THE DIGITAL DIVIDE

FIELD HEARING

BEFORE THE

SUBCOMMITTEE ON EMPOWERMENT

OF THE

COMMITTEE ON SMALL BUSINESS
HOUSE OF REPRESENTATIVES

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THE DIGITAL DIVIDE

TUESDAY, APRIL 25, 2000

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON EMPOWERMENT,
COMMITTEE ON SMALL BUSINESS,
Washington, DC.

The subcommittee met, pursuant to call, at 10 a.m., at the Carson City Council Chambers, Carson City Hall, 701 East Carson Street, Carson, CA, Hon. Bono, Chairwoman of the Subcommittee presiding.

Ms. BONO. Good morning.

I'd like to begin and call this hearing to order. Today the House Subcommittee on Empowerment is convening to discuss issues surrounding "The Digital Divide."

We're in a very exciting time in our history where we can move information faster than ever before, and buy and sell products and services electronically saving time and creating certain efficiencies.

Not only has the Internet provided new opportunities in business, but the Internet has also allowed teachers and students a whole new world of options in education. However, there are sectors of our society that are not being given access to this new economy and the information super highway.

A study that was released by the Commerce Department's National Telecommunication and Information Administration finds evidence of a widening digital divide. Data from the studies show significant differences between those groups with access to the basic components of e-commerce, personal computers, telephones and Internet service providers.

Many solutions have been suggested to address the digital divide and the possible socioeconomic repercussions. However, I believe that we must encourage companies and nonprofits across the country to bring digital opportunities to our communities. Community and nonprofit groups are best equipped to address the specific issues affecting our areas and play an integral in partnering with computer and telecommunications firms.

While I believe that all Americans should benefit from the progress being made in this new economy, we must look at nongovernmental ways to provide Internet access. As well as looking at innovative access ideas for access, we also need to provide these under served areas with training and education into the possibilities that lie within this new economy. Not only do careers in the growing field of information technology pay significantly more than average private sector wages, but distance learning and small busi-

ness opportunities on the Internet are growing at an exponential rate.

While we are seeing that Americans as a whole are advancing with respect to Internet connectivity, problematic issues remain. Some socioeconomic groups consistently fall below the national average with respect to access to the tools of the information age. The study reports that minority, low income, rural, tribal and single parent households are less likely to have access to electronic resources.

Every indication shows that we are moving from a paper-base society to an electronic one where business-to-business and government-to-business transactions occur over the Internet with increased frequency.

As we head in this direction, the personal computer paired with Internet access will be the most basic of tools for tomorrow's business and families.

As opportunities in the high tech industries grow, the need for access and education of the area's information technology has become apparent, and therefore developing ways to bring technology to under served communities will ensure that more people have access to electronic resources and that every American has the ability to prosper from the opportunities associated with the future of technology.

Increased access to technology, coupled with proper instruction, enhances the possibility that those who are currently not computer and internet proficient will come to embrace these resources.

On that note, I would like to recognize my distinguished colleague, Ms. Millender-McDonald for her opening statement.

Ms. MILLENDER-MCDONALD. Thank you so much, Congresswoman Mary Bono from the great area of Palm Springs in this great state of California. She has really excelled in leadership on the full Committee on Small Business, and I am happy to welcome her here to the 37th Congressional District and to the city of Carson, a city that was dubbed the most diverse city in the nation by the "Christian Monitor" last year.

Let me welcome all of you. Now those who are participating here today so that when you come to us, you will come and come through the gate, sit here at the desk so that you can be comfortable in presenting your particular issue of importance and letting us know exactly your feelings about this digital divide and e-commerce. We will begin talking about digital divide the first part of the hearing and then e-commerce toward the end.

All of these are important to small businesses, because after all, you need to know what work force you have out there available to job training and those who are in K through 12, what type of training they are getting in order to close this gap called digital divide.

I would like to also thank those of you who have come out this morning. It is very difficult to readjust schedules in the middle of the week, and so we appreciate your coming out because it's indeed a digital world that we have out there and it is moving very rapidly at a breathtaking pace. And, so it's important that you also understand the importance of how this digital world and digital knowledge will impact you.

I would like to thank the Chairman in his absence, Joe Pitts, whom I work side-by-side with the House and on the Subcommittee on Empowerment. It was he who was very sensitive in bringing that the whole definition of digital divide to this committee. And so, he is out of Pennsylvania. We would recognize that Members are all over trying to do the work of their districts, and so he's unable to come, but we appreciate his sensitivity and his acceptance of our request, both Mary and mine, upon our request to have these field hearings in our districts.

I would like to thank the staff who is here today and has traveled from Washington, as well as staff who is here with us in the District.

We first have Harry Katrichis. He is counsel to us in the House.

We also have Dwayne Andrews, who is staff counsel to us.

And, we have a Michael Day, who is the minority staff resident counsel to us.

These three men are always on the dais with us when we are holding hearings to ensure that what we have before us is exactly what we need to have, and any comments that we need to make, they're there to reply to those for us.

We have our local district office on the dais, Jennifer Payne, who is legislative assistant to the Congresswoman Mary Bono. And I have to my right Imani Brown, who is my chief deputy here with me today.

So we welcome all of you're here to Carson, the city of Carson. In the South Bay we have recognized the diversity in this area. It is the most diverse area in the state of California. All around us here we have, there's eighty-seven languages that are spoken throughout the state of California; we have about 80 of them right here in the South Bay area. And so diversity is very keen, and key to us here.

As we look at diversity we find ourselves looking at this so-called digital divide and how is it affecting those of us who are down here in the southern California region, especially the South Bay in dealing with that.

Today we will hear from experts who will tell us about this digital divide and how it is really absolutely widening. Unless we do something about it, it will absolutely create an impact for the work force in the twenty-first century. The work force in the twenty-first century will not look like the work force of twentieth century; there will be more minorities, more women making up this work force. Therefore, we must ensure that minorities, women and others have access to this information age, this internet, these myriad of programs that we have already. We know them; America Online, Americorp, IBM, Netscape and Microsoft, just to mention just a few of those companies now that are looking at this whole digital and e-commerce era and is trying to see how they can close this gap on digital divide.

And so I'm very happy to have you come out today. And for my colleague, Mary Bono, to come, traveling from Palm Springs to come here, and I know how difficult it is. When we came back to the districts a couple of weeks ago, or last week I should say, we're here for 2 weeks but our schedules are really loaded. And I'm just most appreciative to her coming this way and then tomorrow I go

her way. So I will be in the Palm Springs area as she convenes her hearing.

So again, Madame Chair, thank you so much for being here, and we will begin the hearing. Thank you.

Ms. BONO. I will thank the gentle lady for her kind remarks. I am here and tomorrow you will be Mecca, not the Palm Springs area.

Ms. MILLENDER-MCDONALD. All right. It's Mecca that I'm traveling to, all right.

Ms. BONO. But I also want to commend you. It has been a pleasure working with you in my 2 years that I've been in Washington, and I am proud of you and pleased to call you not only my colleague, but my friend. So, I'm happy to be here.

If we could call upon the first panel to take their seats, we'd like to begin with the testimony.

Given that this is a field hearing, it's not quite as structured as it would be in Washington, and I think we enjoy it this way a little bit more, but I don't have name tags in front of you to identify which of you is who. So, as I call out your names, if you could just raise your hand briefly, we'll dispense with introductions that way. It's something my children do in second and sixth grade. But I don't see any better way.

Francisco Mora, co-author of "Online Content for Low-Income and Underserved Americans." Okay.

Dr. Warren Ashley, Director of Distance Learning, Cal State University, Dominguez Hills.

And, Dr. Jack Sutton, Executive Officer, UCLA Outreach Steering Committee.

All right. If we could remind you to keep your remarks somewhere around 5 minutes, we would appreciate it.

We will begin with Francisco Mora.

STATEMENT OF FRANCISCO MORA, CO-AUTHOR "ONLINE CONTENT FOR LOW-INCOME AND UNDERSERVED AMERICANS"

Mr. MORA. I thank you for inviting me to this partnership to present our findings on our report about on line content for low income and underserved Americans.

We conducted this study because we have seen that as access continues to grow and, that has not been resolved yet, but as access continues to grow there is more need for online content that meets the needs specifically of under served and low-income Americans.

And, so, we conducted a year long study about this kind of content. We spoke to focus groups, hundreds of focus groups, we interviewed hundreds of experts and we also conducted a web analysis of over a thousand sites targeted to this audience. And out of those sites we found major, major gaps in the kind of information that users said they want.

Now, the kind of information that they said they want; they want local jobs that are applicable to them. They also want literacy improvement tools on the Internet. They want information at basic literacy levels; there are 44 million Americans who are functionally illiterate in the United States today. And they also want content for non-English speakers. And in addition, they want content

geared more to their culture and appropriate to their cultural practices and needs.

And out of this analysis we found that less than 1 percent of the information that we looked at meets these needs in terms of local jobs, local housing, limited literacy content, multilingual content and cultural content. Less than 1 percent of the Internet serves these needs.

And this has a huge implication, because without content there is no real access. There is no value on the Internet for these populations to go online.

And we've also learned from—these figures come from the U.S. Department of the Commerce study "Falling Through the Net," that 25 percent of Americans who earn between $10,000 and $14,000 are more likely to use the Internet for job searching in comparison to 12 percent of Americans earning $75,000 or more.

In terms of online courses and online learning, 45 percent of Americans earning between $10,000 and $15,000 are more likely—will use the Internet to learn and study online, whereas only about 35 percent of Americans earning $75,000 or more will use it that way.

So, clearly if information is online under served Americans will use it.

And in addition to identifying these major gaps in terms of content, we provide some solutions in this report. Some of the solutions recommend to empower the communities to use the information that already exists by identifying and training how to collect information and create information that is useful to them.

We also recommend to provide information technology training for low income users and community leaders so they can develop content locally.

In addition, we recommend more research. Our study is really the first ever looked at online content. And we recommend to conduct more market research on low income users and also to provide venture capital to create micro enterprises in underserved communities. That's a recommendation to look at money in a new way; to deploy money more for e-commerce solutions in underserved communities and really look at it as social venture capital.

Finally, we recommend to invest in a nationwide network of community technology centers as hubs to help residents produce and use relevant content. These community technology centers are found in libraries, stand alone centers, schools and the like.

And, that provides a review of the report. Thank you very much.

[Mr. Mora's statement may be found in appendix.]

Ms. BONO. Thank you.

Next, we'll have Dr. Warren Ashley.

STATEMENT OF DR. WARREN ASHLEY, DIRECTOR, DISTANCE LEARNING, CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS

Mr. ASHLEY. Good morning. My name is Warren Ashley, Dr. Warren Ashley. I am the Director of the Center for Mediated Instruction and Distance Learning at California State University Dominguez Hills.

Ten years ago our university made a major commitment to distance learning. Five years we were the first university to offer a complete graduate degree, a Master of Science in Quality Assurance, over the Internet. Today we offer six degrees programs and five certificate programs that can be completed without ever coming to our campus. Three years ago "Forbes" magazine included Dominguez Hills in their list of the top 20 cyber-universities. In January 1999 we were the first university to begin broadcasting live, interactive classes over the Internet.

Technology has developed so rapidly it is easy to forget but for the general public, the Internet is only five years old. Like all new technologies there is a lag between the early adopters and those who are slower to use the Internet. Many times this distinction between early adopters and later groups has been economic.

Initially this was true for the Internet, but that may no longer be the case. Last week an advertisement for a local electronics store, which shall go nameless, offered consumers a 500 MHz PC with 32 MB RAM and a 17 inch monitor for $129.00. This was after rebates. $49.00 if you were to get the color printer to go with it. This is less than half what my parents paid for the electric typewriter which they gave me as a high school graduation present in 1960. Some companies are even offering free computers to consumers to will sign a contract for internet service.

Software used to be an expense but the computer that was advertised for $129 comes with Windows 98 and Sun Star Office. Internet service was also an additional cost, but now there are a number of companies who provide free internet access. One of the newest entries into the free Internet market is bluelight.com from K–Mart. And, if you live close enough to your phone company's switching office, you can even get free broadband service from freedsl.com.

Free Internet services are underwritten by advertising, but that's also true for commercial television and much of our print media. Companies are willing to pay to have their messages on your computer screen. They are also afraid that if they don't provide the services, someone else will.

What then is holding people back from this technology? Why have cell phones become commonplace in neighborhoods where few homes have a computer? People get cell phones when they begin to feel they needed a cell phone to do business and stay in touch with their friends. Many of these people do not feel they need the Internet to do business and stay in touch with their friends.

And, to some extent this is true even at our university. Most of our students cannot get through a day without using a computer and going on the Internet, but there are some who do not feel the need and have never logged on.

Over the years university communities were formed and meetings were held to find a way that would ensure that no student, graduated from Dominguez Hills without a basic understanding of computer applications and Internet technology. Suggestions ranged from a mandatory one-unit technology course to an Internet component for every syllabus. Fortunately, none of these solutions were ever implemented.

This summer, however, we are installing an application that will automatically create websites for every student, twelve thousand

students, every faculty member and every course in the class schedule. When a student or a faculty member goes to their website they will find links to all of their classes. They will also find news about campus events and links to campus services. Now even if only a fraction of the faculty use the class websites as part of their instruction in the fall, we will have created a virtual community and all students will feel the need to be online.

The same principles apply in business, government and society. Businesses should be subsidizing online training for their employees. We know from our experience that when businesses do subsidize, employees will take the on-line training. Municipal and county governments should be putting all of their forms and as many of their activities as possible online. Schools should begin using the Internet for communicating with parents and the community.

Parents should be able to go a website and find out exactly what the homework is that night. Civic organizations should be encouraged to use the Internet for virtual meetings and online events. Libraries should be given even more equipment and greater bandwidth for public access to the Internet.

In Palm Springs, they—Palm Springs Library created a virtual university. They will be listing courses from Cal State Dominguez Hills, on-line courses from Cal State Dominguez Hills. And finally, commerce on the Internet should be encouraged to the fullest extent possible.

Because, when people feel they need that they need the Internet to do business and stay in touch with their friends they will get the equipment and they will get the access, and they will get any help they need to use this technology.

[Dr. Ashley's statement may be found in appendix.]

Ms. MILLENDER-MCDONALD. See Mary, we're already connected here all the way from Palm Springs down to Cal State Dominguez.

Ms. BONO. That's right.

Dr. Sutton.

STATEMENT OF DR. JACK SUTTON, EXECUTIVE OFFICER, UCLA OUTREACH STEERING COMMITTEE, OFFICE OF THE PRESIDENT

Mr. SUTTON. Good morning. My name is Jack Sutton.

I'm part of the UCLA Outreach Steering Committee, and the Outreach Steering Committee was formed as a result of Proposition 409 and the regent's action on Affirmative Action. So we've work with fifty-eight high schools and feeder schools in our outreach programs so that this particular presentation is going to be about the implications for education that we see at those schools.

You can see on the overhead, Alvin Toffler has a very interesting comment that "No nation can operate a 21st century economy without a 21st century electronic infrastructure embracing computers, data communication and other new media."

Then he goes onto say that * * * "This requires a population that's familiar with this information infrastructure as it is with cars, roads, highways, and so on." And so the question is how do we get there? And one comment when we feel the need we will get there and the next transition period we need to be able to fill that.

Looking at work in America over the last couple hundred years, you will see that we've gone through the agricultural age, we've gone through the industrial age and service, and we now into an information age. Now over half of the jobs require and work with information.

If you look at from 1950 to 2000, that the professional jobs have stayed very much the same in terms of percentage. Notice the big difference between skilled and unskilled, and in many cases skilled means at work you have to be technology literate. Ford Motor Company no longer has handles for their cars. Everything's electronic. If you build in improvements to the car, you now have to have the serial number and the date that the car was built to know where you go to get the data to get it fixed.

So the bottom line is welcome to the information age. Emilio Gonzales says that "60% of the new jobs in 2010 will require jobs which—skills possessed by 22% of the workers today." So the question is how do we get the workers—those workers of today and workers of tomorrow, many of them are in school right now. We all know that we will go through three or four jobs, and so school is something like that is going to be pretty critical.

If you take a look of the map of Los Angeles County in a geographical sense, this is what it looks like. But if you look at it from a population perspective, it's a little larger. And it takes on a significant rate. So, the question is how are the students in Los Angeles County doing schoolwise?

Seventy percent of the high school students in LA County attend schools performing below state average on UCLA's Academic Competitiveness Index. And that index is essentially to look at how many—what's the percentage of applicants to the school who are competitively eligible to UCLA or to Berkeley. And if they're in the top half, we consider you to be competitively eligible. The chance of getting in is good.

So it's a percentage of competitive applicants from a school. We have academic competitiveness index calculated for almost every school in the state.

If you look at the way that those schools lay out in the state, this is what the distribution is. Notice that the average is about 41. If you take a look at where LA County sits in there, you will notice that the average drops to 30. If you take a look at LA Unified, that's half the schools in the county, then that drops to 20.

If you take a look at a map of distribution, the green dots are the high schools that are above the state average. Anything else is below the state average on an academic competitiveness index. If an index is very high, you're looking at the competitiveness.

Very quickly, we can look at a chart developed on schools in districts. They have the API which is the state academic performance index based on test scores, the academic competitiveness index, which is UCLA's, the number of computers, the computer to student ratio, and then the internet connected rooms. You'll notice that along Los Angeles Jordan and Long Beach Poly both were digital divide high schools the first year so they have started to implement that particular plan.

Recognize that—the quote by I think it was Louis Gerstner puts it best when he looks at "We need to recognize that our public

schools are low-tech institutions in a high-tech society. The same changes that have brought cataclysmic change to every facet of business can improve the way we teach students and teachers."

I think the next quote of probably is, maybe the most important of the entire presentation. The real challenge we are about is not challenge of technology, it's a challenge of people. How do you work with teachers as there are a number of teachers who have technology in their room and one of the things that they generally do is take it out of the way. Because when it comes to using it, the students pick up very quick.

There's a couple of charts that I think illustrate—the difference if you have a higher education you're going to make more money. Great implications for that digital divide. If we don't have access to the technology, if we don't have access to the information, we won't develop the skills there's going to be a broader divide.

If you take a look at changes from '69 to '89 if you're in that bottom quintal, you're paid—how much you earn drops almost 25%, but if you're in that top quintal you earn another 12% to 13%. And again, so what you earn and what you are educated for makes a significant difference.

Now we talk about a digital divide. I think the next two charts with the black really show where the digital really hits them. The green bars are high income, the red bars are low income. The bottom line is these are indications of using the computer at home.

So regardless of what is available at school, what is available at home is going to—those are first graders to sixth graders. The next chart shows 7th to 12th graders. So you have again, very much the same differentiation with your high income. If you're using the computer at home where there's a lot more time and a lot more things of interest to do, you're going to end up with the higher income.

And finally, there were some recommendations made by the President Committee of Advisors on Science and Technology, Panel on Educational Technology.

Focus on the learning, not on the technology. Emphasize the content, not just the hardware. You have to have the hardware, but the other stuff is really important.

Give special attention to—to professional development. If you don't—if the teachers don't feel comfortable, they're not going to want to use it. You're not going to see it in classrooms. The computers are there, but they won't use it.

Engage in realistic budgeting. That budget has to include a cost range for maybe a third of that budget going into professional development.

Ensure equitable, universal access. I think that's come across the board and there are going to be lot of places where that can occur. It's going to have to occur at schools if we are going to teach people how to be information literate.

And finally, to really initiate a major program of experimental research to find out what works and doesn't work. Thank you.

[Dr. Sutton's statement may be found in appendix.]

Ms. BONO. Thank you. I'm going to go ahead and defer to you for questions.

Ms. MILLENDER-MCDONALD. Thank you Madame Chair.

Before I begin the questioning, I want to acknowledge two persons who have come in. One of the great council members of the City of Carson is with us, Councilman Darryl Sweeney at the back. Good to see you here. Applaud. And we also have, representing Congresswoman Grace Napolitano, Mr. Ray Cordova. Ray, do you want to stand?

I'm not sure I see anyone else who's representing Congresspersons but if I have ignored or—not ignored you but, if I have not seen you please send a card to the front.

These were just telling presentations Madame Chair as we have heard from these three outstanding presenters. The first one, Mr. Mora you said that you had done a year long study on—particularly—specifically I should say, on the web, was it the web that you did this analysis? And if so, was this study done for K–12 or was it done for K–12 and higher learning?

Mr. MORA. The analysis included educational information for K–12 students. And in addition, we also focused on life information, just general life information that people need to go on beyond high school because many people will leave high school, they don't have basic literacy, basic math skills. And so we looked at the whole spectrum of basic information and in addition—basic learning information in addition to living information. The availability to hold jobs, availability to available housing, affordable housing, and health and government, et cetera, all kinds of information.

Ms. MILLENDER-MCDONALD. It was quite interesting that you said less than 1% meet the basic needs, meets just basic literacy, and that is very telling. Would this be because a lot of our citizens, certainly speaking from the California perspective, are immigrants and therefore there is a language barrier that circumvents this, or is it just simply the low income and persons who just have been unskilled for years?

Mr. MORA. Well it's really a combination of all those. Many people are illiterate just basically because of lack of involvement with education in general. Then many people are also in transition. They're immigrants and so they're in the process of becoming more fluent in the language. So it's really a combination of both.

Ms. MILLENDER-MCDONALD. Combination of both, but then learning and education has been the main focus of this, would you say, or is it half and half? Is it lack of really quality education and job skills training or is it more or less the literacy based on the immigrant issue?

Mr. MORA. No, it's really a huge problem with actually—instruction in literacy and building fine—functional literacy skills.

Ms. MILLENDER-MCDONALD. So that's it. The knowledge that you had and you compiled, who did you or have you imparted this information to anyone or any of the companies that I outlined? AOL, Netscape or Microsoft. Have you talked with a group of high tech companies on this information that you—the analysis?

Mr. MORA. Yes, we're in the process—have been speaking and are in the process of speaking with and talking about interventions that they could implement, whether it's local education, content, learning how to solve this whole dilemma. We have also spoken with the Congress.

We've been working with the Congress to influence the next study to follow and then we'll have follow through because this data already is pretty much done, then the following one will be on 2001. We're also involved with several foundations who are partners such as the AT&T Foundation, the Pac Bell Foundation, to look at the whole problem and come up with different solutions because there are really various types of solutions that would be required to address the problem of this magnitude.

Ms. MILLENDER-MCDONALD. This is very true. I had a breakfast meeting, it was an informal meeting with some of the companies that I've outlined to talk about who's doing what and where and with whom.

And it was amazing that there are so many commutations of companies doing things that I have started a steering committee asking to look at what each company does, when they're doing it, for whom they're doing it, what education levels are they doing it, so that we can then start to see, you know, bring together a compilation of all of this and try to synthesize it wherein it will be maximum success in schools with low income level kids.

And so I am very clear that what you have imparted today is something that we need to have you come to the table with us on to talk about as we hear the—

Mr. MORA. Excuse me, if I may say that in addition we're complementing that kind of work because we're in the process of building an on-line resource specifically so synthesize that kind of information so we don't duplicate what another company is already involved in.

Ms. MILLENDER-MCDONALD. I love it.

Mr. MORA. An extensive——

Ms. MILLENDER-MCDONALD. I love it. I just saw us all running around trying to catch tails. And I thought wait, let's stop and see if we can bridge this, bridge at that time the information sharing.

I do want to say that we would like to see you in Washington to help us. I'm speaking, and I hope I speak on behalf of my colleague and friend, Congresswoman Bono. We're all interested in—in closing that line so that once we get the players, if you will, together and start synthesizing this, we'll be able to see then how we have moved in to areas of hopefully helping that new job—work force, I should say to move into the realm of success and job skills.

Dr. Ashley, let me first commend this university that sits right here in my district, Cal State Dominguez Hills, which I knew—and which I have known for years has been just absolutely the premier university that deals with innovative types of things sometimes before any other university, albeit the ivy leagues, the UC's or the CSU sisters.

And you do this because of the need and I'd like to think your—your student population represents this whole area of immigrants and this diversity that we speak of.

But let me just ask you a few questions here. One is distance learning is something that we recognize now is just phenomenal. We've got to make sure that we get this going across the nation because the average student at Cal State Dominguez Hills, last I heard was about twenty- eight to thirty something, they're in that

range. And so they're working folks and they need to have something that's more applicable to that working style.

But you're telling me that with rebates and all, we can get computers and get the necessary equipment, if you will, to become more knowledgeable and more skilled and more into the internet for just a hundred and twenty-nine dollars ($129). You said some color ones we can get are forty dollars ($40). Why aren't we saying this to our students at Dominguez Hills who perhaps are leaving, as you said in your statement, without at least the understanding of computer application?

Mr. ASHLEY. Well I think for most of the students that go through Dominguez Hills, I think they do have experience that includes technology, and I think they leave with the skills to deal with the demands of this—this century.

One of the things, and I think this is true not just for a university, but for any institution is that there is a natural lag for us in terms of information that we just go through a purchasing cycle and make a decision about what we're going to buy and then go ahead and issue the purchase order or the requisition, and then process that order. And it can easily take, it can take a year, it can take eighteen months, and many times by the time you've bought it it's already obsolete. In fact Dell is now running websites that you can have what they believe—you can have what is available.

For instance you can no longer get a 500 MHZ Dell computer because they no longer offer them, 600 is minimum, and they've just started a whole series of new ones. So there's a lag in terms of the speed of the technology, and the way that we can respond.

The other thing is—is that we make plans based upon what we know today rather than, perhaps, what we know tomorrow. It remains a tremendous investment in many places and also in school systems in hardwiring the schools, and we're finding it's incredibly difficult because the schools are not designed for this and they're running conduits on outside and over roofs, and we're doing all kinds of things. And we know that the future is going to be wireless. That my laptop is—today is wireless laptop. I can get a wireless connection anywhere in Los Angeles and most places in California without any phone line, without any wire at all.

Ms. MILLENDER-MCDONALD. So you are saying then that this e-rate is not needed because some of us are trying to implement e-rate to wire these schools.

Mr. ASHLEY. First of all, no one is suggesting that we start tearing out wires and anybody who has good hardware connection should use it and keep it. But the fact is—is that when you look at the future, and the future now is about three years, I mean when you look at the future it may be a better use of money in some situations, for instance we're looking at a housing complex on the Dominguez Hills campus, to create a wireless environment than to try and wire that particular building.

What I see within a very short time, twelve, eighteen months, that a computer lab in an elementary school could be a part of wireless computers. You take it into Mr. Jones' class in the morning and you say you're the lab, you're the computer lab.

And this afternoon this cart will move over to Mrs. Smith's room and she will be the computer lab. It's a whole different concept

than what we've been doing in the past. We're just creating rooms and looking and hardware and, you know, basically creating a very static environment. You know it's going to be much more dynamic.

Ms. MILLENDER-MCDONALD. You know, it's amazing you would say that because we had a hearing about two or three weeks ago to talk about closing this divide, and one of the presenters spoke about the distance learning and broadband and other new technologies that are coming out. And so my question is to you as it was to him, are you suggesting that our kids who have not even gotten on the internet will already have lost a lot because we are going along in a whole new concept of high tech?

Mr. ASHLEY. What's incredible about this technology is that you could go from zero to full speed in three to six months. This is the case, Dominguez Hills has ten years of experience in distance learning. We would like to think that's what makes us better and makes us more qualified than other universities. But the reality is that a university or a college that has never done any distance learning could today adopt a technology and within six months, could be up and running and soon have the infrastructure to do a very good job.

So I think it's mainly getting the computers and the access into the hands of the students. Again then doing that in such a way that there is a real need or at least experience a need——

Ms. MILLENDER-MCDONALD. Irrespective of the fact that you're saying that you have computers that are old, that is not—but again in my area of Watts, I go down and I see old hardware and some of it you can't even get any software for it.

Now that is not—it's not cost effective. It's not effective at all, and efficient for trying to train kids who have not had any access. What do you say to that?

Mr. ASHLEY. There is—there is—it's true. There are some schools—schools have a way of sort of hanging on to things long after the——

Ms. MILLENDER-MCDONALD. No, this is just given to these——

Mr. ASHLEY. The thing is it's a lot of what is old computers—my four year old grandson has a 6200 power MAC. The reason he has that is because when his parents did an upgrade, and they felt they needed a more—a faster computer, there's no market for used computers. What are you going to do with it? They couldn't even sell it at a garage sale. So they gave it to the child.

There—so there's—actually there's a lot of slightly older computers out there that are serviceable, that are more than sufficient for what people need, which frequently is just word process and internet access. And you don't need 500 megahertz to do that. You don't need 128 megs of ram to do that.

Ms. MILLENDER-MCDONALD. So you're saying that I can go out and ask agencies there in Washington if they have these outdated computers, as they see it, please give them to me so we can put them in community centers, put them in libraries, put them in schools first and make sure that I can get some kind of adaptable—or adapt to the internet.

Mr. ASHLEY. Anything from a Pentium 1 on now I would certainly, you know, feel comfortable with them using. There will come a time, and there is coming a time when you're going to have

full video coming over the internet and then you will, perhaps, need a little more robust equipment. But that doesn't mean that you have to just stop now. I mean, it basically means—Hewlett Packard is actually—has a series of what are sort of mini lap tops that they are discontinuing and they have them out—you can get those for about three hundred and eighty-five dollars. And these are like, little lap tops that they would go on the internet and they would do word processing.

You know, but the thing is, nobody thinks in those terms. I mean, they're thinking of, you know, we have to get the—you know, it's almost a—we have to have the biggest and the best.

Ms. MILLENDER-MCDONALD. Are you saying that the—well it's been stated that you have to first start here and then you graduate to this. They don't know that you don't have to start there. If you haven't started there, you can start some other place along this continuum.

Mr. ASHLEY. Uh huh.

Ms. MILLENDER-MCDONALD. If you don't say this, people don't know that. I would like to suggest that I have talked to parents so parents can understand the need to invest in these less expensive computers. I would certainly like you to travel with me around to my schools and talk to parents, have parent nights, and let parents understand that it's more important to get these computers than to get the Michael Jordan shoes.

I mean really, you've got to make sure that our kids get on with the service of—what this whole notion of—getting back to the 21st century, I tell students whom I talk with we were excited when we knew that we could have a job outside of California. Now you can have a job outside of the United States. But you've got to get prepared and ready for that.

And in my last question to you, Dr. Ashley, you state here that this—you subsidize on-line training for your employees. Do you know how many businesses do that on-line training? Do you have any idea?

Mr. ASHLEY. Yes. Some of the larger industries we work with, you know, Raytheon and Boeing, and some of the really large industries, but I think even the small industries if they gave their employees a small subsidy, I'm not talking about even necessarily the entire tuition, I think you would have many more employees taking advantage of these opportunities, because it—it somehow, if the employers were willing to pay a part of it, it somehow it just makes—it makes sense to then participate.

And I, you know, I really know nothing at all about the tax structure, but it makes sense that if you could make that kind of investment in your employees then it would then also improve your business.

Ms. MILLENDER-MCDONALD. Well we're busy. We've have a moratorium on the whole notion of taxes. So we won't even get into that today. But have you asked technology companies what are the skills needed upon graduation for those students whom you are dealing with not to participate in the business community?

Mr. ASHLEY. Basically, because things are moving so quickly as long as the student has a familiarity and a comfort level with the

technology, then they're going to learn everything when they go to the business.

Ms. MILLENDER-MCDONALD. Uh huh.

Mr. ASHLEY. There's no way that we can give them the skills, the specific skills because by—even within two years that will have changed.

Ms. MILLENDER-MCDONALD. I, indeed, will be telling and have my chest out returning back to Washington to let them know Forbes Foundation—Forbes Magazine stating you as one of the top cyber universities. We knew that ten years ago, I can reiterate that, I was not in congress ten years ago so I can go back and tout that.

Dr. Sutton, I am absolutely, I suppose, very touched by your presentation because it was visual. You see that gap, that digital divide so clearly there. I have got to ask my staff here to do what you've already done, so we'd ask that you have these types of slides for us, and I'm sure that Congresswoman Bono might want that too, but she's not L.A. County so she might want to get hers in her area.

But I've been saying all along let's go to the teacher's side of it. I am the only Congressperson who sits on the National Commission on Teaching on America's Future of which I am to do whole methodology change of teaching throughout this country.

But professional development is so critical, and as I have said to them, as a former teacher, this cannot be we can teach professional development. It has to be ongoing. It's the same thing with developing of skills, not only for students but for the teachers and administration.

What are the fifty-eight feeder schools that you are dealing now, and how can we get students, parents, teachers, administration to fill the need that we are talking about so that we can get this over 70% of the lowest percentile of the lowest state average schools of students into a mode of high technology?

Mr. SUTTON. I think there's a couple of things in terms of the professional development that are critical. My wife just finished her doctorate in educational technology, and so I lived through a second dissertation, which was a case study. She was looking at elementary schools that had really implemented technology in the curriculum so it was a seamless tool. She could find three in the state, elementary that met those criteria because she didn't want a very rich district, and she didn't want a very poor——

Ms. MILLENDER-MCDONALD. You are going to need the mic, turn mic on at your desk. Now you're going to have repeat everything you said.

Mr. SUTTON. I think that professional development is the key. I mentioned that my wife had just finished her doctorate, did a case study and looked at elementary schools that had implemented technology and made it a seamless part of the every day life of students.

She could find three in the state that didn't come from very affluent districts or very poor districts, and had a racial diversity. One of those was in L.A. Unified, was the only charter, one was down in San Diego, one was in Vista.

She is the outreach and the technology coordinator at the University Elementary School which is the lab school and UCLA, and they have two hundred and fifty or so computers. They rotate. They buy new computers and the new ones go to the older students, and the other ones go down. And so every year they recycle on down.

But one of the things that has been very—very important in the success that she's working with teachers and others that have, is a concept called "just in time learning." And it really requires a coach. Both of our outreach programs have a coach at a school site because one of the things that we have found, if you want schools to make a change everybody that works at school right now has more than a full time job. So you're going to have to add resources for them to be able to do that.

And so when a teacher starts to do something or wants to do something, there is somebody that's there right away that can work with that teacher, maybe come in and teach a lesson or two with the idea that the teacher will take over. There's a support system not only from that coach but from the other teachers that are working on it.

So you have, not a technology committee, but a technology integration into the curriculum committee because it's not a separate issue. It is, how does this become a tool? You look at the little kids who can use the computer just like they use a pencil.

The story the other night, one of the professors has a six year old who was on the web, got onto Amazon.com, called out and said, is this your credit card number? Yeah. Well, the kid's six years old, ordered the books that he wanted over the internet on Amazon.com.

And so we talk about the very young ones not being able to do it, not being able to read, that's not a problem. Even though students who are second language students at the school, when you have something that you want to learn how to do, and if you have access to the tools and you have access to the support system, whether you are a six year old or whether you are a sixty year old, you'll be able to do it.

So your—our task in the professional development area is, how do we provide people who know instruction, who know curriculum and know technology, because it takes all three of those not just somebody who knows the hardware to come in, not that you can't have to keep hardware up to date, but it's all those issues together. And so when we talked about that budgeting issue, you have to budget for the human part of it if you're going to be successful.

Ms. MILLENDER-MCDONALD. Excellent. Have you ever been in any school districts to talk about the 70% below average, state average with the students?

Mr. SUTTON. That figure is—is a very high figure for us, because you're looking at the two most selected university campuses in the system. But it does show a difference between the state and the county, and if you're looking at the number of students coming in and out, I think we were going to write a grant last year and several schools, elementary and middle schools, the gear up grant, we calculated, I think that the transiency rate was 47% in the participating schools. And if——

Ms. MILLENDER-MCDONALD. I'm sorry, the transient rate was——

Mr. SUTTON. 47% for students. So you're going to turn over. If it were equal we would have ended up starting out with over three thousand kids. We would have ended up with two hundred and some kids who would have been there at the beginning over a six year period. Well it's not an even transiency rate, but all of those factors go together, and so the task is how do we move to that next step?

If you want teaching behavior to change, if you want teaching to become more in line with how we know we learn in terms of inquiry, technology is an excellent way to do it because if you have technology in a classroom, if you are hooked up to the internet or an intranet where you build the curriculum resource and kept it current, the teacher no longer has to be the source of information.

If the teacher is no longer the source of information, the teacher's role has just changed dramatically because now that teacher can be a facilitator. Now that teacher can work literally with small groups and not have to worry about our students—other students accessing their information. You don't have to worry anymore because, how out of date is this science textbook? I mean, given the fact that a science book is probably out of date as soon as it's published now anyway. This way, if you're running your intranet or intranet site, you can keep it up to date.

Ms. MILLENDER-MCDONALD. See, this is why we're trying to change the whole teaching methodology in our country because right now we're not there yet. I'm hoping that we're gradually going there and we having different projects around the country trying to see what we can add to the process.

But the teacher is absolutely leader in her classroom in that she has that timing to develop and move a curriculum that will adjust to the students in her classroom and on a much more individualized basis than just this one size fit all textbook that really aren't interesting for kids, books that aren't interesting to kids anyway. These kids look at these books and find they're not interested. So we need to bring something in that will help to enhance that.

The last thing that I want to say, the last question that I have Dr. Sutton, is that education and job training needs are very quickly becoming the top issue for the business community. Recently a business survey by American Express showed job training is now the number one business issue, ahead of other items like regulations, reductions, and tax breaks.

Have you, or any of the panel members, started to talk with the business industry, or business community I should say, to look at ways to change and begin to solve this problem? Job training, as I said when the welfare bill came before us in Congress, if you don't have enough money for job training, you're not going to move people from welfare to work in a constant basis and sustain a sustainable position because you just haven't put the money in there, and you're talking about unskilled from the beginning. So that's a question to Dr. Sutton, and then we'll let the other panel get on the bench.

Mr. SUTTON. I'd like to refocus it a little bit to say, almost career training. One of the things that we noticed in our lowest performing school, the high schools, is there is no sense of future.

Ms. MILLENDER-MCDONALD. I'm sorry, there's no what?

Mr. SUTTON. There is no sense of future as far as the kids. If you look at your lock cluster, and you're talking to the cluster administrator, there is no business with whom they can establish a business relationship. If that's the case, then students have no sense of career to look forward to. It's unlikely that they have a sense of even maybe job as they grow up.

So that part of what we are looking at is, and it's—I think that the focus on school as the only sources, is probably misplaced in the sense that this is really a community issue, community in the largest sense and the smallest sense, that we're looking at the career awareness. We're looking at the fact that I have a future. That means that everybody has to learn. We have to add in working with schools.

We don't have—we as a university don't have the resources, the state doesn't have the resources, the local school district doesn't have the resources. It is that combination of how do you leverage, how do you build that synergistic move? How do you get teachers from a variety of schools to work together to become a very large team to share? It is a problem that—the coordination issue is a problem by itself and if I were looking at ways of spending funds, looking at how you allocate, is that you allocate toward partnerships, and give those partnerships a chance to develop and mature before you've asked them to come up with a product or present a grant.

Because in many cases you're asked to do a grant, you have a six month planning time which is great except the grant is due half way through the planning time. Not a federal but a state grant. You don't have the time to establish those personal relationships and those business relationships and those school relationship that are going to allow this to continue on.

And meanwhile we lose teachers because they're looking someplace else because they don't see the support coming that they need. And so, if we can build a community, that learning community around the school and around the career issues, and the issues that are important to people, then we'll be successful. If we don't do that, we'll either divide—we'll become a chasm or more of a chasm, and then we will have even more problems than ever.

Ms. MILLENDER-MCDONALD. I see. Mr. Mora, you wanted to say something?

Mr. MORA. Yeah, we're working with a group of superintendents and cluster leaders in the Watts area, and to really build a strong——

Ms. MILLENDER-MCDONALD. You're working with schools around the Watts area?

Mr. MORA. With the superintendents and cluster leaders.

Ms. MILLENDER-MCDONALD. I'll need to know who they are within the district. Let my staff know who those people are.

Mr. MORA. Absolutely. And we are working to build their school to work force, because funding for these programs and support for high schools programs, for high school programs or these partner-

ship type programs and other school to work position jobs, is diminishing, is decreasing.

And another problem is that students don't even know about these programs. They don't take advantage of them, and don't have the skills that are needed to take advantage of them, the soft skills. How to relate on a job, how to hold a job, things like that. So there are many areas to address this problem.

Another group we're working with is the Candle Corporation, and they have a very interesting internship program with Foshay Learning Center where they have taken forty-five interns and have integrated—integrated them into the corporation, and have shown them all facets of the company. And these students work, you know, in advanced communications careers, in marketing, and human resources, and build job skills which led them—which give them skills to obtain jobs after graduation.

Many of them even take part time jobs there at Candle Corporation while they're attending colleges. And Candle Corporation has built the knowledge base for this. So they have this information ready for other corporations. Last week, they had an open house with different companies in the area encouraging them to start these programs.

Ms. MILLENDER-MCDONALD. Cannel Corporation?

Mr. MORA. Candle, Candle Corporation. They're right here in El Segundo. And so they have the knowledge of how to bring and integrate a small group of young teenagers into the corporation. And these are types of interventions that I think go a long way to building a stronger workforce.

Ms. MILLENDER-MCDONALD. Thank you so much, Mr. Mora. Dr. Ashley, you wanted to add something?

Mr. ASHLEY. Well I think just in conclusion, I would say my experience is that the tools are there. It's really now a matter of raising our expectations and letting not just every—every school, but every group within the community, letting them know that we expect more than business as usual. And that it can be done. There's nothing, certainly nothing that the Dominguez Hills has done, there's nothing that other schools haven't done that others can't do.

Ms. MILLENDER-MCDONALD. Who should say that we expect more than business as usual?

Mr. ASHLEY. I think it's across the board.

Ms. MILLENDER-MCDONALD. Absolutely.

Mr. ASHLEY. I think it goes from, it goes from the superintendent of schools to the mayor in the community to the Congress people. I——

Ms. MILLENDER-MCDONALD. I hear that all the time.

Mr. ASHLEY. And I think it's—I think there's too often, what we see is people——

Ms. MILLENDER-MCDONALD. And parents.

Mr. ASHLEY. And parents. But too often, we see people saying well we're just doing the best we can. And I'm not sure that that's good enough.

Ms. MILLENDER-MCDONALD. I know that's right. Let me thank this chairwoman. I think I will ask speaker to remove Chairman Pitts and put her there because she certainly has allowed me more time than what typically would have been if it had been the reg-

ular committee. So we thank you so much Madame Chair. I know you're doing this because I'm in my district and I would like to just state it for the record as well.

Ms. BONO. Without objection. I also have found your questions very informative and enlightening. So I have enjoyed the dialogue that has occurred here. But I too have some questions. I don't know if they're going to be as extensive as my colleague's, but I want to begin by thanking all of you for being here today, and your input and your insight into this.

You know, not too long ago I had the pleasure of having dinner with the head imagineers from Disney. And I, first of all, I don't know if you know these guys. They're all, you know, physicists from MIT and Cal Tech and I don't even think they spoke English. It sounded like English, but I couldn't understand what they were saying. They were so intelligent. And they talked about the future and where we were going, and I was very, very dismayed when I heard them say that they believe, in the next twenty or thirty years, that the written will be no longer.

And I, as a parent, am bothered by this. Meanwhile my twelve year old son just competed and came in sixth in a Shakespeare contest; he recited a soliloquy from Julius Caesar. So I hope that they were wrong actually.

My point here is that people out there with brilliant minds are thinking thirty years down the road, and I am not quite capable, and I get a chuckle out of you talking about antiquated computer systems and people donating them to people, and companies donating those antiquated systems. I would like to see us begin with Congress because we do not have state of the art computers and I believe it hurts us. And with all due respect to all of my colleagues, there are a number of members of Congress who, I don't believe, have ever actually touched a computer keyboard. And it's hard to believe.

I'm sort of rolling into my questions here, and my first one is to explain to you all that I have two children as I said, and I have parents who are in their late seventies, and there's a part of the digital divide that I don't think we've talked about here. I honestly believe that many, many senior citizens are afraid of touching the computer keyboard. My children have never felt that way. Are you kidding? They started pounding on that keyboard as soon as they could. I don't know if my father, who is a retired surgeon at USC LA County Medical Center, has ever touched a keyboard.

He has a fear of computers. But my mother is a wiz. She's educated herself and she's taken it upon herself to educate herself. So I'm afraid that seniors are being left out here, and we've talked a great deal about K through twelve and higher education. But my question to all three of you is, do you have any programs or have you worked with or thought about this segment of our society that is being left out, our seniors?

Mr. ASHLEY. I have two aunts, both in their eighties who recently went on line. One of them is gogranny@webtv.com.

Ms. MILLENDER-MCDONALD. Go granny, I love it.

Mr. ASHLEY. But both—and both of them are using the internet in order to maintain the relationship with family at a time when they're not as mobile as they used to be. And both of them were

basically brought on line by their families. And I just feel that that's the way it's going to happen. I have spoken to senior groups and I have talked to different people, but I really think it's going to be through the family that they're going to get that access. But once they get the access and once they can get the pictures of the grandchildren showing up on the computer screen, and once they can send a message to a hundred and fifty family members all at once, or a greeting card. I get greeting cards for holidays I didn't even know existed. I think it is going to be for—particularly for seniors, it's going to be a tremendous boon.

Mr. MORA. In our of our focus groups we spoke to about twenty-five seniors, and it was amazing to see how eager these seniors were to go on line, because they wanted to talk to their grandkids, they wanted to see their grandkids pictures, or put their own pictures. And they generally are communicating, and they were also interested in finding resources to help them as they, you know, lose some of their mobility and can depend on some of the services that will be facilitated as the on line realm makes it easier for them. So the want to, you know, shop for groceries on line and fill their medications.

And we have a few programs that are excellent. One is called "surfing seniors" back on the east coast which is basically a community of seniors where they teach each other, that is seniors teaching seniors, how to use the internet, how to even build stuff, how to create digital stories and things like that.

Another really active community, incredibly active community and very inspirational, is the—happens in the Boulder, Colorado community network where you have seniors who are some of the most active members of the community in terms of teaching other people how to use the resources, how to be on the internet and how to gain access and things like that.

So we're seeing an emergence of these community centers and community type of networks, and some of the on line spaces targeted for seniors will continue to grow as the population becomes huge, as the senior population grows.

Ms. BONO. Thank you.

Mr. SUTTON. I can't speak to specific programs, but one of the things that we are looking at in terms of the outreach program is a resource of seniors to work with students online. The concept of virtual community is a very powerful one. You can talk to somebody next door with a computer.

You can talk to somebody half way around the world via the computer. As we go on, we'll be talking about the broader the bandwidth, the more the video, we're going to be able to hold virtual classroom between a grandparent and anybody.

So that the concept of looking at seniors, for example, we have a significant number of emeritus professors who have volunteered to be able to work with teachers on content. They have not gone so far as to say we want to go work in classrooms, but they do want to work with teachers on content. And that is their expertise. In some cases, we will get them together face to face, but to a large degree we're going to have to build that electronic community that is going to allow everybody to benefit so that we are taking advantage of all the resources that we have.

You have a former surgeon. If he had—if he saw the need, he would be on. In talking to my eighty-five year old father——

Ms. BONO. You tell him that.

Mr. SUTTON. Well sometimes——

Mr. ASHLEY. He has someone else—he has someone else that's doing it for him.

Mr. SUTTON. Somebody else. But when you get to the point where it becomes a need, you will do it. Part of it is to be able to tap those resources so that we continue to take advantage back to that larger community we talked about.

Ms. BONO. You know, two things have sort of spun off from your comments. And first of all, I also believe that as technology has grown, certainly the fear of touching the keyboard has changed, and I remember ten years ago you needed to know, you know, DOS to get anywhere. And now with touch screen technology, I think seniors are a lot more likely to be less afraid of this.

Dr. Sutton, you just mentioned content, and that leads me to my next question. And it's something we haven't touched on yet but I have huge concerns on. With the future of the internet here and how—the explosion that's going to occur, how are we going to protect people who have intellectual property rights, copyright holders and people who write the textbooks or write the songs? How are we going to protect them? And they do have a right, certainly, to be compensated for the work that as you put it on the internet, it knows no bounds or boundaries. So how does UCLA address that?

Mr. SUTTON. I have no idea how UCLA addresses that. I'm sure that there are people that are working on it. I think there's an interesting point about the content, and if we're going to look at content and say K–12, or even K–14, one of the bits of content that we're looking at that might be the most critical is that content that the teachers themselves working together, whether it's face to face or electronically build themselves. We're looking at websites in terms of professional development where teachers can work with each other.

The product they come up with would be powerful because it would also be accessible to students. And there's no intellectual property right there necessarily. At the same time, the process will be even more powerful because they will learn that much more in the process.

Ms. BONO. Wait a minute. So you're saying here that authors and composers will be no longer be existent here? That this is going to be a collaboration of teachers?

Mr. SUTTON. No, no. I'm talking about the use of material to put together for particular students. We talked about that "just in time" learning of how you meet the needs of all those various students. Well for one teacher to do that is difficult.

If you get twenty teachers working with their twenty classrooms to build that curriculum along with others, then you can—you don't have to put that particular content on the internet. It can go on an intranet that is closed off. You take care of a lot of problems of surfing where one ought not to be surfing. You have some control over the content. It's a great place to train before you turn somebody loose to the broader range. If you want them to be successful early on, you can control it.

To the broader reaches of new content and anything else, that's beyond me at this particular point. But it is an issue that I—that I know that fellow professors at UCLA have a great interest in as they publish research and so on.

Ms. BONO. Thank you.

Mr. MORA. I have a comment about that. I think that it's going to require much of the effort currently going on the internet in terms of regulation, especially as it relates to taxes, it's going to require joining forces with the computer industry and the government sector to look at this issue and the industry unfortunately is going to have to step up a little bit and be a little more responsible.

If you look at the case of Napster.com and doubleclick who are really in big trouble and have CEO's who are not really being very direct about the situation and not very responsive to the fact that people are, you know, infringing on intellectual—intellectual content rights. So it's going to require collaboration of the industry and the government to really come to a solution and responsibly manage this.

Ms. BONO. Thank you.

Mr. ASHLEY. I don't know. I'm thinking of the cassette recorders that came with the two different ones, and they said this is going to ruin the music industry because now everybody's going to make their own cassettes. I think what we're seeing with the internet is the incredibly sophisticated technology currently being used for marketing. Most of it is covert rather than overt. But the fact that they cannot only track who you are but where you're coming from and where you were before you got to that site would seem to indicate that they can also find out who is going to which sites and what they're doing, what they're copying, what they're taking.

All of our sites, all of our class websites are password protected. So any instructor who puts material on a class website knows that the only people who can access it are their students. But then, of course, students could copy that material.

But I—I do think that what we're seeing right now, we have done searches just to see how many different places our name is on the internet, and there's—there's software that you can do that, and you can go around and find out that your name is in places where you never thought it would be. And sometimes you want to have your name removed.

Ms. MILLENDER-MCDONALD [continuing]. Survey material that you're giving through this——

Mr. ASHLEY. No, it's actually by people just sort of just listing the university as being part of something that we're not part of. But the internet allows us to do that. We could never do that through print. There would be no way we could survey all print materials. But on the internet we can do a search and find out all the places.

I understand the concern. I understand why—why authors and people who create art are concerned. At the same time, I think that the safeguards are going to be there, and if they don't feel comfortable at this time perhaps they want to sort of hold back and wait. But I think those safeguards are going to be in place as much as we can ever have them.

Ms. BONO. Thank you. You mentioned again your—the virtual university, and I did partake in one class at Palm Springs Library.

It was fun. The images were a bit slow in loading. I guess as we progress with broadband, it will be a lot smoother. But I have a question for you, and it's a great opportunity for the lawyer joke, a bad lawyer joke, but will law schools ever be on line? And then the question is what quality assurance are included in your distance learning programs to assure that students are honest?

Mr. ASHLEY. That's a very good question. Until we have the face recognition software, which I understand is coming, it's being developed for the ATM's, and we actually will be able to tell who is sitting in front of that screen. But at this time, all of the significant exams for any of the programs are proctored.

And that means that every student, regardless of where they are in the world must find, nominate and have a proctor approved who will then be there when the exam is given. And it's given under our conditions. So we are still using proctors, a very, very old system because we don't—aren't able to authenticate the person.

Ms. BONO. What about a stay at home mom?

Mr. ASHLEY. Stay at home—we have stay at home moms who are enrolled in our programs. Usually our exams are on the weekend or in the evening. We find that local librarians are more than willing to be proctors, but sometimes it's a person from a local church. Sometimes it's a—we have a whole variety of people, a principal, a school principal is willing to stay late and proctor an exam for someone. So our people have never had a problem finding a proctor. It seems like in every community, there's someone who's saying, sure I'll do that.

Ms. BONO. That's great. Shifting gears here a little bit. No one's really talked about training or developing high skilled information technology workers so we can avoid the H1B visa extension that we've been voting on.

How do we encourage students at college age to begin to become programmers and address this lack of skilled workers that we need so desperately?

Mr. ASHLEY. We have to be careful because then they'll leave the university which is what they're all doing. The people who are very—really attracted to those—to those industries. But there is a—that's a real question because the thing is it's usually at the university we're teaching our instructors, who probably received the Ph.D. ten years ago, are teaching from material that they were taught frequently.

And so that there is a more or less of a historical quality to much of what we teach at the university. And it's hard to get the latest information into—into the classroom. But that's a constant effort.

Ms. BONO. Thank you. Do you want to comment further?

Mr. MORA. I have a brief comment. I think you have to start early, and really encourage technical fluency at a very early age. And there are some programs that are beginning to do that, that are doing that effectively. Programs called—a program called Computer Clubhouse started at MIT with some—a local museum where they have kids working with robotics at a very early age, actually doing programming, building video games early on.

We have a program also called Education Place out of New York City in public libraries, where girls are partnered up with mentors and do activities off line about actual designed products. And then

they go online into that online realm with a huge number of pallets and develop and design tools and learn the process of design and get that very, very early on. And I think that builds the force and encourages that skill development early on.

Ms. BONO. All right, I'm going to go ahead and wrap up this panel. I know that we could continue all day long, and I appreciate your time again. And I want to thank you for your testimony and your answers. And at this time, we'll——

Ms. MILLENDER-MCDONALD. I just want to ask one question of the chair. As you speak about the H1B, I'm concerned that the audience is not aware of that. There's a piece of legislation that we are now engaging in to bring over three hundred and fifty thousand high tech personnel from overseas to come in because of the silicon valley and other areas that are in need of high tech workers and we do not have them here in the United States.

My argument is that why is it that we did not forecast or see that early on where we could have trained personnel in these—various jobs or varied jobs so that we would not have to go overseas to bring personnel here. And so Dr. Sutton or Dr. Ashley, when you do all of this research and even Mr. Mora, when you do this research for all other things, why is it that we could not foresee this down the line?

When I was director of gender equity programs and we were looking at jobs for the ten year out, fifteen year out, we did those kinds of projections, and I'm just really curious why a state like

California or a nation could not have projected that, those needs for those jobs. I think three hundred and fifty thousand——

Mr. SUTTON. I think it's one thing—I think it's one thing to be able to project what the needs would be. I think it is another thing to be able to put programs together when you're not sure down the road. Because you're looking at several years down the road. You're looking, I guess Francisco said, you're looking at starting this early. This is not something you turn around and say gee, we need three hundred and fifty thousand workers for tomorrow. Let's put a program together and we'll whip them out. Part of the—part of——

Ms. MILLENDER-MCDONALD. No that's right, you don't do that——

Mr. SUTTON. It goes back to the conversation we had earlier with the career awareness. What are the—what are the options? I'm not sure that five years ago say, how many high school students would have looked at programming as a viable job or a viable career.

Ms. MILLENDER-MCDONALD. How many did you say, five years ago?

Mr. SUTTON. Say five years ago.

Ms. MILLENDER-MCDONALD. Microsoft was around, so we should have.

Mr. SUTTON. Looking at the typical student in schools and go back to the map, that because of that lack of connection to future and to career and to looking at what's possible. You have to be able to play a little, because—one of the physics teachers that I work with said that one of the biggest problems he'd seen over twenty years of teaching was that kids today haven't played with the hardware and the radio, the ham radio kind of stuff and the crystal sets like they used to. They don't have the background experience.

Being able to go into a community center or an after school program and play with robotics, where you can write a program and make this little machine do something is very powerful. One of the hardest things to do with a computer is—you have to realize, the computer does not control you. The computer will only do what you tell it. And if you don't give it the right instructions, it's going to sit there and wait for you to do it right.

Well, there is a certain message and lesson to be learned by going through the program. I'm not going to advocate everybody should take a programming class, but understanding the concept and having lived that and written a simple program to make something happen is very powerful.

Some people, when they do that for the first time, that will—that's their career. They will go that way. We have a lot of kids who have never had that opportunity. If they do have it, it is in a technology only class that doesn't build the connection, and they would rather not be there because it's not an exciting thing. It's a requirement that they have to take and it's with old machines that have nothing to do with current. It's not built around anything that is of interest to get their interest to look at the potential of job or career.

One thing I think is interesting. There is a environmental careers academy at Leuzinger High School and they have a variety of experiences, and it is geared toward students being able to get jobs in various careers. They can go through and get a certificate and get a job right out of high school.

One of the kids, when he—when they were talking about this, started to do this thing and he suddenly realized, he said, you mean I can get a job that pays nine, ten dollars an hour just by going to school for two weeks this summer? He never thought of that. And there are a lot of those kinds of opportunities that we don't take advantage of.

Ms. MILLENDER-MCDONALD. Thank you all very much.

Ms. BONO. Thank you very much. Again, I thank the panelists. You're dismissed, and if we could call the second set of panelists up to the witness table.

We're going to take a five minute break at this time and stretch our legs. Thank you.

[Recess.]

Ms. BONO. We will now begin the second panel which focuses on e-commerce.

We're ready to begin with testimony, and I'd like to welcome our panelists beginning with—actually I'll introduce you as we go forward. We'll start with LynneJoy Rogers who's the Director of the Los Angeles Urban League, Ron Brown Business Center.

Lynne, you have roughly about five minutes if you could.

STATEMENT OF LYNNEJOY ROGERS, DIRECTOR, RON BROWN BUSINESS CENTER, URBAN LEAGUE

Ms. ROGERS. I'll try to stick as close as possible. Good morning. Essentially we represent small business, and this is pretty much dealing with business. The advancement of technologies provided numerous opportunities for big business to become more efficient and competitive in the global economy.

In fact, the primary focus for business today is to utilize technological advancement to become bigger and better with less overhead. Thus, we are seeing the evolution of multinational companies who, through mergers, acquisitions, restructuring or re-engineering are positioning themselves for these 21st century global opportunities.

The key word here is global. As corporations become more global in focus, they will become less supportive of urban issues. This is a major question we must address. The quest for efficiency and competitiveness using the advances of automation has changed the nature of the job and work as we've known it.

These changes have had a direct impact on the inner or urban centers of what used to be major industrial communities. It is almost impossible for semi-skilled, low-skilled or unskilled workers to find jobs in manufacturing. In the US alone, ninety million jobs in the labor force of a hundred and twenty-four million are potentially vulnerable to replacement by machines. Scholars warn that with the introduction of more sophisticated computers, the role of the human will be a less significant factor in the area of production.

In fact, the role of the human is bound to diminish as did the role of the horse in the agricultural age. As the—as machines were introduced more readily, horses became less necessary and, in fact, eliminated by machines. Right now, the majority of manufacturers in the United States have increased efficiency and competitiveness using automation for smart machines.

According to Jeremy Rifkin, author of The End of Work, it is automation and not offshore manufacturing which has impacted American factory workers. Utilizing technology, companies have become more productive, efficient and profitable with fewer employees.

Additionally, smart machines don't take vacations, get sick, file stress claims or talk back. Technology will continue to help corporations to become more efficient, profitable and productive.

However, the price to America will probably be the loss of the middle class as we know it. No longer will there be high paying jobs for low skilled workers. In fact, as machines become more smart, there will be little need for blue collar skilled—blue collar skilled workers or white collar professionals unless they are technology workers.

Technological advancement is one reason we're beginning to see the flattening of the organizational structure. No longer is there a need for middle management. As we continue to utilize the team approach to problem solving in innovation process, there will be less need for a middle layer to interpret or implement process from the top down or bottom up.

More and more, professional employees will find themselves doing more general types of assignments, placing people with only one specialty or profession in jeopardy. Advanced technology coupled with global capitalism will be less inclined to consider community issues as relevant. Thus, people who have been historically disenfranchised from the economic process which develops ownership and wealth, will continue to drift towards an existence mirroring the survival of the fittest.

There is another very troubling possibility as we become more technological, and that is ignoring the human potential, and with it human needs. The new technology worker tends to be younger and less apt to feel responsible for human needs. This lack of social responsibility coupled with corporate restructuring may explain the trend away from philanthropic activities.

As corporations continue to merge and become more globally competitive, there will continue to be less focus on local needs unless they directly impact the bottom line. There is certainly a trend to abandon any commitments to programs for establishing inclusion in diversity and opportunity. We must understand that this global technological revolution will tend to make us less people conscious and more machine oriented.

This coupled with our increased capacity to connect with worldwide networks of information will make us less local in focus and more global in orientation. We may look to the world before we look to our local community. We must understand that the purpose for technology is to help all of us live a better life; and the life is not just for a few who are privileged to wealthy or have access to technology.

The challenge for those of us who are concerned with serving the public interest is to ensure that human needs are met and people are considered before profits. I'm especially concerned that small business who is currently taxed with employing 90% of the population is really less apt to be able to enjoy some of the technological advances that we have today. It's almost impossible for small business to afford the kind of information infrastructure that is necessary to be competitive in the global economy.

With some of the changes that are occurring in the global economy today, when we think in terms of who small business employs, because they cannot afford the high technology paid workers, they must in fact, employ those who have the least skills, those who have lower skills, and those who are less technologically inclined, making small business less competitive in this global economy and more dependent upon the larger multi-national corporations to provide them with contracts which then begins to control their ability to be competitive.

Coupled with this is the growing increase on cost that the distribution system behind this wonderful thing called the internet. It's called the telephone companies. And when we think in terms of telephone costs and we think in terms of how those telephone costs have escalated as a result of deregulation, we must concern ourselves with how a small business who is taxed today with essentially being the one provider of the majority of employment opportunities, how will they begin to be and continue to be competitive in this global economy.

Small business must be free to be enterprising and have the ability to grow. It is small business which becomes the mega-corporations. But without small business and without there being the opportunity to be able to afford the infrastructure, they will not be able to continue to employ the many people that they employ today. Thank you.

Ms. BONO. Thank you.

Next, we have Sam Covington, the Director of Information, Vortex, Incorporated.

STATEMENT OF SAM COVINGTON, DIRECTOR INFORMATION VORTEX, INC.

Mr. COVINGTON. Thank you. And I want to thank Lynn for what she just said because it echoes some of the things that I also believe.

One of the interesting things is that the guys that were on before us made some very interesting comments and illuminated a subject that's really near and dear to my heart. But one of the things that we noticed from what they talked about is they talked more about the symptoms of the problem than the real problem.

And we do have a serious problem in America today. Is there a digital divide? Absolutely there's a digital divide. But that divide really is only a reflection of the other divides that exist in the economy. Right now there is no competitive economy except among a certain group. In this moment in Washington, Janet Reno is suing Microsoft as a monopoly. And there's almost no question that Microsoft is, indeed, a monopoly.

But one of the characteristics of a monopoly are the things that occur when a monopoly is in existence. The laws of physics simply do not apply. Competition simply does not exist. That situation exists in the small business market and in the education market and it affects minorities the most.

Let me explain sort of what I'm talking about. Education, if we really wanted competitive education, I mean in basketball when somebody scores they give the other team the ball. If they lose all of their games during the season, they get to pick the best player from the draft. Our schools are pathetic, and yet and still they don't get funded more, they get funded less.

This reduces competition. You failed to deliver and build the next generation of competitors. In business, it's really interesting that—that we say it's a competitive environment when if you live in the real world out here in business, you find that you go and talk to other businesses and you say, look I can save you money. And the answer is, what do I need that for? And why do they say that? They say it for real legitimate business reasons.

They have relationships with other people. They'd rather pay more and keep those relationships than compete anything. Competition to business is evil. It's a very evil thing. No business wants to compete unless they absolutely are forced to. And so they don't typically compete. Most companies, and I won't mention any names but most companies, and I think someone on the panel mentioned one of them, will intentionally not compete projects because it's more expensive to compete. Competition is expensive. It requires that you look at all the competitors, that you decide which one is the best.

If you already have someone you know can do the job, why compete? Or only compete to get a price so that that competitor can reduce his price, and you get the benefit of competition, but not the cost of it.

So in the business world, we have this non-competitive thing going on, and it's all because there is a monopoly. And that monop-

oly forces the inability to compete for small businesses. It doesn't just affect minority business. It actually affects every business across the board.

So we have monopolies that don't allow the competition to occur in the business world. we have this monopoly that doesn't allow competition to occur in the education world, and we get these results that these guys have basically talked about. And it's sort of like my nose is running, but you know, I'm not fighting the cold I'm just wiping my nose.

We can't change this, and the solution is really simple. We can change this, if not overnight, over some period of time. The way to change this is to really reinvigorate this country and promote competition. People say, you know, why do African Americans excel in sports so well? Well there's simple reasons why. The reasons why is that there are defined set of rules. Those rules are enforced. In the business economy, there is a defined set of rules, but none of them are enforced.

And so you don't get the same result that you get in sports. But if the competition fields are level and opened up, you will get basically exact same result you get in the sporting arena. You will get a healthy set of competitors competing for contract and—and money, and lifestyles that currently the majority enjoys.

In addition to that, all of a sudden these other problems will somehow tend to go away. When people start to make money, when people are building cities and environments and communities, all of a sudden their kids do a lot better in school. So these things are self defeating and self—how do you say that? They defeat themselves.

So when things are bad, they will continue to feed on themselves. And when things are good, they will also produce continually good results. So my plea really, is that we open up the doors for competition. That for people that are really willing to look and open their eyes and see what the competitive landscape looks like for small business, and see the way the majority literally just cheats to get ahead and stay ahead.

Monopolies can't help but abuse their monopoly power. And it's not like they're either good, bad or evil. They just do what's most important for their business model. And so you can fault the result, but you can't fault—you really must fault the system that makes the result come out the way it does. So, thank you for your time.

Ms. BONO. Thank you.

Ms. MILLENDER-MCDONALD. Before we go on to the next panel, I just wanted to acknowledge one of our principles here from Carson High School, Mr. Douglas Wainright. Mr. Wainright, he's one of the principals of the fine Carson High School. Good seeing you here. Thank you.

Ms. BONO. Now we'll move on to John Bryant, founder and CEO of Operation Hope, Incorporated.

Mr. BRYANT. Good morning.

Ms. MILLENDER-MCDONALD. You have five minutes.

STATEMENT OF JOHN BRYANT, FOUNDER AND CEO, OPERATION HOPE, INC.

Mr. BRYANT. Before I read my formal remarks which will be about five minutes in length, I do want to just lay a template out by saying that there is a new economy that is before us is. It is a reality. I would not be surprised if half of all commerce in the next five to seven years is electronic commerce. And as my friend Kevin Ross would say when you get in front of the town—get in front crowd, they're going to parade.

We've got to find a way to make something positive out of something which could be potentially damaging. The capitalist market that we have in America today is a wonderful market, but nothing in the absolute except God is good.

Those things kept in balance can be good. Alcohol in balance reduces heart failure. Drugs on balance are prescribed. All things in balance, including the information technology age can be for good. So first and foremost before I give these remarks I'd like to, of course, commend my friend and Congresswoman Juanita Millender-McDonald, to Congresswoman Bono and the other distinguished members of the Empowerment Subcommittee of the Small Business Committee of the U.S. House of Representatives. I thank you, of course, for having me here today.

Operation Hope, which I represent, is America's first nonprofit investment bank serving the underserved communities of America. I'm here to share with you my vision for a brick and mortar information technology learning tool and a practical means of bridging the digital divide.

It is called the Inner City Cyber Café, and it is sponsored by Operation Hope.

I want to provide a subtext here. The portals that have been created by many African American and Latinos to bridge digital divide often times just enable more middle class black folks to talk to more middle class black folks. Or more middle class Latinos to communicate with more middle class Latinos. We're not bridging the digital divide. We're just walking across the street. We have to go to the people where they are. Going to the market.

Since 1992, the year of the civil unrest here in Los Angeles, Operation Hope has literally done this in the area of economic education, economic literacy, banking and finance. Meeting the people where they are and finding unique and innovative ways to bridge the divide for them in economic education and economic opportunity.

The operational strategy of going to the market has netted results. We have invested some sixty million dollars ($60 million) into south central, east L.A. with some sixty partners, bank partners in tow educating some fifteen thousand adults and thirty-eight thousand youths in economic education and economic literacy. Every loan before is paid as agreed.

Bridging the digital divide, a place to sit. Operation Hope now seeks to utilize this same direct bottom up entrepreneurial approach to bridging the digital divide in inner city and underserved communities. The Inner City Cyber Café, now located at 3721 South La Brea in Central L.A. is a bold, yet fairly straightforward empowerment initiative of Operation Hope joining other innovative

initiative like the Urban League Business Development Center designed to literally bridge the technological and prospective gaps separating inner city and mainstream communities. We're not dumb, or stupid, or misinformed, or ill-informed at worse.

The Inner City Café,—Cyber Café, complete with gourmet coffee kiosk will provide the local community with a comfortable, relaxed and positive atmosphere in which to meet to conduct e-commerce related business and research, to hold one on one business meetings, and to unleash the enormous power of the internet and world wide web.

The Cyber Café, has eighteen cutting edge technology stations, and through a unique partnership with leading edge high tech hardware and software providers, access to the most cutting edge up to date pc tools and equipment available today.

Valuable market research. We're not asking for a hand out, but a hand up. These cyber cafes which—with privacy authorization by the clients will provide valuable research back to the companies seeking to do business in these markets. The growth—the area with the highest growth of internet use in today's market irrespective of race are African Americans. That is the highest number of increase of users of the internet.

Education. Working closely with software manufacturer Intuit, the manufacturer of the immensely popular financial software Quicken and Quickbooks, Operation Hope using the power of technology also plans to teach the individual financial responsibility ethic to low and moderate income individuals with a genuine desire to learn and better themselves.

We are working closely with a full time information system technician who will be there to help them operate the systems and to provide education free of charge on our computers every night of the week that the Cyber Café, is open and it will be open from 9:00 in the morning until 9:00 at night.

Division. Inaugurated by Vice President Gore on April 15th, the first Inner City Cyber Café, came on line with a mission no only to provide learning, but to make learning cool. Aesthetically pleasing to the eye, the Cyber Café, features a twenty-five—twenty five hundred square foot footprint and an attractive and easy to use gourmet coffee kiosk, DVD movies, high speed internet connections, because we meet not only information but entertainment; we call it infotainment, cutting edge hardware and software, an Inner City Cyber Café, website and web portal, and most importantly, technology education.

In closing, the partners. The private/public partners for this innovative collaborative, an on the ground model for bridging the divide includes the U.S. Economic Development Administration, the U.S. Department of Commerce, Intuit, P.S.I. Net, GTE, Unisys, E.D.P. Furniture and Turner Construction.

As a result of the Union Bank and Operation Hope acquisition of a 45% interest in Next Check Cashing Network recently, we hope to move folks from check cashing customers to depository customers. We now have access to six hundred thousand of their low income customers who we also hope to link to the Inner City Cyber Café, network, and to give them a hand up, then a hand over.

Yes, the Cyber Café, is now up and running. We also believe it can be self sustainable. We believe that there's enough revenue that can come from fifty cents per minute usage—I'm sorry, yes fifty cents per minute usage, and if you buy a cup of coffee, half off, to sustain the operation of this Cyber Café. In that way, it's doing well by doing good.

And I close my comments by making a commitment. We commit today to build an Inner City Cyber Café, in every one of our existing operational banking centers. That means our operational banking center in Watts/Willowbrook, the district of Congresswoman Juanita Millender-McDonald, within twelve months we will build a Cyber Café, in your district.

Ms. BONO. Thank you.

And now we'll move on to Perry Parks for a technology demonstration. Correct? Perry is the Vice-President of Government and Public Relations with Media One.

STATEMENT OF PERRY PARKS, VICE-PRESIDENT, GOVERNMENT AND PUBLIC RELATIONS, MEDIA ONE

Mr. PARKS. Perry Parks, Media One, Vice President, Government and Public Affairs.

First of all, I want to thank the distinguished panel for inviting me out today for this particular inquiry. And I want to take the opportunity—the agenda said technical demonstration. So we will have that done on CD Rom, but I want to kind of set the context for the demonstration.

First of all, I think that as we start talking about the digital divide, the agenda and material that we have seen so far has billed infrastructure as a very important aspect of that. It's not the total aspect, but it's a foundational piece, and that Media One essentially is an infrastructure builder. It's a cable network that has been investing and deploying high speed internet cable plant nationally, but in California in particular.

As we sit here today, Media One and the franchises that it covers in its franchise then, has built 75% of all its franchises to seven hundred and fifty mega hertz two way capability, and we're deploying products in the market. In California and in the 37th District in particular, by the end of the year we will be 100% deployed here with that two way capability in residential neighborhoods.

The reason this is important is that this is the backbone infrastructure that will provide high speed internet access to these communities in the 37th Congressional District and all districts that we provide service in.

We have invested over seven billion dollars ($7 billion) starting in 1996 to upgrade our networks nationally, and over five hundred sixty-nine million ($569 million) in California. We have upgraded these networks and it pretty much positions us to be in a very competitive positive posture with other telecommunication providers like the Bell operating companies, direct satellite and wireless.

On the previous panel, one of the speakers indicated that it was all going to be wireless. I hope not, given that we have five hundred and sixty-nine million dollars ($569 million) invested here. To think I was going to be out of business in five years.

But I think what it points to is the fact there are going to be multiple platforms that are going to be available in these communities, wire, hard wire, wireless satellite, that are going to provide the foundation of competition for these particular communities.

What we've seen since our deployment is we actually have seen prices begin to come down. We are providing our high speed internet access at thirty-nine ninety-five ($39.95) a month. Prior to our deployment, it was a minimum eighty-four dollars ($84) or eighty-nine dollars ($89) a month and the speeds were about half as fast. And there's discussion now that it's going to drop another ten dollars ($10) to twenty-nine ninety-five ($29.95) a month. So as the competition begins to take hold here, we'll be seeing prices come down and more access will be made available to the people in this particular community.

We've launched three products. High speed internet access. We've launched digital telephone in direct competition with the telephone company, and we're launching digital satellite—digital television now to compete with the direct satellite companies offering two hundred, two hundred fifty channels of product.

The map in your folder that I passed out and the one that the audience can see on the wall depicts where Media One properties are deployed in Southern California. And what you can see that is that we have actually upgraded every community that we're serving.

Now what we've done essentially is we've connected over eight hundred thousand homes in California to a two way network, and we've also connected over fourteen thousand schools to the network using video product. Where we're beginning to approach this notion of a digital divide isn't in the hardware, it's more or less in what I'm going to call the peopleware and informationware.

The schools that we've approached, we're actually offering school connections at no cost. We'll provide that free, and we've sent out letters to every school in our service area, and we've gotten about two hundred and—two hundred and twenty-six responses back that have indicated a desire to want more information or to be installed, and we've installed eighteen of those schools so far to date with a connection to the internet.

I think that what it points to is that this notion of build it and they will come isn't necessarily going to hold true in this particular market. I think that what it points to is that where the digital divide exists, it exists in the literacy levels that were pointed out earlier. It exists in the lack of familiarity with the technology that maybe our school personnel and other community people have. It exists in the lack of wiring or the capability wire facilities.

So I think that the infrastructure is in place and that we have been able to now identify where the digital divide is actually existing, and I think it is existing in the area of people, software, literacy, those particular kind of issues where I guess the good new is is that we do know how to attack those particular problems if we focus our attention on those issues. The community and this country is pretty creative enough to come up with those solutions.

At the local level, I think that it's important to us that we recognize as a business given that we've wired communities that are predominantly minority that we're looking for a return on that in-

vestment. That the community isn't going to come immediately to these particular products without some outreach and education, and some solutions to this issue about the digital divide.

We have been looking at solutions both internally and externally and what we have been doing and experimenting with these solutions, and I have some of the boards up here, is that we have Culver City High School that we've developed a hundred and thirty computer labs at that particular school to support education in that particular community.

We have taken Challengers Boys Club as a community service center in South Central L.A., coupled it with the Venice Dream Team, which is a nonprofit organization which is training kids in the use of photographic information.

We're marrying out network, the photographic capability and the internet by hosting and putting on line these photographs and digital stories that are going to be developed by kids in the community for the community. We've billed it as—over here I have behind me the broadband stories which is the theme, but the website that it's hosted on is called Street Scenes. So it's on line and hosted, and the kids are Street Scenes.

Street Scenes, Street Scenes; it's a website, www.streetscenes.net. And these kids now from Venice are teaching kids over at Challengers in South L.A. how to use the camera, how to use the equipment, how to use their stories and write for on-line applications. So those are some of the areas that we're beginning to do the experimenting in.

We've looked at other models that begin to be a win/win, and I think that's important given that we are business in the—in the business of trying to make a return on profit. It's important that in partnerships we look at win/win opportunities.

I had the opportunity to visit a school district down in San Diego exploring this opportunity—this notion, and it's called Lemon Grove School District. The thing that's interesting about that school district is they've made some investments already in building servers at the school district site, and they're putting what they're calling thin server clients in student—in classrooms and in student's homes that limit somewhat the capability that you can access on the internet.

But at their server they host those programs and that software that's used by teachers and give them some access to on-line portals and websites that are appropriate for education. And they're putting in the student's homes.

What this allows is that teachers and parents to communicate, student to student communication, and what they are finding is that there is an increase in the average daily attendance which is bringing dollars to this poor school district in San Diego.

Through the e-reg monies and through other subsidies, the system down there is offering the service at a discount rate, like nineteen dollars ($19) a month in a community that would be historically under penetrated in San Diego. And they're beginning to see a lift and rise in the penetration at nineteen dollars ($19) a month. So nineteen dollars ($19) a month isn't sixty dollars ($60) a month, but if you have the capital investment in the ground, some money is better than no money.

So it begins to be a win/win for the company because they're beginning to see growth and penetration. They're educating a new generation of student who will be familiar with the technology which will make them a more likely purchaser of the technology in the future. The school district is getting increased attendance and education is improving.

That seems to me to be the kind of models that we ought to be searching for in terms of deployment in our schools to support the closing of this particular gap.

So with that, what I'd like to do is bring Brian Thatcher up so that we can give you a quick example of why we think high speed internet access is important and one of the roles it might play with the high speed applications in an e-commerce world.

What we're going to attempt to do is show you first of all, a demonstration or example of the download speeds compared to the standard dial up modem. So as Brian begins to show that, what you'll see is that the standard dial up modem moves information very slowly.

Ms. MILLENDER-MCDONALD. That screen right there is in the way of our seeing it.

Ms. BONO. Can you move that visual?

Mr. PARKS. Okay, so what was just demonstrated there is that the picture of the balloon on my right is up, the dial up modem is still trying to process the information. What this means essentially is people will not have the patience in an information age to sit there and wait for the information to upload. They're going to want in instantly and they're going to want it quickly. And so this—these are examples of the comparative speeds in terms of audio, photograph and video. It shows you the speed at which it can be accessed.

If we go to the video, video is a lot more intensive application, so it downloads at a slower speed on the dial up and a little bit slower on our Media One Roadrunner. But again, it's quite dramatic in terms of the comparison.

One of the other applications that we can use is the photographic scenes that will allow you to explore items, locations, materials, in a hundred and sixty degree kind of format. So if we can bring up, what it allows you to do from your home is to go to a particular location. See if we can get it up.

[Pause.]

Mr. PARKS. Okay now, with your mouse then you can move that scene three hundred and sixty degrees to different views, perspectives on the location. Now where I think this begins to have a tie-in to e-commerce is that if small businesses are putting products on line, if you're selling a home, or whatever the product might be, you could put in on line and people get more than just a two dimensional view of that particular product.

So with that particular capability you know, small businesses that can develop their own websites, the Cyber Café, is an example, could have both a camera internally so people could check out who's in the caf, at home, and they could see that Joe is down there and go down and say well I can meet Joe at the caf, because I can see he's there.

Or, you might have some other product that you might want to use that you want to make available to the entire community. So what I'm saying I think here, is that the infrastructure, the capability is there. The 37th Congressional District is, from an infrastructure point of view, is up and ready to go.

Ms. MILLENDER-MCDONALD. Schools and all?

Mr. PARKS. Well it passes the schools. Like I said before, I think the issue here is being able to work through the educational bureaucracy to make sure that we can get those products into the schools, and we're working that every day. Right now, our commitment this year is to wire at least sixty schools in the southern California area so that they are high speed internet capable. And we have a commitment to do 100%, you know, over time.

Ms. MILLENDER-MCDONALD. Let me just ask you, I've got to ask this question. Sixty schools you want to wire. How are you going to do that? What technology are you going to use wire those sixty schools? What would be the criteria?

Mr. PARKS. I think that the criteria is first come, first served. I mean, what we've done as I said before, is that we have mailed out letters introducing and letting schools know that we are—our plan is passing their school, that we have a commitment to providing them the drop and the access at no cost, and the cable modem at no cost, and we're waiting on responses back. So it will be on a first come, first served basis that we will do that.

Ms. MILLENDER-MCDONALD. In the K–12 or the—colleges?

Mr. PARKS. K through 12, and including private parochial schools as well.

Ms. MILLENDER-MCDONALD. So then you're talking about an abundance of requests coming in for sixty schools.

Mr. PARKS. Well you would think so. But what I have so far out of the fourteen thousand—fourteen hundred that we've mailed out so far we've had two hundred that have responded and we started these—the mailing in October of 1997.

Ms. MILLENDER-MCDONALD. So apparently you're saying fourteen hundred that you've mailed out. So you've already narrowed that universe. Fourteen hundred. Who are the fourteen hundred?

Mr. PARKS. The fourteen hundred schools are the schools that are—I misspoke there. I said—there are fourteen hundred schools that are in the Media One service area. Those are the schools that we pass and that would be eligible for and have access to the services that I'm talking about.

So we've mailed letters and made calls to the fourteen hundred schools introducing and letting them know that this service is available at no charge. We started that in October of '97. To date, we've had two hundred and fifty that have responded to the letters. And we have eighteen of those that have been installed.

So part of that process is working through the school's bureaucracy to get installed, and I think the other part of it is that some schools, or a lot of schools aren't quite up to speed on how to address it or what they need to do internally. So I think that that's where the problem lies.

Ms. MILLENDER-MCDONALD. So the more—their inability to have the capability of knowing how to respond to you as opposed to bureaucracy?

Mr. PARKS. Yeah. I think it's a number of things. I think that part of it is—is internal—it could be internal wiring issues. The other factor is that some of the schools have already been wired by Pac Bell on their service. So there's that—so you eliminate some there. And then some of it, I think, has to do with just a lack of familiarity with the technology and how to address it and how to use it.

Ms. MILLENDER-MCDONALD. I would like to think it's the latter as opposed to bureaucracy because that's when I would have to come in and see what's going on, folks not wanting to move an agenda of tomorrow for students today. And so with that, that's why I wanted to know if it's more one thing than the other.

Congresswoman, I just had to ask the question.

Ms. BONO. Well, if you'd like to go ahead and start your formal questioning, perhaps you can do that. But just to remind everybody, if we could try to wrap up by 12:45. The staff and everybody has a long way to go to get to Mecca this afternoon before traffic. So 12:45 is a realistic goal, I would appreciate that. Thank you.

Ms. MILLENDER-MCDONALD. And you have me traveling too, Madame Chair.

Let me just continue with you then Mr. Parks, Perry. Let me ask you a question. We're talking about e-commerce, and we're talking about that being really the most—it's really an issue that has not tapped into my community in a big way or in my understanding of the businesses I've talked with.

They're not provided this or do not have the capabilities of even running an e-commerce component, if you will. What would you say, how many small businesses have you come across who is using broadband capabilities, if any?

Mr. PARKS. Well, speaking from the Media One experience right now, we're primarily a residential service and we——

Ms. MILLENDER-MCDONALD. You don't need to answer that.

Mr. PARKS. Well I'm going to tell you, I think that—no, I don't know of any at this juncture.

Ms. MILLENDER-MCDONALD. Okay LynneJoy, how many you come in contact with your small business—position of serving small businesses? How many have broadband capabilities?

Ms. ROGERS. Very few have broadband. Very few.

Ms. MILLENDER-MCDONALD. How many of them really have internet capabilities?

Ms. ROGERS. Very few.

Ms. MILLENDER-MCDONALD. That's right.

Ms. ROGERS. DSL has emerged, however the majority of the businesses that we work with are still using dial up access which is why become an e-commerce shop primarily.

Ms. MILLENDER-MCDONALD. Uh huh.

Ms. ROGERS. Those that can afford DSL, they are using DSL but it's a very small number of businesses.

Ms. MILLENDER-MCDONALD. So there is a need, Lynne I'll stick with you, business development centers is a critical need for small businesses?

Ms. ROGERS. It's a very critical need. We're one of, I think it's sixty-five minority businesses funded by the Minority Business Development Agency. We are the only minority business development

center in that network that has a focus on information technology and e-commerce.

Ms. MILLENDER-MCDONALD. The only one?

Ms. ROGERS. Only one. We do training for entrepreneurs. We had been doing that even before we had the minority business development site.

Ms. MILLENDER-MCDONALD. Are you going to get any funding from SBA?

Ms. ROGERS. No. No, we seek no funding from SBA.

Ms. MILLENDER-MCDONALD. All right, so you're the only one who provides this technology?

Ms. ROGERS. From the perspective of consultation and training, yes. We're business consultants and we actually go into the businesses and we look at the operations. We make determinations of what they're software applications would be based on their operations and their current infrastructure.

We look at their employees and make determinations as to what their current skill levels are, and what training would be necessary in order to bring those employees' skills up to par in order to be able to operate some of the software applications. But the reason we offer those services is that, you know, our primary base of businesses are mostly African American, primarily African American, but Latino and Asian as well have the least access to technology infrastructure.

And that's essentially what I was referring to in my comments. Small business, and here in California you have a disproportionate number of minority businesses. There are—in fact, we have the largest population of minority businesses located in California and more specifically——

Ms. MILLENDER-MCDONALD. So if they're not internet capable, how can they then do e-commerce?

Ms. ROGERS. That's the issue. I mean, it's—when you talk about being internet capable, you know, anybody can acquire it. Sure, small business can be nineteen ninety five ($19.95) a month. You get dial up access and you get on the internet. And I think we need to be clear when we talk about a digital divide. It's not just gaining access to the internet.

It's not just having the ability to be able to surf the internet. That's why I made the comments that I made earlier. It's the ability to be able to afford the technological infrastructure that helps to really create the competitiveness that is necessary in order to be efficient and effective in any kind of business today. And that's what is difficult for small business, and it's continuing to be difficult.

Ms. MILLENDER-MCDONALD. Let's see, here. We are running on—the creation of manufacturing jobs in our urban communities is still top priority, although trends show differently. Manufacturing jobs, many of them are gone for the most part.

Ms. ROGERS. I know. They are gone. But you'd be amazed at the number of well meaning developers that still continue to look at manufacturing even in the City of Los Angeles as opportunities for neighborhoods and communities to be able to participate in those—it's still labor, it's unrealistic, but that's what's happening. There is less emphasis, if you will, on technology training. There is not

as much emphasis as there needs to be in the world today. And it's not just for——

Ms. MILLENDER-MCDONALD. I just want to know, emphasis on the what? On technology training? Just basic in your adult, job training centers, or where?

Ms. ROGERS. You have it in the adult schools. I think you have some programs. The question becomes, once you go through those programs do you have enough—do you have enough training to be able to compete for the jobs that are available today? If that were the case, then we certainly would not be importing as many technologists as we are.

There's a reason why, you know, we're going through the same thing right now that this country went through a hundred years ago. When we were going from the agricultural society to the industrial society, there was a great immigration, greater immigration. And of course there was no need for people that looked like us, because you know, slave labor was obsolete as a result of automation. Now in Jeremy Rifkin's book, The End of Work, it talks very much about the technological evolution and the impact that it's had on African Americans.

Ms. MILLENDER-MCDONALD. Let me ask you this. I know that time is low, but I'm going to throw a phrase out there and I want you to end it. Small businesses need what to survive?

Ms. ROGERS. Small businesses need information technology, affordable information technology, infrastructure development. Right now, for a small business to be able to do what most businesses do very naturally, establishes networks, what they call extranets and intranets, it would be almost very difficult for small businesses to be able to afford that right now.

We're also talking about the distribution network. When I talk about the phone systems, and it's not picking on one phone system against the other, phone systems right now, I'm not talking cable, but even any distribution system as it relates to getting access to the internet or getting access to a direct line of commerce, is becoming increasingly more expensive.

And that's an issue. Deregulation has made telephones more expensive. I got a bill yesterday from AT&T saying we're getting ready to change our calling card rates from twenty-five cents ($.25) a minute to ninety-nine cents ($.99) a minute.

Ms. MILLENDER-MCDONALD. And the deregulation was supposed to bring about competition.

Ms. ROGERS. Absolutely, and so the idea affordability is really one of the issues that we really need to deal with when we start talking about access to technology. What are we talking about and what are the affordable aspects as it relates to access. If it's not affordable, you're not going to be able to access it.

Ms. MILLENDER-MCDONALD. California has, or Los Angeles has more small businesses than any other state, did you say? Or what was that comment?

Ms. ROGERS. We have more small businesses more specifically in southern California as a whole. Small business plays more of a role in the economy than anyplace else because southern California as you know, there are very few corporations headquartered here. You

have a lot of corporations that have a presence, but they are not headquartered here.

Ms. MILLENDER-MCDONALD. That's correct.

Ms. ROGERS. So small business is really the engine that is driving our economy.

Ms. MILLENDER-MCDONALD. There is no doubt about it, and also has been and continues, I'm sure, to be the ones who provide the job. We understand that.

Ms. ROGERS. That's correct.

Ms. MILLENDER-MCDONALD. Mr.—okay, Mr. Covington, you said competition to business is evil? Can you please explain, or as my grandchildren would say, would you 'splain that to me?

Mr. COVINGTON. Yes, it's really interesting. It's evil because it costs a lot of money to compete, and then so businesses don't want to compete. Let's say a company has a bunch of sub-contracts and they want to find the best contract for them. It's easier to go with the contract base you already have than to go out and compete, you know, against several other——

Ms. MILLENDER-MCDONALD. You cannot sit on your laurels Mr. Covington. You have got to be competitive in this world of competition, for heaven's sake.

Mr. COVINGTON. I would say——

Ms. MILLENDER-MCDONALD. You cannot just continue to say, I have this product. It's a good product. I have these few people who are going to buy this product, so I am happy in my own little place. Competition is real. Competition is growth, is it not?

Mr. COVINGTON. It absolutely is, and that's one of the reasons why we really believe that more competition should be instituted, especially in private business. I think the government——

Ms. MILLENDER-MCDONALD. So it's not evil then?

Mr. COVINGTON. Oh no, it's not really evil.

Ms. MILLENDER-MCDONALD. Okay.

Mr. COVINGTON. No, it's really good. But it's not practiced in business, and you know, sometimes I sit back and I sort of put myself in their position, and you wonder, you know, would I do the same thing? And you know, it would be hard to put another cost into your system when you have other competitors out there that are doing the same thing you're doing. So it's the system more than——

Ms. MILLENDER-MCDONALD. I suppose I agree with you to some degree, but let's say this. You used the metaphor of the basketball or some sports figure, but that sports person, albeit basketball, baseball, or whatever, golf or whatever, they come with their product. They come with a skill to sell and so they do come with something that provides them the opportunity to go into this arena of competitiveness.

Mr. COVINGTON. Absolutely, but one of the things that I——

Ms. MILLENDER-MCDONALD. Is that not the same as business?

Mr. COVINGTON. In a way, but not the same. I used to work at a company called TRW. It's a great company.

Ms. MILLENDER-MCDONALD. I have it in my district.

Mr. COVINGTON. Yes, and one of the things that you'll notice, I mean, they went out and found all of us engineers from all over the country. Their requirements are that you have to have a 4.0

GPA. Well everybody walks in with a 4.0. Everybody is capable. When it comes time to promote somebody, they don't promote the best guy. You only have to be in the average, somewhere in the middle somewhere. So it's sort of nebulous. It's not like in sports where you can go out there and slam dunk.

Ms. MILLENDER-MCDONALD. We don't call that competitiveness, we call that bias.

Mr. COVINGTON. Well it's called——

Ms. MILLENDER-MCDONALD. Is that not true?

Mr. COVINGTON. Well it's called grading on the curve. If everybody is as good, then the curve is somewhere in the middle. So, you know, you don't really always get the best guy.

Ms. MILLENDER-MCDONALD. In politics we certainly understand that. It's not always the best guy or girl that wins.

Mr. COVINGTON. You guys have a more competitive environment in that you have to go out and fight every four or six years, and then they get you back here. But nobody else has to do that, and in a lot of situations they typically pick—you know, the easiest route is to find someone they're already working with. Every—every large manufacturer today is reducing their contractor role, not increasing them. They want to reduce them. They want to go through—if they had their way, they really want to go through one person and let them worry about all the other ones.

Ms. MILLENDER-MCDONALD. We understand that. We're looking at contract bundling, and we're looking at all those things that seem to be sometimes, seemingly adverse to small businesses.

Mr. COVINGTON. Well the real danger is that, you know, and I know you guys are politicians, but I may be as crazy as a road lizard when you take my taxes, but please give them back to me when you start looking at these contracts. You know, a lot of these companies that exist were funded by the government, and as inept as people say the government is, I mean it's producing——

Ms. MILLENDER-MCDONALD. Be careful young man.

Mr. COVINGTON. It's producing all this economic growth. I mean, there are two factors that produce everything we have——

Ms. MILLENDER-MCDONALD. I hear what you're saying.

Mr. COVINGTON. Semi conductors and the internet both created by the government.

Ms. MILLENDER-MCDONALD. Yes, yes, yes. We hear you. So when big businesses no longer need all the contracts. They should provide the tax credits, is what you're saying.

Mr. COVINGTON. Well let's be sure we can get our money back. To the extent that they get their money back, we'd like to get ours back too. I don't know how many seats in Congress we paid for, but——

Ms. MILLENDER-MCDONALD. You're wanting what, getting your money back?

Mr. COVINGTON. Exactly, our tax money.

Ms. MILLENDER-MCDONALD. Okay.

Mr. COVINGTON. That percentage that everyone else gets, our percentage goes——

Ms. MILLENDER-MCDONALD. Well we're working on that. This is one democrat who has told the President himself and Gene Sperling, his advisor, that we need to do tax credits. That we need

to do some, you know, tax credits, in other words. I did tell him that. It may not be as onerous as my friend to my left, oh to my left. Hey that's pretty good.

Ms. BONO. How did that happen?

Ms. MILLENDER-MCDONALD. Anyway, I do feel that there should be some tax credits, and so we're looking at that and I'm trying to push that with the President. We need them.

Mr. COVINGTON. I'm more referring to when you—when the government lets contracts, that they're giving them all to someone else. They aren't giving—I mean, I don't care if it's a janitorial job. Give them all janitorial jobs. But just give back the money so it comes back to the community. We don't get back.

Ms. MILLENDER-MCDONALD. Let me ask you, both of you, what would be most helpful for getting small businesses into the e-commerce world. One liners, can't give you a lot of them because I want to go to John for the Cyber Café. So what will be most helpful to getting small business into the e-commerce?

Mr. COVINGTON. I agree that, I really believe that LynneJoy Rogers and people like her need to train them, because we build them and we have more trouble when we build——

Ms. MILLENDER-MCDONALD. Build them. Build what?

Mr. COVINGTON. Build corporate intranets and internets and extranets. We build those sites for——

Ms. MILLENDER-MCDONALD. Engineers and all?

Mr. COVINGTON. Yeah, we build them so that people can—can maximize the way they do business inside their business and maximize the way they sell their products to the external companies. And we build those things, but it's difficult when you don't understand what's possible.

Ms. MILLENDER-MCDONALD. As we look at people now on line from using the internet for buying food, clothing, cars, Christmas cards, other things, we had better look to see what we need for small businesses——

Mr. COVINGTON. Absolutely.

Ms. MILLENDER-MCDONALD [continuing]. Because e-commerce is real and people will find it will become a very biased system in the long run because you have folks who don't surf that internet who are going to your mainstream malls and all getting these products.

And they're paying the taxes for the folks who are internetting—internetting, oh good word, people on the internet are not paying basically for those things that they're buying. So you know, it becomes an issue of they have not been having to pay for the haves who don't have to pay. So it's indeed an issue.

John.

Mr. BRYANT. Yes ma'am.

Ms. MILLENDER-MCDONALD. Cyber Café. I'm happy that you're providing one in my district soon. Will it provide jobs in the long run?

Mr. BRYANT. I think that if it succeeds in its mission of educating people, educating business entrepreneurs enough to give them the kind of self esteem and what I call education affluence, to go out and have—what Lynne referred to is an integrated perspective. An integrated perspective mean they will create small business and the will create jobs. If they are not successful in doing that, they

will not. And make it clear, I want to be judged mostly based on results.

So you know, the jury is still out on that. I would like the Congresswoman to answer very quickly the question of what's that one thing you mentioned that is important. Federal Reserve Chairman Greenspan said at the White House Conference on the New Economy two weeks ago with the President, he said that there are two irreversible assets in America and we all just sat on the edge of our seats.

My God, everything's a reversible asset. You look at a dot com today, they're a dot gone tomorrow. Everything a reversible asset. And he said, no there are two irreversible assets, and we were all waited for a moment and the pause came. He said it's education or information and access. Once you got them, you don't ever not have them.

And so I think that it really comes down to what I think everybody saying is that education is liberation. No matter what you're talking about. It first and foremost has to be about education. That give you kind of comfort and self-esteem to deal with the confidence, technology or anything else, competition. Whatever else is out there. And then after I'd say that small business ought to be savvy and partner.

Ms. MILLENDER-MCDONALD. Okay, I just want to introduce some folks who are in the audience. We have board of trustee members of Compton College. I see Mr. Carl Robinson and I see Mr. Ignacio Pena. Those two are there. And then I see Councilwoman Marcine Shaw from the City of Compton as well. We have with us visiting from Ghana, Cape Coast of Ghana, Chief Nana Gyepi, the III. So I'm so happy to have you travel so far.

Madam Chair, thank you so much.

Ms. BONO. Thank you. Actually, on that note I am going to just let you all know that usually in Congress we as Members on the dais are allowed five minutes to ask the whole collection of panelists, but I note that this hearing was important to my colleague and was happy to defer as much time as I possibly could to her.

Ms. MILLENDER-MCDONALD. Thank you so much.

Ms. BONO. Oh, you're welcome.

Ms. MILLENDER-MCDONALD. Tomorrow, I will say nothing.

Ms. BONO. No, no, no. I will need your help equally tomorrow. So thank you. But I do also—I will not bring questions forward because I do have to be on the other side of L.A. actually in forty-five minutes. So I'm going to run. So I want to thank this group of panelists as well, and one thing that was missing that I would have loved to have the opportunity to have and it's just an informal request, is your biographies because I'm very impressed with each and every one of you, and I would love to know who you are and where you come from other than what I see in my notes here.

Ms. MILLENDER-MCDONALD. You cannot steal them. They belong to me.

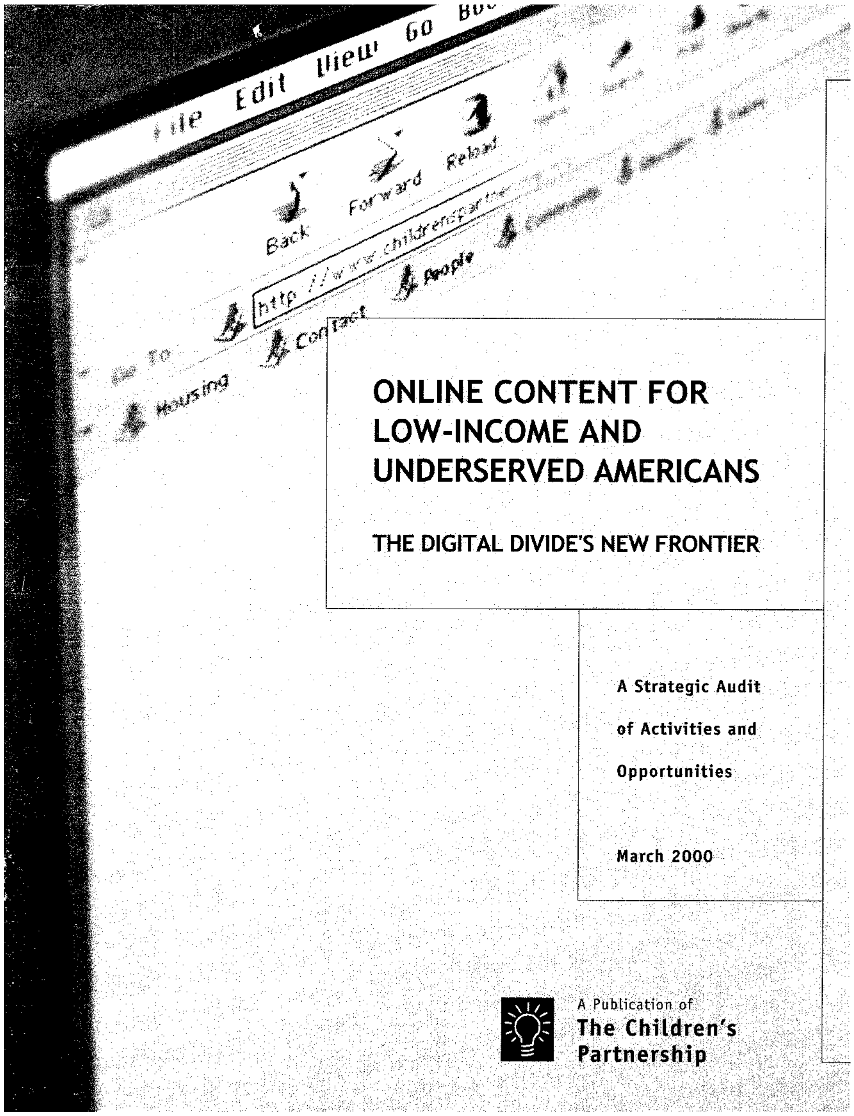
Ms. BONO. But I would like to, if that's possible, you know not a formal request of the Committee, but just to my staff at some point in time or my office. Because I will steal you at some point in time. So I want to thank you all and thank those of you who

stayed with us through the morning for being here as well. And that concludes the hearing.

Ms. MILLENDER-MCDONALD. Madame Chair, I'm sure you want to join me in thanking all of our staff who's been absolutely brilliant helping us to this today.

Ms. BONO. Yes, thank you. I do thank the staff. Thank each and every one of you as well.

[Whereupon, at 12:16 p.m., the Subcommittee was adjourned.]



ONLINE CONTENT FOR LOW-INCOME AND UNDERSERVED AMERICANS

THE DIGITAL DIVIDE'S NEW FRONTIER

A Strategic Audit of Activities and Opportunities

March 2000

A Publication of The Children's Partnership

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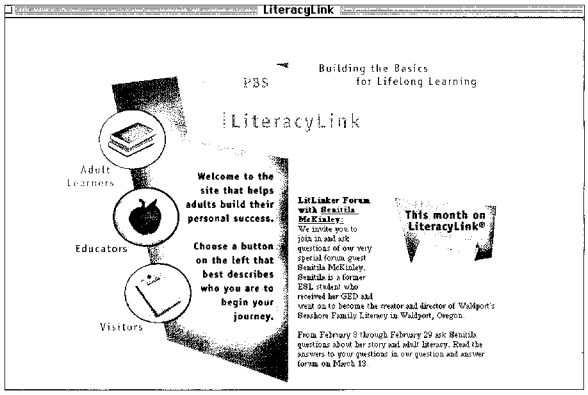
The websites depicted have been mentioned in this report and we encourage readers to visit them.



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EXECUTIVE SUMMARY

THE DIGITAL DIVIDE'S NEW FRONTIER

Computers and the Internet are revolutionizing the ways people learn, communicate, and earn a living. Yet study after study has shown that America faces a significant and troubling "digital divide" between those who have access to online information and opportunities and those who do not. While this digital divide has received a lot of attention from the press, policymakers, and the Internet industry, an important aspect has been neglected: content. This new dimension of the digital divide is beginning to take shape, however, and is having a profound impact on young people and those who guide and teach them.

Through its five years of work to bridge the digital divide, The Children's Partnership has found that it is as important to create useful content on the Internet – material and applications that serve the needs and interests of millions of low-income and underserved Internet users – as it is to provide computers and Internet connections. For Americans at risk of being left behind, useful content includes the following: (1) employment, education, business development and other information; (2) information that can be clearly understood by limited-literacy users; (3) information in multiple languages; and (4) opportunities to create content and interact with it so that it is culturally appropriate.

This report, the result of nine months of research, analyzes this new frontier of the digital divide, providing an analysis of the "state of the art" along with recommendations for policymakers, corporate leaders, technology center staff, philanthropists, and those who work with and on behalf of underserved Americans. (Underserved Americans, for the purpose of this report, include people who have low incomes, live in rural communities, have limited education, or are members of racial or ethnic minorities.) Our research included discussion groups with more than 100 low-income Internet users, interviews with nearly 100 community technology leaders and other experts, analysis of 1,000 Web sites, and a review of the literature and promising activities across the country. This report is the latest in a series of "Strategic Audits" produced by The Children's Partnership on subjects of national importance that affect large numbers of young people.

This Audit has three purposes:
1. To describe the groups of Americans who are underserved by Internet content, what these groups want in the online world, and the barriers they face;

2. To analyze the online content currently available for low-income and underserved Americans, emphasizing the major gaps and the most promising building blocks; and

3. To provide a road map for action – identifying ways in which the public and private sectors working with underserved communities can ensure rich and relevant online content for Americans at risk of being left behind.

CONTENT-RELATED BARRIERS: TAKING A HEAVY TOLL

The Children's Partnership research found that, though many underserved communities are gaining access to the Internet, many are not benefiting fully because of barriers they face related to content. In order to develop a map of the key issues, we focused on four significant barriers that affect large numbers of Americans:

Lack of Local Information. Perhaps the most far-reaching barrier of all is the scarcity of the kind of information that users want most – local information about their community. While this barrier potentially affects a great many Americans, it disproportionately affects Internet users living on limited incomes, especially the nearly 21 million Americans over age 18 whose annual income is less than $14,150 for a family of three (the level used by the federal government to define poverty).

Literacy Barriers. Online content has been primarily designed for Internet users who have discretionary money to spend. The vast majority of information on the Net is written for an audience that reads at an average or advanced literacy level. Yet 44 million American adults, roughly 22 percent, do not have the reading and writing skills necessary for functioning in everyday life.

Language Barriers. Today, an estimated 87 percent of documents on the Internet are in English. Yet, at least 32 million Americans speak a language other than English as their primary language. They are often left out of the benefits the Internet offers.

Lack of Cultural Diversity. The Internet can be a powerful tool to share and celebrate the uniqueness of cultures in this country and beyond. However, despite the tremendous surge in ethnic portals, there is a lack of Internet content generated by ethnic communities themselves or organized around their unique cultural interests and practices. For many of the 26 million Americans who are foreign born, the lack of cultural diversity in available content serves as a real barrier.

AMERICANS POTENTIALLY UNDERSERVED BECAUSE OF INTERNET-CONTENT BARRIERS

Type of Internet Barrier	Estimated Number of Americans Affected
Lack of local information	21 million
Literacy barriers	44 million
Language barriers	32 million
Lack of cultural diversity	26 million

A conservative estimate is that at least 50 million Americans – roughly 20 percent – face one or more content-related barriers that stand between them and the benefits offered by the Internet. These barriers are taking a heavy toll on the 50 million underserved Americans. A high proportion of the underserved are likely to become more active citizens, consumers, and entrepreneurs in this new media, increasing their opportunities for success, if Internet content became more relevant, and if underserved communities had access to content-related services such as training and technical assistance.

WHAT UNDERSERVED INTERNET USERS WANT

Through focus groups with members of our target population and through interviews with a variety of people who work with underserved users, we probed to learn what underserved Americans want from content on the Internet.

Adults want:

- Practical information focusing on local community;

  Local jobs listings including jobs requiring entry-level skills

  Local housing listings

  Community information

- Information at a basic literacy level;

  Preparation for securing a high school equivalency degree

  Online resources as opposed to print materials

  Online learning materials with multimedia components

- Content for non-English speakers; and

  Online translation tools

  Online instructional materials

  Information in native languages

- Cultural information.

  Cultural exploration and development

  Cultural spaces about ethnic and local cultural interests

  Health information and other vital information geared to particular racial and ethnic groups

Children and youth want:

- Participation and self-expression;
- High-impact packaging with interactivity;
- Multimedia; and
- Youth-friendly tutorials.

Both adults and youth want:

- Easier searching and usability;
- Encouragement; and
- Involvement.

THE STATE OF THE ART

Using what underserved users reported they want from the Internet, The Children's Partnership utilized a combination of approaches to explore what is available on the Web that meets these needs. Although we clearly captured only a fragment of the vast Internet content now available, our core findings were corroborated by the various sources we used.

We assessed 1,000 Web sites from portals that we selected to audit because they represent, according to users and informants we worked with, some of the best on the Web. Our findings here represent a systematic scan rather than a comprehensive mapping of the Web's content for various underserved groups.

Our research found the following:

- Generalized information (as opposed to local or community content) on topics of interest is available (26 percent of the Web sites had such information). Generally this information is not at literacy levels and in languages that underserved Americans need.

- Most of the online content we found written at a limited-literacy reading level was designed for the developmental needs and interests of young children and did not provide the information needed by adults with limited-literacy skills (only 1 percent of the Web sites were found to meet this need).

- Much of the multilingual content we found is in Spanish, presumably responsive to the market reality that Hispanics are the largest foreign-born minority group. Much of it, however, comes from Latin America or Spain, leaving gaps in Spanish-language content related to finding opportunities in the United States, such as obtaining a job or a high school diploma. Only 2 percent of the content found was multilingual.

- Precisely the information most often requested by the users we interviewed (e.g., local job resources or job listings for entry-level positions) proved to be the most rare and difficult to find (1 percent). Similarly, information about local low-cost housing was, with few exceptions, unavailable (1 percent).

- We did not locate significant examples of cultural information at the local level (about 1 percent); however, general cultural sites are growing for African Americans, Asians, and Hispanics.

• Our review of interface design and searching tools conducted by low-income users underscored the inadequacy of prevailing tools. In our sample of 45 Internet users who participated in our Web search exercise, 80 percent said it took too long to find the information they were asked to find; 65 percent did not find the material understandable or easily organized; and 65 percent did not find the portals assigned easy to use. Difficulties with search tools for the Web point to the importance of training and support as well as better searching mechanisms.

BUILDING BLOCKS FOR THE FUTURE

While content currently on the Web generally does not meet the needs of underserved Americans, we did find positive examples of Web content, along with content development activities that provide useful building blocks for the future. They include Web site products and tools as well as more extensive initiatives. Because this field is so young, most of the initiatives we spotlight are relatively new, while others are still on the drawing boards.

We looked for promising practices in categories that grew directly from what the users in our study cared about and what experts in the field believed would make the most difference. Our research uncovered a variety of efforts around the country involved in content-related projects for underserved communities. Some pioneering nonprofit groups, community technology centers, networks and libraries are developing or aggregating content for underserved users; many are breaking new ground in this area through the design, the quality of information, and the targeted nature of content on their Web sites. Some of the public-private partnerships focus on equipping individuals to be content developers by teaching advanced Web publishing skills; others offer mentoring programs that build technology skills through effective online programs and learning methods; and still others involve underserved users themselves in creating content for their own communities.

NEXT STEPS AND RECOMMENDATIONS

This Audit provides a clear picture of what underserved communities want and need from the online world. That picture can help guide the Information Age in ways that benefit communities and improve the quality of life for all Americans. In addition, the participation of the underserved can greatly enrich our collective culture. Ignoring the voice and vision of underserved communities will limit the ability of this potent interactive medium to function as a tool for greater opportunity.

Five key characteristics. Our research yielded five key characteristics that define a positive information society. These form a framework for our recommendations.

A positive information society:

1. Is community driven and meets real community needs;
2. Overcomes major content barriers facing the underserved;
3. Provides people to help;
4. Offers online content that is easy to use;
5. Is sustainable.

Two prerequisites. There are two prerequisites to our recommendations. First, many of the positive online activities this Audit chronicles require high-quality hardware, software, and high-speed connections, which most underserved communities do not have today. While a great deal can be accomplished with fairly basic infrastructure, all underserved communities need centers of excellence where the more advanced applications are possible. Our findings and recommendations can help inform the efforts of U.S. companies, the U.S. Department of Commerce, the U.S. Department of Education, some foundations, and others to solve this critical infrastructure challenge.

Second, all interested parties must sustain their advocacy efforts to make sure the powerful interactive capabilities of the Internet are actually used to address real community problems. If the positive scenarios described in this Audit are not persistently promoted by civic leaders, elected officials, and corporate leaders alike, the potential of the new medium to achieve genuine social improvement will be lost.

Three Strategies. Based on our findings, we recommend three strategies to promote a positive information society that includes the 20 percent of Americans who are underserved today:

1. Start with what can be done immediately, including steps every community can take.

• **Find Out What Your Community Values:** We urge communities across the country to begin to map what information residents find most useful, how they want it organized, and how the Internet can help residents use education, employment, recreational, and other opportunities. In underserved communities, trusted places like community or religious centers and many others have a leadership role to play.

• **Build New Online Community Resources:** Communities should begin to build online resources based on residents' guidance.

• **Enlist Local Talent:** Communities can tap readily available resources to support them as they build these online resources.

• **Aggregate and Market Available Good Content:** Using the good content for underserved communities identified through this report as a building block, we urge interested parties to gather and organize what does exist so that community technology centers, after-school programs, community colleges, adult literacy centers, libraries, schools, and the like can use it more easily. To make this resource available most efficiently, we recommend that groups that represent underserved constituencies work together to assemble and maintain this resource.

• **Use Search, Translation, and Multimedia Tools to Reach the Underserved:** We urge the corporate sector to take the lead in deploying existing multimedia tools to make online content more useable by Americans with limited literacy and language skills.

• **Direct Available Government Resources Toward Groups That Can Develop Content in Underserved Communities:**

Federal and state governments should use existing grant programs for technology to encourage and support the development of content most valued by underserved communities. A great deal of valuable new content could be developed if even two of the major federal initiatives focused on underserved Americans – the Commerce Department's Technology Opportunities Program and the Department of Education's Community Technology Center program – devoted a quarter of their $45 million budget to content development.

• **Offer Essential Public Information at a Limited-Literacy Reading Level:** We urge government, schools, and libraries to customize their content for those who lack functional literacy.

2. Put in place a national strategy that leads and supports communities as they use the new online tools to tackle real community concerns and ensure that no Americans are left out.

• **Convene an Online Content Strategy Group:** We urge the philanthropic sector to convene leaders from the corporate sector, underserved communities, and government to determine how best to place the content issue on the national agenda. In addition, this strategy group should establish nationwide goals, measurable targets, and key action steps for creating a positive information society.

• **Build Community Information Portals:** Private industry should work with underserved communities to develop and share models for community information portals. The model would be patterned on private industry's "enterprise information portals," which offer clients a one-stop, interactive online center. The tools offered by WeGo.com (http://www.wego.com/index.html) offer an exciting preview of the potential of such portals.

• **Provide Community-Based IT (Information Technology) Preparation and Training in Underserved Communities:** Private philanthropy, the corporate sector, and government should expand the support of community-based IT (information technology) preparation and training in underserved communities. As a way of focusing on highest-need areas, efforts should target the 130 urban and rural areas designated as empowerment zones and enterprise communities because of their economic distress.

• **Create a New Economy Corps:** We urge private philanthropy, the corporate sector, and government to invest in a nationwide network of the people who support technology skill development in underserved communities. A New Economy Corps should be established to form a "people network." Serving as an Information Age counterpart to the Peace Corps but focused on the United States, New Economy Corps members would go into high-need communities and serve as catalysts for community building, using technology.

• **Strengthen and Expand the Nationwide System of Community Technology Centers:** The nation needs an ongoing investment in a nationwide network of institutions that can serve as the community-based technology hub in underserved communities, helping residents both produce and use relevant content and teaching skills that make individuals more effective participants in the Internet arena.

• **Offer Incentives for Content Developed by and for Underserved Americans:** Business and government should provide incentives for underserved Americans to create high-quality content that has value to their peers.

3. Carry out the research and development (R&D) that creates the knowledge base for community and national efforts to be effective.

• **Undertake Market Research About Underserved Americans:** We urge that additional research be undertaken to better answer key questions about underserved groups, their information needs, and the barriers they face.

• **Collect, Evaluate, and Disseminate Information About What Works:** Both the government and the private sector should track and evaluate what is working to achieve positive outcomes. As knowledge is gained, it should be communicated to the players who support and carry out these initiatives.

• **Develop a Business Model for e-Community Building:** We urge entrepreneurs from underserved communities to join forces with business leaders and business schools to develop a business model for how e-community building works.

• **Create New Search Capabilities and Other Tools:** Search tools should be developed to quickly find online content written at a limited-literacy reading level. In addition, we recommend the exploration of new software with advanced artificial intelligence that allows complex Web sites to be made simpler.

• **Develop Standards to Guide Online Content Development:** Standards have proven crucial in the development of other educational tools as well as other media to ensure positive uses and a level playing field. Basic concepts like ensuring online content is accessible at various literacy levels and in different languages should be incorporated in the development of Internet standards.

• **Learn What Motivates the Underserved and Begin Outreach Efforts:** Research should be undertaken to learn more about what uses of the Internet will genuinely inspire underserved Americans to give it a try. In addition, more must be learned about how these ideas are most effectively communicated to underserved groups.

CONCLUSION

We look forward to working with all interested parties to mount the advocacy needed to make the positive scenarios identified here a reality. In the meantime, the findings from this Audit document the tremendous untapped opportunity – for low-income and underserved Americans to benefit from new information tools for education, economic development, and civic involvement; and for private enterprise to recognize the market value of low-income, underserved constituencies. This confluence represents a rare opportunity to advance the public's interest by using, in part, the power of the marketplace.

We hope this first-ever analysis of the adequacy of online content for disadvantaged communities provides an impetus and road map that enable underserved Americans to improve their life prospects and the corporate sector to do its part to create a positive information society for our generation and those that follow.

ONLINE CONTENT FOR LOW-INCOME AND UNDERSERVED AMERICANS

A STRATEGIC AUDIT ON ACTIVITIES AND OPPORTUNITIES

BY THE CHILDREN'S PARTNERSHIP

I. INTRODUCTION AND OVERVIEW

Most studies of access have focused on the gap between those who can afford the hardware and software they need to go online and those who can't. A new dimension of the "digital divide" is beginning to take shape, however — one with a profound impact on young people and those who guide and teach them: content.

Through its five years of work to bridge the "digital divide," The Children's Partnership has found that it is as important to create useful content on the Internet — material and applications that serve the needs and interests of millions of low-income and underserved Internet users — as it is to provide computers and Internet connections.

As computers and the Internet revolutionize how people of all ages learn, communicate, entertain themselves and do their jobs, the information and opportunities available online are increasingly necessary to thrive in a changing world. At the same time, it has been well documented that significant numbers of Americans are being shut out of these benefits because they lack access to computers and the Internet, creating a so-called digital divide.

WHY WE CONDUCTED THIS ANALYSIS

Much of the public concern about the digital divide has been focused on the gap between those who have the "boxes" and "wires" they need for Internet access and those who do not. However, a new dimension of the digital divide is beginning to take shape, one with a profound impact on young people and those who guide and teach them: content. For Americans at risk of being left behind, the characteristics of relevant content include: (1) needed employment, education, and other information; (2) reading levels that can be clearly understood by limited-literacy users; (3) multiple languages; and (4) ways for the underserved to create content and interact with it so that it is culturally appropriate.

The lack of relevant online content for lower-income, underserved Americans shuts them out of opportunity in several important ways. First, the Internet is increasingly a tool for transacting life's "business," whether finding a job or internship, getting savings on items purchased, or receiving government benefits. If online information is not available in forms that can be easily found and used by underserved Americans, this group — one that has historically had difficulty getting information and finding opportunities — will be further disadvantaged.

Second, the Internet is transforming the two traditional paths for self-improvement for young people in this country: getting a good education and learning marketable job skills. People who cannot access or benefit from the Internet are falling further behind.

Third, the Internet is starting to offer promising solutions to persistent challenges for groups that do have access to these technology tools. Technology, for example, is providing new opportunities for disabled Americans and people living in remote rural areas. In the same way, information technology holds the potential — largely untapped — to give underserved Americans powerful new tools to earn a living, build their communities, and engage as citizens in unprecedented ways.

Because content is such a crucial Internet issue for underserved Americans, The Children's Partnership set out to map this uncharted terrain while the evolution of the Internet can still be influenced. This Audit, the result of nine months of research, provides an analysis of the "state of the art" along with recommendations for policymakers, corporate leaders, technology center staff, philanthropists, and those who work with and on behalf of underserved Americans.

PURPOSES OF THIS AUDIT

This Audit has three purposes:

1. To describe who the underserved Americans are in relation to Internet content, the barriers they face, and what they want in the online world;

2. To analyze the online content currently available in the context of what low-income and underserved Americans want, emphasizing what exists, chief gaps, and promising building blocks; and

3. To provide a roadmap for action — identifying ways in which the public and private sectors working in concert with underserved communities can ensure rich and relevant online content for Americans at risk of being left behind.

ABOUT THE CHILDREN'S PARTNERSHIP (http://www.childrenspartnership.org)

This investigation fits squarely within the mission of The Children's Partnership, a national policy and strategy center that undertakes research, analysis, and advocacy to place the needs of America's nearly 70 million children and youth, particularly the underserved, at the forefront of emerging policy debates. Our hallmark is to forge agendas for youth in areas where none exist, to help ensure that disadvantaged children have the resources they need to succeed, and to involve more Americans in the cause for children.

Since 1994, when we published the first-ever report on how the digital age affects children and how to best advance their interests (*America's Children & The Information Superhighway*), we have worked to help develop safe, high-quality online

media beneficial to children and families, to bring the benefits of the information revolution to youth, and to equip parents and others as guides and advocates for children.

The Children's Partnership is also working with 11 low-income communities in California and with other nonprofit partners, helping to build sustainable community technology centers in very diverse low-income neighborhoods as models that can be replicated across the country. To date, these Computers In Our Future centers have served nearly 4,000 young people (well on their way to a goal of 9,000), teaching them computer skills and providing job training (see http://www.ciof.org.). In addition, we have partnered with the National Urban League, National PTA, American Library Association, the U.S. Department of Education, and many others, along with corporate allies such as America Online, AT&T, Mattel, and Microsoft.

About Our Strategic Audits

This investigation uses an analytic tool developed by The Children's Partnership called a "Strategic Audit." Through the Audit process, The Children's Partnership gathers, analyzes, and presents information on a timely subject. The subject is generally an emerging issue where there is not already a widely recognized research base, and where information and data from several previously unrelated fields are synthesized. The focus is on putting together information that leads directly to decision making. The analysis takes the form of a written product designed to be concise, accessible, and geared toward action. This Strategic Audit is one of a series produced by The Children's Partnership on subjects of national importance that affect large numbers of young people.

FREQUENTLY ASKED QUESTIONS (FAQS)

1. Why did a children's organization choose to conduct this research?

We believe that the uses of the Internet and its content will affect children's future opportunities in many profound ways. We concluded that children's needs are best served at this time by understanding the broader context of this emerging issue area, so while we did include young people in our user group surveys, we did not focus on them exclusively. Getting a better handle on how the new medium affects parents and local communities, for example, will help leaders concerned with children to formulate the children's agenda in this evolving field.

2. What do we mean by "Internet Content"?

At this very early stage in the evolution of interactive media, content encompasses several different categories, including:

- Information That Is More Widely Available — material that was previously accessible only to a few is now available to anyone with online access;
- Information That Can Be Customized by the User — material that can be aggregated and organized for or by any group of consumers;
- Information That Flows from Many to Many — in contrast to broadcast media, which flows from one source to many users;
- Information That Allows for Interaction Among Users — material that enables a user to comment back or act back rather than simply receive data;
- Information That Enables Users to Become Producers of Information — such as online tutorials or displays of products created by others.

While these are some of the parameters of Internet content today, the field is evolving rapidly, and the meaning will almost surely be something different in the future.

3. Who are "Underserved Americans" for purposes of this audit?

We concentrate on groups who are "underserved" today in terms of access to computers and the Internet, including Americans who have low incomes, live in rural communities, have limited education, and are members of racial or ethnic minorities. Low-income is defined as having an annual family income of less than $14,150 for a family of three, the level used by the federal government to define poverty. Throughout this report we use the terms "low-income" and "underserved Americans" to refer to this diverse group.

SCOPE OF THIS AUDIT

The research for this Audit was carried out from April 1999 through December 1999, and builds on the expertise of The Children's Partnership staff and consultants. The project was guided by a group of about thirty knowledgeable and diverse individuals from across the country who served as project advisors. (See inside front cover). We used a set of research methods designed to yield an accurate "baseline" for understanding what underserved Internet users want and what they can locate online.

RESEARCH METHODS

1. *Discussions with user groups.* We conducted meetings with 12 groups of low-income technology users, partnering with community technology centers that serve low-income communities on the east and west coasts. The centers included stand-alone technology programs, computer access centers within multiservice community centers, computer labs in public housing facilities, and nonprofit multimedia training labs. We were interested in hearing the views of adult end-users as well as young people.

We talked with a total of 107 individuals: 56 adults and 51 children and youth (age 10 to 22). All the participants were low-income. They represented a diverse mix of age, gender, and ethnicity. Most of the adults (60 percent) were in their twenties and the rest were in the 30- to 60-year-old bracket; one group of users was made up of a dozen seniors. About 95 percent of the youth were in their later teens. Women made up 65 percent of the user groups. The ethnic breakdown was 45 percent African Americans, 40 percent Hispanic, 10 percent Caucasian, and 5 percent Asian. From these individuals we learned about the types of Web sites that interest them most (in terms of content and look-and-feel) and what information they find most difficult to locate.

Their feedback guided our research by defining what we should be looking for in our analysis of online material and activities.

2. *Interviews with center and community network directors.* Over 30 interviews were conducted with directors of community technology centers and with directors of community networks across the country. The directors of these centers work for organizations housed in or affiliated with park and recreation programs, community colleges, libraries, low-income housing projects, storefront facilities, community multiservice centers, and employment development organizations. Representatives of community networks are associated with networks that offer online access and training over a wide geographic area, including areas as diverse as St. Louis, Missouri; Boulder, Colorado; Minneapolis, Minnesota; Taos, New Mexico; and Appalachia.

3. *Interviews with other experts.* More than 60 additional experts provided our team with insights and guidance about online information for underserved groups. Collectively, these experts bring decades of experience in providing online access and information. They represent education, literacy, academia, library science, museums, information and referral services, development agencies, rural and disabled communities, commercial online content development, and other organizations and institutions. We tapped many of these individuals in the course of designing our research instruments and approach. They pointed us to relevant studies, pertinent data, and promising online activities. Appendix A lists the people interviewed for this Audit.

4. *Web analysis.* To develop a map of content on the Web for underserved Americans, we reviewed 20 community networks, or "portals." These are large areas on the Web that have catalogued and indexed extensive numbers of sites and that link to many others; they are content destinations that attract users because of the rich resources they have aggregated in fairly user-friendly formats. We surveyed a diverse and representative sample where we located information on topics of interest to underserved individuals. Input from users, referrals from experts, and reviews of literature also influenced our selection. The 20 portals vary in nature and include the following:

- Noncommercial sites (e.g., Charlotte's Web, Metropolitan Austin Interactive Network);
- Library and academic sites (e.g., Brooklyn Public Library, The Community Connector); and
- Commercial Web sites (e.g., Yahoo, Snap.com).

See Appendix C for a full listing of the portals included in the study.

We focused our search on portals because, after doing a random search of the Web in two subject categories of interest to our constituents (local housing and jobs), we determined that we could more efficiently develop an overall understanding by focusing on carefully selected sample sites. These large content destinations are known to aggregate high-quality information for Internet users (including low-income users), so an audit of their content could provide a mini-map of some of the best content available.

Our team searched each portal for Web sites in the subject categories that users told us are of interest to them. (Appendix B lists these categories.) We looked for general patterns, gaps, and strengths, but did not make stand-alone assessments of particular sites. We evaluated the sites found according to the following criteria:

- Content (on subjects of interest, including local information);
- Literacy level (limited, intermediate, and advanced);
- Intuitive navigation (ease of use);
- Language (is there information in languages other than English?); and
- Interactivity (can the user interact with the site, send e-mail, etc.?).

In all, we reviewed approximately 1,000 Web sites within these 20 portals and additional sites recommended by key informants.

5. *User Web search exercise.* As a quality assurance measure for our Web analysis, we asked groups of underserved Internet users in technology centers, job development programs, and other media training programs to give us their assessment of the content of portals selected for the analysis. In a Web search, each participant was asked to review several portals; participants tried to locate information similar to what our research team looked for in the Web analysis described above.

6. *Review of relevant literature and data.* A review of existing information enabled us to build on the available knowledge about underserved Internet users, their needs and interests, and efforts (successful or unsuccessful) to respond to their interests. (See Appendix F for a list of resources used.)

A FINAL RESEARCH NOTE

The practical limits of our time and resources meant that this research, though carefully designed and rigorous, provides only an introductory look at this vast topic. A more extensive look will broaden and deepen the findings presented here. In addition, other underserved groups — including people with physical disabilities or different learning styles — are very important and deserve a similar examination. Finally, with content on the Web changing and growing so rapidly, our findings must be viewed as representing a snapshot of the moment in time when they were assembled. Some changes in Web URLs and sites' content may have occurred since our research was completed.

II. CONTENT-RELATED BARRIERS TO THE INTERNET: WHAT ARE THEY AND WHO DO THEY AFFECT?

Though many underserved communities are gaining access to the Internet, many are not benefiting fully because of barriers they face related to content. Four of the most important barriers are: lack of local information, literacy barriers, language barriers, and lack of cultural diversity.

For at least 50 million Americans — roughly 20 percent of the population — one or more content-related barriers stand between them and the benefits offered by the Internet. These barriers are taking a heavy toll on the underserved 50 million Americans. A high proportion of the underserved could become more active citizens, consumers, and entrepreneurs of this new medium, increasing their opportunities for success. For that to happen, Internet content must become relevant, and underserved communities must have access to content-related services such as training and technical assistance.

To provide a framework for our research about Internet content and underserved Americans, in this chapter we provide a brief analysis of what the content-related barriers are and which Americans are affected by them. We begin with a review of the current national picture of computer and Internet access, then outline key content-related Internet barriers and the numbers of Americans potentially affected by them, ending with a look at the untapped market for underserved communities as consumers and producers of valuable online content.

THE STARTING POINT: COMPUTER OWNERSHIP AND INTERNET ACCESS TODAY

While there has been a significant and steady increase in low-income Americans' ownership and use of computers and the Internet, the disparity continues to grow between low-income and higher-income Americans. In fact, the gap has grown in the last year between those at the highest and lowest education levels and between those at the highest and lowest income levels. Chart 1 provides the current picture at a glance.

CHART 1

COMPUTER OWNERSHIP & INTERNET ACCESS AT A GLANCE:

A DISTURBING GAP AMIDST PROGRESS

At Home

Computer ownership among households with children is now almost as common as cable television subscriptions. Internet access among households with children is almost as common as newspaper subscriptions.[1]

Percent of U.S. households with a personal computer: 42[2]

Percent of U.S. households with Internet access: 26[3]

Percent of U.S. households with a telephone: 94.1[4]

At School

Percent of public schools in the U.S. connected to the Internet: 95[5]

Percent of public schools in the U.S. connected to the Internet in 1994: 35[6]

Percent of instructional classrooms connected to the Internet: 63[7]

Percent of instructional classrooms connected to the Internet in 1994: 3[8]

Among Various Groups

Women online: 48 percent of surfers, up from 42 percent in 1996[9]

Two fastest-growing segments of the Net population: children and teens[10]

Percent of small businesses with Net access: 48[11]

Underserved Americans

Percent of children in low-income, rural households with Internet access: 2[12]

Percent of children in urban households earning more than $75,000 with Internet access: 50[13]

Percent of white households with Internet access: 29.8[14]

Percent of black households with Internet access: 11.2[15]

Percent of Hispanic households with Internet access: 12.6[16]

Percent of college-educated individuals with Internet access: 48.9[17]

Percent of individuals with only some high school education with Internet access: 6.3[18]

Percent of two-parent households with Internet access: 39.3[19]

Percent of female, single-parent households with Internet access: 15[20]

Internet and Our Economy

E-commerce spending, holiday season, 1999: $7 billion[21]

E-commerce spending, holiday season, 1998: $3.1 billion[22]

Percent of U.S. real economic growth attributed to Information Technology and Net industries: 29[23]

Percent of GDP attributed to Information Technology and Net industries: 7.8[24]

CURRENT USES OF THE INTERNET: PATHS TO SELF-IMPROVEMENT FOR UNDERSERVED AMERICANS

With so many low-income Americans gaining access to computers and the Internet, it is now possible to analyze how they are using the Internet: where they access the Net, and what kinds of activities they undertake.

Many studies have shown that, across income levels, the primary use of online technology is e-mail. However, a closer examination of the data shows a high level of use among low-income Americans for self-improvement, whether for online courses, job search or information. These data underscore the desire underserved Americans have for content that improves their life prospects and also points out the potential of the medium to offer opportunities of genuine value to low-income communities.

CHART 2

USES OF THE INTERNET

- **Outside the Home:** Large numbers of low-income people are using the Internet outside the home for online courses and information searches, suggesting that they find public access points to get online and that these public access points help them find jobs and educational opportunities.

Search for Information

57 percent of Americans earning between $10,000 and $14,999 who use the Internet outside the home search for information.

31 percent of those earning $75,000 or more use it for this function.

Job-Related Use

20 percent of Americans earning between $10,000 and $14,999 who use the Internet outside the home use it for job-related tasks.

56 percent of those earning $75,000 or more use it for this function.

- **At Home:** Lower-income Americans are more likely than higher-income Americans to use the Internet for online course work and job searching as well as to search for information.

Job Searching

25 percent of Americans earning between $10,000 and $14,999 who use the Internet at home use it for job searching.

12 percent of those earning $75,000 or more use it for this function.

Online Courses

45 percent of Americans earning between $10,000 and $14,999 who use the Internet at home use it for online courses.

35 percent of those earning $75,000 or more use it for this purpose.

Source: U.S. Department of Commerce, *Falling Through the Net: Defining the Digital Divide*, Charts II-33 & II-38, July 1999.

CONTENT BARRIERS RELATED TO THE INTERNET

Our early discussions with project advisors and community allies made clear that many underserved communities are not benefiting fully from access to the Internet because of various barriers they face related to content. It was also clear that these barriers are even more extensive than the scope of this research project. In order to get a map of the issues, we focused on four barriers that affect large numbers of Americans:

- Lack of most urgently needed local information;
- Literacy barriers;
- Language barriers; and
- Cultural diversity barriers.

It should be recognized that other very important Internet content-related barriers having to do with disability and geographic remoteness, for example, are beyond the research scope of this study. We believe, however, that they deserve further study and that many of the findings and solutions uncovered in this research might address these additional barriers as well.

WHO IS AFFECTED?

Lack of Local Information

"Many of the people in the housing project where I work want to find out about jobs they can do in the neighborhood. If the neighborhood was more connected and mapped online, this kind of information would really make a difference to residents."

Nicol Turner
Net Consulting Group

Perhaps the most far-reaching barrier of all is the scarcity of the kind of information users want most — local information about their community. This content barrier goes to the heart of how the Internet is evolving, as it becomes more and more common for large commercial companies to develop prepackaged information, rather than enable communities to tailor-make their own. This barrier disproportionately affects Internet users living on limited incomes, who cannot afford to travel and who must struggle to meet their survival needs (whether for housing, food, or child care). For the nearly 21 million Americans over age 18 whose annual income is less than $14,150 for a family of three (the level used by the federal government to define poverty)[23] the general absence of community-level information on the Internet serves as a very real barrier.

Literacy Barriers

"When people come in [to the library] who can't read, we encourage them to go to the Web and go to sites that contain many pictures. In the library there are icons/pictures to guide navigation. There should be more audio and video information on the Web, and more material with limited-literacy adults in mind."

Martha Shimmers
Librarian, Public Libraries of Saginaw, Michigan

Because a commercial business model largely guides development of the Internet, online content has been primarily designed for Internet users who have discretionary money to spend, that is, a highly educated audience that reads at average or advanced literacy levels.

Yet 44 million American adults — roughly 22 percent of the adult population [67] — do not have the reading and writing skills necessary for functioning in everyday life.[68] They are served inadequately by today's Internet content.

Ironically, appropriate online content for limited-literacy Americans could help raise literacy levels as well as employment levels, saving business and taxpayers considerable dollars. The learning potential offered by the Internet could help the 75 percent of unemployed adults with reading or writing difficulties and help offset the over $60 billion American businesses lose in productivity each year due to employees' lack of basic skills.[69]

Language Barriers

"An Asian man came into our computer center who couldn't speak very much English. I took him to a language development site with lots of useful exercises, but, after that, there weren't many places to go."

Elena, Computer Lab Assistant
University Settlement, NYC

Today, an estimated 87 percent of documents on the Internet are written in English.[70] Yet, at least 32 million Americans use a primary language other than English.[71] They are often left out of the benefits the Internet offers — either because current search tools are still primitive and difficult to use even for people for whom English is the primary language; because they cannot get easy access to translation programs; or because content in their native language may be developed in another country and may not include information relevant to their community in the United States.

Lack of Cultural Diversity

"I don't know of too many places on the Web like Harlem Live where youth get to express what's going on for them culturally."

Mara Rose, Director
Playing2Win, a community access center in Harlem

Distinctive cultural practices and beliefs among ethnically diverse Americans influence the ways in which these groups participate in everything from their children's education to use of health services to civic activities like voting. Similarly, the diverse cultural and ethnic groups that comprise the United States have their own rich heritage that makes them, as anthropologist Carlos Veles-Ibañez writes, "funds of knowledge within these communities."

The Internet can be a powerful tool to share and celebrate the uniqueness of cultures in this country and beyond. However, the lack of Internet content generated by ethnic communities themselves or organized around their unique cultural interests and practices serves as a formidable barrier, especially for many of the 26 million[72] Americans who are foreign born.

Chart 3 summarizes the number of Americans affected by one or more of these barriers.

CHART 3

AMERICANS POTENTIALLY UNDERSERVED BECAUSE OF INTERNET-CONTENT BARRIERS

Type of Internet Barrier	Estimated Number of Americans Affected
Lack of local information	21 million
Literacy barriers	44 million
Language barriers	32 million
Lack of cultural diversity	26 million

Even taking into account that many Americans fit into more than one of these categories, a conservative estimate is that at least 50 million Americans — roughly 20 percent — face one or more content-related barriers that stand between them and the benefits offered by the Internet.[73]

THE POTENTIAL USE RATE AMONG THE UNDERSERVED

Additional data suggest that a high proportion of the 20 percent of Americans who are "content-underserved" are likely to become active consumers and producers of this new media. For that to happen, content has to be made relevant and appealing and other content-related services such as training and technical assistance must be made available.

Lessons from Cable Television

Many people question whether the Internet will ever become a priority for underserved Americans because of their more urgent needs and limited budgets. The example of cable television suggests that so long as the product is seen as valuable, price alone does not deny a market for media products.

According to the most recent estimates, 56 percent of low-income families have a cable subscription, typically paying about $28 per month for basic service and additional monthly fees for premium service.[74] The potential exists for far greater adoption of digital media like the Internet by underserved communities, if the content is made more relevant.

"New Markets"

In this time of unprecedented economic growth for some Americans, policymakers and opinion leaders are beginning to turn their attention to the untapped potential for commerce in urban and rural areas of poverty. Through various programs like the Initiative for a Competitive Inner City (ICIC) and President Clinton's new Market Initiative, there is an increasing awareness of the market potential in the low-income regions of the country.

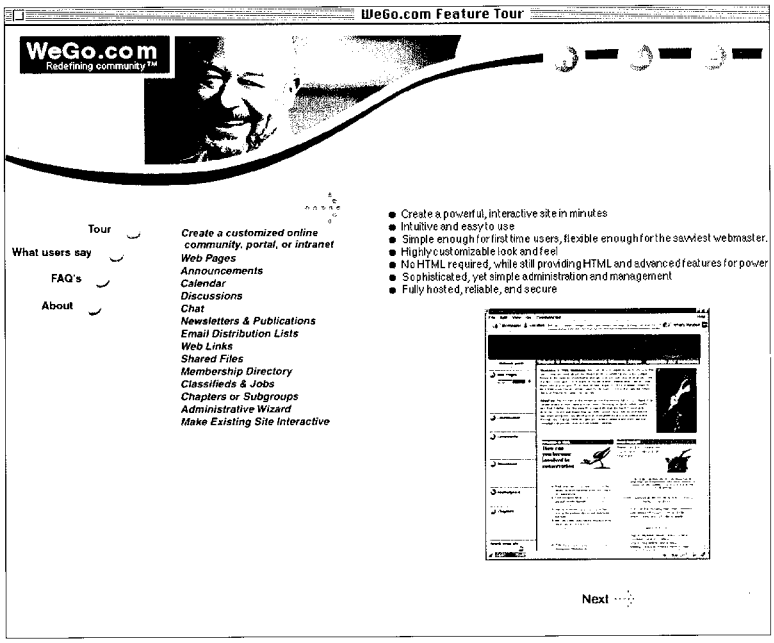
According to recent estimates, the inner-city portions of America[54] represent more than $300 billion in retail purchasing power. Much of this is untapped, despite the ready consumer base, because of a gap in information about retail choices and options.[55]

Add to this the potential for residents in low-income neighborhoods to be trained in the information technology skills necessary to join in the emerging digital economy, and a compelling business case begins to emerge regarding the untapped market underserved communities represent. The business case would not only take into account the spending power these communities hold for consumer products in general, but also the potential of these communities as viable locations for investments in local e-commerce ventures.

A READY DELIVERY SYSTEM

There is a strong and growing nationwide delivery system capable of distributing widely good online content and content development activities:

- More than 300 community technology centers (CTCs) at the Community Technology Network Web site (http://www.ctcnet.net);[56]
- Over 11,000 public libraries offering public access to the Internet — 73 percent of this country's 15,718 public libraries;[57]
- Over 1,100 accredited community colleges across the country;[58] and
- Numerous stand-alone literacy centers and many more that share space with other supportive services for low-income populations.



III. WHAT UNDERSERVED INTERNET USERS WANT

Focus groups with members of the target population and interviews with a variety of people who work with underserved users revealed that underserved Americans have unique needs and interests when it comes to content on the Internet. A particularly striking characteristic among underserved Americans is that they seek "life information," or what has been referred to in the library and information science field as "community information." Two points stand out about young people in underserved communities: Because they are comfortable with the Internet, they can do much more with it than adult users. They want to create sophisticated Web pages and complex programming that inspire their imagination and teach them technical skills. In addition, because some young people are drawn to online activities that are not always healthy, it is essential that they receive guidance and training to use the medium productively.

Through focus groups with members of the target population and interviews with a variety of people who work with underserved users, we probed what underserved Americans want from content on the Internet. While our findings represent only a starting point for discussion, consistent patterns emerged.

In many respects, users who participated in our focus groups showed similarities to other Internet users, wanting to engage in social, cultural, and professional activities that are fast becoming standard and necessary practice. Though we found tremendous differences between what adult underserved users want and what children and youth want, these differences are also consistent with other Internet users. In several important areas, however, the underserved adult and young users we interviewed have unique needs and interests.

A particularly striking characteristic among underserved Americans is that they seek "life information," or what has been referred to in the library and information science field as "community information":

". . . information that helps citizens with their day-to-day problems and enables them to fully participate as members of their democratic community. It [includes] information pertaining to the availability of human services, such as health care, financial assistance, housing, transportation, education, and child care services; as well as information on recreation programs, clubs, community events, and information about all levels of government."[29]

The users we interviewed are particularly interested in local information — whether about entertainment, jobs, places of worship, or educational opportunities. Appendix B contains a list of the subject categories and topics that we were told are important in local and general forms. We also learned that underserved users want more support and training to access, interpret, and use the information on the Web. Following is a more detailed analysis of what underserved users and people who work with them told us underserved Americans want.

CONTENT AND TOOLS ADULTS WANT

Practical Information Focusing on Local Community

Over and over again, the users we talked with told us that practical information about their local community is what they want most.

Local job listings, including jobs requiring entry-level skills.

The users over the age of 21 in focus groups shared a concern about the lack of local, entry-level jobs on the Web. "There aren't jobs on the Internet that I can apply to; they're too advanced and you need to speak good English," says a computer user and an aide in the computer lab at University Settlement House in New York City. Although the Internet contains many job resources, such as the popular Monster.com, they often do not advertise entry-level positions that are useful to this demographic group.

Local housing listings, including apartments with relatively low rents and homes in foreclosure.

Many of the users we spoke with were particularly interested in local housing information. Cathy Trout, the project director at the Bresee Foundation in Los Angeles, said that some of Bresee's clients want to learn more about homes that are in foreclosure to try to acquire them, but cannot find that information online. Low-rent apartments are in high demand across the country. Magda Escobar, the executive director of Plugged In in East Palo Alto, California, says: "low-rent apartment listings and other pragmatic information would really be useful to have online for residents here."

Community information about neighborhood events, places to go for family outings, and local schools.

Amanda, a mother we spoke with, would like to be able to learn online about events and programs that take place during the summer in her neighborhood in Harlem. "but it isn't easy to get this in one place; you have to talk to different people." Users we interviewed would like to learn about local child care and after-school programs, activities in churches, and services offered by local job agencies and other service institutions.

Information at a Basic Literacy Level

Preparation for securing a high school equivalency degree, especially for low-literacy users and people for whom English is not their primary language.

Helmer Duverge, program director at the National Center for Family Literacy, states that there needs to be more online material for GED preparation that uses business language. A focus group at the Union Settlement House in New York City corroborated that need. Many recent immigrants are preparing for their GED, which has become a standard prerequisite even in entry-level service jobs.

Online resources as opposed to print materials.

Jaleh Behroozi, director of LINCS (Literacy Information & Communication Systems) at the National Institute for Literacy, reported, "there are not many sources designed directly for low-literacy readers online; there are plenty of print materials."

Online tutorials for different software programs; tutorials that show people the benefits of the Internet and how it can assist in day-to-day living.

Users also want more online tutorials that cover basic business productivity tools, such as spreadsheets, and new media tools, such as Photoshop and HTML coding. Center directors would like to see more tutorials, specifically ones tailored to the underserved and limited-literacy populations.

Content for Non-English Speakers

Users want three kinds of content aimed at their linguistic needs: online translation tools, tools to improve their English language skills, and information in their native language.

Online translation tools.

Because much of the content that underserved users want to read on the Web is in English, end users would like translation support.

Online instructional materials.

Many users want tools to develop linguistic and other skills, such as interactive Web sites that contain grammar practice, vocabulary development, and reading assistance. Some users want to visit sites to pick up a few skills here and there, while others want a more comprehensive online curriculum.

Information in native languages.

Users are interested in information in their native languages related to government efforts that affect them, whether Medicare, taxes, or voting. For example, one senior citizen at the computer center in University Settlement House told us that she wants information in Spanish about immigration and has difficulty finding it.

Cultural

Cultural exploration and development.

Judith Pepper, the executive director from La Plaza Telecommunity, told us that users want more spaces on the Internet that reflect unique cultural characteristics and attributes. This would allow people to share information about their heritage and cultural practices; cultural Web sites could foster such rich dialogues. Culture in a broader sense also encompasses art, music, food, sports, or other ethnic-specific areas. The sharing of culture engenders interactions that bring people together.

Cultural spaces about ethnic and local cultural interests.

"Low-income groups don't have enough cultural spaces that they can call their own; they need more environments dedicated to this," says Tamara Sturak, program director of The Interactive University at the University of California, Berkeley. This is important because ethnic-specific Web sites and Web projects can generate rich new content not available widely now.

Health information and other vital information presented with the interests of particular racial and ethnic groups in mind.

For example, Imani Bazzell, director of SisterNet, says that African American women in Urbana-Champaign, Illinois, need information about health issues that typically affect African American women; the information should be local and should be easily available. It should focus on those diseases and illnesses that are more common in the African American community.

CONTENT AND TOOLS CHILDREN AND YOUTH WANT

Two points stand out about young people. First, because of their comfort with the Internet, they can do much more with it, creating sophisticated Web pages and complex programming that inspire their imagination and teach them technical skills. Second, because some young people are drawn to online activities that are not always healthy, it is essential they receive guidance and training to use the medium productively.

Participation and self-expression

Many of the comments from youth in our focus groups demonstrate a consistent message: They want to express themselves on the Internet. More than adults, children and youth see this domain as a place for self-expression, which most likely comes from having more hands-on experience with the medium than adults.

At a number of the places where we conducted user groups, young people are the "experts." Consider the technical know-how of Manuel, a teenager who is a "regular" at Playing2Win. "I look for sites with equations and computer programming scripts to write programs; sometimes I run into very advanced mathematical equations that I can barely follow. But I try."

Packaging and interactivity

How content was packaged and how interactive the content was seemed more important to underserved children and youth than the subject matter itself. In addition, the young people we interviewed do not talk much about the Internet as an education or information resource. Often, we found, mentioning "school" or "learning" to kids in the context of the Internet causes their interest in the conversation to drop. But give them challenging robotics or animation projects that involve extensive computer interaction — or research and information manipulation — and they become engaged.

Unlike the adults, young people in our study see the Internet primarily as a place for gaming and participating in interactive communities with kids all over the world. Many were attracted to games that contain shoot-and-kill, which also offer the most immersive (i.e., life-like) experience and graphics.

Many young people we talked to want more centralized spaces where they can participate in a variety of ways from one portal. It would work best for them if one site contained games; downloadable plug-ins; tips and strategies; e-mail; user profiles; and links to other game environments. Many complain that they have to move around to many different places to find what they need in order to play.

Downloading also has a high value with many youth. They especially like to download music from the Net. They also

like to download video streams, pictures, and software programs, and they collect HTML codes (to pick up Web design tips). Chat and e-mail interaction is so popular among many youth that some public access centers set strict limits.

Multimedia

Most underserved children and youth seek a multimedia experience on the Web. TV was most often the model. They want to be able to do a lot of activities at once — listen to music, view video clips, read entertainment information, and chat with others — as one can do to some extent in sites such as MTV and Defjam.

Youth-friendly tutorials

The gamers are primarily the ones who want youth-friendly tutorials and online support in order to learn how to create animation and how to do programming. However, interest in tutorials is not limited to gamers.

DIFFERENCES BETWEEN ADULTS AND YOUNG USERS

The adults we interviewed prefer succinct, uncluttered information, whereas younger users want Web sites that have fast-moving imagery and sound. The adults we spoke with prefer a Web page interface that provides information without too many distractions. They want simple text-based presentations with easy-to-use categories that lead quickly to practical content. The medium for them has more utilitarian and practical value than it does for kids, though they do use it for entertainment and cultural purposes as well. Adults also need computer literacy training and outreach. In addition, some of them want to learn Web design skills so they can contribute the wealth of information they know.

Interest in multimedia, combined with the gamesmanship of many youth, makes them a savvy consumer market of the latest innovations in Web technology. In contrast, ideal sites for many adults look like *USA Today* news pages with easy-to-grab, practical information.

Some youth know how to design and understand hypertext technology, which makes them important partners in content development efforts. Yet young people pose a challenge to those who want to encourage positive use of the medium. Young people instinctively see the Internet as an entertainment source rather than an information source, as adults do. More safe and secure environments are needed that are entertaining and also educational, and which offer guided activities that are purposeful, yet not taught in a traditional academic style.

WHAT ADULTS AND YOUTH BOTH WANT — EASIER SEARCHING, COACHING AND INVOLVEMENT

"With a lot of our learners, they need a lot of human contact."

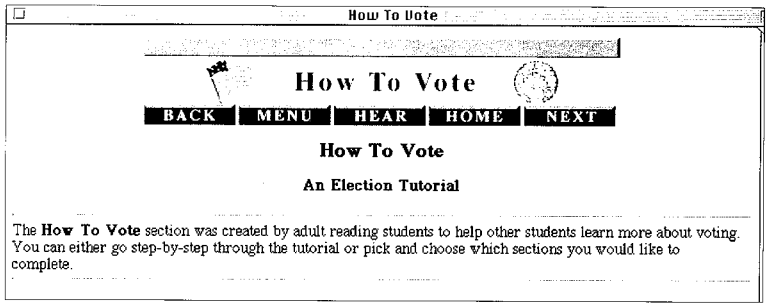
Noreen Lopez
Director, Literacy Link

Even if valuable content is developed, will it be used?

Searching is a major deterrent for adults, as it is for youth. Searching for information poses a special challenge to bilingual Internet users who try to look for information in English. The young people we spoke with would like to have this mechanism made easier.

Many underserved people obtain the information they want from family, friends, and other trusted people, so there is not a "felt need" to go to the Web or library to seek information. This lack of motivation is reinforced when people are confronted by confusing, slow, or text-heavy searches.

Our interviews further revealed that appropriate content alone is not enough to motivate underserved users to use the Net. Youth and adults alike want coaches and mentors to guide them in finding what they want on the Web, suggesting sites or activities to get started, helping use a tutorial and the like. Moreover, they want an environment where they can get literacy support or help with English if they need it. They want to be in a place where others in their community are doing the same thing and where they can count on coaching and support to build their confidence, answer their questions, and guide them in new directions. This support will give users more confidence, whether they use the Internet at home or at work. According to Douglas Schuler with the Seattle Community Network, "the circumstances through which people get the information is as important as the medium."



IV. ONLINE CONTENT: STATE OF THE ART

Based on what underserved users reported they want from the Internet, The Children's Partnership utilized a combination of approaches to explore what is available on the Web to meet these needs. Our research found major gaps in Internet content for underserved communities, especially sites for adults with limited-literacy skills or those looking for multilingual content; local job resources or job listings for entry-level positions; information about local low-cost housing; and cultural information at the local level. We also found a shortage of easy-to-use interface and search tools.

We utilized a combination of approaches, including compilation and assessment of content on portals used by our target groups; analysis of content on sites that key informants told us were useful; and the involvement of low-income Internet users themselves in searching for appropriate content. Although we clearly captured only a fragment of the vast Internet content now available, our core findings were corroborated by the various sources we used, including interviews with experts.

Our team searched for content in subject areas that users and experts said are important to underserved people, including education, family, finance, government, health, housing, jobs, and personal enrichment. We assessed 1,000 Web sites from portals that we selected to audit because they represent, according to users and informants we worked with, some of the best on the Web. Our findings here represent a systematic scan rather than a comprehensive mapping of the Web's content for various underserved groups. Below are the number of Web sites and percentages found for areas of interest.

CHART 4

THE STATE OF ONLINE CONTENT FOR UNDERSERVED AMERICANS

Number and percent of the 1,000 sites included in TCP's survey that addressed key content barriers:

Local Information	61	(6 percent)
Local Jobs	9	(1 percent)
Local Housing	8	(1 percent)
Limited Literacy	10	(1 percent)
Multilingual	20	(2 percent)
Cultural	5	(1 percent)

Although these figures were not designed to be projected to the Internet as a whole, it is worth noting that our findings are fairly consistent with more extensive analyses of commercial Web sites.[9]

FINDINGS ABOUT ONLINE CONTENT

- Generalized information (as opposed to local or community content) on topics of interest is available (26 percent) but generally not at literacy levels and in languages that underserved Americans need.
- Most of the online content we found written at a limited-literacy level was designed for the developmental needs and interests of young children, and did not provide the information needed by adults with limited-literacy skills (only 1 percent of the Web sites we found meet this need).
- Much of the multilingual content we found is in Spanish, presumably responsive to the market reality that Hispanics are the largest foreign-born minority group. Much of it, however, comes from Latin America or Spain, leaving gaps in Spanish-language content related to finding opportunities in the United States, such as obtaining a job or a high school diploma. Only 2 percent of the content found was multilingual.
- Precisely the information most often requested by the users we interviewed (e.g., local job resources or job listings for entry-level positions) proved to be the most rare and difficult to find (1 percent). Similarly, information about local low-cost housing was, with few exceptions, unavailable (1 percent).
- We did not locate significant examples of cultural information at the local level (about 1 percent), however, general cultural sites are growing for African Americans and Hispanics.
- Our review of interface design and searching tools conducted by low-income users underscored the inadequacy of prevailing tools. In our sample of 45 Internet users who participated in our Web search exercise, 80 percent said it took too long to find the information they were asked to find; 65 percent did not find the material understandable or easily organized; and 65 percent did not find the site easy to use. Difficulties with search tools for the Web point to the importance of training and support as well as better searching mechanisms.

LOCAL COMMUNITY INFORMATION

"There should be links that take me directly to neighborhood services."
Steve Snow
President, Association for Community Networks

Our research revealed much less local information than generalized information in the subject areas on which our study was focused. One positive example of the kind of local information requested in our focus groups was an activity calendar on the Web site of the city of Davis, California (http://www.city.davis.ca.us/city/parks/programs/promote/eventcal.htm). Our interviews revealed that this kind of information is particularly useful to individuals living on limited resources who may be looking for community services or for work to improve the quality of their lives.

Information about local housing rarely showed up. Because housing typically accounts for low-income families' largest expense, information about affordable rentals is especially

important to many of the clients with whom we spoke. The Champaign County Apartment Association Web site on Prairienet, a community network (http://ccapaartments.com/), is one effort to address this need. Users can perform a search after they enter the apartment size desired (e.g., one, two, or three bedrooms) along with the price range and the area desired.

Monster.com and Apartments.com are two examples of national content destinations for housing and jobs. Jobs on Monster.com tend not to be matched to the education and skill levels of underserved users. However, these national sites offer certain sophisticated and easy-to-use features that could be adapted to low-income communities. Apartments.com, for example, provides listings that one can search by city; a user can narrow a search to specific neighborhoods by clicking either on names or on a map. However, the site does not include many underserved neighborhoods or low-rent apartments.

The few job sites we found with local listings usually did not include the kinds of jobs most needed by individuals who are not well integrated into the work force. For instance, even the excellent Web site of local job postings on the community network Charlotte's Web (http://www.charWeb.org/job/locpost.htm#jobs) does not address the need fully. Many of the jobs posted are beyond the reach of many low-skill or entry-level workers; they are technical jobs, such as those for systems engineers, production artists, and directors of student development.

We did find that community networks tend to contain more local and regional information than commercial portals; most participate in community development by helping community organizations develop a Web presence. However, the quality and the availability are very uneven within the portals we reviewed.

Even the community-based Web sites we found tend to be very limited in the local information they provide. One reason, we were told, is that some community-based agencies fear that, if they provide extensive information online, they might lose their walk-in clientele. As a consequence, they could also lose funding that attaches to the number of people who walk through their doors. A few network directors told us, for example, that certain organizations, such as employment development agencies, are reluctant to share job information for resource pages on the Web for fear of losing potential clients.

CONTENT FOR LIMITED-LITERACY READERS

"Everything on the Net is for intermediate readers."
Helmer Duverge
Program Manager, National Center for Family Literacy

Perhaps the greatest gap we found in content is material for the 44 million adults in the United States who lack functional literacy skills to perform everyday tasks. Most of the Web sites we found at this reading level were designed for the cognitive and social level of young children and do not provide the information needed by adults. Of the 1,000 sites we reviewed, we found only 10 that were appropriate for limited-literacy adults. Especially since online content can be a powerful tool for raising literacy skills,[41] we expected to find more material designed to provide a bridge to higher levels of literacy.

According to literacy expert David Rosen, the best content gives early readers as many context clues as possible using other media in addition to text.[42] These clues allow the reader to derive the meaning of the content while at the same time also building reading skills. One positive example we found was Rebecca's EZ Pages (http://www2.wgbh.org/mbcweis/ltc/ezpage/), an interactive page that allows users to click on pictures and match them to words. Literacy experts confirmed that considerably more content that helps to raise literacy levels is needed.

MULTILINGUAL CONTENT

"The Web is primarily for people who can speak good English."
Amparo Baron
ESL Teacher, University Settlement House
New York City

Multilingual content was also poorly represented on the 20 portals. Only a handful of useful Web sites (20 of the 1,000 we reviewed) had content in languages other than English that provide practical information for a more productive life in the United States. Multilingual content is particularly important for underserved Americans because it can provide the scaffolding to develop skills to thrive in American culture.

Spanish-speaking users in our groups expressed their dismay at not finding content in their language that could help them obtain local jobs and learn about local programs. Although more and more Spanish-language information is becoming available on the Web, much of the online content we reviewed is developed in Latin America or Spain, limiting its usefulness in meeting the needs of the 33 million Hispanics in the United States today.[43] The situation was the same for other non-English speakers. Although that is changing, the Web is clearly English dominated and rather inaccessible without linguistic skills. We analyzed Spanish-language content because of the large numbers of people who speak Spanish in this country.

Content destinations such as Yahoo! (http://www.yahoo.com) and the community network Charlotte's Web (http://www.charWeb.org/) include Spanish sections. Yahoo! Español, for example (http://espanol.yahoo.com/), includes extensive information on health, and it directs users to other links in Spanish (some of them, though, were not active). However, certain other subject areas on Yahoo! Español, such as education, family, government, and jobs, did not contain the same amount of useful (practical and local) information in Spanish. Our research into other portals and other places on the Web also indicated that there is some information in Spanish about health, but relatively little generalized or local information about education, family, housing, or jobs in the United States.

We also found that some sites with bilingual sections, such as Charlotte's Web, offer users hyperlinks that take them to sites with English content. Our focus group participants who spoke limited English commented on the difficulty this raised. Even if a Spanish speaker can interpret some of the

material by using Spanish cognates, this approach allows for only limited comprehension and requires tremendous effort.

In addition to these Spanish content areas, we found a few sophisticated multilingual Web sites that offer online learning tools with extensive interactive capabilities. For example, on some sites, students can listen to English word pronunciations; they can practice grammar and receive immediate feedback. On others, they can also practice writing skills. These approaches demonstrate the enormous potential of interactive media to help underserved Americans improve their skills and life prospects.

CULTURAL CONTENT

"Low-income people think they're not legitimate information providers."
Douglas Schuler
Advisor, Seattle Community Network

"There's a cultural bias in content."
David Hughes
Partner, Old Colorado City Communications

Although local cultural content was extremely limited, we did find a few very strong examples of local content where users are expressing and celebrating their local culture. However, these represented only 1 percent of the total of sites analyzed. By contrast, cultural content of a generalized rather than a local nature is becoming more prevalent on the Web. For instance, the Web is now hosting a number of portals for African Americans as well as Latinos.

Following are some cultural (or ethnic) portals that offer features now common on many popular portals; some are quite advanced. Their features generally include editorial content; services such as email, chat, and searchable areas; personal Web publishing; and online communities.

- African Americans: BET.com, the Black World Today
- Hispanics: StarMedia Networks, Yupi.com
- Asians: A-Space, Click2Asia

These sites are only a sampling of the many content providers now targeting ethnic and cultural markets, but these early players demonstrate the strengths as well as potential weaknesses in efforts to reach ethnic audiences. Many providers are productive at communicating and sharing general cultural affinities, thereby expanding them. Others are also good intermediaries to bring information from abroad. However, while most build important bonds that can tie members of ethnic groups together, it is often difficult to do so without ignoring some of what makes certain ethnic cultures unique.

The trend toward homogenizing and ignoring differences, dictated by a desire to build market share, shuts out to some extent the distinctive essences that give vitality to a culture. For instance, A-Space.com is working to bring together the Asian world under one umbrella, a difficult challenge because of the widely varying heritages among Asian Americans. Yet it is precisely these distinctive differences, which are often lost in big portals, that can provide great impetus for ethnic groups to actually go to the online world. These unique traits are also what can bring people into a community access center to develop culturally relevant information together.

NAVIGATING THE INTERNET EASILY

We found that even when content destinations have appropriate information to offer, the information is often still out of reach to users because it is so difficult or confusing to find. Of the low-income users who performed the Web search, 80 percent said that it took too long to find the information they were asked to find on portals, 15 percent said it took an average amount of time, and no one found it quickly. In another interesting finding, 65 percent did not find layout understandable, while 25 percent found it adequately organized and intuitive. The majority of these users had trouble obtaining the information and — even more significant — 65 percent did not find the sites easy to use. Following is a sampling of reactions from the people with whom we spoke:

"These sites seem very dry at best, and most of the time, I didn't see the logic of how most of the contents were organized. I think these sites can benefit from more simplistic layouts, brighter colors, more images and graphical icons to highlight or point information out."
Henry, age 25

"Topics were vague; [portal] should be more basic. They should have a tech support number."
Dontray, age 17

"If I lived in [this town], I would not find this a valuable site to learn about my community. Not enough local links. The links really lead nowhere. And the site is BORING..."
Suzanne, age 27

"Many times the information was not in a logical place and you had to do/go [sic] numerous places."
Erica, age 27

These findings are similar to the conclusions of an important study authored by Nicholas Burbules and Thomas Callister, who argue that real Internet access has to do with more than access to hardware. It involves — among other variables — being able to interpret and navigate effectively through complex online environments. The authors make the case that information does not have value and the user does not have real access if s/he can't get what s/he wants.[1]

In sum, the problem with search tools is twofold: most do not accommodate the needs of underserved users, and they require a great deal of sophistication and training. However, many users we interviewed are very interested in learning tips for faster and more effective searching and recognized that it takes time and coaching to learn the skills that make online information more accessible.

V. BUILDING BLOCKS FOR THE FUTURE

While content currently on the Web generally does not meet the needs of underserved Americans, we did find positive examples of Web content, along with content development activities that provide useful "building blocks" for the future. They include Web site products and tools as well as more extensive initiatives. We also talked to people about what would be required to move some of these building blocks to scale. Because this field is so young, most of the initiatives we spotlight are relatively new, while others are still on the drawing board.

Building blocks include Web site products and tools as well as more extensive initiatives. This chapter describes some of the best efforts we found; a more complete showcase of good content destinations can be found in Appendix E. What follows should be viewed as a sampling rather than a comprehensive inventory. Inclusion of these initiatives does not represent an endorsement, but an attempt to analyze productive directions for change.

We looked for promising practices in the following categories:

- Content in subject areas of relevance to underserved users;
- Efforts to break new ground in overcoming barriers of literacy, language, and culture;
- Coaching, mentoring, and involving community residents in content development;
- Organizing content in a manner that makes it easy to use;
- Using technology tools to better reach the underserved.

RELEVANT WEB CONTENT

The following Web sites are good examples of practical information that helps people with their everyday needs, including child care, education, jobs, and transportation:

- The education category of the Internet Resources page of the Brooklyn Public Library provides a valuable source of local educational activities (http://www.brooklynpubliclibrary.org/refernce/refernce.htm#Education). A user can learn about GED test preparation classes taking place throughout Brooklyn, including the address and telephone number of the organization offering the course as well as class times. The site also contains information for Adult Basic Education Programs, assisting a user to enroll in these types of programs. A complete reference such as this one offers clients choices they might not otherwise know exist.
- On Charlotte's Web (http://www.charWeb.org/), residents of Charlotte, North Carolina, can learn about public transportation by clicking on a link on the home page. The public transportation information is easy to find. The page lists the names of the transit systems near the top, making the times and routes only one more click away.
- Welcome to Neighborhood Link's All About Work (http://www.nhlink.net/employme/index.htm) provides information for jobs in Cleveland, Ohio, and answers the following questions: How can I find a job? Where can I find a job? Who can help me find a job? What if I need training or a GED? The site also includes a job vacancy list. The site is relatively simple to navigate because of the simple language and questions and because of the design of the page.
- East Bay Works (http://www.eastbayworks.org/) is a free employment-training site for the East Bay Area outside San Francisco. The site allows users to create a resume online and view job listings for different counties that, in turn, allows them to determine what's most convenient for them in terms of transportation. Users can also watch a video that explains the entire service, step by step, and the video is available in a variety of modem speeds: 28.8, 56K, ISDN, T1.
- A Web site on the network Prairienet (http://www.aces.uiuc.edu/~CCRScare/) offers information about child-care resources for families. The ChildCare Resource Service page helps families in six counties in Illinois to find child care through a telephone service staffed by child-care resource specialists. Parents can receive help developing a child-care search action plan and obtaining child-care subsidy support, if they qualify. Prairienet has also been collaborating with agencies to create the area's most comprehensive online human services guide (http://www.helpsource.org). On this resource, users have access to a database of 1,000 human services in the six counties covered by the community network.
- The Education Center (http://bcn.boulder.co.us/univ_school/center.html) on the Boulder Community Network home page includes local education programs, two online student newspapers, and extracurricular activities. Students, parents, and other adults interested in education can find many links to local Web sites for further information.
- Community calendars are common on networks. The Taos Community Calendar on the La Plaza Telecommunity site (http://www.laplaza.org/cc/) has a particularly user-friendly interface. The user can read a few short sentences and search the calendar by months and events. In addition to events of interest to families, the calendar lists local cultural and political information.

Some of the community networks in the group of portals analyzed for this Audit consist of collaborations and partnerships with libraries, universities, schools, community-based organizations, and private business. The more successful ones derive their funding from diverse sources, such as federal funds, private industry, and social venture capital investments.

Brooklyn Knowledge Network

Brooklyn is building an online network of community-based organizations, libraries, schools, and government agencies. The advanced communications infrastructure at the Brooklyn Public Library will provide high-speed connections to all participating organizations at reduced fees. The network will have the capability to offer audio and video transmission, video multicasting, and voice services to its constituents.

The network will leverage resources and electronic databases. It will develop training and support programs to encourage organizations to participate and to assist them in distributing their information electronically to their clients. This citywide collaboration pools together resources and expands access to the advanced technology in place at the library, paving the way for more sophisticated broadband connectivity and services. It also builds content development capacity in the community through programs that teach and support content development efforts. For example, Brooklynx, a project of Brooklyn Information and Culture (within city government) and a network member, trains representatives of community-based groups to build Web sites and then hosts them on the highly designed Brooklynx Web site (http://www.brooklynx.org/).

Davis Community Network
Davis Community Network (DCN) in Davis, California, (http://www.dcn.davis.ca.us/) refers to itself as a "smart community" and is part of the "smart community" movement. The network has contractual agreements with a number of community organizations, city and county government, and the Davis Unified School District (http://www.dcn.davis.ca.us/organizations/). These entities make financial contributions to DCN, and they work together to plan the network infrastructure. As the main portal for the city of Davis, the site receives 100,000 hits per week from the city, county, and surrounding region. Core contents of the DCN Web site include access to tools such as forums, discussions, GIS (Geographic Information Systems) mapping, and online databases.

Missouri Express
Missouri Express (http://www.more.net/projects/mo_express/), a statewide community information network, "strives to share public information with Missouri citizens and to provide a powerful community and economic development tool to showcase the community to the world." The network unites the efforts of school districts, libraries, local government, and other agencies to support public access to information. Furthermore, the network builds upon the efforts of local information providers already online, while assisting other information-providing organizations to get on the Internet.

The Community Connection Web page on Missouri Express (http://www.communityconnection.org/cc_1_1/background.html) offers a database with information from thousands of community-based health, education, and human service resources. It provides basic service information (e.g., types of services, staffing, locations and phone numbers) to the public. Libraries, schools, and other public resources distribute this content.

Prairienet
Prairienet (http://www.prairienet.org/online/) is part of the Community Networking Initiative (CNI) at the University of Illinois, Urbana-Champaign. Prairienet is seen as the community repository of information. In addition, the network has trained more than 500 low-income individuals in computer skills and has given them free computers and Prairienet accounts after they completed the course. The network has also worked with many community organizations to put information about them online, resulting in more than 700 groups being included on the Prairienet Web site. More of these sites now focus on providing information directly to low-income users. In addition, CNI has collaborated with local health and human service organizations to develop comprehensive Web-based information and referral directories and other cross-institutional information resources.

OVERCOMING LITERACY, LANGUAGE AND CULTURAL BARRIERS

For Limited-Literacy Users

The Web sites described below are excellent examples of products that offer rich activities to improve literacy skills using a variety of media; they also provide "life information."

- The Voter Involvement Project is one of the few examples we found of online information designed for individuals who are at a beginning reading level. The content on the "How to Vote" section of the "Key to Community: Voter Involvement Project" (http://www.otan.dni.us/cdlp/vip/welcome.html) was developed by adult reading students to help other students learn more about voting. One can either go step by step through the tutorial or pick and choose sections to complete. The user can derive the meaning of the simple text from sketches and by listening to a reading of it, when the "HEAR" button on the menu is pressed. The menu itself is very simple, made up of five buttons and five words. The sentences are also spread out across the page, above and under the sketches.

- Another Web site, Rebecca's EZ Pages (http://www2.wgbh.org/mbcweis/ltc/ezpage/), follows similar design ideas but creates more sophisticated online reading exercises. One of the exercises, titled "What the Landlord Must Do," teaches students basic terminology about housing and landlord responsibilities. Then, it provides a written exercise in which the student explains the responsibilities and also describes the functions of certain parts of the house. The Web site gives the student a list of words that link to pictures about parts of a house. Or the user can click on different parts of a sketch of a house, which then show the appropriate word. The interaction between text and pictures, along with the written exercise, allows students to go back and forth between the pictures and the words as much as needed to succeed at the tasks.

- LINCS (http://www.nifl.gov/lincs) is the adult literacy community's gateway to the world of adult education and literacy resources on the Internet. LINCS features multimedia curricula developed by practitioners, special collections on major literacy topics, the latest literacy-related research and statistics, and opportunities for communication with colleagues directly and through online discussion.

- Western/Pacific LINCS (http://literacynet.org/lincs/), one of the LINCS regional hubs in partnership with the CNN office in San Francisco, offers a Web site for adults who are learning to read. It also uses multimedia to give the reader clues that help decipher textual meaning. A user can read a story in full, abridged, or in outline form.

What is particularly interesting about this site is that, as part of its "Learning Resources," the students can listen to the story or watch it as a video. Afterward, they complete a series of exercises testing vocabulary and reading comprehension, and then they write their own ending for the story. The learning experience involves many different components to assist an early reader as much as possible.

- Literacy Link (http://www.pbs.org/literacy/) is a very strong example of content on the Internet for early readers. A joint venture between PBS, the National Center on Adult Literacy, KET (The Kentucky Network), and Kentucky's Department of Education, the Web site has an instructional area geared to pre-GED students who lack basic reading skills and focuses on workplace skills. The director of Literacy Link, Noreen Lopez, explains: "The aim is to improve reading, math, and communication in a business context." Full instructional lesson units are built around video clips. In a unit about planning for a career, for instance, the user clicks on a link to perform an "anchor activity" that involves watching a video program, thus setting a context for the activity. Next, the user can do corresponding work in an offline workbook as well as online learning activities (e.g., taking inventory of areas that interest her/him). Each unit ends with a "closure activity" to help the learner reflect on what s/he has learned. The content was developed with strong input from educators and users and has high production value.

Multilingual Content

As with literacy content, the best sites help students learn better English skills through carefully designed practice sites. We also found some sites with important information about government residency requirements, Social Security, and health. We did not uncover sites that are as sophisticated as Literacy Link to educate this population.

- The DEIL/IEI Lingua Center (http://deil.lang.uiuc.edu/Web.pages/esl.html) offers many resources for online ESL practice. It contains grammar, listening, and speaking exercises.
- English Practice.com (http://www.englishpractice.com/), a free service, offers thousands of lessons, with new ones added every week. The user can listen to explanations and directions before using the site. In the grammar section, users can practice verbs, prepositions, and vocabulary, and they can complete grammar tests. All of these are interactive multiple-choice exercises with a program that provides correct answers. Students can also play crossword puzzles, practice reading, and learn business vocabulary in a business course.
- NOAH: New York Online Access to Health (http://noah.cuny.edu/) is a bilingual site where Spanish speakers can find national and local health information through word searches. The information is also available in English, which can be useful in developing English skills, while providing important health information. The general section contains information about diseases and general physical well-being, while the local section provides references for services in New York, such as hospitals and a directory of services for children. The combination of national, local, and bilingual subject on this site is very useful.
- English-Spanish Glossary of Social Security Administration Terminology (http://ssa.gov/espanol/glossintro.html) is a government information Web site that distributes vital Social Security information to Spanish-speaking Americans.
- Immigration-USA.com (http://www.immigration-usa.com/spanish.html) contains topics with vital information for immigrants. Spanish-speaking immigrants can read in their native language about visa eligibility, residence cards, and what to do if a card is lost. The site also provides a comprehensive list of forms required.
- In Randall's ESL Cyber Listening Lab (http://www.esl-lab.com/), students can listen to general quizzes, quizzes for academic purposes, long conversations, and short listening exercises; the user can choose easy, medium, or difficult levels for the exercises.
- Another useful online tool is the AltaVista Translator, a tool provided by the search engine. A beginning speaker can enter English words or phrases and receive a Spanish translation. This allows new speakers to read and comprehend written material in English, an important element in learning to speak with fluency. However, this program lacks the sophistication to do some of the more complex translations that commercial software can do.
- Through other resources, such as healthfinder.gov, one can find many other Spanish or bilingual Web sites.

Culture

The cultural sites we found that address the needs of underserved users are bringing together individuals to express cultural attributes using technology. Technology is enabling conversations about local interests, as in the case of Harlem Live, and about traditions that have been handed down over several generations, as in the case of La Plaza Telecommunity's Open Studio. In addition, by building cultural Web sites, participants in these programs learn technical skills that they apply to develop other content, or which encourage them to increase their skill base and become even better producers. Often this progress can have positive impact, as it builds self-confidence and expands areas of interests.

- Harlem Live (http://www.harlemlive.org/) is Harlem's online publication by teens. Approximately 60 students from public high schools located in the Bronx, Brooklyn, and Manhattan develop and maintain this award-winning interactive journal about life issues for teenagers of color. On the Web site, one can read about events and happenings, poetry and memoirs, and view a gallery of photos. The aim of the site is to empower leaders to be caretakers of tomorrow by building a network of information from within the community. Harlem Live has been recognized nationally for its contributions to the online world of youth of color, receiving praise from international as well as national leaders.
- La Plaza Telecommunity (http://www.laplaza.org/) is partnering with groups such as Artesanos de Questa and

La Jicarita Enterprise Community to provide training, access and support in information technology to artists in Taos County, New Mexico. The program is instructing local artists in how to post artwork online, disseminate cultural information through the Web, and link with arts communities across the country and globally. Some of these artists are seeing age-old artisan traditions distributed more broadly than ever before possible and, in the future, envision selling their art online. This interchange is creating community connections by building productive alliances within, and is also creating new forums for the art and culture of Taos. The effort is part of a larger initiative funded by the Benton Foundation's Open Studio project.

COACHING, MENTORING, AND INVOLVING UNDERSERVED COMMUNITIES: THE ROLE OF COMMUNITY TECHNOLOGY CENTERS

Our interviews and focus groups made clear why underserved users need to be involved in the development of content for their communities. Inclusion helps ensure that online content incorporates what the community wants and will use, that content acknowledges residents' methods of acquiring information, and that the look and feel of the content works with the user's literacy and linguistic levels. Equally important, involvement of the community builds a group of users who sees the Web as a space that reflects their culture and values and is useful. Finally, it enables the community to benefit financially from economic development that may occur from technology resources in the community.

Community technology centers, neighborhood centers that provide technology skills training and open access to the community, have begun to prove their value as local sources of coaching and mentoring that promote involvement of low-income residents in technology and content development. Evaluations of the California-based Computers in Our Future project have shown that these 11 centers are reaching groups who have normally been intimidated by technology, and people who have been difficult to attract to the computer-using world. Fully 81 percent of users are people of color, 56 percent are under 24 years old, and over half of the adult users come to the center seeking employment.[15]

Similarly, affiliates of the Community Technology Network have been found by evaluators to share the following characteristics:

- Have a positive impact on participants' educational goals and experiences;
- Foster a sense of personal effectiveness;
- Be a valuable resource for obtaining job skills and learning about employment opportunities;
- Be an important resource for the traditionally underserved, including women and girls, people of all ages, and members of racial or ethnic minorities; and
- Encourage community building.[16]

Access Centers for Children and Youth

Computer Clubhouse

The Computer Clubhouse in Boston brings together a network of computer centers with the goal of teaching participants to express themselves fluently with new technology. Unlike many other centers where the main goal is to teach youth basic computer techniques and basic computer applications, the Clubhouse focuses on creating "fluency" among young people: the ability to use the computer as a medium for expression (beyond word processing). In this learning community, young people and mentors work together on projects, using new technologies to explore and experiment in new ways. For example, they use tiny computers (embedded inside LEGO bricks), motors, and sensors. Their Web site showcases some of these sophisticated projects (http://www.computerclubhouse.org/). Elements that help make the Clubhouse work for kids include mentors and a well-planned curriculum that was developed with researchers at the MIT Media Lab, who also created the microcomputers used in the experimental scientific projects.

Street-Level Youth Media

At Street-Level in Chicago, youth learn video design and digital video production techniques. The Web site (http://streetlevel.iit.edu/) is an online cultural space for Chicago's inner-city youth. It contains a "multimedia block party," which celebrates Web sites created by participants, and reports about the Chiapas Youth Media Project in which youth from Street-Level went to Chiapas to share video techniques with the residents of this Mexican village. At present, the youth are building an oral history (broadband) site with material from video installations of the past four years.

Imagination Place!

EDC's Center for Children and Technology is collaborating with Libraries for the Future to implement an interactive online design space for girls ages 8 to 12 called "Imagination Place!" Its goal is to equip girls to use technology and understand the process of building technology so they learn to be creators and engineers. Imagination Place! is allowing girls to animate objects by using powerful Internet-based multimedia tools.

In addition to the online environment, many offline activities are planned with mentors and instructors, recognizing that the success of a project like this relies on offline and informal educators. Mentors meet with participants in after-school programs in libraries in several U.S. cities. They also communicate by e-mail, work on design-based projects and solve puzzles to learn about the design of everyday objects. Because Imagination Place!'s activities are designed to be fun and challenging, they hold the potential to provide more purposeful guided activities.

Access Centers for Adults

The Gateways Community Voice

The Gateways Community Voice in New York City (part of the Gateways Technology Grant funded by the US Department of Education) supports a coalition of settlement house staff, community members, parents, students, and teachers who work together to develop Web-based content

relevant to the study of immigration and emigration at community centers. During one of our focus groups, we observed a Web-design class comprising recent immigrants between 16 and 23 years old. Poems written in an ESL class made up the content of their Web pages. One of the most exciting parts of the Gateways Community Voice Web page, called Life Stories, contains audio files of immigrants recounting stories of their journey to the United States. Project staff are working with grade-school teachers to integrate this content into the fifth-grade history curriculum in order to teach the subject more authentically.

The Technology Community at Villa Victoria
The community center at this low-income housing facility in Boston is a community of very actively involved Hispanics, who are coming together in part around cultural interests and concerns and who are planning the computer lab and the content. Villa Victoria has partnerships with the city government and the largest ISP in the area, Lycos (one of the major players in the national portal market). An intranet will be built for all the housing units, and plans call for installing a computer and printer in every home. There is a technology center at the facility, which is developing a Neighborhood Clubhouse with Lycos. A Clubhouse is a password-protected environment for residents that hosts online resources useful to the community. The Clubhouse director and community representatives work very closely to determine the content. Parents can use the Clubhouse to communicate with teachers, other residents, and the city government or to publish information in Spanish.

ORGANIZING GOOD CONTENT AND MAKING IT EASY TO USE

We were able to find some portals that organized a great deal of material by subject matter in forms that were easier than most to use. Portals such as Yahoo!, Snap.com, and those created by the Brooklyn Public Library (http://www.brooklynpubliclibrary.org/refernce/refernce.htm) and the Public Libraries of Saginaw, Michigan (http://www.saginaw.lib.mi.us/), contain subject categories organized by people who catalog and index each subject. These staffing resources allow the portals to offer more complete and high-quality information in each subject area. Commercial portals now allocate resources to aggregate and create content in order to attract and keep users in their sites, having evolved from their original role as browsers that pointed people out to the Web into online channels that aim to meet all information needs. Some community networks also have well-developed subject categories; however, many have not and must rely on volunteers, or limited staff, for content editing.

The Community Networking Initiative at the University of Michigan School of Information produces The Community Connector Web site (http://www.si.umich.edu/Community/). The Web site provides links to an annotated list of resources useful to people gathering community-building information, and it labels as "best practices" those that are successful at reaching out to communities. Best practices are either national or local, or a combination of the two. A health site from Charlotte's Web considered outstanding, for example, features Community/Social Service Agencies, Charlotte's Web AIDS Project, Family and Children Services, and national information about cancer. Practitioners in the community networking field who use the site find it a valuable general resource because of the aggregation work it performs.

USING TECHNOLOGY TOOLS TO BETTER REACH THE UNDERSERVED

Though most are still in their infancy, we were able to find some multimedia, search, and translation tools that hold the potential to make electronic information more accessible to limited-literacy and bilingual users. It is particularly important to develop technologies that facilitate access to all types of content, in order to prevent "dumbing down" existing content, and to extend the reach of high-quality content now available. In fact, many of the users we interviewed want to be able to use the "deep," multilayered content available on the Web.

Educational technology research and design initiatives for disabled users offer some direction to design products that can help to make the Web a more accessible environment. For example, projects at the Center for Applied Special Technology (CAST) (http://www.cast.org/) address limitations with search and reading support in a Web environment. CAST is an organization that incorporates widely accepted tools that make technology available to disabled users (using so-called universal design principles) at the beginning of the product design process. Redesigning the product later is often much more difficult, if not impossible. For instance, if application program interface (API) standards are not included initially in an application, assistance software may not work with that application. For these reasons, API standards should be incorporated early on in the development of software and other content for limited-literacy and bilingual people.[17]

One promising approach for limited-literacy users is a reading assistance software program, The Web Trekker, that helps with identifying key words, spelling, and narrowing Web searches. In this multimedia environment, users also receive support in "reading" information from the Web and navigation through text-to-speech support and synchronized highlighting. A similar piece of software, Responsive Text by Lexicon Systems (http://www.lexiconsys.com/), helps to teach basic skills and content relevant to today's workplace to adults in adult education agencies. The program helps the user comprehend text with audio assistance in reading and vocabulary.

Commercial translation and search tools also show promise for assisting this target population. Speech recognition is starting to be built into some commercial products. For instance, software manufacturer Lernout & Harpie recently unveiled the L&H "Translator Online," a Web-based, e-commerce translation device. Other players, such as Transparent Language and Conversa, have also developed products that incorporate speech into their applications.[18] The search engine AltaVista (mentioned earlier) offers full text translation, capable of translating Web site passages originally in English into Spanish. Software created by Babylon.com allows a user to highlight a portion of text and receive an immediate translation. In our focus groups, some adults with

limited-literacy skills found the natural language search engine Ask Jeeves (http://www.askjeeves.com/) to be useful.

In addition to encouraging development of software tools that facilitate reading and locating information, it is also crucial that industry standards now being developed for broadband content address these points, since interactive (broadband) content is a crucial part of the digital future. Many important conversations are now under way that should take into account the special needs of this target group. The International Organization for Standardization (http://drogo.cselt.stet.it/mpeg/standards/mpeg-4/mpeg-4.htm), for example, released MPEG-4 (Motion Pictures Experts Group) standards[10] in October 1999 for interactive video on the Web. In the summer of 1999, the Advanced Television Enhancement Forum (http://www.microsoft.com/atvef/) issued criteria to guide the convergence of Internet and television programming.

These and other efforts to define the emerging broadband arena offer tremendous new opportunities to serve this population more effectively. The descriptive text in closed captioning used by those with hearing disabilities is one example. This technology can also be used for searching and translating so that people who speak a language other than English can search video and audio to find what interests them and then translate it into their native languages. As broadband standards are developed, they should also enable two-way communication so that limited-literacy or limited-English users can interact with the information and produce content themselves.

In this period of intense research and development (R&D) in the Internet industry, and as content migrates to various information devices, now is the time to develop the tools and guidelines that will make it easier for everyone to use the Internet. History has shown that striving to make technologies accessible to specific constituencies leads to advances that benefit everyone. Development of a "talking book" for the blind, for example, led to the cassette tape,[20] and research on communications devices for the deaf led to the development of the telephone.[11]

FORGING PUBLIC/PRIVATE PARTNERSHIPS TO GET THE JOB DONE

Web content is heavily driven by the private marketplace. Many of the building blocks presented here show that there are tremendous opportunities for the private and public sectors to join forces to extend online content development to underserved groups and individuals. While the market can be counted on to produce some of the desired content, special partnerships must be forged to develop local, community-based information and Web products for limited-literacy and bilingual users.

Private-public partnerships that use market-based concepts to design social products and services have a long history and are important foundations to build upon. *Unleashing New Resources and Entrepreneurship for the Common Good: A Scan, Synthesis, and Scenario for Action,* a 1999 report by Tom Reis with support from the W. K. Kellogg Foundation, presents a conceptual model and a plan for how to build philanthropic social investment to solve social ills using market-driven and venture capital concepts.

The report identifies the following as necessary elements to integrate business ideas into the service of the common good: knowledge management, human capacity development, and deal making. The initiatives and Web products discussed below exhibit some of these components and are solid building blocks for developing community-generated online content.

ACENet
http://www.seorf.ohiou.edu/~xx001/

The Appalachian Center for Economic Networks is a community-based economic development organization located in rural southeastern Ohio that jointly administers the Southeastern Ohio Regional Free-net, a community-based network committed to providing low-cost access to information and communication resources. ACENet's programs employ market-based principles to build successful businesses that help people move out of poverty. They work with 75 specialty food businesses to develop niche markets for food products. Many of these have been incubated at ACENet with social venture funding. In addition, they provide market and trend information for various types of businesses. Approximately one third of their funding is generated by ACENet.

CitySoft.com
http://www.citysoft.com/

CitySoft is a high-growth Internet company that is expanding with a pool of talented employees recruited in lower-income neighborhoods. Many of its employees are graduates of training programs for underserved constituencies. CitySoft provides Web design services to a variety of private clients, such as BankBoston, Reebok, Polaroid, and Sapient, from which they generate their revenue. In the process, CitySoft is proving that high-tech employers do not need to look abroad for employees because talent exists here. In America's inner cities, employers are recruiting and training developers, administrators, managers, and entrepreneurs.

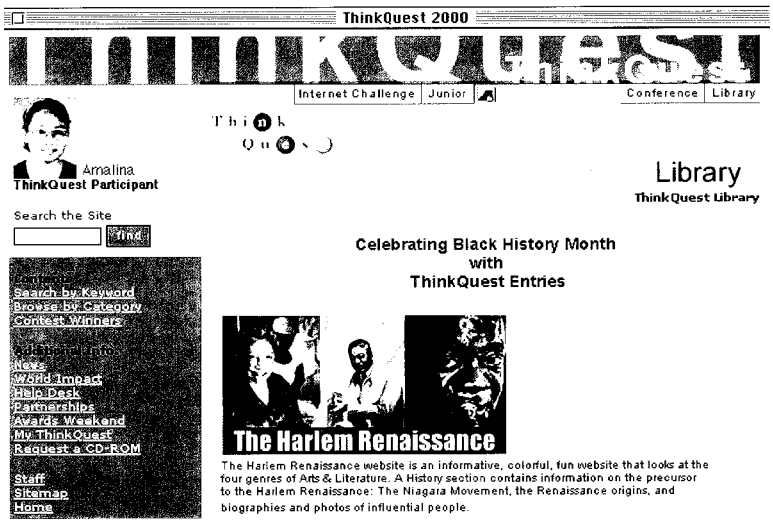
Grassroots.com
http://www.grassroots.com

This site is a political action network with a commitment to improving democracy. It helps candidates and voters communicate, increases political participation, and empowers grass-roots movements while still generating a profit. This revenue comes from charging candidates for Web hosting, advertising, and offering fund-raising services to local campaigns with limited budget. With easy-to-use tools and content to generate activism at the local level, Grassroots is a commercial venture serving a public mission.

PowerUP & IT Training Programs
http://powerup.org/

The mission of PowerUp is to give underserved youth access to technology and guidance. The program aims to offer teens mentorship and direction to help them succeed in the digital age. More than a dozen nonprofit organizations, major corporations, and federal agencies are involved in this initiative. Partnerships with various public and private insti-

tutions, such as schools and community centers around the country, will allow PowerUp to reach thousands of youth. Partners will provide technology, funding, trained personnel, in-kind support, and other resources. Although not primarily involved in the generation of content or content skills, Power Up Online is being designed to house the content for the program, which will be delivered through youth centers across the country.



VI. CREATING A POSITIVE INFORMATION SOCIETY FOR AMERICAN FAMILIES: NEXT STEPS & RECOMMENDATIONS

This Audit provides a clear picture of what underserved communities want and need from the online world. That picture can help guide the information age in ways that benefit communities and improve the quality of life for all Americans. In addition, the participation of the underserved can greatly enrich our collective culture. Ignoring the voice and vision of underserved communities will greatly limit the ability of this potent interactive media to function as a tool that strengthens local communities.

Five key characteristics. Our research yielded five key characteristics that define a positive information society. These form a framework for our recommendations for action.

A positive information society

1. Is community-driven and meets real community needs. Activities should build on existing organizations, resources, and needs in the community.

2. Overcomes major content barriers facing the underserved. Most critical are those related to local needs, literacy level, language, and culture.

3. Provides people to help. Offers training and technical support so that, like businesses and more affluent Americans, underserved communities have the support required to plan, design, produce, and use content that best serves their interests.

4. Offers online content that is easy to use. Content is aggregated, organized, and searchable in a way that all Americans, especially the underserved, can easily find what they want.

5. Is sustainable. Financial resources are available to keep these information resources current so that content can move and change as the community changes and so that necessary equipment and high-speed connections can be maintained.

Two Prerequisites

There are two prerequisites to our recommendations. First, many of the positive online activities this Audit chronicles require high-quality hardware, software, and high-speed connections, which most underserved communities do not have. While a great deal can be accomplished with fairly basic infrastructure, all underserved communities need centers of excellence where the advanced applications are possible. Our findings and recommendations can help inform the efforts by U.S. companies, the U.S. Department of Commerce, the U.S. Department of Education, some foundations, and others to solve this critical infrastructure challenge.

Second, all interested parties must sustain their advocacy efforts to make sure the powerful interactive capabilities of the Internet are actually used to address real community problems. If the positive scenarios described in this Audit are not persistently promoted by civic leaders, elected officials, and corporate leaders alike, the potential of the new media to achieve genuine social improvement will be lost.

RECOMMENDATIONS

Because the new "two-way" interactive media are so fundamentally different from traditional "one-way" media, they require altogether new partnerships to realize their potential for community building. Most of the actions we recommend require working alliances of underserved communities, corporate leaders, philanthropy, and government. While much of the activity and leadership on this issue appropriately rests with the private marketplace, government and philanthropy also have critical roles to play in research and development, by establishing basic principles and regulation within which the private sector can flourish, and providing certain kinds of financing and incentives.

Based on our findings, we recommend three strategies to promote a positive information society that includes the 20 percent of Americans who are underserved today:

1. Start with what can be done immediately, including steps every local community can take. Enough is known to act now, and there is no time to wait.

2. Put in place a national strategy that leads and supports communities as they use the new online tools to tackle real community concerns, and ensure that no Americans are left out of the Information Age benefits.

3. Carry out the research and development (R&D) that creates the knowledge base for community and national efforts to be effective.

1. GETTING STARTED TODAY

Find Out What Your Community Values: Local communities across the country can begin to map what information residents find most useful, how they want it organized, and how the Internet can help residents use education, employment, recreational, and other opportunities. In underserved communities, trusted places like community or religious centers and many others have a leadership role to play. One good example is the Neighborhood Technology Resource Center at Chicago's Northwest Tower Apartments (http:www.northwest.com), where the unemployment rate is 89 percent and where 95 percent of the residents are African American. Residents are involved in building a Neighborhood Network that includes local businesses, such as salons and dollar stores. The project collects information on the residents' interests and skills (which are as diverse as baby sitting and sewing) as well as local jobs and then aggregates the information on a Web site. In this way, the project is beginning to build an employment resource network similar in concept to monster.com but that emphasizes the many different and unique "assets" available in the community. .

◎ **Build New Online Community Resources:** Communities can begin to build online resources based on residents' guidance. One model is Brooklynx, a nonprofit online community network designed by and for the residents in each neighborhood of Brooklyn. Through Brooklynx, residents can click on a map that includes their neighborhood and find everything from the community calendar of events to technology courses taught in the neighborhood, to family service organizations and cultural exhibitions (see www.bkny.net/neighborhoods/).

◎ **Enlist Local Talent:** Communities can begin tapping readily available resources to support them as they build these online resources. For example, enlisting the help of technology, savvy teenagers identified by the local high school provides the double benefit of Web expertise for the community and practical work experience for youth. Youth offer tremendous untapped expertise. Communities can also ask local businesses for a "loaned tech expert," an experienced technology professional who can be detailed to their project through a paid leave or sabbatical from the employer.

◎ **Aggregate and Market Available Good Content:** Using the good content identified through this report, interested parties can gather and organize what exists so that community organizations can use it more easily. To make this resource available most efficiently, we recommend that a small consortium of groups that represent underserved constituencies work together to assemble and maintain this resource. Blue Web'n, an aggregator site for education and training related materials, is one good example (www.kn.pacbell.com/wired/bluewebn/).

◎ **Use Search, Translation, and Multimedia Tools to Reach the Underserved:** The corporate sector should take the lead in deploying existing multimedia tools to make online content more usable by Americans with limited literacy and language skills. Specifically, more sophisticated translation tools should be made available to convert text from English into other languages. Users should have access to them in the public domain. In addition, voice capability that can read aloud any text that a user highlights should be made a standard feature of online content.

◎ **Direct Available Government Resources to Groups That Can Develop Content for Underserved Communities:** Federal and state government should use existing grant programs for technology to encourage and support underserved communities that can develop content. Today, many government grant programs either do not support content development at all or, like the Commerce Department's Technology Opportunities Program, do not support projects whose primary purpose is content development. A great deal of valuable new content could be developed if even two of the major federal initiatives focused on underserved Americans — the Technology Opportunities Program and the Department of Education's Community Technology Center's program — devoted a quarter of their $45 million budget to content development. States should also consider providing incentives for the creation of content that appeals to underserved groups, as has been recommended for California by the California Research Bureau.[52]

◎ **Offer Essential Public Information at a Limited-Literacy Reading Level:** Government, schools, and libraries should customize their content for limited-literacy users. For example, the government programs that are designed to benefit low-income families who sometimes have limited-literacy skills should provide information about these programs on Web sites at a limited literacy reading level. There should be an automatic default to this simple interface and text, with an option for more advanced readers and Internet users to move to the more complex version. Funding should be available in government budgets for this purpose. Similarly, this information should also be translated into the languages most prevalent among program clients.

II. CARRYING OUT A NATIONAL STRATEGY TO ADDRESS THE UNDERSERVED

◎ **Convene an Online Content Strategy Group:** The philanthropic sector should convene leaders from the corporate sector, underserved communities, and government to determine how best to place the content issue on the national agenda. In addition, this strategy group should establish nationwide goals, measurable targets, and key action steps for creating a positive information society.

◎ **Build Community Information Portals:** Private industry should work with underserved communities to develop and share a model for a community information portal. The model would be patterned on private industry's "enterprise information portals," which offer clients a one-stop, interactive online center to, for example, learn about cars, buy a car, or talk to other car owners, and which also allow the employees of car companies to collaborate and communicate more efficiently with business partners. The community information portal should have certain features that are standard across communities but also offer extensive flexibility so that each community can develop a portal that has the best fit.

Industry leaders should come together to make tools (and technical support) available that enable local communities to add new functions to existing Web sites or create brand new ones that can gather and organize information of value to residents —whether bus routes and schedules, information on the nearest child-care center, online tutorials, or help writing a resume. Portals should offer a variety of features, including classifieds, community calendar, neighborhood services, discussion, chat, search, Web links, and an e-commerce mall for the neighborhood or area. These tools would enable residents in underserved communities to organize community food co-ops, safety patrols, or neighborhood festivals. Similarly, users could find tools to become producers of goods or services and start their own e-business. An exciting preview of the potential are the tools offered by WeGo.com (http://www.wego.com/index.html).

◎ **Provide Community-Based IT (Information Technology) Preparation and Training in Underserved Communities:** Private philanthropy, the corporate sector, and government should expand the support of community-based IT (information technology) preparation and training in underserved communities. Approximately one fifth of American businesses spend 25 percent or more of their training budget on IT related training, and a large majority expect this to

continue to increase rapidly because they know that productivity depends on their employees learning new technology skills and receiving ongoing coaching. Moreover, an estimated 350,000 jobs for computer programmers, system analysts, and computer scientists are currently unfilled. It is in the interest of business to extend its investment in IT training to underserved communities across the country.[34]

As a way of focusing on highest need areas, efforts should target the 130 urban and rural areas designated as empowerment zones and enterprise communities because of their "economic distress." Training should support the ongoing technology planning and operations needs of underserved communities as well as their work to develop community information portals and other content. Cisco's "Networking Academies" that operate in all 50 states and in 60 countries provide a useful model for building on training currently offered in the private sector and extending it to underserved communities. The academies offer a four-semester 280-hour program at nearly 1,200 high schools, colleges, and nonprofit organizations on how to design, build, and maintain networks.

In addition, a program should be developed to train community residents in creating Web content. Learning from the handful of technology leaders who have considerable experience providing content development training in underserved communities, such as Frank Odasz with Lone Eagles Consulting, training modules and "train the trainer" strategies can be put in place (see, for example, the Texas Community Networking Guide at http://lone-eagles.com/texas/). Furthermore, master trainers should also be available to "ride circuit" much like the circuit rider in the LINC Project who offers on-site technology assistance around the country in addition to periodic training to organizations involved in welfare reform (www.lincproject.org).

◎ **Create a New Economy Corps:** In a related measure to support the ongoing technology needs of underserved communities, private philanthropy, the corporate sector, and government should invest in a nationwide network of the people who support technical skills development in underserved communities. A New Economy Corps should be established to form a "people network." Serving as an information age counterpart to the Peace Corps but focused on the United States, New Economy Corps members would go into high-need communities and serve as catalysts for community building, using technology.

First suggested by Mario Morino and the Morino Institute, this cadre of young people, by understanding the potential of technology, would serve as innovators who "work with people, organizations, and institutions to improve their program and operational effectiveness, community outreach, communications, staff development, funding, and so forth."[35]

◎ **Strengthen and Expand the Nationwide System of Community Technology Centers:** The nation needs an ongoing investment in a nationwide network of institutions that can serve as the community-based technology hub in underserved communities, helping residents both produce and use relevant content. The early experience from roughly 1,500 community technology centers across the country affiliated with the Community Technology Centers Network[36] demonstrates the unique and vital role they play in recruiting into their centers residents who are the most underserved.[36] Libraries and schools have vital roles to play as well.

◎ **Offer Incentives for Content Developed by and for Underserved Americans:** Business and government should provide incentives for underserved Americans to create high-quality content that has value to their peers. Some extremely innovative, exciting online content has been developed by school-aged youth through contests like ThinkQuest (www.thinkquest.org/index.shtml) in which youngsters compete in teams — sometimes with teammates in other parts of the world — to create rich and complex Web sites. These efforts just scratch the surface of what is possible if incentives are provided for content creation. New microenterprise programs, social venture funding, and tax incentives are also promising approaches that should also be tried to foster content development and the e-commerce that can extend from this.

III. NEEDED RESEARCH AND DEVELOPMENT (R&D)

Historically, the higher education research community has pioneered important breakthroughs in technology and socially valuable applications, including the development of search engines. Schools of information science, engineering, and computing, for example, offer tremendous expertise in tackling difficult R&D challenges identified through our research. Corporate R&D, philanthropy, and government also have critical roles to play. And, more recently, efforts are under way to bring together university-based education researchers and product developers in private companies to guide the development of new products. For example, the National Science Foundation-funded Center for Innovative Learning Technologies (CILT) is showing the kinds of R&D breakthroughs possible when researchers and corporations join forces.[37]

◎ **Undertake Market Research About Underserved Americans:** We urge the philanthropic sector to fund additional research to better answer key questions:

- What obstacles prevent underserved individuals from using computers?
- What do various underserved groups want and need with regard to the Internet?
- In what ways are the needs and wishes of underserved Americans similar to and different from those of other Americans?
- What are the differences between underserved youth and adults?
- What are the differences between underserved males and females?
- Where in their communities do underserved Americans want to access the Internet and what kinds of IT training do they really need?
- What kinds of activities and community applications hold the greatest value?

- How can youngsters in a household or underserved community best help others?
- What engagement activities work best for involving community residents in creating content?

◎ **Collect, Evaluate, and Disseminate What Works:** There is precious little information about which online content and strategies are effective in improving opportunities for the underserved — whether measured by bringing them valuable goods and services, providing a bridge to higher literacy and opportunity, helping solve community problems, or promoting broader civic involvement.

We recommend that both government and the private sector track these activities and evaluate what is working to achieve these outcomes. As knowledge is gained, it should be made widely available. We urge other funders to follow the positive example set by The California Wellness Foundation in including a five-year evaluation effort as part of its California-based community technology program called Computers in Our Future.[58]

◎ **Develop a Business Model for e-Community-Building:** Further work is needed to demonstrate to "investors" how underserved Americans behave as a "market." We urge entrepreneurs from underserved communities to join forces with business leaders and business schools to develop a business model for how e-community building works. This new thinking will encourage government and the private sector to provide social venture capital in the most effective ways.

◎ **Create New Search Capabilities and Other Tools:** Search tools should be developed to quickly find online content written at a limited-literacy level. Natural language search engines, such as Ask Jeeves, serve as a good model to start to make the Web more accessible and useful for these groups.

In addition, we recommend developing a new software device that allows complex Web sites to be made simpler. This device would allow documents to be translated into simpler text, and/or read aloud by a computer voice so that the information can be understood through oral presentation in addition to text. This will enable people learning to read or those with special needs (such as limited-literacy groups or seniors with low vision) to use more of the Web.

◎ **Develop Standards to Guide Online Content Development:** Standards have proven crucial in the development of other educational tools and media to ensure positive uses and a level playing field. Basic concepts, such as ensuring that online content is accessible at various literacy levels and in different languages, should be incorporated in the development of Internet standards.

Valuable models from other fields offer lessons and precedents. In the literacy area, for example, a standards development project called "Equipped for the Future" is engaging educators and others who work with adult literacy to develop adult literacy content standards from a student perspective. Similarly, a great deal can be learned from the disabled community, which has developed and started to implement standards to make sure the disabled have genuine access to information technologies. Standards have been written by a subgroup of the World Wide Web Consortium (W3C) to guide Web designers to make sites more usable for the blind and other disabled individuals. While these standards are voluntary, they are beginning to have a positive impact.[59]

◎ **Learn What Motivates the Underserved and Begin Outreach Efforts:** A key finding in this report is that many Americans remain underserved because they do not see how the Internet can help them in their daily lives. Research should be undertaken to learn more about what uses of the Internet will genuinely inspire underserved Americans to give it a try. Second, more must be learned about how these ideas are most effectively communicated to underserved groups — whether by word of mouth from trusted friends, individual success stories that could be carried in local radio or television, or through other mechanisms. Based on these answers, tailored efforts should be made to reach out to underserved communities.

VII. CONCLUSION

In trying to chart a constructive course of action, we were sobered to realize how many facets of the telecommunications future are unknown and unknowable. And yet some of the scenarios that could unfold hold tremendous potential for solving the challenges raised here. If, for example, broadband develops in positive ways and voice activation becomes a mainsteam feature of multimedia, a great many barriers that keep certain Americans underserved today will be removed.

We look forward to working with all interested parties to mount the advocacy needed to make these positive scenarios a reality. In the meantime, the findings from this Audit demonstrate the tremendous untapped opportunity for low-income and underserved Americans to benefit from new information tools; and for private enterprise to recognize the market value of low-income, underserved constituencies. This confluence represents a rare chance to advance the public's interest by using, in part, the power of the marketplace. We hope this first-ever analysis of the adequacy of online content for disadvantaged communities provides an impetus and road map that enable underserved Americans to improve their life prospects and the corporate sector to do its part to create a positive information society for our generation and those that follow.

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[25] *Federal Register*, Vol. 65, No. 31, February 15, 2000, pp. 7555-7557. Poverty Guidelines state that a family of three earning less than $14,150 is classified as below the poverty level.

[26] *National Center for Education Statistics, National Adult Literacy Survey*, 1992. New figures will be available in 2002. Literacy experts define a functional literacy level as, for example, being able to locate an intersection on a street map or calculate the costs of a purchase from an order form. See http://www.nifl.gov/reders/1intro.htm#D and National Institute For Literacy, Fast Facts On Literacy, Web site Publication, 1999 (http://www.nifl.gov).

[27] Ibid.

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[32] To arrive at this estimate, we had to make certain assumptions. Further survey work is needed to make these estimates more precise. We started with the 44 million Americans who lack functional literacy skills, and assumed a high degree of overlap between the limited literacy Americans and the other three barrier groups. Assuming that even 7.5 percent of the 79 million Americans counted in the other three categories are new (i.e., not already counted in the limited literacy group), at least 50 million Americans are affected. We believe that further research will show that, in fact, the number is considerably higher.

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References Errata

-- Footnote 9 - Substitute: Mediamark Research as cited in "Tracking the Internet Economy: 100 Numbers You Need to Know," *The Standard*, September 13, 1999

-- Footnote 25 - Add: Also, U.S. Department of Commerce, Bureau of the Census, "Historical Poverty Tables - People: Poverty Status of People, by Age, Race and Hispanic Origin: 1959 -1998," *Current Population Survey*, March 1999

ing; Scientific, 6 percent; Pornography, 1 percent; Government, 1 percent; Health, 3 percent; Personal, 2 percent; Community, 1 percent; Religion, 1 percent; Societies, 2 percent; Commercial, 83 percent.

[40] The potential of the Internet to improve literacy skills has been demonstrated using a variety of methods. For example, scholarly research has documented the benefit of using hypertext information to improve reading; some studies are included in Appendix F. Community programs have also demonstrated the benefits, including, for example, literacy programs at the Brooklyn Public Library, where the Internet is used to improve reading. Similarly, new online literacy programs such as Literacy Link and LINCS, which use the Internet as a primary tool in adult literacy development, are also showing promising results.

[41] Interview with Dr. David Rosen, October 1999.

[42] Interview with Felipe Korzenny, President and CEO, Hispanic and Asian Marketing Communication Research, Inc., December 1999.

[43] Nicholas Burbules, Thomas A. Callister Jr., "Who Lives Here? Access to and Credibility Within Cyberspace". Forthcoming in *Watch IT: The Risks and Promises of New Information Technologies for Education* (Westview Press) (http://www.ed.uiuc.edu/facstaff/burbules/ncb/papers/who_lives_here.html).

[44] "Computers In Our Future (CIOF) At a Glance: Public Information Document," based on an evaluation of a group of eleven community access centers that make up CIOF. Evaluation conducted by evaluation team from the Claremont Graduate University.

[45] "Impact of CTCNet Affiliates: Findings from a National Survey of Users of Community Technology Centers," July 1998, p. 1. This report was conducted by CTCNet Research and Evaluation Team at Education Development Center, Inc. The work was supported by the National Science Foundation.

[46] For a more detailed discussion of API standards, see Bergman, Eric; Johnson, Earl. "Towards Accessible Human Computer Interaction." Excerpted from *Advances in Human-Computer Interaction*, Volume 5, Jakob Nielsen, Editor. Ablex Publishing, 1995 (http://www.sun.com/tech/access/updt.HCI.advance.html).

[47] Stuart Glascock, "Speech Recognition is No Longer All Talk," 11/26/1999. (http://www.techWeb.com/wire/story/TWB19991126S0005).

[48] These can be found from the MPEG home page at http://drogo.cselt.stet.it/mpeg/standards/mpeg-4/mpeg-4.htm.

[49] W. K. Edwards, E. D. Mynatt, and T. Rodriguez, "The Mercator Project: A Nonvisual Interface to the X Window System," *The X Resource*. O'Reilly and Associates, Inc. April 1993.

[50] Bergman, *op. cit.*

[51] Rosa Maria Moller, *Profile of California Computer and Internet Users*, California Research Bureau, Report Prepared for Joint Hearing of Senate Energy, Utilities, and Communications Committee and Senate Select Committee on Economic Development, January 2000, p. 20.

[52] American Society for Training and Development, *National HRD Executive Survey*, 1998.

[53] Statement of the Morino Institute on the "Digital Divide," 1999.

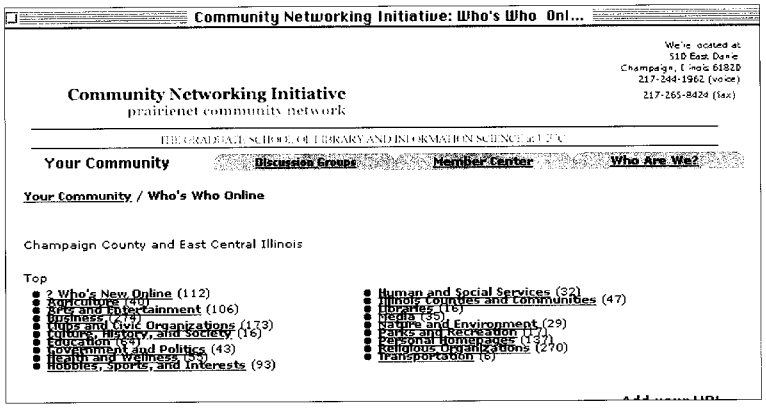
[54] Affiliates are only a portion of the more than 3,500 centers projected to exist throughout the country.

[55] This observation is based on two evaluations: (1) "Impact of CTCNet Affiliates: Findings from a National Survey of Users of Community Technology Centers"; and (2) "Computers in Our Future (CIOF) at a Glance," *op. cit.*

[56] See http://www.cilt.org.

[57] See http://www.ciof.org.

[58] See http://www.w3org/wai.



APPENDIX A

PEOPLE INTERVIEWED FOR THIS AUDIT

Paul Adams
Technology Director
Prairienet

Scott Aikens
Project Director
Mapping the Assets

Sara Armstrong
Content Director
George Lucas Educational Foundation

Mindi Arrowroff
New Media Instructor
Bay Area Video Coalition

Norma Bahena
Center Manager
Santa Barbara City College

Amparo Baron
ESL Teacher
Union Settlement Association

Betsy Bayha
Director of Technology Policy
World Institute on Disability

Anne Beamish
Managing Editor
ArchNet

Jaleh Behroozi
Director
Literacy Information and Communications Systems
National Institute for Literacy

Dorothy Bennet
Program Director
Center for Educational Technology

Amanda Binbaum
Managing Director
CitySoft New York

Ann Bishop
Assistant Professor
Graduate School of Library Science and Information Studies, University of Illinois, Urbana-Champaign

Amy Borgstrom
Executive Director
ACENet

Joseph Bowman
Assistant Professor
Department of Theory and Practice
SUNY Albany

Kelly Brown
Program Director
OpNet

Elizabeth Cahill
Manager, Brooklynx
Brooklyn Information and Culture

Andy Carvin
Senior Associate
Benton Foundation

Roger Cazares
Executive Director
Inner-City Net

Richard Chabran
Director
Community Digital Initiative, UC Riverside

Cranston Chester
Technology Coordinator
Urban League of New Jersey

Clifton Chow
Research Assistant
Education Development Center, Inc.

Rebecca Cook
Program Assistant
Community Partners

Stina Cooke
Program Developer
Computer Clubhouse

David Corticlla
Manager
The Technology Community at Villa Victoria

Michael Cossaboom
Computer Resources Director
City of New York Parks and Recreation Department

Joan Durrance
Professor
School of Information, University of Michigan

Helmer Duverge
Program Manager
National Center for Family Literacy

Jane Emerson
Education Marketing Manager
LYCOS

Leigh Estabrook
Dean
School of Library Science, University of Illinois, Urbana-Champaign

Eric Fischer
Associate Director
Playing 2 Win

Karen Fletcher
Content Director
Prairienet

Askia Foreman
Computer Teacher
The Computer Center at School Street

Linda Fowells
Program Director
Community Partners

Martin Freedman
Director
LINC Project

Amber Garcia
Research Associate
Claremont Graduate University

Dan Geiger
CEO
OpNet

David Geilhufe
Director
Eastmont Computer Center

Sandy Goldberg
Project Director
The American Gateways Project

Florencia Gomez
Project Coordinator
Casa Familiar

Mario Gonzalez
Librarian
Brooklyn Public Library

Barbara Hanley
Director of Field Programs
Laubauch Literacy Services

Joe Hawkins
Director of Training and Support
OpNet

Terri Holbrooke
Group President, Corporate Operations
Ziff Davis Publishing

Russ Holland
Program Director
Alliance for Technology Access

Michael Holzman
Program Director
Libraries for the Future

Jaime Hurtado
Instructor/Employment Development
Community Digital Initiative, UC Riverside

David Jensen
Program Director
The Getty Museum

Boris Katz
Principal Research Scientist
MIT Artificial Intelligence Laboratory

Sylvia Keene
Director
Metro Delta Adult Literacy Council

Felipe Korzenny
President and CEO
Hispanic and Asian Marketing
Communication Research, Inc.

Jenine Laurie
Project Producer
The American Gateways Project

Carol Linn
Assistant Director
Brooklyn Public Library

Noreen Lopez
Director
PBS Literacy Link

Richard Lowenberg
Executive Director
Davis Community Network

Susan Lowes
Curriculum and Professional
Development Manager
Institute for Learning Technologies,
Columbia University

Jim Lynch
Development Director
Senior Program Manager
CompuMentor

Melissa Magallanes
Neighborhood Strategies Project
Greater Williamsburg Collaborative

Michael Margolis
Director of Communications
CitySkills

Jamie McClelland
Consultant
Libraries for the Future

Kevin Allard Mendelson
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Brooklyn Public Library

Anna Mendenhall
Acting Executive Director
Charlotte's Web

Teresa Murillo
Computer Coach
Casa Familiar

Susan O'Connor
Literacy Program Manager
Brooklyn Public Library

Frank Odasz
Consultant
Lone-Eagles Consulting

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Education and Technology
Coordinator
Happy Camp Community Computer
Center

Ursina Osoa
Computer Lab Coordinator
University Settlement

Sonya Pelli
Project Manager
St. Louis Development Corporation

Judith Pepper
Executive Director
La Plaza Telecommunity

Paige Ramey
Director, Media Link
Bay Area Video Coalition

Kevin Rocap
Director, Program Development
California State University, Long Beach

Mara Rose
Director
Playing2Win

David Rosen
Director
Adult Literacy Resource Institute

Brenda Ruth
Executive Director
Boulder Colorado Network

Douglas Schuler
Faculty Member
The Evergreen State College

Josh Senyak
Senior Associate (former)
CompuMentor

Martha Shimmers
Librarian
Public Libraries of Saginaw, Michigan

Andrea Skopera
Executive Director
Casa Familiar

Rick Smith
Program Manager
Fifth Dimension

Steve Snow
President
Association for Community Networks

Ben Stallings
General Manager
Twin Cities Free-Net

Antonia Stone
Founder
Community Technology Center
Network

Tamara Sturak
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The Interactive University Information
Systems and Technology Planning,
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PBS Literacy Link

Dan Sullivan
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Search Engine Watch

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Street Level Youth Media

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Career Resources Development Center

Mike Trombetta
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Happy Camp Community Computer
Center

Cathy Trout
Project Director
Bresee Foundation

Nicol Turner
Consultant
Net Consulting Group

Jim Veneziano
Web Master
Public Libraries of Saginaw, Michigan

David Vidal
Director, Digital Partnerships
The Conference Board Program

John Zoltner
Community Technology Manager
Edgewood Terrace

APPENDIX B

CONTENT CATEGORIES USED

Education
Family
Finance
General Information
Government and Advocacy
Health
Housing
Personal Enrichment
Profession/Vocation/Job

BREAKDOWN OF CATEGORIES

Education
- Adult high school degree programs
- Adult literacy
- Financial aid, scholarships
- Counseling
- Homework and research assistance
- Subject area information
- Computer education
- Distance learning programs
- Telementoring
- Referrals (e.g., online or in-person, local support, coaching)
- Other

Family
- Guides for parents (e.g., local activities for families, parenting tips)
- Public programs for families (e.g., food and social services, domestic violence help)
- Low-cost enrichment and entertainment activities
- Activities for kids
- Child care (e.g., low-cost care, finding and assessing the quality of a child care center)
- Referrals (e.g., online or in-person, local support, coaching)
- Other

Finance
- Consumer information (e.g., how do you buy a used car, a house, a computer)
- Public benefits eligibility (e.g., food stamps, social services)
- Public benefits news and updates
- Using a checking account
- Applying for credit, maintaining good credit
- Referrals (e.g., online or in-person local support and coaching)
- Other

General Information (Other)
- Community events
- Local search engines

Government and Advocacy
- Taxes support (e.g., filing, laws)
- Immigration assistance
- Legal services
- Unemployment benefits
- City/county government services
- State government services
- Referrals (e.g., online or in-person local support and coaching)
- Other

Health
- Health information (e.g., self-care guide for individuals and families)
- Easy-to-understand health encyclopedias
- Health education
- Online advisors (e.g., online pharmacist)
- Insurance resources (e.g., sources of low-cost insurance)
- Public hospitals
- Local clinics (e.g., free screenings)
- Referrals
- Other

Housing
- Low-cost housing
- Low-cost utilities
- Buying a home
- Neighborhood crime rates
- How to relocate to a different city, neighborhood, or state
- Home repair and other issues (e.g., paint, asbestos/chemical problems)
- Referrals (e.g., online or in-person support and coaching)
- Other

Personal Enrichment
- Ethnic interests (e.g., foreign-language newspapers and search engines, ethnic communities)
- Communities of interest for youth and adults
- Sites of general interest to low-income users
- General reference tools (e.g., dictionaries)
- Arts and entertainment (e.g., local, online)
- Transportation
- Referrals
- Other

Profession/Vocation/Jobs
- Vocations (e.g., types of careers, schools, financial aid)
- Professions (e.g., types of careers, jobs available)
- Career counseling, free or low-cost (e.g., libraries, employment development departments, job training programs)
- Local and national job listings
- Job readiness (e.g., resume, skills matrix)
- Entrepreneurship, starting your own business (e.g., small-business loans, creating a business plan)
- Grants for minority businesses
- Referrals (e.g., online or in-person support and coaching)
- Other

APPENDIX C

ONLINE NETWORKS/PORTALS ANALYZED IN THIS STUDY

About.com
http://www.about.com

Austin Free-Net
http://afn-neighbor.net

Blacksburg Electronic Village
http://www.bev.net

Boulder Community Network
http://bcn.boulder.co.us

Brooklyn Public Library
http://www.brooklynpubliclibrary.org/reference/reference.htm#Librarians

Charlotte's Web
http://www.charweb.org

The Community Connector
http://www.si.umich.edu/community

Davis Community Network
http://dcn.davis.ca.us

Eugene Free Community Network
http://www.efn.org

FairNet
http://www2.cdc.org/ctcnet/ctc.asp

LibertyNet
http://libertynet.org

Los Angeles Free-Net
http://www.lafn.org

Midnet
http://www.midnet.sc.edu/midcom/index.htm

Prairienet
http://www.prairienet.org

Public Libraries of Saginaw, Michigan
http://www.saginaw.lib.mi.us

Sailor
http://www.sailor.lib.md.us

Snap.com
http://www.snap.com

TINCAN (The Inland Northwest Community Access Network)
http://www.tincan.org/

Tripod.com
http://www.tripod.com

Yahoo
http://www.yahoo.com

APPENDIX D

CONTENT CRITERIA USED

Each Web site selected was evaluated according to the following criteria on a scale from 5 to 1.

5 = Excellent, "The Best I've Seen"
4 = Very Good
3 = Average
2 = Below Average
1 = Poor, Nonexistent

Usefulness

- Is the information relevant to one or more of the categories important to our target groups?
- Is the information current information? (e.g., updated within the last six months for time-sensitive information)

Language/Literacy Level

- Is the information available in other languages?
- Is the information accessible to a nonnative speaker, or a person with the reading level of an early reader?

Intuitive Navigation (Interface Design)

- Can the user move quickly through the site without having to stop to think or read too much?
- Does the site provide good links and annotated links so users know ahead of time where they're going?
- Do the graphics enrich content and add to it in a logical fashion, not merely decoratively?

Interactivity (Extensibility)

- Can the user interact with the site? Can she/he send e-mail for quick help, or participate in a list-serv, or a bulletin board service? What other kind of interactivity is possible?
- Can the user add to the site?

APPENDIX E

ONLINE CONTENT FOR UNDERSERVED AMERICANS: A SHOWCASE

Following is a sampling of some of the best content destinations we found in that they overcome content barriers addressed in this report. This showcase is intended to provide concrete examples of positive features that underserved users view as important; it is by no means a comprehensive listing. Some of these examples are also featured in the body of the report.

SAMPLER OF INNOVATIVE PROGRAMS

CONTENT FOR LEARNING

Blue Web'n Learning Sites Library
(http://www.kn.pacbell.com/wired/bluewebn/)
This site is an example of excellent aggregation of practical information. It is a project of the Pacific Bell Knowledge Network (http://www.kn.pacbell.com/wired/bluewebn/). The high-quality education content on this site contains material for different kinds of learners, encompassing bilingual content as well as learning tools. The searchable database of 1,000 outstanding Internet learning sites is categorized by subject area, audience, and type (lessons, activities, projects, resources, references, and tools).

The Pacific Bell Knowledge Network also offers a project involving two sites, Videoconferencing for Learning (http://pomo.kn.pacbell.com/support/workshops.html) and Filamentality, a workshop site that contains a tool for teachers to help them integrate good Web sites into their curriculum. In a three-hour workshop they learn how to start doing this and can, in turn, teach kids.

Western Pacific LINCS: A Project of the National Institute for Literacy
This project is a partnership between the CNN office in San Francisco and Western Area Literacy LINCS (http://literacynet.org/cunsf/), one of the LINCS regional hubs. LINCS is a key gateway for the literacy community to the world of adult education and literacy resources on the Internet (http://literacynet.org/lincs/). CNN-SF provides content and abridged stories that are useful to adults learning to read or who are improving their reading ability. The site provides many tools for interpreting each story. This scaffolding helps users learn how to decode text and become fluent readers. Users can interact with the whole story, an abridged version, or a story outline; they can perform various learning activities, involving vocabulary, word selection, multiple choice, and sequencing (arranging the chronology of the story).

This site exemplifies deep, multilayered content that incorporates audio and video to help learners and engage them in meaningful and productive learning activities. The depth of the content allows for active participation.

CONTENT FOR COMMUNITY RESIDENTS

Prairienet
Prairienet (http://www.prairienet.org/online/) is part of the Community Networking Initiative (CNI) at the University of Illinois, Urbana-Champaign. Prairienet is seen as the repository of community information, and, in its relatively long history, it has earned the respect of the community. The network has trained more than 500 low-income individuals in computer skills and has given them free computers and Prairienet accounts after completion of a training course. The network has also worked with many community organizations to put information about them online, resulting in more than 700 groups being included on the portal. More of these sites now focus on providing information for low-income users. In addition, CNI has collaborated with local health and human service organizations to develop comprehensive Web-based information and referral directories and other cross-institutional information resources.

Brooklynx
This is a program of Brooklyn Information & Culture (part of the larger Brooklyn Knowledge Network, a "smart community"), which is creating a community-based online network. Brooklynx is helping communities develop an online presence in the following ways:

1. Offering access to computers;
2. Offering Internet training and Web publishing classes; (http://www.bkny.net/neighborhoods/training/page.html)
3. Providing free technical support to local organizations;
4. Maintaining www.brooklyn.org., a highly designed web site containing a map of Brooklyn. A user can click on each neighborhood represented on the map and go to a local portal (http://www.bkny.net/neighborhoods/). These local portals contain employment, cultural, and housing information; these sites are created by the community organizations themselves.

Brooklynx is putting into practice many of the most crucial elements necessary to foster development of content for underserved constituencies: bringing together leaders from community-based organizations, teaching them how to put their organizations and services online, and offering technical support. With this type of outreach, content grows – directly – from the community.

Increased funding for training will allow Brooklynx's outreach effort to involve end users more directly. Up to now, the program has been working primarily with leaders of community-based organizations, which often lack the resources to build a Web presence. The next step would be to provide more online information and services to clients directly.

Brooklynx is an excellent example of state- and city-wide network projects developing throughout the country, some of which are taking place within neighborhoods and housing complexes. One of their best features is the ability to leverage partnerships between different organizations and corporations. Brooklynx is a partner in the Brooklyn Knowledge Network, which includes the Brooklyn Public Library, Brooklyn schools, and other organizations. In partnership with Bell Atlantic, an advanced network has been built at the central library.

Mapping The Assets
http://www.mappingtheassets.org/foundations.html
Connecticut Public Television and Radio is working with IBM Research on an effort to link public institutions to one another and to citizens throughout the state. The project is called "Mapping the Assets." It is working to transform television into low-cost Internet gateways that provide educational, civic, health, arts, and cultural services. The five-year project includes a series of sessions with different segments to determine the best way to provide and to deliver content, as well as to learn from the community what it wants. The early participation of the community in the conceptualization and design helps to ensure that services will be more usable and engaging to the end users. By mapping the assets within each community, this project builds on what is already available in Connecticut's communities.

SUPPORT FOR THE DEVELOPMENT OF CONTENT

Community Access Centers
Community Access Centers are growing around the country. The Community Technology Center Network (CTCNet) includes many of these centers as affiliates. The organization offers access and training as well as excellent technology expertise to communities. National evaluations have documented the positive impact of these centers in reaching the underserved and providing them valuable services.

These access centers have tremendous potential to help generate content by underserved communities because they build a sense of community and can create projects for local residents. Playing2Win in New York City, for example, offers a technology training program for youth in the summer where young people learn advanced Web and multimedia design. This project-based learning experience encourages kids to continue to develop skills to build more digital products to share with others. Another community access center, the Bay Area Video Coalition, trains low-income adults to enter new media professions.

"Imagination Place!"
While youth at some community access centers are creating their own video games (Playing2Win), making movies (at ZEUM in San Francisco), and designing other digital artifacts (Computer Clubhouse), there are also other sophisticated online spaces for youth that support learning and exploration in fun and fruitful ways. "Imagination Place!" (http://www.lff.org/demo/hpc/accessharlem.html) is a collaboration between the Center for Children and Technology and Kahootz, a private software developer. The program is housed in inner-city libraries around the country. Extensive online activities are designed to encourage young girls to become engineers and designers.

The online environment is very elaborate with many tools (hundreds of palettes, for instance) for kids to design animations and talk to each other. The Center for Children and Technology planned and designed the entire curriculum, and Kahootz created the online environment. Other components of the project include the following:

- Mentorship by professional adults;
- Designing with online tools with a wide set of options; and
- Designing imaginary inventions offline to learn what design is.

ThinkQuest
http://www.thinkquest.org/index.shtml
This site contains a large collection of high-quality Web sites produced by children and youth who compete in yearly contests offered by ThinkQuest. The contest offers teams of children and youth from around the world cash prizes for the best educational page. There are three contest groups: a junior group (grades four through six), one for students between the ages of twelve and twenty, and another for future teachers. The pages cover numerous subjects, from the stock market and programming to Edgar Allan Poe. The site contains a searchable library with over 1,000 student-authored sites that are very impressive as well as useful. The contest encourages and challenges the intellectual capacity and energy of youth to build online content that is useful to others.

WeGo.com
http://wego.com/index.html
This company offers nonprofits (and other organizations such as trade associations) a set of tools to create, manage, and host their own customized community information portals, or intranet. The tools are relatively easy to use and offer the following features: home pages, web pages, chat, announcements, calendars, discussions, shared files, Web links, search, and an e-commerce mall.

WeGo.com enables groups to create portals, and because these tools enable communities to develop online marketplaces, they hold the potential to encourage e-commerce activities in communities.

SAMPLER OF OTHER GOOD WEB SITES

We selected the following Web sites from the twenty portals analyzed in our audit of the World Wide Web. Key informants and users suggested additional sites. In general, we chose sites because the content was relevant to the low-income and underserved users we talked to; the interface presented the content intuitively, and some were written for people with limited literacy and limited English skills. These URLs, which are current at the time this document was published, are subject to change.

BILINGUAL/ESL

Please see "Overcoming Literacy, Language, and Cultural Barriers," page 22-23)

CHILDREN AND YOUTH

700+ Great Sites
http://www.ala.org/parentspage/greatsites/
The American Library Association compiles sites for kids and guides the adults who care for them to safe and secure content.

Back to School: Resources for Reentry Students
http://www.back2college.com/
A resource with a wide library that contains a college locator and information on a range of subjects (e.g., study abroad, internships, and discount textbooks). Feature articles appear on the front page with stories pertinent to students reentering college.

Brain Pop
http://www.brainpop.com
Animated movies that explain health matters and answer science and technology questions in child-friendly way.

e-teen
http://www.e-teen.net/
A socially conscious teen network for teens by teens, where they can become involved in community activities, building Web sites, entering contests, volunteering, and discussing social issues.

Highwired.Net
http://www.highwired.com/
This site calls itself the world's largest community of online high schools. Students publish online versions of newsletters and newspapers with free Web publishing tools. The site also fosters interaction among high schools.

YoungBiz
http://youngbiz.com/
YoungBiz contains entrepreneurial ideas for young people. Profiles of young entrepreneurs and message boards are also part of this site. In addition it provides educational information about business concepts, especially those related to investment.

[redacted]

College Is Possible
http://www.collegeispossible.org/
Information prepared by universities and colleges for preparation, selection, and finance of higher education.

College Net
http://www.collegenet.com/
A portal for applying for college over the Web.

Education World (Student Resources)
http://db.education-world.com/perl/browse
A site that makes the Web easier for educators, with an extensive database.

FinAid: The Smart Student Guide to Financial Aid
http://www.finaid.org/
A guide for financial aid that includes links to scholarships, loans, and financial aid information.

GED Information
http://www.acenet.edu/calec/ged/home.html
The official site for GED tests. It offers guidance for preparing and taking the exam.

Homework Help
http://www.bjpinchbeck.com/
A unique site created by a young teenager that offers help in various education subjects and other relevant areas, including SAT preparation.

Learn2.com
http://www.learn2.com/
Extensive database of online tutorials on topics beyond traditional education subjects, such as desktop utility tools and home repairs.

The Math Forum Student Center
http://www.forum.swarthmore.edu/students/
This is one of the model interactive projects from the Math Forum, an online math education community center. Here students can request math support from elementary to college levels.

OneLook Dictionaries
http://onelook.com/
This tool allows users to search the OneLook Dictionary indexes (500 dictionaries) for word definitions. Or they can link directly to a dictionary page.

Online Learning Series of Courses
http://www.bestnet.org/~jwalker/course.htm
Online learning series available for computer literacy, web development, and programming. Users can translate the page into French, German, Italian, Spanish, or Portuguese.

Resource Library from Blacksburg Electronic Village
http://www.bev.net/library/index.html
This site from the Blacksburg, Virginia, community network collects various local and generic resources for a variety of needs.

Study Guide
http://www.iss.stthomas.edu/studyguides/index.htm
Study guides and strategies for academic skills available in Arabic, Chinese, French, German, Italian, and Turkish.

Study Web "The Learning Portal"
http://www.studyweb.com/
The site contains a comprehensive index that categorizes and reviews over 28,600 educational and reference Web sites and, through a clear interface, links users directly to their desired information.

Web Teacher
http://www.webteacher.org/winnet/menu.html
A self-paced Internet tutorial with both basic and in-depth information about the World Wide Web. The site covers topics such as e-mail, video conferencing, chat rooms, Web page design, Internet safety, and curriculum searches; users can learn at their own pace through guided information and online exercises and activities.

[redacted]

Austin Metro Area Child Care Directory
http://www.careguide.net/careguide/yahoo/austin.html
This site allows the user to select a local city, where they can find local services for infant, toddler, and school-age children. It contains a map and contact information for services.

CTW (Children's Television Workshop) Family Workshop
http://ctw.org/home/0,1042,FF,html
This site is designed to be an environment that enriches the time families spend together. It contains activities for all members of the family. Parents can create stories with their toddlers and become Web savvy with the technology tips offered.

Family Support Resources (The Inland Northwest Community Access Network)
http://www.tincan.org/~headstrt/family.html
A network of localized information for family-related needs.

Parents Place.com
http://parentsplace.com/
A rich site for parents of newborns and young children. It contains various departments (from fertility to immunization records) and other services, such as daily chats, ask an expert, daily parenting news, and a radio show.

Sesame Street Online
http://www.ctw.org/parents/0,1178,00.html
Practical tools for parents are found at this site. Parents will find activities for kids, product reviews, advice and tips.

Single Parents
http://www.makinglemonade.com/
A site that provides a channel for single parents to network and learn from each other. One of the features is a business network of single parents who have created their own businesses. The resources section includes links to legal and financial services.

FINANCE

Fidelity Family Financial Center
http://disney.go.com/ads/sponsors/fidelity/index.html
Tools and information available at this site for calculating (and managing) college and retirement savings.

Finance Center
http://www.financenter.com/
Smart personal finance information for autos, budgeting, and homes.

Yahoo Finance
http://insurance.yahoo.com/
Calculation tools offered at this Web site for auto, home, and personal insurance. In addition, it contains resources, Web sites, and articles.

GOVERNMENT

FedWorld
http://www.fedworld.gov./ftp.htm#irs
This site contains more than 10,000 data files of various sorts that have been produced by U.S. government agencies. Some of the files include the Federal Job Announcements in the jobs directory, White House press releases, and IRS tax forms and instructions.

Social Security Welfare Reform
http://www.ssa.gov/pubs/faq.html#CARDS
Answers to frequently asked questions about Social Security Administration services, such as Social Security cards and numbers, and maximum family benefits.

The Tax Center
http://www.armchairmillionaire.com/tax/forms.html
Some of the most important federal tax forms for individuals and small businesses are collected here. They also have annotations.

Vote-Smart
http://www.vote-smart.org/
Citizen's toolkit of free services and programs. The site tracks and provides to the public independent factual information on over 13,000 candidates and elected officials. Vote Smart Web makes available voting records, campaign issue positions, performance evaluations by special interests, campaign contributions, backgrounds, previous experience, and contact information.

HEALTH

Discovery Health
http://www.discoveryhealth.com/DH/ihtIH
Large site for health information for the whole family, all age groups, nutrition guides, and an "ask the doctor" section.

Health Finder
http://www.healthfinder.gov
Information for the whole family and a minority health guide. Available tools include libraries, online journals, medical dictionaries, and database.

Health Resource
http://www.noah.cuny.edu/
Excellent example of a local health resource with full-text health information for consumers. It contains health topics (from "aging and Alzheimer's" to sickle cell disease) and resources on New York city, state and regional hospitals; HMOs; and hospices.

LITERACY

Please see "Overcoming Literacy, Language, and Cultural Barriers," page 22-23.

PROFESSION/VOCATION/JOBS

All About Work
http://www.nhlink.net/employme/index.htm
Local job information on this site, plus helpful answers to employment questions in a simple format.

America's Career InfoNet Resource Library
http://www.acinet.org/acinet/resource/
Ideas and assistance for where to go or what to do when searching for employment. This site links to other resources to find ideas and answers. Information is grouped into four main areas: occupational information, job search aids, job and resume banks, and relocation.

Eastbay Works
http://www.eastbayworks.org/
An online directory of services designed to take the user through a series of self-service steps in one visit or over time; video clips guide parts of the process. The development of this site is still in progress. As an Internet Web site, the directory has links to regional partners and community resources to enable users to identify support.

STEP (Searching for Training and Employment Programs)
http://www.ci.seattle.wa.us/business/step/
This is an online guide for job seekers to hundreds of resources for career planning, job search assistance, job skills training, apprenticeships, and self-employment in local counties in the Seattle area.

SHOPPING

Bottom Dollar Shopping Agent
http://bottomdollar.com
At this site one can compare prices in numerous categories.

Consumer Central
http://www.pueblo.gsa.gov/
This Web site gives access to hundreds of the best federal consumer publications.

Consumer Information
http://www.dca.ca.gov/r_r/index.html
Department of Consumer Affairs, providing statewide information for consumers.

Consumer World
http://www.consumerworld.org/
Consumers will find shopping information (e.g., price comparisons, product reviews, catalogs, and stores), discounted merchandise, and other consumer resources.

ESmarts
http://www.esmarts.com/
This Web site offers buying guides for many consumer items, including books, electronics, and tickets. The site critiques various online services to help consumers make better choices.

EvenBetter.com
http://www.evenbetter.com/
A tool to compare prices at different Web sites. It also allows users to download a price comparison feature which they can access when browsing a shopping site, and thus avoid leaving the site.

U.S. CITIZENSHIP

50 States and Capitals
http://www.50States.com/
Information about each state and its capital.

Immigration and Naturalization Services Online
http://www.ins.usdoj.gov/
This government Web site provides forms and fee information; forms by mail; answers to frequently asked questions; and glossary and acronyms, among other services.

The National Network for Immigrant and Refugee Rights
http://www.nnirr.org/
The site offers information about local affiliates around the country and instructions for immigration assistance.

APPENDIX F

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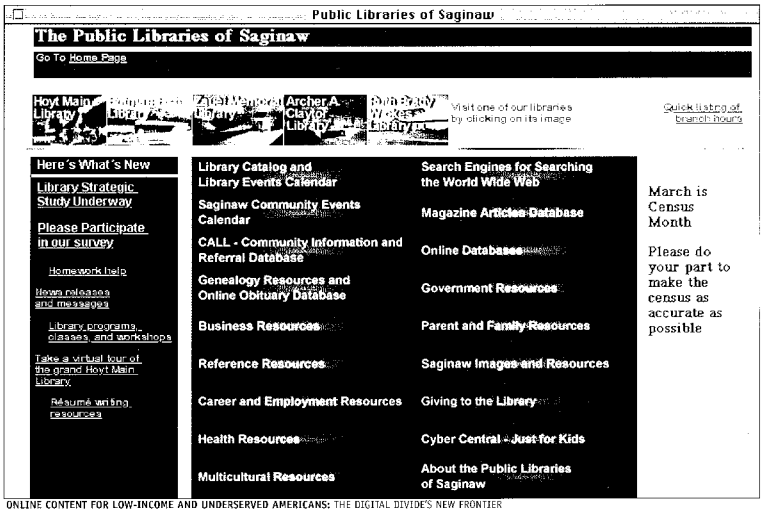

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The Children's Partnership is a national nonprofit, nonpartisan organization. We undertake research, analysis, and advocacy to place the needs of America's nearly 70 million children and youth, particularly the underserved, at the forefront of emerging policy debates. The hallmark of The Children's Partnership is to forge agendas for youth in areas where none exist, to help assure that disadvantaged children have the resources they need to succeed, and to involve more Americans in the cause for children. We are grateful to our funders, including America Online, AOL Foundation, ARCO Foundation, AT&T Foundation, California Community Foundation, The California Endowment, The California Wellness Foundation, Carnegie Corporation of New York, Coalition of Community Foundations for Youth, Nancy M. Daly Foundation, Joseph Drown Foundation, The Favrot Fund, The Ford Foundation, Foundation for Child Development, The Johnson Foundation, The Robert Wood Johnson Foundation, The Henry J. Kaiser Family Foundation, W.K. Kellogg Foundation, KPMG Peat Marwick, Morino Institute, Markle Foundation, Mattel Children's Foundation, Microsoft Corporation, MSNBC, Pacific Bell, David and Lucile Packard Foundation, Southern California Edison and The Streisand Foundation.

"With this Audit, The Children's Partnership is making an important contribution towards understanding what underserved communities want and need in the online world. Their findings support the notion that the "digital divide" can become a "digital opportunity" if online content addresses the real needs of low-income communities, and if that information is presented in a useful and localized way. TCP should be commended for their work."

Zoë Baird, President, Markle Foundation

"This report is grounded in what low-income communities want and need–a feature all too rare these days. It represents a significant contribution to the field of community technology and to social justice. The report is informative, thought-provoking, and practical...and for those of us who live and breathe these subjects on a daily basis, that's a significant accomplishment."

Dr. Holly M. Carter,
Executive Director, CTCNet

"This report is chock-full of actionable items that corporate leaders as well as policy makers will find of great interest. We can all use these ideas to guide our work to reach all Americans with the benefits of the information revolution."

Roberta Katz, CEO, TechNet and former Senior Vice President and General Counsel, Netscape Communications

"The Children's Partnership has provided a very timely, thoughtful and useful briefing on the availability of content online for low-income and underserved Americans. These issues are critical for a broad sector of people who stand uniquely to benefit from the empowerment the Internet promises. The report is also solution-oriented, raising helpful ideas for designing public/private partnerships to help make more content available."

David Eisner, Vice President,
Corporate Relations, America Online, Inc

"The Children's Partnership report gives us
we've all needed to widen the meaning of th
can now better understand the content dim
and the practical steps needed to include all
benefits that online content offers."

B. Keith Fulton, Director of Techno
Programs & Policy, National Urban

"This report is full of great ideas and reference
those working with young people living in low-
enrich learning experiences and add value in
out-of-school settings. Its recommendations are
and emphasize the importance of ensuring acce
the pipes and wires, but to relevant content."

Mario Morino, Chairman, The Morino

"Thank you for addressing such an important iss
stage in the Web's development. The report capt
sentiment of many local communities and takes t
the right direction by focusing on literacy, langua
practical barriers faced by so many Americans."

David J. Cortiella, Executive Director,
Inquilinos Boricuas en Accion, Inc.

The Children's Partnership
www.childrenspartnership.org

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Santa Monica, CA 90401-1321
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4000 Albemarle St., NW, Suite 306
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Good morning. My name is Dr. Warren Ashley. I am the Director of the Center for Mediated Instruction and Distance Learning at California State University Dominguez Hills.

Ten years ago our university made a major commitment to distance learning. Five years ago we were the first university to offer a complete graduate degree, a Master of Science in Quality Assurance, over the Internet. Today we offer six degree programs and five certificate programs that can be completed without ever coming to our campus. Three years ago, Forbes magazine included Dominguez Hills in their list of the top 20 cyber-universities. In January 1999 we were the first university to begin broadcasting live, interactive classes over the Internet.

Technology has developed so rapidly it is easy to forget but for the general public, the Internet is only five years old. Like all new technologies there is a lag between the early adopters and those who are slower to use the Internet. Many times the distinction between early adopters and later groups has been economic.

Initially this was true for the Internet but may no longer be the case. Last week an advertisement for a local electronics store offered consumers a 500 MHz PC with 32 MB RAM and a 17 inch monitor for $129.00 after rebates. This is less than half what my parents paid for the electric typewriter they gave me as a high school graduation present in 1960. Some companies are even offering free computers to consumers who will sign a contract for Internet service.

Software used to be an expense but the computer that was advertised for $129.00 after rebates comes with Windows 98 and Sun Star Office. Internet service was also an additional cost but now there are a number of companies who provide free Internet access. One of the newest entries into the free Internet market is bluelight.com from K-Mart. If you live close enough to your phone company's switching office you can even get free broadband services from freedsl.com.

Free Internet services are underwritten by advertising but that is true for commercial television and much of the print media. Companies are willing to pay to have their messages on your computer screen. They are also afraid that if they don't provide the services, someone else will.

What then is holding people back from the technology? Why have cell phones become commonplace in neighborhoods where few homes have a computer? People got cell phones when they began to feel they needed a cell phone to do business and stay in touch with their friends. Many of these people do not feel they need the Internet to do business and stay in touch with their friends.

To some extent this is true even at our university. Most of our students cannot get through a day without using a computer and going on the Internet but there are some who do not feel the need and have never logged on.

Over the years university committees were formed and meetings were held to find a way that would ensure no student, graduated from Dominguez Hills without a basic understanding of computer applications and Internet technology. Suggestions ranged from a mandatory one-unit technology course to an Internet component for every syllabus. None of these solutions were ever implemented.

This summer, however, we are installing an application that will automatically create websites for every student, every faculty member and every course at the university. When a student or faculty member goes to their website they will find links to all of their classes. They will also find news about campus events and links to campus services. Even if only a fraction of the faculty use the class websites as part of their instruction in the fall, we will have created a virtual community and students will feel the need to be online.

The same principles apply in business, government and society. Business should subsidize online training for their employees. Municipal and county governments should put all of their forms and as many of their activities as possible online. Schools should begin using the Internet for communicating with parents and the community. Civic organizations should be encouraged to use the Internet for virtual meetings and online events. Libraries should be given more equipment and greater bandwidth for public access to the Internet. And finally, commerce on the Internet should be encouraged to the fullest extent possible.

Because, when people feel they need the Internet to do business and stay in touch with their friends they will get the equipment, they will get the access and they will get the help required to use the technology and go online.

Testimony

Subcommittee on Empowerment
of the
House Committee on Small Business

Tuesday, April 25, 2000

Carson City Council Chambers
Carson City Hall

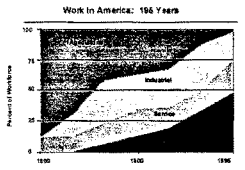
Jack Sutton, Ed.D.
Executive Officer
UCLA Outreach Steering Committee

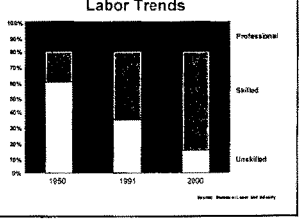
No nation can operate a 21st-century economy without a 21st-century electronic infrastructure, embracing computers, data communication and other new media...."

Alvin Toffler, Power Shift, p. 369

"...This requires a population as familiar with this informational infrastructure as it is with cars, roads, highways, trains, and the transportation infrastructure of the smokestack period."

Alvin Toffler, Power Shift, p. 369.





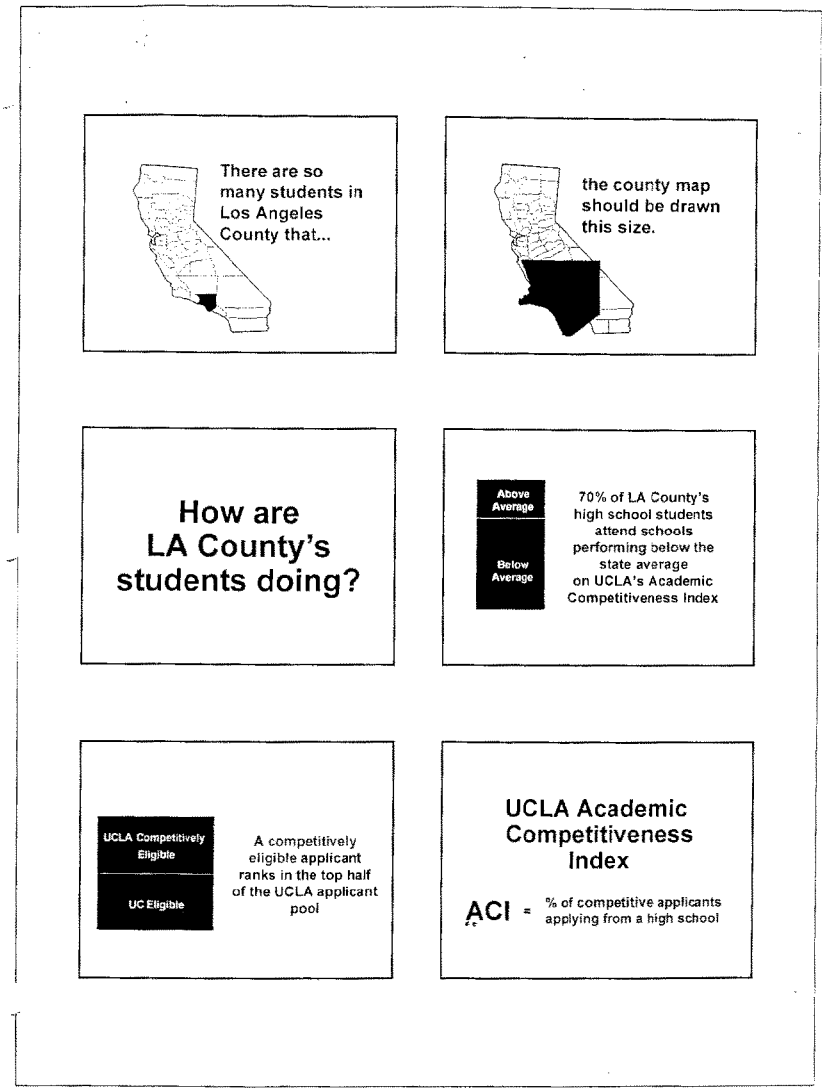
Welcome

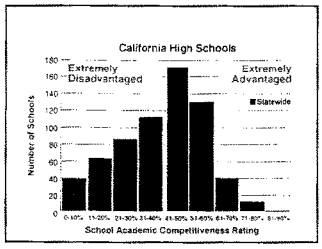
to the

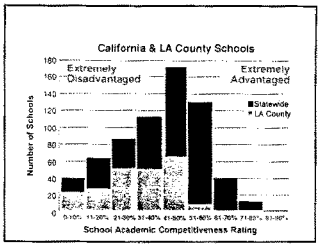
Information Age

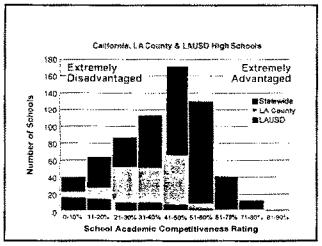
"It is estimated that 60 percent of the new jobs in the year 2010 will require skills possessed by only 22 percent of the workers today."

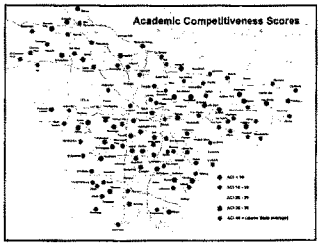
Emilio Gonzalez
US Dept of Commerce
June 1995


There are so many students in Los Angeles County that...
the county map should be drawn this size.
How are LA County's students doing?
Above Average
Below Average
70% of LA County's high school students attend schools performing below the state average on UCLA's Academic Competitiveness Index
UCLA Competitively Eligible
UC Eligible
A competitively eligible applicant ranks in the top half of the UCLA applicant pool
UCLA Academic Competitiveness Index
ACI = % of competitive applicants applying from a high school









School	API	ACI	Students	Computers	Computers/ Students		Internet Connected Rooms	
Dominguez	1	0	2124	0	0.0		0	13
Carpenter	1	NI	1419	100	14.2	7	12	4
Compton	1	4	1810	184	9.8	9	4	7
LA Jordan	1	0	2178	318	6.9	2	3	8
Locke	1	0	2284	204	11.1	6	2	10
King/Drew	5	7	992	93	21.0	10	1	11
Banning	2	9	3044	145	20.1	11	2	6
Carson	3	15	3038	147	20.7	9	34	1
Narbonne	4	21	2774	163	17.0	8	6	5
Lynwood	1	15	3915	360	11.3	9	0	13
LS Jordan	1	27	3626	344	10.6	4	5	9
LS Poly	6	47	4302	762	5.9	1	30	2
Calif Academy on Math/Science	10	47	597	75	7.8	3	13	3

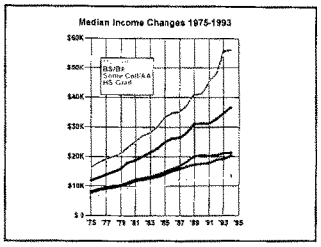
Boldface = Digital High School Year 01

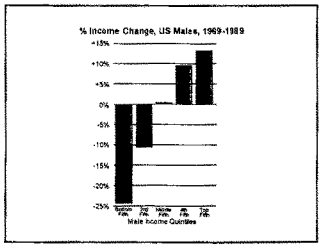
"We need to recognize that our public schools are low-tech institutions in a high-tech society. The same changes that have brought cataclysmic change to every facet of business can improve the way we teach students and teachers."

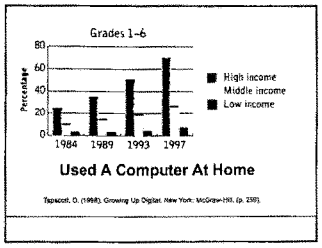
Lewis V. Gerstner
Chairman
IBM Corporation

"The challenge of integrating technology into schools and classrooms is much more human than it is technical. What's more, it is not fundamentally about helping people to operate machines. Rather, it is about helping people, primarily teachers, integrate these technologies into their teaching as tools of a profession that is being redefined through the... process."

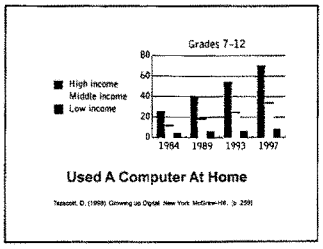
Barbara Means







Tapscott, D. (1998). Growing Up Digital. New York: McGraw-Hill. (p. 259).



Tapscott, D. (1998). Growing up Digital. New York: McGraw-Hill. (p. 259)

President's Committee of Advisors on Science and Technology: Panel on Educational Technology

1. Focus on learning with technology, not about technology
2. Emphasize content and pedagogy, not just hardware
3. Give special attention to professional development
4. Engage in realistic budgeting
5. Ensure equitable, universal access
6. Initiate a major program of experimental research

John E. "Jack" Sutton, Ed.D.
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Pacific Palisades, CA 90272
(310) 454-3195
jsutton@ucla.edu

EDUCATION

Ed.D. Curriculum & Instruction	University of Southern California "Restructuring a California High School: A Case Study"
M.S.Ed. School Administration	University of Southern California
B.S. School Health Education	University of California, Los Angeles
Teaching Credentials	General Elementary (California) General Secondary (California)

PROFESSIONAL EXPERIENCE

1998 - present **Executive Officer, UCLA Outreach Steering Committee**

1997 - 1998 **Grant Writer**
Centinela Valley Union High School District

1994 - 1999 **Director of UCLA/Center X Math/Science Collaborative**
Center X - UCLA Graduate School of Education & Information Studies

Summer 1995 **Principal, Summer School**
Seeds University Elementary School
UCLA Graduate School of Education & Information Studies

1994 - 1996 **Project Developer/Director, Career Transition Project: Teaching**
UCLA Center on Aging, UCLA School of Medicine
(JTPA-funded Credential Program for Displaced Aerospace Workers)

1990-1991 **Mentor**
South African Career Development Fellowship Program
(Funded by the Regents of the University of California)

1987 - 1996 **Lecturer and Supervisor of Teacher Education**
Program Coordinator Joint Program in Mathematics/Science Education
Graduate School of Education & Information Studies, UCLA
Courses taught include "Cultural Foundations of Education," "Psychological Foundations of Education," "Principles of Curriculum and Instruction," " Instructional Decision Making," and various seminars in teacher education.

1974 - 1990 **Workshop Coordinator and Co-Instructor with Dr. Madeline Hunter**
Clinical Supervision Workshops presented by UCLA Education Extension at UCLA
Increasing Instructional Effectiveness (Parts I - VI) and Clinical Supervision (Parts I - III)

1974 - present **Consultant**
Instructional Coaching, Clinical Supervision, School Change, and Grant Writing

PROFESSIONAL EXPERIENCE (continued)

1973 - 1987 **Demonstration Teacher - Supervising Teacher**
Corinne A. Seeds University Elementary School, Graduate School of Education, UCLA

1968 - 1973 **Teacher, Department Chairperson, Student Government Coordinator**
Hamilton High School, Los Angeles Unified School District

1965 - 1968 **Captain - United States Marine Corps**
Vietnam (1966-1967)

Private Business

- Instructional Dynamics, Inc. (Founding Partner)
  Distributor of the *MASTERY TEACHING Videotape Series*
- Mastering the Teaching Process, Inc. (Editor and Publisher)
  TEACHING-COACHING-SUPERVISING newsletter

Grants

- Developer/Writer/Director of Eisenhower Planning and Implementation Grants for *the UCLA Mathematics/Science Collaborative.*
- Writer and Director of the *Career Transition Project: Teaching* teaching credential program for displaced aerospace workers funded by Joint Training Partnership Act funding
- Co-Writer, with Arlene Russell of the UCLA Chemistry Department, of a Defense Reinvestment Initiative grant submitted to the National Research Council
- Co-Director of a FIPSE grant, *Improving the Preparation of Students for Secondary Mathematics Instruction*, designed to train local middle school teachers to mentor first-year students in the Joint Program in Mathematics/Science/Education.
- Consultant to the Los Angeles Educational Partnership for the *Target Science 2000* and *Kaleidoscope* grants submitted to the National Science Foundation.
- Co-writer of a grant written to Apple Computer in 1985 which resulted in 25 Macintosh Plus computers, three ImageWriter II printers, one LaserWriter printer, 25 copies of MacWrite word processing software, and AppleTalk network cabling being supplied to the Corinne A. Seeds University Elementary School, Graduate School of Education at UCLA.

UCLA RESEARCH

AWARD DOLLARS BY MAJOR FUNDING SOURCE FY 1994/5 - 98/9

FUNDING SOURCE	1994/5	1995/6	1996/7	1997/8	1998/9
Department of Health and Human Services					
NIH		$162,023,372	$165,582,401	$166,715,737	$197,368,516
Other		$9,940,857	$9,019,142	$9,761,302	$11,285,955
Total DHHS	$ 161,965,971	$171,964,229	$174,601,543	$176,477,039	$208,654,471
Department of Defense	$20,651,134	$15,963,813	$18,000,197	$29,019,806	$23,726,651
Department of Education	$7,920,758	$5,568,625	$6,981,601	$5,394,576	$6,766,961
Department of Energy	$17,278,305	$14,568,607	$15,761,913	$18,727,018	$23,186,045
National Aeronautics and Space Administration	$8,248,839	$9,183,241	$8,029,658	$16,114,446	$12,414,132
National Foundation for Arts and Humanities	$1,850,475	$320,088	$1,252,443	$421,742	$154,506
National Science Foundation	$21,684,994	$21,606,604	$24,146,914	$22,714,034	$34,259,558
Other Federal	$25,736,191	$35,130,340	$22,667,105	$22,178,737	$5,181,817
TOTAL FEDERAL	$ 265,336,667	$ 274,305,347	$ 271,441,374	$291,047,398	$314,344,201
State of California	$7,861,386	$5,563,998	$8,813,145	$6,076,054	$8,620,675
City/County/Other Government	$20,497,976	$32,177,068	$26,688,194	$21,349,310	$20,797,653
Total State & Local	$28,359,362	$37,741,066	$35,501,339	$27,425,364	$29,418,328
Private Agencies					
Business for Profit Entity	$18,617,757	$25,691,902	$32,442,035	$24,468,695	$37,640,148
Foundation/Charitable Trust	$23,826,462	$13,143,167	$18,830,584	$34,309,937	$38,213,997
Other	$27,733,555	$52,588,344	$51,748,505	$32,866,038	$40,573,551
Total Private	$70,176,774	$91,523,413	$101,021,124	$91,644,670	$116,427,696
TOTAL NON-FEDERAL	$98,536,136	$129,264,479	$136,522,463	$119,070,034	$145,846,024
GRAND TOTAL	$363,872,803	$403,569,826	$407,963,837	$410,117,432	$460,190,225

NOTE: 1997/8 data was generated from the CGX System database maintained by UC Office of the President and has not been reconciled against data maintained internally in the SR Research Management System (RMS) database.

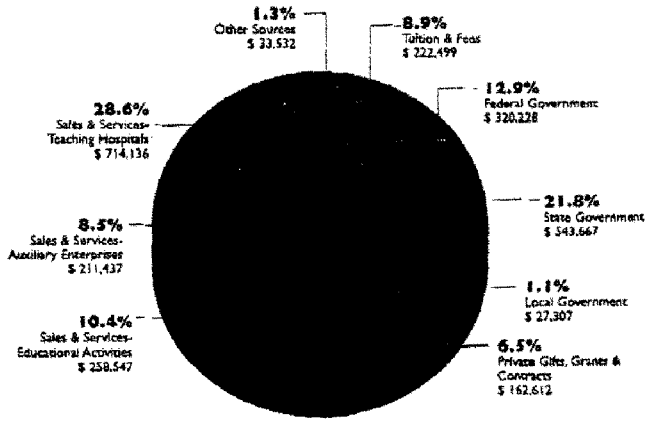
INTERNAL NOTE: [do not delete]:
Data derived from RMS codes as follows:
Other Federal = 13
Business = 4
Found/Charit. = 6-7, 11
Other = 5, 8-10,12,14

Funds for Current Operations

The fund balance in the current funds group increased by $17 million to $494,222,000 in 1999. The Statement of Current Funds Revenue, Expenditures and Other Changes details the activity that occurred in 1999.

UCLA receives its funding through a complex structure of governmental appropriations, grants, tuition and fees, gifts and revenue generated from business activities and interest earnings. For the 1998-'99 fiscal year, total receipts reached $2,493,965,000, whereas the expenditures from these sources totalled $2,395,203,000.

Sources of Funds
(dollars in thousands)



Receipts
(dollars in thousands)

SOURCES	1998-'99 GRAND TOTAL	PERCENT OF TOTAL	PRIOR YEAR GRAND TOTAL	PERCENT OF TOTAL	CHANGE OVER PRIOR YEAR
Tuition & Fees	$ 222,499	8.9%	$ 222,738	9.7%	-0.1%
Federal Government	320,228	12.9%	287,931	12.4%	11.2%
State Government	543,667	21.8%	474,342	20.6%	14.6%
Local Government	27,307	1.1%	21,102	0.9%	29.4%
Private Gifts, Grants & Contracts	162,612	6.5%	151,648	6.6%	7.2%
Sales & Services-Educational Activities	258,547	10.4%	244,226	10.6%	5.9%
Sales & Services-Auxiliary Enterprises	211,437	8.5%	193,965	8.4%	9.0%
Sales & Services-Teaching Hospitals	714,136	28.6%	678,174	29.4%	6.0%
Other Sources	33,532	1.3%	32,148	1.4%	4.3%
TOTAL RECEIPTS	$ 2,493,965	100.0%	$ 2,306,274	100.0%	8.4%