

**Cities Online:  
Urban Development and the Internet**

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## Executive Summary

The Internet is injecting new energy into many U.S. cities as public, private, and nonprofit institutions realize that a powerful new communications tool can transform the traditional roles of government and business. In social terms, this promises a closer, more interactive relationship between a community and its citizens. To a city's business community, it offers the dream of a local or regional economy transformed, Silicon Valley-style, by high-tech success.

This report examines how institutions in five cities are adapting to the Internet. Its main focus is on economic and community development organizations in those cities that have sought to use the Internet to improve performance or broadly benefit the community. The cities studied are Austin, Texas; Cleveland, Ohio; Nashville, Tennessee; Portland, Oregon, and Washington, D.C.

In exploring how institutions in these cities are using the Internet, this research asks whether the Internet is serving as a catalyst to change the "rules of the game" that shape social capital—the informal norms and customs that grease the wheels of urban life. It also looks at how communities themselves may shape the Internet by developing Internet content to serve their needs in specific ways. And by comparing what is happening in all five cities, the report makes recommendations on best practices for cities seeking to take advantage of the Internet.

### **The Internet as a catalyst**

In searching for ways to exploit the Internet, a common theme in all five cities is to develop physical places where social networks can be nurtured. In those places, community members establish relationships that the Internet can subsequently strengthen. This applies just as much to entrepreneurs networking in hopes of finding venture capital in Austin as it does to Internet neophytes attending computer boot camps in low-income neighborhoods Cleveland.

In the *economic development community*, the recognition that the New Economy rewards entrepreneurship has led to a fundamental change in economic development strategies in the cities studied. Whereas economic development officials used to spend much of their time "smokestack shopping," or trying to lure companies from outside the region, more and more they use a social network strategy to encourage entrepreneurs. This usually means establishing networks of entrepreneurs to exchange ideas and look for business contacts. It also includes "angel finance networks," that is, groups of wealthy individuals in a community who are willing to provide start-up capital for entrepreneurs. Each of the cities studied has employed a social networking strategy of some sort to foster entrepreneurship.

Among *community activists*, the social network strategy consciously uses the Internet to change how people interact with community development organizations. That is, community organizations are using Internet access as a way to draw new people in the doors. This approach has been especially prominent in Cleveland, where activists have successfully lobbied city government to provide funds to expand community Internet access. In some cases, Internet access is seen as an end in itself, which means the organization provides access and the minimum training necessary to allow people to surf the Web and send email. In others, the goal is job training that will expand people's economic opportunities and, in the cases of Portland, Austin, and Washington, alleviate regional worker shortages in the

technology sector. Whatever the motivation, an outcome of these initiatives is additional social interaction among residents of neighborhoods.

### **Content Development: The Effect on the Internet**

In several cities, the catalytic effect of the Internet has also resulted in the development of Internet content to serve community needs. In other words, people have developed Web-based portals for home-based businesses or nonprofits to improve service delivery.

In terms of *neighborhood and community content*, this report profiles a case in Portland in which a community listserv helped shape and deliver a message to the city that stopped a development plan. In another instance in Portland, a community nonprofit prompted the development of a Web site for artisans to sell their work, thus expanding the size of their market beyond their neighborhood and region. Content development for nonprofits has been a prominent theme in the cities studied. Nonprofit organizations devoted to providing affordable housing in Cleveland and Portland are using the Web to connect providers of housing to clients, as well as using the Web to more efficiently schedule maintenance of units. Austin and Nashville are using public funds to enable nonprofits to develop Web content.

*Content development in the business sector* is difficult to pin down, since a measure of that would be the ease of starting an Internet-based business. The flow of information on how to start a business, the existence of supporting services in the area, and, of course, the availability of capital are all ingredients for starting a dot-com business. In the present environment, however, little capital is available to start or even sustain dot-coms. Nonetheless, several cities are embarking on strategies to provide physical locations for businesses that want to develop Internet content. Portland is refurbishing an office building to provide space for multimedia entrepreneurs and other electronic-content businesses. Washington, D.C., Nashville, and Austin, in different ways, are encouraging the development of downtown districts inviting enough to serve as a hotbed of New Economy creativity. Much of this is tied to the notion that “amenities”—the things that make a city a desirable place to live—drive economic growth; the specific growth objectives generally encourage businesses that rely on the Internet.

### **Best Practices, Best Cities**

In adapting to the Internet, it is no surprise that different cities—and different parts of cities—move at varying rates. Austin, which is one of America’s most wired cities and a center of high-tech innovation, is ahead of Nashville in most ways. Cleveland, by contrast, though it is not known as a center of Internet innovation, is surprisingly advanced in using the Internet for community purposes. Taking into account performance across different dimensions, economic, social, and governmental, here is a summary of what cities are doing best in exploiting the Internet.

1) **Portland:** Of the five cities studied, Portland emerges as the leader because its strengths cut across many dimensions. Its combination of technological sophistication, economic vitality, commitment to regional planning, and community engagement, and its existing infrastructure of community nonprofits, make it the city most likely to effectively exploit the Internet for economic and social purposes. Community use of the Internet in Portland extends widely, from neighborhood listservs to community development corporations that are reaching out to low-income people. The business community’s active network of angel financiers and entrepreneurs, added to the city’s commitment to a new,

downtown high-tech center, puts Portland in a good position to compete in the information economy.

**2) Austin:** Austin has a strong track record of community activism in providing Internet access to low-income areas, and a great deal of technical literacy, wealth and economic vitality. Local government supports community Internet initiatives, and Austin is at the forefront nationally in exploiting the Internet's economic and social possibilities. Unlike Portland, Austin does not have a well-developed network of community-based organizations that could channel Internet initiatives deeply into the community. For that reason, Austin rates just behind Portland among the cities profiled.

**3) Cleveland:** Although the city is not known as a hub for high-tech entrepreneurship, Cleveland rates well among the five cities because of innovative coalition building by a group called Digital Vision that encourages Internet access in the low-income community. Activists' success in obtaining city funding for community Internet projects is a distinguishing feature, and civic leaders are actively cultivating an entrepreneurial environment for the city. No dot-com successes have occurred, but city leaders are focusing on business-to-business ecommerce--a sensible long-term strategy to exploit the Web for a city that understands manufacturing. Cleveland also enjoys an abundance of broadband infrastructure in the downtown area, which makes it attractive to many telecommunications carriers.

**4) Washington:** The District is a latecomer with promise when it comes to using the Internet for social and development purposes. A package of incentives to attract high-tech firms downtown and the development of NoMa, a downtown district for creative high-tech people, could spur a tech boom in the District. But these programs are in their early stages. At the community level, there are several Internet access initiatives aimed at low-income people, but they would benefit from greater coordination and more support from city government.

**5) Nashville:** Nashville lags far behind the other cities in projects that provide Internet access to low-income citizens. The federally funded "Designing a Community Online" project indicates some promise for the future on this front, as does the mayor's commitment to the use of information technology in city government and outreach to neighborhoods. But Nashville is late to the table relative to the other cities in this study. On the economic front, Nashville's entrepreneurial culture suggests it can effectively exploit the Internet, and several initiatives show that Nashville is aggressively trying to become a player in the New Economy.

### **Sustaining the Effects of the Internet**

With the downturn in the dot-com economy and the constant challenges of maintaining funding for community development projects, sustaining the Internet's early positive effects will be difficult. However, lessons from the five cities point to ways in which early success can be built upon:

**Encourage bottom-up initiatives:** Almost invariably, Internet projects in the five cities started because interested people in the community took the initiative. This underscores the fact that successful programs tend to be driven by demand rather than pushed by technology. Community-computing programs do not come from the top down.

**Encourage catalysts:** The bottom-up nature of most of the Internet initiatives has come about because committed individuals in the community have served as catalysts. Just because these people have taken the initiative does not mean that they and their initiatives do not need nurturing. Financial support is the most obvious, and probably most useful, form of encouragement, but publicity is another. The media could do a community service by focusing on how community groups are using the Internet for social purposes

**Encourage public funding:** The coffers of local governments have played an important role in several cities. Cleveland and Austin have programs that channel public funds to community technology projects, although it is important to underline that the programs came about only after community technology activists had been running technology programs in the cities for some time. But as demand in the community for publicly available Internet access and training expands, local government help is needed to meet it. Additionally, federal funding, in the form of grants from the Technology Opportunities Program of the U.S. Department of Commerce, often is crucial to getting projects off the ground. There is still considerable demand for community computing programs and great need to wire local governments for better service delivery. It is appropriate to maintain or expand federal, state, or local programs that provide public funds for community technology.

**Encourage “bridging” among groups:** In several cities, coalitions have been formed to bring advocates of low-income people into contact with people from the technology sector for community development. Such initiatives hold significant promise, but the existence of them should not be seen as ends in themselves. The partners in these coalitions have differing outlooks and goals. Business leaders may see community-computing programs as a quick way to increase the supply of skilled workers. Community activists may see the partnerships as part of a long-term strategy to improve people’s lives and foster civic engagement among forgotten members of the community. Recognizing these differences early is key to making bridging work.

**Encourage experimentation:** Across the five cities, there are a number of different models for using the Internet for community purposes. Some are new organizations that provide access and training. Others are new organizations that partner with existing community groups. Still others are existing organizations that have integrated the Internet into their missions. There is no single solution to exploiting the Internet’s potential and community leaders and policymakers should be aware of this. A willingness to tolerate multiple approaches should also be accompanied by a willingness to tolerate fits and starts in programs, and even failure. The lessons learned in the process can be as valuable as successful models that are often showcased.

## I. INTRODUCTION

Communities and economic development groups across the country are exploring ways to encourage people and organizations to go online. They believe that good things will happen in their communities with greater Internet connectivity. They think it will help their children learn, improve the job skills of their workforce and make their community a more vibrant and productive place. In addition, people with Internet access will be better-informed citizens, able to make better use of government services and to play an active part in decisions that affect the future of the community to which they belong. Furthermore, “wired” communities will face a brighter economic future because they will offer attractive locations to businesses thinking about building new plants and offices.

To date, there have been few studies about the specific impact of Internet access on any community's economic and social life. To begin to explore this, the Pew Internet & American Life Project joined with the Progress and Freedom Foundation to study both sides of the issue. The PFF looked at the economic side of the story; the Pew Internet Project looked at the social side of the story. The PFF has found that high levels of connectivity in communities are tied to some measurable factors. “Wired” communities have large numbers of high-income households, college-educated citizens, and young people. These kinds of communities have always tended to be prosperous, and there are interesting suggestions in the early PFF data that Internet connectivity helps enhance that prosperity but does not necessarily drive it.

The Pew Internet Project's part of the study consists of cases studies in five communities—Portland, Ore.; Austin, Texas; Cleveland, Ohio, Nashville, Tenn., and Washington, D.C.--to see what kind of change is occurring in social institutions. The one consistent finding in each of these cities is that the availability of the Internet is encouraging people and organizations to spend time thinking about how to exploit it. These new conversations, many of them spurred by grass-roots initiatives, have branched out in several directions. Here are some of the main lessons that have been learned:

### PORTLAND

Real changes in communities are evident in Portland as a result of a wide range of community Internet projects, some of them long-established. Portland's Neighborhood Pride Team, initially founded to revitalize a community in southeast Portland, has grown from one computer in 1995 to a skills center with 20 computers and two full-time instructors that handled more than 1,200 students in 2000. A listserv that began as a way to keep southwest Portland citizens informed about a development proposal has turned into a model forum for allowing activists to talk through technical and environmental issues surrounding neighborhood growth. And on the economic development front, Portland has made a significant government commitment to providing a place for businesses that sell Internet content or rely on the Internet for distribution.

**Main Lesson:** A technologically sophisticated city, in combination with strong commitment from city government, interested citizens, and an existing infrastructure of community development organizations, has taken identifiable steps to use the Internet to enhance economic and community development. In the wider community, the existence of many community development organizations makes the soil for community Internet initiatives that much more fertile.



## AUSTIN

Like Portland, Austin is a center for high-tech industry and a large number of dot-com start-ups, both of which have created considerable wealth in the city. Along with a core of city activists and an engaged city government, this has resulted in a flurry of initiatives to maintain Austin's status as a technology hub. Examples include plans for a "digital downtown" that promises to attract multimedia developers, lessening the pressure for urban sprawl. In the wider community, entrepreneurs are encouraging technology literacy for low-income people through the Austin Idea Network, and city government has started several initiatives of its own. Additionally, community activists have begun projects that have attracted government aid from all levels, federal, state, and local. But Austin has been hurt by the downturn in the dot-com economy.

**Main Lesson:** Good intentions and resources are not always enough. In spite of Austin's many assets, the dot-com shakeout has taken the wind out of some initiatives, such as the Idea Network. Austin also lacks a well-developed infrastructure of community development organizations, making it more difficult to implement community access initiatives. Austin's dearth of community development organization sets it off from Portland in this respect.

## CLEVELAND

Cleveland remains a manufacturing city with no real reputation as a center for innovation or Internet activity. Activists in Cleveland have nonetheless made significant strides in shaping local government policy on community Internet access. The Digital Vision coalition's successful effort to get \$3 million for "computer boot camps" from local government distinguishes it from other cities in the study (with the exception of Austin). Economically, Cleveland lacks the sort of entrepreneurial tradition that would help it make fast progress in the New Economy, but an accident of history—it has abundant bandwidth in fiber-optic cables laid along railroad rights-of-way--could give it an advantage in business-to-business electronic commerce.

**Main Lesson:** Coalition-building in communities can succeed in procuring public funds for community technology projects.

## NASHVILLE

Even with a strong entrepreneurial ethic in the regional economy, the limited availability of venture capital and the dot-com shakeout means that no dot-com in Nashville struck pay dirt—even fleetingly—while other centers of the New Economy were hot. The city is actively promoting a downtown district for young entrepreneurs, but community Internet projects are only beginning to emerge in Nashville, and it lags significantly behind other places in this area.

**Main lesson:** City government is beginning to engage with issues of information policy and community Internet access. Neglect of these policy issues can be costly for cities, and those trying to make up for lost time must reach out to neighborhood groups to succeed. Fortunately, Nashville city government does appear to be doing this.

## WASHINGTON, D.C.

The District of Columbia is a latecomer, with several promising initiatives just getting underway. Tax breaks for tech companies locating downtown and in a revitalized urban district may pay off, but in the distant future. The District does have a number of innovative community initiatives designed to bring technology access and workforce skills to low-

income people. None of these, however, receive financial support from city government, nor do they appear to be on city government's radar screen.

**Main Lesson:** Playing catch-up—especially with attractive suburban competitors in Maryland and Virginia—is difficult. The plans for tech-based urban economic development seem sound, but the city's lack of attention to community Internet access is an unfortunate oversight.

This report examines how institutions in the five cities studied are going about exploiting opportunities presented by the Internet. The cities were chosen because of the variability in their economic profiles and for reasons of geographical diversity. Portland, Austin, and Washington are all centers of high technology, although their specializations differ. Each has a high level of Internet penetration in its population. Cleveland and Nashville have lower Internet penetration levels, and high technology is less important to their economic bases. Cleveland is a manufacturing center; Nashville's economy has a large service sector. An appendix to this report contains data outlining the economic and demographic characteristics of each city, as well as a list of individuals interviewed for the report.

As for the institutions chosen for study, it is important to underscore that not all institutions within cities have seized on the Internet. Exploring why some institutions or organizations have not yet chosen to use the Internet in any strategic sense would be an important research undertaking in itself. However, the focus here is on those institutions that *are* using the Internet for organizational goals. In broad terms, this meant looking at economic and community development organizations in the five cities that have sought to use the Internet to further their objectives. And as a practical matter, this turned the focus mainly to economic development officials—both in the private and public sectors—and community technology centers. The latter organizations have been hailed as new kinds of community institutions, and they are bearing the brunt of bringing Internet access to low-income neighborhoods. Frequently, however, such initiatives are linked to existing nonprofits, such as community development corporations (CDCs), many of which are devoted to providing affordable housing in low-income areas. As for city governments, the report profiles innovative uses of the Internet by such bodies, but it pays greater attention to whether local governments are creating hospitable environments for community-driven Internet initiatives to take hold.

### **SOCIAL CAPITAL AND THE INTERNET**

One way of analyzing the impact of the Internet on institutions is to look at it in terms of "social capital," the phrase that social scientists invoke to capture the notion of social networks. Social capital, as described by Robert Putnam, constitutes "those features of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions."<sup>1</sup> Social capital can be thought of in two ways: *bridging* social capital and *bonding* social capital. Bridging social capital allows disparate groups in society to come together in ways they normally do not. The civil rights movement, which brought young Northern whites into contact with Southern blacks, is often cited as an example of bridging social capital. Bonding social capital refers to organizations that deepen ties among groups with a lot in common; country clubs are good examples of bonding social capital.

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<sup>1</sup> Robert Putnam, *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press, 1993, p. 167.

The specific way in which institutions facilitate cooperation—and thus build social capital—is through their effect on the cost of transactions.<sup>2</sup> For an entrepreneur who wants to obtain venture capital financing, it is costly to find a venture capitalist with interest in his project. It is also costly for the venture capitalist to determine the merit of the idea and business acumen of the entrepreneur. If a group wants to organize the neighborhood to change the mind of City Hall, it is costly to marshal interest, settle on a message, and deliver it to elected officials. An institution such as a neighborhood association or, in the former example, a network of entrepreneurs, can reduce the costs of organizing. In both of these examples, the institutions amount to the “rules of the game” for carrying out transactions. In other words, the institutions are key sources of people and information for telling actors how things get done in a given environment and what the norms are for social cooperation.<sup>3</sup>

The Internet can play a role in reducing transaction costs in two ways. First, through email or the Web, the Internet provides lots of information quickly and cheaply—information that could aid cooperation. Second, the Internet, due to its relative novelty in organizations, can serve as a catalyst to overcoming the friction that is part of any collective undertaking. This catalytic effect usually arises as organizations try to figure out how best to integrate the Internet into their missions. If the catalytic effect takes hold, it may result in the development of innovative Internet content that furthers the missions of organizations. The net impact of the catalytic and “content” effects is a change in the “rules of the game” that define how an organization functions.

How can you tell when the “rules of the game” are changing in an institution and, more importantly, if you can, how do you attribute it to the Internet? The answers have to do with “foot traffic” and content. With respect to foot traffic, the presence of Internet connections may bring new people to a place who might not otherwise go there. This can inject new life into an organization by stimulating social networks. In this way, foot traffic is an indicator of the catalytic effect of the Internet on social capital formation. It is the presence of the Internet that shapes social capital, as people establish new networks of contacts as they congregate at places where the Internet is.

As for content, Internet-driven projects may result in the creation of new Internet content that is devoted to addressing economic or community needs. Rather than the Internet shaping social capital, as is the case when the Internet spurs new social networks, the presence of social capital is shaping the Internet through the creation of specialized content. The creation of specialized content is a strong indicator of the connection between the Internet and social capital, because content creation only comes about if levels of trust about the Internet’s potential have been established in the “foot traffic” phase of the Internet’s development within an organization.

The “Internet as catalyst” theme, whereby the Internet’s presence alters foot traffic, will figure prominently in this report. If a community organization decides to provide Internet access and training, the organization may draw new people to it. This changes the character of the organization, while providing a different kind of place where people can gather. Similarly, economic development organizations have established new rules of the game in their cities by adopting social network strategies to encourage entrepreneurship.

Content creation comes into play less frequently in this report, but its impact is important when it is present. When affordable housing providers come together in a city to

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<sup>2</sup> Putnam, *Making Democracy Work*, p. 179.

<sup>3</sup> Douglass North, *Institutions, Institutional Change, and Economic Performance*. New York: Cambridge University Press, 1990, p. 93.

develop a Web-based system to track the supply and condition of housing, this Internet content greatly improves operating efficiencies for clients. When neighborhood nonprofits help residents create Web pages for their home businesses, this reflects a growing level of trust in the neighborhood, and the content on the Web pages represents economic opportunities that benefit individuals and communities. It takes time for content to translate into higher levels of trust in a community, but Internet-driven social capital is not likely to arise unless the initial catalytic effect from Internet planning translates into content.

Some have pointed out the limitations in linking the Internet with social capital. As Putnam has written, “[V]ery few things can yet be said with any confidence about the connection between social capital and the Internet.”<sup>4</sup> Putnam acknowledges the potential for the Internet to build social capital, because the Internet is, after all, a network that connects people. He rightly concludes that “the Internet will not *automatically* offset the decline of more conventional forms of social capital, but it has that potential.”<sup>5</sup> It is this potential—the ways in which communities are beginning to try to convert this potential into reality—which this report charts.

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<sup>4</sup> Robert Putnam, *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster, 2000, p. 170.

<sup>5</sup> *Ibid.*, p. 180.

## II. PORTLAND

Portland prides itself as a center of manufacturing for high-tech goods and an entrepreneurial city where independent-minded people find a receptive climate for starting new businesses. Portland also has a strong sense of identity as a community, with a passion for environmental protection and a strong ethic of managing growth throughout the region. City government is actively trying to balance the area's desire for technology-driven growth with an equally strong preference for maintaining Portland's livability, and it is using the Internet to do it.

In terms of business development, Portland's most notable innovation has been its "creative services initiative," a policy designed to support the growth of emerging multimedia industries while directing this growth to the city's center. Containing dense development downtown, thereby protecting rural areas on the city's outskirts, has been an article of faith in Portland since 1980, when it established an "urban growth boundary." This has created lots of pressure as the region has grown, and Portland has become a very fashionable place to move to in recent years. *Money Magazine* rated it the best place in America to live in 2000, and the city's location between Silicon Valley and Seattle, with a lower cost of living than either, has added to Portland's allure for Internet entrepreneurs. A number of Internet companies, such as Lucy.com and 800.com, call Portland home.

In the wider community, Portland has a long tradition of organized neighborhood involvement in city affairs. In 1974, Mayor Neil Goldschmidt established the Office of Neighborhood Associations—now called the Office of Neighborhood Involvement (ONI)—to facilitate communication between neighborhoods and city government. Today, neighborhood associations in Portland are fairly well wired; associations representing neighborhoods of varying income levels and demographic characteristics generally have Web pages.

### A. The Internet and the Community

Portland's active citizenry and city work force means that there are a number of people willing and able to think of ways to use the Internet as a tool in civic affairs. This has resulted in efforts to bring the Internet to low-income people, programs by city government to use the Internet to improve delivery of affordable housing services, and the use of email listservs to participate in city planning debates.

#### i. The Portland Area Housing Clearinghouse (PAHC)

On the strength of a \$480,000 grant from the U.S. Department of Commerce's Technology Opportunities Program, Portland's Bureau of Housing and Community Development (BHCD) is creating a Web-based system to improve housing and other services for Portland citizens. The BHCD proposal addresses an enormous information gap facing low-income residents when they seek social services. In a survey of low-income people in the region, BHCD asked clients which agency they would turn to if they were evicted from housing, needed help in finding housing, had a problem with a landlord, or felt they were facing discrimination. In each case, about two-thirds of respondents said they did not know; four out of five (79%) said they would not know where to turn to find housing. Given that half of the respondents change housing status in a given year, awareness of city housing services could help low-income individuals in Portland significantly.

The BHDC project, called the Portland Area Housing Clearinghouse (PAHC), is ambitious. First, since low-income people say they lack information on where to find affordable housing, the PAHC will provide a single data base with housing listings. As with the Cleveland Housing Network—a similar model that BHDC has studied—housing providers will have strong incentives to keep the data base current so as to rent inventory and minimize unwanted inquiries about already-rented properties. Second, the system should mitigate the negative effects of high staff turnover in social services agencies. With an up-to-date data base of services, for example, new workers will be able to see a history of services provided to clients. Finally, BHDC plans to have much of the housing data available publicly on the Internet so users can search on their own. This will include information on which documents to bring when signing up for social services—a major stumbling block at present.

As BHDC manager Andy Miller puts it, the objective of PAHC is to allow low-income people to receive the kind of service from social workers that airline travelers receive from travel agents when planning a trip. A travel agent not only has flight information available for customers, but also can make hotel or car rental reservations. As one example, Miller describes a client coming into a Legal Services office to find out how to fight an eviction notice. If the intake interview reveals that the client needs a new place to live, a Legal Services staff person with access to PAHC can quickly find what is available and direct the client to a new unit. With an error rate of close to 80 percent for inquiries to Portland social services agencies (meaning that agencies tell clients 80 percent of the time that they have called the wrong agency), the “travel agent model” has enormous potential to improve efficiency for agencies and the people they serve.

## **ii. The Neighborhood Pride Team**

Portland’s oldest and most active community computing initiative is the Neighborhood Pride Team (NPT), a community development corporation in outer southeast Portland that has taken a bottom-up approach to providing computer and Internet training. NPT was initially founded as a community revitalization effort with a special commitment to the empowerment of women; the neighborhood has a substantial number of female-headed households and a high incidence of domestic violence. An early survey found that residents wanted NPT to be a place where they could build job skills; two-thirds of respondents specifically said they wanted NPT to provide computer training.

From one computer and some electric typewriters in 1995, NPT’s Skills Center has grown to 20 computers and two full-time instructors for computer and Internet courses. Over 1,200 students passed through NPT’s Web and computer skills classes in 2000, and NPT recently contracted with a company called TechforAll that uses the Internet to build people’s Internet and computer skills. Using a DSL connection to NPT, TechforAll allows NPT students to log onto a server that contains educational versions of Microsoft Word, Excel, and Access. This greatly economizes on software expenditures for NPT, thereby enabling it to devote more resources to hardware and training classes.

NPT’s Internet and computer training programs are not ends in themselves. They serve a broader goal of promoting leadership development in outer southeast Portland. Cooley says NPT’s goal is for two or three dozen community leaders to emerge out of the 1,200 students it has trained. NPT’s motto is “Each One, Teach One” to convey the idea that students are expected to pass on skills to others in the neighborhood.

NPT’s computer training program has energized the community in ways that individuals taking computer classes at a community college could not, according to Cooley and her staff.

The social atmosphere fostered at NPT has enhanced the learning environment for those coming to NPT for Internet training and access, and in a neighborhood isolated from the rest of Portland, NPT has been a catalyst for people to make new connections.

By providing an entrée to the Internet and computer skills, NPT gives its students greater economic opportunity and broader access to information. In some cases, this has led to small-scale entrepreneurship. As an example, Cooley said one neighborhood resident had intermittently run a candlemaking business out of her home for years. The woman took as many Web classes at NPT as she could and revived her business by creating a Web site for it. In another case, a woman with a history of mental illness discovered she had a knack for Web page design as she worked her way through NPT's classes. In two years, she has gone from being a welfare recipient to a successful independent Web page designer, and she now mentors others in developing Internet and design skills.

On a larger scale, NPT has formed the Trillium Artisans program, which matches another NPT initiative, its Sewing Program, with the Web. Several women in the Sewing Program thought that their work in transforming reclaimed material into handmade products would appeal to the environmental consciousness of people in Portland and beyond. They set up a Web site, [www.trilliumartisans.org](http://www.trilliumartisans.org), to post photographs of their work, and their wares were available for purchase online starting in the 1999 holiday season. Over 50 women have participated in Trillium Artisans.

#### **BOX 1**

##### **Mapping Portland's Community Computing Projects**

Portland's NPT may be its preeminent neighborhood computing project, but it is not the only one. Researchers at Portland State University have charted the publicly available computer labs in the city and surveyed users of the labs to ask how effective they are. Using a student class project, a team of researchers led by Portland State Professor Meg Merrick administered a survey to 149 users of 11 community-computing sites in Portland. The project also entered the sites into a geographical information system (GIS).

Like other surveys of users of community computing centers (e.g. Children's Partnership), the Portland State report shows that respondents were predominantly women (73%), heavily African American (27%), and older (48% over age 55). The computer labs were also a supplementary means of access for users; 75% had computer access elsewhere and 55% had access at home. This suggests that the social dimension of the computer labs is an important attraction for users. Based on follow-up interviews with users, researchers concluded that the "comfort level" provided by the labs as a learning environment was a reason why users came to them. Moreover, 40% of users said they had heard of the lab through a family or friend, about twice the number who had heard about it directly through the community organization hosting the lab.

Portland State's use of GIS technology is part of a broader movement among community activists to improve communities by cataloging their assets. John Kretzman and John McKnight have pioneered an approach to community development that focuses on appreciating the assets that exist in any neighborhood in terms of individuals, associations and enterprises instead of listing the community's deficits, the traditional

tool for evaluating low-income areas.<sup>6</sup> Arguing for an “internally focused” outlook on community development, Kretzman and McKnight believe that looking at the upside in communities—which typically draws attention to important relationships among people and institutions in a neighborhood—is indispensable to renewing low-income areas. Technology does not play a prominent role in Kretzman and McKnight’s underlying philosophy, but the growth of the Internet and GIS software has given activists a new tool for mapping community assets. By giving local decision-makers a way to visualize assets via online maps, activists hope to focus greater attention on communities and increase the pace at which outside resources are directed to distressed areas.

Portland State is not the only entity trying to call attention to community computing in Portland. The director of Portland’s cable access TV station, Rob Skelton, has undertaken two initiatives to increase Internet availability in his community. The first is to offer Internet training and assistance in Web page development to the staff of “mom and pop” nonprofit organizations, such as community development corporations. Skelton is also using the power of cable television to publicize Internet training programs in Portland. Working with the Sabin Community Development Corporation, which has 15 computers available to the community with Web access, Skelton cablecasts Sabin’s training classes on one of Portland’s access channels. Skelton believes that showing training classes as they occur will diminish people’s hesitancy about coming in to get computer training, as they see how non-threatening the Internet really is.

### **iii. A Neighborhood Listserv and the Southwest Community Plan**

Portland’s high level of community activism, its tradition of careful planning, and its tech-savvy citizenry combined in the late 1990s to stymie a community planning initiative in southwest Portland. When it established its urban growth boundary in 1980, Portland also set in place a planning process by which communities throughout the city periodically develop a community plan in conjunction with the Portland Bureau of Planning. In 1996, the Planning Bureau circulated the Southwest Community Plan (SWCP), including a map outlining proposed zoning changes. A number of the changes permitted more dense development in some neighborhoods in southwest Portland. This was in keeping with the philosophy underlying the urban growth boundary. But in the minds of some residents of southwest Portland, the proposals threatened the streams running through the area as well as the character of southwest Portland itself.

In 1996, email was the primary means of communications among neighborhood leaders who had concerns about the Planning Bureau’s proposal. The number of people on the email list grew, and in April 1997, a listserv was established to handle the volume of traffic. Eventually 100 people in southwest Portland subscribed to the list.

The listserv served an analytical as well as informational function for participants. In particular, it allowed activists to talk through the technical issues surrounding the Planning Bureau’s proposal, such as the threat to steelhead trout in the area’s streams. The listserv allowed neighborhood leaders to sharpen their thinking and coordinate strategy for delivering their response. This could have been done in neighborhood meetings, said the listserv’s founder, Jere Retzer, but the listserv was invaluable because it permitted frequent

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<sup>6</sup> John P. Kretzman and John L. McKnight, Building Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community’s Assets. Chicago: ACTA Publications, 1993.



exchanges that would have been impossible at weekly or monthly meetings. Moreover, the listserv forced participants to commit ideas to writing, improving the technical quality of the community's response to the Planning Bureau.

Metro officials credit the listserv with hastening the demise of the original plan, which was shelved in 1998 after years of hearings and debate. By July 2000, the Planning Bureau had produced a new plan that it hoped would be acceptable to the eighteen neighborhood groups that comprise southwest Portland.

The listserv is not as active today as it was at the height of the SWCP controversy. However, where slow home Internet connections and relatively antiquated computers made anything other than text-based communication difficult in 1997 and 1998, today's home computers make it easier for many residents to exchange planning maps more easily. As the debate over the SWCP continues, the listserv will be an important forum for the community's discussions of the plan.

## **B. The Internet and Portland's Economy**

Portland's economy has undergone a transition in past decades from a resource-based economy relying on logging to a center of high-tech manufacturing that has been dubbed the "Silicon Forest." Today, Intel is the largest private-sector employer in the region, along with a significant cluster of computer-display and other electronics manufacturers. Many of these are spin-offs of Tektronix, a maker of testing, measuring, and monitoring equipment for the electronics industry, whose employment topped out at 27,000 in the 1980s but is down to about 5,000 people today. As the company downsized, a large number of former employees started their own small technology firms in the Portland area. To keep the economic momentum going in the New Economy, Portland is trying to develop a place for innovation to thrive, a pool of investment capital to fund business start-ups, and the bandwidth that will deliver multimedia content to residents of Portland and beyond.

### **i. The Creative Services Initiative**

Creative services refers to a cluster of industries whose missions are to design and produce content that is delivered over a variety of electronic media, such as CD-ROMs or, increasingly, the Internet. A public relations firm is an example of a creative services business, as are the film and advertising industries. As a general rule, creative service firms are small (often with a single proprietor), value flexibility, need high-speed data connections, and integrate technical expertise and artistic talent in their work.

Portland already boasts more than 800 creative service firms employing approximately 13,500 people and between 1,400 and 2,000 sole proprietorships. The sector has experienced twice the job growth rate of the Portland economy in recent years, 9 percent annually from 1992 to 1997 versus 4.4 percent for the Portland region. It is also a high-wage industry; creative service employees average \$44,000 per year (\$55,000 for freelancers) compared with a regional average of \$31,240. The location of choice for Portland's creative service companies is the Central City, where creative service firms account for 1 job in every 10. Although creative service businesses serve local clients, a distinguishing feature of the sector is that it exports a lot of its output. This means that bandwidth and Internet connectivity are indispensable.

The country's large media and technology centers, such as New York, Los Angeles, Chicago, San Francisco, and Boston, dominate the creative service industry, but smaller cities such as Seattle, Denver, Minneapolis, and Salt Lake City also have significant creative service clusters. Portland sees itself as competing with the second set of cities, and worries that it

might be seen as a poor suburban imitator of Seattle. To address Portland's competitive disadvantages and capitalize on its existing strengths, business and civic leaders have undertaken a major initiative to promote creative services in downtown Portland.

The cornerstone of the initiative is the \$6 million renovation of a building in northwest Portland to house creative service businesses. The building is in Portland's Pearl District, an area adjacent to downtown with many empty warehouses that was once a center of industrial activity. The Pearl District is quickly being transformed into a more vibrant urban scene with multi-use buildings that have retail on the ground floor and lofts on the upper floors. The Portland real estate market is driving the changes in the Pearl District; downtown is densely developed, the urban growth boundary discourages suburban growth, so turning to an area near downtown is natural. The Pearl District also has a thriving arts community. It hosts a number of film and recording companies, and it is headquarters for the advertising firm Weiden and Kennedy, whose top client is Nike.

By developing a space for creative service entrepreneurs, Portland development officials want to tap into the "funky factor" that they feel must be present for creative services to thrive. This means that the building will have exposed brick walls, hardwood floors, and "offbeat" lighting. With lots of open space within the building, developers hope to provide an environment that nurtures creativity among tenants. Bandwidth is the final ingredient to the creative services center; the building will be wired to accommodate the most advanced communications systems a business may have. This will not only facilitate exporting creative services products, it will also enable creative service firms to communicate with subcontractors in Portland (or elsewhere) that may operate out of their homes.

Predicting the return of the city's \$6 million investment in the building is difficult, especially in light of the dot-com downturn, which lessens the demand for creative services. However, the Pearl District enjoys development momentum independent of any city initiative, and its emerging trendiness suggests that the building will attract tenants. The city is also embarking on a \$50,000 national ad campaign to promote Portland as hub for creative services. City officials hope that by providing a combination of amenities, the Pearl District building will attract the young minds that will sustain high wage job growth in Portland.

## **ii. Promoting Entrepreneurship and Networks of Financiers**

Although Portland has a well-developed base of technology companies, it lags other cities in the availability of venture capital. In a recent study of 14 high-technology centers done for the Brookings Institution, Portland State's Joseph Cortright found that Portland accounted for 0.8 percent of total venture capital investment nationally and only 1.8 percent of the venture capital invested among this elite group of cities, which account for nearly half of all venture capital investments in the United States. Businesses are taking steps to address the problem through the Oregon Entrepreneurs Forum and the Portland Angel Network.

The Oregon Entrepreneurs Forum (OEF) was established in 1991 as one of 18 worldwide Enterprise Forums founded by the Massachusetts Institute of Technology. Since 1997, when it merged with the Oregon Young Entrepreneurs Association, its membership has grown from 100 to over 1,200 members. Much of that growth has come from the Portland area. To promote local entrepreneurial activity, the OEF holds between 35 and 40 events per year. Many are networking opportunities, but a number are designed to match entrepreneurs' ideas with business expertise and investors. OEF's Venture Oregon and Angel Oregon conference is a yearly chance for entrepreneurs to come together with venture

capitalists and wealthy investors to make deals. Companies have 10 minutes to make a presentation to a panel of financiers, pitching ideas to them like writers pitching movie ideas to Hollywood producers. In 2000, two dozen companies made business pitches for \$139 million in funding; financiers committed \$20 million to the competition. Not all the companies seeking funding are Internet companies, but 12 out of 16 business plans highlighted in a *Portland Oregonian* article relied on the Internet to carry out the business plan.

The Portland Angel Network (PAN) is a less formal vehicle that brings together successful Portland business people who have an interest in financing promising start-ups, and it also reaches into the business community to try to increase the supply of angel financiers. Many wealthy investors prefer to keep a low profile about their business investments, and many established business people have been hesitant to invest in New Economy companies, lacking the expertise to make informed judgments about a business plan's prospects in this sector. By bringing successful technology entrepreneurs together with "old economy" business people, PAN has broadened Portland's base of angel investors.

### **iii. Telehotels and Competitive Access Providers**

In trying to spur investment in high-speed Internet infrastructure, Portland is fiercely protective of local prerogatives, which sometimes places it at odds with the city's desire to be a New Economy hub. The city gained a national reputation in its battle for open access for Internet service providers to cable systems that offer Internet service. This legal battle may have, in the short term, lessened incentives for investment in bandwidth in the Portland area. The city has also been beset by telehotels, several of which have been proposed for the downtown area. Telehotels fill buildings with telecom equipment rather than people, and this conflicts with Portland's desire for a densely packed downtown filled with people and jobs. Yet there is clear demand for the high-speed data connections that telehotels provide.

The open access issue turned on whether the Mt. Hood Cable Regulatory Commission—the regional authority in the Portland area that regulates cable TV—could compel AT&T to allow any Internet service provider to connect to AT&T's cable system. The litigation gained Portland the reputation as "the mouse that roared" over whether local authorities could exert control over the Internet and the new communications infrastructure. Industry actively opposed Portland's lawsuit, and the Federal Communications Commission declined to intervene on Portland's behalf. But Portland persisted for two reasons. First, the recommendation for open access came from a grassroots panel that advises Metro government on cable policy. Second, Portland is home to many independent ISPs, making the suit a cause on behalf of small businesses in Portland.

The city lost the battle but won the war. A federal judge ruled that the city had no authority to dictate open access provisions, but that cable companies were common carriers for the purposes of providing Internet access over cable infrastructure, meaning the Federal Communications Commission had authority to impose open access on all cable companies—something it has since done.

It is difficult to know whether Portland's lawsuit delayed the rollout of broadband in Portland or elsewhere. But city officials were clearly concerned about this possibility. To address this, they asked the telecommunications industry to come up with plans for a citywide broadband network. In exchange for moving quickly on franchise negotiations, city officials sought to ensure that the provider would wire all neighborhoods with broadband, not just high-income areas where demand would appear earliest. Two companies, RCN and Winstar, agreed to build their broadband network throughout the city.

The other telecom infrastructure issue that has created difficulties for Portland is telehotels. Telehotels are a vital link in providing high-speed Internet access. They are like boarding gates at the airport for loading and discharging passengers; if data do not have an efficient way to get on the high-speed Internet trunk lines, an inefficient bottleneck slows down the delivery system. Technically, the best way to avoid the bottleneck is to locate the Internet boarding gates near customers—generally in central city business districts (see Box 2). But in Portland’s highly developed downtown, telehotels and creative service firms are competing for space, and creative services bring people downtown while telehotels do not. One proposed telehotel, the Pittock Block, illustrates the conundrum nicely. This huge old office building on the northern edge of southwest Portland is located near the Pearl District, making it equally valuable for housing creative service firms or the telecommunications equipment they need to get on the Internet.

From a policy perspective, the city cannot coerce the developer of the Pittock Block to abandon its plans for a telehotel or develop it elsewhere. The only ordinance on the books about telehotels in Portland requires that the first floors of buildings in Central City have space for retail businesses. At this point, city officials hope that the creative services center in the Pearl District will be adequate incentive for telehotel developers to search for sites in that more spacious section of Portland. For now, Portland will monitor plans for telehotel development. With the cooling of the Internet economy, the proliferation of telehotels may subside on its own.

### **C. The Internet and Social Capital in Portland**

The breadth and intensity of interest in the Internet is the most striking feature of how institutions throughout Portland are engaging with the Internet. A youthful, educated, and entrepreneurial population has prompted an ambitious range of Internet-related activity. From the Neighborhood Pride Team’s computer classes to the Metro cable commission’s efforts to shape national telecommunications policy, Portlanders are sophisticated activists when it comes to exploiting the Internet’s opportunities.

A remarkable part of Portland’s adaptation to the Internet has been the focus on content. Several initiatives began explicitly to develop content. The Portland Area Housing Clearinghouse is aimed at creating and aggregating local Internet content to improve service for low-income people, and the Southwest Community Plan used the Internet to deliver high-quality information to elected officials. The Trillium Artisans site is a direct outgrowth of the Neighborhood Pride Team, and the number of neighborhood residents developing Web pages for home-based businesses shows that individuals are actively engaged in creating Internet content for entrepreneurial reasons. The creative services initiative also focuses on content; it is intended as a place where multimedia firms can create content. Portland’s focus on content may be no accident; the city, after all, pioneered the “open access” lawsuit whose objective was to preserve the Internet as a place where information would be available across all systems.

Portland’s energetic approach to the Internet sometimes comes at the cost of lack of coordination and awareness, at least at the community level. Different segments of the community have embarked upon community computing programs at different times; with better coordination, newcomers could learn best practice from places like the Neighborhood Pride Team and avoid costly mistakes. Greater coordination could also give community-computing activists a stronger voice when seeking city funding. The lesson from the SWCP is instructive here; the voice of residents there was strengthened by the coordinated public

campaign that the listserv greatly facilitated. So far, no coherent voice has developed to advocate on behalf of community computing initiatives.

### III. AUSTIN

Austin has experienced a high-tech boom in the past ten to fifteen years that has transformed a university and state government town into one of the country's most dynamic technological environments. Leading the boom has been electronics manufacturing, primarily semiconductors. Firms such as IBM, Advanced Micro Devices (AMD), and Motorola all have large semiconductor manufacturing plants in Austin, and IBM, Intel, and Motorola also have significant research and development (R&D) operations in the area. The Austin area's R&D capacity was greatly bolstered in the 1980s when two R&D consortia, the Microelectronics and Computer Technology Corporation (MCC) and SEMATECH, decided to locate there. MCC, which disbanded in 2000, was devoted to next-generation computer research. SEMATECH, which still exists, conducts research to improve semiconductor manufacturing technology.

Dell Computers, founded in Austin in 1984, is a large presence in Central Texas, but its innovation has been in business practices rather than technology development. By creating a business model that minimizes inventory, Dell has grown to the world's second largest computer company. In terms of its impact on Austin, Dell has spawned so-called "Dellionaires"—people who have amassed large fortunes from skyrocketing stock options. Between the core of technology professionals attracted to Austin by large electronics firms or R&D consortia and Dellionaires, there has been ample talent and wealth in Austin to fuel a number of dot-com start-ups. And, very notably, wealth created by Dell and dot-com start-ups is beginning to be channeled into the community for social purposes.

The city has benefited from the new wealth but it is also increasingly burdened by rapid growth. In Austin, the three issues that have dominated community and political debate in recent years are all related to growth: traffic congestion, environmental protection, and income inequality among citizens. In many communities, rapid growth brings environmental activists to the forefront, but Austin's concern with its environment predates the 1990s growth boom and is very much part of the city's political fabric. Issues of economic inequality have a long history as a central part of the city's political debate, without much resolution. However, growing technology-generated wealth, along with input from community activists, has resulted in innovative programs to improve technology access to low-income Austinites.

#### A. The Internet and the Community

Austin has been at the forefront in promoting access to the Internet for low-income people through Internet-based literacy programs and job training programs. City officials, in most cases prompted by community activists, have devoted energy and resources to using the Internet to reach out to citizens. This combination of activism and city leadership has resulted in community initiatives remarkable in their scale and scope. The level of Austin's activism in technology is owed mainly to its progressive government and engaged citizens, and less to the presence of technology firms in the region. However, Austin's high-tech community has recently begun to turn its attention to social equity issues in the city.

Less attention has been paid to thinking of ways to use the Internet for delivery of public services, such as housing. Part of this is because Austin does not have a well-developed network of community development corporations that might be vehicles for delivering such services using the Internet.

### **i. The Austin Free-Net**

The Austin Free-Net (AFN) is the city's most established public Internet access project and is an important node for related initiatives that have blossomed in Austin over the past six years. The AFN got its start in 1995 when city employees began creating a Web page for the City of Austin. It occurred to them that not all of Austin's citizens would have access to the information that they planned to put online, and this made public Internet access a priority. From the start, AFN's approach has been to provide a place for people to learn about the Internet, not just a site where computer terminals are publicly available. This was a departure from many public-access initiatives, which typically provided only computer access and free dial-up connections.

Initially, one full-time city employee ran AFN. Over time, the city also provided a contract for AFN to maintain computers at libraries and community policing stations. However, the Free-Net by necessity has also raised funds within the community from local foundations or from companies such as Southwestern Bell, Time Warner Cable, SEMATECH, Excite, and Applied Materials. A 1996 grant from the forerunner of the U.S. Commerce Department's Technology Opportunities Program enabled the AFN to pursue a community network project in one of East Austin's poorest neighborhoods. The \$250,000 grant, which covered about half the project's total cost, established the East Austin Community Network (EACN), connecting 11 places in the neighborhood, such as schools, libraries, job training centers, and public housing sites.

The EACN has two primary goals, one day-to-day and the other long term. On a day-to-day basis, organizers of the AFN understand that "[p]oor people spend more time than others tending to their most basic economic, education, and health needs." A goal of EACN, then, is to give residents access to the Internet as a way to help them to reduce the amount of time they spend. Giving them information about what documents to bring to a social service agency is one example of this.

The other goal is for the EACN is to build "community competence." This means increasing the community's capacity for helping itself through the knowledge and skills learned through the Internet. Such increased competence could take the form of better jobs for people in East Austin or greater ease in finding places to live. Indeed, according to a federal evaluation of the EACN grant, increased self-esteem among community residents is cited as an important outcome. East Austinites who have become Internet users through AFN feel more in control of their ability to figure out what bureaucracies need from them.

Much of AFN's early work involved establishing Internet presences at schools and libraries in Austin's low-income neighborhoods. State and national programs have relieved AFN of that obligation, enabling AFN to devote its efforts to helping nonprofits wire themselves in order to improve operating efficiencies. Where possible, AFN encourages nonprofits to make their Internet connections available to under-served people in their communities.

As AFN approaches seven years of operation, it finds itself on a firmer funding base than it was during its infancy. It is also growing. AFN now boasts 34 sites throughout Austin, with 10 new sites on the drawing board. Demand in the community for Internet access has always been high and continues to grow, according to AFN Director Ana Sisnett.

A new challenge that AFN faces is coordination. It is no longer the only Internet access initiative in Austin, and AFN must keep up with other programs so it can refer people appropriately. For example, AFN's introductory Internet courses are inadequate for people seeking high-tech jobs, so AFN refers such people to the Capital Area Training Foundation, which offers in-depth computer training. The success of the Free-Net, in combination with

continued political pressure from Austin's technology activists, has led to the creation of additional access programs by city government.

## **ii. City Government Initiatives**

Having funded the Free-Net mainly through in-kind contributions such as salaries and office space, the City of Austin has embarked on two grant programs to promote Internet access for Austin's low-income population. The city is also involved as a partner in a third project, funded by the state's Telecommunications Infrastructure Fund (TIF), whose objective is to provide Internet access to specific population groups.

The first program is the Community Technology and Training Center (CTTC), until recently known as the Telecommunity Partnership Initiative. This initiative was conceived by the Austin Telecommunications Commission, a City Council-appointed citizens advisory panel that believed that the Internet could increase civic participation and that the city should play a role in encouraging this. As the initiative evolved, its focus shifted to job training, in part because of Austin's high demand for people with technology skills.

In August 1998, the city awarded its first CTTC grant to the Capital Area Training Foundation (CATF), an arm of the Greater Austin Chamber of Commerce. With the \$200,000 grant, CATF began operating a computer and Internet training program in January 1999 using six classrooms and 120 computers in the evenings at a local high school. Some students take courses to upgrade job skills. Some own small businesses and want to learn how to design a Web page so they can use the Internet to advertise their business or sell a product. And others would like to start their own business and want to gain enough Internet skills to function in the New Economy.

The CATF's executive director, John Fitzpatrick, says two things have surprised him about the job-training program he runs. First is the level of demand; classes are filled, and CATF is expanding its programs to other high schools. Fitzpatrick has also been struck by the "esprit de corps" of a typical CATF class. People talk about their Internet experiences after class and help each other troubleshoot computer problems they are having at home.

The second City initiative, the Grant for Technology Opportunities Program (GTOP) is brand new. It was announced in February 2001, with applications for the \$100,000 program due in March. GTOP is designed to fund organizations and citizens groups in Austin to:

- a) Increase points of public access to computers and information technology;
- b) Support information technology literacy, education, and training;
- c) Encourage information technology applications that support community and neighborhood planning and action;
- d) Support access to information technologies and applications by community media groups.

Distributed funding and community activism are the themes for GTOP. Where the Telecommunity Partnership Initiative directed all its funding to one organization, the goal of GTOP is to provide grants of \$5,000 to \$10,000 to a number of existing organizations in Austin that could benefit from bolstering their Internet capabilities.

The third project is an effort among five entities—Austin Community College, the City of Austin, Knowbility (a nonprofit that promotes Internet access to disabled people), St. Edward's University, and the University of Texas. This project has a two-year, \$500,000 grant from the State's TIF fund to provide Internet access at five sites throughout the city. One site will serve the disabled and one will be aimed specifically at seniors, with the remaining sites in Austin's low-income area. Another part of the grant will fund community



mapping, creating a database of community Internet access sites throughout Austin. Eventually, using GIS software, online maps of community Internet resources will be developed. This is similar to the initiative being carried out by Portland State University for the Portland area. With community access sites proliferating—Austin’s Parks and Recreation Department recently decided to provide public Internet access at parks throughout the city—coordination is increasingly difficult. The mapping project will facilitate coordination simply by identifying where resources are.

### **iii. The Austin Learning Academy**

While most technology initiatives in Austin have coincided with the growth of the Internet, the Austin Learning Academy (ALA) is a literacy program founded in 1988 that has transformed itself into a family-learning project that uses the Internet to promote informational literacy. The ALA grew out of the frustration of a small group of teachers with the educational bureaucracy of the Austin Independent School District. ALA founders decided to provide a place for after-school learning that would be less regimented than school and inclusive of the entire family. As one of the Academy’s founders, Lodis Rhodes, puts it, the ALA promotes a “social learning” model whereby learning occurs through rich interaction among students and teachers. Classrooms, Rhodes says, are among the worst places to learn; we learn more informally by working with others and observing situations.

The ALA began using computers in its programs in 1996 as a literacy tool. As ALA executive director Toni Williams says, the Internet improves students’ reading because they have to practice their reading just to use it. Because the Internet lets students go where their interests takes them, reading is fun for them, and they can read while surfing to sites they like. While there is no definitive evaluation of ALA’s program yet, the Academy continues to experiment with ways to use the Internet to improve people’s educational levels.

One example is ALA’s collaboration with the Children’s Bookpress in San Francisco. Children at ALA communicate over the Internet with the author of a children’s book and work with the author to develop an online book of their own. Similarly, for ALA’s general education diploma program, adults develop a cyber yearbook, which requires them to practice a number of different computer skills.

Toni Williams believes the 50 computers at the ALA’s four sites attract people to its programs who otherwise would not be there. How much “community building” has resulted is another question--both Williams and Rhodes say building community is a long-term process--but Williams believes the ALA has certainly helped the East Austin community. It serves about 400 students a year and gathers families together in news ways with a focus on education. But no one who has come through ALA has seized on the Internet as a tool for political action. That may be a consequence of the perception in East Austin that city leadership is still not attuned to their needs.

As an organization, ALA continues to grow. It now has a \$1 million annual budget, and the Dell Foundation is among those who have given it grants. The ALA also attracts national attention as a model to address gaps in technology access. When President Clinton focused on the digital divide at an event in East Palo Alto, Calif., last year, the ALA was one of five sites around the country online to participate in a chat with the president. At the state level, the ALA received visits from then-Governor Bush and his wife Laura.

## **B. The Internet and Austin’s Economy**

Economic growth has been rapid in Austin in recent years, fueled by computer and semiconductor firms (whose growth in part has been generated by the Internet) and dot-

coms. Personal income in Austin rose an astonishing 14 percent in 1999 and unemployment stood at only 1.9 percent at the end of 2000. In a sense, the New Economy in Austin can be divided into “old” New Economy activities such as computer and semiconductor manufacturing and “new” New Economy ones, such as software, multimedia, and Internet start-ups. Austin’s business leaders see the region’s economic future in the latter sectors, but the technological and financial resources that give this future its potential are in large measure the “old” New Economy companies.

Wealth generated by Dell Computers is setting the table for the future. Dell’s growth has helped provide capital for local venture capital firms such as Austin Ventures and Triton. Growing investment opportunities in technology companies have attracted additional venture capitalists from outside Central Texas. John Thornton of Austin Ventures, the city’s most prominent venture capital firm, says, “The rate of change in activity in venture capital has been larger in Austin than probably anywhere else in the country.” In 1996, venture capitalists invested \$67 million in Austin; by 1999, investment had soared to \$1.1 billion.

Dell is by no means the only homegrown tech company that has spurred economic change in the city. Tivoli Systems, founded in 1989, develops systems management software that enables computers to link remotely regardless of software platform. Tivoli made its founders very rich in 1996 when IBM acquired the company for \$743 million; today Tivoli employs 4,200 people worldwide, 1,600 in Austin. Vignette, a software company whose products enable companies to conduct business online, was established in 1995, had its initial public offering in 1998, and now has annual revenues of about \$500 million. Finally, a number of local dot-coms have made a splash, although some of the more prominent, such as Garden.com and DrKoop.com, have been casualties of the dot-com shakeout.

City government has also been preparing for a New Economy future in Austin with initiatives in multimedia and film. Austin bills itself as the “Live Music Capital of the World,” and city officials see the multimedia and film industries as sectors with economic growth potential that fit with Austin’s artistic profile.

#### **i. Austin Idea Network**

The Austin Idea Network is a coalition of entrepreneurs and community leaders organized to engage high-tech executives in the Austin community by addressing “quality of life” issues facing Central Texas. Rapid growth is straining capacity throughout the area, with tight labor markets, crowded roads, limited and expensive housing. This is an area that takes great pride in its cultural and natural environment, and the fear is that high-tech riches will rob Austin of essential parts of its identity. This sense of identity is seen not just as a component of Austin’s character, but also as an economic asset. In bringing the resources and talents of high-tech executives to bear on these issues, the Austin Idea Network issued a “Declaration of Interdependence” proclaiming the high-tech community’s intention to reach out to the Austin community to maintain Austin’s status as a “cool” place to do business.

The Idea Network had its origins in 1999 at Austin’s 360 Summit, a gathering of the high-tech community that examined challenges facing the industry and sought to explore the industry’s role in the Austin community. The summit became an annual event, and in 2000 summit attendees decided to set up an organization to help bring entrepreneurs’ community enthusiasm to life. At the 2001 summit, the Idea Network announced four projects: promoting affordable housing, improving air quality and reducing traffic congestion, increasing access to technology, and strengthening educational resources in East Austin.

The technology access project is called DigiKids and its objective is to improve educational achievement through home computer ownership for public school students in

Austin's low-income neighborhoods. As a start, DigiKids will provide computers and training to teachers in a given grade level, followed by students at that grade level. The Capital Area Training Foundation will train both students and teachers at its centers, thereby expanding its mission, which has been devoted to job training for adults.

The DigiKids project is in its formative stages, and funding remains unsettled. The Idea Network has calculated that to purchase computers for kids and teachers in one grade level in Austin public schools would cost between \$10 and \$15 million. For outside funding, the Idea Network will explore local and national foundations for funds, as well as wealthy individuals. Corporate sponsorship of classrooms or schools is another possibility.

### **ii. Austin Entrepreneurs Foundation**

The Austin Entrepreneurs Foundation (AEF) was established in 1999 to bring the concept of "equity philanthropy" to Central Texas. Spearheaded by Bill Bock, CEO of a local software company called Dazel, the idea was to channel funds from successful entrepreneurs to social causes. Bock initially had the idea for something like AEF in 1997, when a friend from the Austin Community Foundation suggested that he set up a family foundation. Bock had accumulated significant personal wealth as chief operating officer at Tivoli Systems, as CEO after IBM acquired Tivoli, and as CEO of Dazel, a software company whose products ensure the reliable delivery of information over electronic networks. Upon being pitched the idea of a family foundation, it occurred to Bock that many other successful entrepreneurs in Austin might be interested in family foundations, and that they might do more good if they were organized in some fashion.

At the same time, another Austin entrepreneur, Ingrid Vanderveldt, CEO of Dryken Technologies, was thinking of ways to help good causes. She asked her company's attorney to draw up the papers to give 1,000 shares of her company's stock to seven Austin nonprofits. The attorney, Paul Hurdlow, was aware of Bock's similar interests and suggested that the two meet. Because it was legally cumbersome and financially complex for nonprofits to manage gifts of equity shares, it was decided to establish the AEF to manage that process for start-up companies with philanthropic intentions.

The AEF now has about 100 members—a number that has contracted slightly as some dot-coms have shut their doors—and it has gained significant capital through initial public offerings or acquisition activity by member companies. One was Bill Bock's Dazel, which was purchased by Hewlett-Packard in 1999, generating \$120,000 for the AEF. Another member firm, Agere, was bought by Lucent, resulting in \$150,000 for AEF. These funds have been directed to Austin charities identified by the companies themselves; the AEF does not manage its own grant making.

The AEF's second function, which has grown in importance since the dot-com shakeout, is advising start-ups on how to manage their philanthropic impulses. The young founders of many start-ups simply lack information on philanthropic opportunities in the community; AEF executive director Paula Fracasso will help them identify opportunities. The AEF will also broker relationships between nonprofits and AEF member companies, for example by directing volunteers to causes that need them.

### **iii. The Digital Downtown**

Austin's long-standing tradition of environmental activism has combined with its recent ire at growing traffic congestion to create a movement for a "digital downtown," a technology district that would be home to New Economy companies, residential space, and a vibrant social scene. An early impetus for this movement came in 1996 when the city

asked a University of Texas professor to survey high-tech workers for their perspectives on Austin's livability. One striking finding was that many workers—particularly those identified as working in multimedia—said they would prefer to work downtown rather than in suburban Austin. At the same time, much of Austin's development was taking place to the west, an environmentally sensitive area that marks the beginning of the Texas Hill Country. Politically influential environmental activists were loudly arguing for limits to growth there.

Momentum for developing a digital downtown accelerated with the election in 1996 of Mayor Kirk Watson. A proponent of "smart growth"—packing business and residential development downtown—Watson also wanted to be responsive to Austin's environmentalists in the community and on the City Council. This meant, among other things, convincing high-tech companies to abandon a traditional preference for sprawling corporate campuses that had led to the rapid development of northwest Austin.

The digital downtown movement has scored a number of successes in Austin, in part because of \$52 million in incentives that the city has offered to three large corporate construction projects downtown. In 1999, Computer Sciences Corporation decided to put its headquarters in Austin's warehouse district along Town Lake's north shore. The \$161 million project will be home to 3,500 workers and be complete in 2002. The second large downtown corporate presence was slated to be a \$124 million chip-design facility for Intel Corporation. The final project in the triad was to be Vignette Corporation's headquarters building, which in November 2000 received City Council approval for \$25 million in incentives to build downtown.

The dot-com downturn has knocked two legs out of this three-legged stool. Intel put its facility on hold in mid-construction, leaving a skeleton of a building in downtown Austin—an eyesore that has irritated many citizens and public officials. Vignette, which employs 1,000 people in Austin and 2,500 worldwide, laid off about 15 percent of its workforce, prompting an indefinite delay indefinitely in construction of its new facility.

The "digital downtown" has not been oriented solely toward large companies. Small software and multimedia firms are increasingly locating downtown. The city also funds a business incubator designed to provide space and business services to multimedia entrepreneurs. This modest effort, funded at about \$30,000 per year but matched with in-kind contributions from the University of Texas, has resulted in several business successes from incubator graduates. As an added stimulus, the city has turned over the former municipal airport to the film industry. The Austin Film Society will renovate old hangars to provide sound stages and offices for multimedia companies. The objective is to make Austin more desirable for both local and out-of-town filmmakers to shoot in Central Texas.

An unavoidable lesson of Austin's digital downtown experience is the fragility of its dreams. Beyond the effect of the slowdown in the Internet economy on Intel and Vignette, the city's plans also relied on the building of a light rail system to ease automobile congestion downtown. Austin voters rejected a referendum to build light rail by a 2,000-vote margin in November 2000. For a variety of reasons, then, Austin's digital downtown may take longer than anticipated to come online.

### **C. The Internet and Social Capital in Austin**

Austin is blessed with two indispensable elements when it comes to using the Internet for community purposes: ambition and resources. A tradition of community activism, a progressive city government, a core of skilled technology professionals, and riches from electronics and dot-com successes have combined to make Austin a place where the number of Internet-related undertakings is startling. With the Austin Free-Net at the center, other

initiatives—often unconnected to one another—have fanned out, such as the Austin Learning Academy and the Capital Area Training Foundation. Help from all levels of government—city, federal, and state—and numerous volunteer efforts have exposed a lot of low-income people in Austin to the Internet, and the Austin Idea Network and the Austin Entrepreneurs Foundation hold the potential to bring enormous resources to this group.

Austin's exploitation of the Internet has focused on access rather than content, a surprising finding in light of the city's substantial Internet resources. The CATF is mainly about increasing the supply of high-tech workers through computer and Internet literacy. The Austin Free-Net is one of the oldest and most expansive access projects among the five cities. DigiKids has access as its main goal, along with home-school communication between families and teachers. Access is a laudable goal in each case, but content creation is very much on the periphery.

One reason for the comparative lack of emphasis on content in Austin is that infrastructure for community development there is not as well developed as in other places studied. There are relatively few community development corporations in Austin, and they do not appear to have a strong role in public debate. Cleveland's T2K and Portland's Bureau of Housing have partnered with community nonprofits to develop content for improved service delivery. This simply has not happened in Austin, due mainly to lack of community infrastructure to reach into the low-income housing community.

Still, Austin is not completely lacking in efforts to spur Internet content. The Austin Learning Academy's "family learning model" builds Internet competency in part through the creation of Web pages by ALA's clients. On the business side, the hoped-for "digital downtown" looks to multimedia firms to create a vibrant central city economy. Austin's traditional electronics manufacturing high-tech base is diversifying into software development, suggesting that programs to develop multimedia firms hold real promise. Of course, much depends on capital availability. Although Austin has a core of homegrown venture capitalists, the dot-com downturn has dampened investment in Internet companies.

Overall, Austin represents the huge potential and likely challenges in putting the Internet to work for community purposes. If social capital is thought to be broadly in decline in America, one would expect a city enjoying an Internet-driven boom and an influx of young people to demonstrate little interest in things that could even loosely be classified as social capital. Young people tend to be less civically engaged than older ones, and the flat-out mentality of the dot-com business culture leaves little time for anything other than work. However, with the Austin Idea Network and the Austin Entrepreneurs Foundation, the commitment to community building in Austin is notable. The objective that connects dot-com riches to Austin's east-side, low-income community is ambitious indeed.

Even in the midst of plenty and with the commitment of high-tech entrepreneurs to community causes, profound cultural differences in Austin make realizing the city's ambitions a huge challenge. The divide between East Austin and the more prosperous west side has strong historical roots. This divide will not vanish because a coalition of high-tech executives issues a "Declaration of Interdependence." It is likely to take considerable effort to effect long-term change in Austin's low-income communities. Initiatives such as the Idea Network or the Austin Entrepreneurs Foundation are necessary but not sufficient for accomplishing the far-reaching goals articulated by the coalitions.

## IV. CLEVELAND

Cleveland, though not known as a hotbed of Internet activity, is taking some innovative approaches to using the Internet for economic and social purposes. Most prominently, the city is using approximately \$3 million in revenue from cable fees to subsidize Internet access and computer training through community development corporations (CDCs). A number of CDCs have provided Internet access in low-income neighborhoods for several years, so an infrastructure exists for putting that money to use. Additionally, providers of affordable housing are starting to use the Internet to improve service and to promote Internet access among residents.

Economically, Cleveland is not as entrepreneurial as other cities when it comes to dot-com start-ups; its economy has traditionally been dominated by large manufacturing firms. But the Cleveland area sees a great opportunity in the New Economy in using the Internet for business-to-business electronic commerce. Cleveland's business leaders believe the city can exploit its knowledge of manufacturing to develop ecommerce business plans that address inefficiencies in manufacturing operations.

Two other factors bode well for Cleveland in the New Economy: software and bandwidth. Cleveland has a surprisingly strong cluster of software developers, with over 2,000 software companies in the region. The Northeast Ohio Software Association (NEOSA) has 325 members, and the Cleveland Area Growth Association has identified software as one of the keys to the region's economic future. As for bandwidth, Cleveland's abundance has taken city leaders almost by surprise. Because major railroads run through Cleveland, and because railroad rights-of-way are used to run fiber cable, an enormous amount of bandwidth runs through the city. This has led to the growth of a number of "telehotels" in Cleveland--buildings that house telecommunications switching equipment linking the customers of telecom providers to high-speed data transmission infrastructure. The presence of bandwidth presents an economic opportunity to attract firms that need high-speed links, although as in Portland there have been concerns about the impact of telehotels on Cleveland's downtown.

### **A. The Internet and the Community**

Cleveland has a long history of using the Internet for community purposes. The National Telecomputing Public Network, a movement designed to provide free dial-up access to online resources, got its start in Cleveland, and the Cleveland Free-Net was founded in 1986, well before the Worldwide Web. At its height, 10,000 people used the Free-Net, which was run by Cleveland State University. The Cleveland Free-Net closed in 1999 because the cost of making it Y2K compliant made its continued existence unfeasible. Although it never developed a critical mass of community content or made strong inroads into the low-income community, it provided email access to many people who otherwise would not have had it. Many of these individuals later became active in today's community computing activism in Cleveland.

Cleveland currently has several initiatives aimed at providing Internet access to the low-income community and improving the computing capacity of nonprofits. In 1994, a settlement in a regulatory case before the Public Utility Commission of Ohio required the local Bell operating company, Ameritech, to provide funds for community access to the Internet. This set in motion two major efforts to put the Internet to use for the low-income

community. First was networking nonprofit organizations in Cleveland that provide services to low-income people. The second was providing computer and Internet access and training directly to low-income individuals.

### **i. Wiring Nonprofits**

Neighborhood Link, operated out of Cleveland State University, is a partnership of Cleveland State, the City of Cleveland, the Cleveland Public Library, the Neighborhood Centers Association, and Ameritech. The goal of Neighborhood Link is to promote economic growth in Cleveland through communitywide access to government information and through enhancing the delivery of government and social services. One of its priorities is connecting community development corporations to the Internet. As of mid-1999, only about 15 percent of CDCs in Cleveland had Internet access, and frequently there was only one email address for the entire staff. Equipment was of poor quality and CDCs had little technical support for training and troubleshooting.

The preeminent program to link Cleveland's 49 CDCs is the T2K initiative, located at [www.T2K.org](http://www.T2K.org) on the Web, which links CDCs to potential funders and helps improve service delivery to clients. A wide range of partners beyond Neighborhood Link, including The Enterprise Foundation and the Cleveland Housing Network, drives T2K. Half of the funding for the development of T2K came from a 1999 grant of \$525,000 from the U.S. Department of Commerce's Technology Opportunities Program (TOP). T2K software is designed to provide a one-stop shopping screen for social service providers in determining which services are available for their clients, and T2K also tracks affordable housing inventory. Because pictures of housing units are posted, social workers can discern whether they are suitable to clients' needs. The T2K software also allows affordable housing providers to update the housing database. Housing providers have every incentive to do this, since promptly removing a filled listing reduces unwanted phone calls and posting new listings gets a paying tenant into the unit quickly.

A final benefit of T2K is easing reporting by community organizations to funders. Many CDCs in Cleveland receive federal funding from the Community Development Block Grant (CDBG) program. Reporting to city officials granting CDBG funds can be burdensome, so automating it online can save significant time for CDCs.

One CDC in Cleveland, the Westtown CDC, received a grant from the Enterprise Foundation two years ago and has added computers for staff, thus improving operating efficiencies: Westtown can now train staff online and look for funding more easily. The Internet also allows Westtown to find low-interest loans for housing rehabilitation. Another benefit of the Internet for nonprofits is institutional memory. CDCs often have high staff turnover, and archiving case histories and common forms can help new staff get up to speed quickly. As Westtown CDC director Lou Tisler put it, CDCs generally have been under pressure to operate in a more business-like fashion in recent years, and Internet access is part of the drive for tighter internal management practices.

### **ii. The Internet in Low-Income Neighborhoods**

Like most cities, Cleveland has a well-developed system of public access points for the Internet. Between CDCs and access points in the library system, there are approximately 150 computers with Internet access publicly available throughout the city. However, mere access to the Internet is usually not thought to be sufficient in encouraging extensive Internet use, particularly in low-income neighborhoods. Models for rolling out the Internet to the underserved remain unsettled around the country.

In Cleveland, Bill Callahan of the West Side CDC is the most prominent community-computing activist, and he has clear ideas about the Internet's role in a community. The explicit goals behind his programs are to increase community activism, provide greater economic opportunity for individuals, and improve communication within his community. Callahan proceeds from the premise that there is no reason to think that low-income people learn about the Internet any differently from higher-income people. The latter might have first gotten Internet access at work or at a university. Low-income people learn about the Internet from family and friends and, most important, must have a good reason to go online.

Although Callahan hopes that Internet access will eventually lead to community activism, his immediate goal is to provide job skills. Some of this involves formal training, but Callahan believes that making the Internet part of the fabric of the community is necessary as well. In the Stockyards neighborhood, people tinker with cars; it is a social phenomenon, as people gather together to fix up an old car. It is also an economic phenomenon, as the neighborhood's informal economy revolves around lots of car "fix it" businesses that bring in extra cash. Callahan wants people to be as comfortable going online as they are with opening the hood of their car; by giving people enough training, he hopes to foster a culture of computer tinkering in the Stockyards. Callahan was the "community help desk" when he introduced computers to his community center five years ago; people with home computers turned to him because they felt he was the most knowledgeable person around. Today, residents know of several other people they can turn to for technical help.

At the Westtown Community Development Corporation, computers have been part of the mission for the past 18 months. According to Westtown CDC Director Lou Tisler, it has been slow going. The neighborhood is largely elderly and working class; some people—often older ones—are afraid of the technology, and others, often younger, simply do not see why the Internet and computers are important to them. But as Westtown has obtained more computers, interest has grown. Computer and Internet training are available, and at least one person nearby runs a Web design business out of his home. In 2001, Tisler hopes to expand Westtown's after-school computer program for kids and build upon a small core of highly engaged senior citizens who use the Internet.

Asked how the Internet has affected their communities, Callahan and Tisler said it has brought new people into their community centers. This, in turn, has fostered new relationships. Many people exhibit genuine excitement about the Internet and some are using it to make extra money, although Callahan emphasizes that a key goal is to have people certified in programming or computer repair to permanently increase their employment prospects. Some of the early Internet activities in Cleveland neighborhoods amount to people emailing their neighbors. But, says Callahan, anything that increases communication among people in the neighborhood is bound to be beneficial.

### **iii. The Digital Vision Coalition**

In October 2000, the Cleveland City Council took action to address the issue of long-term funding for community computing projects in Cleveland. Adelphia Communications' acquisition of Cablevision Systems, which had been the main cable operator in Cleveland, required the transfer of the city-granted franchise from Cablevision to Adelphia. Under the terms of the transfer, Adelphia will donate \$5.5 million to the City, \$1 million for the city channel that broadcast council and other public meetings, \$1.5 million to a minority affairs station, and \$3 million for computer access centers. According to Michael O'Malley, the council member who took the lead on the computer access provision, Callahan's West Side



Community Computer Center is the model for programs to be funded under the plan. The Cleveland Foundation will administer the \$3 million fund.

The Council's action was the outgrowth of lobbying by Digital Vision, a group of community activists who see computer access as a way to address economic inequality. The specific proposal for channeling a portion of cable access fees to community access projects came from a conference in early 2000 that brought together community leaders and national specialists in community technology access.

The notion of using cable franchise fees for community purposes is not unique (Servon, 1999). However, the action is notable for Cleveland, where until recently City Hall has paid little attention to the digital divide and the Internet. The city lacks a unified domain name for city workers' email addresses, and department Web pages are little more than brochures and directories. The Digital Vision coalition has stimulated new debate in the city and is in a position to build bridges between low-income neighborhoods and the traditional economic development community. Since the success on cable fees, Digital Vision has worked with the Cleveland Growth Association (essentially the chamber of commerce) to run computer boot camps to train people without degrees for jobs in the technology sector.

## **B. The Internet and Cleveland's Economy**

Cleveland has had few dot-com start-ups, but the city believes it is well positioned to be a smart close follower as the Internet matures. According to a survey conducted by Ecom-Ohio, only about 15 percent of Ohio businesses had a Web site in November 1999, placing Cleveland below the national average. As one regional business magazine put it, there is a fear in the area that "a lot of companies are turning a deaf ear to the Internet's siren song." However, the past year has seen a number of initiatives to hasten Cleveland's transition to the New Economy. Among economic development officials, there is widespread agreement that Cleveland's large companies finally "get it" about the reality of the New Economy.

In particular, Cleveland sees opportunities in business-to-business electronic commerce. Economic development officials are fond of quoting a February 2000 report from Forrester Research that says:

"Business-to-business [electronic] trade isn't growing up in high-tech centers like Silicon Valley; it's developing in industrial hubs like Cleveland and Detroit. As B2B trade expands, there will be a flight of talent and venture capital money to support these efforts, leaving the coasts feeling a bit of a frost—while middle America experiences the Internet boom in 2001."

With intimate knowledge of manufacturing systems and where their inefficiencies are, Cleveland foresees developing a cluster of ecommerce vendors to serve large manufacturers such as Eaton, TRW, and Ford. Between "entrepreneur boot camps," establishment of networks of angel financiers for start-ups, technology incubators, and telehotels, Cleveland is optimistically playing catch-up in the New Economy.

### **i. Creating an Entrepreneurial Environment**

Cleveland's strategy in adapting to the New Economy centers on exploiting its existing economic assets and improving the climate for business start-ups. At a conference at Case Western Reserve University in early 1999, economic development officials and representatives from the private sector acknowledged that Cleveland has lagged behind the national norm in many measures of the New Economy. When it comes to initial public offerings (IPOs), Cleveland ranked 18<sup>th</sup> nationally from 1988 to 1996, compared with its population rank of 14<sup>th</sup>, and only one of the thirty-nine IPOs was related to the computer

industry. Moreover, the Cleveland-Akron area ranks below the national average in educational attainment. While there are prestigious universities in the area and throughout the state, Cleveland has a difficult time keeping young brains at home. A challenge to reversing these trends is the state's fragmented civic leadership; as Roderick Chu, the chancellor of Ohio State University, observed "there is no *state* of Ohio" that might move in concert to facilitate economic change.

Notwithstanding these statewide issues, leaders of Cleveland's business community are searching for ways to promote greater entrepreneurial spirit in the region. One initiative is the Seed Capital Initiative spearheaded by the Northeast Ohio Software Association (NEOSA). The objective is to bring wealthy individuals in the Cleveland area interested in investing in start-ups together with New Economy entrepreneurs looking for funding. A challenge to this sort of matchmaking is the gulf between established wealth and New Economy businesspeople. Much of Cleveland's wealth has come from manufacturing tangible goods; people in this sector are more inclined to invest in businesses they understand, not dot.com start-ups whose business models are radically different from their business experience. Boake Sells, former head of the Revco drugstore chain, has invested in several dot.com start-ups, but he says he is hesitant to invest when business plans are sent to him because he lacks expertise in assessing them (Crain's, May 15-21, 2000). Sells acknowledges that there is not yet a critical mass of angel investors for the New Economy in Cleveland. Angel networks usually build on the success of a few highly successful start-ups; absent those successes, it is difficult to set the investment cycle in motion.

In addition to the Seed Capital Initiative, NEOSA has sponsored an "EntrepreNerd Boot Camp" to give potential entrepreneurs the tools to bring technology ideas to the market. Entrepreneurs often do not have the business skills to match their technical prowess, and the boot camp provides information on how to develop a business plan, how to manage a growing business, how to develop partnerships with other businesses, and where to find capital to start the business. NEOSA also sponsors a regular happy hour open to interested businesspeople. The monthly "Tech Thursday" gathering is supplemented by a monthly "New Horizons" breakfast meeting that is devoted to specific topics, such as sales and marketing for start-up firms.

NEOSA is not the sole focal point for entrepreneurial promotion in northeast Ohio. In Lorain County, just west of Cleveland and part of the metro area, the Lorain County Community College (LCCC) has established a technology incubator that college officials hope will serve as the county's presence in the New Economy. Lorain County's "Digital Economy Task Force" is chaired by LCCC's president Roy Church, and the Great Lakes Technology Park will provide a place to nurture business ideas while also providing job opportunities for LCCC students. LCCC has invested \$6 million in an engineering, training, and development center for faculty and students. The technology park will be a 57-acre site south of the college to house emerging information technology businesses. At any given time, the incubator will house eight to ten companies, with companies moving out as they mature.

The LCCC incubator will not operate in isolation; indeed Church recognizes that such a strategy would be self-defeating. The Great Lakes Technology Incubator will market itself jointly with NEOSA, which already has established channels to software entrepreneurs in northeast Ohio. The incubator will also work with large companies that may have business ideas that are promising but so peripheral to their core businesses that they want to spin

them off. Because the state has well-developed economic development programs, the incubator will coordinate with state programs such as the Thomas Edison Centers.<sup>7</sup> Finally, the incubator will link its tenants to venture capital. This includes not only NEOSA's seed capital initiative, but other sources around the state as well.

A tension in Cleveland's efforts is that the New Economy moves quickly, while the development of a region's entrepreneurial spirit takes time and patience. In Silicon Valley, for instance, one of the hallmarks of the region's entrepreneurialism is a high tolerance for failure. Whether a region dominated by fairly conservative manufacturing firms can adapt to the pace and spirit of the New Economy is an open question. Cleveland's efforts, while promising, would benefit from a big dot.com success to accelerate the pace of adjustment.

## **Box 2**

### **Telehotels: Hubs in the Information Economy**

As consumer and business demand for Internet service grows, cities are starting to be affected by the infrastructure requirements of the networks that run the Internet. One prominent phenomenon is the telehotel, is a facility that houses switches, routers, and servers for telecommunications carriers or Internet service providers. Telehotels are not quite on-ramps to the information superhighway; they are more like airports, which provide gates where airlines collect and discharge passengers. Like airlines, different types of "data movers" demand different numbers of gates. A large telecommunications carrier such as AT&T or MCI might have sufficient demand to build its own airport—a telehotel just for itself. An Internet service provider might only need a few gates, or rooms at the telehotel, to route traffic onto high-speed trunk lines. A dot-com that ships content over the Internet might need to rent only a small amount of space.

If not built by large telecom carriers, telehotels are frequently conceived as real estate projects. That is, real estate developers purchase an existing office building, retrofit it to house telecommunications equipment, and then rent space to telecom carriers, ISPs, or other companies. Real estate developers are banking on the Internet axiom that data traffic will expand to fill existing bandwidth capacity. The hope is that Internet companies, whether business-to-business or business-to-consumer, will choose to locate near telehotels, or that non-Internet firms with large data needs (e.g. financial institutions) will set up operations nearby.

Telehotels are an urban phenomenon because they need to be located near abundant bandwidth. The reasons are technical; communication signals degrade over distance, so they need the boost a switch provides. Telehotels also require a lot of space, buildings with high ceilings and sturdy construction, excellent cooling systems, and plentiful and reliable electric power. Old department stores fit this bill nicely. They are spacious, with high ceilings and wide-open floor space, and are fairly easy to retrofit as homes for communications equipment.

While there is no established geography of telehotels yet, they are springing up in major U.S. cities such as Chicago, Boston, Los Angeles, New York, Washington, D.C., and San Francisco. Smaller markets such as Atlanta, Baltimore, Cleveland, Phoenix, Portland, and Seattle have also experienced a surge of development. Because telehotels

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<sup>7</sup> Established in 1983 to encourage the use of technology in the Ohio manufacturing economy, the incubator will try to complement the center's focus areas, which, in the Cleveland area, include biotechnology and manufacturing technology.

put to use buildings that have sometimes been abandoned for years, many hail them as a way to revive underused buildings while serving as a magnet for New Economy firms. Some are less sanguine, worrying that buildings filled with humming telecom equipment will populate parts of downtowns and disrupt street life with noisy electric generators. Telehotels, it is feared, will exhibit few signs of life and take up scarce office and residential space.

### **ii. Cleveland's Telehotels**

One resource that has made Cleveland an attractive place for telehotels is the gold mine of bandwidth that runs through the city. Cleveland has long been a hub for railroads, and the railroad right-of-way that passes through the city contains an enormous amount of bandwidth. According to the Ohio Supercomputer Center, 50,500 megabits per second of bandwidth are available in Cleveland/Akron area, more than twice the combined bandwidth available in Dayton, Cincinnati, Columbus, and Toledo. This abundance first became evident to city leaders when a fiber cable whose capacity was 40 gigabits of data was accidentally cut near Cleveland in September 1999. The cut slowed data transmission speed dramatically between the East and West Coasts, and effectively shut down the networks of some companies and ISPs.

Although city officials were unaware of their bounty, the private sector was not. By early 2000 several telehotels were under development downtown, some of them in former department stores. One of the first conversions was the May Company building, an old building near Cleveland's Public Square. Because of the building's picturesque façade, the May Company conversion set off some alarms in City Hall, as there were concerns that the building's beauty would attract attention to the fact that it lacked any commercial activity. To address this, the Council passed an ordinance aimed at telehotels that required the first floor of downtown buildings to set aside space for retail storefronts. Another prominent telehotel conversion is the upper eight floors of the building that houses Dillard's Department store on Cleveland's Public Square. Dillard's maintains operations on the bottom floors, so the site already complies with the Council ordinance. Several other telecom hotels are under development in Cleveland, some downtown and one on the outskirts of the city.

As an economic development tool, officials at the Cleveland Area Growth Association see telehotels as a way to make Cleveland more attractive to New Economy firms that require bandwidth. By themselves, however, telecom hotels have prompted some anxiety within Cleveland. First, they do not generate many new jobs on their own; it takes a modest number of employees to keep floors of telecom and computer equipment online. Second, telecom hotels are huge consumers of electric power, mostly to cool the buildings so the switching equipment can run properly, and onsite generators are very noisy. Finally, there is concern over the "build it and they will come" approach to telehotel development. Some telehotels are built on speculation; if projected demand does not occur, large buildings with idle telecom equipment may adorn the downtown. However, if Cleveland does become a center for business-to-business ecommerce, telecom hotels will be vital infrastructure for business development. In the meantime, long-abandoned buildings are being purchased at a premium and space is being rented out at \$16 to \$20 per square foot, more than the going rate of \$10 to \$13 for office space or \$5 per square foot in industrial buildings.

### **iii. Business-to-Business Ecommerce**

Established manufacturers in Cleveland in the chemical, steel, and automotive sector have made forays into the business-to-business ecommerce sector. In each case, the ecommerce business plan aims at reducing inefficiencies in the supply chain while also providing a “many buyers/many sellers” environment in which stiff price competition lowers procurement costs for participants in the electronic exchange. In the steel industry, eWinWin, Inc., was founded in Cleveland with online DealRooms in which suppliers invite potential buyers to review products and negotiate over price. The firm initially included 40 companies from northeast Ohio; the goal is to expand to include the roughly 400 companies in the Steel Service Center Institute trade association.

Among chemical companies, Geon Corporation, a major polymer manufacturer in Cleveland, has set up GetGeon.com to serve as an ecommerce site for its industrial customers. Its main attraction is automated ordering and order filling, and in its first three months, GetGeon.com processed \$10 million in orders. Finally, for automotive suppliers in the area, TRW, Inc., and Eaton, major manufacturers headquartered in Cleveland, have initiated a study to examine how electronic commerce might improve supply-chain management and quicken product delivery.

The hope is that these initiatives will create first-mover advantages for Cleveland manufacturers in specific ecommerce areas. If eWinWin becomes the standard for electronic exchanges in the steel world, then Cleveland suppliers may benefit disproportionately. Going further out in the supply chain will present a different challenge for small manufacturers. There are hundreds of small “mom and pop” suppliers in Cleveland in a wide variety of manufacturing sectors. Not all are online, but the number is growing. In a survey conducted by Cleveland’s Council of Smaller Enterprises (COSE), 45 percent of small businesses in Cleveland had a Web site by the first quarter of 2000, a small increase (from 43 percent) from a year earlier. Among goods producers, however, the growth was substantial, with 54 percent reporting having Web sites in 2000, up from 36 percent the prior year. This does not mean that small goods producers are conducting online sales; in fact, only 22 percent sell over the Internet. However, this represents a dramatic increase from the 1999 figure of only 6 percent.

### **C. The Internet and Social Capital in Cleveland**

Cleveland has achieved solid successes in altering foot traffic in the city to take advantage of Internet opportunities in the community and economic arenas. Bill Callahan’s vision of what the Internet can do for the Stockyards area is squarely about using the Internet as a magnet for people to come to his CDC with civic goals in mind. With the \$3 million in City funds, Callahan hopes to replicate his initiatives throughout the city. All in all, in the community arena, the catalytic effect of the Internet is strong in Cleveland, with the Digital Vision coalition serving as an ongoing forum to strengthen the social networks that the Internet has helped to stimulate.

In the economic development community, the “foot traffic” effect is manifest in attempts to create a stronger entrepreneurial spirit in Cleveland. NEOSA and the Lorain County Community college business incubator have spearheaded these efforts, but changing a region’s business culture is a long-term challenge. Cleveland’s manufacturing base and conservative outlook on business start-ups are bound to loom large in the area for some time. But tailoring dot-com promotional activities to business-to-business ecommerce is certainly a sensible strategy. Whether this economic development strategy pays off depends on a lot of things that Cleveland’s leaders do not control, such as capital availability for

Internet start-ups. Nonetheless, the prospect of dot-com pay-offs has brought together Cleveland's business community in new ways.

Content development—the more advanced manifestation of the connection between the Internet and social capital—has come into play in some important ways in Cleveland. In the affordable housing community, the T2K project is a content-driven portal that helps nonprofits take aim at inefficiencies in the delivery of housing services. A long-term goal of Bill Callahan's Internet access project in the Stockyard area is to make the Internet a prominent enough part of the neighborhood so that people start to create content. On the economic side, there has been little in the way of content development in the form of Internet start-ups, although that is the clear goal of the Lorain County business incubator and the Cleveland Growth Association's emphasis on business-to-business ecommerce.

At present, however, the whole of Cleveland's efforts does not seem equal to the sum of its parts. One reason is that nearly all of the initiatives profiled here are in their infant stages. It will simply take time to see if any surprising synergies arise in the community from these undertakings. One missing ingredient, according to a number of people involved with community computing, is strong leadership from City Hall. As one measure of Cleveland's lack of engagement with the Internet, by fall 2001 there was still no standard domain name for emailing City employees, and there seems to be strong consensus that the City has lagged in considering ways to use the Internet to improve service or provide information to citizens online. Even with the promising initiatives among community activists and economic development proponents, more active leadership from the City is a missing ingredient that, if added to the mix, could add momentum to Internet efforts in Cleveland.

## V. WASHINGTON, D.C.

Washington, D.C., is in some ways the latecomer among the five cities studied when it comes to adapting to the Internet, but that does not mean that citizens and government officials have not been aggressive in pursuing Internet opportunities. The city is actively trying to promote dot-com development downtown through networks of entrepreneurs who are linked to venture capitalists. And as in several of the other cities, planners are trying to develop a hip, artsy downtown district that will serve as a magnet for young people with dot-com business ideas. The area is known as NoMa, for an area north of Massachusetts Avenue near Union Station. City government is also moving to provide financial incentives for dot-com and other technology companies locating in the District of Columbia.

At the community level, the city boasts a large number of projects devoted to bringing Internet and computer access to low-income people. Several have received funding from the U.S. Department of Commerce's Technology Opportunities Program; others have foundation funding. Some focus on job training while others are more broadly educational. The city government has not been active in funding community Internet projects, but the Metropolitan Washington Council of Governments has a "Digital Divide Task Force" whose objective is to catalog existing computer and Internet literacy projects and explore where gaps exist.

Washington's case is unique in that it is a distinct governmental unit surrounded by suburban Maryland and Virginia, both of which are affluent centers of vibrant New Economy business activity. This section concentrates solely on the District.

### A. The Internet and the Community

Like most of the cities studied, Washington has a variety of initiatives designed to make the Internet available to low-income people. These initiatives have different focuses. One is devoted mainly to job training, another to integrating the Internet into a charter school for troubled kids, and another to bringing the Internet into the homes of residents of low-income housing.

#### a. See Forever Foundation

In Washington's Shaw neighborhood, the See Forever Foundation has established the Maya Angelou Public Charter School as a way to reach at-risk kids who have not been well served by the public school system. Technology plays a large role in the curriculum; the school has about 50 computers on site and 20 in a central lab that serves as a classroom. The school is also trying to serve the Shaw community by introducing the Internet to nonprofits and senior citizens in the neighborhood.

The school serves approximately 80 students, most of whom have had trouble with the law. Many had dropped out of school. About 20 percent live at the school, and school days are long—from 9 a.m. to 8 p.m. In addition to providing students essential course work, the school also offers practical exposure to real-world employment. At the school's "Student Tech Center," students teach parents and siblings computer and Internet skills and engage in graphic design projects for neighborhood clients. Students are paid for teaching and receive evaluations of their work.

The location and design of the building that houses the school are important parts of its mission. Originally started as an after-school tutoring program, See Forever for a while

operated in a public school building. It needed its own facility to operate as a charter school, so See Forever chose to renovate a building in the Shaw neighborhood, long known as a center of the District's drug trade. Maya Angelou Co-Principal David Domenici wanted to renovate a building that students and neighborhood residents could have pride in; he also wanted to create a "technology storefront" feel, so people in the neighborhood would avail themselves of the technology classes offered.

Initially, Shaw residents disliked the prospect of a school that served kids who had had run-ins with the law. However, students and school staff have reached out to the community, and there has been steady growth in attendance at computer classes and use of the school's computers by residents. This has done much to improve the school's reputation.

In a more systematic fashion, the school is developing ShawNet, a wide-area network and Web-hosting site for area small businesses and nonprofits. The project will cost \$900,000, with \$395,000 coming from the U.S. Department of Commerce's Technology Opportunities Program. The project puts students' skills to practical use as they perform a service for the nonprofits. This initiative has had a slow start. Nonprofits' resources are thinly spread, and Internet access is limited. But in the three years supported by the TOP grant, See Forever hopes to get 50 nonprofits on the Web and 50 small businesses as well.

The other goal of the grant is to encourage Internet access among senior citizens through the "Back Pack Technology Program," in which Maya Angelou students will take laptop computers to seniors and provide Internet training. Over the longer term, students will help interested seniors buy home computers and set up Internet access.

#### **b. Byte Back**

Byte Back is a Washington, D.C., nonprofit with a small paid staff, many volunteers, and a presence in numerous-community based organizations. It offers two types of training to District residents. The first is basic computer and Internet literacy. As of spring 2001, Byte Back courses were available at nine sites throughout the city, ranging from Byte Back headquarters near Catholic University to a family center in a housing project, several churches, a Boys and Girls club, and a Catholic Charities facility. Classes are usually limited to about 10 people, and students pay nominal fees--\$10 for introductory courses and \$25 for more advanced ones such as Power Point or HTML. In spring 2001, 560 students were participating in 70 courses and more than 2,000 people had passed through one of these classes since Byte Back was founded.

The second type of training is a yearlong program for what Byte Back calls its "interns," designed to give them the advanced training necessary to gain employment in the information technology industry. Interns "test in" to the program based on pre-existing computer aptitude or on skills gained in basic Byte Back courses. They commit 30 hours a week to the program: ten hours of class time, ten hours of homework, and ten hours of service, which can include technical support or teaching. Interns, of whom there are 40 at a time, also attend bi-monthly community meetings.

Volunteers serve as another pillar of Byte Back's organizational approach. Through word of mouth and postings in church bulletins, Byte Back has a corps of computer and Internet professionals who teach Byte Back classes to walk-ins or interns. This gives interns valuable contacts to professionals whose companies may be hiring.

Like many organizations that provide computer and Internet training to low-income people, Byte Back has to cope with high demand for its services, which in turn means rapid organizational growth. Interns whose primary interest lies in computer programming have



to deal with administrative issues as more people sign up for courses. Byte Back hopes that its model can be replicated in other cities; if so, similar organizations will have to handle growth effectively.

**c. Edgewood Terrace's EdgeNet**

Northeast Washington's Edgewood Terrace housing development represents an ambitious and well-publicized effort to transform once run-down apartment units into a vibrant and wired community. The Community Preservation Development Corporation (CPDC) purchased the low-income public housing development in 1993 from the U.S. Department of Housing and Urban Development. CPDC set out to create a community with on-site amenities such as after school programs for kids, adult education classes, and Internet access. The innovative part of the plan was to provide Internet access in residents' apartments along with a portal and intranet known as EdgeNet. To date, CPDC's overall plans have unfolded well, although in-home Internet access has hit some technical snags.

Edgewood Terrace has 884 apartments on a 16-acre site, and its courtyard once housed an open-air narcotics market. After redevelopment, Edgewood Terrace has become a mixed-income community with an average annual household income of \$35,000. Early in planning, CPDC saw Edgewood as an opportunity to use computer technology to improve the community. Since the units were to be completely refurbished, CPDC decided to wire the buildings and apartments with high-speed communications infrastructure—T-1 lines into buildings and fiber-optic cables to each floor. A project such as this takes time. CPDC will begin in the summer of 2001 the refurbishment of the final 200 units of Edgewood. This means that 592 apartments will have been retrofitted with broadband connections. However, due to technical problems, only 140 units have Internet terminals.

When Edgewood reopened in 1995, CPDC immediately started offering computer training to residents. By 1998, Edgewood's learning center had opened, offering more classes and Internet access. Today, about 150 adults per year pass through the learning center's 16-week training programs in computing and Internet skills. The course's objectives are to prepare students for entry-level jobs in areas such as Web page design. The results appear to be good; because of vocational assessments of applicants for the classes, students admitted have strong aptitudes for the courses. Job retention rates are high; approximately three-quarters of the students are working at the same job six months after starting. And not all students are Edgewood residents; today, about 90 percent of students in the workforce training programs come from the neighborhood surrounding Edgewood.

Edgewood also has extensive computer and Internet programs for kids aimed at helping them perform better in school. CPDC is opening a new "experiential learning center" in the summer of 2001 for kids and families, and there are plans for an "Edgewood News" program to be produced by students and Web cast on EdgeNet. The learning center will also have a cyber café

The path to home Internet access has been rocky at times. Any Edgewood resident is eligible for a terminal as long as he or she pays a \$24 fee for admittance to the Edgewood technology advisory board (ETAB) and undergoes a 45-minute orientation session. The ETAB was established to give residents a strong voice with CPDC management about the program. About 18 months ago, in-home Internet access became a reality for about 30 Edgewood residents—the development's "beta" testers. However, seven months after the 30 residents were wired, the network started experiencing frequent crashes. CPDC spent money to solve the problems, but during the process the entire ETAB board resigned (many were later persuaded to return). Progress was set back, but rollout of terminals in homes

continues. As of late Spring 2001, 140 of 592 units have Internet access and CPDC's goal is to have terminals in 400 units by the end of the summer.

The ambitious scope of Edgewood Terrace, along with its presence in the nation's capital, has made it a focal point for publicity. Many politicians have visited Edgewood and many technology companies have showcased their technology there, to the benefit of the community. For six months, Microsoft ran a commercial that identified Edgewood by name, showing residents using computers and Microsoft software. The attention Edgewood has attracted has, on balance, been a good thing for the community, but it has also been something of a distraction to CPDC management. Now the surge of publicity has run its course, CPDC management seems to be heaving a sigh of relief.

As with other community access projects profiled in this report, Edgewood has benefited from a TOP grant from the U.S. Department of Commerce. The \$500,000 grant was used to purchase much of the technical infrastructure for the project, such as the new server and switches. The CPDC also received grants from HUD's Neighborhood Networks program. Edgewood has received limited support from District government, mostly in grants from D.C.'s Department of Employment Services for work-force training programs. With only one quarter of current residents having Internet access in the home, it is too early to assess the Internet's impact on the community. But CPDC's investments in improving Edgewood has made the community a much better place to live.

One part of CPDC's approach that seems worthy of emulation is the ETAB. This gives residents a voice in how CPDC's technology plans will unfold and, as evidenced by the protest over the network's technical problems, the ETAB is a focal point for community dialog. The resignations from the ETAB obviously signaled great dissatisfaction over CPDC's management of the network, but as a forum for protest it gave the community a chance to participate in addressing the problems.

## **B. The Internet and Washington's Economy**

The economic prospects for the District of Columbia and its surroundings are very bright. *Fortune* magazine rates the District and its suburbs as one of America's top five large cities in which to do business, and the software and Internet start-ups in Virginia and the biotechnology industry in Maryland have added to the area's tech reputation. Inside the District, a solid though limited network of Internet start-ups has developed. The Federal government dominates D.C.'s business climate, and this brings stability to the city's economy. However, the District's reputation as a government town has not helped entrepreneurship. A recent study of regional economies rated the D.C. area high in most New Economy areas, but fairly low—31 out of 50—when it came to the entrepreneurial environment. Many of the New Economy initiatives are aimed at addressing the city's weaknesses relative to its suburbs.

### **a. North of Massachusetts Avenue (NoMa)**

The District of Columbia's NoMa project is in an ambitious initiative that is trying to bring to life a barren section of downtown Washington by using the arts and new media companies for redevelopment. The initial impetus for NoMa was a grant from the D.C. Housing Authority to the Cultural Development Corporation to study the possibility of an arts district in the city. The goal is to make the District more attractive to artists, in hopes that NoMa will become a new hub of residential and commercial activity. In April 2001, the Cultural Development Corporation (CuDC) released its report: "The NoMa Development

Strategy: Integrating Arts, Technology, Neighborhood Quality, and Economic Development in the District of Columbia.”<sup>8</sup>

The NoMa area already has considerable development momentum, as the CuDC report notes, but the CuDC argues that a coordinated planning process is likely to have greater payoffs. In particular, the report says a public planning process will place greater emphasis than purely private development on integrating culture and arts into the neighborhood. A public planning process would also attend to the public realm—the sidewalks, streets, and open spaces that, along with cultural life, add up to the amenities that are important to urban economic revitalization. The report sets forth fundamental principles for NoMa development, including these:

- Future economic development will rely on attractive urban neighborhoods that integrate workplaces, the arts, and housing;
- NoMa development should respect and build on existing residential patterns, i.e., it should leverage existing historic neighborhoods such as Shaw and Mount Vernon;
- Arts and technology in NoMa should be integrated to harness the area’s creative energy in a way that makes it attractive to new media companies;
- Public resources should be used to build on the incomplete vision of Pierre L’Enfant’s original urban design in the NoMa area.
- The District’s ownership of land in NoMa should be leveraged as a way to shape development.

In the short term, the CuDC report suggests that the city move ahead with new housing units in the Mount Vernon Square area of NoMa, which is also adjacent to the District’s new convention center, now under construction. The centerpiece of that effort is a three-acre site that once housed the National Wax Museum. The District followed up by asking developers to consider a mixed apartment-retail complex to attract new residents to the area. In all, the city hopes that as many as 1,000 residential units will come online in the next few years, along with other amenities such as high-end supermarkets. In encouraging the development of an urban residential neighborhood, the District asks developers to build some affordable housing, offer first-floor retail in apartment buildings, and plan for affordable units in which artists could live and work.

Another key to NoMa development is attracting anchor business tenants to make the area a hotbed of new media development. One step in that direction is a new headquarters building for XM Satellite Radio, Inc. in the NoMa area. XM will provide digital radio signals in the continental United States on a subscription basis; it is expected that the service will be available in mid-2001. The area’s employment picture will also be helped by the decision of the Bureau of Alcohol, Tobacco, and Firearms to build a new headquarters building in the NoMa district. One sticking point is public transportation; there is no Metro station in the area. Although one is planned, it will be years before it is operational.

The long time horizon for NoMa, especially with the downturn in the dot-com economy, is the project’s biggest challenge. The NoMa district is also competing with telehotels for real estate. As noted, NoMa is planned for an area of downtown Washington that is largely abandoned, but also close to the city’s railroad terminal, Union Station. This, along with the presence of empty warehouses, makes it attractive for the development of

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<sup>8</sup> Available at the Cultural Development Corporation’s Web site, [www.culturaldc.org](http://www.culturaldc.org).

telehotels. As is the case in Portland, the city has been struggling with the demand for telehotels and the desire to create a livable downtown area. There have been several proposals to convert abandoned warehouses into telehotels, and city officials fear these will occupy prime space before NoMa can get a strong foothold. The lifelessness and noise associated with telehotels might make the area unattractive to businesses and residents.

To cope with this challenge, the city temporarily suspended telehotel applications in the District, a move that proved controversial. The three-month freeze did not dampen telehotel development, however, and by December 2000 the District had approved four telehotel applications. By April, the largest of these, proposed by Level 3 Communications, was shelved. The reason was not D.C. regulations, but tight capital markets.

#### **b. The Digital Capital Alliance**

The city has also tried to nurture networking among technology entrepreneurs in Washington and to make sure D.C. city government is responsive to the needs of Internet start-ups. The Digital Capital Alliance (DCA) is an advisory panel established by Mayor Anthony Williams to address how the District can best manage the development of technology infrastructure for the city and how the District can effectively market the city as an attractive place for Internet companies to do business.

Elliot Frutkin, head of D.C.'s Doceus, Inc., an e-business Internet firm, says the Digital Capital Alliance has three main goals. The first is to serve as a forum where executives of D.C.-based Internet firms can discuss common problems they face in doing business in the city. The DCA also gives D.C. Internet executives a vehicle through which to educate Internet executives from around the area about the virtues of doing business in the city. Finally, the alliance has helped educate city policymakers about what types of incentives to offer to attract Internet companies to the District. (This initiative is discussed in detail below.)

The driving force behind the DCA strategy is what Frutkin calls a “people over wires” approach to economic development--making the city an attractive place for technology entrepreneurs. He believes the freeze on telehotels was appropriate because it signaled that the city wanted to develop a desirable location for tech entrepreneurs in NoMa, even if that meant taking an action that might be interpreted as dampening infrastructure development.

Related to the DCA's networking efforts is a technology accelerator that has been started by a D.C. lobbying firm to provide a home for Internet start-ups oriented toward e-government. The technology accelerator is called DC VentureNet, is funded by the Carmen Group, and is billed as the country's first effort to stimulate the growth of firms focused on the business-to-government e-commerce market. The Carmen Group will provide \$1.5 million in financing and services to firms, as well as \$3 million to renovate a building in downtown Washington to provide space for emerging firms. Like NoMa, the fruits of DC VentureNet are not likely to be ripe for some years. However, it believes that the expertise of its managing director, former Indianapolis Mayor Stephen Goldsmith, will lend it cachet. Goldsmith has a reputation as a government reformer, and his eye for effective government service delivery will, it is hoped, enable him to identify sound e-government business ideas.

#### **c. The New Economy Transformation Act**

To complement the place-based strategy (NoMa) and the networking initiative (the Digital Capital Alliance), D.C. city government has recognized—especially in light of the burgeoning tech industry in the suburbs—that it must act affirmatively to get businesses to locate in its borders. The “New Economy Transformation Act” offers these incentives.

The Act has three thrusts: a) workforce development, which provides franchise tax credits for employees' wage, training, and moving expenses; b) affordable facilities, which provides security deposit relief and other services to help companies obtain office space in the District, and; c) targeted tax relief in specific areas, such as property, franchise, and sales taxes. To be eligible for the incentives, a qualifying firm must derive at least 51 percent of its gross revenues from defined high-tech fields, such as Internet-related services, data processing, biotechnology, or advanced hardware or software development. The District has also set aside \$2 million in the 2001 budget for facilities assistance.

The Act became law in April 2001, but its effective date was retroactive to January 1. A public education campaign is become the next step; D.C. Mayor Anthony Williams has met with the Digital Capital Alliance since the act's passage to urge it to spread the word to other high-tech firms about the legislation. Williams has asked DCA companies to consider how to use a site being vacated by St. Elizabeth, a mental hospital that is closing, and work to get D.C.'s "mom and pop" neighborhood stores online.

The presence of this legislation underscores how the District of Columbia is in competition with its suburban neighbors—especially northern Virginia—when it comes to New Economy business development. According to a study conducted by DC Agenda, technology employment accounts for 11 percent of all jobs throughout the Washington metropolitan area, but just 1 percent in the District itself (DC Agenda, p. 4). Nearly all (99 percent) of the District's technology employment is concentrated in software and telecommunications services, whereas the region overall has a mix of engineering and technology manufacturing. The heavily service-oriented nature of the District's technology base is also reflected in the size of D.C. technology firms. On average, D.C. tech firms tend to be smaller than their counterparts in the suburbs; 62 percent of D.C. tech firms have fewer than ten employees versus 48 percent in Virginia.

The DC Agenda report also finds that technology firms in the District are loyal to their location; more than three-quarters say they plan to remain in Washington. But like tech firms across the country, D.C. technology firms complain about a lack of office space and skilled workers are problems. Given this concern, it is understandable that the New Economy Transformation Act emphasizes lease assistance, tax credits that lower the cost of hiring workers, and workforce training.<sup>9</sup>

Given the dot-com slowdown, though, the act's effectiveness is in question. The shut-down of dot-coms has softened office rents in Northern Virginia, which partially undercuts the act's rationale, as it was based on the prediction that scarce and expensive suburban office real estate would drive firms to the District. A number of ingredients are there for the District, but whether they come together to start a virtuous cycle of technology-driven development remains to be seen.

### **C. The Internet and Social Capital in the District**

In the District of Columbia, the community technology initiatives tend to have a mix of content creation and Internet access as priorities, while the nascent New Economy development programs are devoted mainly to altering foot traffic. Specifically, the economic development initiatives seek to divert foot traffic of Internet entrepreneurs from the suburbs to the District.

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<sup>9</sup> One program to expand the pool of skilled workers in the District is the Technology High School at the site of the McKinley Tech High School; it is scheduled to open in 2002.

In the community, Edgewood Terrace and Byte Back both emphasize access and job training as ways to encourage people to take advantage of the Internet's potential to improve people's economic prospects. Edgewood Terrace has been aided by federal grants, while Byte Back uses grants from individuals and foundations for support. In both cases, the initiatives have used the Internet to inject additional energy into their communities. The See Forever Foundation's charter school offers access and training to students, but also tries to shape the outside community through its computer backpack program to wire seniors and its outreach to neighborhood nonprofits. With the effort to wire neighborhood nonprofits, See Forever's program also has the potential to shape community Internet content in the District. It is worth noting, however, that these initiatives do not receive financial support from the District's government.

In economic development, the city is providing incentives to lure companies downtown, but perhaps more important, the District is also providing a place where entrepreneurs can do business (NoMa) and a forum where ideas can be exchanged (the Digital Capital Alliance). D.C. Mayor Williams seems to have done a good job in gaining support from the dot-coms that have survived and that participate in the DCA. This commitment should be beneficial to NoMa, although the overall health of the dot-com sector and the economy will have a greater affect on NoMa's development than a group of entrepreneurs. Most of all, long-term commitment by the District government and business leaders will be needed for NoMa and the New Economy Transformation Act to pay off. The District is competing with suburban Virginia and Maryland for high-tech businesses, and making headway will be difficult.

The sustainability of the community and economic development initiatives is the challenge facing the District. The current downturn in the Internet economy could actually be good news for NoMa. Expectations of a quickly burgeoning technology district cannot be met, but only those technology entrepreneurs committed to NoMa are likely to stay with the process developing the area. Meeting the demand for Internet access in low-income communities will be an ongoing challenge for the projects mentioned here, and securing funds for upgrading and maintaining equipment will also pressure project directors.

## VI. NASHVILLE

Nashville's business community has been active, if not wildly successful, in attempting to catch the wave of dot.com riches in the New Economy. Nashville's economy is service oriented, with health care and country music being the region's dominant and highest profile business sectors.<sup>10</sup> The city also has traditionally had an entrepreneurial spirit, and a number of Internet start-up companies have cropped up in the past several years. These companies have not generated the Internet riches through initial public offerings that might set off a cycle of dot-com start-ups in Nashville. But business leaders in Nashville are hopeful of a huge dot-com success, particularly in the online health care business. To set the stage, business leaders have established a technology council within the Chamber of Commerce and launched a private-sector dot-com incubator. They are developing an "urban technology district" and are in the early stages of establishing a network of angel financiers for start-ups. However, as has been the case around the country, the recent shakeout in the dot-com world has restricted the flow of capital to Internet start-ups in Nashville.

On the social side, the city until recently has been slow in using the Internet to reach out to neighborhoods (low-income and otherwise) and to improve delivery of public services. But new leadership in the metropolitan government has adopted an activist posture toward using the Internet for community and public purposes. Nashville's new mayor, Bill Purcell, took office in 1999 and ran on a platform of doing more to reach out to neighborhood groups—an outreach effort that will include use of the Internet. As for bottom-up initiatives by citizens to use the Internet for social purposes, Nashville received a huge boost when it received a \$477,000 grant from the U.S. Commerce Department's TOP program for a community online project explicitly designed to enhance civic participation in the Nashville area. Citizen activists were the driving forces behind the application, although the grant recipient is the Metro Nashville-Davidson County Planning Department.

### A. The Internet and the Community

Nashville has a distinctive system of government dating to 1963, when the governments of the city of Nashville and Davidson County were combined. The result is the Metro Nashville-Davidson County government in the region, a 533-square-mile area in Middle Tennessee that is known simply as Metro. The expansive nature of the region's government—embracing rural and urban areas—has led to some special problems when it comes to compatibility of information systems and distribution of public information.

#### i. Information Technology in Nashville: Raising the Grade

Metro officials in Nashville were jolted in February 2000 when *Governing Magazine's* Government Performance Project gave a D+ grade in information technology in the context of an otherwise solid rating for Metro Nashville Davidson government. The poor grade was attributed to a patchwork of old and rarely compatible computer systems, some with hardware dating to the 1970s that made impossible simple tasks such as sharing files across departments. Because of the poor information system, and also because of the culture of Metro government, Metro departments see themselves as a collection of separate enterprises,

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<sup>10</sup> The major technology employer in the area is Dell Computers, which in 1999 established a manufacturing facility just outside Nashville. While it created jobs, the location of the facility has more to do with Nashville's natural location as a distribution center (80% of the continental United States is reachable in a day by ground freight) than with the area's technology resources.

not a single entity. This means that agencies' Web sites have very different looks and almost no interactive or transactional capabilities.

Mayor Purcell has made upgrading information technology a priority. Upon assuming office, he brought in a new director of Information Systems, Richard McKinney, to improve networks citywide and to make delivery of city services more Web-friendly. Mayor Purcell, according to McKinney, hopes that a major overhaul of the city's information system can help fundamentally reform Nashville government and improve services for citizens. In terms of Web page design, McKinney wants Nashville to move away from pages that do little more than display organization charts to pages that post meaningful information to citizens.

Exactly when that might occur hinges on bandwidth. The Metro government last negotiated a cable franchise in 1995 with Intermedia. However, AT&T acquired Intermedia last year, which will result in a transfer of the franchise to AT&T and a formal reopening of franchise negotiations. Metro's Information Services department wants to use these negotiations to build Metro an institutional network, or I-Net, providing "bureaucrat to bureaucrat" communication within Metro government. As AT&T upgrades Intermedia's cable network with fiber-optic cable, Metro hopes to have two strands of fiber set aside for government use and have the company provide "drops," or technical links, to Metro facilities. This would include government buildings as well as community centers. The Information Systems department was in the midst of these negotiations in the Fall of 2000; even if it is successful, it will take time to complete the upgrade and run fiber to Metro facilities.

Because of the antiquated information system, use of the Internet by Metro departments is mixed. The public library receives high marks; its catalog is online, and the library system provides Internet access city wide with many public access terminals. By contrast, the Metropolitan Development and Housing Agency has been slow to integrate the Internet into its operations. In fact, there is little evidence that the agency has given much thought to how the Internet might improve delivery of services to residents of affordable housing or how Internet use by clients might improve their lives. The primary initiative in Nashville to provide Internet and computer training in low-income housing units is a U.S. Department of Housing and Urban Development Neighborhood Network at the Cayce-CWA public housing development. Cayce-CWA has a new computer lab, with 15 computers with high-speed connections to the Internet and Internet training provided to parents and kids.

## **ii. Designing a Community Online**

The upgrade of city information technology is occurring at the same time as citizen activists have been clamoring to use communications networks to link neighborhoods together with each other and Metro government. Historically, neighborhoods in Nashville have not had their voices heard in city politics. Part of this is due to lack of organization. Fifteen years ago, only about a half dozen neighborhood groups existed in the city, and they had a difficult time being recognized as legitimate groups by Metro government. The number of neighborhood groups has swelled to nearly 200 in recent years, but these groups still feel that Metro government has not always been receptive to their concerns.

Much of this changed with the election of Mayor Purcell in 1999. Purcell ran on a platform of welcoming neighborhood groups into Metro government's decision-making processes. Partly because of this, he won a resounding victory. Among his earliest acts was to create an Office of Neighborhoods to coordinate with Nashville's numerous neighborhood groups. Soon thereafter, Purcell appointed a new director of Metro's



Planning Department, Rick Bernhardt, who has committed to encouraging greater citizen and neighborhood-group participation in planning decisions. Part of Bernhardt's agenda is to promote "New Urbanism" in Nashville, an urban design movement that favors dense downtown growth and neighborhood development to urban sprawl.

The Internet is not going to be the sole ingredient in Nashville's revival of dialogue between government and neighborhoods, but it is certainly envisioned as part of the picture. Working with the Nashville Neighborhood Alliance, the Metro Planning Department won a \$477,000 federal grant from TOP program for its "Designing a Community Online" project. Adding in-kind contributions from Metro Planning, the total cost of the project is \$1,153,000. The name of the project implies that the Internet will be a tool to enhance community life, not a means to move community interaction from the physical world to cyberspace. The TOP grant application identifies a number of barriers to public participation and civic engagement and proposes to use the Internet to address them. Among the problems the application identifies are:

- Inaccessibility of public information—public information is widely dispersed in Davidson County, and community groups often do not know where it is. There is no central office that might direct citizens to the right information.
- Community groups' lack of access to information makes it difficult for them to participate in shaping the community's future.
- Insufficient dissemination to the public of changes to zoning regulations and of development decisions.

To address these problems, the TOP project proposes a two-fold strategy of assembling Metro content in user-friendly ways and increasing the number of public access sites throughout the Metro area. The project will put the following kinds of information online for the public: crime, land (e.g., floodplains, topography), historic properties and sale values, development plans, street plans, public transportation, population, and a variety of resources for the neighborhoods (boundaries, contact information, community-based social services). The goal is to make this information visually appealing, searchable by census tract, and available to citizens in different languages using language-translation software.

The project aspires not only to add to the amount of available public information in Nashville, but also to stimulate additional participation in civic affairs. To do this, it proposes to use geographical information systems (GIS) and other sophisticated software tools to promote dialog between citizens and Metro. For example, using GIS tools, the Planning Department will create interactive maps so citizens can see where zoning changes will occur or where subdivisions are planned. This software will enable the Planning Department to administer online surveys to assess citizens' views on development decisions.

Another application is the Visual Preference Survey (VPS), which displays pictures of alternative development possibilities online. Citizens can then register their preference. Usually, administering visual preference surveys requires a public meeting on a weekend at which city planners show alternatives on large poster boards or on overhead projectors. Turnout can be low, and people with busy weekend schedules rarely attend.

As for public access, the grant proposes to purchase 75 computers, all connected to the Internet, and place them in 53 neighborhood and ethnic-based organizations in the Nashville area. The Neighborhoods Resource Center will partner with other educational entities to train people at the neighborhood sites on how to use the Internet and navigate the new public information on the Metro Web site. This initiative is not a home-based or

community Internet access project. Rather, the hope is that people in the neighborhood centers will serve essentially as Internet evangelists for individuals in their community.

The “Designing Community Online” project is very ambitious in scope, as it tries to simultaneously address government content and community connectivity—all from a \$477,000 cash grant from the U.S. Commerce Department and an additional \$700,000 in resources from Metro Planning. At best, the project is a modest first step for Nashville, but an indispensable one nonetheless. As Metro Planning and the Council of Community Services recognize, the project itself is an innovation for Nashville. Its benefits will come not just from additional electronic communication, but also from bringing together disparate community actors to plan Nashville’s Internet future.

### **iii. Arts and the New Media**

With its country music scene, large university population, and cultural reputation as “the Athens of the South,” Nashville has a large and diverse artistic community. Nashville is attempting to exploit these advantages to promote local artists and to translate Nashville’s artistic creativity into dot-com businesses.

The Metro Arts Commission has undertaken an inexpensive project that tries to expand the sales of the wares of Nashville artists. At the initiative of Richard Mitchell, a local artist and Arts Commission volunteer, the Commission provides space on its Web page for artists to post pictures of their work. Artists pay \$12 to submit three slides to be scanned onto the page, and then their name and contact information are posted. This opens their work up to a much wider audience; in fact, a number of artists have made Web sales to people far away from Nashville. Some artists have still declined to participate.

Another foray into linking the creative community with Internet business ideas is the Nashville Internet and New Media Association (NINMA), a loose affiliation of entrepreneurs founded in late 1999. NINMA’s mission is to “educate and expand the Nashville Internet community, as well as give the Internet community a place to gather and discuss issues.” The association’s membership divides itself into committees oriented toward business services that an Internet entrepreneur might need, such as help with sales and marketing, legal and financial services, and design and development. NINMA also has two content areas among its subcommittees, entertainment and health care, reflecting Nashville’s desire to be a player in these Internet business areas. In addition to referring members to business services, NINMA holds forums that allow people to exchange ideas informally and to air important issues facing Internet businesses.

An example of the latter was an October 2000 forum on Napster called “Canary in the Coalmine: Survival of Intellectual Property on the Internet.” The forum allowed songwriters, music publishers, and record companies to air their perspectives on Napster, which at the time allowed the trading of music over the Internet at no charge. The forum did not settle the question of whether such activity was appropriate, nor did the business models it examined catapult any Nashville Internet start-up to riches. Yet NINMA members are hopeful that the interaction NINMA facilitates will over time contribute to the economic viability of Nashville’s new media Internet firms.

## **B. The Internet and Nashville’s Economy**

Nashville’s promise in the Internet economy rests with its entrepreneurial spirit and its existing regional strengths in health care and country music. Efforts to capitalize on

Nashville's New Economy potential revolve around two initiatives. The first is the Nashville Technology Council, an organization affiliated with the Chamber of Commerce. The second is a technology incubator called eConception.

**i. Incubating Nashville's Economy: eConception**

The primary initiative in Nashville to foster Internet start-ups is the business incubator eConception, which provides seed capital and business services to companies with ideas to exploit the Web. The incubator was founded in 1999 with \$9.2 million in capital and with seven companies in its portfolio. EConception provides office space and other business services to its companies in a renovated warehouse called Cummins Station. This large structure, located near downtown Nashville, now houses about 10 eConception companies at any given time, which occupy 20,000 square feet of leased office space.

The idea for eConception, as with most incubators, is to bring a company to maturity and allow it to operate on its own; eConception is compensated by a share of profits or, better yet, with shares in an IPO. The vision of IPO riches has not been realized, and eConception is contemplating a change in strategy as a result. With the market for Internet IPOs waning and investors increasingly wary, eConception may sell its equity position in its companies and move toward providing incubator and business services for a fee. Rather than raise capital itself, eConception may partner with venture capital firms to channel funds to eConception's start-ups.

Even with a possible upheaval in the offing, eConception has produced some modestly successful companies. Weberize is a Web architect firm that will not only design Web pages for clients, but also transform a client's information management system into a Web-based platform for an intranet or Worldwide Web presence. Another company, Groovetone.com, is an attempt to capitalize on Nashville's reputation as "Music City USA." Groovetone.com assembles "Americana" music at its Web site—largely country and western, bluegrass, and folk music—to serve as a portal for fans of the genre. Working cooperatively with record labels, Groovetone provides RealAudio clips of artists' songs, sells CDs, and even has a Groovetone radio station.

The Weberize and Groovetone stories show the promise and potential pitfalls of an incubator such as eConception. Weberize provides a clear service to its clients—in a market that is very competitive for Web-design services—and if it carries out its business plan, Weberize can certainly be a profitable company, if not the next IPO star. Groovetone falls more into the category of a brand-based Internet company—one that delivers an established service in a new way and thus must spend a lot on advertising to create brand awareness. If Groovetone fails to gain necessary "mind share", its long-term business prospects are questionable. The music industry as a whole is struggling to find the right business model for the Internet; as far as Nashville goes, neither Groovetone nor other start-ups in Nashville have found a way to make Music City USA a hub for online success.

Whatever eConception's fate, the incubator is the flagship physical space for ecommerce and Internet start-ups in Nashville. A building of four high-ceilinged stories, the Cummins Station structure takes up an entire city block. EConception and its companies occupy part of one floor, with the remaining space taken up by other Internet start-ups and arts organizations such as the Metro Arts Commission. In fact, the Metro Housing and Development Agency has designated the area including and surrounding Cummins Station an arts center redevelopment center. With technical expertise adjacent to artistic talent, eConception hopes to be part of a Cummins Station complex that drives Nashville's Internet economy.

Another attempt to develop physical space for innovative companies in Nashville is known as “The Gulch.” Developers hope to transform the Gulch into a “dynamic urban environment”. This project, located near Cummins Station, will bridge downtown and Music Row, with a mix of high-end and affordable housing and retail and office space. The ambitious 25-acre development will cost \$350 million and is intended to “offer a contemporary urban lifestyle” for Nashville, giving the city a 24-hour-a-day downtown. The Gulch also plans to use nearby universities to attract Internet and biotechnology start-ups to the area. The development is driven by the private sector, but the city has pledged support and has offered \$15 million in tax increment financing for the Gulch.

## **ii. The Nashville Technology Council**

In addition to developing a physical space for innovation, Nashville business leaders are establishing a network of people designed to foment dot-com ideas among creative people. The Nashville Technology Council (NTC), a year old offshoot of the Chamber of Commerce, provides this sort of environment for the Middle Tennessee region. The Council’s director, entrepreneur David Condra, says the NTC’s membership grew rapidly, reflecting pent-up demand for a forum at which entrepreneurs can exchange ideas and expand their network of business contacts. The Council’s main service so far is providing networking events for members. One is a monthly breakfast meeting with a keynote speaker—the kick-off speaker was U.S. Senator Bill Frist—which members treat mainly as an opportunity to meet like-minded entrepreneurs. The Council also has topical events at which speakers talk about how to raise capital and develop a business plan.

The next major undertaking for the Council will be the Technology Funding Alliance, which will be an investor network for Nashville Internet entrepreneurs. A challenge for Nashville—not unlike that facing Cleveland—is how to engage wealthy business people whose fortunes were not made in the dot-com world in channeling funds to Internet start-ups. Whether in health care or publishing, Nashville’s old-line business leadership is thought to be conservative with its money, which is understandable given the novelty and volatility of the New Economy. Launching the alliance is proving to be difficult, mainly due to the stock market’s increasing skepticism toward Internet start-ups. The Technology Funding Alliance was initially scheduled to kick off in January 2001; the launch has been postponed.

The climate for Internet companies in Nashville would clearly benefit from a big dot-com success that would generate wealth that would then be reinvested in the region. This has not happened, and the two companies that held the most promise have not met what were once very high expectations. Healthstream is perhaps Nashville’s most prominent ecommerce company; it provides online computer-aided medical training for health care professionals. Its CEO is Robert Frist, Jr., a member of one of Nashville’s most prominent families, which made its fortune from the Columbia/HCA health care company. Healthstream issued its initial public offering in April 2000, just before the market backed away from dot-com IPOs, and managed to raise about \$50 million in capital. As has been the case with other dot-com stocks, however, the past nine months have been unkind; as of early December, Healthstream was trading at \$1.13 per share, well below its high of \$11 per share. And stock price is not Healthstream’s only problem. The company had announced a major marketing partnership with Healtheon/WebMD, a popular health care portal, in hopes that the traffic to Healtheon’s site would spur demand for Healthstream’s services. Because of Healtheon’s business problems, this agreement has been put on hold.

BlueStar was Nashville’s other dot-com disappointment. BlueStar provides high-speed Internet connections using digital subscriber line (DSL) technology; the company’s target

markets are Southeastern cities with populations of less than 1.5 million. The DSL business is capital intensive and requires heavy investment in routers and switches before customers can be served. BlueStar initially won \$31 million in venture capital from Crosspoint Venture Partners, and by early 2000, the company filed its intent to issue an IPO to raise up to \$200 million. That was postponed indefinitely, and Covad Communications, a national DSL provider from California, wound up acquiring BlueStar in June. With a loss of \$18.8 million in 1999 on revenues of \$800,000 and capital markets balking, BlueStar's continued viability depended on merging with another firm.

Nashville is in a classic bind when it comes to funding Internet businesses: The lack of Internet successes makes investors reluctant to invest, and the reluctance to invest lowers the chances of a dot-com success. Yet David Condra sees tight capital as a potential blessing: It will discipline entrepreneurs and financiers to create and fund business plans that are conceptually sound, address market needs, and have valid Internet solutions. Given the strong entrepreneurial spirit in Nashville, Condra is hoping that this spirit, supported by the Technology Council, will position the city as a player in the Internet economy.

### **C. The Internet and Social Capital in Nashville**

The Internet's impact on social capital has been fairly modest in Nashville. There is some evidence of altered "foot traffic" in the city attributable to the Internet but little evidence of community-generated Internet content. However, the Designing a Community Online TOP grant has been a catalyst for community activists and government officials to jointly consider the Internet's role in improving Nashville's traditionally balkanized neighborhoods. And the Internet's potential to provide public information and improve service delivery has been recognized, though perhaps belatedly, by the Information Services department of Metro government.

At this point, the Arts Commission's Web site for artists is the only real evidence of content. Still, Nashville has a lot of what a region needs to succeed in the Internet society: a core of creative people and a strong tradition of entrepreneurialism. In Cummins Station, it is trying to develop the right environment for creative people to pursue business ideas, and the Nashville Technology Council hopes to provide the people-to-people networking and financial support that is necessary.

This unevenness between Nashville's economic and social awareness of the Internet's opportunity suggests that a great deal of patience will be required in the region as Internet initiatives evolve. A TOP grant by itself will not be sufficient to change neighborhoods' engagement with Metro government or improve access to low-income people. Moreover, Nashville does not have a well-developed set of community development corporations or other institutions that signal a large existing stock of social capital. And with the downturn in the dot-com sector, payoffs from the Nashville Technology Council will probably take much longer than initially envisioned, if they ever come to pass. Patience, however, may be difficult to come by in an environment where the hype surrounding the Internet—at least in the economic arena—may be fading. A challenge for Nashville, then, will be to devote resources to areas where the Internet has clearly identifiable benefits to the community.

## VII. THE INTERNET, CITIES, AND SOCIAL CAPITAL

The Internet is helping to change the “rules of the game” in various institutions within cities. In most cases, the Internet’s effect is primarily catalytic. By prompting people to come together to plan how to use the Internet, the Internet’s presence stimulates social networks and lays the groundwork for building new social capital. The development of Internet content has been less prevalent in the cities studied, but there are identifiable examples of it.

In this concluding section, I summarize the Internet’s impact on catalyzing new social networks and how those changes have affected the Internet itself through the creation of Internet content that serves the community. I then look across the five cities rating their relative strengths and assessing “best practice” for how cities can use the Internet beneficially. I conclude with recommendations on how cities can sustain the emerging positive impacts of the Internet.

### A. The Catalytic Effect of the Internet

Activists of different stripes—from advocates for low-income communities to promoters of economic growth—have in their respective spheres come together to find ways to use the Internet constructively. This has represented a boost to social networking in the cities studied, which in turn lays the groundwork for Internet-driven increases in social capital. Taking a look across the five cities studied, here is how the Internet’s effect has unfolded.

#### **i. Social Networking Strategies Among Economic Developers**

The economic development community offers a good example of how social networking is a pre-eminent strategy in the New Economy. In many places, economic development programs have traditionally connoted “smokestack shopping” whereby city and community leaders have dangled financial incentives to lure a factory to their region. This strategy has not disappeared in the high-tech era; cities still vie for semiconductor and computer manufacturing facilities and campus-like research parks. However, the increasing focus on entrepreneurship as a driver of economic growth has altered traditional economic development strategies. To a great extent, they have been replaced by strategies that try to promote social networks.<sup>11</sup>

Portland presents a good example of the type of strategy that is being employed to stimulate the demand for business ideas and find the capital to fund them. The Oregon Entrepreneurs Forum has grown in membership from 100 in 1997 to about 1,200 people today. The main service the Forum offers its members is networking opportunities. As the forum has grown, financiers in Portland have established the Portland Angel Network to direct start-up funding to promising new companies. Although the network is not oriented solely to dot-com start-ups, Internet ideas receive a great deal of attention.

The other cities studied have similar initiatives, in different stages of development. Nashville’s Chamber of Commerce has the Nashville Technology Council, although its offshoot, the Technology Funding Alliance, is dormant. Cleveland’s high-tech happy hours and the Seed Capital Initiative sponsored by the Northeast Ohio Software Association try to stimulate social networks for entrepreneurs in that region. Washington’s Digital Capital

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<sup>11</sup> See the National Commission on Entrepreneurships’ *Building Companies, Building Communities*, July 2000, for a discussion on inward-looking strategies at the local and regional levels to spur entrepreneurship.

Alliance serves a similar purpose. In each of these cities, new entrepreneurial and angel finance networks rely on physical interaction. Although the business plans of most of the companies interested in such forums rely on cyberspace, the process of getting them off the ground is unavoidably tied to face-to-face contact.

### **ii. Social Networking in Neighborhoods**

The same pattern of social networking is manifest in efforts to use the Internet at the community level. In Cleveland, Bill Callahan, the director of the West Side CDC, characterizes the Internet's impact on his organization in this way: "It wouldn't make sense to have this place without the Internet, and it wouldn't make sense to have the Internet in this neighborhood without this place."<sup>12</sup> In other words, his CDC needs to have Internet access to make it a place where people want to go, but merely providing Internet access to people in a disembodied fashion would not work. People need a place to learn about the Internet, and they benefit from having an environment where they can find out who else in the neighborhood is on the Internet. In Callahan's CDC and others, the Internet has changed the pattern of foot traffic; people who probably otherwise would not visit a CDC are being drawn to it because of the Internet. With the Digital Vision coalition and the money from the city for computer boot camps, Cleveland is in a position to expand the Internet's role in social networking.

In a number of other community organizations profiled in this report, the catalytic effect of the Internet in changing foot traffic has drawn people to community organizations. The Neighborhood Pride Team revitalized itself by providing Internet and computer training to residents of a southeast Portland community. The Austin Learning Academy, due largely to the Internet, has changed from an after-school program for kids to a family learning center where the Internet is the centerpiece. And by partnering with existing community organizations in the District of Columbia, Byte Back's Internet training programs have added new dimensions to the missions of these nonprofits. In these examples and others (e.g. the Austin Free-Net and D.C.'s See Forever project), the presence of the Internet has served as a catalyst to social networking.

### **B. Content Development: Social Capital's Effect on the Internet**

In several cities, there are indications that people have begun to develop Internet content to help their communities or organizations operate more effectively. Some of this builds on existing stocks of social capital, while some is a direct outgrowth of Internet initiatives that first stimulated new networks of people. These people in turn have been instrumental in creating new content.

#### **i. Neighborhood and Community Content**

The listserv activity surrounding the Southwest Community Plan in Portland shows how the Internet used an existing stock of social capital in the neighborhood to create Internet content to shape an outcome important to the community, and the cooperative process in developing a response to the Metro government's proposal may have helped build additional social capital in that community. The Neighborhood Pride Team, on the other hand, became a focal point for people interested in the Internet who subsequently created their own online content. The Trillium Artisans, who now market their wares on the Web, are an

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<sup>12</sup> Interview with Bill Callahan, director of West Side Community Development Corporation, Cleveland, Ohio, September 28, 2000.

example of content creation, as are the people who have been through the NPT and then posted Web pages to market home-based businesses.

In Cleveland, theT2K.org portal for affordable housing providers is an example of Web content designed to improve service for providers and clients of public housing. In the design phase, the Portland Area Housing Clearinghouse serves a similar purpose. Also in the design phase is Nashville's Designing a Community Online project; this project will provide access to the Internet for underserved populations and also create community content. Farther upstream is Austin's Grants for Technology Opportunities program that will fund Internet content development among nonprofits. Although the development of Internet content by communities is not widespread, projects such as Portland's NPT indicate that it can have a substantial impact on people's lives when does occur.

## **ii. Content in the Business Sector**

The ease of starting dot-com businesses is an indicator that sufficient social capital exists in a community beyond financial capital. This social capital is embodied in people—more specifically, in the ease with which information flows about where and how to find support for a business idea. In Portland, the region rates well, but not spectacularly, when it comes to the availability of venture capital. For that reason, Portlanders have actively employed the social networking strategy to match entrepreneurs with financiers. To make up for a shortage of financial capital, people in Portland are trying to leverage other sources of community capital. Similar coalitions in other cities, some fairly active (Cleveland and D.C.) and others not (Nashville), try to do the same thing.

The goal of these efforts is, of course, to create New Economy businesses. With the dot-com shakeout, it is hard to find evidence that these regional networks of entrepreneurs and financiers are paying off. But in some places, such as Cleveland, an important goal of such networks is to change the business culture of the region so that entrepreneurialism is encouraged, so that ultimately business plans involving electronic content receive warmer receptions. This is a long-term strategy and only time will tell whether it bears fruit.

One common long-term strategy evident in several cities is creating places for New Economy start-ups to flourish. Washington's NoMa initiative is perhaps the most ambitious of these, as it will try to create a place where the arts and mixed-use business-residential development revitalize a section of the downtown and attract high-tech businesses. NoMa will be combined with tax incentives to lure start-ups to the District. In Austin, the city is offering incentives to new and existing high-tech start-ups to develop its "digital downtown." Portland's creative services initiative also will try to combine a rich urban environment with creative people to spur multimedia start-ups. Where D.C. is offering incentives to developers to push NoMa, Portland is retrofitting a building to provide space for multimedia companies.

## **C. Best Practices, Best Cities**

Even with many common themes evident in the five cities, it is clear that different cities move at different paces in different areas of Internet impact. Nashville, for instance, is behind Austin, one of America's most wired cities, in most ways. But Cleveland, not often associated with the growth of the Internet, is perhaps surprisingly advanced when it comes to programs to bring Internet to low-income neighborhoods. What are the best ways cities are using to exploit the Internet?



### **i. Portland**

Of the five cities studied, Portland has a combination of technological sophistication, economic vitality, commitment to regional planning, community engagement, and an existing infrastructure of community nonprofits that makes it the city most likely to effectively exploit the Internet for economic and social purposes. The use of the Internet in the community in Portland cuts across several different environments. The Southwest Community Development Plan shows how the Internet has been used in a grassroots fashion in a middle-class neighborhood. There are also efforts in low-income neighborhoods—as witnessed by the Neighborhood Pride Team—to integrate the Internet into the day-to-day lives of residents. Finally, Metro government’s Bureau of Housing and Community Development shows great promise in using the Internet to improve the lives of low-income people in Portland. The Enterprise Foundation, which is working to wire nonprofits in the area, should have the same effect.

In economic development, the Oregon Entrepreneurs Forum and the Portland Angel Network are strong evidence of new vitality in making Portland a place where business ideas—New Economy and otherwise—can find support. The city’s support for the creative services initiative is a notable public financial commitment to Internet-driven commerce. The initiative is also tied to Portland’s long-time commitment to urban planning, and business and government have worked cooperatively in encouraging business development downtown. There is reason to be optimistic about the initiative’s prospects for success—assuming sufficient demand for creative services in the local and national economies.

### **ii. Austin**

Austin has a strong track record of community activism in providing Internet access to low-income areas, a great deal of technical literacy, wealth and economic vitality, and an emerging dialog about social equity that encompasses information equity. Austin’s Free-Net, Community Technology Initiative, and Grants for Technology Opportunities Program are examples of the city government’s strong commitment to encouraging community-wide access to the Internet. These programs have come about as a result of pressure from community technology activists, and the existence of initiatives such as the Austin Learning Academy suggests that the grassroots nature of Internet equity concerns in Austin is quite strong.

The city government’s “digital downtown” program also signals the city’s desire to encourage dot-com development in an urban setting. Of course, this commitment can only bear fruit if the market for high-tech and multimedia products is strong. The fact that Vignette and Intel have had to put their plans for downtown headquarters on hold demonstrates how fragile such initiatives can be.

The Austin Idea Network is the best example of the promise and fragility of the Internet’s impact on Austin. The Idea Network was formed primarily by dot-com entrepreneurs who wanted to find ways to help out the less fortunate in Austin. As the dot-com economy has soured, the Idea Network has had a difficult time implementing its ideas, in part because some of its leaders’ businesses have gone under. Moreover, the Idea Network, even though it aimed at low-income residents on Austin’s east side, did a poor job initially in reaching out to leaders in that community for input. The network’s slow start is thus only partly attributable to the dot-com downturn.

Another reason for the slow start is the relative dearth of community-based organizations in Austin. Unlike Portland or Cleveland, Austin does not have a well-developed network of CDCs in housing. Because of this, it is difficult for a new or outside

group like the Idea Network to find a ready list of organizations to turn to when starting new initiatives. Thus the financial resources that the Idea Network brings to community Internet projects in Austin are not matched by a strong social infrastructure that would grease the path for such projects. For that reason, even with all the assets Austin has with respect to the Internet, the city ranks just behind Portland.

### **iii. Cleveland**

Cleveland rates well among the five cities because of its focus on business-to-business ecommerce as its New Economy priority and its innovative coalition building to encourage Internet access in the low-income community. On the economic front, Cleveland's abundant bandwidth and encouraging attitude toward telehotels suggests that the infrastructure for ecommerce in northeast Ohio should be more than adequate. Cleveland's decision to focus on business-to-business ecommerce for large manufacturing operations looks prescient in light of the downturn in retail and brand-oriented dot-coms. The B2B ecommerce strategy is clearly long-term in nature and will require a shift in business culture in Cleveland. However, with the Northeast Ohio Software Association and the Lorain County Community College business incubator, social networking has taken on greater prominence in economic development circles in Cleveland.

Community activists in Cleveland have been remarkably persistent and successful in moving community technology issues onto the city's policy agenda. The Digital Vision coalition is a striking example of the Internet's catalytic affect in bringing members of the community together in a new way for a common goal. More important, the coalition was successful in lobbying the city to set aside \$3 million in cable franchise fees to bring the Internet to neighborhoods via CDCs. In fact, CDCs in Cleveland have been a focal point for community Internet projects. The Cleveland Housing Network has used the Internet to improve its operating efficiency and is working toward providing Internet access in affordable housing units. The existing network of CDCs in Cleveland is a stock of social capital that Digital Vision has been able to exploit, and by obtaining resources for Internet "boot camps", the coalition seems to be creating new social capital in Cleveland.

### **iv. Washington, D.C.**

Washington is a latecomer with promise. It is playing catch-up against its thriving high-tech competitors in suburban Maryland and Virginia; in response, the District is beginning to aggressively market itself as a hip, lower-cost alternative to its congested suburbs. The main vehicles for its marketing campaign are the New Economy Transformation Act and development in the NoMa downtown technology district. One challenge for these initiatives is the fading fortunes of dot-com companies, which are making office space in the suburbs suddenly cheaper. NoMa is also a long-term project, making its payoff difficult to predict. Nonetheless, NoMa and other initiatives by the District have brought energy to high-tech development in Washington. The existence of the Digital Capital Alliance shows that the business community shares the enthusiasm.

Community Internet projects in Washington amount to a diffuse set of innovative and ambitious projects that might benefit from greater coordination. These projects enjoy support from the private sector or from federal grants; thus far, the city government has not played much of a role. Still, the scope of the projects profiled here is impressive. Byte Back, the SeeForever Foundation, and Edgewood Terrace have each made significant inroads into their communities and exposed a large number of people to the Internet. This adds up to a

stimulus to social capital in several places in the District and is a useful model for other D.C. initiatives, whether they are supported by public or private funds.

#### v. Nashville

Nashville ranks fifth among the cities studied primarily because it lags far behind the others in projects that provide Internet access to low-income citizens. The TOP-funded “Designing a Community Online” project indicates some promise on this front, as does the mayor’s commitment to the use of information technology in city government and outreach to neighborhoods. But these initiatives are in the nascent stages, and the clamor in Nashville for community Internet projects is modest in comparison to that in the other cities.

From the economic development perspective, Nashville has embraced social networking by providing forums where entrepreneurs can exchange ideas about business opportunities. The Chamber of Commerce has been a driving force behind these, although its more ambitious effort to channel start-up financing to entrepreneurs stalled with the dot-com economy. Although Nashville had a number of dot-com start-ups—many oriented to music or health care—none achieved the financial success that might have provided capital for subsequent entrepreneurs. It is unclear how robust the networking approach will be in Nashville in the face of the dot-com shakeout.

Still, Nashville is trying to make itself more attractive for entrepreneurs. The development of a hip downtown district near the Gulch is designed to attract young entrepreneurs. Perhaps more important, the development signals a long-term commitment by city and business leaders to make Nashville more attractive to New Economy entrepreneurs. Thus, while Nashville does not rate well on community-oriented Internet programs, the business community is well in line with other cities in trying to create an attractive business climate for Internet firms.

#### **D. Social Capital and The City: Sustaining the “Internet Effect”**

Even with signs that the Internet is having a positive impact on social capital, sustaining this impact will be no easy task. “Digital downtowns” that are part of smart-growth initiatives wax and wane with the health of the technology economy. Community programs typically struggle for resources, and a key source for support from the public sector, the Technology Opportunities Program, is under constant budget pressure in Washington. Nonetheless, lessons from the five cities point to ways in which early efforts to capitalize on the Internet can be sustained.

**Encourage bottom-up initiatives:** Almost invariably, the Internet projects in the five cities started because interested people in the community took the initiative. This underscores the reality that successful programs tend to be pulled by demand rather than pushed by technology. In particular, the social networking approach employed in community technology programs has reached out to determine community needs and respond to them; cities have not imposed community-computing programs on communities from the top down. Portland’s Neighborhood Pride Team is a good example of this, and there are similar examples in Austin, Cleveland, and Washington, D.C.

**Encourage catalysts:**<sup>13</sup> The Internet as a catalyst to building social capital is a prominent theme in this report, so a recommendation to encourage community catalysts is hardly a surprise. The bottom-up nature of most of the Internet initiatives has come about because individuals in the community have served as catalysts. Just because these people have taken the initiative does not mean that they and their initiatives do not need nurturing. Financial support is the most obvious, and probably most useful, form of encouragement, but publicity is another. The media could do a community service by focusing on how community groups are using the Internet for social purposes. This might help these programs obtain the resources—financial, volunteer, and technical—they need.

**Encourage public funding:** The coffers of local governments have played an important role in several cities. Cleveland and Austin have programs that channel public funds to community technology projects, although it is important to underline that the programs came about only after community technology activists had been running programs in the cities for some time. But as demand in the community for services expands, local government help is needed to meet it. Additionally, federal funding, in the form of U.S. Commerce Department TOP grants, often is crucial to getting projects off the ground. There is still considerable demand for community computing programs and great need to wire local governments for better service delivery. With high demand likely for some time into the future, cutting the TOP, as has been rumored, does not appear wise.

**Encourage “bridging”:** In several cities, coalitions have been formed in an attempt to foster “bridging”—that is, bringing advocates of low-income people into contact with the technology sector for community development. Cleveland’s Digital Vision and Austin’s Idea Network are two examples. Such initiatives hold promise, but their existence should not be seen as ends in themselves. These coalitions are partnerships among people and groups with differing outlooks and goals. Business leaders may see community-computing programs as a way to increase the supply of skilled workers—something that they need quickly. Community activists may see the partnerships as long-term strategies to improve people’s lives and foster civic engagement among forgotten members of the community. Recognizing these differences early is key to making bridging efforts work.

**Encourage experimentation:** Across the five cities, we have seen several different models for using the Internet for community purposes. In Washington, D.C., the nonprofit Byte Back partners with existing social service agencies to provide Internet access. In Austin, the Free-Net, which receives some public support, also partners with community groups, but the city also funds job-training programs that focus on computer skills. On the economic front, Portland is funding the retrofitting of a building for creative services, while Washington is nurturing an entire downtown district for similar purposes. There is no single solution to exploiting the Internet’s potential and community leaders and policymakers should be aware of this. A willingness to tolerate multiple approaches should also be accompanied by a willingness to tolerate fits and starts in programs, and even failure. The lessons learned in the process can be as valuable as successful models that are often showcased as successes.

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<sup>13</sup> This idea builds on a recommendation in the Kettering Foundation’s report “Meaningful Chaos: How People Form Relationships with Public Concerns” available on the Web at: [http://fly.web.net/ccic/volsect/PE4A-meaningful\\_chaos.htm](http://fly.web.net/ccic/volsect/PE4A-meaningful_chaos.htm)

The Internet brings new possibilities to cities and communities, from improved delivery of government services, to greater civic engagement, to new economic opportunities for regions. But cities also bring new possibilities to the Internet, as community leaders can bring content to the Internet that furthers a wide variety of community objectives. The reciprocal relationship between the Internet and places is how the “rules of the game” for institutions are shaped. There are early signs that the Internet can play a positive role in revitalizing city institutions. Patience, persistence, and resources will be needed over time to sustain and build upon these early successes.

## Appendix A: Economic Profiles of the Five Cities

The five cities studied in this report have a variety of characteristics, with several being among the most highly wired cities in the United States (Austin, Portland, and Washington, DC), some being centers of high-tech manufacturing (Austin and Portland), others being service oriented (Nashville and Washington), and one traditional manufacturing center (Cleveland). The following tables present portraits of the five cities.

*Table A.1 Population and Internet indicators for case study cities.*

	Internet Penetration Rates at home or work (% of adults) (2000)	Internet Penetration Rates at home or work (% of adults) (1999)	Population (2000)	Population Growth in percentage ('90-'00)	Median Age in years (1999)
Washington, DC	73	71	4,815,581	14.1	33.5
Austin	69	64	1,186,279	40.2	30.2
Portland	61	57	1,870,730	23.5	34.7
Nashville	50	50	1,187,521	20.6	33.5
Cleveland	48	42	2,217,174	0.7	33.5

*Table A.2 Economic Structure of Cities (% Employment in Each Sector, excluding Public Administration)*

SECTOR	Year	Construction	Manufacturing	Distributive Services	Sales (Whole-sale + Retail)	Producer Services	Health & Education	Other Services
Cuyahoga County (Cleveland-Lorain-Elyria, OH)	1987	3.9	25.2*	5.4	27.2	15.4	12.2	10.7
	1997	3.4	19.3*	4.8	25.8	22.1	14.9	9.7
Davidson County (Nashville, TN)	1987	7.1	16.6	6.8	29.2	15.7	12.0	12.6
	1997	5.4	10.9	7.2	28.1	19.2	16.1	13.0
District of Columbia (Washington, DC)	1987	2.8	4.3	5.5	16.7	29.2	17.7	23.8
	1997	1.6	3.1	5.0	13.6	31.8	21.6	23.2
Multnomah County (Portland-Vancouver, OR)	1987	3.7	15.5	10.1	29.3	19.1	10.6	11.8
	1997	5.2	13.2	8.9	27.1	22.1	12.7	10.8
Travis County (Austin-San Marcos, TX)	1987	5.6	15.4**	4.3	30.4	22.0	7.7	14.6
	1997	5.5	16.2**	4.2	26.6	26.9	10.1	10.6
United States	1987	5.8	22.7	6.1	28.9	15.0	10.2	11.3
	1997	5.3	18.0	6.0	27.9	18.9	13.1	10.8

\* Percentage of employment in machinery was approximately 13.0 % in 1987 and 10.4 % in 1997.

\*\* Percentage of employment in electronic and other electric equipment was approximately 3.9 % in 1987 and 7.7 % in 1997.

Data Source: County Business Patterns, "<http://fisher.lib.virginia.edu/cbp/>"

As the tables show, Washington has the highest Internet penetration rate, with 73% of adults with Internet access, followed closely by Austin at 69% and Portland with 61%. Cleveland (48%) and Nashville (50%) have the lowest Internet penetration rates of the five cities (Scarborough Research, 2001). By the end of 2000, overall Internet penetration in the United States for adults was 56% (Pew Internet and American Life Project, 2001). In terms of distribution of employment, Cleveland, Austin, and Portland lead the way in manufacturing, with Austin and Washington leading in producer services followed by Cleveland and Portland. Washington's high share of "other services" is accounted for by the many membership organizations located in the U.S. capital. Nashville rates very low in manufacturing, but relatively high in health care services and education.

Although not disaggregated in Table 2, Austin and Portland are known as centers of manufacturing in electronics, with Austin specializing in semiconductors, computers, and semiconductor manufacturing equipment (SME), and Portland in semiconductors, SME, displays, and silicon wafers. The Washington, DC metro area, another tech center, specializes in telecommunications and Internet services. In 1997, overall high-tech employment location quotients (with high-tech sectors defined as computer and electronic manufacturing, software publishing, information services and data processing, and computer systems design) were 3.5 for Austin, 2.2 for Washington, D.C., and 2.0 for Portland (Cortright and Mayer, 2001). Making causal statements about economic structure and Internet penetration is risky, but it seems that Austin, Portland, and Washington have high Internet penetration rates because of a workforce accustomed to being very wired. That is, because people's jobs produce the infrastructure for the information economy and use it in production processes, they demand such products for themselves at home.

Other measures of regional economies show the variability in the five economies. The Progressive Policy Institute has developed the Metropolitan Economy Index to describe how well suited to the New Economy metropolitan economies are. The report uses 16 indicators in the index that fall into five categories: knowledge jobs, globalization (the export orientation of the area's manufacturing sector), economic dynamism and competition, transformation to the digital economy (e.g., the number of adults online, the number of "dot-com" domain names registered), and technological innovation capacity (e.g., the number of patents issued).

San Francisco rates highest in the PPI's index, but among the top 10 two cities from this study appear, Austin (ranked 2<sup>nd</sup>) and Washington (ranked 6<sup>th</sup>). Portland is ranked number 15, Nashville comes in at 32, and Cleveland at 33. In terms of specific categories, Austin ranked very well in online population (2), share of managerial and professional jobs (3), share of high-tech jobs (1), patents (3), and availability of venture capital (1). Austin had relatively low ratings in measure of economic dynamism, ranking 22<sup>nd</sup> in share of high growth companies (called "gazelles" by PPI) and 13<sup>th</sup> in job churning (the creation and destruction of new companies). Washington rates first in managerial and professional jobs as well as technical literacy of its workforce. The District does not do as well in measure of innovation and dynamism, with 31<sup>st</sup> in patents, 9<sup>th</sup> in venture capital availability, and 29<sup>th</sup> in "gazelles." Portland's ranking reflects its high tech manufacturing base, with a strong ranking (11) in manufacturing exports, share of high tech jobs (11); its ranking of 10 in venture capital availability is good, though the amount of venture capital available drops off quickly after the top five cities. By other measures of dynamism, Portland's rankings are unremarkable; it is 26<sup>th</sup> for "gazelles" and 28<sup>th</sup> in job churning.

The less high tech cities, Nashville and Cleveland, are in the middle of PPI's pack, but they have a few bright spots. Nashville ranks 9<sup>th</sup> in managerial and professional jobs and

9<sup>th</sup> in job churning, reflecting the entrepreneurial image Nashvilleans have of their city. Nashville also rated 16<sup>th</sup> in terms of the availability of broadband connections. Cleveland rates fairly well in managerial jobs (17<sup>th</sup>) and patents (20<sup>th</sup>), as well as use of computers in schools (10). However, venture capital is relatively scarce in Cleveland (42); this contrasts with Nashville's rating of 20. And in job churning, it rates only 44.



## **Appendix B: List of Interviewees**

### **Portland**

Mike Andrews, Enterprise Foundation  
David Biedermann, Information Technology Department  
Vanessa Blake, Portland Chamber of Commerce  
Rob Bole, Enterprise Foundation  
David Bragden, Portland Development Commission  
Molly Cooley, Neighborhood Pride Team  
Hansford Hair, Neighborhood Pride Team  
Mary Beth Henry, Office of Cable Communications and Franchise Management  
Hugh Mackworth, Smart Forest Ventures  
Meg Merrick, Portland State University  
Andy Miller, Portland Bureau of Housing and Community Development  
Gary Oldenburg, Portland Development Commission  
Michael Ogan, Portland Development Commission  
Marshall Runkel, Office of Council Member Erik Sten  
Robert Skelton, Portland Cable Access  
Erica Waldon, Neighborhood Pride Team  
Linda Weston, Oregon Entrepreneurs Foundation

### **Austin**

Lon Berquist, Office of Cable and Regulatory Affairs, City of Austin  
Jim Butler, Interactive Industries Development, City of Austin  
Terry Dyke, Office of Cable and Regulatory Affairs, City of Austin  
John Fitzpatrick, Capital Area Training Foundation and Austin Chamber of Commerce  
Paula Fracasso, Austin Entrepreneurs Foundation  
Kristen Gossett, Austin Idea Network  
Jon Hockenyos, Texas Perspectives  
Paul Hilgers, Neighborhood Housing and Community Development, City of Austin  
Rhondella Pugh, Office of Cable and Regulatory Affairs, City of Austin  
Lodis Rhodes, University of Texas at Austin  
Jon Roberts, Angelou Economic Advisors  
Margaret Shaw, Neighborhood Housing and Community Development, City of Austin  
Ana Sisnett, Austin FreeNet  
Kristen Vassallo, office of Mayor Kirk Watson  
Toni Williams, Austin Learning Academy

### **Cleveland**

Bill Callahan  
Roy Church, Lorain County Community College  
Michael Ciccarello, Department of Community Development  
Jim Cookinham, Northeast Ohio Software Alliance  
Kevin Cronin, Digital Vision  
Keith King, Cleveland Growth Association  
Jack Kleinhenz, Cleveland Growth Association  
James Kroeger, Cleveland Growth Association

Bob Sadowski, Cleveland Growth Association  
Lou Tisler, West Side Community Development Corporation  
Chris Warren, Office of Economic Development, City of Cleveland  
Charles Webb, Cleveland Growth Association

**Washington, D.C.**

Lara Belkind, D.C. Office of Planning  
Al Browne, Edgewood Terrace  
Susan Cummings, Columbia Heights Development Corporation  
David Domenici, SeeForever Foundation  
Elliot Frutkin, Doceus  
Judi Greenberg, Office of Deputy Mayor for Economic Development  
Debony Heart, Byte Back  
Ben Hecht, One Economy Corporation  
Jennifer Steingasser, D.C. Office of Planning  
Gail Williams, SeeForever Foundation

**Nashville**

Peter Chapman, Metro Davidson Office of Economic Development  
David Condra, Nashville Technology Council  
Doug Eckert, Department of Information Systems  
Chris Ferrell, MarketingOps.com and Nashville City Council Member  
David Fox, Nashville Post  
Rebecca Foy, CWA-Cayce Learning Center  
Kelly Garrett, XOR, Inc.  
Martha Gregory, Metro Davidson Housing Authority  
Jody Lentz, eConception  
Anita McCaig, Metropolitan Planning Commission  
Teri McElhaney, Metropolitan Nashville Arts Commission  
Richard McKinney, Department of Information Systems  
Richard Mitchell, consultant to Metropolitan Nashville Arts Commission  
Ed Phillips, U.S. Department of Housing and Urban Development  
John Stern, Neighborhoods Resource Center  
Thomas L. Turk, Metropolitan Nashville Arts Commission