,583	4,576	60.3
Bottom Quarile	22,824	1,680	7.36
Second Quartile	22,824	2,809	12.3
Third Quartile	22,824	5,457	23.9
Four Quartile	22,824	10,963	48
By Race			
Black	21,361	2,949	13.8
White	158,927	42,814	26.9

Table 2.2.1-1 Summary of Home Computer Ownership

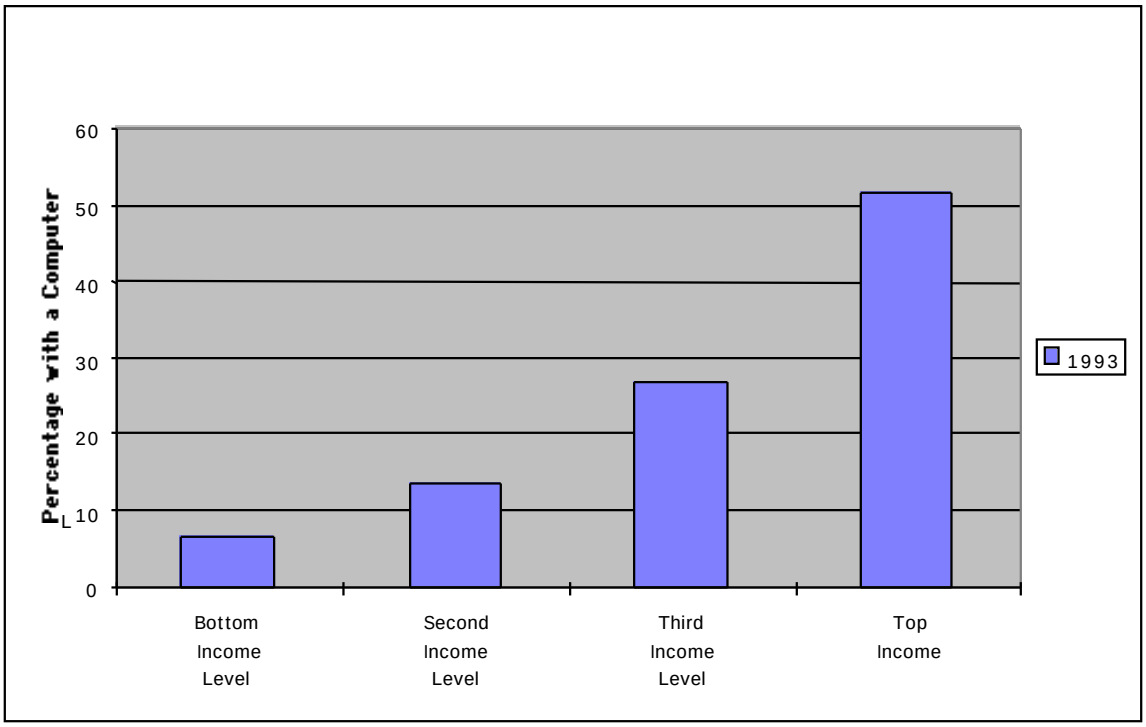

Fig 2.2.1-5 National Ownership of Home Computers by Income Level

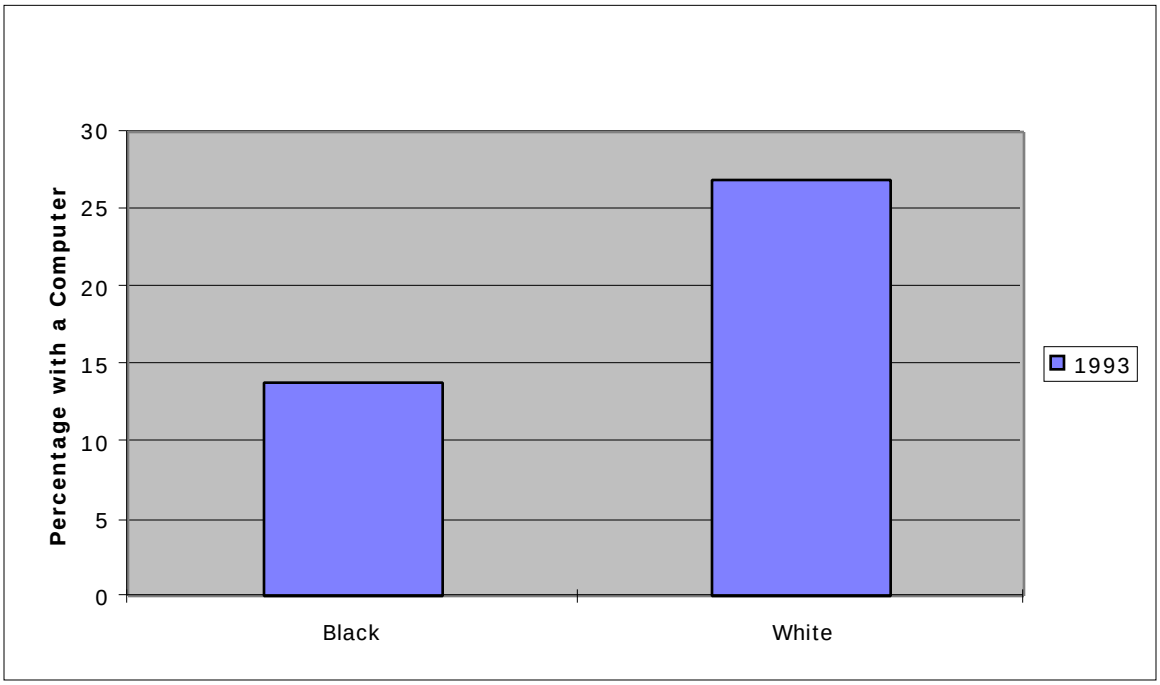

Fig 2.2.1-6 National Ownership of Home Computers by Race

In Figure 2.2.1-5, the difference in computer ownership between the top income level and the bottom income level is clearly very large. Nearly 50% of the individuals in the top income level reported owning a computer, while only about 6% of those individuals in the bottom income level have a computer at home. People in the top income level are nearly 9 times more likely to have a computer than those individuals in the bottom quartile. Racial inequalities, though not quite as extreme, still exist, (see Figure 2.2.1-6). Only 13% of black individuals have reported that they own home computers, while 35% of white individuals report owning home computers. These numbers were used in predicting home computer ownership in Allegheny county.

2.2.2 Socioeconomic and Racial Access in Allegheny County

The socioeconomic and racial make-up of Allegheny County is far from integrated. In most cases there seems to be a significant amount of segregation between upper and lower income levels and as well between races. In Figure 2.2.2-1, the map represents the percentage of residents in Allegheny County. Each dot is at the centroid of a block group. A block group is a selected geographical area that normalizes the census information, by creating groups of individuals of about the same size. The color of each dot is representative of the percent of people in Allegheny county that make up that block group, and each block group contains all the census data that was available from the 1990 census which can be accessed and evaluated with the GIS. In Figure 2.2.2-2, each dot represents the percent of black individuals that make up that block group. It is very clear that there are many areas that are made up of mostly black residents. This is important, since race matters.

In Figure 2.2.2-3, each dot represents the percentage of individuals in the lowest income level. It is also evident that the highest percentages of people in the lowest income level are also concentrated into a few small areas. In Figure 2.2.2-4, municipal libraries and branches within the city limits of the Carnegie Library are plotted to illustrate the penetration that the libraries have in these areas. Each library is circled with a white buffer. These buffers have a radius of 1.5 miles. This radius was chosen as a distance that a majority of the people in that area would walk to receive access. The final map, Figure 2.2.2-5, is a map that represents the predicted percentages of people in each block group that have home computers. The national data was used to calculate the number of each race that should have a computer, and the number of people in each income level that should have a computer, and the numbers were averaged for each block group.

Overall, access in Allegheny County, on the basis of race and income, was not as low as the national averages. Using the GIS to see approximately what percentage of individuals are covered by the libraries, it was found that approximately 65% of whites were covered and approximately 78% of blacks are covered, although, only approximately 68% of the people in the income level $0-$24,000 would have access to a computer under the EIN plan. It also has been predicted that only about 2% of the 32% without access have home computers. This means that with the EIN project in place, with full operation, approximately 81% of black residents would have access at home or through the libraries, along with about 70% of white residents. Also, looking at the lowest income level, approximately 70% will have access capabilities, either at home or through one of the libraries. You may better see the dramatic results that the library coverage has had by the following two graphs, Figures 2.2.2-6 and 2.2.2-7.

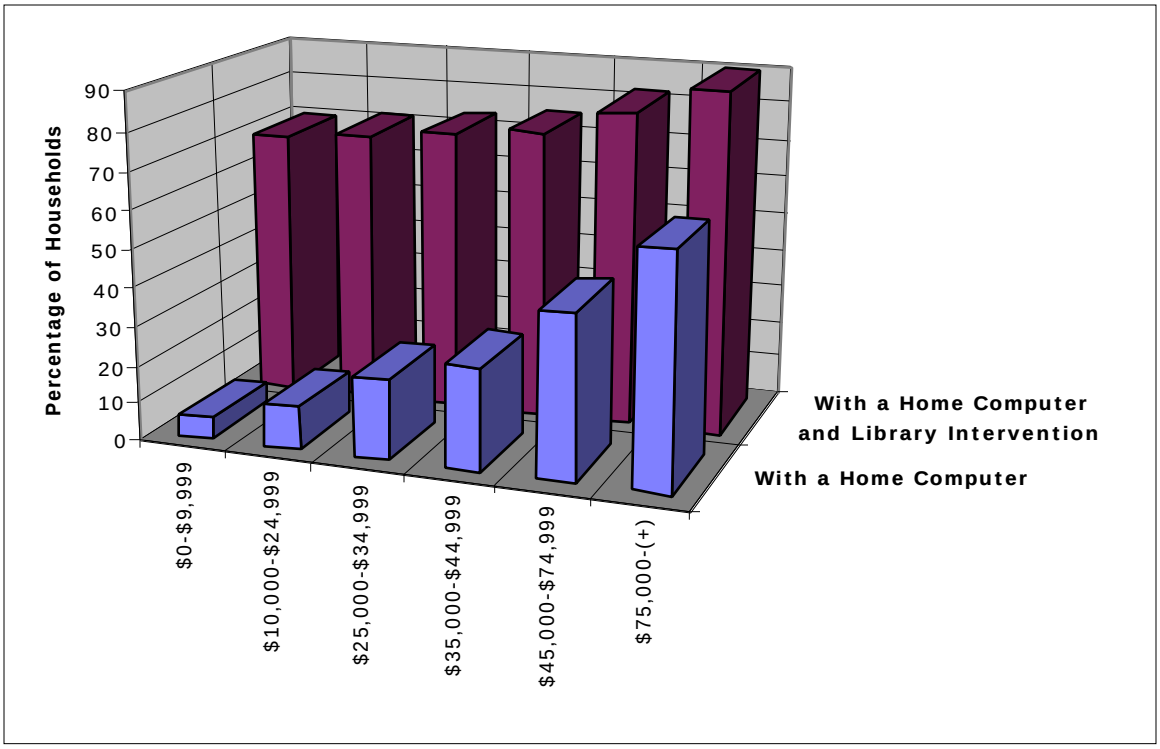

Fig 2.2.2-6 Households With a Home Computer or Covered by Libraries

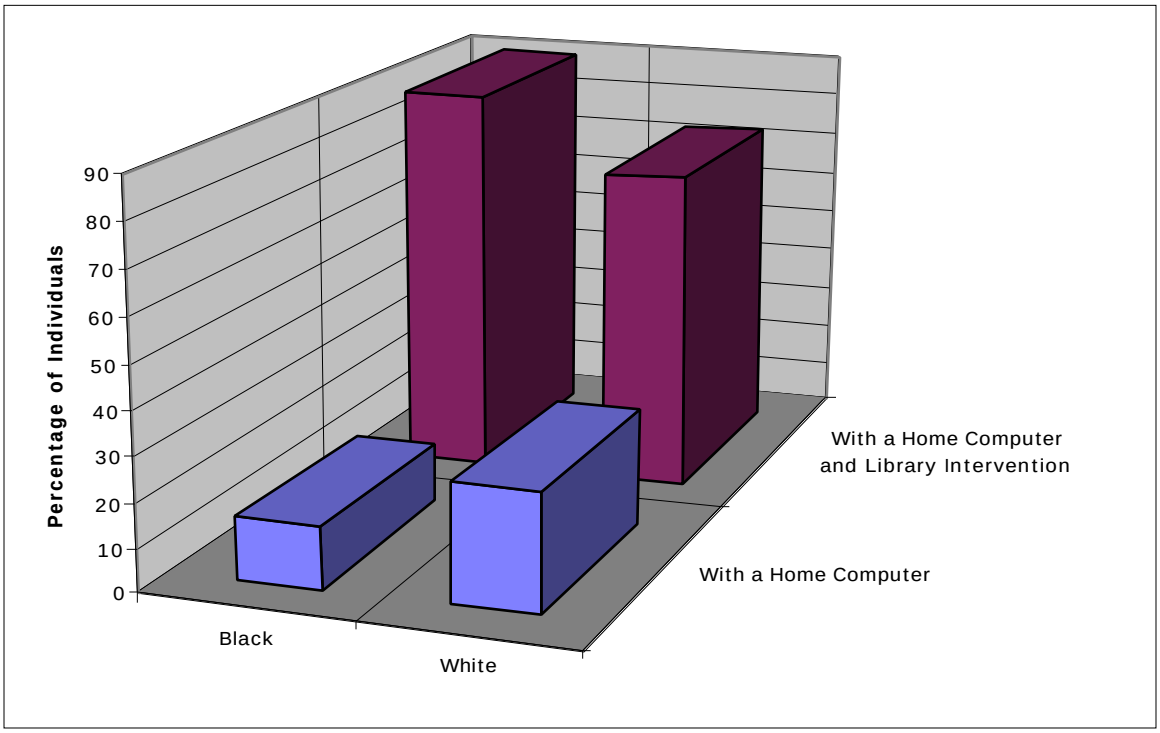

Fig 2.2.2-7 Individuals With a Home Computer or Covered by Libraries

These graphs show the significant potential that the libraries have to provide with the geographical coverage that they have to offer. However, this potiental may be limited by the number of computers they provide. Exploring this idea, the number of computers per person and per household in Allegheny County, were calculated. It was found that the predicted number of computers per 100 households was 23.14, and the predicted number of computers per 100 people was 9.43. The next calculation that was made was finding the number of computers that were outside the libraries buffers. Then using this number and adding the 168 computers that the libraries currently have online it was estimated that the libraries increased coverage from 23.14 computers per 100 households to 23.18, and from 9.43 computers per 100 people to 9.44. It soon became obvious that the library intervention was not quite as dramatic as first thought, and that some other sort of intervention was desirable.

2.3 Geographical Access in Allegheny County

If, in fact, intervention is necessary, what type will work best? From the last section, one can clearly see that lower income families and minorities are those who need help the most. As illustrated by the maps, the libraries participating in the Carnegie Library's EIN project are located throughout the county, but have a large density in and around these low income minority areas. It may seem that relatively little to no geographical access limitations exist; but under further inspection, even in these areas where libraries seem to be highly concentrated some limitations still exist, since not all libraries are participating in the EIN project, and those that will do not cover these areas completely. There also exists geographical limitations in rural areas, where some rural areas and municipalities are without libraries.

2.4 TAPs

2.4.1 What are TAPs?

People have contact with computers in so many varied settings and with such varied motivations that it is often difficult to draw generalizations about computer access. To help address this problem, a solid concept describing access across Allegheny County is necessary. The term Technology Access Point, or TAP, will be used throughout this report to describe any place where people have computer access. A TAP is a geographic location with no specifications other than its having a computer; a TAP can be a private residence, a school, a business, or a public place. Technology Access Points represent all of the many spots in Allegheny County where individuals interact with computers; it is the goal of this project is to give recommendations for the dispersal of TAPs to all residents in this area. Technology Access Points should be ubiquitous, user-friendly, and should raise the levels of computer awareness and understanding in the population. In an Allegheny County with universal access to computer technology, TAPs would be everywhere, in all parts of the region and throughout all well-visited locations. Furthermore, citizens would know where to find TAPs and how to use them. Ensuring equal and universal access means everyone can get "Information on TAP."

2.4.2 Current TAPs

The following are examples of TAPs (Technology Access Points) currently found in Allegheny County:

- Home
- Workplace
- School

- College/University
- Library
- Housing Project
- Retirement Home
- Copy Center
- Coffee Shop
- Public Computer Cluster
- Stand-Alone Kiosk Computer

The scope of this project will include descriptions of all of the above TAPs, the level of access they provide to Allegheny County residents, and their individual and aggregate contributions to the goal of ensuring equal access to information and computer technology.

2.5 Availability of Access through Observations of Current Access Points

The majority of public TAPs are currently located at schools (K-12) and at municipal libraries. Since TAPs at local libraries are readily available to a wide cross-section of people, it is worthwhile to attempt to delineate the extent of access within the local libraries of Allegheny County. Table 2.5-1 lists the number of computers at each of the Pittsburgh District Libraries. All of the information that is contained in the table was obtained through telephone conversations with individual representatives from each of the libraries. When reading the table, take note that the **Computers** column lists the total number of computers (excluding dummy terminals) at each of the libraries, the **Net** column displays the number of computers (out of the total) that are currently available for public access to the Internet, and the **Expected** column lists the number of additional computers

that each library expects to receive in the future. In addition, a question mark within the **Expected** column signifies that the library representative was not aware, at the time, of how many additional computers their library was expected to receive.

Library	Computers	Net	Expected	Library	Computers	Net	Expected
Avalon	0	0	0	Monroeville	3	1	?
Baldwin	3	1	?	Moon	1	1	6
Baldwin Twnshp	2	0	?	Mt. Lebanon	1	1	?
Beechwood	0	0	6	N. Versailles	1	1	?
Bellevue	1	at most 1	8	Northland	5 or 6	1	?
Bethel Park	14	at most 1		Oakmont	2	1	?
Braddock	4	?	7	O'Hara	2	1	?
Brentwood	2	1	?	Penn Hills	1	1	?
Bridgeville	4	1	?	Pleasant Hills	3	3	11
Castle Shannon	1	1	6	Plum Borough	0	0	6
Clairton	0	0	8	Richland	1	1	?
Coraopolis	1	0	?	Sewickley	2	1	?
Crafton	1	0	7	Shaler	8	1	?
Dormont	3	2	?	South Fayette	1	1	5
Edgewood	1	1	?	South Park	3	1	6
Glassport	0	0	6	Springdale	0	1	1
Greentree	0	0	?	Swissvale	1	1	5 or 6
Hampton	1	1	6	Torentum	1	1	11
Homestead	4	1	?	Upper Saint Clare	4	1	?
Jefferson	2	1	6	Western Allegheny	1	1	?
McKess Rocks	2	0	?	Whitehall	4	1	14
McKeesport	3	1	?	Wilkinsburg	1	1	?

Table 2.5-1 Computers within Pittsburgh District Libraries

Some initial observations from this data are that most of the libraries currently only have one computer that is connected to the Internet. As stated above, a number of the libraries were not able to give an exact, much less an approximate, date to signify when they are slated to receive additional computers. This makes it increasingly difficult to invent lasting recommendations based on the current data, because the data could change drastically within the next few months.

However, one thing is for certain, additional computers in each library will not erase the fact that a few municipalities still do not have their own library and thus require people to travel additional distances to obtain information from a library.

2.6 Current Access Providers

When assessing the current state of public computer access, the availability of access and who provides it must be addressed. This section, partitioned into two parts, will discuss current public and private sector providers in Allegheny County. Public providers are funded through charitable donations and government (local, state and federal) grants. They are open to the public, free of charge. Private providers, usually businesses, generate revenue through the charge of a usage fee or earn profit through private advertising.

2.6.1 Community Outreach Programs

The programs discussed in the following section are examples of the public programs available in Allegheny County. It is not a comprehensive report of all the community outreach programs in Allegheny County: there are numerous other technology access community outreach programs which will not be discussed. A comprehensive list of these programs can be found in the "Directory of Information Highway Projects in Western Pennsylvania" by Bill Stricklend.

Common Knowledge: Pittsburgh (CK:P)

Common Knowledge: Pittsburgh is a joint collaboration of the University of Pittsburgh, the Pittsburgh Public School System and the Pittsburgh Supercomputing Center whose goal is to support curricular activities and education reform through the use

of computer networking (Bearman 4). CK:P is being largely funded by a National Science Foundation (NSF) grant which is earmarked for the development and application of electronic school networking in urban areas. This program is located at selected Pittsburgh public schools who showed interest in sponsoring a CK:P site. There currently are 16 schools participating in CK:P. A complete list can be found in Appendix 4 . More detailed information can be found on CK:P's homepage at "http://info.ckp.edu/local.html."

Electronic Information Network (EIN)

The Electronic Information Network project aims at electronically connecting the 19 Carnegie Libraries of Pittsburgh with the 40 municipal public libraries in Allegheny County. It will provide public access to PC workstations, on-line catalog systems and dial-in remote access to library collections and global information networks (Bearman 4). As stated by Bearman, "Goals for this project include equitable access to electronic databases, connectivity to the Internet, facilitating and enhancing resource sharing of library materials, providing interconnections among automated systems, and providing continuous training in the use of the Internet and other share systems and services." (Bearman 5) The EIN project intends to wire and to provide equipment, training and expertise to any Allegheny public library interested in joining the program. By joining the program, individual municipal libraries agree to have EIN computers installed in their libraries, to become integrated into the Allegheny County network of on-line libraries, and to reap the benefits of having free computer access for their patrons.

Three Rivers Free-Net (TRFN)

The Three Rivers Free-Net is a community computer-based network which is committed to providing free and open access to information to the population of Allegheny

County. This project is a joint venture between the Carnegie Library of Pittsburgh and the University of Pittsburgh School of Library and Information Science. The Commonwealth Libraries of Pennsylvania initially funded the program through a Library Services and Construction Act grant. Currently, the program is primarily funded through the Commission on the Future of Libraries in Allegheny County and the Allegheny Regional Asset District. TRFN also has a website at "http://trfn.pgh.pa.us" and is integrally linked with the EIN project.

Knowledge Connection

A Knowledge Connection, as defined by the organization, is " a mini library with computer capabilities located in a public housing community" (Lucchino[1] 1). This program, operated by the Commission on the Future of Libraries in Allegheny County and the Allegheny Housing Authority, provides free computer access to public housing communities. There are currently five sites, with another planned for late summer, 1996. These educational, technology community centers offer children a haven to do homework, as well as to research, learn and strengthen their computers skills. They also offer adults the opportunity to create a resume, search for employment, study for their high school equivalency exams and a myriad of other computer related activities. These facilities, usually open from noon to 8 PM, are staffed by full time supervisors who are responsible for the smooth operation of all aspects of these community centers. Most sites are equipped with anywhere from three to five computers, depending on the size of the community being serviced. The Knowledge Connection program is being spearheaded by Ms. Mary Buckley under the supervision of the County Librarian Ms. Marilyn Jenkins. A complete listing of the five sites can be found in Appendix 4.

Hill House Community Access Network

The Hill House Community Access Network is a multi-purpose social agency which provides computer access and training for the Hill District of Pittsburgh, a predominantly black, low-income region of the City. The program's mission (Hill House Home Page WWW) is to:

- help meet the personal and professional information needs of people;
- foster communication among individuals and the institutions that serve them;
- support community groups in their efforts at professional development, outreach and community service;
- enhance opportunities for sustainable, community based economic development; and,
- create a favorable environment for business and employment growth.

Hill House hopes that the Community Access Network will open doors of opportunity, knowledge and information for the Hill District residents. The Hill House Association homepage on the Internet is located at "http://www.hillhouse.ckp.edu/."

Seniors On-Line

Seniors On-Line is "a program designed to enhance access to library services, electronic databases and computer technology to senior citizens. Computer workstations with state-of -the-art equipment, computer classes and 1-1 tutoring is provided to older adults at targeted senior citizen centers" (Lucchino[2] 1). There are currently two sites operating under the guidance and supervision of the Commission on the Future of Libraries

in Allegheny County. The two site are the Turtle Creek Senior Citizens Center and Greenfield Senior Citizens Center, with a third opening in the fall of 1996.

2.6.2 Private Initiatives

Computer usage occurs primarily in private settings, such as in the workplace or at home. These settings will not be addressed as private initiatives. The following discussion will focus on private sites which offer the public access to computer technology.

Kinkos

Kinkos Copy Center is the only national chain that leases computer time to the public. They have rented computers to patrons for over 4 years and have recently linked some of their computers to the Internet. Their price structure is:

- $0.16 per minute or $10 per hour
- $0.60 per page printed

Kinkos offers a large variety of applications and the staff assistants are available to assist patrons. There are 10 Kinkos locations in the Greater Pittsburgh area, all of whom offer computer rental time to their patrons.

"Internet" cafes

Internet cafes, also known as cybercafes, have recently come into existence with the popularity of the Internet. Although, there are no cybercafes in Allegheny County, it is believed that cybercafes will be appear in this area in the near future. These cafes cater to technology oriented people and are usually located in densely populated, urban areas. They provide their clientele with drinks, desserts, ambiance and computers access. The

organization and ambiance of cybercafes differ drastically from one to another: some cybercafes charge per drink while others charge for usage time. Refer to section 7.2.2 for pricing information.

2.7 Findings and Recommendations

Access has been defined as having a awareness of computer resources and the ability to use them. A TAP is, therefore, a geographical location which provides public computer access. Through GIS modeling and the CPS data, it was determined that the current state of computer access in Allegheny County is insufficient and that inequities to computer access exist along economic, geographical and racial lines.

There are numerous community outreach programs which attempt to address this issue. In Allegheny County, there exist many more public computer access providers than to private providers. Private providers are less common, due to the proliferation of personal computers in the workplace and homes. The public providers tend to cater specific groups and include CK:P, Knowledge Connection and Seniors On-Line. This is done in an attempt to bridge the gap between computer access have's and have-not's. These programs are struggling to keep pace with rapidly changing technology and tight budget constraints. To remedy the inadequacies in current access, a comprehensive plan to increase the number of TAPs and improve existing TAP sites must be adopted.

3. Assessment of Users' Wants and Needs

In addition to the two components of access discussed in chapter two, awareness and ability, it is important to also discuss a third dimension of access: actual demand. The public's actual demand, or wants and needs, form a necessary component to making the availability of public TAPs much more beneficial to the residents of Allegheny County.

Providing TAPs for the public is an impressive beginning to ensuring equal access to information and computer technology in Allegheny County. But too often, policies are adopted with the purpose of bettering the general public's lives and environment without first consulting the public to determine what policies they may find useful and beneficial. Therefore, an integral part of this proposal to ensure equal access to information and computer technology was the administration of a survey to determine the public's opinion on matters concerning technological access.

The survey provides a general overview of the public's computer literacy and familiarity with computers, in order to determine the starting point for increased access, as well as the public's desires for various software applications to determine what applications will be the most useful to the public. The survey was designed to be administered via telephone interviews to randomly selected residents of Allegheny County. The sample space was selected to ensure that the racial make-up of the survey respondents successfully approximated that of Allegheny County. The proposals in this chapter are based on the results from the survey discussed in more detail in Appendix A1.

3.1 General Familiarity with Computers

Based on the completed survey responses, Figure 3.3-1 shows that 47% of those surveyed reported never having even used a computer. This complete lack of computer usage in the 47% leads us to infer that a significant portion of the public probably lacks even a general familiarity with computers and software applications

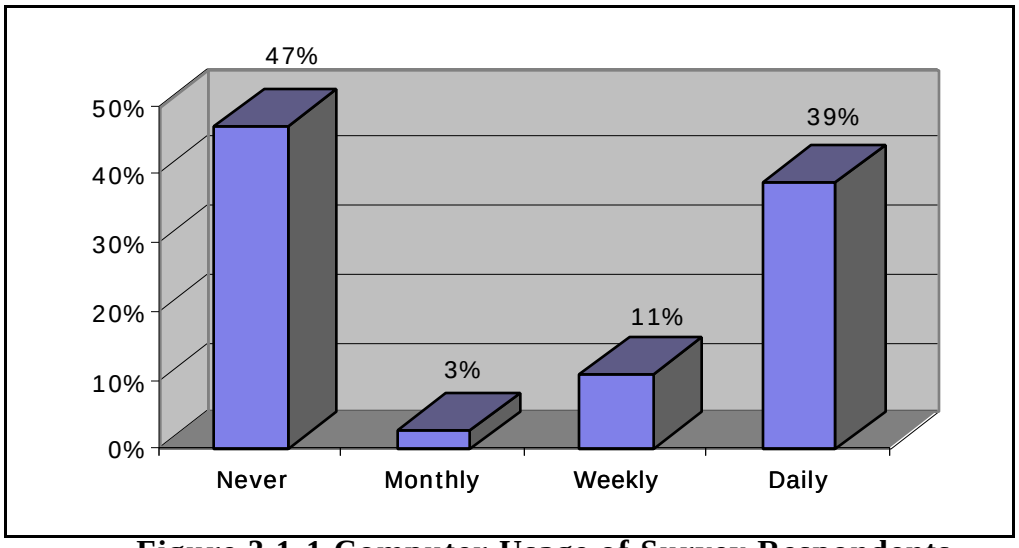

Figure 3.1-1 Computer Usage of Survey Respondents

In today's world, where familiarity with technology is becoming imperative to succeed in the workforce and to facilitate day-to-day communications, at least a basic knowledge of computers is a necessity. Based on survey results, it can be inferred that a significant portion of Allegheny County residents do not have even a basic knowledge of computers, and are, therefore, being put at a disadvantage in their career search and in their future communications due to the lack of accessible hardware and software. Establishing numerous TAPs will provide Allegheny County residents with the basic access they need to become familiar with computers as an initial step towards moving forward in today's highly technical environment.

3.2 Computer Literacy

Computer literacy will be measured here, in general terms, by evaluating the respondent's basic awareness of various software applications, in combination with a measure of their aforementioned familiarity with computers.

Basic computer awareness, is quite common today due to the extensive advertising of computers on television, radio, and in newspapers and magazines. Therefore, it was not surprising to discover that the sample indicated that the residents of Allegheny County have a rather high level of computer awareness. The public's level of awareness was determined through a variety of survey questions concerning general knowledge of the Internet and other software applications. Figure 3.2-1 shows the graphical representation of the percentage of survey respondents who were aware of the various software applications listed, (see Figure 3.2-1).

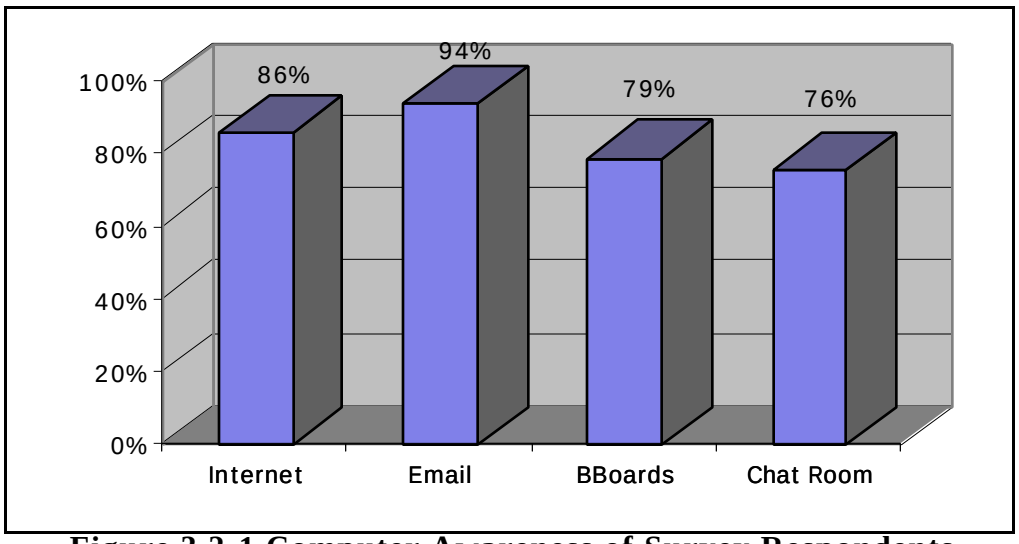

Figure 3.2-1 Computer Awareness of Survey Respondents

As can be seen in Figure 3.2-1, the public was fully aware of many of these applications, including email, chat rooms, bboards, and the Internet. But, as suspected, further survey comments indicated that their awareness was only due to hearing of these concepts on TV or reading about them in magazines, not from actual hands-on experience with these applications. This high level of "hands-off" awareness combined with the rather low level of computer familiarity noted in Section 3.1, leads to the assumption that the public's level of computer literacy is fairly low.

Also, the survey indicated that, for the most part, those with less than $50,000 in household income were less aware of computer applications than those with greater incomes. This difference is due, in part, to the lack of home computer access in those homes with less than $50,000 household income, as seen below in Figure 3.2-2.

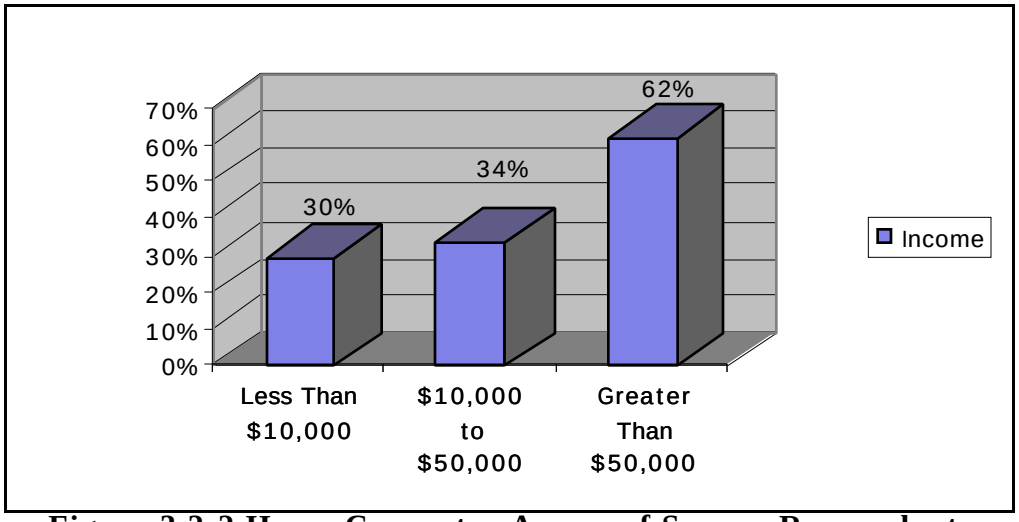

Figure 3.2-2 Home Computer Access of Survey Respondents

Additionally, as one might suspect, the applications that the public were most aware of were also those they reported a desire to access. The survey shows that the public is interested in these applications; therefore, if access is provided, the public will surely utilize these resources, which will help to bring Allegheny County and its residents up to par with society's technological advancements.

Based on the general lack of computer familiarity, coupled with the strong level of computer awareness, we can conclude that the distribution of TAPs in Allegheny County should be wide-spread since so many people need to be reached. As well, the software applications provided, as discussed in Section 3.3, should be plentiful and diverse, so as to supply the public with a sufficient range of areas to explore and to utilize on a regular basis.

3.3 Software Applications

Although access to the Internet will provide the residents of Allegheny County with a plethora of information that would not normally be readily accessible to the public, there are also other software applications that can be quite beneficial. These applications include, but are not limited to email, word processing, and travel information.

As noted graphically below, approximately 39% of those surveyed stated that they would be interested in using email on a public computer, 35% were interested in having access to word processing programs, and 50% desired access to computerized travel services, as well as other interests displayed in the following graph, Figure 3.3-1.

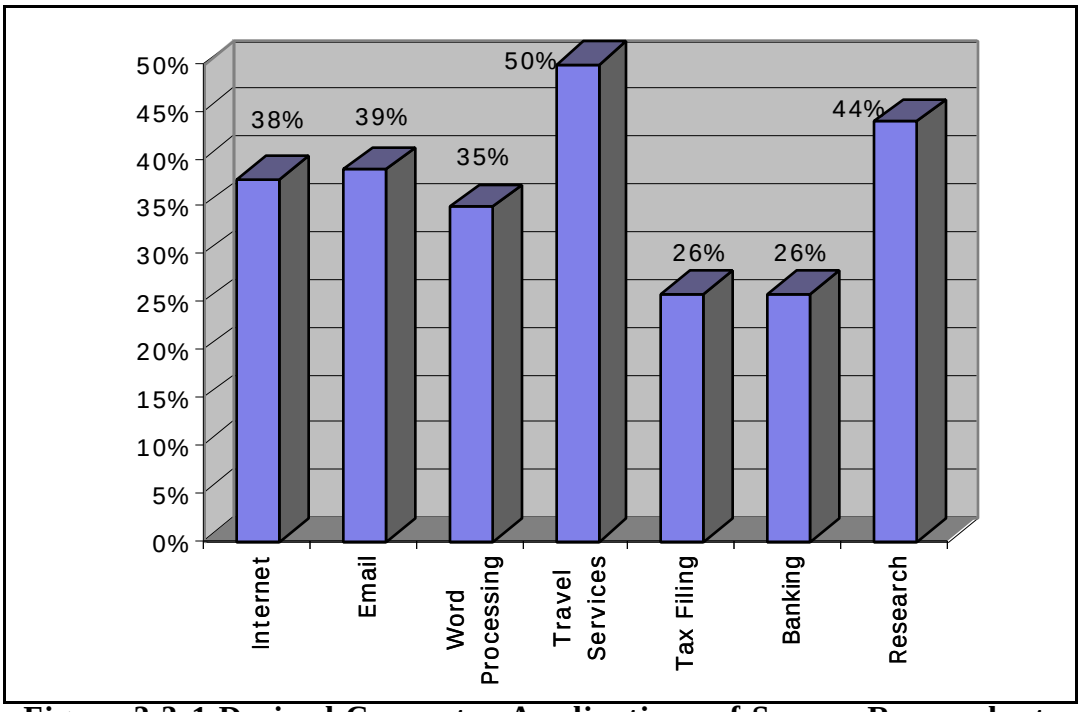

Figure 3.3-1 Desired Computer Applications of Survey Respondents

Email is quickly becoming a preferred method of communication for the future. It is on the same route that the now common fax machine followed: beginning as a luxury used only by a few, and then turning into a widely-used means of communication. To provide mail access is to open the doors to the future for the residents of Allegheny County.

Other software such as word processing programs, travel services, tax filing, and banking were also rather widely desired. Such software is not necessarily being touted as the wave of the future, but can add a great deal of convenience to the public's life. Familiarity with basic computer usage such as word processing and spreadsheets can greatly enhance skills that are vital in today's workplace. These valuable and highly desired skill builders can be provided with the simple addition of new software to already existing hardware, as well as to the newly positioned TAPs.

3.4 Findings and Recommendations

In conclusion, it is apparent that the most residents of Allegheny County have very little hands-on familiarity with computers coupled with a quite strong awareness of computers and their applications obtained from various media sources. If Allegheny County is to remain in step with the technological advances of today's world, it must capitalize on the awareness of the residents by providing them with access to computer hardware and software. This access will allow all residents, particularly those who are not fortunate enough to have home computers, to improve on their technological skills through direct hands-on use. The public has indicated a strong desire for computer access; thus, providing such access will enable the residents to follow an inner desire for learning that will not only be self-beneficial, but also beneficial to Allegheny County and the Greater Pittsburgh Area as a whole.

4. Technology for Increasing Access in Allegheny County

4.1 Introduction

There are two models that can be used to supplement existing TAPs and to address the wants and needs of the user. These models are the kiosk and the computer cluster. This chapter describes these two models and how they may help to alleviate the lack of computer access and affordability.

First the two models are defined. Then, a description of the hardware required for each model follows. The wiring and infrastructure concerns are addressed next and are followed by a description of possible additions to a basic TAP. Automated teller machines and other case studies are then examined in order to investigate parallel to this project. Finally, the chapter concludes with findings and recommendations.

4.2 Alternative TAPs

Upon examining the GIS data in Chapter 2, one can clearly see that there are many areas in Allegheny county that lack access to TAPs. There is a need for an alternative form of a TAP to address the areas that do not have schools, libraries, or other TAP locations nearby. There are a number of different forms that of alternative TAPs, but this report will be primarily concerned with the options of the kiosk and the computer cluster.

This report looks at the kiosk and computer cluster forms because each serve access needs in different ways. Kiosks are versatile because of their ease of placement and built in security measures, and serve the rapid information needs of people on the go. On the other

hand, clusters can be used as a mass access point serving large numbers of people at once, for longer periods of times. Both forms of TAPs can be easily placed in areas that lack conventional TAPs.

4.2.1 Kiosks

The computer kiosk has received much attention recently, and has been used to give people rapid access to information. Kiosks are computers enclosed in a secure casing that provide information dispersal services such as advertising, video conferencing, and various Internet tools. Many kiosks found today use the existing communications infrastructure to connect to the Internet. There are obvious concerns regarding security and maintenance, and there are over two dozen vendors selling various enclosures designed to protect the valuable equipment inside. The advantages of an enclosed casing will be freedom of placement: a kiosk will have the ability to be placed in just about any location, inside or out. This kind of flexibility will enable people to have access in locations where there is none.

There is one main quality that kiosks have that make them a prime example of an alternative TAP. That is their ability to attract people and to distribute information easily. There are many people who are fearful of computers. One cannot wait for people to come to the computers, so computers must be taken to the people. With a simple touchscreen interface and a user friendly operating system, kiosks can be designed to accommodate just about anyone.

Kiosks are not the final answer to universal access. Truly universal access will come from individual ownership, just as it has with the telephone. But like the telephone, there needs to be an intermediary step to help the public rise to a level of preparedness so

proliferation can begin. Kiosks will fill the immediate need of access to informational technology while helping to raise the awareness level and computer literacy of the general populace.

4.2.2 Computer Clusters

Public computer clusters will be access points designed to be placed in dense commercial urban developments such as malls, airports, or coffee shops. The setup of a computer cluster would be a number of computers with chairs so patrons may sit comfortably. These clusters alleviate the costs of enclosures for the computers and other security concerns, but will have higher upkeep costs due to routine maintenance and the need for full-time user consultants.

The services offered by computer clusters are very broad. Possible applications are: word processing, spreadsheets, tax filing, graphic design, and practically anything one may in a home computer. In addition to the self-contained applications, computer clusters would provide Internet access by using communication channels and Internet service providers to offer electronic mail, World Wide Web access, and other network-based applications.

The reasons for having these clusters are numerous. The high traffic locations where the clusters are to be installed will create wide exposure and solve some of the problems of geographic universal access. Many of the time-consuming elements of actually owning a computer are alleviated when one can use a public computer cluster, especially when trained consultants are on call. Lastly, the availability of free, public computer clusters will help the socio-economically disadvantaged achieve technical equality.

4.2.3 Construction of Alternative TAPs

There can be massive overhead regarding the design and implementation of an alternative TAP. The number of possible hardware configurations is enormous. The following section will outline some of the hardware requirements of both kiosks and clusters, and also discuss some of the vendors of kiosks.

4.3 Hardware

Having seen what a kiosk and a computer cluster consist of, there is a need to see what is currently available. This section looks at what is being offered by current vendors in the market. It also examines if what is available matches the needs of the TAP network. Kiosks are examined first with computer clusters following.

4.3.1 Kiosks

Fifteen kiosk vendors were contacted and asked questions on what could be provided in a typical kiosk. Eight vendors responded with the following information on wiring, hardware, and user interfaces.

All ranges of Internet access to kiosks are available with the most common way being through a 28.8 Kbps modem or ISDN, (see Section 4.4 for a full description of the types of Internet connections).

Since kiosks are meant to provide access to the Internet at more remote locations, the vendors were asked if they were able to institute a web browsing feature in their kiosks.

Seven of the eight vendors responded that they already had or were working on a web browsing feature for their kiosks. All vendors that were able to institute a web browsing feature also indicated that they were also able to incorporate a site blocking feature which would allow users to filter Internet resources.

Also, a higher end system will be needed to run in the kiosks. All of those companies responding indicated that their systems were running on Macintosh or PC architecture with the Macintoshes being Power Macs and the PCs being mostly Pentium based.

The user interface is also a major concern, since it is needed to allow a comfortable and easy way for users to input their commands, while maintaining a level of security in the system. Most of the vendors accomplish this through the use of touch screens, with some adding membrane keyboards, and a few adding traditional keyboards. The kiosks need to be protected from physical and software tampering. Most vendors achieve this through the use of alarm systems, passwords, and limited access.

Kiosks are best suited to stand alone. The typical size of a kiosk would be approximately three feet wide and three feet deep while standing four to five feet tall. The cabinets for the kiosks can be custom made as can the general make-up.

All vendors expressed a willingness to custom make a kiosk to meet the particular needs of the client. From cabinets to software applications, all were willing to listen to the client's needs and work out a reasonable solution. In addition, all vendors also conclusively stated that their units were easily maintained and upgradable.

The basic costs of current kiosks vary from approximately $5500 to $45,000 with the average price being nearly $13,000. All vendors indicated that the cost of each unit will decrease if multiple units were bought. The Macintosh-based kiosks cost less but have less power than the PC-based kiosks. A more exact cost function is described in Section 7.1.1.

4.3.2 Computer Clusters

The cluster locations would consist of multiple computers with the standard user interface of a mouse and a keyboard. Someone would be required to staff the cluster to answer questions, handle maintenance, and manage security. Such a location would allow users more time to accomplish their tasks than would a kiosk.

The two basic types of systems that would be useful in a cluster situation are Macintosh and PC systems. The system consists of a keyboard, mouse, as well as a RAM and a hard disk drive. Both types of system have a low end cost of approximately $1200 with an upper end cost of $4000. The average cost for both systems lie in the $1500-$2000 range.

Costs would also vary depending on the applications of the computers. The computers can be stripped down to solely provide Internet access. Smaller hard drives can be used in this case, and this would save nearly $100 a machine. Also, if the computers were to be used only for email services, smaller monitors can be used to save money.

If the computers are to be used for multiple applications such as electronic shopping and data processing, they must remain fully loaded. Certain features can be sacrificed for others, but that is dependent on the needs of the client. The systems can be purchased as an entire system, which eliminates the worry of additional costs such as mice and

keyboards, or the systems can be purchased in pieces, which saves a little money and allows for more customization of the computers.

Most manufacturers are heading toward the Pentium PC type of architecture. Macintoshes offer some benefits with their "user friendly" environments, but PCs are heading in that direction with new operating systems such as Windows 95. PCs also offer a wider range of power and applications which will make computer clusters an integral part of the TAP network.

4.4 Information Infrastructure

The Internet is an intangible "Cyberspace", a network of millions of computers connected to each other, and all sharing information. Most commonly used for communications (such as electronic mail) and information sharing (via the World Wide Web), the Internet is the largest repository of knowledge ever devised. On the Internet, all who have access are truly equal to one another; therefore, ensuring that residents of Allegheny County have access to the Internet is the one of the most important tasks within the scope of this project. However, in order for any computer to reach the Internet, an Internet connection must first be established. There are several ways to make this connection, all of which currently depend on renting service from the local or long distance telephone companies. An alternative system is also being developed which will make use of the network maintained by cable television providers.

Three common forms of Internet connections will be evaluated for their value to public TAPs in Allegheny County. These options are standard telephone modems, ISDN, and T1 connections; for contrast, the new cable television modems will also be considered. The criteria for evaluation will be the speed of the connection, the equipment and

installation costs, and the monthly usage rates. Based on this evaluation, the most viable alternative for both the public cluster and stand-alone kiosk models of public TAPs will be determined.

4.4.1 Modems

The basic telephone modem, or modulator/demodulator, is the predominant form of Internet connectivity in Allegheny County today. However, as demands on the Internet increase and the methods of communication become more complex, modems are increasingly reaching a state of obsolescence. The benefits of modems are: They are simple and relatively inexpensive. Modems hook directly into the "Plain Old Telephone System" network without the need for special installation or additional monthly charges. Modems run in the price range of $150-$300, and monthly rates are identical to standard local and long distance phone calls. At a long-distance rate estimate of ten cents a minute, the cost of downloading a 1 Mb file is about six cents. Although affordable to purchase, modems unfortunately lack speed. The fastest modems on the market run at 28.8 Kbps, which is adequate for some Internet use, but not for the graphical interface of the World Wide Web; in this increasingly important information medium, modems are discouragingly slow. Frustration with technology is one of the biggest hindrances to building confidence with computers; for that reason, modems are not recommended for either the public cluster or stand-alone kiosk models of public TAPs.

4.4.2 ISDN

ISDN, or Integrated Services Digital Network, is an all-digital communications line that enables voice, data, video, and graphics to be sent over a single wire over two 64 Kbps channels, which can be combined into one 128 Kbps channel (Bell Atlantic[2]).

ISDN was made available in Allegheny County on August 1, 1995, and has shown progress within the business community as the new standard for rapid data transfer. ISDN lines must be installed from a Bell Atlantic local exchange office, but under the “ISDN Anywhere” Program, the installation price is identical for all locations, $169.75 (Bell Atlantic[1]). An ISDN Adapter is also required for computer hook-up, which Motorola currently sells for $300. ISDN connections are $19.50 per month plus a data transfer charge of four cents per minute on weekdays, two cents on weekends (Bell Atlantic[1]). With fast enough equipment, the time actually spent downloading information from the network will be a fraction of the time spent on the computer; a reasonable estimate of standard day-to-day transfer would be five hours, or approximately 281 megabytes of information flowing into the computer. At an estimated usage rate of five hours per day for a public computer, the monthly cost would come to $319.50. ISDN can offer speeds fast enough to handle most Internet traffic and is relatively affordable; for single public computers such as the stand-alone kiosk model discussed in Section 4.2.2, ISDN is the best of the available options for providing Internet connectivity.

4.4.3 T1

Currently the fastest link available for most home and business use is a T1 connection. T1 is a fully fiber optic transmission medium that multiplexes twenty-four individual signals together and provides extensive connectivity in the local "Baby Bell" phone system today. Each of the twenty-four signals operates at 64 Kbps for a combined speed of 1.536 Mbps. Like ISDN, T1 lines must be direct connections to one of Bell Atlantic’s local exchange offices; installation typically is at least $200 and necessary connecting equipment currently is priced at $2395 (Motorola Information Systems Group). The monthly connection is also somewhat more expensive than either of the two types of connections above. Rates are calculated by the distance between the user and the local

exchange office; for a five-mile connection, unlimited usage would be $572.50 for one month. However, Bell Atlantic's Small Business Services Division will lower monthly rates if a connection is guaranteed for a certain number of years. For instance, a guaranteed two-year connection has monthly rates of $528.75, a savings of $43.75 per month. A seven-year guarantee lowers rates to $405.00, a savings of $167.50 (Bell Atlantic[3]). In addition to the monthly leased line charge, there is also an additional fee for connecting to the Internet through an Internet Service Provider (ISP). Netcom, one of the major ISPs in the U.S., charges $1000 per month for connecting a T1 link to the Internet. Though T1 has great speed, its high price is unsuitable for a single computer TAP. But because each T1 line is made up of twenty-four 64 Kbps signals, it is ideal for public cluster TAPs; a single connection could be made to serve an entire cluster at considerable per unit savings.

4.4.4 Cable Modems

Currently undergoing very successful trial tests in communities such as Palo Alto, California, and Elmira, New York is the emerging technology of Internet access via cable television. The primary cable company in Allegheny County, Tele-Communications, Inc. (TCI) has begun work on converting their existing coaxial cable network into a data-transfer alternate to the telephone system. This project, known as TCI @Home, is still in development but when made available to the public would present great new opportunities for home Internet connectivity, as well as for public TAPs (Hafner 47). The monthly rate for @Home would be approximately $45 for unlimited access time, and connections would be made with Ethernet 10BaseT connections similar to those in use in local area networks (LANs) today (unknown[2]). The cost for a "cable modem" is currently around $400, but the price is expected to fall sharply once the product becomes more widely available (Hafner 47).

Due to the information delivery nature of the cable TV system, the speed of transfer in the cable network is much faster from the Internet to the user than it is from the user to the Internet: The download speed of a cable modem could be as high as 36 Mbps (1250 times faster than a standard telephone modem), and the upload speed could reach 10 Mbps (unknown[2]). In order to provide Internet connectivity from the same wire that brings cable television, TCI is in the process of rebuilding its entire coaxial cable network with a hybrid fiber-coax (HFC) network to allow two-way communication. By the year 2000, cable companies across the country expect to have 6.9 million homes connected with this new capability (Hafner 47). Once TCI @Home is completed, it will present Allegheny County with a viable and cost-effective method of creating widespread and affordable Internet access.

Connection	Speed	Equipment/ Installation	Usage Rates	Comments
Modem	28.8Kbps	$150	$.10/min	Very slow
ISDN	128Kbps (64Kbps x2)	$469.75	$.04/min weekdays $.02/min weekends	Recommended for stand-alone kiosks
T1	1.544 Mbps (64Kbps x24)	>$2600	$1572.50/month	24 signals in one; good for public clusters
Cable Modem	36 Mbps (10 Mbps upstream)	$400	$45/month	Not yet available but the method of choice in the future

Table 4.4.4-1 Summary of the Information Infrastructure Choices

4.5 Possible Features

Besides the basic features of a cluster computer or kiosk model, there may be a need or desire for some additional features. These features can be a part of the original alternative TAP models, included in subsequent versions of these models, or, in some cases, can be added later to these TAPs as well as to current TAPs. The features described

in this section are card readers, visually impaired access, speech recognition, and printers. Again, none of these options are essential to the basic computer cluster or kiosk, but one or more of them may be useful depending on the provider's goals or requirements.

4.5.1 Card Readers

Several kiosks available today provide the option of a card reader. This device reads from and writes to a small plastic card containing, in most cases, either a magnetic stripe or an integrated circuit chip. These cards have an abundance of applications, the most common being credit cards and ATM cards. They are used primarily to store information deemed by the provider of the card to be necessary or useful in the provision of the service to the customer. Information pertaining to user identification or service fees, among other things, may be very useful in the offering of TAP services. There are basically two considerations to be aware of when deciding what type of card to use: the utility or purpose of the card and the data storage format of the card.

Card Utility

The type of card used may be determined by what information needs to be stored or retrieved from the card. For use at a TAP, the card will most likely contain identification and other user-dependent information.

If necessary, the cards can be used to provide a method of payment for TAP services not free to the public. There are three classes of cards available today that may be of use in charging fees for TAP services: prepaid cards, debit cards, and charge cards. Prepaid cards allow the user to pay for a set amount of, or unlimited, access before using the services. Prepaid smart cards can keep track of the time usage of each session and

deduct the corresponding fee directly from the card. Debit cards are similar to prepaid cards in that fees can be deducted from the card or possibly a bank account, but these cards have no particular prepaid limit, just the current amount on the card or in the account, which can be added to by the user. Finally, a charge card may be used to allow a user to accumulate a balance over a specified period of time and pay off that balance in full at the end of that time period.

Other applications of the cards might be:

- maintaining user security by providing an extra layer of protection for user accounts
- maintaining system security through user identification
- limiting access to specific users such as children
- application usage and time consumption statistics that can be used to improve services
- providing on-line services requiring user identification, such as electronic banking and bill payment, Internet shopping, or checking out library books (at library TAPs)

Data Storage Format

The most common format for storing data on cards today is a readable magnetic stripe. They have a variety of uses such as credit cards, debit cards, automated-teller cards, driver's licenses, workplace identification cards, and health insurance cards (unknown[1] D-11). Only a few lines of type can be encoded on the magnetic tape, but they are relatively inexpensive, costing between $0.50 and $1.50 apiece (Bair D-11). They are, however, vulnerable to loss of data due to scratches or close proximity to devices with magnetic components (unknown[1] D-11).

The "smart" card, invented by Roland Moreno in 1975 (Buckler), can be read and written and contains, in most cases, a silicon microchip on it's face (A card with a read/write magnetic stripe is also sometimes considered a smart card). The typical smart card can hold three to four pages of type but is generally more expensive than the magnetic-stripe card, costing at least $1.50 each and in some cases as much as $10 each. (Bair D-11) Although not a recently conceived technology, the smart card has been slow to catch on in the U.S. In 1992, only about one million were in use here while there were 114 million in use in Europe for such varied applications as paying highway tolls and unscrambling satellite TV signals (unknown[1]). However, according to a recent study, their acceptance is growing. The study reports that "40% of consumers would prefer to use smart card technology for everyday purchases, as opposed to using cash," and that "almost two-thirds of the respondents saw 'smart cards' as a convenient option for carrying important personal information, like medical and insurance-related data" (Woods).

The final storage format option is the fairly new optical card. These cards can hold enormous amounts of information but are still relatively expensive, about $4 each, as is the laser equipment needed to read them (Bair D-11).

Card readers, as discussed earlier, can provide a multitude of services for both the provider and users of TAPs. They are therefore a recommended TAP feature. Smart cards are recommended, unless the amount of information to be stored is minimal; however, it is further suggested by this study that this information be more than just user identification, allowing for more efficient and useful TAP services.

If service fees are necessary, prepaid smart cards in various denominations are probably the best choice. Debit cards can provide the same usefulness with added

flexibility, but with this flexibility comes additional complexity and likely higher costs. Charge cards are not recommended due to the monetary risks involved, since no one could be denied a card based on income if equal access is desired and thus retrieving unpaid charge amounts could be difficult.

4.5.2 Vision Impaired Access

The issue of handicapped access to TAPs needs to be addressed. One plan is currently being implemented at the new San Francisco Public Library. This plan involves the use of large visuals and voice output to help the vision impaired.

The large visuals consist of text printed in a larger font. In some cases a larger monitor may be needed. This will only be a factor if there is a need to put large amounts of information on a single screen. It is unlikely that a monitor of greater than 20 inches will be needed since most programs can format based on font size.

Voice output is already commercially available in limited quantities. Sound bits can easily be stored and played back when needed. This will be more easily accomplished if a limited number of utilities are available because the computer then has a limited vocabulary set to work with.

There is another option rather than storing sound files and playing them back when needed. The system can be configured to handle a large vocabulary set. To implement such a system will be expensive in terms of memory required because the computer must be able to read and pronounce a given word. This feature needs the extra memory to process all of the possible pronunciations of a word.

There is not much extra hardware needed to implement this feature. The press of a button on the keyboard can start up the interface, or the machine can already be configured for handicapped access. Larger monitors are a luxury rather than a necessity. The main cost increase comes from the extra memory needed.

Still, the cost of such a plan does not greatly increase the overall cost of the TAP network. A few machines can be ideally spaced throughout the network. This will allow access to the visually impaired and bring the TAP network one step closer to universal access.

4.5.3 Speech Input

The next step in handicapped access is voice recognition technology. Voice recognition is ideal for those who could not reach or comfortably use the standard keyboard or touch screen interface. Although this technology is not commercially available, research is bringing this closer to a reality. An example of a typical interface is a microphone into which users voice their commands. Voice recognition software can be used to allow the user to select items from menus and even to access WWW addresses.

Current interfaces require vast amounts of memory and high CPU speeds. Pentium processors are widely used in machines current running programs. However, a Pentium can be set up as a server with multiple 486 machines running as clients. The amount of RAM required varies between different voice recognition programs, but one can expect to use upwards of 16 megabytes for even the smallest applicable programs. Such a small amount of memory is only satisfactory for a very powerful server. The optimal amount of RAM for such a project is 64 megabytes, but 32 megabytes is sufficient for basic voice recognition.

The accuracy of voice recognition is also rapidly increasing. A voice powered email project that is being researched at Carnegie Mellon University has eighty-five to ninety percent accuracy. This is remarkable considering that the interface is not configured for one particular voice. The program also becomes more accurate as the vocabulary set of the user decreases.

Voice recognition TAPs serve best in an individual, or booth type, setting due to privacy concerns. A few specialized machines can easily be placed at various locations giving access to the handicapped and greatly enhancing the TAP network.

4.5.4 Printers

Users of the TAP network may need access to a printer. The kiosk vendors are already making plans for public printer usage. All of the contacted vendors stated that printers were already or could easily be incorporated into their plans for a kiosk.

Printers would only be feasible if someone were to keep these printers stocked with paper and to perform regular maintenance checks. Printers traditionally break down more than other computer components, and thus require more attention. This makes printers ideal for the computer clusters as someone would be present to take care of the printer. Also, a kiosk visit would generally be brief and require few printouts while a visit to a cluster would be more substantial. Thus, more use would be made of printers in the clusters.

This leaves printers as a viable option for clusters and a few select kiosks. Widespread printer usage is not feasible since the average printer ranges in cost from $200

to $1500, with laser printers being in the upper ranges. One possibility of decreasing the overall cost of the printers is to charge patrons for their printer usage. This can be accomplished in the cluster setting by the person who is in charge. This person can oversee the printing and collect the charge. The use of a card reader can also be used to charge someone using a printer. Once the user has been identified through their card, the appropriate charges can be made to their account. This option is better for a kiosk printer as no one will be present to collect the charge. The user can be charged by page or by any means that are appropriate. With such a plan in place, the printer can more easily become a functional part of the TAP network, but demand for the printers is still not enough to justify the cost of their widespread distribution. However, well placed printers may greatly enhance the TAP network.

4.6 A Similar Technology: the Automated Teller Machine

The automated teller machine, or ATM, is quickly becoming an integral part of today's society, nearly as common and accepted as the telephone or television. The ATM, with automated services, a kiosk-like structure, and its own sophisticated telecommunications network, bears a similarity to the computer kiosk discussed in this study, and, to a lesser extent, a TAP in general. The progression of the ATM and, more importantly, the public's response to the ATM may shed light on how the public would respond to TAPs, kiosks in particular. These aspects of ATMs, therefore, might be considered in the development of a system of such TAPs.

4.6.1 Progression of ATMs

The automated teller machine was invented in 1969 (patented in 1973) by engineers Don Wetzel, Tom Barnes, and George Chastain (Vonderharr). Wetzel came up with the

idea one day in 1968 while waiting in line at the bank. "The line was long and very slow-moving, and I was getting a little frustrated and wondered, 'There ought to be a little better way of doing this'" (Vonderharr). He wanted a more convenient way to do his banking. This is not entirely unlike the need today to obtain information quickly and conveniently, which can be quite difficult for those without access to a computer and the Internet.

The usefulness of ATMs did not catch on quickly, however, due to their relatively poor placement and minimal services offered. The first ATMs were only placed outside of banks and only allowed customers to withdraw cash and make deposits. However, in recent years a myriad of locations and services have been added, drawing more people to ATMs and allowing regular users to do much more.

An examination of this progression of ATM placement and services can provide useful insight into placement and service decisions regarding TAPs. To achieve near universal access in the near future, a parallel to the slow early advancement of ATMs must be avoided. TAP providers must ensure that TAPs are placed where people will use them, and the services offered are those desired by the public. The addition of new locations and services will also likely accelerate TAP usage as it has for ATMs.

4.6.2 Similarities to TAPs

Today's ATMs are becoming more sophisticated, continuing to expand features and services for customers, making their similarity to TAPs even greater. At a TAP machine with a card reader, a user would insert his card, punch in a Personal Identification Number or password, and then navigate through the interface to perform specific tasks. Although the latter step may vary quite a bit from what one might do at an ATM, the navigation techniques are similar: The user is given options that he or she may choose

from by pressing a keyboard or mouse button or touching an area on the screen, while at an ATM, the user chooses from a list of options by pressing a particular button. Once the desired application is opened, however, the user must know how to use it; this can be accomplished through various forms of training discussed in Chapter 6.

An unfortunate similarity to ATMs, though, may be the presence of lines at kiosks. Kiosks, however, are intended primarily to provide quick information from the Internet to the user, whereas more time consuming tasks can be performed at a cluster, where there are several computers available. Lines may be kept minimal at all TAPs by placing time restrictions on the users and if services are not entirely free, by charging higher fees during time periods of extensive usage, as is done with long distance telephone services.

4.6.3 Current Acceptance of ATMs

The acceptance of ATMs is growing rapidly, lending support to the idea that people in general are becoming less fearful of technology, and, in particular, computer-related systems or interfaces.

After a rather sluggish start, the growth of ATMs in recent years has been phenomenal. The number of ATM transactions nationwide is growing by over fifty million a year (Austin). In 1995, seventy percent of the nation's population owned an ATM card, and were expected to make nearly nine billion transactions altogether (Vonderharr). This growth can be attributed in large part to the recent expansion of ATM locations and services, enticing consumers to make transactions at the bank less and less because it's much more convenient to use an ATM.

Because of the increased availability of ATMs and the multitude of services provided, people are using them more often and becoming familiar with them. For someone with little experience with computers, this familiarity with ATMs will make it easier for that person to adapt to using a TAP to quickly obtain information, write a letter, or even transfer money between bank accounts, like he or she already does at an ATM.

4.7 Case Studies

It is often helpful to look at other case studies when trying to see the feasibility of certain technical options. A number of other organizations have tried to implement other forms of alternative TAPs to address issues of equality and availability of access, and the technical decisions others have made can serve as good examples for this project. While some of the following projects may not have the same goals (that is to ensuring equal access to information technology) as this project, their solutions to provide the services that they offer may be invaluable should any of this report's technical conclusions be acted upon.

A note to mention is that three out of the four case studies examined are in a university campus setting. To offset the notion that the alternative TAP model is only applicable to universities, one must also know that kiosks have been successfully implemented in places such as Disney World and the Olympic Village in Atlanta, GA.

While there are no case studies mentioned for the cluster model, there are already a number of them in existence. They come in the form of university computer clusters, and private clusters such as those found in Kinko's and Internet coffee houses.

4.7.1 United States Postal Service

The scope and heading of the United States Postal Service's (U.S.P.S.) "Service to the Citizen Kiosk" project is similar to many of the equal access programs for Allegheny County. The U.S. Postal Service was asked by the White House to provide electronic access to government information and services using a kiosk model (USPS[1]), and the U.S.P.S. responded to this request with the formulation of the "Service to the Citizen Kiosk" project.

Proposed government and postal services that can be delivered through these kiosks are:

Government Services

- expanded federal, state and local agency office hours and locations
- capacity to print forms for local, state and federal agencies
- access to job bank information
- ease in filing applications for local, state, and federal services
- ability to pay fines, renew automobile registrations, etc.
- capability to order local, state and federal information and products for delivery by mail
- help in solving real life situations such as: loss of job, retirement, health problems, births/deaths
- ability to obtain recreational information and reservations
- new access to Electronic Benefits Transfer systems

Postal Kiosk Services

- mailing information
- stamps by mail

- sale and display of commemorative stamps
- expanded office locations, hours and service
- Electronic Commerce Services (authentication, certification, electronic date and time stamp)
- USPS delivery of government service information ordered via kiosks
- ZIP Code lookup

The insertion of the kiosks will be started with initial test units in the Washington, DC area at participating USPS offices, and also at highly visible sites such as libraries, grocery stores and shopping malls. Following the tests of this pilot program, kiosks will be market tested in urban and rural areas throughout the country. Other sites will include, but are not limited to, domestic and overseas military bases and embassies.

The U.S.P.S. will then gauge the public's reaction, software and hardware usability, kiosk operation and support, usage rates and identification of the most popular topics, and willingness to pay for convenience (USPS[1]). This information will then contribute to evaluating the success of the program.

The plan was originally formulated in October 1994, and this past November (1995), the U.S.P.S. took the first step toward making 24-hour electronic access to government services a reality by awarding four contracts to develop interactive kiosk prototypes. The task order contracts were awarded to: Cordant, Inc., Digital Equipment Corp., IBM Government Systems, Inc., and North Communications, and should market testing prove successful, more than 10,000 kiosks could be on-line in post offices, libraries, shopping malls and other convenient locations within the next few years (USPS[2]).

While the equipment and telecommunications infrastructure that this project require exists, the services provided are not the same as those one would like to see in kiosks for Allegheny County. Fortunately, services provided are based mainly on software, so enabling these kiosks to serve as web browsers would not be a daunting task. Also, once the prototypes emerge from the four contracted companies, many elements discussed in this report can be compared and contrasted.

4.7.2 Project iTower

Project iTower is an important case study to examine for their use of Apple Computer's technology in their kiosk models: most kiosk manufacturers are using Intel based computers, so a feasibility study on the use of Apple's PowerPC architecture is useful. The primary aim of Project iTower is to produce a series of publicly accessible computers to deliver a wide array of information services for the University of Texas. The iTower kiosks will serve as a highly visible showcase of the fusion between local university talent and Apple Computer (University of Texas at Austin). The tools and technologies that comprise this project are specifically designed to be portable so that other institutions can use them for their own kiosk-based applications.

Some of the information services provided are:

- Multimedia introduction to UT Austin
- Campus-wide Events Calendar
- Interactive Campus Maps
- Maps of Shuttle Bus Routes
- Directory of Students/Faculty/Staff
- Directory of Departments and Buildings

- Scholarships offered by the University of Texas' Departments
- Campus Job Bank
- Astronomy Department

The spread of iTOWER kiosks started small and is planned to grow in size. To date there are six iTOWER kiosks in operation on the university campus, and as many as thirty more are planned for 1996 (University of Texas at Austin).

The iTower Kiosks are based on Apple's core technologies, including the PowerPC microprocessor architecture, QuickTime, and MacTCP. The PowerPC is the microprocessor designed by Apple in a joint venture with Motorola and IBM . QuickTime v2.0 is Apple's proprietary digital video format and MacTCP provides the basic tools for iTower's Internet communications.

However, considering the number of Pentium-based kiosks being offered, the vendor's preference of the computing speed, and the rapid transfer of information advantage that the Pentium has over the PowerPC, this report declines to recommend the iTower architecture for future projects of Allegheny County.

4.7.3 Various Universities Using the TouchNet System

This project's main interest in this case study is the TouchNet's use of different peripherals that are used to transact information to and from the user. TouchNet's kiosks are used mainly for fast, routine transactions that require security to access real-time data and provide hard copy output. The TouchNet system shows that a number of interesting input devices could be applicable to our own kiosk paradigm. Some are the magnetic stripe

card reader, coin/cash acceptor, flatbed scanner, telephone interface, and the public ready keyboard. The laser printer in the kiosk can also be used to generate paper output.

The TouchNet corporation has developed a kiosk model for a number of universities such as University of Southern California (USC), San Francisco State University (SFSU), Oregon State University (OSU), and several others. The TouchNet WorkStation Kiosk was designed to be a robust and easy to use platform, focusing on performing useful transactions and also providing access to static information.

As was mentioned before, TouchNet has implemented their kiosk solution in a number of college campuses. For example, the University of Southern California (USC) has five machines currently performing student services, including the display and printing of grades, class schedules, unofficial transcripts and financial aid information. The kiosks also perform other interactive transactions, including allowing students to change their addresses (TouchNet). Already several articles have been written about the system, chronicling the ease of use, functionality and student acceptance. In winter semester 1995, the five kiosks performed over 24,000 valid transactions when a student ID card was validated and information was accessed. USC has also generated over $5,000 in usage fees from the TouchNet pay per use transactions of send a fax, receive a fax and make a copy.

4.7.4 CMU Kiosk

The CMU kiosk project offers valuable insights to some of the challenges of implementing kiosk system. The project was started in 1993 and consists of three kiosks in various administrative buildings on campus. The services provided are information about CMU and also a student/staff directory for easy look-up. Funding for the project

originally came as a grant, providing for each kiosk, whose cost ranged from $1200 to $1500.

CMU kiosks are run on Mac II's with a touch screen as input, although for the services that it offered, the power was adequate. The touch screen managed to rid the problem of maintaining keyboards, but maintenance of the entire machine was a major problem; whenever a machine was brought down due to technical difficulties, a maintainer had to go on site to reboot the machine and fix it. There were a few cases of vandalism, but over its life-span only two or three touch screens were damaged.

At the moment there appears to be little funding in the future for the kiosk project, mainly due to lack of use. With all of the computing facilities there are on campus, there was far too much competition for the kiosks to handle as far as students and faculty were concerned: many students found it easier to find information using the public computer clusters rather than use a touch screen kiosk. Visual reports dictate that the main users of the CMU kiosk system were visiting parents and perspective students (Hill).

Lessons learned from this case study show that gathering information from a kiosk when easier forms of information transmission are nearby can severely hurt usage levels. The fact that the project's kiosk will offer WWW access will hopefully nullify the previous observation since the Web has connections to information that are usually not easier to get nearby.

4.8 Findings and Recommendations

This section provides a summary of the findings of this chapter followed by recommendations for the alternative TAPs that may be implemented in Allegheny County.

Findings

It has been established that there is a need in Allegheny County for increased access to information and computer technology. Two alternatives to the current TAPs that can increase this access and ensure that it is available to all residents are kiosks and computer clusters. Both of these models are quite feasible today.

The primary components of concern for each model are the type of computer or architecture and the Internet connection. The machines considered are the PC and Macintosh, with emphasis on Pentium based PCs and Power Macs; less expensive, less powerful machines may be used also but are not recommended. The two machines are comparably priced, although the Power Macs are slightly less expensive in the kiosk models. The PC, however, provides a wider range of applications and power. Power Macs are generally considered more user friendly, but with the advent of Windows 95, the gap has been shortened appreciably.

The types of Internet connections covered were telephone modems, ISDN, T1, and cable modems. The cost of telephone modems and their usage is small, but their speed is relatively slow and inefficient for connections requiring large data transfer. ISDN, though more expensive, is reasonably priced and provides adequate connection speed for a single computer. The third option, T1, has an extremely large bandwidth (speed) but is quite expensive. Finally, cable modems provide a large bandwidth and at a lesser cost, but this type of connection is not yet readily available.

For the kiosk model, input devices were also discussed. A touch screen is the device chosen by most vendors as opposed to keyboards and mice, which carry a high risk of theft.

Some optional features discussed that may be part of one or both models are card readers, visually impaired access, speech recognition, and printers.

Recommendations

The choice of computer architecture should be based on cost, power, available applications, and the level of user friendliness desired.

ISDN Internet connections are recommended for kiosks because they are more cost effective than T1 lines and more efficient than telephone modems. T1 is recommended for clusters since several computers can share the bandwidth of a single connection efficiently, allowing for a lower cost per computer. When feasible, cable modems are a recommended replacement for both ISDN and T1.

Touch screens are recommended for kiosk machines due to their higher level of security. They are not necessary for cluster computers as long they are always staffed when open.

Card readers are recommended for both models for the several services they can provide. The type of card used, however, will depend on the type and extent of information to be stored on the cards. Printers are recommended for clusters because they can be utilized more in clusters and staff can correct problems when they occur, unlike an unstaffed kiosk. Mechanisms for visually impaired access, such as large visuals and voice output, may be placed on a few select kiosks without raising overall costs by a significant

amount. Speech recognition, on the other hand, is still quite expensive, but, nevertheless, like the visually impaired access, could be added to a small number of machines if further handicap access is desired.

5. Placement

This chapter investigates placement of additional TAPs. Recommendations are given for the geographic locations in Allegheny County where additional TAPs would be most beneficial. The analysis is based upon the demographic information that was presented in Chapter 2, as well as on an analysis which was facilitated by the GIS model. In addition, the survey results are also used in recommending the installation of public vs. private TAPs.

5.1 Geographical Information System (GIS) Model

The research presented in Chapter 2 illustrates the current access situation in Allegheny County with respect to geographic disposition as well as demographic disposition. The GIS model showst that the majority of the residents of Allegheny County are within a 1.5 mile radius of a library that is participating in the EIN program (a distance chosen to represent within walking distance) and thus, are within a 1.5 miles radius of a TAP (see figure 2.2.2-5). Table 5.1-1 lists the exact percentages of the population who fall under this geographic region. (Note: The lowest income level is defined as households with annual incomes between $0-24,999.)

Black	White	Lowest Income Level
81%	66%	68%

Table 5.1-1 Percentage of Population within a 1.5 mile radius of a TAP

These percentages are interpreted as follows: 81% of the black residents of Allegheny County, 66% of the white residents, and 68% of the low-income residents fall live within 1.5 mile of an existing TAP at a library. The percentage of the total population of

Allegheny County within this geographic region is 68%. Thus, it appears that the current access in Allegheny County is very good. However, additional information about the TAPs leads to an entirely different picture of the current access.

For these calculations, it is assumed that each library participating in the EIN project has 3 computers available for public use (the average according to our research). There are 56 libraries (see Figure 2.2.2-5) total. This amounts to a total of 168 computers serving a population of 890,409 people (total population that is within 1.5 miles of a library), the majority of which (68%) are in the lowest income level and are unlikely to have a computer in the home. Therefore, as shown in Table 5.1-2, the number of computers available per person living within 1.5 miles of a library is quite small. The libraries provide 0.19 computers to every 1000 people living within 1.5 miles, and provide 0.26 computers to every 1000 residents who are in the lowest income level.

	Total Population	Lowest Income Level
# of computers per 1000 people	0.19	0.26

Table 5.1-2 Number of computers provided by a Library per Resident

These numbers could easily be doubled or even tripled by strategically placing additional TAPs in Allegheny County. In order to illustrate this point, we have done an analysis of the increase in access that 8 additional TAPs would provide. Figure 5.1-1 shows where these TAPs would be located in Allegheny County. If one compares this figure to Figure 2.2.2-1, it is obvious that the additional TAPs have been placed in densely populated areas of Allegheny County.

The total population living within 1.5 miles of these additional TAPs is 313,390. Table 5.1-3 shows the percentage of these residents who are Black, White, and low-income residents. The additional TAPs were placed with the specific intent to target low-income residents. As stated in Table 5.1-3, 72% of the residents living within 1.5 miles of the additional TAPs are in the lowest income level.

	Population	**Percentage of Total Population Served**
White	254,147	81%
Black	59,243	19%
Lowest Income Level	224,451	72%

Table 5.1-3 Characteristics of the Population Served by Additional TAPs

These additional TAPs increase the access in Allegheny County dramatically. If each of these additional TAPs were a cluster with 10 computers each then the number of computers per 1000 people provided by the libraries would be more than doubled, as shown in Table 5.1-4.

By placing the additional TAPs in these 8 locations the combined access provided by the Libraries and the additional TAPs more than doubles the access provided by the libraries alone. The cost of installing these 8 TAPs (clusters with 10 computers each), is 3.5 million dollars.

This example of 8 additional TAPs was done to illustrate that access in Allegheny County can be improved by the strategic placement additional TAPs. In future work, the GIS model could be used to analyze the multitude of options available for the placement of additional TAPs. For example, this section has not mentioned the placement of kiosks,

	Total Population	Lowest Income Level
Access Provided by the Libraries: # of computers / 1000 people	0.19	0.26
Combined Access (Libraries + TAPs): # of computers / 1000 people	0.28	0.41
Factor of Increase in Access	1.5	1.6

Table 5.1-4 Increase in Access Provided by Additional TAPs

which might be a viable alternative for less densely populated areas of the county. The issue of where the additional TAPs should be located must also be addressed. Should they be in public buildings such as the libraries or post offices, or should providing the public with additional access be left to private initiatives? The following section will address the issue of public vs. private placement.

5.2 Private vs. Public locations

Through the GIS model, a needs assessment of TAPs in Allegheny County has been established. Within a given area, the placement of the TAP is very important. There exist two types of spaces available for TAPs: public and private locations. Public locations include libraries, schools, community centers and any other site programs funded by a public body, while private sites are owned by an individual or non-governmental body. Key variable to consider when discussing placement are security, available training/assistance, comfortability, cost and technical feasibility.

Private

Private sites offer a potentially more secure environment than public ones. Due to the nature of a private site, a proprietor or supervisor is usually present to safeguard the TAP from being misused, vandalized or stolen. TAPs at a private site are usually owned and operated by the owner, and this is a source of revenue. The owner assumes all responsibility of protecting this investment, and therefore, will use better or more security precautions than at a public site. Private sites also potentially offer a higher staff to patron ratio then public sites, because the patrons are directly paying for these services.

Public

Security at public sites is less well-defined. It depends on the setting and staff available to supervise the TAPs. At the Knowledge Connections sites, there is always an adult or teen supervisor present when someone is using the computers. Similarly, at the main Carnegie Library in Pittsburgh, the computers are placed on the second floor directly in front of the Social Sciences Department's reception desk. Due to the diverse setting and staffing arrangements at public sites, the range of security is therefore much larger. Technical implementation of a TAP system in a private location is believed to be more feasible than at a public location. In large part, this is due to the age, design and architecture of many public building. Many public buildings in Allegheny county are over 50 years old and some are designated historical sites. The renovation of these building to accommodate computers makes public sites much more expensive to rewire than private sites. Again, technical feasibility also varies from site to site.

5.3 Survey Results

From the survey it was found that people preferred public sites over private sites by a ratio of 7:1. The question asked, "Suppose computers with free public access were available in Pittsburgh. Where do you think would be a convenient place for these computers to be placed." Interviewees were asked to list their top two choices from a list of 5 possibilities: libraries, schools, public buildings, coffee shops and Kinko's. Categorizing libraries, schools and public buildings into the public domain, and coffee shops and Kinko's into the private sector, it was found that most people preferred placement of computers at public sites.

5.4 Findings and Recommendations

We have found that geographically, as well as demographically, there are information have-nots in Allegheny County. These residents do not have sufficient access to computing, and are hence disadvantaged in modern society. By placing an additional eight TAPs in Allegheny County, the number of information have-nots can be greatly decreased.

Through the survey conducted, it was determined that for every 1 person who choose placement at a private site as one of their two choices, 7 people choose placement at a public site as one of their two choices. This gives an approximate estimate of Allegheny County residents' preferences on placement of TAPs.

When comparing public versus private placement for these eight locations from a consumer perspective, public placement is undoubtedly preferred. But from an administrative perspective it is difficult to differentiate the general benefits and drawback of

public versus private placement for all cases. It is recommended that placement should be done on a case by case basis to ensure that security, training, technical feasibility, and cost issues are carefully balanced.

6. Training

Once computers are available for public use, institution of a training program for the public is important. If training and help are not available, then people who do not find it easy to learn new concepts or are not comfortable with new electronic devices, will get easily frustrated or not attempt to use the computers at all. According to M. Lippert , "use of the Internet is so user-unfriendly, the [people] who pursued this trend were generally those that enjoyed working with computers and didn't mind ... figuring things out by trial and error." (Lippert 18) Because of all of the complications of a computer, it is desirable to have a training program, even for those who are able to comprehend new concepts easily.

6.1 Types of Programs

There are several types of training programs for the TAPs that could be implemented: one-on-one personal teaching at the computer, group classes with an instructor or instructors and hands-on use, lecture and demonstration, video presentation, computer based approaches, and printed instructions. All of these approaches have positive and negative aspects. Their overall success depends heavily on the individual and how well they learn.

One-on-one teaching requires a consultant to be available at the computer for individual attention. The consultant is on hand to answer questions on demand and is available for help if the student gets stuck. In this form of training, the student gets attention suited to his or her ability. The consultant can go as slow or as quick as the student requires. This form of training requires the consultant to be at the computer location, or on call, full time. If more people need help, there could be a burden on the person's time.

Group classes with an instructor or several instructors and hands-on experience require many computers, enough for every participant. Some of these classes use one instructor or a main instructor and an assistant. The assistant is available to monitor the class, watching for problems. The assistant can remedy major problems without disrupting the flow of the class. A major advantage of this type of training is the human interaction and hands-on work. It has been observed that there is a reluctance of participants in training courses to keep their hands off the keyboards – "the urge to explore is too great" (Greenfield, et. al. 23). Daniel Kowall says, "Some may say that classroom training is a thing of the past, it still offers one large advantage: A human being monitoring the class, with the ability to make changes immediately." (Kowall 26) A disadvantage to this type of training is that it has to occur in a location where there are many computers clustered together that may not exist at a kiosk location. Class scheduling may force people to modify their own schedule to attend the class, which may discourage some from attending. To make it more convenient for people to attend the class, it would have to be given often and at a variety of locations around the county.

A lecture and demonstration consists of a teacher in front of a large group and a projector to show different procedures that are done on the computer. This is probably the least desirable, as Greenfield, et al. say, "Adult students are interested in learning independently and often have limited patience for long lectures and demonstrations." (Greenfield, et. al. 23) The disadvantage is that the people do not receive hands-on practice, so they do not know how well they understand the material presented to them. There is also the same convenience problem as for group classes above. However, an advantage is that it can be implemented in areas that do not have enough computers to support a classroom environment.

Video and broadcast television training is a variation on the lecture and demonstration, with the same educational value but without the opportunity to ask questions. Videos offer the convenience of being able to be played anytime and anywhere there is a video cassette player. They can be shown to a group of people or be viewed in private. Videos can be borrowed or bought for private learning. They can be stopped and rewound in case a point is missed (Kowall 26). They also reduce cost because an instructor does not have to be present all the time. However, as with the lecture and demonstration, there is the disadvantage of not getting hands-on practice.

Computer-Based Training (CBT) uses computers and tutorial software to teach users. This type of training is normally done on an individual basis. The advantages are that a student can go through the lessons at his or her own speed and can review the lesson as desired. Before a student is presented this method, he or she should know the basics of a computer, such as how to use a point and click device, or there should be informative literature around the computer to get the person started. Its disadvantage is that it does not provide human support if a problem develops.

Printed material or tutorials can be implemented as a stand-alone approach or it can be incorporated with any of the other previously mentioned options. If it is the sole teaching tool, then it would have to be very detailed in the procedure so the student can copy each step and not get lost. Printed material or handouts can be used as a supplement to the other previous options. An example for group classes is outlines of what was done in the class for future reference (Greenfield et. al. 25). Workbooks for use while watching a video, that include actual printouts of screens so the student can take notes, have proven useful. In the same manner, a workbook handout could be provided for use with a computer tutorial.

6.2 Components of Training Programs

The training option that works best usually depends on the individual. The combination of their prior experience and learning ability is a big factor in what is the best training method. There is no category of people who are hardest or easiest to train; the only predictor of their trainability, according to trainers, is their familiarity with and ability to use computers . One exception are the physically disabled, who are usually more difficult to teach because of the coordination needed with the point and click mechanisms (mouse) of current computers. It was found in a Pikes Peak Library study of their then new on-line catalog system that younger people were generally not as intimidated by the system as adults and tended to use the system without instruction more than the adults (Magrath). Some people, such as children, may be able to learn well using CBT, but others, such as those adults in the study, may need someone to show them what to do. A classroom situation can benefit both, whereas CBT may only be beneficial to a person who has at least some basic computer skills. The most basic skill that is difficult to understand for beginners is how to use a mouse. Different training techniques work best for different people, so a variety should be available to the public. By providing options, classes, for example, would not be as overwhelmed as might be the case if they were the only method of training available.

Training programs should include some conceptual information and a brief summary of what the Internet is, what it is composed of, and how it works. There is no consensus on how much conceptual information to include. The class should be kept to a maximum of ten participants per instructor or assistant to ensure each participant gains the most benefit from the session (Greenfield et. al. 23). If it is being taught by instructors, they should try to assess the level of the class and gear it towards the majority of the class. If there is a group of beginners, some instructors present analogies to try to compare the

Internet to everyday life. Instructors and guides should stay away from technical acronyms, maintain a high level of enthusiasm, and reinforce examples (Foster et. al. 435). A hands-on session to freely explore is very important to the students. Participants have also suggested lengthening the hands-on time and shortening the formal presentation part of a certain program. The program should provide the students with handouts to recollect what they had learned, so they could repeat it on their own and use it for reference. If a CBT is used, the screens should be free of clutter, and it should be graphics-based.

6.3 Current Programs in Allegheny County

There are currently various training programs around Allegheny County for the general public. The Carnegie Library of Pittsburgh's Oakland location currently uses a combination of classes and one-on-one consultant help for their World-Wide Web access. The classes are offered every two weeks during the time the library is closed. The classes are two hours in length and consist of a maximum of fifteen people, with two instructors. The instructors endorse hands-on training because their surveys indicated that people wanted more time at the computer. The classes begin with a brief introduction to the Internet and what the library has to offer. The students are then taught the mechanics of the World-Wide Web and how to use various search engines. A free exploration time is available for further "surfing" and specific questions, such as how to connect from home. One-on-one consultation is used for people who walk in during library hours and want immediate, non-comprehensive help. This service is provided by regular librarians, usually ranging from one to two, in the departments that the computers are located.

At the Knowledge Connection sites, another set of current TAPs in Allegheny County, there is no formal training (except for three to five year old children), due to a small staff. To learn how to use the software, the users take advantage of their prior

knowledge of computers from school and work, proceed on a trial-and-error basis, and have the software manufacturer's owners manual and instructions available to them for assistance. The staff at the Knowledge Connection is also available for basic help, if needed.

The University of Pittsburgh's Computer Learning Center offers public classes on the Internet on a fee basis. Their basic classes consist of ten to twenty students and last for three hours. The Community College of Allegheny County offers comprehensive ten week software classes also on a fee basis, but they do not offer Internet classes at this time.

The decision on what topics to teach would depend on the level of the class or student. Basic training should always be offered to get people started. The basic class should include learning how to use the input device(s), how to navigate through the computer interface, and how to find help screens. Additional learning support should be available, too, for every application available at the TAP.

6.4 Cost of Training

The different options all have a different cost associated with them. Based on the prices of current programs, a range of costs can be estimated. There are colleges and private companies currently offering basic Internet training classes on using the Internet and World Wide Web. The prices for these classes are in the range of $69-$125 for a one day session, as shown in Table 6.3-1. Books on the basics of the Internet and World Wide Web range from $50 - $69. Various on-line software is available on the Internet and World-Wide Web for free distribution. Software applications usually come with an on-line tutorial and manuals from the manufacturer. Video-based training is offered for $90 from SkillPath. One-on-one help costs $60/hour at Kinko's.

Institution	Price
PITT's Computer Learning Center (Internet)	$125
SkillPath (Internet)	$69
National Seminars Group (Internet)	$99
Pryor (Internet)	$89
Community College of Allegheny County (Word Processing)	$85

Table 6.4-1 Prices of Computer Classes

6.5 Survey Results

The survey results indicate that 43% of those surveyed prefer a person on site, 34% prefer group classes, 33% would favor computer-based training, and 15% would like to see books available. The percentages indicate that some respondents chose more than one option. As expected, the two options for personal interaction were ranked as most favorable. Most wanted personal support available for private help, if needed, and the second highest response was for group classes. The next highest result came from computer-based training which is favorable for people who enjoy the trial-and-error approach. The least number of respondents indicated that they would want just books available.

6.6 Findings and Recommendations

There are various options available for training the users of TAPs. They are one-on-one teaching, hands-on group classes, group lecture and demonstration, video training, computer-based training, and printed material. The cost is greatest for one-on-one training when compared to the other options with the amount of time spent being equal. Books and printed matter cost the least. Based on the opinion of trainers, the literature, and the survey responses, it is best to have a variety of training options available, and they should involve

hands-on practice . The most useful options are group classes and tutorials (computer-based and printed). Classes should not exceed a ratio of ten students per instructor or assistant. Tutorials are useful because of their availability to the public for use at their convenience. Some people prefer to learn in a self-paced leisurely manner where they can discover how to use the system on their own and not feel rushed in trying to keep up with a class. If computer-based tutorials are used, then there should be clear instructions on how to use the hardware before the student even touches the computer. This can calm the fears of anxious people and of those who have never seen computers before.

The survey indicates that a human led training program is most desirable, and so it is recommended that they be used for the different TAP models. In computer clusters that are staffed, the staff person should be qualified for training and helping the users on a one-on-one basis, the option for group classes should also be available, so the consultant does not get overwhelmed. For kiosks, the main source of training should be the classes; it would be too expensive to hire a consultant for each location. The classes for both cluster and kiosk TAPs should be scheduled as demand warrants. The classes need not be on-site, but announcements should be publicized at each site. Other options should also be available for people who desire an independent self-paced approach, or cannot attend classes.

7. Cost

A survey of the current state of information technology in Chapter 4 indicates that it is technically feasible to deploy alternate TAPs in Allegheny County today. It is also clear that the selective deployment of these TAPs at targeted areas in the county will significantly enhance the level of computer access to those residents who are outside the service areas of existing TAPs. It is imperative, then, to tackle the costs of actually undertaking such a project.

7.1 Implementation Costs

A simple cost model is constructed to evaluate the cost effectiveness of the alternate TAP technologies discussed in Chapter 4, namely the kiosk and public cluster models. The model is then applied to the placement recommendation made in Chapter 5 to provide an estimate for the amount for funding necessary to implement the recommendation.

The model is meant to communicate an order of magnitude for cost estimates only. Therefore, several cost components are omitted for simplicity. Costs for system hardware and software, installation, maintenance and upgrade, utility, networking and telecommunications are included in the model. Costs for training are considered separately, since there are a multitude of training options that can be chosen. Excluded from the model are costs associated with space rental and administrative functions. No adjustments are made for inflation or equipment depreciation. Details of the cost model can be found in Appendix A3.

7.1.1 System Costs

Kiosks

The total system cost for installing and operating a kiosk-based TAP for a ten-year-period is estimated to be $107,300 per kiosk-TAP. The cost can be broken down into the following components:

- initial system cost = $13,000
- network installation cost = $500
- telecommunications cost = $62,000 (ISDN connection 8 hours/day)
- utility cost = $1,200
- maintenance cost =$17,600
- system upgrade cost = $13,000

While the ISDN line and usage charges dominate the cost of a kiosk, it is expected that this cost will be reduced by a factor of six when Bell Atlantic revises its ISDN rate tariff to bring it in line with the national average. This will translate into a 50% reduction in the cost of each kiosk.

Clusters

When evaluating the implementation costs for public computer clusters, it is important to consider not just the number of clusters to be established in the county, but also the number of computers in each cluster. Installation, maintenance, lighting and T1 connectivity costs, for example, are weak functions with respect to the actual numbers of computers in a cluster. For a cluster with ten computers, the cost for establishing and

operating the cluster for ten years will amount to approximately $425,400. Component costs may be broken down as follows:

- initial system cost for ten computers = $28,000
- network installation cost = $2,600
- telecommunications cost = $168,600 (dedicated T1 connection)
- utility cost (cluster) = $14,000
- utility cost (for ten computers) = $12,000
- maintenance cost = $172,500
- system upgrade cost = $28,000

Figure 7.1.1-1 shows the system cost of cluster implementations based on the number of clusters and the number of computers in each cluster.

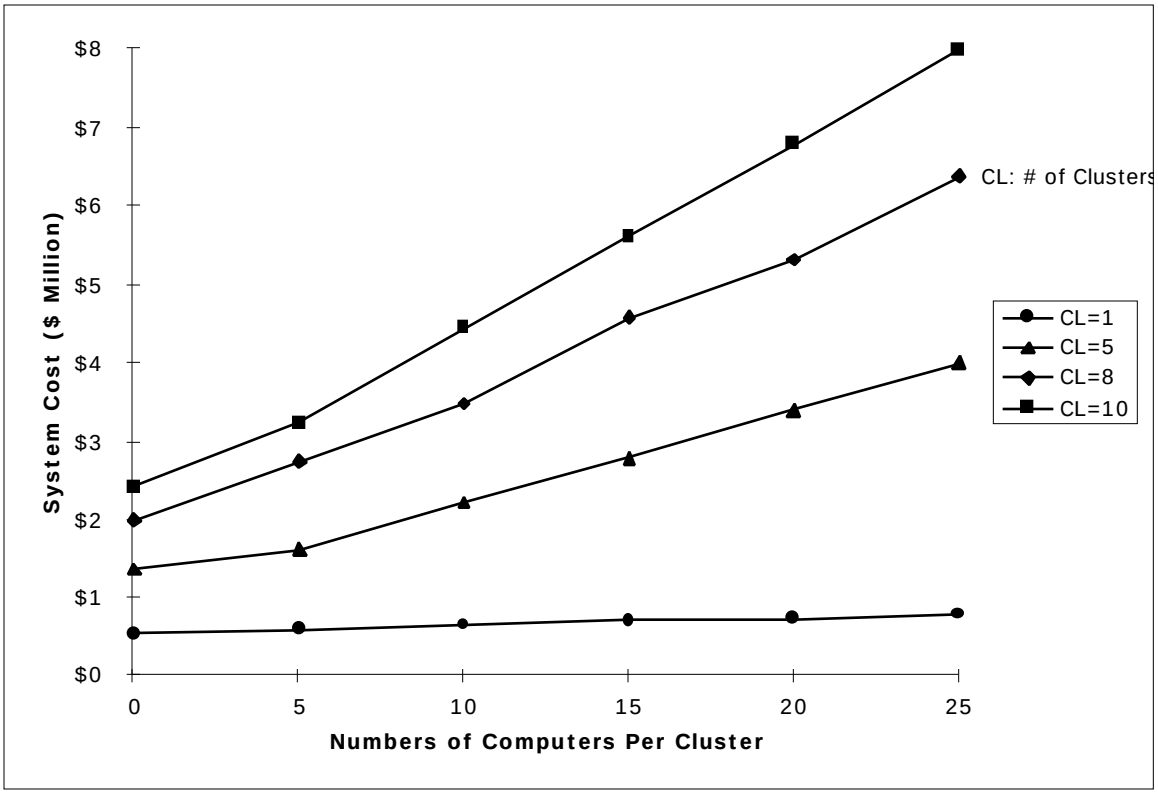

Figure 7.1.1-1 Cost Estimate for 10-year Cluster Implementation Plan

Based on the cost estimates established for the kiosk and cluster configurations, it is possible to calculate the total system cost for implementing the eight additional TAPs recommended for Allegheny County in Chapter 5. If at each of these eight TAPs is a public cluster with ten computers, it will cost approximately $3.4 million over the ten year period. In contrast, it will cost $850,000 to install and operate a kiosk at each of these eight TAPs. An alternate plan of 80 kiosks (ten kiosks per TAP) will cost $8.5 million.

7.1.2 Training Costs

There are four main types of training considered in the cost analysis. They are group classes, printed tutorials, on-line tutorials, and a one-on-one attendant. Group classes, books, and on-line tutorials are adequate for both systems.

To adequately train the public, a total of twenty group classes per week for a period of ten years is suggested (In ten years, a maximum of 156,000 people would be trained. See Figure A3-3 for detailed calculations on training). The total cost for ten years of this training is $884,000.

The total cost of the printed tutorial training ends up being a little more complex. For 80 terminals, the printed tutorial training has an initial cost of $4,000 and a yearly replacement cost of $1,250 (twenty-five books replaced each year). The total cost for this type of training after ten years comes to $20,500.

The on-line tutorial cost has a cost of $10,000, accrued during the implementation of the 80 terminals, with one tutorial per system. This number is doubled for the ten year period, assuming the systems, whether kiosks or cluster computers, will be replaced in five years. The ten year cost, therefore, is around $20,000.

A person on-site is only feasible for the cluster system and is recommended for that system . The need for on-site staff at a cluster is one of the main cost disadvantages the cluster system has versus the kiosk system, although it is the best form training as stated in Chapter 6. The yearly cost for a person on-site at each of eight clusters is $4,000,000 for ten years.

Overall, the printed and on-line tutorials are the least expensive training systems to use, but they might not adequately fulfill the desired training requirements. (For more on how training statistics were compiled and calculated, see Chapter 6 and Appendix A3)

7.1.3 Project Costs

Based on the cost estimates established from sections 7.1.1 and 7.1.2, it is possible to calculate the total project cost for implementing the eight additional TAPs recommended for Allegheny County in Chapter 5. If at each of these eight TAPs is a public cluster with ten computers and a person on-site for training, it will cost approximately $7.8 million over the ten year period. Including the training cost more than doubles the cost of a cluster project. Therefore training is an important factor in the cluster projects costs. An alternate plan of 80 kiosks (ten kiosks per TAP) with group training, on-line tutorials, and printed tutorials will cost $9.4 million. The kiosk project isn't as affected as the cluster project by the introduction of training costs. It is only raised by ten percent.

7.2 Survey Results

Survey respondents indicated that they are not willing to spend much of their own money (non tax dollars) on computing services. The survey shows that, on average,

a resident is willing to pay less than $10 per month but would likely use that service for an average of about ten hours per month. According to these results, the public is only willing to spend less than a dollar per hour on computer access. This is much lower than any fee charged by privately operated access providers such as Cyber Cafes. Consequently, at the present time, private access is not likely to ensure equal access for the general public because the general public is not willing to pay the high costs of private access. Therefore, unless the cost for private access is lowered to an acceptable rate that everyone can afford, the only viable way to ensure equal access is to develop a plan that is publicly funded in part.

7.3 Findings and Recommendations

From the examination of the overall costs of these programs, several observations can be made. The first is that all TAPs needed for adequate access cannot be furnished by private organizations. Kinkos and Cyber Cafes, for example, charge much more than the average individual of Allegheny County is willing to pay. Until competitive pressures drive down the price of access at these private TAPs, they will only be able to serve the segment of the population who can afford to pay the lofty prices.

The cost of kiosks is dominated by ISDN connection charges. Unless the ISDN fee structure is revised to adopt a flat-rate (i.e. usage insensitive) pricing scheme, it will not be as cost -effective as the T1 or the cable modem alternatives.

The implementation of eight public cluster TAPs, each with ten computers and a person on-site for training, will incur a system cost of approximately $7.8 million for a ten-year period. This is cheaper than a comparable configuration of 80 kiosks with group

training, online tutorials, and printed tutorials, which will cost $9.4 million over the same period of time. A hybrid combination of kiosks and clusters can also be considered.

8. Extent of Access

TAPs provide the public, including children, with access to computing technology and to the Internet. The Internet contains a plethora of helpful information and services, yet there also exists many sites that contain potentially offensive material. Recently, there has been much debate over the explicit content of the Internet. The United States Congress has proposed legislation to deal with this problem, while at the same time, the computer industry has worked to develop software applications capable of limiting access to users with the intent of protecting children from inappropriate materials. In light of these facts, the Telecommunications Bill of 1996, the proposed On-line Parental Control Act of 1996, and the software packages that provide alternatives to strict government regulation of the Internet will be discussed.

8.1 Current Policies Regarding Access

Presently, there are many different viewpoints on the issue of how much access the public, or more specifically children, should have to particular sites on the Internet. For example, the Carnegie Library of Pittsburgh's policy concerning Internet use follows that of the American Library Association which states that there shall be no restrictions on which sites one can view on the Internet. However, a consistent policy pertaining to censorship does not exist in Allegheny County, or anywhere in the country for that matter. Therefore, the federal government has tried to establish a uniform policy on censorship. When the Telecommunications Reform Bill was signed into law in February 1996, it contained a provision called the Communication Decency Act (CDA). This article amended the Communications Act of 1934 and thereby made it a felony to knowingly use telecommunication devices to create and/or send obscene material, as well as to threaten or

harass individuals (U.S. Rep. Eshoo). The bill intends to restrict indecent and/or obscene material from the Internet with the intent of protecting minors from "controversial" and "inappropriate" sexually explicit material. At face value, the CDA appears to be favorable; however, its main drawback stems from its use of the term "indecent." This term is vague, meaning that it could possibly lead to a prohibition on such classic works as Michelangelo's David or the novel The Catcher in the Rye, as well as a legal challenge based on constitutionality. In fact, the CDA is already being tested in court cases due to the use of this term, and the federal government has indicated that it will refrain from prosecuting anyone for violating this provision, for the time being. It is very likely that the "indecency" standard in the CDA will be found unconstitutional by the courts, leaving the Internet with the same explicit content that led to the CDA proposal in the first place. As these court cases continue to evolve, one finds that most minors still have access to on-line material that some consider to be inappropriate for children. Further, parents are left with no other alternative but to continually police, if possible, what their children see on-line.

With the growing importance of the Internet, the issue of content, especially for the parent, is one that cannot wait for the legalities of the CDA to be sorted out by the court system. Several legislators became aware of this need for action in reference to content and, subsequently, in March 1996 proposed a piece of legislation titled the On-line Parental Control Act of 1996 (OPCA). The OPCA amends the CDA in several key areas. First, it replaces the "indecency" standard with a "harmful to minors" standard, which is one that has been previously upheld in court. Fortunately, the elimination of the "indecency" standard does not create any new restrictions on free speech because "harmful to minors" is already widely used by the states. Second, the OPCA, unlike the CDA, encourages the Internet community to develop software which will enable the parent to control what children see, rather than relying on government regulation. Specifically, OPCA endorses the CDA's existing legal defenses for those who provide parents with technology that can

block or restrict access to on-line materials deemed obscene or harmful to minors or restrict access to such materials through the use of adult access codes or credit card numbers (U.S. Rep. Eshoo). Moreover, OPCA adds to these defenses one that would actually encourage companies to provide parents with the means to use new labeling and blocking standards that are being developed. An example of such technology is an industry-wide project known as the Platform for Internet Content Selection (PICS), which, in the near future, will be the dominant parental control technology on the market. Furthermore, OPCA defends any other device or system that will serve the same function of allowing parents to control what their children see over the Internet. This provision also encourages the industry to develop enhanced parental empowerment technologies that are more effective than those that are currently being used or are in development.

8.2 Platform for Internet Content Selection (PICS)

PICS is the technology that seems to be the most promising for parental control of Internet access and could also be implemented with TAPs. It is a cross-industry group assembled under the direction of MIT's World Wide Web Consortium to develop a standard Internet labeling and selection platform that enables people worldwide to carefully select the material they receive via the Internet. As shown in Figure 8.2-1, PICS blocks out inappropriate material, while allowing access to more appropriate material. Each individual can determine his/her appropriate level of access, without restricting the access of others.

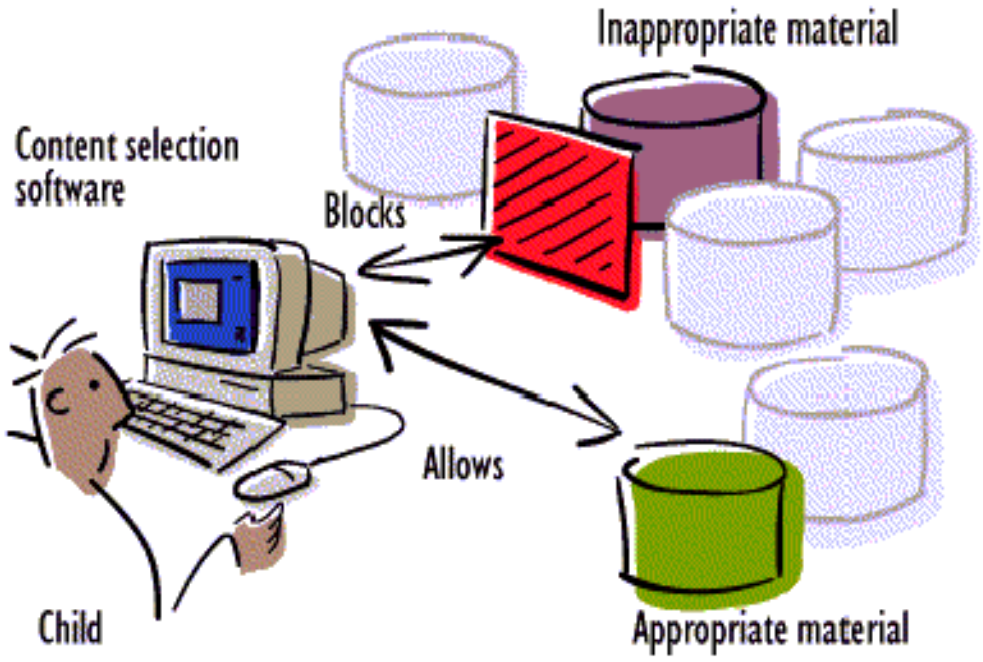

Figure 8.2-1 Content Selection Software

PICS is capable of processing labels provided by a number of rating services and allows the blockage of certain Internet resources, without censoring what is distributed to other sites. Each site may have many different labels from a number of sources, including information publishers, independent consumer magazines, or organizations, and users can choose those that fit their values. With multiple perspectives to choose from, PICS will allow a parent or TAP provider to choose labeling sources that reflect their values, or the values of their community, whichever the case may be, and ignore all others (see Figure 8.2-2).

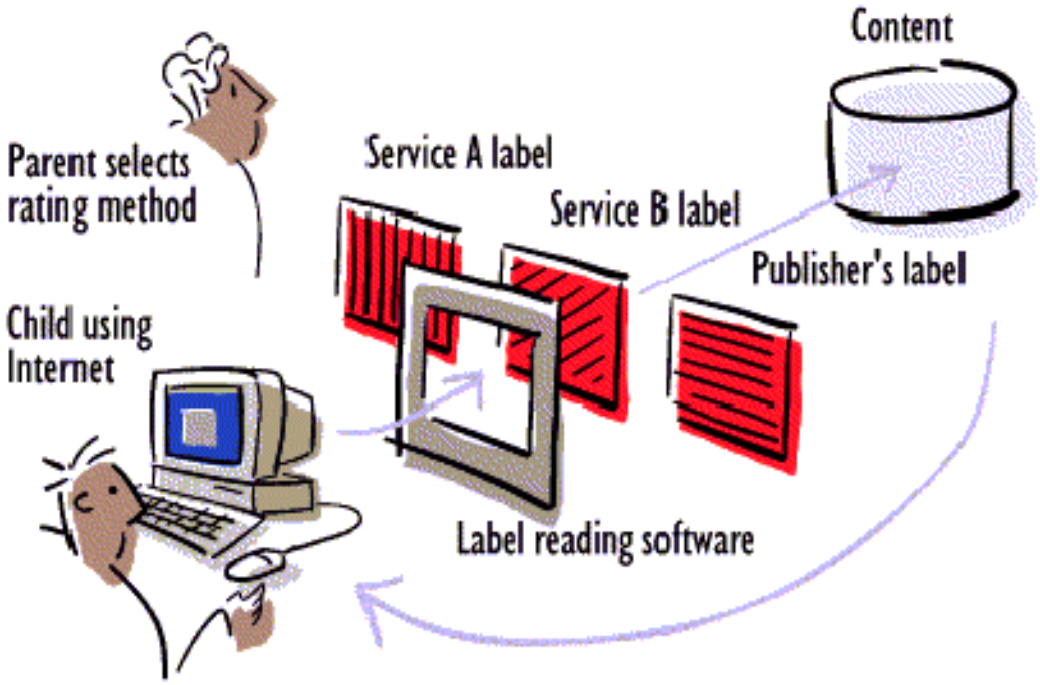

Figure 8.2-2 Parent Selects Rating Method

Many different companies and groups are working on PICS. They include, but are not limited to: America Online, Apple, AT&T, CompuServe, IBM, MCI, Microsoft, Netscape Communications Corporation, Recreational Software Advisory Council, SurfWatch Software, Time-Warner Pathfinder, and Nickelodeon. This widespread cooperation is intended to ensure quick and extensive use of PICS throughout the nation.

8.2.1 PICS' Rating System and Content Label Distribution

A *rating service* is an individual, group, organization, or company that provides content labels for information on the Internet. Content labels are based on a *rating system*. A *rating system* specifies the dimensions used for labeling, the scale of allowable values on each dimension, and a description of the criteria used in assigning values (PICS). An example of a rating system would be the rating of movies in the USA based on a single

dimension with allowable values G, PG, PG-13, etc. The PICS rating system is identified by a valid URL, or Uniform Resource Locator. This enables several different services to use the PICS' rating system and refer to it by its identifier. Then, the URL naming a rating system can be accessed to obtain a human-readable description of the rating system, or a *content label* which contains information about the Internet site. Since PICS can filter through many different ratings systems, it does not promote a single viewpoint; therefore, a wide range of groups may use it, free of charge, to create label rating systems and offer rating services. Parents and Internet providers will be able to obtain the systems and services that work best for them and also those that most closely reflect *their* values -- and not, per se, the government's.

8.2.2 The Present and Future of PICS

PICS is already available. In fact, the Recreational Software Advisory Council (RSAC) began to use PICS standards on April 1, 1996. The RSAC "is an independent, non-profit organization that empowers the public, especially parents, to make informed decisions about electronic media by means of an open, objective content advisory system" (RSAC). By implementing this detailed, voluntary ratings system, computer users will be able to filter out varying degrees of sex, violence, nudity, and foul language when used with PICS-compatible software.

To illustrate how PICS might be used, consider the prototype in Figure 8.2.2-1. In the figure, the parent is determining which sites Johnny can visit. The parent drags the slider to indicate the maximum permitted value on the language scale. The software has lifted the icons and the text description ("Strong, vulgar language") directly from the service description. The details of the configuration software packages may differ; the prototype featured was written by an MIT student and shows that the selection software can

use any service description to generate a reasonable user interface that will make configuration easier for the parent.

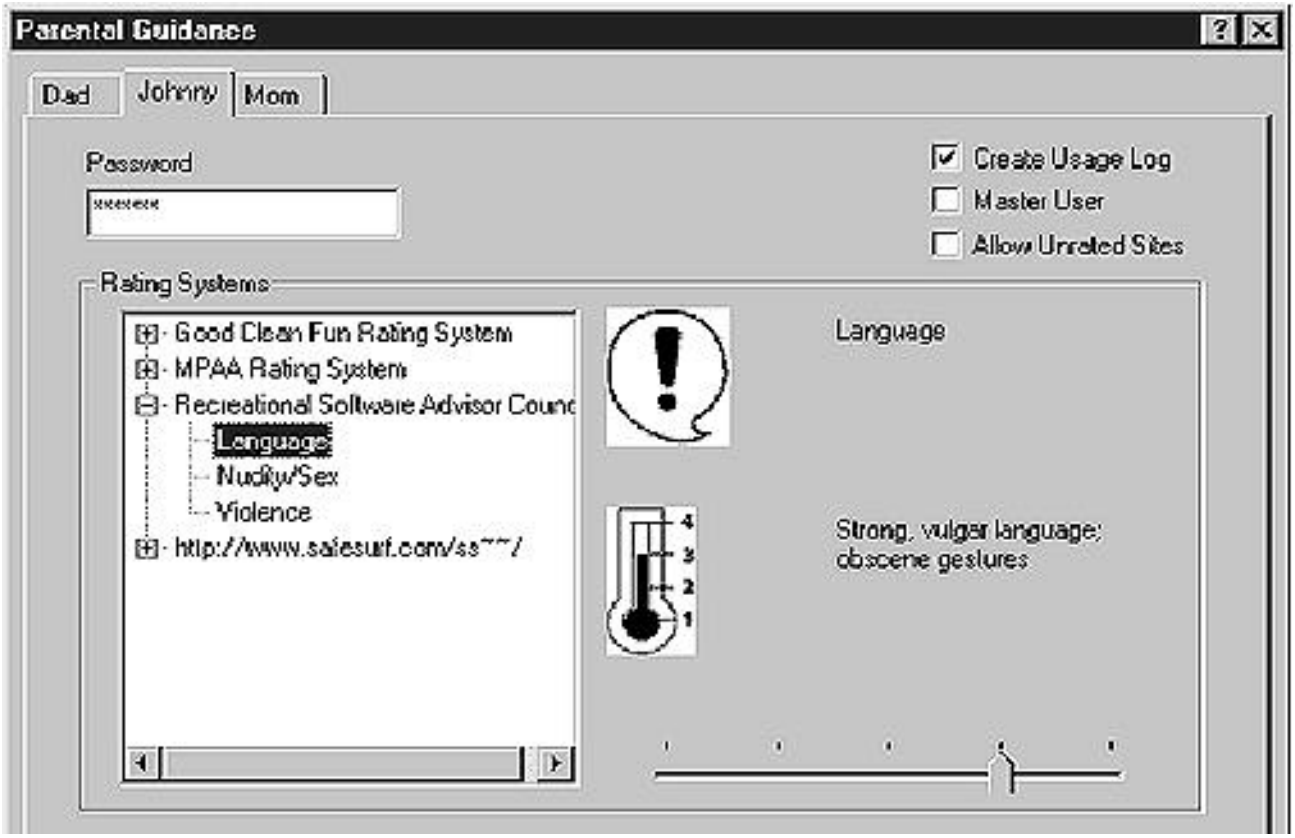

Figure 8.2.2-1 Parental Configuration Interface

As shown in Figure 8.2.2-1, this system will provide Internet ratings for 4 categories: sex, nudity, violence, and language. The descriptions of each will be modified so as to filter out such things as "hate speech," yet allow for non-obscene or art-oriented nudity. For example, a "zero" rating in all four areas means that the material contains nothing for the parent to worry about, while a "four" in all four areas will signal to the parent that the site includes extreme violence, explicit sex, nudity, and offensive language. Once this rating system is in place, parents can modify other software such as SurfWatch to allow them to decide what their children can or cannot see. This feature is exceptionally attractive because it will enable parents to allow different levels of access to children of

different ages. Clearly, material that is appropriate for a 16-year-old to see is not always appropriate for an 8-year-old to see, and thus PICS, when used with an appropriate software package, will give parents the flexibility they need.

Some companies, like SurfWatch, offer software that allows parents, teachers, and Internet providers a means to block sexually explicit material on the Internet, without restricting the rights of other Internet users: the software does not remove content from remote servers. Since new sites appear on the Internet daily, SurfWatch software offers a service that will automatically update the blocked sites, as well as the capability to customize site databases to block according to specific preferences (SurfWatch Software, Inc., 1996). When used in conjunction with PICS standards, these software packages will allow the parent to control what their children will see.

8.2.3 Guidance for Children on the Internet

In addition to site-blocking software packages, there are other alternatives available to parents for the purpose of guiding what their children see on the Internet. A new option, the result of a collaboration of SurfWatch Software and the Yahoo! Internet World Wide Web directory, is a site called "Yahooligans" (unknown[6]). Yahooligans provides a "safe" starting place for children who wish to explore the Internet, as well as a way for parents to download SurfWatch's parental control software at a reduced price. The new site, seen as an excellent way for 8 to 14 year-olds to become familiar with the positive aspects of the Internet, also features a "Stay Street Smart" area which contains tips regarding on-line safety. This new development is just one of many alternatives that the Internet industry and community are creating to make the Internet safer for children.

8.2.4 PICS and TAPs

It is important to note that the same technology that will allow parents to restrict children's Internet access at home can be applied to TAPs, perhaps through the use of a smart card and card scanner system. For example, by configuring the smart card, a parent can define what types of material their child can access on the Internet, so that when a child uses a TAP, the card will be scanned to ensure the blockage of inappropriate sites. Therefore, a child can use a TAP and explore the Internet without being accompanied by an adult, yet still have the necessary adult supervision.

The main purpose of TAPs is to provide public access to computer technology and the Internet; yet, one must also remember that the providers of such a service must be responsible enough to limit the level of access to a fraction of the user population (i.e. children). At this time, it is uncertain as to whether there should be uniformity at all TAP sites or if there should be several different policies for each location a TAP is placed. For example, a stand alone public kiosk may need to have a different policy to determine its level of access than a TAP located in the library, due to the adult supervision that is available from librarians. However, it is clear that such policies are necessary for public support and use of TAP facilities.

The Internet is a global network: control content statutes cannot effectively control the availability of inappropriate material to children. There will always be one or more countries in which one can provide material that is out of the reach of US law or US expression standards. The only effective way to protect children is to encourage the further development of tools that will enable the parent to control their child's on-line exploration based on their own values.

8.3 Public Opinion

What level of access does the public want? Our survey results have found that 80% of the people surveyed felt that minors should have limited access to sites on the Internet, while only 24% felt that adults should have limited access to the Internet. When asked who should decide the standards for limiting minors' access to the Internet, 44% said parents and 15% said government officials, while 14% said community members, and another 14% said the provider of the computer service, with 9% choosing librarians. The remaining 8% of those surveyed felt that no one should determine the level of access individuals should have at public sites.

8.4 Findings and Recommendations

The current government statute, the Communications Decency Act, is too vague to be effective for its intended purpose or to be upheld in a court of law. The On-line Parental Control Act will be an effective piece of legislation; however, it is not likely to be voted on in Congress until the end of 1996 at the earliest. Therefore, for the time being, the public's best option for limiting access to inappropriate Internet resources is the combination of PICS and a content-blocking software package.

The findings from the survey indicate how strongly the people of Allegheny County, and more specifically parents, feel about determining what children see over the Internet. The public feels that adults are responsible enough to choose what they see over the Internet. They do not want to violate the constitutional rights of other adults, yet most were concerned with the explicit material on the Internet that is accessible to children.

After examining the results of the survey, it is clear that restricting children's access to particular sites on the Internet is desired. A combination of PICS standards, a site-blocking software package, and perhaps a smart card/ card scanner system will give the users of TAPs the level of access they are most comfortable with, as well as access that is constitutionally sound.

9. Conclusions and Recommendations

Access to information and computer technology is lacking in Allegheny County. It is important for the people of Allegheny County to obtain this access, so they are not lacking the important information that is becoming increasingly available on computers, and that is necessary in a democratic society. Access to information technology is also essential for future economic opportunity, because more jobs have become computerized. Basic knowledge and proper training in the usage of computers will be a necessity if one is to succeed in the workforce. The cost of the average computer still high enough to make private ownership of one not economically feasible for most Americans and Allegheny County residents. A number of private and non-profit organizations, such as Kinko's, and the Allegheny County Library EIN project have stepped in to try and give Allegheny County residents who do not have their own computer at least some access to computers and the Internet. Unfortunately though, more of these efforts have been slow due to the high costs that can be associated with computing technology. It is suggested that access is increased through more publicly accessible computers.

- Access has been defined as having an awareness of computer resources and the ability to use them. A TAP is, therefore, a geographical location which provides the public with computer access. Through GIS modeling and the CPS data, it was determined that the current state of computer access in Allegheny County is insufficient and that inequities to computer access exist along economic, geographical and racial lines. Using this data it was determined that placement of eight additional TAP locations throughout Allegheny county would serve to remedy this situation.

- It was found from the survey that most residents of Allegheny County have very little hands-on familiarity with computers. Access to computers hardware and software will allow all residents, particularly those who are not able to afford home computers, to improve on their technological skills through direct hands-on use. This access will be beneficial to the residents and to the Allegheny County economy.
- Additional supplements to the current TAPs that can increase this access are kiosks and computer clusters. The machines considered are the PC and Macintosh, with emphasis on Pentium based PCs and Power Macs. The PC, however, provides a wider range of applications and power, and is increasingly becoming as user friendly as the Power Mac, with the new Windows 95. The choice of architecture should be based on cost, power, available applications, and the level of user friendliness desired.
- The survey indicates that a human lead training program is most desirable. In computer clusters that are staffed, the staff person should be qualified for training and helping the people on a one-on-one basis, the option for group classes should also be available. For kiosks the main source of training should be the classes because it would be too expensive to hire a consultant for each location. Other options, such as computer-based or printed tutorials, should also be available for people who cannot attend classes or find a consultant too busy.
- All TAPs needed for adequate access should not be furnished by private organizations because their rates are higher than what the average resident of Allegheny County stated they would be willing to pay. Clusters are cheaper than kiosks in overall costs, and the consultant should provide training for the cluster model because the marginal cost is minimal, since an attendant must be

on-site in this model. Providing the options of printed and on line tutorials add minute marginal costs.

- The results from the survey indicate that the people of Allegheny County feel strongly about determining what children see over the Internet. The current government statute, the Communications Decency Act, is vague, and will probably not be affective for its intended purpose or upheld in a court of law. The On-line Parental Control Act will be an affective piece of legislation; however, it is not likely to be voted on in Congress until the end of 1996. Therefore, for the time being, the public's best option for limiting access to inappropriate Internet resources is the combination of PICS and a content-blocking software package. A combination of PICS standards, a site-blocking software package, and perhaps a smart card/card scanner system will provide the users of the TAPs with their preferred level of access.

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Appendices

A1 Survey Design

In order to determine the public's opinion concerning access to information and computer technology, the following survey was designed to be administered via telephone interviews to randomly selected residents of Allegheny County.

Survey

Please circle the most appropriate response. Phone Prefix _____

1. How often do you use a computer? never _____ hours/day weekly monthly

2. Where have you used computers? home work library other_____

3. How often do you visit public libraries?
never weekly every 1-2 months a few times a year

4. Do you know what the Internet or the world wide web is? yes no

4a. Where did you first learn about the Internet? school friends family work magazines TV other_____

4b. How often do you use the Internet? never daily weekly monthly rarely

5. Would you or your family use computers that were available to the public free of charge?

probably not maybe yes

5a.. Which of the following services do you or your family currently use on a computer ?

5b. Which of the following services do you or your family think you would like to use on a public computer free of charge?

	Use now	Would like to use	Would Not Use	Don't know
Internet	_____	_____	_____	_____
Email	_____	_____	_____	_____
Chat Rooms	_____	_____	_____	_____
Bboards	_____	_____	_____	_____
Library Research	_____	_____	_____	_____
Word Processing	_____	_____	_____	_____
Travel Info	_____	_____	_____	_____
Spreadsheets	_____	_____	_____	_____
Creating Art	_____	_____	_____	_____
Games	_____	_____	_____	_____
Tax Filing	_____	_____	_____	_____
Banking	_____	_____	_____	_____
Shopping	_____	_____	_____	_____

5c. Suppose computers with free public access were available in Pittsburgh. Where do you think would be a convenient place for these computers to be placed. Please list your first and second choice.

libraries schools public buildings (post office) coffee shops

Kinkos other _____

5d. What kind of training would you like to have available for these computers? Please list your first and second choice.

_____person on site _____ on line tutorial

_____books _____ Group classes

6. Do you think there is material on the Internet that should not be accessible to children under the age of 18 from these public sites? Yes No

6a. Do you think there is material on the Internet that should not be accessible to adults 18 and older from these public sites? Yes No

6b. Who should determine what access individuals should have at these public access sites? Please list your first and second choices.

parents community librarians govt. officials provider of the computers no one other_____

7. Approximately how much do you pay per month for the following services?

_____ phone _____ cable TV_____ newspapers _____video rentals

8. How many hours per month do you expect to use the public computers?

_____/month

8a. How much would you be willing to pay per month for access to public computers in Pittsburgh if the access was not completely free?

_____/month

9. Did you know that libraries in Pittsburgh are now starting to offer public computers with free access to the Internet? Yes No

age:_____
Municipality:_____
Zip code: _____
gender:_____
race:_____
approx. household income: less than $10,000
$10,000 - $50,000
above $50,000

education level of household adults:_____

Question Design

The questions on this survey were developed based on class discussion, and research areas suggested by guest speakers. The questions were designed as closed-end questions so as to facilitate answering the questions.

Pre-Testing

The survey was pre-tested on five randomly selected adults, as well as by all class members. Four of the random pre-tests were administered face to face while the fifth was administered via the telephone. The pre-tests helped to clarify and shorten the survey questions so as to include only those questions that pertain directly to the goals of this project.

Sample Space

All survey participants were randomly selected using demographically chosen phone prefixes, and randomly generated numbers to follow the prefixes.

The survey population was designed to approximate the racial demographics of the entire population of Allegheny County. The 264 telephone prefix, encompassing the Coraopolis area, and the 681 Pittsburgh telephone prefix were selected for the survey sample using Geographical Information Systems because their combined demographics were similar to those of Allegheny County. The racial mix of our completed survey population did successfully approximate that of Allegheny County (see Figures A1-1 and A1-2).

The last four digits of the phone numbers were randomly generated using Excel's Random Number Generator tool. The numbers were generated as uniform random variables with a lower bound of 1000 and an upper bound of 9999.

455 random phone numbers were called, with successful interviews completed with 66 respondents.

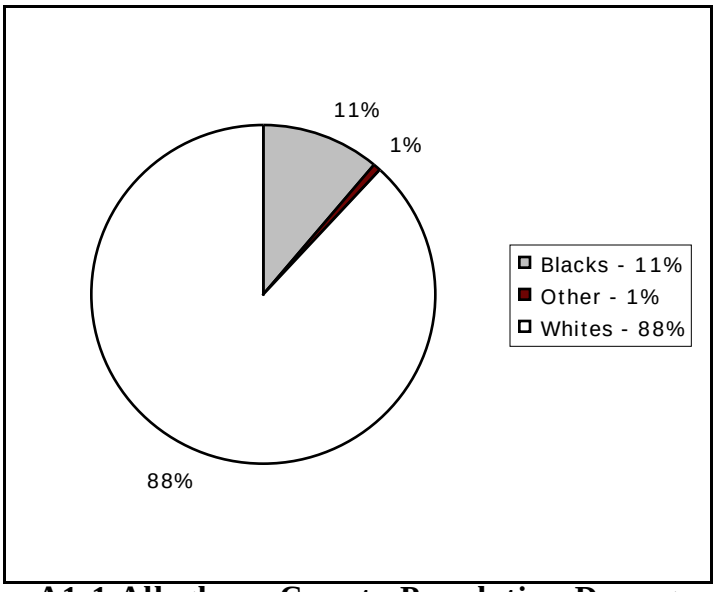

Figure A1-1 Allegheny County Population Demographics

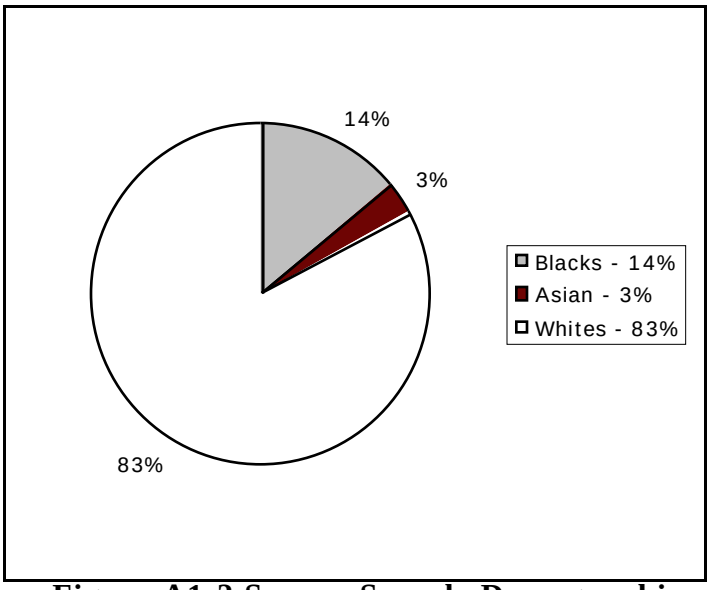

Figure A1-2 Survey Sample Demographics

Anonymity

The respondent's anonymity was maintained by the use of randomly generated phone numbers, and by avoiding obtaining the respondent's name during the administration of the survey.

A2 GIS Model

A Geographic Information System (GIS) model for Allegheny County was built and used as an analysis tool for this project. The software used is MapInfo Professional. The purpose of using a GIS for this project is that a GIS serves an efficient and illustrative way to describe and organize information that is attributable to geographic locations. The majority of our data is geographic and demographic, thus the GIS for this project has evolved very naturally.

The GIS has been used to draw conclusions that are important to this report, and it has been referenced in many of the chapters and sections of this report. The purpose of this section is to provide a more detailed description of the GIS model that was used by describing two examples of how data may be presented using the GIS model.

Example 1

Figure A2-1 is an example of how we have used MapInfo to organize data about the libraries participating in the EIN project. Each library marker is associated with a row in a spreadsheet that contains information specific to that library (i.e. address, population served, etc.). When a user clicks on a particular marker an information box appears that displays all of the information. This is the first of two ways we have chosen to represent data from our research.

Example 2

The second way data can be presented in MapInfo is through "thematic objects." Figure A2-2 illustrates how pie charts can be used as thematic objects to show the racial composition of Allegheny County. The data were taken from the 1990 census information.

The GIS model has provided us with a powerful analysis tool. It allows us to compare data that we have collected on Internet access in Allegheny County with demographic information from the 1990 census. We also use the GIS to develop an algorithm to predict home computer usage in Allegheny County. A great number of the conclusions we were able to draw form our research stem from the GIS model we have built.

We have included the following data in the GIS:

1. All current TAPs in Allegheny County
    - Libraries Participating in the EIN Project
    - Knowledge Connection Sights
    - Common Knowledge Sights
    - Seniors On-Line Sights
    - Locations of Kinko's Copies

2. 1990 Census Information
    - Age
    - Sex
    - Race
    - Income levels

3. Expected home computer usage density

This information was generated by an algorithm that relates national figures and trends to those of Allegheny County. The factors considered in the algorithm are race, age, income level, and education level.

The results and conclusions drawn from using the GIS model can be found in Chapters 2 and 5.

A3 Cost Model

This simple cost model is used to compare the costs of different alternatives for implementing new TAPs. This model is dependent on several individual factors. The total cost (T) is dependent on installation costs (I), initial system costs (S), maintenance/security costs (M), power or utility costs (P), telecommunications costs (Te), and training costs (Tr).

$$T=I+S+M+P+Te+Tr \quad (A3.1)$$

This total cost (T) is compiled on a yearly basis starting at year zero and ending at year ten (assuming a ten-year project duration).

P, Te, Tr, I, S and M can be broken down even further. P, Te, I, S and M are calculated for both the cluster model and the kiosk model in Tables A3-1 and A3-2. The power costs (P) involved the power of the individual systems and the power for the housing of the systems namely the power costs for the office space of the cluster model. Telecommunications costs (Te) are monthly recurring charges associated with dial-up or leased-line access to provide Internet connectivity. The cluster model includes a package for Internet access via a dedicated T1-speed leased line, while the kiosk model is configured with ISDN dial-up access. Installation costs (I) involve the startup costs for installing networking and communications hardware. Initial systems costs (S) comprise of the basic hardware needed for the system. The kiosk model entails the individual kiosk itself presuming that the kiosk already has a built in software package. The cluster model entails not only the computer and a basic software package, but also desks, chairs, and wiring for the entire cluster. The final cost component is the maintenance cost (M). This cost entails both the maintenance and security for the individual systems. Both models

have the same maintenance cost, but the kiosk system already has the security costs included in the initial systems cost. The cluster model must have a security system, such as a card key security system. In Figure A3-3 the costs of implementing training programs are examined. These costs are calculated from the four training options discussed in Chapter 6. Finally, administrative costs and housing costs are excluded from the model. These costs are dependent on the geographical placement of the systems, and can vary considerably in the county. Note that all costs are in 1996 dollars. Since the model is meant to provide only an order of magnitude estimate of the system costs, no adjustments have been made for inflation and depreciation.

System Cost Model - Clusters			
Number of Clusters	8		
Number of Computers/Cluster	10		
Total Number of Computers	80		
Number of Years	10		
Installation	Unit	Unit Cost	Total Cost
Network hardware/T1 installation (Year 1)	per cluster	$2,595	**$20,760**
Initial System Costs			
computer hardware	per computer	$1,750	$140,000
basic software package	per computer	$500	$40,000
desk and chair	per computer	$525	$42,000
wiring	per cluster	$200	$1,600
Total System Costs (Year 1)			**$223,600**
Telecommunications			
Leased Line + ISP charges (10 years)	per cluster per month	$1,405	**$1,348,800**
Security and Maintenance			
Maintenance Parts	per computer per year	$300	$240,000
Maintenance technician salary	per technician per year	$35,000	$1,120,000
Security	per year	$2,000	$20,000
Total Security and Maintenance Costs (10 yrs)			**$1,380,000**
Utility			
Average computer power usage (kW per hour)	0.08		
Average computer power usage (10 years)	7008		
Total power consumption (10 years)	560640		
Electricity rate	per kWh	$0.17	$95,309
Lighting, heating, air-conditioning	per cluster per month	$116	$111,360
Total Utility Costs (10 years)			**$206,669**
System Upgrade Costs (in Year 5)			**$223,600**
Total System Cost (10 years)			**$3,403,429**

Figure A3-1 Cluster Costs

System Cost Model - Kiosks			
Number of Kiosks	80		
Installation	Unit	Unit Cost	Total Cost
ISDN installation package	per kiosk	$470	**$37,600**
Initial System Costs			
kiosk system	per kiosk	$13,000	**$1,040,000**
Telecommunications			
subscription fee	per kiosk per year	$234	$187,200
usage based charge	per kiosk per year	$5,990	$4,792,000
$0.04/minute (peak)			
$0.02/minute (off-peak)			
assume 8 hours usage per day			
Total telecommunications Costs (10 years)			**$4,979,200**
Maintenance			
Maintenance Parts	per kiosk per year	$300	$240,000
Maintenance technician salary	per technician per year	$35,000	$1,120,000
# technicians needed	3.2		
Total Maintenance Costs (10 yrs)			**$1,360,000**
Utility			
Average kiosk power usage (kW per hour)	0.08		
Average kiosk power usage (10 years)	7008		
Total power consumption (10 years)	44851		
Electricity rate	per kWh	$0.17	$7,625
Total Utility Costs (10 years)			**$7,625**
System Upgrade Costs (in Year 5)			**$1,040,000**
Total System Cost (10 years)			**$8,464,425**
Average Cost Per Kiosk	$105,805		

Figure A3-2 Kiosk Costs

Training Cost Model - 10 Year Programs			
Number of Clusters	8		
Number of Computers/Cluster	10		
Total Number of Computers	80		
Number of Kiosks	80		
Option 1: One-on-one (cluster only	Unit	Unit Cost	Total Cost
instructor salary (annual)	per instructor	$25,000	**$4,000,000**
# of instructors needed	16		
Option 2: Group Training			
training session costs	per session	$85	**$884,000**
# of sessions	10400		
Option 3: Online Tutorial			
tutorial software	per computer	$125	**$20,000**
Option 4: Printed Tutorial			
printed tutorial cost	per computer	$50	$8,000
replacement cost	per year	$1,250	$12,500
Total cost			**$20,500**
Option #2 + Option #3			
Initial Cost	$20,000		
Yearly Costs	$88,400		
Option #2 + Option #4			
Initial Cost	$20,500		
Yearly Costs	$88,400		
Option #1 + Option #3			
Initial Cost	$20,000		
Yearly Costs	$400,000		
Option #1 + Option #4			
Initial Cost	$20,500		
Yearly Costs	$400,000		

Figure A3-3 Training Costs

A4 Program Sites and Kiosk Vendors

Common Knowledge Affiliated Schools

CAPA High School
Colfax Elementary School
Fulton Elementary School
Madison Elementary School
Miller Elementary School
School Schenley High School
Taylor Allderdice High School
A. Leo Weil Elementary School
Carrick High School
East Hills Elementary School
Liberty Elementary School
McKelvy Elementary School
Phillips Elementary
Spring Hill Elementary School
Vann Elementary School
Westinghouse High School

Knowledge Connection Sites

Burns Heights
3-G Burns Heights
Duquesne, PA 15110
Jennifer Hawkin, Melvin Hays (466-4791)

Hawkins Village
Building 37 - Right Basement
Rankin, PA 15104
Aaron Coleman (271-8238)

Hays Manor
19-A Locust St, Hays Manor
McKees Rocks, PA 15136
Eva Malesnick, Portia Glenn (771-7933)

McKees Rocks Terrace
19-J Mc Kees Rocks Terrace
McKees Rocks, PA 15136
Toni Schuler (331-1120)

Mon View Heights
1A Midway Dr.
West Mifflin, PA 15122
Debbie Haye (462-3793)

Kiosk Vendors

Capitol City Kiosk Solutions
MicroTouch
OnRamp Kiosks
Real Time Enterprises, Inc.
First Wave, Inc.
Olivetti
Pixelmedia Group
Syntropy Corporation

A5 Legislation on Extent of Access

A5.1 The Telecommunications Act of 1996 (CDA Provision)

SEC. 410. PROTECTION OF MINORS AND CLARIFICATION OF CURRENT LAWS REGARDING COMMUNICATION OF OBSCENE AND INDECENT MATERIALS THROUGH THE
USE OF COMPUTERS.

(a) PROTECTION OF MINORS.

(1)GENERALLY. -- Section 1465 of title 18, United States Code, is amended by adding at the end the following:

"Whoever intentionally communicates by computer, in or affecting interstate or foreign commerce, to any per son the communicator believes has not attained the age of 18 years, any material that, in context, depicts or describes, in terms patently offensive as measured by contemporary community standards, sexual or excretory activities or organs, or attempts to do so, shall be fined under this title or imprisoned not more than five years, or both.". .

(2) CONFORMING AMENDMENTS RELATING TO FORFEITURE. --

(A) Section 1467(a)(1) of title 18, United States Code, is amended by inserting "communicated," after "transported,".

(B) Section 1467 of title 18, United States Code, is amended in subsection (a)(1), by striking "obscene".

(C) Section 1469 of title 18, United States Code, is amended by inserting "communicated," after "transported," each place it appears.

(b)CLARIFICATION OF CURRENT LAWS REGARDING COMMUNICATION OF OBSCENE
MATERIALS THROUGH THE USE OF COMPUTERS. --

(1) IMPORTATION OR TRANSPORTATION. -- Section 1462 of title 18, United States Code, is amended

(A) in the first undesignated paragraph, by inserting "(including by computer) after "there of"; and

(B) in the second undesignated paragraph

(i) by inserting "or receives," after "takes";
(ii) by inserting ", or by computer," after "common carrier"; and
(iii) by inserting "or importation" after "carriage".

(2) TRANSPORTATION FOR PURPOSES OF DISTRIBUTION. The first undesignated paragraph of section 1465 of title 1~, United States Code, is amended

(A) by striking "transports i~" and inserting "transports or travels in, or uses a facility or means of,";

(B) by inserting "(including a computer in or affecting such commerce)" after "foreign commerce" the first place it appears; and

(C) by striking ", or knowingly travels in" and all that follows through "obscene material in interstate or foreign commerce," and inserting "of".

SEC. 411. ONLINE FAMILY EMPOWERMENT.

Title II of the Communications Act of 1934 (47 U.S.C. 201 et seq.) is amended by adding at the end the following new section:

"SEC. 230. PROTECTION FOR PRIVATE BLOCKING AND SCREENING OF OFFENSIVE
MATERIAL; FCC REGULATION OF COMPUTER SERVICES PROHIBITED.

"(a) FINDINGS. The Congress finds the following:

"(1) The rapidly developing array of Internet and other interactive computer services available to individual Americans represent an extraordinary advance in the availability of educational and informational resources to our citizens.

"(2) These services offer users a great degree of control over the information that they receive, as well as the potential for even greater control in the future as technology develops.

"(3) The Internet and other interactive computer services offer a forum for a true diversity of political discourse, unique opportunities for cultural development, and myriad avenues for intellectual activity.

"(4) The Internet and other interactive computer services have flourished, to the benefit of all Americans with a minimum of government regulation.

"(5) Increasingly Americans are relying on interactive media for a variety of political, educational, cultural, and entertainment services.

"(b) POLICY. It is the policy of the United States

"(1) promote the continued development of the Internet and other interactive computer services and other interactive media;

"(2) preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by State or Federal regulation;

"(3) encourage the development of technologies which maximize user control over the information received by individuals, families, and

schools who use the Internet and other interactive computer services;

"(4) remove disincentives for the development and utilization of blocking and filtering technologies that empower parents to restrict their children's access to objectionable or inappropriate online material; and

"(5) ensure vigorous enforcement of criminal laws to deter and punish trafficking in obscenity, stalking, and harassment by means of computer.

"(C) PROTECTION FOR 'GOOD .SAMARITAN' BLOCKING AND SCREENING OF
OFFENSIVE MATERIAL. --No provider or user of interactive computer services shall be treated as the publisher or speaker of any information provided by an information content provider. No provider or user of interactive computer services shall be held liable on account of

"(1) any action voluntarily taken in good faith to restrict access to material that the provider or user considers to be obscene, lewd, lascivious, filthy, excessively violent, harassing, or otherwise objection able, whether or not such material is constitutionally protected; or

"(2) any action taken to make available to in formation content providers or others the technical means to restrict access to material described in paragraph (1).

"(d) FCC REGULATION OF THE INTERNET AND OTHER INTERACTIVE COMPUTER
SERVICES PROHIBITED. Nothing in this Act shall be understood or construed to give the Commission the power of censorship over the content of the Internet or other interactive computer services. Nothing in this act shall be understood or construed to give the Commission the power to regulate the prices or rates of interactive computer services.

"(e) EFFECT ON OTHER Laws.

"(1) NO EFFECT ON CRIMINAL LAW. Nothing in this section shall be construed to impair the enforcement of section 223 of this act, chapter 71 (relating to obscenity) or 110 (relating to sexual exploitation of children) of title 18, United States Code, or any other Federal criminal statute.

"(2) NO EFFECT ON INTELLECTUAL PROPERTY LAW. Nothing in this section shall be construed to limit or expand any law pertaining to intellectual property.

"(3) IN GENERAL. Nothing in this section shall be construed to prevent
any State from enforcing any State law that is consistent with this section.

"(f) DEFINITIONS. As used in this section:

"(1) INTERNET. The term 'Internet' means the international computer network of both Federal and non-Federal interoperable packet switched data networks.

"(2) INTERACTIVE COMPUTER SERVICE. The term 'interactive computer service' means any information service that provides computer access to multiple users via modem to a remote computer server, including specifically a service that provides access to the Internet.

" (3) INFORMATION CONTENT PROVIDER. The term 'information content provider' means any per son or entity that is responsible, in whole or in part, for the creation or development of information provided by the Internet or any other interactive computer service, including any person or entity that creates or develops blocking or screening software or other techniques to permit user control over offensive material.

"(4) INFORMATION SERVICE. The term 'information service' means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available in formation via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.".

http://www.cdt.org/policy/freespeech/exon_111795.html

A5.2 Online Parental Control Act (proposed)

104TH CONGRESS

H.R.

_____

2D SESSION

_____

IN THE HOUSE OF REPRESENTATIVES
Ms. ESHOO (for herself,) introduced the following bill; which was referred to the Committee on

_____

A BILL

To amend the Communications Act of 1934 in order to provide parents with greater control of their children's access to online material.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Online Parental Control Act of 1996".

SEC.2. SUBSTITUTION OF HARMFUL TO MINORS FOR INDECENCY STANDARD.

(a) DIRECT COMMUNICATIONS.-Section 223(a)(1)(B) of the communications Act of 1934 (47 U.S.C. 223(a)(1)(B)) is amended by striking "indecent" and inserting "harmful to minors".

(b) INDIRECT COMMUNICATIONS.-Section223(d)(1) of such act is amended to read as follows:

"(1) in interstate or foreign communications knowingly-

"(1) uses an interactive computer service to send to a specific person or persons under 18 years of age, or

"(B) uses any interactive computer service to display in a manner available to a person under 18 years of age,

any comment, request, suggestion, proposal, image, or other communication that is harmful to minors, regardless of whether the user of such service placed the call or initiated the communication; or".

(c) DEFINITION OF HARMFUL TO MINORS.-SECTION 223(h) of such Act is to amended by adding at the end the following new paragraph:

"(6) HARMFUL TO MINORS.-The term "harmful to minors' means sexually explicit matter which meets all of the following criteria:

"(A) Considered as a whole, the matter appeals to the prurient interest of minors.

"(B) The matter is patently offensive as determined by contemporary local community standards in terms of what is suitable for minors.

"(C) Considered as a whole, the matter lacks serious literary, artistic, political, educational, or scientific value for minors".

SEC. 3. PROTECTION FOR PRIVATE BLOCKING AND SCREENING MATERIAL.

(a)PROTECTION FROM FEDERAL COMMUNICATIONS INDECENCY LAW.-Section 223(e)(5) of the communications Act of 1934 (47 U.S.C. 223(e)(5)) is amended-

(1) by striking "or" at the end of subparagraph (A);

(2) by striking the period at the end of subparagraph (B) and inserting a semicolon;

(3) by adding at the end thereof the following new subparagraphs:

"(C) has in good faith-

"(i) labeled such communications as inappropriate for minors,

"(ii) placed such communications in a segregated access site identified as inappropriate for minors, or

"(ii) otherwise established a mechanism,

and that labeling, segregation, or other mechanism enables such communications to the automatically blocked or screened by software or other capabilities reasonably available to responsible adults wishing to effect such blocking or screening, and has not otherwise solicited minors not subject to such screening or blocking capabilities to access the communications or to circumvent any such screening or blocking; or

"(D) has in good faith, installed or provided some other device, system, or method that serves the function of allowing adults to prevent access to such communications by minors and that is reasonable, effective, and appropriate as a method described in subparagraph (A), (B), or (C) in the preventing such access.".

(b) PROTECTION FROM STATE LAW.-Section 230(c) of the Communications Act of 1934 (47 U.S.C. 230(c)) is amended by adding at the end thereof the following new paragraph: "(3) PROTECTION FOR MAKING AVAILABLE PA-

RENTAL CONTROL TECHNOLOGY..-No provider or user of an interactive computer service, information content provider, or access software provider shall be held civilly or criminally liable for making available to a minor a communication that is indecent or harmful to minors if such provider or user has taken an action that qualifies as a defense under subparagraph (A), (B), (C), or (D) of section 223(d).".

A6 Glossary

486 - Economy Intel-based micro-processor currently on the market. Much slower than the newer Pentium processor.

ATM - Automatic Teller Machine. Commonly found in banks or busy commercial areas (i.e. malls, grocery stores, etc.) and is used for bank transactions such as withdrawal, deposit, balance inquiry, and many other services.

Bit - Smallest unit of data. A boolean value (i.e. is either one or zero).

Byte - Composed of 8 bits. A byte can also be construed as a character of data (i.e. the word, "cat", is composed of 3 characters, or 3 bytes.

GIS - Graphical Information System. An analysis tool used for this project which serves as an efficient way to describe and organize information that can be found using geographic locations. Software that is used is MapInfo Professional.

Internet - Currently the largest network of computers in existence. Was originally conceived as a defense project and called ARPAnet in 1969, and later institutionalized in academia through the National Science Foundation's NSFnet.

Internet Connection - A channel of information that connects a computer to the Internet. Internet connections can come in the form of phone lines, coaxial cable lines, or even cellular channels.

Internet Service Provider - These are vendors who allow users to access the Internet, usually through modem dial-up connections, for a monthly fee.

ISDN - Integrated Services Digital Network, an all-digital transmission medium designed for voice and data transfer at speeds up to 128 Kbps. Has the added functionality of being split to run both voice and data transfer simultaneously at a sacrifice of only being able transmit data at 64 Kbps. If you say a page of text has roughly 1840 characters, a full data-only ISDN connection can transfer roughly 8.7 pages of text per second.

Kbps - Kilobits Per Second, the rate of transfer of data across a communication channel in thousands of bits per second.

Macintosh - A personal computer made by Apple, and also uses either a Motorola 68XXX or PowerPC microprocessor.

Modem - Modulator/Demodulator. This device acts as the mediator between a computer and a telephone line, converting digital to analog signals and vice versa. The reason the extra hardware is needed is because the present-day phone system still uses twisted pair copper wire and analog signals and computers need to use digital 1's and 0's.

Mbps - Megabits Per Second, the rate of transfer of data across a communication channel in millions of bits per second.

PC - Generally a personal computer, but in this report considered any personal computer running a Intel microprocessor and a Microsoft DOS/Windows based operating system.

Pentium - The entry-level processor for many Intel/DOS/Windows based personal computers on the market right now. Significantly faster than the 486 chip.

RAM - Random Access Memory. This is the piece of hardware that generally acts as a 'scratch pad' for the computer, and effectively dictates the amount of work the processor can do at one time. The more RAM one has, the bigger area one has to work with.

TAP - Technology Access Point. See Chapter 2.

T(n) - A US standard of all-digital multiplexed fiber optic transmission medium. The most common formats are T1 and T3, and the standard discussed in this report is T1, which is capable of transmission speeds of 1.54 Mbps. This is roughly equivalent to 105 pages of text transmitted per second.

URL - Uniform Resource Locator. This is the address one uses to access WWW pages. A common example would be http://www.lycos.com which will point you to a popular web search engine.

User Consultant - Staff person in charge of a public computer cluster. Possible responsibilities may include maintaining the computers or helping users out with general questions.

User Interface - The method of input for the computer. When considering a kiosk, the user interface would generally boil down to a touch-screen or keyboard *user interface*.

WWW - World Wide Web. This is a graphical interface to the Internet, and essentially makes all the various services (FTP, Gopher, Telnet, etc.) easier to use by using a point-and-click interface. Originally created at the CERN European Laboratory for Particle Physics in 1990.