



Critical Planning

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Editorial Note

Cities are products of proximity, and few things influence our need for proximity as much as technological innovation. The car, the telephone and the computer have all brought distant places closer, and reduced our need to be near one another. The steady advance of transportation and communication technology, and the decline in urban density that has accompanied it, has informed a longstanding and pessimistic idea in urban studies: that technology will wipe out cities. Le Corbusier imagined highways and highrises that would render the metropolis obsolete. In 1964 Lewis Mumford said the automobile would destroy the city. In 1992 Joel Garreau said the fax machine would.

And yet cities persist. The relationships between technology, the economy and society are more complicated than either the doomsayers or dreamers would have it. Technology pulls as well as pushes. Technological innovations allow us to live apart, but the act of innovating, paradoxically, requires that we be together. The challenge of technology is not that it will unravel cities, but that its benefits will reach some but not others, and that its costs will fall hardest on those who benefit least.

In this twelfth issue of *Critical Planning* we take on the question of how technological change affects people in cities. In our first article, Stuart C. Strother critically evaluates the idea of the "digital divide." Using a case study of Louisville, Kentucky, he argues that the divide is caused less by unequal access to technology, and more by unequal rates of technology adoption.

Ashok Das offers a slightly different take on the digital divide in his interview with the staff of UCLA's Center for Neighborhood Knowledge (CNK). The CNK staff discuss their efforts to make the Internet more relevant to disadvantaged groups, and they focus in particular on the Net's potential to empower both low-income people and people with disabilities.

A second form of digital divide is addressed by Christopher V. Hawkins, in his article on the importance of human capital. Today's labor market increasingly rewards those with education and technological skills, and increasingly neglects those who lack them. The rise of this "knowledge economy," Hawkins argues, demands increased investments in human capital, which can help both poor people and poor regions.

Technology's impact on cities is perhaps nowhere more evident than in the field of transportation. If any one force governs daily urban life, it may be the uneasy tension between the car, the built environment, and the people who use both. In David King's interview with David Levinson, Levinson describes the difficulties of providing mobility and access to all members of the metropolis, and speculates as to what the future of transport innovation might hold.

Technological change often leads to political unrest. Progress by definition uproots established institutions and threatens existing ways of life. The industrial revolution in Britain was no exception, and E. Joanna Guldi's article examines the changing role that riots played during the turbulent years of England's

industrialization. Although at first sanctioned by custom, riots later came to be seen as threats to private property, and were brutally suppressed. Guldi contends that Britain's experience with riots holds lessons for our own tumultuous times, particularly as cities grapple with the regulation of public space.

While the benefits of technology are often broadly dispersed across the population, its costs are often concentrated on a minority. Progress is for this reason frequently accompanied by locational conflict—the topic of our last two articles.

First, In Kwon Park analyzes the relationship between local autonomy and conflicts over nuclear power plants in South Korea. She finds that increases in local autonomy led to longer and more severe conflicts between local residents and the central government.

Second, Alvaro Huerta reports from South Gate, an impoverished city already burdened with numerous sources of pollution, where activists and community members rallied to defeat a proposed natural gas power plant.

Our issue is rounded out by two review essays. Daniel Freedman takes on the topic of water scarcity, while Enrique Gualberto Ramirez searches for coherence in the spaces of both sprawl and the World Wide Web.

Much of the work that goes into *Critical Planning* is done by our review board and our outside reviewers, as well as by our production staff. We extend our thanks to them, and also to our funders: the UCLA Department of Urban Planning, the UCLA Graduate Students' Association, the Ralph and Goldy Lewis Center for Regional Policy Studies, and the Dean of the UCLA School of Public Affairs.

— *Michael Mamville*

Unequal Access or Consumer Preference? An Economic and Geographic Analysis of the Digital Divide



Abstract: This paper examines the digital divide in the context of consumer preference and economic inequality. It analyzes the role of income, education, and geography in determining access to digital technology. The study finds that while income and education are significant factors, geographic location also plays a crucial role in determining digital access. The paper discusses the implications of these findings for policy and suggests ways to improve digital access for underserved populations.

Introduction

The term "digital divide" refers to the gap between those who have access to digital technology and those who do not. This gap is often measured in terms of computer ownership, internet usage, and digital literacy skills. The digital divide is a complex phenomenon that is influenced by a variety of factors, including income, education, and geography. This paper examines the digital divide in the context of consumer preference and economic inequality. It analyzes the role of income, education, and geography in determining digital access. The study finds that while income and education are significant factors, geographic location also plays a crucial role in determining digital access. The paper discusses the implications of these findings for policy and suggests ways to improve digital access for underserved populations.



Members of the staff and students of the Central Technical College, London, are seen by our camera board and our students in a room where they are producing their work. We visited our staff in their classrooms in London in 1971. The Department of Technical Planning, the U.K. Education System, Association, the Graph and Family Group, (Committee Regional) Policy Studies, and the Department of Technical Education of People, Africa.

— Michael J. ...

Unequal Access or Consumer Preference? An Economic and Geographic Analysis of the Digital Divide in One U.S. City

Stuart C. Strother

A digital divide exists between those individuals who use certain telecommunication services and those who do not use them. It has been argued that the poor, minorities, and central city residents have 1) less access to computers, and 2) less access to advanced telecom services (NTIA 1995, 1998; Hammond 1997; and Bucy 2000). This study examines these claims by using geographic analysis to explore the affordability of computers and the availability of high-speed Internet access in Louisville, Kentucky. The results suggest that computers have become vastly more affordable in recent years and are financially within reach of most households. This study also suggests that central city Louisville residents do not have less access to high-speed Internet than those living elsewhere in the city. These findings indicate that the digital divide exists more as a result of consumer preference than as a consequence of unequal access to telecommunications services.

Introduction

The term "digital divide" refers to the observation that not all members of society have the same access to telecommunications and information technologies, resulting in a gap, or divide, between technology "haves" and "have-nots." The have-nots are then excluded from certain economic, educational, and political opportunities because they have no access (or limited access) to basic and advanced telecommunications networks and services. Many groups may be on the "wrong" side of the digital divide, including the poor, minorities, rural residents, central city residents, women, people with limited education, and the elderly. While no single person is credited with coining the phrase "digital divide," the term gained wide use after 1995, when former President Bill Clinton and then-Vice President Al Gore suggested that government action was necessary to bridge this divide. Since then, policies have been employed at many levels of government to help close the digital divide. The oft-stated goal of these policies is to increase rates of computer ownership and Internet access, in order to achieve more balanced technology use across all socioeconomic groups (NTIA 1995; 1998).

This article contributes to the digital divide literature by testing the hypothesis that the poor, minorities, and those living in central cities have less access to computers and advanced telecom services. Using consumer expenditure data and geographic data from the Louisville, Kentucky Metropolitan Statistical Area, this study considers the relative affordability of computers and examines the availability of digital subscriber line service (DSL), a high-speed method of connecting to the Internet. The findings suggest that, compared to other consumer expenditures, computers have become vastly more affordable in recent years for most households. This study also finds that central city residents and minorities are not at a disadvantage in terms of access to high-speed Internet service. These results suggest that government policies focused on increasing access to computers and the Internet might be less effective than those aimed at informing individuals of the educational, political, and economic advantages of being connected in the digital age.

The Digital Divide

The digital divide has received plenty of attention in the media (Woellert and Krim 2000; Krim 2005), government reports, and scholarly research. The problem associated with the digital divide is that people without access to telecommunications, and specifically the Internet, are excluded from some educational, economic, and political opportunities. Examples of educational resources found on the Internet include informational search engines, dictionaries, encyclopedias, scholarly research programs,

and online college programs. Delores Cross, president of Morris Brown College in Atlanta, also notes that children who are not exposed to computers and the Internet at a young age will not be able “to compete successfully in the workforce of the 21st century” with peers who grew up technologically savvy (2001: 104). Economic opportunities available through the Internet include the ability to pay bills and purchase goods online, and also an increased ability to find work. Jansen, Jansen and Spink (2005) conducted research on online job seeking and noted, “The web is now a significant component of the recruitment and job search process” (2005: 49). Political opportunities afforded by the Internet can range from simple interaction with local government—such as applying for a building permit or downloading the agenda for a city council meeting—to coordination and information-sharing between distant but likeminded groups (opponents of big box stores, for example, often trade strategies and ideas online). Without access to the Internet, those on the wrong side of the digital divide have a harder time taking advantage of these educational, economic, and political opportunities.

The scholarly literature on the digital divide consists primarily of evidence as to the divide’s existence and policy recommendations for closing it. The policy recommendations vary. Singleton and Mast (2000) argued that government regulation could provide incentives for telecommunications providers to increase accessibility for those without computers and/or Internet access. Other research observes that de-

regulation of the communications industry, including the 1984 divestiture of American Telephone and Telegraph (AT&T), and the Telecommunications Act of 1996, has increased access to telecommunications products and services (Samuelson 2002; Woellert and Krim 2000). This latter research focuses on the demand side of the market, and argues that policies designed to educate individuals about the Internet's benefits would be more effective than policies that seek only to increase access. Some scholars deny the existence of a digital divide. Representative literature is reviewed below, including government reports and empirical research.

Government Digital Divide Research

The federal National Telecommunications and Information Administration (NTIA) regularly publishes reports summarizing access and usage of telephones, computers, and the Internet. NTIA reports are based on data from the Current Population Survey and from the Computer and Internet Use Supplement, both collected by the U.S. Census Bureau. The re-

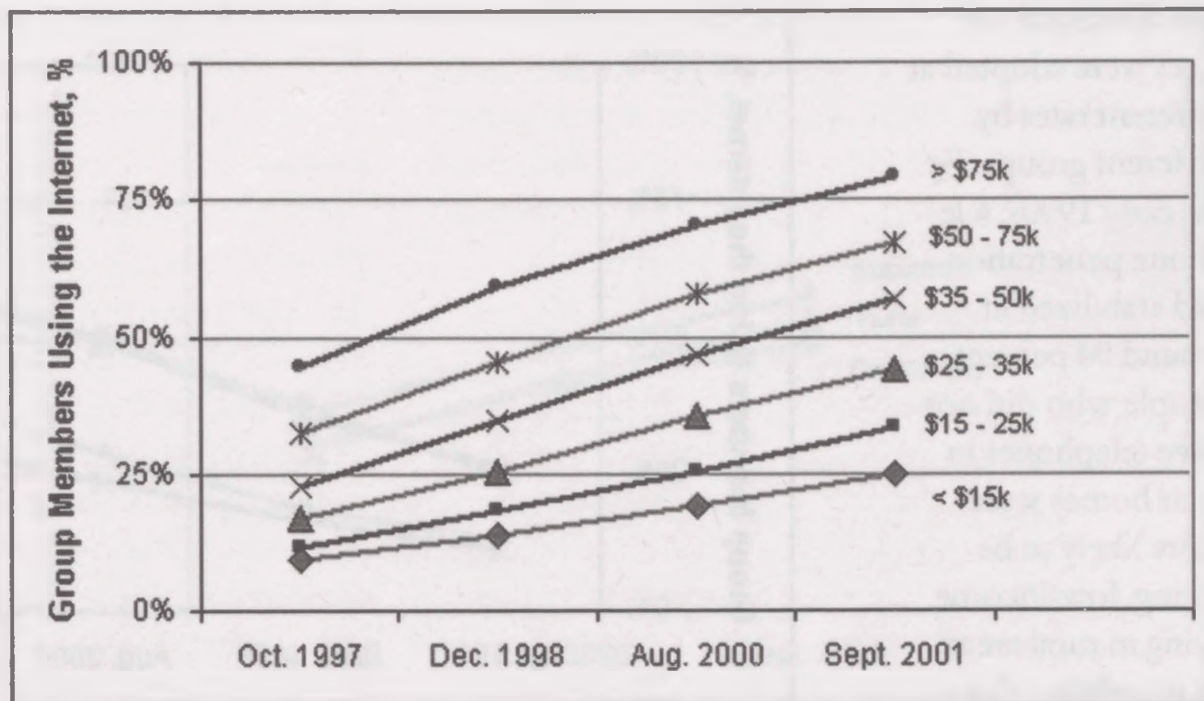


Figure 1: The digital divide in home connections to the Internet, by income.

Source: NTIA, 2002.

ports have been issued in 1995, 1998, 1999, 2000, and 2002. In these reports, and as follows in this article, "basic telecommunications service" is defined as a single analog telephone line, and "advanced telecommunications services" include digital Internet services such as narrowband (i.e., dial-up) and broadband (i.e., Integrated Service Digital Networks (ISDN), DSL, and cable modem) service.

The first three NTIA reports (1995, 1998, and 1999) noted that basic telecommunications services had been adopted by almost all U.S. households, but

that advanced services were adopted at different rates by different groups. By the early 1990s, telephone penetration had stabilized at around 94 percent. People who did not have telephones in their homes were more likely to be young, low-income, living in rural areas, or members of certain minority groups (NTIA 1995; 1998).

Regarding advanced telecommunications services such as wireless telephone service, computer ownership, and Internet use, the 1995 and 1998 reports documented differences among user groups, especially according to income, race, and residential location.

People with higher incomes use the Internet more than people with low incomes, and the usage difference between the two groups seems to be growing. Figure 1 shows the percentage of households in each income group that were connected to the Internet in a given year. In 1997, there was a 35.3% difference in Internet connectivity between the highest income group (44.5%) and the lowest income group (9.2%). By 2001, this gap had grown to 53.9%. Although the

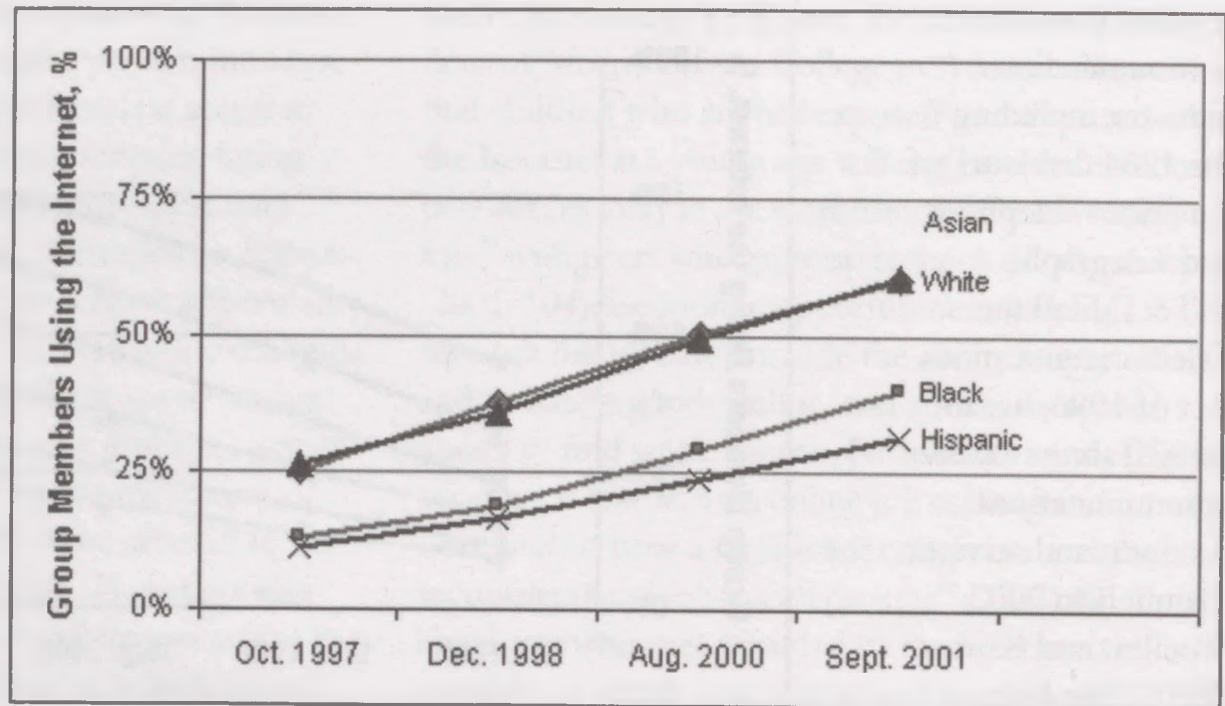


Figure 2: The digital divide in home connections to the Internet, by race.

Source: NTIA, 2002.

difference in relative levels of connectivity has grown over the short term, an important observation from this data is that absolute levels of Internet use are growing for all income groups. More people are using the Internet each year, and presumably they are reaping the economic, political, and educational benefits of Internet service.

In 1999 the NTIA reported that, "the digital divide has turned into a 'racial ravine' when one looks at access among households of different races and ethnic origins" (8). Figure 2 shows the trends of

Internet use by different racial groups. Asians and whites were “early adopters” of computer technology, while African Americans and Hispanics have adopted the technology more slowly, although usage rates for all races are steadily rising. It is quite possible that the adoption curve for advanced telecommunications services will follow the same trajectory as that for basic telephone service, resulting in near ubiquitous usage across all groups over time. The NTIA alluded to this possibility when it stated that, “Americans of every demographic group and geographic area have experienced a significant increase in computer ownership and Internet access” (1999:5). The term “digital divide” creates an image of some groups having less access than others to Internet technology, but if other technologies can serve as examples, then one possible explanation for the digital divide is that different groups have simply chosen to adopt new technologies at different rates. If this is true, the divide we see today may not persist.

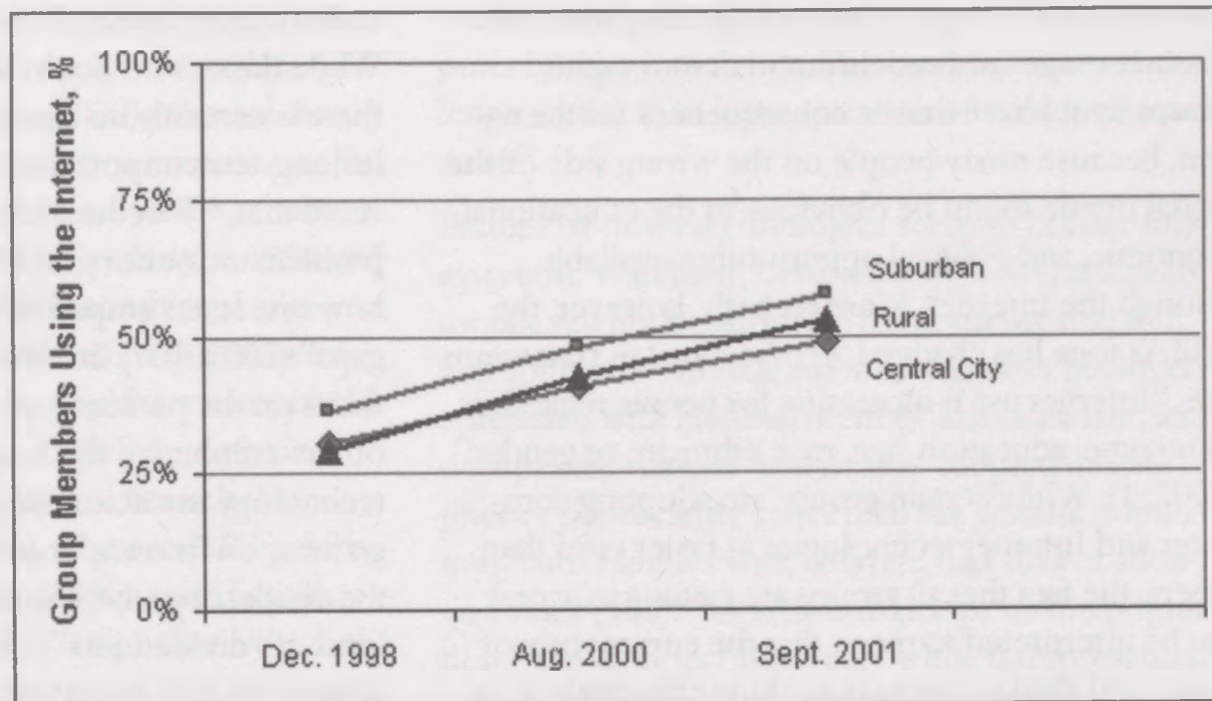


Figure 3: The digital divide in home connections to the Internet, by residential location.

Source: NTIA, 2002.

In addition to the income and race divides, a digital divide also exists between central city residents, rural residents and those in the suburbs. Figure 3 shows the rates of Internet connection for urban, suburban, and rural American households. The data show that higher numbers of suburban residents are Internet users, but between 1997 and 2001, the divide between the groups remained constant, around 5 percent. This data reveals a small digital divide between the three groups, but also shows an overall trend of rising usage rates for all groups.

The early NTIA reports warned that disparities in Internet usage between different demographic groups could have drastic consequences for the nation, because many people on the wrong side of the digital divide might be oblivious to the educational, economic, and political opportunities available through the Internet. More recently, however, the NTIA's tone has changed, as evidenced in statements like, "Internet use is increasing for people regardless of income, education, age, race, ethnicity, or gender" (2002: 1). While certain groups are adopting computer and Internet technologies at faster rates than others, the fact that all groups are gaining in access can be interpreted to mean that the current mix of policy and market forces is working effectively to increase the overall numbers of participants in the digital economy.

Empirical Digital Divide Research

Most empirical research on the digital divide has confirmed that different groups have adopted technologies at different rates (Bikson and Panis 1995; Jung, Qiu and Kim 2001; Gorski 2002 and 2003; Hacker and Mason 2003). There is disagreement, however, as to the causes of the digital divide. Many have attributed the divide to institutional sources, such as unequal access to technology in educational institutions (Smerden et al 2000; Gorski 2003), or unequal access because of discriminatory service offerings by profit-motivated telecom firms (Hammond 1997). Others, however, have argued that the digital divide exists because individuals' technology adoption decisions are based on consumer preference rather than

access opportunities (Frezza 1999; Stanley 2003). While there is no doubt the digital divide exists, there is certainly no agreement on its causes, nor on its long-term importance. Hacker and Mason observe that, "Whether one claims the digital divide is problematic or not problematic is clearly related to how one states empirical conclusions...of the divide gaps" (2003: 107). In other words, some researchers focus on the present gaps between groups, while others emphasize the long-term trends of growing technology use across all groups. So the divide may go away on its own, or action could be taken to close the divide, or perhaps society will decide that a certain level of "dividedness" is both inevitable and acceptable.

Bikson and Panis (1995) analyzed the use of e-mail and the Internet and found different levels of use along the lines of income, education, and race. Noting that e-mail and the Internet are tools that provide the user with practical advantages in finding employment, obtaining education, and interacting with government, Bikson and Panis recommend increased provision of computer training courses and public computing facilities.

Other research has focused on federal telecommunications policy as a source of the digital divide. Research by Hammond (1997), for instance, argues that the Telecommunications Act of 1996 has "codified" the digital divide (179). Hammond contends that industry deregulation allows carriers to focus on profitable high-end business and residential customers and neglect other groups, especially the poor.

Many researchers have focused on the digital divide in terms of race. For instance, survey research conducted by Spooner and Rainie (2000) revealed that 42% of African Americans said their community had no public computing site, while only 29% of whites reported the lack of such a site. Similarly, in 1998 and 1999 Jung, Qiu, and Kim (2001) conducted telephone survey research of residents of different ethnic neighborhoods in the Los Angeles metropolitan area. They found that people of different ethnic backgrounds had different rates of household Internet use: Caucasian (63%), Chinese (53%), African-American (44%), Korean (38%), and Hispanic (18%). Hoffman and Novak (2000) observed a digital divide between African-Americans and the general population in terms of computer ownership rates and Internet use. However, they also observed that African-Americans are early adopters of technologies such as cable and satellite dish technology. The fact that African Americans in Los Angeles have adopted some advanced telecommunications technologies quickly, while shunning computer ownership and Internet use, suggests that consumer preference may be driving these purchasing decisions, not economic constraints.

Stanley (2003) conducted ethnographic research with low-income adults to discover what factors contribute to their acquisition of computer skills. He found that cultural factors such as "relevance, fear, and self-concept" were more to blame for the digital divide than were sources suggested by the "conventional wisdom," namely "high computer costs and lack of

access" (407). Stanley concludes that increasing computer literacy is more a cultural and educational challenge, rather than just a question of economics and access.

Studies of other technologies seem to bolster this assertion. Wareham, Levy, and Shi (2004) analyzed mobile telephone adoption using survey research, and found that mobile phone usage was positively correlated with income, metropolitan area size, and occupation. African Americans "adopted mobile phones significantly faster than the general population," but families with children had slower adoption rates (456). "Certain subgroups of the population," the authors observed, "while unrepresented in terms of Internet use, have adopted 2G mobile communication devices at rates equal or faster than the base population" (456).¹

Much of the current research focuses on the demand side of the telecommunications market by studying the technology adoption choices of individual users (Bikson and Panis 1995; Jung, Qiu and Kim 2001; Gorski 2002, 2003; Hacker and Mason 2003). Supply side policy recommendations have also been made that center on encouraging telecommunications carriers to provide affordable services to all groups, regardless of demographic and geographic criteria. Historically, this type of reasoning has been very effective in the policy arena, as evidenced by the numerous universal service programs at the federal and state level, many of which will be discussed later.

Store	Computer Price
Best Buy	\$524
Circuit City	424
Comp USA	419
Dell	499
Office Max	499
Office Depot	299
Wal-Mart	498
Mean	452
St. Dev.	79

Table 1: Prices for complete personal computer systems in Louisville, Kentucky, 2004.

Source: Advertising supplements in the *Courier-Journal*, July 2004.

This Study's Contribution to the Digital Divide Literature

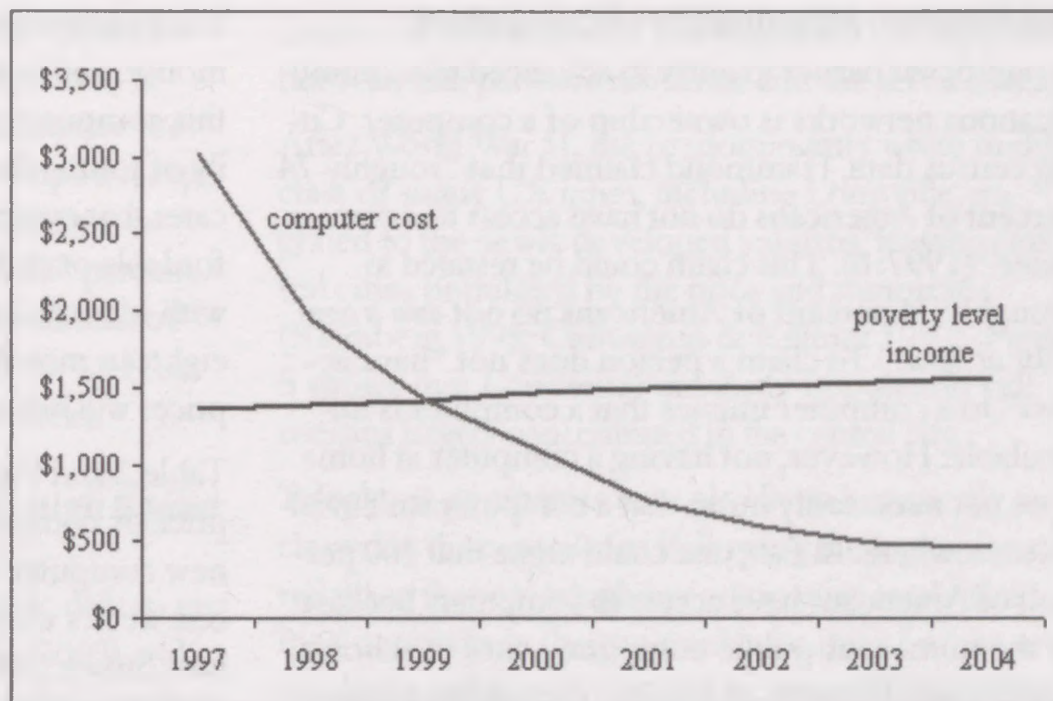
While claims have been made that carriers are unevenly offering access (i.e., Hammond 1997; Singleton and Mast 2000), little empirical research supports this view. Much of the previous research does not distinguish between the level of technology *usage* and the level of *access*. As such, groups with lower rates of use are assumed to have lower rates of access. For example, the NTIA (2002) reports that central city residents have fewer home Internet connections than suburban residents, although the telecommunications network is more mature in central cities. This study differs significantly from previous research by using a more typical definition of

	Poverty line (family of four)	Monthly Poverty Level Income	Cost of a Computer	Computer Cost as % of income	# of Weeks of Income to buy computer
1997	\$16,400	\$1,367	\$2,992	18%	9.5
1998	16,660	1,388	1,921	12%	6
1999	17,029	1,419	1,412	8%	4.3
2000	17,603	1,467	1,092	6%	3.2
2001	17,960	1,497	757	4%	2.2
2002	18,100	1,508	589	3%	1.7
2003	18,400	1,533	484	3%	1.4
2004	18,850	1,571	452	2%	1.2

Table 2: Poverty level income for a four-member household and annual computer prices.

Sources: Federal Register, 2004; *Courier-Journal*, 2004; Consumer Price Index, 2004. 2004 data is based on advertised prices, and previous year pricing is calculated using the Consumer Price Index for "personal computers and peripheral equipment." All figures are current dollars.

access. That is, this study does not ask whether or not a technology is being *used* by a certain group, but whether or not the group has the *opportunity* to use the technology. This is an important distinction in that all members of society should be guaranteed equal opportunities of access—and so long as the opportunities are equal, policymakers might not have to be so concerned if the outcome is unequal usage.



Empirical Analysis of Telecommunications Access

This study is concerned with what Stanley (2003: 407) calls the “conventional wisdom” of the digital divide: that “high computer costs and lack of access” cause the divide, and that people with access to telecom networks have a competitive advantage over those without such access. The digital divide literature makes two strong claims: that the “have-nots” (the poor, minorities, and central city residents) cannot afford computers, and that they lack access to telecommunications services. In this section of the paper, these two claims are put to an empirical test using economic and geographic analysis.

In many ways Louisville, Kentucky is an ideal subject for digital divide analysis. With its distinct central city and sprawling suburbs, Louisville represents a textbook example of a modern U.S. metropolitan area

Figure 4: Computer prices compared to monthly poverty level income.

Sources: Consumer Price Index, 2004; *Courier-Journal*, 2004; Federal Register, 2004.

(Burgess 1925). The city’s mature telecommunications infrastructure has been developed throughout the course of its 200-year history by private firms such as AT&T and Southern Bell. Because part of the metropolitan area is in Kentucky and part is in Indiana, this case affords the opportunity to observe two different regulatory environments and two different telephone companies. Historically, BellSouth has been the primary telecommunications provider in Kentucky, while Ameritech (now SBC) has been the primary provider in Indiana.

The Relative Affordability of Computers

A significant barrier to entry to advanced telecommunications networks is ownership of a computer. Citing census data, Hammond claimed that “roughly 74 percent of Americans do not have access to a computer” (1997: 6). This claim could be restated as “roughly 74 percent of Americans do not *own a computer at home.*” To claim a person does not “have access” to a computer implies that a computer is unavailable. However, not having a computer at home does not necessarily mean that a computer isn’t available elsewhere. In fact, one could argue that 100 percent of Americans have access to computers because of the numerous public computing sites in schools, universities, libraries, and public computing centers. On its Digital Divide Network website, the Center for Media and Community has located thirty public Internet access sites in Louisville’s libraries, community centers and other public places. Many of these public sites are in the central city.

By 2001, the share of Americans without a computer at home had dropped to 39 percent (NTIA 2002). Possible explanations for lack of computer ownership include computers’ expense, or people’s consumer preference for other goods. In other words, people who do not own computers either cannot afford them or do not want them.

To analyze the affordability of computers, I gathered computer pricing data over a two-week period from newspaper advertisements in Louisville. The results shown in Table 1 reveal an average 2004 price of around \$450 for a complete, entry-level desktop per-

sonal computer including a monitor, keyboard, mouse, and in most cases a printer. Table 2 compares this computer pricing data with the income of a family of four at the federal poverty line. The table indicates that computers have become vastly more affordable over the past few years, which is consistent with Moore’s Law (Moore’s Law predicts that every eighteen months computer power will double while prices will halve (Moore 1965)).

Table 2 and Figure 4 show a dramatic drop in the price of computers between 1997 and 2004. Today a new computer can be purchased for little more than one week’s wages for an income earner at the poverty line. Stowe (2002) points out that the second-hand computer market is also robust. If a person is willing to settle for a one- or two-year old machine, computers are significantly more affordable than ever before.

Samuelson noted that digital divide theorists “suggested a simple solution (computers) for a complex problem (poverty)” but “computers were never the source of anyone’s poverty” (2002: 39). The claim that computers are not easily accessible by the poor appears to be inaccurate. Ownership of a computer seems a much smaller barrier to entry into the national electronic nervous system than it once was.

Perhaps a greater barrier to entry is knowledge about how to use a computer. However, free and low-cost computer training is available through some libraries and community-based organizations (CBOs). Additionally, “the majority of US temporary help supply

firms offer nominally free, unrestricted computer skills training” (Autor 2001: 1409). Still, access to computer training does not by itself guarantee that people will understand how to use a computer, especially for those who are illiterate. In 1998, the National Institute for Literacy reported that 22 percent of adults are functionally illiterate. No amount of free computer training will enable them to “get connected” and read the content of the Internet.

A Geographic Analysis of Access to High Speed Internet Service

This section of the paper uses geographic data to test the claim by Hammond (1997), Gorski (2003) and others, that the poor, minorities, and central city residents have unequal access to advanced telecommunications services such as DSL. Hammond argues that “network deployment will be driven by short-term market strategies” which will “preclude near-term access to advanced network infrastructure” for many inner city residents (1997: 180). Carriers will “cherry-pick” the most profitable locations at the expense of the poor in inner cities. By definition, telecommunications services allow communication across long distances between two nodes on a network, but to take advantage of the services, the user must physically be present in the service area—even wireless services have geographic boundaries. Telecommunications service areas are not ubiquitous; they are geographically bound by certain environmental, regulatory, and technological limitations. In other words, every service is not available everywhere. To test whether an individual or a group has access to a tele-

communications service, a comparison can be made between that person’s residence and the service area.

After World War II, the predominantly white middle class of many U.S. cities, including Louisville, migrated to the newly developed suburbs, leaving central cities populated by the poor and minorities (Kleinberg 1995; Cummings & Killmer 1997). Figure 5 shows that Louisville’s minority population still remains largely concentrated in the central city.

Telephone companies have also been historically anchored in the central city. Following the logic of central place theory,² telephone companies established their networks in the geographic center of urban areas. Even today, most central business districts have a high-rise building that is full of telephone company personnel and equipment. From the 1960s through the 1990s, when masses of individuals and businesses vacated central cities and moved to suburban locations, telephone companies could not. They were “path dependent” because their lines ran across telephone poles and through underground pipes to converge at the switching equipment in the geographic center of their network. Moving a switch away from the network center was not feasible—it was more efficient to simply extend the network outward and add smaller central offices in the suburbs that connected back to the main switch in the central city (Dodd 1998; Strother 2002).

As businesses and individuals added data traffic to the existing network originally designed for voice traffic, the telephone companies had to increase net-

work capacity. Simply adding more physical lines would not be economical due to the labor-intensity of the work, especially across the “last mile” of the network. Instead telephone company engineers developed new broadband technologies such as ISDN and DSL, which increased the amount of data that could be transmitted (Dodd 1998; Strother 2002). Unlike previous advanced network services, DSL and ISDN work across existing telephone wires; the only physical network upgrade is done at the central office and on the customer’s premises. Thus carriers can easily deploy this technology with only minimal capital investment. Although ISDN service offered high-bandwidth computer connections, “customers were not eager to subscribe” because the

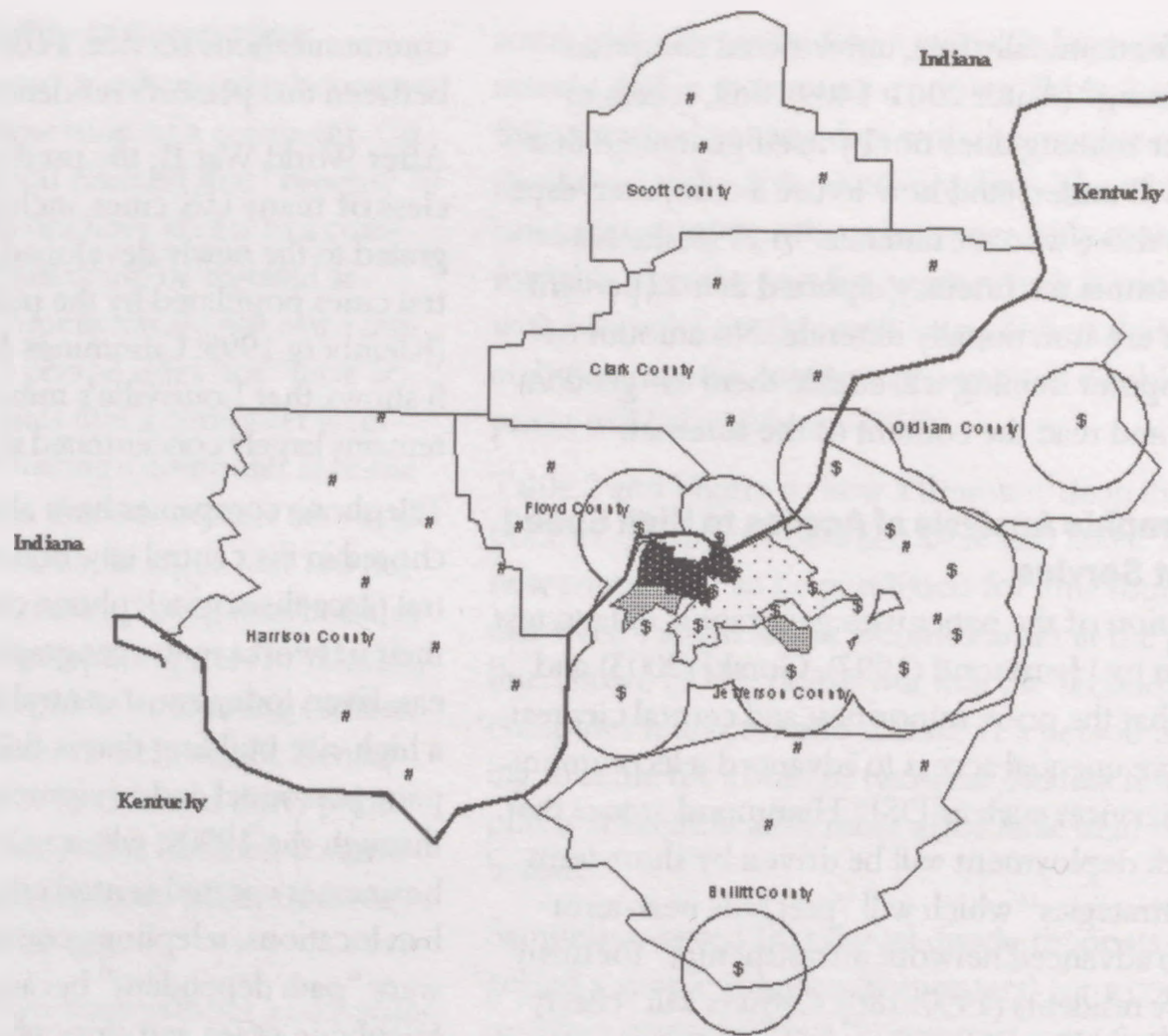


Figure 5: Range of DSL availability in the Louisville Metropolitan Area, August 2004.

Sources: ESRI, Broadband Reports.com, 2002.

technology was not user-friendly (Strother 2002: 191). Telecommunications companies began to

widely offer DSL in 1998, and today the service has more than 10 million subscribers in the United States (Fitchard 2004: 32). Because of certain technical limitations, among them the fact that the technology only works within 5.5 kilometers of the central office, DSL is most likely to be deployed in urban areas (Strother 2002: 202).

To analyze the availability of DSL service in the Louisville, Kentucky Metropolitan Statistical Area (MSA), I used geographic data from BroadbandReports.com and BellSouth to locate the central office of each telephone company and those central offices that offer DSL service (Mangeot 2002). Geographic Information System (GIS) software was then used to locate all areas within 5.5 kilometers of a DSL-equipped central office. The map in Figure 5 shows the availability of DSL service in the Louisville metropolitan area. Geographic census data obtained from Environmental Systems Research Institute, Inc. (2002) was used to locate the areas where minorities outnumber whites. These areas are shaded in the map in Figure 5. The comparison reveals that the entire original central city of Louisville and all of the areas where whites are outnumbered by minorities are contained within the area of DSL availability. In this case, claims made by Hammond (1997) and Gorski (2003) that minorities and central city residents have less access to advanced telecommunications network services than other groups is false. To the contrary, Figure 5 reveals that minorities and central city residents have relatively high access to these services.

Due to market competition, DSL service is now relatively affordable compared to other telecommunications services. In 2004, Louisville residential customers could purchase DSL service for \$25 per month, which is less than the typical monthly cost of mobile phone or cable television service. Just a few years ago, the amount of bandwidth (1.544 Mbps) that a typical DSL customer now receives was only available to businesses, and at a cost of around \$1,000 per month (Strother 2002).

In 1996, Moss predicted that, "those areas with dense concentrations of communications users" (i.e., urban areas, especially central cities, where telecom infrastructure is mature) "will be the first to get the benefits of the new telecommunications services" (1996:1). Rural areas, such as the outlying Indiana counties in the Louisville MSA, may thus never get DSL service. But while DSL is not available from the telecom service providers in these areas, access to cable Internet is available everywhere cable television is offered (Soriano et al. 2005). This casts further suspicion on the claim that people do not use the Internet because they lack access.

Different telephone companies use different strategies in deploying DSL service, as demonstrated with BellSouth in Kentucky and SBC in Indiana. BellSouth has aggressively rolled out DSL service in Kentucky, while SBC in Indiana has not been as aggressive, perhaps because the region is not densely populated. Anticipated revenues from this small, mostly rural customer base might not be large

enough to warrant the initial capital investments that DSL requires. Precisely because different vendors offer different services in different places, Hammond (1997) has argued for government intervention to require carriers to provide the latest technology services, including DSL, everywhere. An alternate perspective, based on Tiebout's (1956) public choice model, is that people "vote with their feet." Tiebout observed that, "The consumer-voter may be viewed as picking that community which best satisfies his preference pattern for public goods" (1956: 418). People choose where they live based on certain amenities available in that area. Those with limited access to advanced telecommunications service have the option of relocating to another community to meet their consumer preferences. Perhaps the educational, economic, and political benefits of telecommunications and information technologies can now wield significant influence on the location decisions of individuals and businesses.

Policy Implications

Government policy has increased access to basic telecommunications services and now a number of policies are in place to increase access to advanced telecommunications services, especially computer ownership and Internet connectivity.

The Communication Act of 1934 established the Federal Communications Commission (FCC) and stated this policy goal: "to make available, so far as possible, to all people of the United States a rapid, efficient, nation-wide, and worldwide wire and radio

communications service with adequate facilities at reasonable charges." Put into action, this policy allowed telecom carriers to subsidize the cost of providing service to rural and poor customers by charging businesses more for service.

The 1984 Modified Final Judgment (MFJ) broke up the AT&T monopoly and split it into eight new monopolies: seven Regional Bell operating companies and one long distance carrier that retained the AT&T name. The MFJ also included the "equal access" ruling, which gives consumers a choice of vendors for their long distance calling. The Telecommunications Act of 1996 gives consumers choices for their local telephone company (so long as a new carrier is willing to enter the market, which has only happened to a small extent to this point).

The Telecommunications Act of 1996 also established the "universal service" policy. A fee is added to each phone bill and this money is deposited into the Universal Service Fund. Residential consumers currently pay only \$0.72 per line, while businesses pay 4.5 percent of their long distance bill into the Fund. The money is then used "to subsidize rural telephone companies and provide telecom services to schools, hospitals and libraries" (Strother 2002: 14). From the Universal Service fund, the FCC awards grants to organizations such as schools, hospitals, and community technology centers through an application process. Those who are most financially needy (or those who are most savvy in applying for the grants) are most likely to get these funds.

The Lifeline program is another federal program available in various forms nation-wide. Administered by telephone companies, the program provides discounted telephone service to low-income families through a subsidy paid for by other telephone users. For instance, service provider NYNEX uses the Lifeline program to offer telephone lines to low-income households for only one dollar per month (Moss 1996). In Louisville, low-income customers receive a twelve-dollar per month Lifeline discount on telephone service. To qualify, the customer must provide evidence of enrollment in one of many state or federal welfare programs, such as Temporary Aid to Needy Families (TANF) or food stamps. Considering the expanded availability and affordability of landline telephone service, it is reasonable to conclude that virtually all Americans have access to basic telecommunications service.

In addition to the above-mentioned policies, the federal government also has specific programs in place to help bridge the digital divide, including the E-rate program, Technology Opportunities Program, Community Technology Centers, and Community Access Centers. Many of these programs face uncertain futures under the Bush administration, as their dedicated funds might be folded into larger block grants to the states (Krim 2005).

Many state and local governments actively try to provide their citizens with greater access to computers and the Internet by creating public Internet access sites, especially at libraries. Funding for these programs usually comes in the form of grants from the

federal government. Simultaneously, state and local agencies have begun to offer many of their functions online, putting people who continue to have limited Internet access at a relative disadvantage in their ability to access government services.

Private firms, especially telecommunications firms, have also participated in the effort to bring electronic access to the unconnected. In a partnership with the National Association for the Advancement of Colored People (NAACP), AT&T provided a \$300,000 grant for the establishment of computer training centers inside NAACP facilities in twenty U.S. cities including Baltimore, Dallas, Miami, New York, Seattle and Philadelphia (Lewis 1999).

Public policy should steer telecom carriers to provide basic and advanced telecommunications access to all consumers, and it has. The 1934, 1984 and 1996 policies made telecommunications services more accessible and affordable for individuals (at the expense of businesses). It should be noted that some telecom carriers have had the same goals long before 1934. In the 1909 annual report AT&T President Theodore Vail stated: "The value of a telephone system is measured by the possibility of reaching through its connections any one—at any possible place...any development which is comprehensive must cover some territory which...must be carried at the expense of the whole..." (1909: 22-23). Vail's statement expressed the idea of universal service long before policymakers codified the idea into law in 1996. The regulatory environment created by the 1984 and 1996 actions allowed for greater competi-

tion among telecom carriers, resulting in more choices and lower costs for consumers. The NTIA states "the data show that the overall level of U.S. digital inclusion is rapidly increasing" (2000: xv). This trend will continue as a market function, and no additional policies are needed to artificially force the digital divide to close. With new computers costing as little as \$400 and Internet access available publicly, now almost all Americans can connect to the national electronic nervous system.

Conclusions

Access to basic telecommunications (i.e., the telephone) and advanced telecommunications (i.e., the Internet) is essential for all citizens because of the educational, economic, and political benefits of these technologies. Disparate rates of computer ownership and Internet use among different demographic and geographic groups are evidence of a digital divide.

Computers and the Internet are widely thought of as tools with the power to improve the lives of the poor and minorities. It is also possible, however, that disadvantaged groups do not benefit from these technologies to the same extent as others. Low-skilled job openings and low-cost housing opportunities, for example, are more likely to be advertised in traditional media, such as newspapers, rather than on the Internet. Future research could perhaps determine whether or not access to the Internet becomes more valuable at a certain level of income and/or education, and whether or not consumer preferences in computer ownership reflect the relationship be-

tween income, education and the benefits derived from Internet access.

Much of the public debate on the digital divide has centered on the concept of technology adoption rather than technology access. Although certain minority groups and central city residents have not *adopted* advanced telecommunications services as rapidly as other groups, in this study of Louisville, these groups were not found to be at a disadvantage regarding *access* to computers and the Internet. These findings suggest that the digital divide is not caused by unequal access, but is perhaps the result of different consumer preferences. There is no divide regarding the *supply* of basic and advanced telecom services in Louisville, yet there is a divide in terms of *demand* for these services.

The combination of price deflation in the computer industry, market-driven deployment of telecommunications services, and a history of universal service policies explains in part the relative affordability of computers and accessibility of DSL service. Still, a digital divide persists, and numerous policies have been proposed to close the gap. Supply side policy recommendations have included suggestions for government intervention to require private telecom firms to increase access opportunities, to subsidize the purchase of computers, or to create more public access sites. Proposed demand side policy recommendations have included increasing Internet training for those on the "wrong" side of the divide, decreasing illiteracy, and changing certain Internet content to match the abilities of users.

If computers and the Internet truly offer worthwhile educational, economic, and political opportunities, and if, at the same time, certain members of society are choosing not to access those opportunities, then the efficacy of both supply-side and demand-side policy changes must be questioned. That said, demand-side policies that educate individuals of the benefits of being connected might be more effective in bridging the divide than supply-side policies offering economic assistance, because this paper shows that it is more consumer preference than access to Internet services, perhaps influenced by knowledge about opportunities available on the Internet, that is affecting Internet usage. In light of recent technology adoption trends in the NTIA 2002 report, we might also conclude that the digital divide will continually narrow without additional policy intervention. The historical mix of equal access policies, free market conditions in the telecommunications industry, and increasing consumer preference for advanced telecommunications services have made the eventual closure of the digital divide a realistic possibility. On the other hand, differences in consumer preference and in the relative usefulness of Internet access between different groups may well result in a persistent digital divide, even with policy designed to close it in place. The current regulatory environment and market conditions have provided sufficient opportunities for individuals to own computers and connect to the Internet. Consumer preference, however, appears to have an influence on technology adoption, or lack of adoption, which may prevent the total closure of the divide. This case study shows that groups typically

named as being on the wrong side of the digital divide were not found to have unequal access, and computers were found to be increasingly affordable. In light of these two findings and the NTIA data showing that digital divides are narrowing for all groups, total closure of the digital divide requires a change in consumer preference that is outside the scope of a typical policy solution. At this point, the opportunity costs of investing additional political and economic resources towards closing the digital divide might be too great—society's scarce resources might better be invested elsewhere.

Notes

¹2G refers to second generation.

²Central place theory is a "purely market explanation for the emergence and location of cities" (Maki & Lichty 2000: 85). The main idea of this theory is that cities emerged as central places where society's needs for defense, worship and trade would be met. Since telecommunications lines connect at a central hub, early telephone company central office switching facilities were strategically located as close as possible to the geographic center of the city so that the telephone lines could connect in a central place.

References

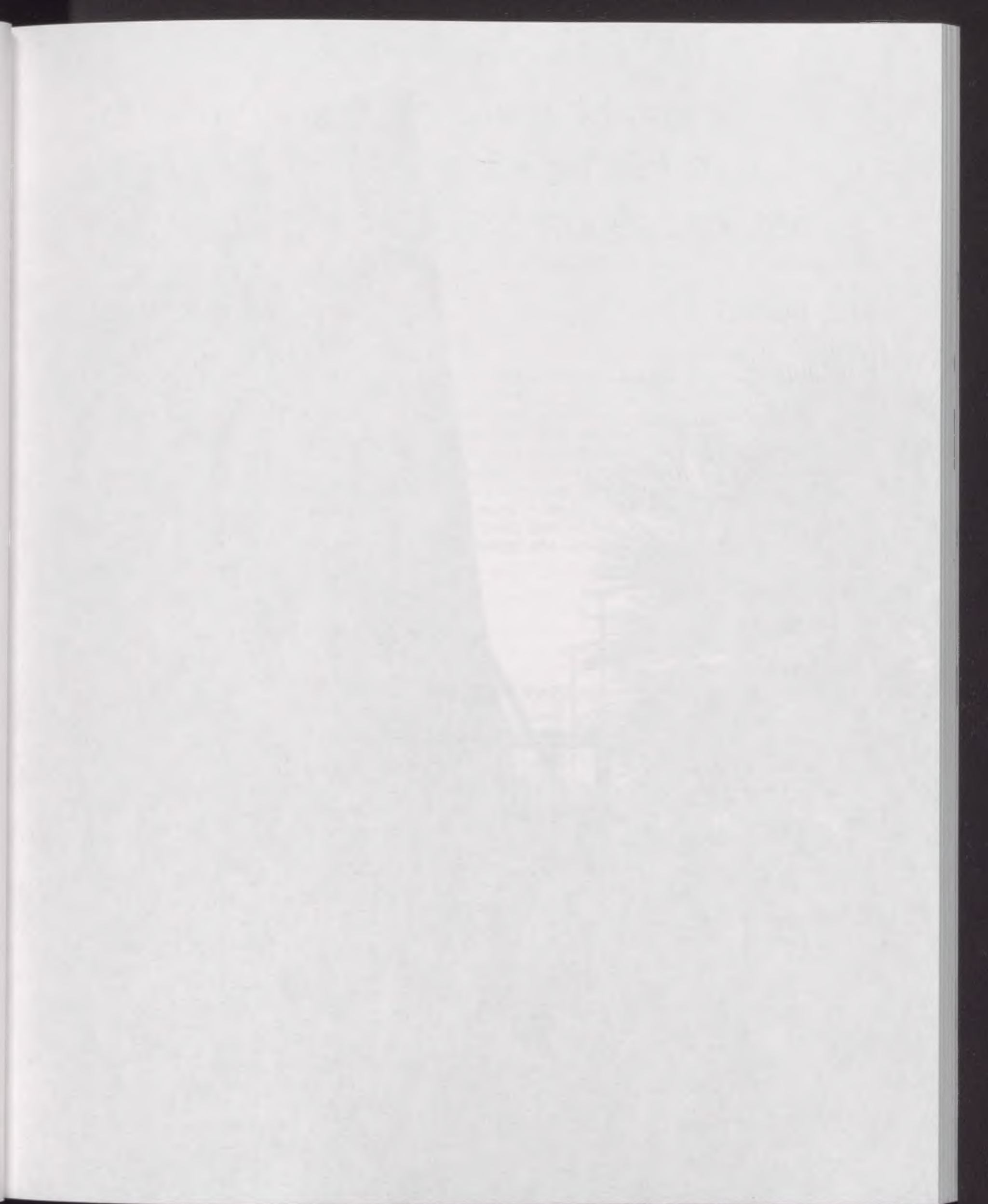
- "2004 Poverty Guidelines" *Federal Register*, Vol. 69, No. 30, February 13, 2004, pp. 7336-7338
- American Telephone and Telegraph. 1909. *Annual Report*.
- Autor, David. H. 2001. Why Do Temporary Firms Provide Free General Skills Training? *The Quarterly Journal of Economics* 116 (4): 1409-1448.
- Bikson, Tora. K., and Constantijn. W. A. Panis, 1995. Computers and connectivity: Current trends. In *Universal Access to E-Mail: Feasibility and Societal Implications*, edited by Robert Anderson, Tora K. Bikson, Sally Ann Law, and Bridger M. Mitchell. Santa Monica, CA: Rand.
- Broadband Reports.com [database online]. New York, NY, Broadband Reports.com. [cited 1 November 2004].
- Bucy, E. Page. 2000. Social Access to the Internet. *Harvard International Journal of Press/Politics* 5 (1), 50-61.
- Burgess, Ernest. W. 1925. The Growth of the City: An Introduction to a Research Project. In *The City*, edited by R. E. Park, Ernest. W. Burgess and R. D. McKenzie. Chicago: The University of Chicago Press.
- Communications Act of 1934, ch. 652, 151, 48 Stat. 1064 (codified as amended at 47 U.S.C. 151).
- Center for Media and Community. "Digital Divide Network." <<http://www.digitaldividenetwork.org/scripts/mqinterconnect.exe>> (14 April 2002).
- Cummings, Scott., and Margaret Killmer. 1997. Urban Poverty, Public Policy, And The Underclass. In *Handbook of Research on Urban Politics and Policy in the United States*, edited by Ronald. K. Vogel. Westport, CT: Greenwood Press.
- Cross, Delores E. 2001. For Whom does the NET Work? *Black Issues in Higher Education* 18(15): 104.
- Dodd, Annabel. Z. 1998. *The Essential Guide to Telecommunications*. Upper Saddle River, NJ: Prentice-Hall.
- Environmental Systems Research Institute, Inc. (ESRI). 2002. *ESRI Data & Maps 2002 (Census 2000, SF1, Census of Population & Housing ASCII Disk 6)*. [electronic resource]. Redlands, California, USA: Environmental Systems Research Institute, Inc.
- Fitchard, Kevin. 2004 DSL Demand in U.S. Surges Ahead. *Telephony*, 245(13): 32.
- Frezza, Bill. 1999. Clinton-Gore's Digital Divide: Race Mongering on the Internet. *Internetweek* 775: 31-32.
- Gorski, Paul. C. 2002. Dismantling the Digital Divide: a Multicultural Education Framework. *Multicultural Education*, 10(1): 28-30.
- Gorski, Paul. C. 2003. Privilege and Repression in the Digital Era: Rethinking the Sociopolitics of the Digital Divide. *Race, Gender, and Class* 10(4): 145-176.
- Hacker, Kenneth. L., and Mason, Shana. M. 2003. Ethical Gaps In Studies of the Digital Divide. *Ethics and Information Technology* 5 (2): 99-115.

- Hammond, Allen. S. 1997. The Telecommunications Act of 1996: Codifying the Digital Divide. *Federal Communications Law Journal* 50 (1): 179-214.
- Hoffman, Donna. L., and Thomas P. Novak. 2000. The Growing Digital Divide: Implications for an Open Research Agenda. In *Understanding the Digital Economy: Data, Tools and Research*. Edited by Brian Kahin and Erik Brynjolffson. Cambridge: MIT Press. (pp. 245-260).
- Jansen, Bernard J., Karen J. Jansen, and Amanda Spink. 2005. Using the Web to Look for Work: Implications for Online Job Seeking and Recruiting. *Internet Research* 15(1): 49-67.
- Jung, Joo-Young, Jack L. Qiu, and Yong-Chan Kim. 2001. Internet Connectedness and Inequality: Beyond the "Divide." *Communication Research* 28(2): 507-535.
- Kleinberg, Benjamin. 1995. *Urban America in Transformation*. Thousand Oaks, CA: Sage Publications, Inc.
- Krim, Jonathan. 2005. 'Digital Divide' Plan in Peril; Two Tech Programs for Poor Would Die. *The Washington Post*, February 5.
- Lewis, Femi. 1999. NAACP and AT&T Partner to Create Tech Centers. *Black Enterprise* 30(3): 19-20.
- National Institute for Literacy. 1998. *The State of Literacy in America*.
- Maki, Wilbur. R., and Richard W. Lichty. 2000. *Urban Regional Economics: Concepts, Tools, Applications*. Ames, Iowa: Iowa State University Press.
- Mangeot, Hank. BellSouth, Manager. April 22, 2002.
- Moore, Gordon E. 1965. Cramming More Components onto Integrated Circuits. *Electronics* 38 (8): 114-117.
- Moss, Mitchell L. 1996. *Telecommunications Policy and Cities*. New York University: Taub Urban Research Center.
- Samuelson, Robert. J. 2002. Debunking the Digital Divide. *Newsweek* 139 (12): 37-40.
- Singleton, Solveig, and Lucas Mast. 2000. How Does the Empty Glass Fill?: A Modern Philosophy of the Digital Divide. *Educause Review* 35 (Nov/Dec): 30-36.
- Smerdon, Becky, Stephanie Cronen, Lawrence Lanahan, Jennifer Anderson, Nicholas Iannotti, and January Angeles. 2000. *Teachers' Tools for the 21st Century: A Report on Teachers' Use of Technology* (NCES 2000-102). U. S. Department of Education, National Center for Education Statistics. Washington, DC: U. S. Government Printing Office.
- Soriano, Enrico. C., Lee Tiedrich, Amy Levine, and Emily Hancock. 2004. A Look at Key Issues Currently Shaping Broadband Deployment and Regulation. *Computer and Internet Lawyer* 21(7): 1-22.
- Spooner, Tom, and Lee Rainie. 2000. *African-Americans and the Internet*. Pew Internet and American Life Project. <http://www.pewinternet.org/reports/pdfs/PIP_African_Americans_Report.pdf> (1 August 2004).
- Stanley, Laura. D. 2003. Beyond Access: Psychosocial Barriers to Computer Literacy. *Information Society* 19 (5): 407-417.

- Stowe, Gene. 2002. Growing Used Computer Market Basis for Firm. *Tribune Business Weekly* 13(10): 12.
- Strother, Stuart. C. 2002. *Telecommunications Cost Management*. Norwood, MA: Artech House.
- Telecommunications Act of 1996, Pub. LA. No. 104-104, 110 Stat. 56 (1996).
- The Courier-Journal* [Louisville], 11-18 July, 2004.
- Tiebout, Charles M. 1956. A Pure Theory of Local Expenditures. *The Journal of Political Economy* 64(5): 416-424.
- U.S. Department of Commerce, National Telecommunications & Information Administration. 2002. *A Nation Online: How Americans are Expanding their Use of the Internet*.
- U.S. Department of Commerce, National Telecommunications & Information Administration. 2000. *Falling Through the Net: Toward Digital Inclusion*.
- U.S. Department of Commerce, National Telecommunications & Information Administration. 1999. *Falling Through the Net: Defining The Digital Divide*.
- U.S. Department of Commerce, National Telecommunications & Information Administration. 1998. *Falling Through the Net II: New Data on the Digital Divide*.
- U.S. Department of Commerce, National Telecommunications & Information Administration. 1995. *Falling Through the Net: a Survey of the "Have Nots" in Rural and Urban America*.
- U.S. Department of Labor, Bureau of Labor Statistics. 2004. *Consumer price index: U.S. City Average; Personal computers and peripheral equipment*.
- Wareham, Jonathan, Armando Levy, and Wei Shi. 2004. Wireless Diffusion and Mobile Computing: Implications for the Digital Divide. *Telecommunications Policy* 28 (5): 439-457.
- Woellert, Lorraine, and Paula Dwyer. 2000. One Wired Nation, Indivisible? Or One Big Boondoggle? *Business Week* February 14: 57.

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Transforming Community Planning through Technology: A Conversation with the Center for Neighborhood Knowledge

Ashok Das

The UCLA Center for Neighborhood Knowledge (CNK) is a research center at the School of Public Affairs at UCLA. The CNK uses information technology to create resource databases for community development.¹ Its projects, which include Neighborhood Knowledge Los Angeles, Neighborhood Knowledge California (NKLA), Living Independently in Los Angeles (LILA), the Land Opportunities Tracking System (LOTS), and California Works for Better Health, have been developed collaboratively with community members to collect and make available information about local environments and services. CNK also acts as a bridge between university-based research and public policy in the Los Angeles region. We invited four members of CNK's staff—Dr. Neal Richman, Director; Alan Toy, Associate Director; Yoh Kawano, Director of Information Technology; and Charanjit Singh, Project Manager—to talk to us about their work.

Introduction

The CNK began with the insight that liens on property were a good predictor of urban decay, and that information technology could be used to track liens, identify neighborhoods in danger of disinvestment, and provide residents and officials with the information they need to reverse neighborhood deterioration. The program that arose from this idea is now NKLA. The CNK's scope has since expanded, and its programs now address not just urban decline but services for people with disabilities, opportunities for infill development, and homeland security. Underlying all of the programs, however, is a belief that information technology can not only bring information to communities that need it, but also help those communities *create* information that will inform policy. Thus many of the center's databases are built by the very people they are designed to help.

Interview

Das: What is the UCLA Center for Neighborhood Knowledge's mission or vision?

Kawano: The belief that technology can improve or change society has been an underlying mission and goal at CNK. I believe that technology can increase participation. When we first started in 1997, the Internet had just started to boggle our minds; today its big advantage over television is active participation, which has a hugely empowering potential.

Richman: We design open-ended systems to promote exploration, rather than provide answers. We encourage people to think theoretically and inductively about information. We don't make projections filled with assumptions, or impose our view of how the world should be; instead we provide people with information and allow them to decide how to use it. To this end, our sites are not text heavy; instead, they are very graphical and intuitive, and speak to people in diverse cultural settings.

Das: How did the CNK evolve?

Richman: The Center has been around, in one form or another, for about ten years. Its origins lie with the HUD (US Department of Housing and Urban Development) Community Outreach Partnership Center program. I began to work with residents on one of the worst slum properties, located at 8th and Union, in the city. While trying to acquire that property we found that there were many liens and administrative actions because of neglect and disinvestment by the earlier owners, who allowed drug dealers and prostitutes to live there, and ultimately abandoned the property—making a lot of money and leaving bills behind. We decided to make searchable data-

bases available on the Internet to pinpoint and target similar disinvestment. All this was still pretty early in the Internet's development. Our proposal to create a Neighborhood Early Warning System (NEWS) was funded by the City of Los Angeles. NEWS was first owned by a nonprofit called the Community Building Institute.

Receiving a \$100,000 grant from the Technology Opportunities Program was the next big step. We pressured the city to use NEWS to target efforts at code enforcement, and we developed a system to use Palm Pilots in the field, for inspections and uploading information. That marked the beginning of the Neighborhood Knowledge Los Angeles (NKLA) project.² Around the same time, the Community Building Institute sold NKLA and NEWS to us here at UCLA, and we were first housed in the Advanced Policy Institute at UCLA.

The idea behind NKLA was to map residential disinvestment and deterioration by using indicators. Data were not integrated by property address or parcel numbers. Getting different data from individual desktops and integrating them into a unified picture had never been attempted—even real estate firms do not integrate them. With the unified picture, we could see a whole pattern of disinvestment. NKLA provides information about residential properties that are at risk of deteriorating, at risk of loss of affordability, are tax-delinquent, have not paid their utility bills, and where there is risk of subsidies being discontinued. With this information you can create overlays. Where are these properties located? Are

these communities of color? Are these low-income properties? What patterns are evident?

The problem was that everyone in the city and county offices was mired in their own work, and so no one tended to think about data at this meta-level. The city of LA's website had every bit of data, but the data did not tell a coherent story because the indicators were not integrated meaningfully. However, the university [CNK at UCLA] obtained city and county-level data, and integrated them through NKLA, which has led to many positive effects on code enforcement.

Our evolution also emerged out of a dialogue with participating communities. People from these communities said, "This [the database] is great in pinpointing disinvestment, but our communities are not just about deficits. We also have resources and assets such as cultural organizations, social programs, and historical monuments, which this data does not reflect or respond to." So we piloted an 'electronic treasure hunt'—a grassroots data collection effort with community youth to map resources that communities valued, which was supported by Microsoft and the Fannie Mae Foundation.

The next significant move was the inception of the Living Independently in Los Angeles (LILA) project.³

[Editor's note: LILA is designed to benefit people with disabilities living in Los Angeles County. LILA uses a GIS-based, interactive information resource database. The LILA database is created by local resi-

dents with disabilities, since they have the "expert knowledge" to identify and map local independent living resources. Rather than rely on outside experts, then, LILA aggregates the individual expertise of people with disabilities, and creates a resource from this cumulative knowledge.]

Das: How did LILA begin?

Kawano: The IMLA (Interactive Assets Mapping for Los Angeles) concept, which led to LILA, actually began with some undergraduate class projects by students in UCLA's Chicano Studies program to map the Boyle Heights and Vernon Central neighborhoods. We sent students into the community to gather visual data using disposable cameras. They scanned those pictures, located them by address, and then uploaded them. That laid the roots for the idea of a bottom-up data and information collecting system.

Toy: Microsoft, which had also funded IMLA, agreed to provide seed funding for a project in which people with disabilities would map assets in their own neighborhoods, and LILA was born. We developed LILA by building a close partnership, for joint funding and sharing resources, with one of the 29 independent living centers in California. LILA has taken independent living resources on to the Internet, and it allows people to have 24-7 access to the resources, products, services, and other quality of life things that enable people with disabilities to lead easier and fulfilling lives. People with disabilities are a community that has historically been challenged in

terms of transportation, economic development, education, and connectivity.

LILA was developed on theories and practices of independent living and asset-based community development. Using digital resources, it created an opportunity to connect and develop communities by building upon what exists, rather than focusing on what doesn't. Most of the information contained in the databases of the project has been created by people at the grassroots. People can add their own data to the website and become the webmasters of the project. The LILA site has evolved from being an asset mapping tool to having a community calendar, a sophisticated tool for undertaking surveys, and an advocacy section that puts up alerts and allows people to email their legislators and local representatives. We also have a forum where people can simply exchange ideas and concepts, sell things, advertise events, and so on. We have mapped thousands of resources in LA and the neighboring counties, including, for the first time, affordable housing with accessibility information. The effort now is to make it a statewide project for each independent living center to have its own homepage, supported by an underlying statewide database to locate things by zip code or address.

Das: Tell us about your other projects. What kinds of information do your projects or sites provide?

Richman: About three years ago, Children's Hospital decided that LA really needed an asset map mapping basic health, social, and educational services for

children. They wanted something that was similar in concept to LILA, and this resulted in the Healthy City initiative. The Healthy City project included the Children's Hospital, the Center for Nonprofit Management, and the Advancement Project. The project incorporated Infoline, which has an annually updated database of all services available throughout LA County. Prior to our project you had to call up Infoline to describe where you lived and what your needs were, and then they would give you information referrals. We took that same database and used their taxonomy to also overlay census data on a citywide information referrals resource.

Kawano: The biggest challenge was to integrate Infolines's phone retrieval and referral system into our system, which locates resources spatially. Now, instead of calling, people can straightaway go online, execute a series of queries and instantaneously map resources available in their neighborhood or zip code.

Richman: A project to segue from the NKLA project was Neighborhood Knowledge California (NKCA). There was a powerful trade association in Silicon Valley that believed that telecom investment would lead to growth and economic development. The state gave this IT trade association a significant sum of money to be invested in R&D projects that would lead to direct economic growth. We were funded to build NKCA. The donors felt that broadband lacked adequate content to appeal to low-demand groups like nonprofits, low-income communities, and communities of color. NKCA was meant

to address that lack in content by providing information useful for these user groups.

Singh: NKCA data includes census data, Home Mortgage Disclosure Act data, and vital statistics (health data). We will soon have school level data, and point-level data to locate brownfields, banks, nonprofits, check cashers, etc.

Richman: We will be rebuilding the website for First 5, a program for early childhood intervention for education, particularly in low-income communities.⁴ [Ed. Note: The First 5 Association of California works to enhance the health and early growth of young children through the dissemination of both information and services.] First 5 is being used extensively as an early warning system to know where young children (under the age of 5) are likely to be at risk, and to ensure that preschool is available for all children throughout the state.

We are also working on a new project with the Center for American Progress, a progressive think tank based in Washington D.C., on issues of broadband deployment. We feel that the FCC and California's Public Utilities Commission have not researched an adequate level of granularity to measure the availability of high-speed connectivity. So we will work with grassroots groups in a few cities for local data collection to identify alternatives and costs, as well as innovative applications of broadband—for instance, for telemedicine and education.

Toy: The eprepared.org⁵ is a citizen corps management site that allows volunteers interested in disaster

response or homeland security to find opportunities that meet their skills. Agencies can find volunteers with specific skills, or people can look for opportunities in their neighborhood. It also allows citizen corps managers to learn about the people enlisted in Community Emergency Response Teams, and manage their teams efficiently in the event of a disaster. For the first time, volunteers can be managed, through queries and database information, by location, training levels, or skills sets.

Singh: In another project, the Los Angeles Land Opportunity Tracking System (LA LOTS), we wanted to address a critical barrier to infill development in LA—the information barrier—by integrating numerous datasets and making pertinent information available at one source. Development requires both macro- and micro- (existing physical and socio-cultural characteristics of neighborhoods) scale analyses. Our focus is to explore and promote appropriate infill development by redeveloping brownfields and closed school-sites, and reusing abandoned properties for housing.

Richman: The Southern California Association of Governments (SCAG) has done research that shows the need for greater urban density. The question that follows is where to create density? Given spiraling housing costs, sprawl, traffic problems, and air pollution, the answer lies in more inner city infill development. But there is opposition to infill development everywhere. Our idea is to not only assemble parcel level and market data to show the potential for infill development, but to engage communities and

identify where such infill development would be appropriate. SCAG is excited about this tool's ability to realize a new vision for regional planning to mitigate sprawl. Thus we are trying to expand the LA LOTS into a regional project.

Das: Who are the users of the technology that CNK creates?

Singh: There is a broad array of users. NKCA is used by nonprofits, city government and other public officials. Researchers use it extensively, as do students, representatives of various foundations, community groups, and individual citizens.

Toy: LILA is mostly used by people with disabilities, their families, their friends, people who provide services, activists and others. With the eprepared.org website, we now have numerous sheriffs, deputies, fire captains, and other precinct officials using it to manage volunteers. Politicians and administrators routinely use our websites to answer questions posed by constituents.

Das: Since poor communities also have less access to technology, or the skills required for accessing your resources, how do you actively reach out to these communities?

Toy: These days more and more people have access to computers—either at home or in libraries, schools, and neighborhood community centers. We have also provided hardware to some communities. We have ensured that each independent living center in LA County has one computer dedicated to LILA usage.

If these communities have access to the Internet, then practically they have access to all the software underneath our sites. Having the hardware or the software is not an issue anymore; it is just getting access to the Internet and broadband.

Richman: Because of our connections to and networks with nonprofits organizations, a single email about, say, a workshop spreads much beyond the immediate recipients. UCLA's Urban Planning graduates also play a major role in taking our tools to poor communities.

Singh: We build capacity through our training modules for community members on how to use our websites and create GIS maps. Due to the convenience of our websites people do not need to learn the real GIS package, or worry about storage space, or about losing data.

Das: You have stressed the importance of feedback to your work. How do you obtain feedback from the users and how do you use that feedback?

Kawano: During development, we usually go through three phases. In the first, alpha launch phase, we ask a selected group of about ten users to play with the preliminary version for about a week and provide initial feedback. In addition, we create online surveys so that they can then post their comments directly to us. After making modifications based on that feedback, we do a beta release to a much larger group, anywhere between a hundred to a thousand users. We repeat the process of deliberation and modification, following feedback, for two

to three weeks. The whole process can take up to two months before a site is launched

Singh: The feedback that we received while developing NKCA was very useful in addressing issues of information asymmetry and empowerment—to develop easy tools for everyone. In the last two years we have done a lot of outreach in rural areas, and we are trying to develop tools specific to that task, such as adding data using GPS coordinates because rural areas do not have streets everywhere.

Comments on our websites, our training sessions, and regular emails from users also offer continuous feedback. If it is not feasible to change something according to suggestions, we explore the next best solution.

Richman: Our major projects like LILA and NKCA have a system of formal third-party evaluations. A paid evaluator meets with our users, looks at our webtrans, and prepares a formal report for our donors about the growth and utilization of our sites, as well as lingering problems and issues.

Das: Can you cite specific examples of how your technology has led to empowerment of communities or groups?

Richman: This is one of my favorite examples. Alan once planned a meeting of LILA users in Westwood on a Friday afternoon. I thought almost no one would come to Westwood on a Friday afternoon from all over LA County. Well, the turnout was spectacular, probably because of their sense of ownership of LILA. And these were people with disabili-

ties, with all their transportation challenges. The meeting triggered a discussion on the county's decision to reduce the funds for the major rehabilitation center serving the whole region. So on that day LILA generated a regional coalition that forced the county to rescind its decision—without a prior plan to form such a collective opposition.

Toy: Following that episode, LILA increasingly became a platform for advocacy. People used it now to share thoughts and ideas, organize protests, and teach others how to contact their senators and assembly persons. It has become a central meeting point for people with disabilities.

NKLA's involvement in a summer project in the Vernon Central area, to teach the use of technology to youth to identify neighborhood assets and deficits, also led to the creation of a park. A senior official from the Department of Parks and Recreation was present when the youth decided to situate a park opposite the Dunbar Hotel. The youth actually designed the park and Parks and Recreation gladly built it, because it knew that this park would not be vandalized.

Das: More recently, CNK has become involved in international projects. Can you tell us how this interest developed?

Richman: Using one underlying map room, and by creating different windows on different places around the world, we can do for the world, inexpensively, everything that we do for California. Our first international project is to cull indicators of potentials

and obstacles for economic development in Kenya through grassroots data collection using a partner called People Link. People Link's online trading system can access trade guilds and local craftspersons directly and market their products on the world wide web, thereby eliminating intermediaries.

We realized that we can also address an ongoing crisis—the post-tsunami redevelopment in Indonesia—where one of the biggest problems is logistics. In collaboration with a former team member of ours who now works for the United Nations in Indonesia, we want to put together a free digital supply and demand map to spatially locate and match needs with supplies, and link a wide range of actors.

Kawano: Since our technological applications have become increasingly sophisticated, efficient, and scalable over the years, and since the tsunami disaster has affected us profoundly, we want to create this digital map to minimize mismatch, by matching needs on the ground for hospitals, doctors, teachers, housing, etc., with appropriate relief efforts from above.

Das: What has been CNK's most significant achievement? What makes you most proud?

Singh: The fact that these projects build capacity through information democratization, and reduce technical and knowledge divides.

Kawano: That we have stuck to our mission of doing technology projects for the betterment of society. I also think that we are just at the tip of the iceberg in terms of our platform, which can now go from

local to global in an instant. That potential is truly exciting.

Toy: I am very proud that our work benefits so many people and is now getting recognized—people from over ninety countries have logged on to LILA. LILA has twice been nominated for the Innovations in American Government Awards given by Harvard's Kennedy School of Government, and it has been a finalist in the prestigious Stockholm Challenge Awards.

Richman: We have influenced community and metropolitan information systems around the country. Several universities and institutions, such as Fannie Mae, have followed in our footsteps. I am most excited about our technical breakthrough in developing a common platform that now allows us efficiencies of scale.

Das: Is there anything that you would do differently if you were to do it again?

Richman: I think I would be much more open-source with our work now. Once, the City of LA wanted NKLA as a gift because the city had also contributed in developing it. I was mad then because we were always struggling for funds, and it wanted NKLA for free! In retrospect, though, I wish we had done exactly that, with the understanding that the code would not be remarketed. That would have built more ties and fewer barriers. Experience has led me to understand a peculiarity of the digital world: you can get a lot more when you give more.

Das: What do you see yourselves doing over the next five years or so?

Richman: I am really interested in exploring how our tools and data can lead to measurable, progressive social change. I do not just want to see cool information systems, I want our work to directly impact change—policy implications for real change, positive changes in communities, changes in ways people communicate, and so on. I think the business community understands the power of technology. Increasingly, government has begun to understand it too. We want to provide technology to empower civil society, for people at the grassroots, because the power to shape social realities lies with the one who creates data.

Notes

¹ More information about CNK's activities can be found on their website <<http://api.ucla.edu/Master.cfm>>.

² NKLA provides tools for accessing property and neighborhood data and works with neighborhood residents, community organizations, and policymakers to mobilize support for community improvement in the Los Angeles area. For more information see <<http://nkla.ucla.edu>>.

³ For more information see <<http://lila.ucla.edu/>>.

⁴ For more information see <<http://www.f5ac.org/default.asp>>.

⁵ Prepared.org is a web-based center for community preparedness and volunteerism. It was created by

CNK for LA County's Office of Emergency Management. The project is a collaboration between the university and the county to make it easier for individuals, families, associations and agencies to connect with each other to improve preparedness against threats of crime, terrorism, and disasters. It is a part of the national, community-based Citizen Corps program to prevent crime and respond to emergencies.

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Human Capital Development as an Economic Development Strategy: The Case of Workforce Plus

Christopher V. Hawkins

This article provides an argument for emphasizing human capital development in a regional economic development strategy. It presents three theoretical economic development foci that many development officials are actively engaged in: 1) addressing the issue of significant wage inequalities and earning differentials among the labor force; 2) facilitating regional economic growth and supporting firm productivity and technological advancements that will lead to regional competitiveness; and 3) working to resolve labor force issues that result from economic restructuring and industrial reorganization. Lastly, the article presents a descriptive case study of how a workforce development agency is responding to these issues.

Introduction

The practice of economic development takes a variety of forms. Historically, it has focused on luring firms to a region through the supply side, via subsidies for land and infrastructure. Cities and states have used specific tools, such as tax incentives or the provision of utilities, to entice firms to relocate. On the demand side, development agencies have used lending programs to provide flexible capital for new or growing firms. But firms do not make location decisions based only the availability of land and financial capital. Firms also consider the cost and quality of labor, and labor force development is therefore increasingly emphasized by economic development practitioners. Specific labor force based or human capital development strategies that improve the quality of the local labor pool have emerged as separate, but still unequal, tools in economic development.

This article positions human capital development strategies within the broader rubric of economic development. Why is human capital development important as an economic development strategy? The article begins by providing an argument for the importance of skill building, from three perspectives: 1) the relationship between skill level, wage and earning profiles of workers; 2) the role skills play in supporting community and regional economic growth; and 3) the increasing complexity of larger economic transitions, and the effect this complexity has on the skill requirements of the labor force. Planners and economic development officials are

typically tasked with combating poverty and unemployment, growing the regional economy, or adjusting for the effects of greater global economic integration and industrial reorganization. These three foci are very different community objectives. However, this article will demonstrate that in part they may be jointly addressed through skill building and job training.

This article uses Workforce Plus in north-central Florida as a case study. Workforce Plus is a regional development agency predicated on the idea that human capital development is equally important as other economic development policies. Rather than focusing on headline-grabbing infrastructure projects, Workforce Plus improves the employability of area residents and supports the growth of existing businesses through skill-building programs. The Center for Business and Employer Services at Workforce Plus is a case of a successful human capital development program.

Human Capital Development Defined

Human capital development is the augmentation of an individual's capacity to successfully enter the workforce. This augmentation may take the form of enhanced skills, experiences and knowledge (Flamholtz 1981), or improvements in personality, reputation and appearance (Becker 1975). In some cases it even includes talent development (Davenport 1999). From a broader perspective, investments in medical care can be seen as human capital development strategies, to the extent that increased overall

health of the population improves the productivity of the labor force (Becker 1995).

The literature on economic development presents a variety of ways human capital development strategies may be employed. Mueller and Schwartz (1998) identify and discuss four general strategies for advancing human capital: job training, job creation through private sector development initiatives, dispersal/mobility strategies and wage subsidies that allow for more jobs training to take place. The emphasis on human capital varies greatly among these different strategies. For example, private sector development projects that include labor force development, such as training for newly hired workers, are often part of the larger tax incentive deals for development projects. The effectiveness of each of these strategies also varies. However, the job training strategy is often the most popular of the public sector and community based initiatives. The variety of development strategies, whether they are focused on health, education investments, or skill building, are what Schultz refers to as "population quality" investments (Schultz 1981: 7). All these strategies improve the economic prospects of people, but they differ in outcomes and benefits.

The Importance of Human Capital Development: Community Issues

Human capital development can be considered an effective strategy to alleviate poverty. Policymakers provide job training programs to reduce unemployment and poverty by increasing the skills of potential

workers (Ashenfelter 1978). The causes of poverty are complex, but a lack of skills and low educational attainment are often associated with lower earnings. This contributes to the persistence of poverty among a variety of groups who are typically labeled the "working poor" (Shipler 2004). Developing a skill level or a particular skill type may positively influence the wage level of a worker and result in an enhanced economic position. Skills powerfully affect both a worker's opportunity to enter the workforce, and the compensation that the worker is likely to receive (Champemowne and Cowell 1998).

Enhancing human capital can improve not just the fortunes of individuals, but also of entire regions. Regions are in competition with one another, vying for new businesses and protecting their existing industrial bases from poaching. A local labor force with the skills to meet the demands of new and expanding firms plays a significant part in creating a competitive regional environment (Porter 1990). The accumulation of human capital has positive effects on firm productivity. It also generates positive externalities at the level of the industrial complex as well as for the entire regional agglomeration (Mathur 1999). Strategies that facilitate the accumulation of human capital in the form of a skilled and knowledge-intensive labor force will therefore benefit cities and regions in a competitive environment.

Structural shifts in economic activity have forced regions to navigate a changing landscape of industry needs, work demands, and labor linkages. The new global economic system has created new work stan-

dards that require different skill levels. The nature of work is no longer rigidly specialized and narrowly focused, but is now flexible and increasingly sophisticated. Regional development actors must respond to these changes with a renewed focus on human capital development as a strategy to increase their competitive advantage in a global economic system.

These theories of human capital development provide a basis for policy initiatives to build human capital. The underlying themes of wage inequality, economic growth and industrial transition are each addressed in greater detail below.

Wage Inequality

Wage inequality exists because compensation varies across different occupations. To some degree this variation can be attributed to the different levels of skill, education, and experience required for different jobs. Classic theory and modeling of the relationship between wage differentials and human capital strengthens the argument for employing labor force based development strategies. Mincer's (1958) compensation model first illustrated the distribution of wages across various occupations, and subsequent work by Becker (1964) introduced a model for optimal investment in human capital. Early work using this model displays the accrued human capital investment through a sequence of investments over a worker's lifetime, and empirical research demonstrates that the return on human capital investment is greatest at earlier ages. The results also suggest that investments in human capital can have a strong posi-

tive effect on wages. The distribution of earnings is skewed in favor of those who have a greater ability to invest in human capital—often those with individual or family wealth (Becker 1975). Although Becker's model reveals the important relationship between human capital investment and earnings, the model does not identify precisely when workers will choose to invest.

Ben-Porath's (1967) model of the life-cycle earnings profile refines Becker's arguments. This model suggests that earnings will be greater for workers who initially postpone human capital investment. The earnings profile of workers who make investments in training over time will eventually surpass that of workers who had forgone human capital investments. Ben-Porath's study bolsters Becker's claim that over a life-cycle of human capital accumulation there are optimal paths of human capital investment. These investments will directly affect the wage profile of the worker. Job training and skill building will have a positive relationship to earnings.

Two important questions emerged in light of this early research, and dominated subsequent studies. First, how much of the observed growth in wage profiles is attributable to investments in training? Second, what type of training is most beneficial? The first question has been difficult to answer. In comparing rates of training reported in the Bureau of Labor Statistics surveys of 1983 and 1991, Mincer (1998) measured the incidence of job training and skill acquisition between high school graduates and college graduates. During this time, job training in-

creased from 35 percent to 41 percent of all workers. However, there was a stronger relationship between skill improvements and higher levels of schooling. Intuitively, these results are not surprising, but the conclusions suggest that higher rates of return on skills training must include more comprehensive educational preparedness measures.

The relationship among skills development and training, educational attainment, and wage profiles points to the fact that investments in human capital can be an effective strategy for enhancing the economic position of a region's labor force. The issues of low wages, poverty and unemployment are, again, complex. Human capital development will not necessarily make the working poor into highly skilled workers, but there is reason to believe that the increased earnings they derive from new skills can make them more self-sufficient (Mincer 1998). Skill building is an effective strategy to raise the economic position of the region's labor force.

Human Capital Growth Model

In addition to the relationship between human capital development and wage profiles of workers, models of economic growth also provide a theoretical foundation for the importance of investing in labor force based development strategies. The evolution of the "old" economic growth theory first proposed by Solow (1956) to what is now considered "new" or modern growth theory (Malecki 1997), is directly related to the emergence of human capital as a centerpiece in explaining regional growth and improved

firm productivity. An enhanced competitive advantage of regions can be realized as they develop a more highly skilled, educated and knowledgeable labor force.

The rise of human capital as an explanatory factor in economic growth was in part a response to the inability of "old" economic growth theory to explain productivity increases, technological progress, and their relationship to economic growth. In explaining economic growth, old growth theory relied solely on the accumulation of stocks of physical capital, which it viewed as the primary motor of economic expansion. Absent from the old growth model were knowledge and human capital. Yet studies suggest that investments in fixed capital account for less than one half of the measured increase in outputs; the residual productivity gains are attributable to human capital investments (Malecki 1997). Modern growth theory incorporates this human capital dynamic. It focuses on growth that emerges from endogenous economic processes such as internal technological advancements and entrepreneurship, not the exogenous quantity increases of the old growth model. Human capital, in modern growth theory, is thus a powerful engine of economic growth (Romer 1990). Investments in human capital in the form of training and education contribute to increases in productivity.

Education and training spread the knowledge required to spur intra- and inter-firm spillover effects (Romer 1994; Lucas 1988). These effects are crucial for both communities and regions, since firms seek

locations near significant knowledge resources (Porter 1990). As such, areas with a greater concentration of skills and talent—particularly the skills coveted by employers in knowledge-based industries—tend to be high-wage areas (Rauch 1993).

Regions with large concentrations of human capital tend to have high levels of knowledge transmission throughout the industries they host (Rauch 1993). Strong human capital resources can facilitate linkages between firms, which can in turn result in technological advancements and productivity gains. Technological innovation is commonly thought to be a function of information spillovers between firms, mostly in the research and development sector and in maturing high-tech industries (Henderson, Coro and Turner 1995). This link between human capital, innovation and productivity can make human capital a major factor in a firm's decision-making process. A large, well-educated and skilled labor force will attract firms to a region, resulting in employment gains and an expansion of the industrial base. Regions may attempt to harness this dynamic by investing in labor force based development strategies.

Economic Trends: Considerations for Human Capital Development

The importance of human capital development is best understood if it is placed in the context of the broader restructuring of the American economy. The most noticeable aspect of this restructuring is the transition from a Fordist to a post-Fordist mode of production and the resultant reorganization of

work. This shift has undoubtedly affected human capital requirements; therefore mapping the relationships between restructuring and human capital development is a crucial task for planners and policymakers.

Post-Fordism is characterized by various economic arrangements: the globalization of economic activity, the increasing use of flexible and vertically-disintegrated production arrangements, the rising importance of international financial institutions, and increasing skill differentiation among workers (Scott 2000; Sassen 1996). Under this new system, firms have shifted much of their heavy manufacturing employment to low-cost regions for the sake of increased international competitiveness. Improvements in transportation have further accelerated this dispersal of production. As a consequence, restructuring has altered the industrial makeup of regions and drastically changed employment opportunities for those regions' residents.

Specifically, production technologies have evolved from atomized Fordist modes of production into reflexive teams of problem solvers. Not surprisingly, these team members require new skills and knowledge. In order to compete in a global market, cut costs and meet the demands of customers, firms are creating new production systems built around "high performance work organizations" (Rayner 1993: 9). Rather than the distinct division of labor and specialized positions of Fordist production systems, many manufacturing occupations that demand higher skills are now flexible in nature. Osterman (1998) identifies

four characteristics central to this transformation of work: 1) self directed work teams, 2) job rotation, 3) the use of employee problem solving groups, and 4) the use of total quality management.

The changed economic structure of the United States has two main implications for human capital development. First, new production systems require new sets of skills and training. New higher order skills are needed, although basic soft skills—such as reading and writing, computer literacy, and math—remain essential (Duncan 1998). Second, firms increasingly employ non-standard employment contracts (or what is referred to as "contingent work") such as temporary positions and part time employment. Blank (1998) identifies a number of reasons for the rise in contingency, including the variable demand of products that force firms to hire flexible workers on non-routine days and times, the need to lower labor costs, and a desire of firms to increase their flexibility in hiring and firing. Many of these nonstandard positions are service oriented, have little job security and offer low wages. In addition, many require neither formal training nor a complex skill base.

The schism in job requirements—with some positions demanding high skills and paying well, and others requiring little skill and paying little—has led some scholars to argue that a dual labor force is emerging, whose skill basis differs from those of the Fordist economic systems of the industrial era (Shaw 2001). The occupational makeup of the new economy is oriented toward service work, much of it bound up in the rise of intermediate economic activ-

ity such as transportation, wholesaling, and communication industries. These poorly-paid jobs, when juxtaposed against the demand for a well-educated workforce to fill positions within the emerging finance and technology fields (Stanback 1991), make the implications of skill-building programs more apparent. A social and occupation-based stratification best characterizes this new economic activity (Castells 1993), and the effects of the rapid economic transition are compounded by the amounts of knowledge required to make the jump between strata. The knowledge-intensive occupations have a specific set of skills, and a larger part of a worker's life—in years of school and training—is required to accumulate them.

Castells (1993) has identified three distinct socio-economic transformations that reflect this economy: 1) knowledge as growth in the economy, 2) shifts in industries, and 3) the emergence of a marginalized labor force. Information processing within the service sector has replaced goods processing as the dominant economic activity. The role of knowledge based productivity, which depends on information technology and the ability to use it, will define the economic success of many regions. This has direct implications for human capital development strategies. Skill building that enables workers to manipulate more complicated work systems and technology will define labor force-based development strategies in the future.

Human Capital Development at Workforce Plus

This section of the article provides a descriptive case study of a skill-building program in the state of Florida. Florida's human capital development programs are coordinated through the Florida First Initiative. Florida First is a statewide effort to improve the wage earning potential of Florida's workers through direct service delivery in the form of skill-building and workforce preparedness programs. Twenty-four Workforce Development Boards have been established throughout the state to ensure that skill-building services are appropriately targeted to the needs of area residents. Workforce Plus is the Workforce Development Board that serves Leon, Gadsden and Wakulla counties in north-central Florida. The skills building programs provided by Workforce Plus highlight the economic development efforts that are intended to serve both residents and businesses of the tri-county area.

Leon, Gadsden and Wakulla counties are located in the "panhandle" of Florida. Most local economic activity in the panhandle is provided by state government agencies and the two major universities in Leon County. Wakulla and Gadsden counties are rural, and characterized by the remnants of a once strong lumber industry. By most accounts, these areas hold exceptional promise for growth and prosperity, but they have been struggling to realize their potential. Household income in the three counties lags behind the average household income of the state. Unemployment averaged over 15 percent in 2002. In 2000, only 16 percent of the residents in

Wakulla County and 13 percent in Gadsden County had received a Bachelors Degree, compared to the statewide average of 22 percent. Workers suffering from the loss of timber related manufacturing jobs are struggling to find adequate employment opportunities.

There are signs of improvement, however. According to County Business Pattern data, between 1993 and 2002 employment in the tri-county area increased by fewer than 20,000 jobs. Between 1998 and 2002 employment in the professional, scientific and technical services sectors increased by approximately 10 percent (U.S. Census Bureau). Most of this job growth is associated with services provided to state government agencies. The average hourly wage of most private sector jobs, at less than \$10 an hour in 2002, suggests that much of the newly created employment does not demand high skills. In fact, the retail trade and food service sectors—which generally pay low wages—combined to represent 27 percent of total tri-county employment in 2001. It is clear that the industrial composition of the region suppresses wages and limits the earnings of residents.

Tallahassee is the major city of the tri-county area. A recent study¹ of opportunities for economic development in the city revealed the lack of needed skills. Using in-depth interviews with regional businesses, the report concluded that these businesses often could not find appropriately skilled workers to fill their existing positions, or to support expansion. A major recommendation from this study is continued investments in human capital development. These

investments would improve regional competitiveness and enhance the wage earning potential of area residents. The Center for Business and Employer Services at Workforce Plus was created to do just that.

The mission of Workforce Plus is twofold. First, its primary goal is to help the existing labor-pool transition to more skill-intensive positions in the tri-county region. Second, it partners with businesses in the tri-county region to identify the skills that are in demand, and to link adequately trained clients with potential employers. The Center for Business and Employment Services at Workforce Plus was established to more effectively implement these goals. The uniqueness of the program lies in the close partnerships it has established with businesses. These relationships allow the skills of recent graduates to be matched with appropriate employment opportunities of participating businesses.

The skills-building program of the Center for Business and Employer Services has the following structure: Workforce preparation consultants interact directly with regional businesses and industry in the tri-county area to identify employer needs. A Targeted Occupation List is then developed, which lists those skill-based occupations that are projected to be in demand. Occupations and industries that are targeted for the tri-county are identified in conjunction with Florida's broader workforce development strategy. The industry targeting process is flexible enough to allow Workforce Plus to identify sectors consistent with the larger economic development strategy, but

without sacrificing training tailored specifically to the region's growing industries. Occupations in health care, computer and electronic manufacturing, and technical services are expected to have high demand for workers in the near future. These positions are also expected to provide higher wages for tri-county area workers. For example, it is expected that over 400 medical and clinical technologist positions will be available within the next year at an average wage of over \$20 an hour. Openings for automotive and electrical technicians with comparable wages are also expected to increase.

Workforce Plus' assessment of business' needs is used to develop targeted skill building and workforce preparedness classes. The skills-training classes are offered directly at Workforce Plus and through its network of service providers. Off-site training centers are used to manage more industry-specific skills-development programs, including electronics and automotive occupations, and medical and health related positions. The providers of the industry-specific skills must be approved annually by Workforce Plus, and are designated as official training sites. The skills-building classes offered directly from Workforce Plus emphasize "soft-skills", and are developed in consultation with area businesses. Soft skills taught at Workforce Plus range from critical thinking, to quality management, cooperative group work systems and task management. These skills are often the most in-demand by business, and the classes are popular among training participants.

The delivery of services through the Center for Business and Employer Services is designed to ensure that working directly with businesses does not overshadow the core mission of skills-building and training. Since the main purpose of the program is to improve the employability of the regional workforce, individual client consultation is maintained throughout the client's participation in the program. Close monitoring of clients ensures that the skills training given is consistent with the client's prior experience. After a client completes training, he or she is directly linked with area businesses. This linkage is a departure from other regional skills-building programs that offer only workforce preparedness programs, and do not establish close relationships with regional businesses. Over time these relationships continue to grow. As an example, Workforce Plus now offers customized training requested by businesses for their employees.

The success of Workforce Plus' strategy for skills-building and employment is evident in its performance. In 2000, only 7 percent of the regional employers who partnered with Workforce Plus hired participants of the skills-building classes. By 2004, 23 percent of these businesses hired participants. Although these numbers are impressive, they are often obscured by more widely publicized economic development efforts. "Our programs are just not that visible," notes the Manager of Workforce Plus.² Nevertheless, the program remains successful. In 2004, over 10,000 individuals received skills training. Those that lost jobs and participated in skills-building ob-

tained positions with businesses in the region that pay an average of \$12.72 an hour. This represents an average 124 percent increase from their previous wages. The skills building classes have undoubtedly contributed to this success. For instance, in a recent survey of program participants,³ 88 percent of the workers who obtained credentials from Workforce Plus said that their enhanced skills assisted them in finding employment with higher wages, or improved their earnings at an existing job.

Investments in human capital development by Workforce Plus are intended to support growing businesses in the tri-county area. The Center for Business and Employer Services is a successful skills-building program that highlights the importance of working closely with the business community. Improving the skills level of the tri-county workforce has not only supported industry competitiveness but has had remarkable results on increasing the wage profiles of program participants.

Conclusion

This article has argued that human capital development is an important part of any regional economic strategy. Three theoretical perspectives were provided to support the claim that investment in human capital is an important economic development strategy that can address distinct economic development foci. First, levels of human capital are directly related to wage inequality and earning differentials. Second, human capital is a significant cause of productivity increases and the technological advancements that

drive regional growth. Lastly, a renewed focus on human capital development is essential for communities and regions as they undergo economic restructuring.

Restructuring is undoubtedly a challenge for many regions throughout the nation. The globalization of economic activity is a source of tremendous economic volatility. Local human capital development efforts need to be oriented towards emerging industries and associated human capital demands. This is one of the challenges faced by regional development officials in a global economic system. Another is the difficulty in implementing human capital development strategies. Recently, there has been a re-organization of work and a new demand for skill levels that reflect larger economic transformations. Communities are confronted with the need to maintain and increase their local competitive advantage through labor-force-based development strategies, while at the same time continuing to advance social programs directly related to job training and skills-building for the working poor and unemployed.

In spite of these difficulties, the benefits of investing in human capital are apparent. There is a positive relationship between the skills of workers and their wages, and there are positive regional externalities from the agglomeration of knowledge that can result when investments in human capital are made. The theoretical arguments that relate firm productivity, broader economic growth and human capital have strong empirical support. Regional growth prospects are directly tied to the presence of a skilled

and knowledgeable workforce. The case of Workforce Plus shows that regional growth depends in part on the relationships forged between businesses and regional workforce service providers. The skills-building program of the Center for Business and Employer Services is a model for enhancing the skill levels of workers and supporting business growth. Workforce Plus shows that building the skills of workers and servicing local businesses do not have to be mutually exclusive. Both of these goals can be met with human capital development strategies.

Notes

¹ See Angenou Economics 2004, *City of Tallahassee-Leon County Southside Economic Development Plan 2004*.

² Zsa Zsa Ingram-Fitzpatrick (Manager, Workforce Plus) in discussion with author, February, 2005.

³ Workforce Florida Inc. "Red and Green Reports: Five-Year Past Performance" <http://www.workforceflorida.com/wages/wfi/news/reports/rgr_pe_5yr.htm> (February, 2005).

References

Ashenfelter, Orley. 1978. Estimating the Effect of Training Programs on Earnings. *Review of Economics and Statistics* 60(1): 47-57.

Becker, Gary S. 1964. *Human Capital*. New York: Columbia University Press.

Becker, Gary S. 1975. *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*. Chicago: University of Chicago Press.

Becker, Gary S. 1995. Investments in Human Capital: A Theoretical Analysis. In *The Essence of Becker*, edited by Ramon Febrero and Pedro Schwartz. Stanford: Hoover Institution Press.

Ben-Porath, Yoram. 1967. The Production of Human Capital and the Life Cycle of Earnings. *Journal of Political Economy* 75(4): 352-365.

Blank, Rebecca M. 1998. Contingent Work in a Changing Labor Market. In *Creating Jobs: How to Increase Demand for Less Skilled Workers*, edited by Richard B. Freeman and Peter Gottschalk. New York, NY: Russell Sage Foundation.

Castells, Manuel. 1993. European Cities, the Informational Society, and the Global Economy. In *The City Reader* (2nd edition), edited by Richard T. Le Gates and Frederic Stout. New York: Routledge.

Champernowne, David G., and Frank Cowell. 1998. *Economic Inequality and Income Distribution*. New York: Cambridge University Press.

Davenport, Thomas O. 1999. *Human Capital. What It Is and Why People Invest In It*. San Francisco: Jossey-Bass.

Duncan, Greg J., and Rachel Dunifon. 1998. "Soft - Skills" and Long Run Labor Market Success. In *Research in Labor Economics*, edited by Solomon W. Polachek. Greenwich, CT: Elsevier.

Flamholtz, Eric G. 1981. Personal Management, Human Capital Theory and Human Resource

- Accounting. *Industrial Relations Monograph Series* No.27 UCLA.
- Henderson, Vernon., Arikun Coro, and Matt Turner. 1995. Industrial Development of Cities. *Journal of Political Economy* 103(5): 1067-1090.
- Lucas, Robert E. Jr. 1988. On the Mechanics of Economic Development. *Journal of Monetary Economics* 22(1): 3-42.
- Malecki, Edward J. 1997. *Technological and Economic Development: The Dynamics of Local, Regional, and National Competitiveness*. London: Longman.
- Mathur, Vijay K. 1999. Human Capital-Based Strategy for Regional Economic Development. *Economic Development Quarterly* 13(3): 203-216.
- Mincer, Jacob. 1958. Investment in Human Capital and Personal Income Distribution. *Journal of Political Economy* 66(4): 281-301.
- _____. 1998. Investments in Education and Training as Supply Responses. In *Research in Labor Economics*, edited by Solomon W. Polachek. Greenwich, CT: Elsevier.
- Mueller, Elizabeth J., and Alex Schwartz. 1998. Leaving Poverty Through Work: A Review of Current Development Strategies. *Economic Development Quarterly* 12(2): 165-178.
- Osterman, Paul. 1998. The Shifting Structure of the American Labor Market. In *Jobs Creation: The Role of Labor Market Institutions*, edited by Jordi Gual. Northampton, MA: Edward Elgar.
- Porter, Michael. 1990. *The Competitive Advantage of Nations*. New York: The Free Press.
- Rauch, James E. 1993. Productivity Gains from Geographic Concentrations of Human Capital: Evidence from the Cities. *Journal of Urban Economics* 103(5): 1067-1090.
- Rayner, Steven R. 1993. *Recreating the Workplace: The Pathway to High Performance Work Systems*. Essex Junction, VT: Oliver Wight Publications.
- Romer, Paul, M. 1990. Endogenous Technological Change. *Journal of Political Economy* 98(5): 71-102.
- Romer, Paul M. 1994. Increasing Returns and Long Run Growth. *Journal of Political Economy* 94(5): 1002-1037.
- Sassen, Saskia. 1996. Cities in a World Economy. In *Readings in Urban Theory*, edited by Susan S. Fainstein and Scott Campbell. Malden, MA: Blackwell.
- Schultz, Theodore W. 1981. *Investing in People: The Economics of Population Quality*. Los Angeles: University of California Press.
- Scott, Allen J. 2000. Industrial Urbanism in Late-Twentieth-Century Southern California. In *From Chicago to L.A. Making Sense of Urban Theory*, edited by Michael J. Dear. Thousand Oaks, CA: Sage.
- Shaw, Douglas V. 2001. The Post-Industrial City. In *Handbook of Urban Studies*, edited by Ranon Paddison. London: Sage.
- Shipler, David K. 2004. *The Working Poor: Invisible in America*. New York: Knopf.

Solow, Robert M. 1956. A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics* 70(1): 65-94.

Southside Economic Development Plan for the City of Tallahassee and Leon County Florida. Prepared by Angelou Economics, June 11 2004

Stanback, Thomas J. 1991. *The New Suburbanization: Challenges to the Central City*. Boulder, CO: Westview Press.

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Technology and Transportation: A Conversation with David Levinson

David King

David Levinson is an Assistant Professor in the Department of Civil Engineering at the University of Minnesota. His recent books include *Financing Transportation Networks* (2002), *Assessing the Benefits and Costs of ITS* (2004) and *The Transportation Experience* (2005). In 2005 the Council of University Transportation Centers gave him its New Faculty Award.

Introduction

Advances in transportation have always been closely aligned with technological innovation. Most notably, technological advances can give us entirely new transport systems. Railroads, automobiles and telecommunications, to name a few, have had profound effects on how people experience cities. Yet as cities and transportation networks mature, technology can also be used to better manage existing systems, rather than build new ones. In his work, David Levinson models transportation and land use interactions, and seeks to understand why people make the transportation choices they do.

Interview

King: You have referred to yourself as a “transportationist.” What do you mean by this, and how does it define your approach to research?

Levinson: I mean to put the area of study above the methodology. We have transportation planners, transportation engineers, transportation economists, transportation policy-makers, etc. Each tries to apply the tools of their field to study transportation, but as a consequence each gets an incomplete perspective. Transportation is about the movement of people and goods. We move people and goods to serve some greater end: people in general are consuming transportation to be able to reach some other place, which ties transportation to land use, because depending on where and what that place is, we require more or less transportation. Transportation is a highly structured process, it takes place on networks, it is time sensitive, and it has issues with queuing and congestion. Transportation facilities themselves are major land uses, transportation requires space to occur, and radically alters spaces both at nodes—the terminals, stations, interchanges, which often become important activity centers—and along links (lines, roads, tracks, etc.).

While there is a unifying structure to transportation, each mode implements transportation differently. "Public" modes (e.g. buses, trains, airplanes on the passenger side, mail, express services, some less-than-truckload shipping on the freight side) operate on schedules, and require economies of scale. There must be more than one person or item going from somewhere near A to somewhere near B for the service between A and B to be provided. If the economies of scale are there, the service can be frequent, and even thought of as part of the permanent infrastructure. If there is high demand in a market (an origin-destination pair in the transportation jargon), a bus company can provide a route with such a high frequency of service that I don't need to think about when to catch the bus, I can step outside and one will be right along, just like turning the faucet on the sink and I get water. But a slight drop in demand will lead to some cutback in service, which will make the time between buses longer, which may make me think about whether I really want to go outside and wait, which reduces demand ...

This is a process that I understand as a transportationist. I need to understand economics, of course, but that is insufficient. I also need to understand the technology of bus service (engineering), and how to shape land uses together with transportation so that the result is an internally consistent system: high density urban places with high quality transit service, low density and more rural places with adequate roadways. History is rife with cities building infrastructure that was not suited to their land use,

both rail transit systems without adequate local demand and highways through high-density urban cores. The transportation plexus needs to be coupled with the activity place.

King: I know you have used driving simulators in your research. How do these simulated driving experiences improve transportation/land use research? How can planners use simulation technologies in their work?

Levinson: "What do people want?" is a crucial question that affects all of our decisions. As planners, we are planning for people. Of course not all people want the same thing, and we can't be sure that we know even what most people want, because people don't know themselves. As a result, we get community plans that reflect what planners want, and we get transportation infrastructure that reflects what engineers want.

One way of determining what people want is to ask them. Opinion polls and survey questionnaires are means for doing this. But when asking people to understand something they have never experienced, surveys will be potentially misleading. Imagine a surveyor asking "Do you want to live in a crowded city with high rise tenements, or in a more rural pastoral setting, with a large yard for your children to play in?" and then reporting that people want to live in the suburbs. Alternatively you could phrase the question to favor the vibrant street life of an urban area over the isolation of rural areas. Words are inherently loaded. As any photographer will tell you, pictures

and images can also distort reality. I could simply ask which you prefer, and show you pictures of a crowded high-rise tenement on a cloudy rainy day versus an English country mansion. Careful design can provide more accurate and complete representations of the alternatives we are trying to create.

Still, as careful as your design is, it is hard to ascertain truth. We had a study that was trying to assess the value people place on travel time under different conditions: waiting at a ramp meter versus driving in stop-and-go conditions versus free-flowing conditions on the freeway. Clearly people prefer not to be delayed, but if there is a choice of being delayed, a computer-based survey that simply asks the questions using words and a bar chart suggests that being stopped at a ramp meter is more onerous. However, using exactly the same times we presented in the bar graph, but having travelers experience them in a driving simulator (a full sized car positioned in a room with wrap-around screens that provide a virtual-reality like environment of road conditions) produced the opposite results.

There are a number of hypotheses about why the results are different, but the key point is that they are. My colleagues and I disagree about which one is closer to truth, but we agree that as good as the simulator is, it is still not as good as reality, so our next experiments involve having subjects travel on real roads under real conditions, and then telling us which they preferred, giving them the opportunity to actually experience the alternative conditions. This, of course, is still imperfect, as driving a road once is not

the same as driving it everyday, and visiting a place is not the same as living there. But the closer the alternative realities that we show people are to things they can fully envision in three dimensions, with actual colors and shapes and sizes, the better their imagination can fill in the remaining details of what life would be like in that scenario, and—we hope—the more accurate their resulting responses about which they prefer.

King: Technology has played a big role in the evolution of urban transportation. Internal combustion engines, automobiles, airplanes and interstate freeways come to mind as obvious examples. How do you feel these innovations had the greatest impact on the function of cities?

Levinson: In a book I am editing with Kevin Krizek, *Access to Destinations*, I have, paraphrasing Le Corbusier, called cities “Machines for Access.” By this I mean that the purpose of a city is to enable people to be able to quickly reach each other. As technologies such as the streetcar, then the subway, then the automobile, then the freeway have enabled people to reach each other more quickly, or reach more people in the same time, cities (metropolises) have grown both in population and in area, but generally faster in area than in population. The traditional idea of a city as a dense, walkable area is simply one manifestation of the city given a particular set of technologies. The city is really an accessible area, which includes high density development and walking as one way of achieving accessibility, but also includes lower density development and automobility

as another means. Individuals may prefer one over the other, but as long as the market is free to create spaces in response to consumer demand we will continue to have both kinds of places. Planners should, when addressing the potential for new development, enable those places to be created (without needless restrictions) in response, and ensure that neither kind gets subsidies. The difficulty is that in order for me to live in an area with a dense population, others must do so as well, while in order for me to live in a low density area, others must not do so. I can't have density without people: other people are creating positive externalities for me if I want to live in an urban core; other people are creating negative externalities if I want to live in a rural setting.

King: Technology innovations in transportation can be used to improve the way we currently do things, or can be used to do new things altogether.

Oftentimes, new technology is implemented with the capability of doing new things, but ultimately does things the same as before. An example of this is contactless parking cards, which have the capability of data management or dynamic pricing, but mostly are just replacements for the parking cards that were used previously. What are the difficulties of implementing new technologies in order to get the most out of them, or of calculating the costs and benefits of technology?

Levinson: New technologies require learning, experimentation, trial and error, and perhaps several failures before the best path can be found. Often there is an impatience with failure, and a rush to pre-judge.

As professionals, we need to be able to separate the wheat from the chaff. There are lots of new ideas that are junk, and some that require further investigation to pull out the useful bits from the noise, and once in a while a bona fide winner (a steam railroad, a streetcar, an automobile) emerges. But the automobile had been on the inventors' collective radar screens (so to speak) since the 1780s; it took over a century to become a useful product. We need to place multiple bets, and pursue multiple paths, before we fully deploy any particular technology. We cannot know the costs or benefits of any truly revolutionary technology in advance, we can only estimate them for existing technologies deployed in new places, or for relatively minor tweaks. Overall, however, we need to "let a thousand flowers bloom," and then tend to our garden, pulling out the many losers and supporting the few winners.

King: What is the role of planners and public officials in getting the most out of technological innovations? As an example, you studied ramp meters on Twin Cities freeways when the legislature ordered them shut down for six weeks. When the ramp meters were turned back on, they were programmed differently than before, so that the waiting time was minimized rather than the freeway travel time. Did political interests play a role in this change, and how does it affect the original intent of the ramp meters?

Levinson: This is actually a good (if uncommon) example of politics affecting science in a favorable way. Ramp meters have two major purposes. The simplest one, on which there is little disagreement, is

to break up the platoons of vehicles entering freeways. Merging is easier if only one car enters the freeway at a time. The other is to ensure that the flow through bottlenecks is just below capacity. This, our engineering research tells us, ensures almost maximum flows at almost maximum speeds. But this means that a lot of delay is transferred from the freeway to the ramps. This in turn means that the delay is transferred from some individuals to others. Ultimately this is an equity issue as much as an efficiency issue. It turns out the most efficient solution to the ramp control problem is also the least equitable one. If we want more efficiency, we lose some equity.

As political as the entire ramp meter shutdown process was, in the end an experiment was done. If left to the traffic engineers and managers at the Minnesota Department of Transportation, nothing would have changed. The experiment was not perfect—no experiment is—but a great deal was learned from it. The experiment affected three million people, and I have called it (with some hyperbole, but I have yet to see it contradicted) “the single most comprehensive experiment in the history of surface transportation.” People were shown a world with aggressive ramp metering, resulting in delays of sometimes over twenty minutes at freeway on-ramps, and a world with no ramp metering. And they were asked, with opinion polls, which they preferred. And what they seem to have preferred is something in between, a world with some metering, but with maximum waits capped at four minutes. Is four minutes the right number? The study I mentioned before, in-

volving the driving simulator, was intended to get a better sense of this (and perhaps suggests there is no single magic number that is the right maximum). But because the science gives us contradictory evidence, and we do have to act, we decide with incomplete and imperfect information, which is where the transportation professional’s judgment is brought to the fore.

King: Continuing on the subject of ramp meters: they are an example of using technology to manage the existing capacity of transportation systems. Do you feel that managing existing resources is where we will see new technologies implemented in transport, or are there innovations along the lines of the automobile out there? Why or why not?

Levinson: The automobile truck-highway system is mature, and the public transit system is senescent. As such, we can make changes to make them somewhat healthier, but we cannot expect either system to radically change the way we do things going forward. In terms of management, introducing pricing would present the most significant change. We can eliminate congestion if we choose; it has just not been worth it in most places (yet).

New technologies may come from the outside (the long-forecast but yet-to-be-really-implemented substitution of telecommunications for transportation). The Internet may ultimately be as radical as the automobile in how it affects our use of time and space. Flying cars (a la *The Jetsons*), if they could ever be mastered, would have a radical effect. In the mean-

time, truly automated cars (cars that drive themselves) would pose a significant change over the current auto-highway system. A driver can (safely) do many other things in much greater comfort if he or she is not distracted by the task of driving. While now people use cellphones and even laptops while driving (neither is advised), this involves multi-tasking, resulting in neither the driving nor the cellphone being used well. Relieving the driver of his or her role would make transportation sufficiently more comfortable (perhaps) that commutes would again increase. In a sense, just as we see that commuter rail users travel longer distances than automobile users, automated vehicle users would behave similarly.

King: How can public agencies and government encourage technological innovations? Should they institute technology standards or stay away from this? It seems difficult for government to spur innovation in managing publicly owned transportation systems, but it seems equally difficult for competition to produce innovations on public systems, largely because they are unpriced. What do you think the role of public agencies should be? What incentives can be put in place to encourage technological innovations?

Levinson: California has pushed the adoption of cleaner cars with various zero-emission vehicle standards through the years. By mandating performance standards on new vehicles, two things happen. First, new vehicles do meet higher performance standards. Second, because new vehicles are now more expensive, old vehicles are kept around longer, perhaps offsetting the gains. Mandating performance on ex-

isting vehicles (e.g. through inspection programs) is one way of trying to eliminate this problem. But government standards should be limited to things with a strong public purpose (e.g. minimizing the pollution externalities that arise because no one owns the air). People used to think about telecommunications as "natural monopoly", until the phone company AT&T was broken up in the early 1980s. The state DOT's and public transit agencies are very much in the same position as the phone company. Is there some feasible way of breaking them up? I don't know. But if they were broken up we might see new innovations in transportation.

Roads have been around a long time, and have been both public and private, and have failed (at various times) under both ownership regimes. Transit has been around over a century as well, again both public and private, and has seen losses in both sectors. Something one could see with private roads that we do not have with public roads is service quality differentiation. Different routes could have different prices and different levels of service (low cost and congested, high cost and reliable free-flow conditions). We see service differentiation in almost every aspect of human life, including transportation. We can FedEx (a recent transportation innovation) a package same-day, overnight, two-day, five-day, etc.

Perhaps the worst thing government can do is to try to pre-specify everything. The world (outside of transportation) is a dynamic place, and establishing standards and protocols before deployment needlessly places artificial constraints on progress. The

most widely deployed Intelligent Transportation System technology is Electronic Toll Collection (ETC)—this was introduced independently in several parts of the country with incompatible systems. On the other hand, it was introduced. The marketplace will sort out the standards and achieve compatibility downstream. Requiring it a priori reduces functionality.

One needs to ask if there are rewards. During the 19th century railroad booms and the late 20th century Internet boom, successful technologists made (and lost) their fortunes. Who makes their fortune in surface transportation? Who even thinks this is possible? We accept that surface transportation is managed by middle-class technocrats employed directly by government (or indirectly as consultants and vendors). To create the railroad boom, the government

gave away vast tracts of land for rights-of-way. Towns competed to be stations on the railroad for fear of being bypassed. Are there rights-of-way left to be exploited in new ways without taking away from the old (at least at first)? To create the Internet boom, the government (the Department of Defense) funded research into what evolved into the Internet, deregulated telecommunications, and largely got out of the way. Are there seed research opportunities where the government can offer support (it does some of this already), but then stand back and let the system grow on its own?

David King is a current PhD student in the Institute of Transportation Studies at UCLA. His research interests focus on the implementation of new technologies on transportation systems and land use patterns, the influence of the built environment on travel behavior and the emergence of sub-local governance within metropolitan regions.



Chaos Creation and Crowd Control: Models of Riot Regulation, 1700 to 2005

E. Joanna Guldi

Does policing public space aid peacekeeping or disrupt local patterns of government? The author surveys a variety of historical approaches to regulating public space, focusing on the controversy in nineteenth century Britain over riot control. The Tory view of landscape asserted that a less interventionist pattern of surveillance is more likely to quickly diffuse cultural tensions. Various modern analogues for policing and surveillance are explored, including embassy architecture in the post-9/11 world.

As the invasion of Iraq was being plotted, the *New York Times* remarked on a Pentagon screening of Gillo Pontecorvo's 1966 film *The Battle of Algiers*. Pentagon officials interpreted the film using what political historians like G. Kitson Clark and John Vincent refer to as the "official mind": an institutional set of tools and prejudices for defining and approaching a problem. In the last three decades, America's official mind has formed a discernible response to the problem of terrorism. A gathering of elite American army officers for such a screening signaled the existence of certain shared assumptions: the army knew that the conflict it faced would take place in cities; that the opposition would be governed by small networks; and that the approach must be to establish democracy and avoid tyranny. Following from these priorities, intelligence agents gathered information about Middle Eastern cities and looked for the appropriate technology to deploy. What assumptions about cities, peaceful society, and military strength influenced decisions regarding the kind of force the American army would eventually apply?

In the mid 1980s, the organs of American military intelligence perceived a sea change in the nature of threats facing the nation. No longer simply fighting a cold war between evident superpowers, strategists saw the U.S. as vulnerable to terrorist attacks by organizationally obscure assailants hidden in the labyrinthine cities of the Third World. The Rand Corporation published reports on centers of violence, terrorist networks, and urban warfare. Army strategists even contemplated lessons learned about street fighting in the LA riots. These and other early reports codified a number of suppositions about imminent conflicts. Perhaps foremost among these suppositions was the centrality of urban warfare in the major struggles to come.

As America's predecessor in the role of global hegemon, Great Britain dealt with colonial peacekeeping only after attaining stability and equanimity at home. Between 1688 and 1832, Great Britain moved from a traditional society of face-to-face relationships and local obligations to a modern society of new, formalized institutions. During this time, the government faced active domestic unrest in the form of the Jacobite Rebellion, the Gordon Riots, the Jacobins guillotine, and the threat of Napoleonic invasion. Like ours, British society was torn between an inherited ideal of public openness and an authoritarian willingness to censor dissent. Elites read Gibbon's *Decline and Fall of the Roman Empire* and wondered whether Great Britain might follow Rome. British military and political leadership together sought an avenue between despotism, which prompted revolution from below, and lassitude, which threatened overthrow from without.

During the transition to modern forms of government, the British gentry debated how best to reestablish order. Would fencing the public out of public spaces make rebels more or less violent? Was surgical removal of the most hostile elements the best way of establishing order? Or should the riot be met where it stood? Or was the best path to seed native militias capable of protecting their own turf?

Around 1768, public violence took an unprecedented form in England, and its causes and organization resembled the destabilizing shifts of experience that many parts of the world are undergoing today with the globalization of advanced capitalism. Like the

world today, England suffered social upheaval rooted in the transition from a localized, familiar, small-town barter economy with limited trade to a large-scale, industrial economy. Similar to the present-day clash of civilizations described by Samuel Huntington, Britain underwent an era of violent outbreaks unparalleled in scale and coordination, which directly resulted from a misfit between government culture and the culture of the governed. Britain, however, learned what to do.

The lessons learned in Britain become relevant to America today as we build walls at home and abroad, as police handle riots in major American cities, and as tanks patrol the streets of Baghdad. The problem is that few lessons are as straightforward as wall-building and trench-digging: erecting barriers in cities is a matter of propaganda as well as military strategy. Walls symbolize exclusion, delineate the safe from the chaotic, the privileged and protected from the anarchic and hopeless. In *The Battle of Algiers*, a sanitary cordon and curfew temporarily stemmed riot only to provoke a more intense period of suicide bombings. British magistrates similarly noticed that the suppression of riots might later trigger worse outbreaks of violence. In the French example, the official mind never changed and so lost its colony; in the British example, the official mind responded to urban violence with a complex understanding of culture, urbanism, and the use of force. When political leaders are able to appreciate the changing aims, means and organizational structures of unrest, their application of force changes appropriately. This essay

will highlight the spatial and urban dynamics of peacekeeping, riot, and political symbolism.

Riot and Civil Society in Modernizing Britain

The larger question of public space is always one of access, where the spatial stands in for the political. In Great Britain, access to the public commons—a means of livelihood as well as a visibly public space—became endangered during the country's transition to a modern nation. Before the democratic traditions of compromise and settlement were institutionalized, riots served the purpose of expressing popular grievances. As political circumstances changed, so too did the motivation behind riots; they came to be used to redress different forms of exclusion. Rioting was effectively the only appreciable form of democratic representation—the only possible public and visual presentation of the human body before other human bodies.

New exclusionary measures primarily included enclosure in the countryside and the ensuing displacement from the countryside to the city. These measures decreased most persons' access to the traditional securities of an agrarian economy. Enclosure meant not only the exclusion of the poor from familiar neighborhoods and communities, but also their exclusion from once secure sources of income. Enclosure was fundamentally unsettling to traditional local relationships of place (Hay and Rogers 1997).

If enclosure in landscape caused practical hardships for the families it affected, alienation from the land came to sharply reflect the political exclusions implicit

in the civic settlement of the Glorious Revolution in 1688. At the same time, political philosophers construed landed property as a primary ground of democracy. In a tradition going back to Hobbes, the Englishman's enclosure of his home formed the primitive and essential act of self-preservation that made democracy possible. Just as everyone had to consume space to survive, every land owner would defend the use of space against anarchy.

Changes in language reflected the reality of spatial exclusion. The English word "property" had gained a second meaning by 1760. "Property" can slip between "private property," material wealth in any form attributable to one individual, and "real property," that is, real estate. When the term "property" was first applied to real estate between 1710 and 1760, the linguistic shift marked the development of two ways of looking at land. On one hand were those with access to land, who saw property as the basis of their government. These landowners cultivated a sentimental attachment to place, whose social networks were generated through the use of informal public places. On the other hand were those recently dispossessed of their land. These peasants, who had often moved from place to place, and whose income afforded them none of the delights of the urban center, now saw land as but another kind of property whose benefits they were unfairly denied.

As land made its way into the domain of exchange, it entered the class of things that traditional riots were used to protest against. It, like other commodi-

ties, became a target of rioting. For instance, rioters would stop a miller on his way to sell much-needed local grain at a better market. Such collective protests against unfair use of property were generally countenanced by the local gentry and looked upon as a fair expression of popular politics. Exclusion from land was an increasingly evident threat, and it plainly meant exclusion from the circulation of capital and from political representation: the stakes had been drawn, and space—in the form of “real property”—had been defined as a crucial point of access to political representation.

New measures of enclosure, as well as proto-industrial urbanization, signaled a shift in provincial English towns from a monocentric to a multicentric structure. Among other things, multicentricity meant that the rich and the poor were increasingly isolated from each other. This new spatial arrangement changed the stakes of rioting. Unlike the monocentric town, where a riot could easily claim victory after occupying the town hall, the multicentric town could not be straightforwardly seized. To use John Bohstedt's phrase, traditional riots depended on the “symbolic possession” of the city, and what possession meant was no longer the same when the town sprawled across a half dozen squares and neighborhoods (Bohstedt 1983). The difficulty of identifying a public target recognized by all classes may have spurred the shift toward targeting private property. The new culture of public entertainments and allegiances meant that a single individual might belong to a dozen clubs, participate in a dozen enter-

tainment venues, and frequent a wide variety of religious and political associations (Brewer 1997; Plumb 1973; Plumb 1980). To associate the origin of a social wrong with a visual icon or spatial center in the city was now impossible.

Older forms of rioting also lost effectiveness with the changing shape of English social geography. Even as the poor were displaced, other segments of English society continued to seek out relationships based on informal interactions in a place. Coffeehouses and other urban institutions drew together the burgeoning ‘middling sort’—persons rising on the tide of capital and trade (Borsay 1989). While place-centered relationships were disappearing for the agricultural poor, they were flourishing for the middling sort, helping to define what would emerge in the early nineteenth century as the middle class.

The change in the urban landscape made necessary a changed practice of rioting. From the 1760s, riots began to exhibit a new level of violence and geographical breadth. The shift came in two stages: first, an attack on property rather than people, and second, an attack on private property rather than public property.

As it existed until mid-century, a traditional riot was expected to be nonviolent because it was sanctioned by custom (Shoemaker 1987). Riots became accepted at the end of the seventeenth century as a legitimate way of enforcing social propriety where other institutions had lapsed. Along with citizens' arrest and the posse comitatus, or temporary militia, the riot was

seen as a legitimate extension of government, during which common people were transformed into agents of the law. Thus "riots were expected to be nonviolent and not threaten to undermine the rule of law" (Shoemaker 1987: 27). However, once a law was in place giving authority to the constable for acts formerly under the mandate of riots, it became the responsibility of the law to suppress the riots rather than to stand aside and let them run their course. Riots then acted as a form of consensus: violence within certain bounds to reaffirm access to public space.

Riots of the seventeenth century typically attacked a single individual or household for some action seen as corrupt or dangerous to the community. These dunkings, charivaris, and "rough music" on occasion turned deadly.¹ The riot might have targeted the particular politician involved, but in targeting a public figure, the crowd risked alienating its middle-class sympathizers. Roger Wells describes the change as "the transformation of the rural incendiary tradition from a mode of exacting private vengeance to expressing public protest" (Wells 1991: 214). The rioters could have besieged and even have torn down the village's town hall. The riot might have targeted a public place: crimping houses, the Bristol Bridge and Blackfriars Bridge were all foci of riots. By the 1790s, destruction of public property took on a more important role in protesting the faults of local government (Harrison 1988). The public landmark stood in for an abstract complaint—a financial relationship, an

unfair tax, or a corrupt government—rather than the deeds of an individual.

In 1768, the form of riots distinctly shifted. Rioters in British cities began attacking the private body as well as the private residence. According to George Rudé, by 1768 the practice of house-breaking by renters against householders had become a common feature of urban riots (Rudé 1959). The shift to targets of private property rather than public property or private persons is extremely clear in the case of religious riots. The anti-Catholic, anti-Dissent and anti-foreign riots of 1680-1740 targeted houses of worship (Stevenson 1992). The early anti-Methodist riots of 1743-46 focused on dragging ministers from the pulpit. But in 1780, the anti-Catholic Gordon rioters besieged the houses of patrician Catholics. During the Gordon Riots, raids on rich Catholics and their churches were coupled with raids on public places and raids on the Inns of Court to seek out the parliamentary supporters of the Relief Act (Rogers 1988). Dissenter chemist Joseph Priestley's personal house and belongings were attacked in 1791 (Sheps 1989). Both classes of riot were sparked by differences in religious ideology and not, principally, by differences in wealth, but only the later ones ended in attacks on private property.

On the other hand, the difference between the two kinds of riots was governed by geography. Attacks on public property seemed to be more typical of the provinces, while attacks on private property appeared more in the cities (Harrison 1988). It is therefore plausible to relate the riot against private property to

a set of conditions specific to the city. As in the provinces, urban space could have signified an abstract concept like "corruption" or "greed." But in the city, rioting emphasized the difference between those settled in a place and those displaced from property, as seen in instances of renters attacking householders (Shoemaker 1987). Attacks on private property suggested a spatialized antagonism between different groups. The house-breaking riots suggested violence not so much to gain symbolic possession of the town, as much as to symbolically challenge the possession of private land.

The shift to house-breaking signified a disjuncture between two very different conceptions of property, which corresponded to two antagonistic segments of the population. For the rioters, public space remained a symbolic territory to be claimed by the politically active. Private space was an extension of its owner, a commodity to be punished in the course of riot. For the middle class, however, private space was a sacred territory outside the limits of politics. In the early eighteenth century, the middle class had seen public space as fair game for political seizure. But the clash over private space would change their views about public space as well.

Ideologies of Community, Ideologies of Spatial Control

The new riots were terrifying. Pamphlets prophesied the invasion of London and the destruction of Parliament at the hands of frenzied crowds. The middle class began to react, in its travel habits, its view of the

mob, and its general intolerance for traditional riot.² Policing of London escalated in the 1790's. A patrol was placed at the head of the New River to watch for its contamination. Volunteer sentries were positioned at several points to quarantine the aristocratic West End from outside violence (Wells 1991). For a year after the Gordon riots, the army was garrisoned in Hyde Park. In 1796 the king bullet-proofed his coach.

The shape of public space changed, as well. The West End squares were fenced-in by householders concerned about safety. Bristol fenced in its commons and would soon start charging an entry fee, to keep out the rabble. Regent Street offered a cordon to keep rioting Easterners away from the West. These changes marked a fundamentally new concern with property ownership, threatened invasion, and secure seclusion.

Although the new riots were more intimidating than their antecedents, violence had, in reality, become less common over the course of the century (Tilly 1993). Theories attempting to explain the decrease in value tend to emphasize the group discipline instilled by life in the army or factory, and a rising awareness of the need to be perceived as rational in order to engage effectively in politics (Charlesworth 1994; Bohstedt and Williams 1988).³ Better-organized riots were necessary to make a political statement of any weight in the late eighteenth century, and better-organized riots were more frightening and more destructive to private property—but they were less violent to other humans.

We reach an ironic slip here: although the riots were less violent, middle-class fear was so heightened that reconciliation between the rioters and the middle class was almost impossible. By the time the level of violence fell, the middle class had become so alienated that it only policed and repressed radicals harder. Protest was met with repression, which inflamed further protest. This cycle led inexorably towards an escalation of violence. The possibility for reconciliation was lost until the dispossessed eventually gained enough leverage to bully their way into politics.

Under English law, the private home was protected against trespassing and surveillance, and things said in the home between man and wife could not be compelled as testimony in court (Curry 1997). Transactions treating land as an investment like any other kind of property became more prevalent; the riot targeted private land as well as public land. These riots against private houses effectively pitted middling opinion against the rioters.⁴ Yet the destruction of private property was a major factor in the alienation of middle-class sympathy from the rioters during the Gordon Riots. George Gordon told the rioters when he attempted to intercept their progress that there was no fault in their tearing down Catholic churches, but that they ought not have "touched private property" (Rogers 1998: 163). The wanton destruction of private property during the Gordon Riots inspired a middle class otherwise well-disposed to reform to think better of it. Riots against private

property were the least condoned and the most likely to be put down by the army.

As we have seen above, traditional riots were peaceful when expected to be. Consensus broke over the property issue. Riots against private property happened when society divided into two groups that had fundamentally different relationships with housing, land, and the landscape. When society divided consensus collapsed, and in the absence of consensus inbuilt limits to violence were eliminated.

Gordon's quote illustrates the middle-class perception that the act of rioting had slid into a category outside of public consensus. Meanwhile, the linguistic shift and the frequency of house-breaking imply a major alienation of the poor from a concept of the house as something sacred, i.e., something outside the normal realm of property.

The shape of the riot changed with shifting political access and exclusions from public space. In the commercialized, diverse, multicentric town, only attacks on property were effectively statements of political presence.

Gradually the official mind came to incorporate a faction of Tory traditionalists interested in the preservation of order through the maintenance of local relationships. In the nineteenth century, the 'Tory view of landscape' would limit the use of military aggression in putting down riots. In 1842, the Rebecca Rioters of rural south Wales challenged the local turnpike authority by burning down tollhouses and breaking toll bars. Colonel James Frederick Love,

commander of the south Wales military district, ordered his troops to charge the rioters, but the Royal Commission for Inquiry sympathized with the rioters rather than the local authorities, and asked for the resignation of William Day, the Welsh poor-law commissioner in charge.

Riot and the British Built Environment

The political ideology of traditional moral economy had been virtually unchallenged since the 1680s. But the 1790s brought the threat of terror, which by coincidence seemed to substantiate all of Edmund Burke's dreary predictions about what would happen if property were not defended (Dinwiddy 1991). The violent suppression of riots was asserted as the only possible defense of property. Looking forward, the importance of property as the basis of rights was firmly established by the next generation of political philosophers. Property rights was a major contribution of Paley's generation of conservatives, and a most convincing reason for eschewing the Jacobin threat to readers convinced by Adam Smith of the importance of free circulation. Lord Melbourne, the new Home Secretary, retorted in response to the Swing Riots that "the whole duty of government is to prevent crime and to preserve contracts" (Philips and Storch 1999: 71).

The early ideology of the "Tory View" has been masterfully traced by Nigel Everett (1994). But by the 1790s, growing fear of Jacobin anarchism compounded the general panic to such an extent that the public right to space reached plummeted to its nadir

in British history. In 1795, the right to public meetings was revoked. Even private speech in debating societies came under fire (Epstein 2003).

The connection between the early eighteenth century "Tory View" of intellectuals and the later return to clemency for rioters was pieced together by examining the reaction of one contemporary, Uvedale Price. In 1793, he wrote about the political alliances most likely to resist an imminent French invasion.

Price preached in favor of visual intelligence. He argued for a visual awareness of how land could be defended. A good landlord, he said, had such a fine-tuned eye that he could tell where sheep had been foraging and what trails animals had followed. Just as the Tory landlord could understand where the sheep had been, the ruler needed to understand that members of the working class would only defend their property so long as the landscape convinced them that they had an effective interest in it.

Price epitomized the old Tory appreciation of traditional relationships between gentry and peasants, generally understood by social historians as the "Country Ideology." The squire was supposed to train himself to watch where his sheep had been grazing, and to maintain responsibility for the peasants under his care. The elite were a foregone conclusion to Price: he preached no utopian vision, no major challenge to tradition or capital. But he imagined an elite bounded by their acknowledgement of those who lived nearby, and denied the fantasy of sweeping away villages in the name of improvement. He

preached the joys of visual knowledge and casual interaction. He argued for intelligence about the landscape and for a politics that preserved the landscape as a territory shared by rich and poor. Was it possible that landscape could actually make a society politically intelligent?

Price's idea of a visually aware land stewardship of shared space was not realized. But if riots caused a reconsideration of private and public space throughout London, this reconsideration was preceded by an even clearer form of retreat by the elite. As discussed earlier, fences and troops demonstrated the West End's paranoia even as riot violence declined.

The evidence of architectural retreat increased in the last decades of the eighteenth century, as polite buildings indicated a hostility to unregulated public interaction. In London, the same development occurred in the formation of exclusive enclaves around Pall Mall. After 1755, a handful of conservative coffeehouses began moving away from the financial center of the East toward the residential district around the Palace of St. James'. The architecture of the club was decisively established in the period after 1780 as a repressive indoor agora for those who wanted to retreat from the street (Arnold 2000; Watkin 1982). As if in affront to the public places without, the clubs offered a virtual public within. The clubs established a rhetoric of sight that would hold the British imagination: ground-story bow windows let the members survey Pall Mall as if from an opera box; a grand stair displayed members to

each other as they entered a great, open hall (Bolton 1913; Ramsey 1913, 1921; Rendell 1999).

Habermas (1989) reminded us that the new commons constructed of money placed demands for entry such that it widened the gap between those allowed to participate and those not. We see here that this was equally true of the spaces. Eighteenth century civil society, as epitomized by the coffeehouse, was a model of how governing institutions could exclude those they governed. But the coffeehouse model sowed the seeds of its own destruction. The coffeehouse's public sphere was only open to those able to live up to the requirements put in place by the market. London at the end of the coffeehouse era was a warren of enclaves inaccessible to most. The public space they left behind was policed. The city that had begun as the epitome of enlightened interaction had been persuaded by riot to retreat. The elite retreated to their city; the middle class to theirs. The coffeehouse had theoretically promised informal interaction between the classes, but that now was impossible.

To summarize what was said about the changing shape of the city after these riots, when local consensus about the riot's legitimacy ended, there was division in terms of the classes' ideas about land. When the working class was formed as such, one part of its identity became its comparative placelessness, comparative mobility, and comparative exclusion—all to a much greater degree than before—in a monocentric world where frequency of encounters characterized interactions between rich and poor. Meanwhile, the

rich withdrew into enclaves where they would not see the poor, recreating freedom of movement and the variety of a wider social mixture through the artificial devices of consumption and masquerade. The social division begat spatial division.

Between the two halves were contested public places: streets, commons, and parks. In the cases of Bristol and London, parks were claimed as the preserve of the rich, policed by military forces, fenced and guarded. Streets, the ways of capital and exchange itself, could not be technically enclosed. They became a domain of symbolic violence, which was apparent in the nineteenth century pedestrian's ever more guarded and anonymous means of getting across the city: hidden behind hats, umbrellas, arcades, coaches, and a new set of manners that kept the eyes to the ground.

American Feudalism and the Alternatives

This spatial manifestation of social division has continued into the current time. Those who lost homes after the movements of capital were those most likely to become terrorists, and they were quick to lose public sympathy (Harmon 2000). The ruling classes barricaded themselves in geographically specific locations (Blakely and Snyder 1997). Such lessons at least teach us to see local posse comitatus, as well as terrorists, in their own light, to propose an escape from the racing loop rather than its repetition, and to contemplate what it would be like to intervene on behalf of capital or human rights while emphasizing place and local authority. To redevelop neighbor-

hoods instead of wrecking them with housing projects, we might lay plans for the reenfranchisement of the global oppressed, whether through education or the market. This argument leads us back to the contemporary call of so many architecture critics: give us more public space. Instead, I will recall Price and use this problem to open up another, more practical question: how does architecture encourage or deter a community from interaction?

Cities are currently experiencing a shift analogous to that seen in early nineteenth century Britain. In the last ten years, violence abroad has caused a massive redesign of America's embassies. Embassies now nestle like feudal villages within 100-foot setbacks and twelve-foot blast-proof walls. A single entrance helps personnel screen visitors. Car parks, residential areas, and offices are carefully segregated. In Jordan and elsewhere, new embassies have been moved to the borders of the city, where they will be less susceptible to assault. The pattern was established under the 1986 security requirements mandated by the State Department's Foreign Buildings Operations division (Nesmith 1990). After 9/11, standards for embassy design abroad were the prototype to which those trying to design secure buildings at home turned. But architects are now crying out that each successive year brings worse design, as windows are narrowed and communication curtailed. The architectural standard of America abroad is now the domain of the bunker (McKee 2003; Isenstadt 2005). What does this augur for architectural standards at home?

The architectural community has spoken with a solid voice against the "city as bunker" (Ivy 2002; Vidler 2002; Nason 2000; Hart 2002). But two major strategies have characterized post-terrorist urban design. Israeli architecture has established a pattern of setbacks, blast-proof engineering, and built-in checkpoints with accommodation for long lines. Energy absorbing building materials, masonry reinforced with steel, and single-entrance buildings are now prevalent in Jerusalem and Haifa, and increasingly they appear in the United States (Horwitz-Bennett 2003).

Britain effectively killed the market for urban setbacks and blast-proof engineering with a federal injection to private terrorism insurance under the Acts of Terrorism Bill of 1993 (Evans 1993). Instead, British and Canadian architects called for creative design to improve safety, while not substantively changing the way people moved in buildings. They recommended design for safer escape from skyscrapers, the elimination of stairwells that served as smoke chimneys, and design tactics that would force building occupants to use stairs instead of the elevator (Sandori 1993). British architects speculated about insurance rates killing the skyscraper (Pawley 2002). British planners studied Manchester's recovery and made recommendations for municipal building codes that would enable swift rebuilding for the recovery of urban community in the event of a terrorist attack (Kitchen 2001). In Britain, the major question for secure designs remains: is a city center worth having if people do not feel safe and happy there?

America has largely followed Israel, with some concessions to the British idea of perceived safety. The result is invisibly paranoid architecture designed to promote calm. Jersey barriers disguised as flowerpots, twenty-first century moats, more policing, more scrutiny and ever more separation of the landscape (Hart 2002). Yet these concessions are mere Band-Aids over the gaping hole left in American architecture as it abandons its ideas of openness. American architects cry out against bunkers, but happily limit the number of entrances when told to do so. They have yet to respond to the rich creative response of Britain, and they seem incapable of thinking about a defensive architecture that would make its inhabitants more aware of potentially threatening changes in their immediate surroundings.

Consider the shift in aesthetics implied by the single entrance checkpoint. The Western exemplar of the building accessible from all directions was the Greek temple, whose peripheral screen of columns seemed to invite continuity with the landscape from every direction, as if a spatial reflection of Athenian concept of democracy. Nineteenth century Britain and America opened up buildings by applying the ideal of Greek accessibility to institutional forms. In so doing, the single-entrance building vanished, and in its place were university and state buildings with a variety of entrances. The Beaux Arts ideal body was one that passed freely through walls, disciplines, and departments, moving through the city inside and outside, looking at the same vista from a dozen points of view. It inherited an aesthetic and an idea

of landscape intelligence from the same school of the Picturesque characterized by Uvedale Price.

Through modern architecture, the aesthetic of the multiple-sided entrance invited car owners to use the entire circumference of a building as a point of access, promising democratic access from all sides. Modernist screens of columns diffused a single entrance into the illusion of a wide, welcoming arm.

The reversal of such an aesthetic threatens to accidentally do away with the ambience of welcome that buildings once had. Courthouses once accessible from four sides now greet confused visitors with angry signs pointing them to the long queue at the other end. Whatever the good intentions of the security line, the building now announces its hostility to all who approach. The building tricks them, lies to them about how they should approach, and then marshals them to move anonymously in a single direction along with a mass of strangers, venerating the entrance with their bodies and eyes.

In telling the story of London's shift to a city built for less rather than more information, another possible story has been shunted. Gentry in the countryside realized they had lost the ability to reconcile the crowd to their own aims. They objected to the idea that better policing and better identification of potential threats were better strategies than seeking a resolution with the lower classes (Philips and Storch 1999).⁵ Cobbett and the rest of the radicals would also take sympathy with the lower classes and lobby for their universal rights, to the tune pursued to this

day by embattled liberals fighting for acknowledgement.

Yet the Tories recognized the fundamental disjuncture between people and land as a major problem. Those who live as neighbors should band together in recognition of the fundamental commonality of lot. Rich or poor, they are equally susceptible to anarchy and invasion. Recognition of this should make the rich amenable to riot and the poor amenable to petitioning the government. Ideally, Price's vision is one of dialogue, glued together by place.

In 1793, the only perspective able to forge a common ground on which classes could unite emphasized place and displacement. In one of history's ironies, it did so in an outmoded form. Poor old Uvedale Price would be relegated to the realm of cultural history as one of the founders of the Picturesque movement in garden design, only to be dismissed as a hopeless aesthete even within the tiny bastion of Landscape History. Yet over the next century, writers fascinated with the sharing of particular places would flourish amidst the very cities plagued with adversarial space. Cobbett, Hone and Dickens would take such thick description of place as a means of wooing readers back to an interest in their fellow men, encountered as equals on public thoroughfares and highways.⁶ This underground of nineteenth century Situationism typifies a fierce movement in early romantic literature, but its speculation about the built environment is rarely encountered by students of urban history. Still less are any of these conversations

noticed by those restructuring access to official buildings abroad.

To talk about the eighteenth and nineteenth century politics of place is to talk about one of the subterranean passages in history, about a country ideology that technically failed and disappeared, and to take up an antiquarian curiosity in examining the nineteenth century roots of Situationism. But now, when the academy's most livid critics of globalization are geographers like Mike Davis and David Harvey, and when the critique of place again damns our rash actions and offers a clearer explanation of why we find ourselves in increasing cycles of violence, now seems to be a time to return to these dark side-shows of history and to ask what alternatives they saw to the high road we took.

Notes

¹ Charivaris (in west England they were known as "skimmingtons") were extralegal public shaming rituals designed to punish behavior that was outside existing social mores. Often this unacceptable behavior involved women who did not conform to society's expectations of female passivity and docility. During charivaris "rough music" was played outside the offender's home—rough because it was created not with instruments, but through banging household objects (i.e. pots and pans) against one another.

² Roger Wells gives a few examples of evidence of everyday fear on the streets. In 1799, a clergyman goes about London incognito to not be insulted.

Aristocratic diarists record a feeling of being "nervous" in 1800 (Wells 1991: 206-207). Ronald Paulson has argued that satire in the 1790s shows a shift to a more disparaging view of the crowd than the lightly humorous pictures of Hogarth's generation (Paulson 1972: 25-30). The middle class in Birmingham reacted as forcefully against Priestley as the same demographic had reacted in Wilkes' support twenty years before—this time scared by the violence of the Gordon Riots and the lurking threat imagined in the Jacobins (Sheps 1989: 46-64). Those in power protected themselves against everyday violence in the escalation of riots in London of the 1790s. The king's coach was flanked with an immense guard and bullet-proofed in 1796. Pitt began to go incognito everywhere in the provinces, and even in London riot erupted wherever he was seen. At the same time, distrust of the badly disciplined urban infantry developed, possibly in response to the fear of an armed urban poor (Wells 1991: 206, 208, 210).

³ In Tilly's argument, changing use of space comes out of a period of "negotiation." As the object of riots shifted from the local magistrate or miller to the national Parliament or class of employers at large, rioters begin to find new ways of operating so as to act more efficiently. This means less street theater, perceived as chaotic tumult, and more targeting of specific issues. The political construction of coherence corresponds to a structural building of coherence. Street theater gives way to lobbying. Harrison offers a similar argument, suggesting that

the shape of the crowd had largely to do with its intention, not so much with its composition (polite/not) or with a historical era. To evidence this he offers the parades that often ushered in political candidates. Tilly himself admits that his argument, if too simplified, may boil down to "modernization theory." Thus in his 1993 redaction of his work in the 1970s, Tilly leaves open the possibility that the new "repertoire" is not forcibly "better" than the older version, but is simply characterized by a kind of coherence appealing to the middle-class target. In fact, the later version may be less responsive to local issues (Tilly 1993: 269, 276).

⁴ Reversing an earlier trend. Religious faction within London and Birmingham united the rioters with their middling-sort sympathizers against minority religious groups.

⁵ Among the gentry a general reluctance to police the rioters by any centralized authority lasted through the early nineteenth century unto the threshold of Peel's Police Act of 1848. Even Paley, a reasonably conservative advocate of property, was convinced that civil liberty could not survive a state run police, as he wrote in 1785. In part this was always about fear of losing gentry's authority to a centralized government. In the provinces, resistance to a centralized police lasted through the 1820s, amid major fears about the dissolution of local relationships between the gentry and the people (Philips and Storch 1999: 59ff).

⁶ In 1826, the radical satirist William Hone published his *Everyday Book*, a project meant to encompass all

useful information, to be posted to him by anyone interested and anthologized in a great compendium of experience. Hazlitt's *Table Talk* essays followed, exhorting the reader to travel and take in experience on his own. William Cobbett's *Rural Rides* similarly complained of the evil that the linear highway had done, making merchants and politicians accustomed to traveling quickly over a smooth road rather than interacting with the great variety of farmers whom they passed on their journey, and by consequence, developing a great sensitivity to the variety of living conditions in their nation. (Hone 1826; Hazlitt 1821-22; Cobbett 1830).

References

- Arnold, Dana. 2000. *Re-Presenting the Metropolis: Architecture, Urban Experience, and Social Life in London, 1800-1840*. Aldershot, England: Ashgate.
- Blakely, Edward James, and Mary Gail Snyder. 1997. *Fortress America: Gated Communities in the United States*. Washington, D.C.: Brookings Institution Press.
- Bohstedt, John. 1983. *Riots and Community Politics in England and Wales, 1790-1810*. Cambridge: Harvard University Press.
- Bohstedt, John and Dale E. Williams. 1988. The Diffusion of Riots: The Patterns of 1766, 1795, and 1801 in Devonshire. *Journal of Interdisciplinary History* XIX(1): 1-24.
- Bolton, Arthur Thomas. 1913. The Older Club-Houses of London. *Country Life* 33: 13-18.

- Borsay, Peter. 1989. *The English Urban Renaissance: Culture and Society in the Provincial Town, 1660-1770*. Oxford: Oxford University Press.
- Brewer, John. 1997. *The Pleasures of the Imagination: English Culture in the Eighteenth Century*. New York: Farrar Straus Giroux.
- Charlesworth, Andrew. 1994. The Spatial Diffusion of Riots: Popular Disturbances in England and Wales, 1750-1850. *Rural History* 5 (1): 1-22.
- Cobbett, William. 1830. *Rural Rides*. London: W. Cobbett.
- Curry, Michael R. 1997. The Digital Individual and the Private Realm. *Annals of the Association of American Geographers* 87 (4): 681-699.
- Dinwiddy, Joan. 1991. Interpretations of anti-Jacobinism. In *The French Revolution and British Popular Politics*, edited by Mark Philip. Cambridge: Cambridge University Press.
- Epstein, James. 2003. *In Practice: Studies in the language and culture of popular politics in modern Britain*. Stanford: Stanford University Press.
- Evans, Barrie. 1993. Repairing Bomb Damage. *The Architects' Journal* 198 (7): 39-41.
- Everett, Nigel. 1994. *The Tory View of Landscape*. New Haven: Yale University Press.
- Habermas, Jürgen. 1989. *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society, Studies in Contemporary German Social Thought*. Cambridge, Mass.: MIT Press.
- Harmon, Christopher C. 2000. *Terrorism Today*. London: Frank Cass.
- Harrison, Mark. 1988. *Crowds and History: Mass Phenomena in English Towns, 1790-1835*. Cambridge: Cambridge University Press.
- Hart, Sara. 2002. In the Aftermath of September 11, the Urban Landscape Appears Vulnerable and Random. *Architectural Record* 190 (3): 135-57.
- Hay, Douglas, and Nicholas Rogers. 1997. *Eighteenth-Century English Society: Shuttles and Swords*. Oxford; New York: Oxford University Press.
- Hazlitt, William. 1821-22. *Table Talk: Essays on Men and Manners*. London: John Warren..
- Hone, William. 1826. *The Every-Day Book: Or, Everlasting Calendar of Popular Amusements, Sports, Pastimes, Ceremonies, Manners, Customs, and Events, Incident to Each of the Three Hundred and Sixty-Five Days, in Past and Present Times; Forming a Complete History of the Year, Months, & Seasons, and a Perpetual Key to the Almanack*. London: Hunt and Clarke.
- Horwitz-Bennett, Barbara. 2003. Security State. *Architecture* 92 (9): 35-36.
- Isenstadt, Sandy. 2005. Ground Plan for the Future: Time on the Site of Sert's American Embassy in Baghdad. In *The Architecture of Josep Lluís Sert*, edited by Josep Maria Rovira and Jaume Freixa. Barcelona: Miro Foundation, c.Fall.
- Ivy, Robert. 2002. Editorial: 'the Security Paradox'. *Architectural Record* 4: 15.

- Kitchen, Ted. 2001. Planning in Response to Terrorism: The Case of Manchester, England. *Journal of Architectural and Planning Research* 18 (4): 325-40.
- McKee, Bradford. 2003. Design-Build Diplomacy. *Architecture* 92 (1): 45-46.
- Nason, Randy. 2000. Maintaining Security in an Insecure World. *Architectural Record* 188 (12): 153-54.
- Nesmith, Lynn. 1990. Safe Diplomacy: Security: New Safeguards Established by the U.S. State Department. *Architecture: The Magazine of the American Institute of Architects*. 79(5): 78-83.
- Paulson, Ronald. 1965. *Hogarth's Graphic Works*. New Haven: Yale University Press.
- Pawley, Martin. 2002. Are Our Tall Buildings Simply Going to Become Uninsurable? *Architects' Journal* 215 (8): 26.
- Philips, David and Storch, Robert D. 1999. *Policing Provincial England, 1829-1856: The Politics of Reform*. London: Leicester University Press.
- Plumb, J. H. 1973. *The Commercialisation of Leisure in Eighteenth-Century England*. Reading: University of Reading.
- _____. 1980. *Georgian Delights*. Boston: Little, Brown.
- Ramsey, Stanley. 1913 London Clubs. *Architectural Review* 33: 87-90.
- _____. 1921. London Clubs. *Royal Institute of British Architects* 29: 417-36.
- Rendell, Jane. 1999. The Clubs of St. James: Places of Public Patriarchy - Exclusivity, Domesticity and Secrecy. *Journal of Architecture* 4 (2): 167-89.
- Rogers, Nicholas. 1998. *Crowds, Culture, and Politics in Georgian Britain*. Oxford, New York: Clarendon Press, Oxford University Press.
- Rudé, George. 1959. The London 'Mob' of the Eighteenth Century. *The Historical Journal* 2 (1): 1-18.
- Sandori, Paul. 1993. Terrorists and Tall Buildings. *Canadian Architect* 38 (6): 25.
- Shoemaker, Robert. 1987. The London 'Mob' in the Early Eighteenth Century. *Journal of British Studies* 26(3): 273-304.
- Sheps, Arthur. 1989. Public Perception of Joseph Priestley, the Birmingham Dissenters, and the Church-and-King Riots of 1791. *Eighteenth-Century Life* 13(2): 46-64.
- Stevenson, John. 1992. *Popular Disturbances in England, 1700-1832*. 2nd ed, Themes in British Social History. London: Longman.
- Tilly, Charles. 1993. Contentious Repertoires in Great Britain, 1758-1834. *Social Science History* 17(2): 253-280.
- Vidler, Anthony. 2002. A City Transformed: Designing 'Defensible Space.' *Grey Room* 7: 82-85.
- Watkin, David. 1982. *The Buildings of Britain: Regency*. London: Barrie & Jenkins.
- Wells, Roger. 1991. English Society and Revolutionary Politics in the 1790s: The Case for Insurrection. In *The French Revolution and British Popular Politics*, edited by Mark Philip. Cambridge: Cambridge University Press.

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Local Autonomy and Conflicts over State Projects: The Case of the Yeonggwang Nuclear Power Plants

In Kwon Park

What impact does change in local autonomy have on locational conflicts over controversial state projects, and what are the effects of extended conflicts on society? This study investigates the relationship between the implementation of local autonomy and an extended conflict over a state project in South Korea, the Yeonggwang Nuclear Power Plant. The study finds that the influence of local civic organizations and the role of local government, both significantly augmented by the degree of local autonomy, were primary causes of the conflict's extension. The study also estimates the effects of the conflict on productivity, stability, and adaptability. The findings show that the extended conflict did not have solely negative effects. The results suggest that in an era of local autonomy, the state should make the implementation of its projects more open to the public.

Introduction

In implementing controversial state projects, there are often locational conflicts between the state and local residents living near the proposed projects. These conflicts are influenced by many factors, including the decentralization of power. Before 1995, local governments in South Korea were not vested with the power to affect decisions made by the central government, even on issues affecting local land use. After 1995, local governments gained the power to influence such issues. How are locational conflicts over state projects affected by changes in local autonomy? It is commonly expected that as local autonomy increases locational conflicts become more severe, and that the extended conflicts have a negative effect on the projects. Is this expectation substantiated? If so, what explains it?

This study investigates the relationship between locational conflicts and local autonomy by focusing on the causes and effects of extended conflict. I use conflicts over proposed nuclear power plants in South Korea as case studies. The power plants are located in an area where local autonomy increased significantly in recent years. As a result of the popular local elections of 1995, South Korea moved towards democratic decentralization and local autonomy increased. Local governors and local councilors, who before 1995 had been ap-

pointed to their positions by the central government, instead came to be elected by local residents. Since then, conflicts between local residents and the state have risen sharply, particularly with regard to controversial state projects such as the construction of dams, power plants and airports.

I examined two cases of locational conflict, both involving phases of the Yeonggwang Nuclear Power Plant (NPP). The first phase, construction of Yeonggwang NPP Units 3-4, was planned in 1987 and executed in 1989. Conflict over these units arose before the full-scale implementation of local autonomy in South Korea. The second phase, construction of Units 5-6, was planned in 1993 and executed in 1996. Comparing these two cases can show changes in the nature of conflict before and after the implementation of local autonomy in 1995.

The methodology of this study included an investigation of national assembly and local council meeting minutes, white papers, statements, pamphlets and newspapers, interviews, and a review of public opinion polls. The interviewees represented opposing parties, such as local civic groups, local civil servants, and staff of the electric power company (Korea Electric Power Corporation, or KEPCO). The two public opinion polls were conducted by Gallup Korea in the years 1989 and 1995.

Conflict between the State and Local Residents

Conflict is often defined as a struggle in which two or more parties perceive and take advantage of

chances to interrupt each other in order to seek incompatible goals. In this article the "state" implies branches of the central government such as the executive, the legislature and the judiciary. It also includes government-financed enterprises that are organized and managed by the central government.¹

"Local residents" refers not only to individuals but also to all civic groups with which these individuals are affiliated. Local civic groups, in turn, include both interest groups and social movement groups (Gurr and King 1987: 57-62). For the purpose of this article, "conflict" is what takes place when central government agencies pursue projects that have intended national benefits, but that local individuals and/or groups see as harmful to their security and existence.

Determinants of the Degree of Conflict

The determinants of the degree of conflict between the state and local residents can be divided into three types: 1) *potential determinants*, 2) *manifest determinants*, and 3) *situational parameters*.

Potential Determinants

Potential determinants are the fundamental causes of conflict. They include both the objective and perceived difference of interests between conflicting parties. In the case of conflict between the state and local residents, this type of determinant may be characterized as follows:

- a) The objective difference (or "gap") of interests between the state and local residents arises from the unfair distribution of a project's benefits and costs.

That is, while the benefits are spread over the entire country, the costs are concentrated in a specific locality. In this article, the conflict arises over the distribution of economic, social, and environmental/security costs and benefits.²

b) The perceived gap of interests is connected with how local residents view their interests versus the interests advanced by state projects. In many cases local residents view their interests as being violated by state projects, which deepens conflict.

Manifest Determinants

A conflict's manifest determinants are those of an emotional or behavioral nature, including mutual distrust, insincerity, and perceptions of strength. In the case of conflict between the state and local residents described here, the determinants are:

a) The residents' degree of trust in the state, which can produce and deepen conflict. If local residents are excluded from the decision-making process they are often suspicious of the state.

b) The state's response to local residents' discontent. Conflict between the state and local residents can arise from the state's improper response to local concerns. If the state grasps local residents' discontent in advance and considers it during the decision-making process, the conflict's severity can be reduced and sometimes the conflict can be avoided entirely. Conversely, the state's ignorance or suppression of local discontent can deepen conflict.

c) The strength of local civic groups is an important determinant of the power of local residents. When these groups are well organized and take action, conflict can develop and grow. Conversely, when these groups are uncoordinated and slow to respond, conflict can quickly be reduced.³ Resource mobilization theory suggests that resources, solidarity, strategy and tactics, and leadership of a civic organization determine its power (Institute of Society and Culture 1993: 189-195; Hong 1997: 32-33).

Situational Parameters

While situational parameters are not direct sources of conflict, they can be exacerbating factors. Situational parameters include the internal discord in conflicting parties (Coser 1956; Pondy 1967), the role of the local government and media, and the influence of external social movements (Yoo et al. 1997; Kim 1998). In the case of conflict between the state and local residents, this type of determinant affects the conflict in the following ways:

a) The internal discord of the state can worsen conflict. The presence of opposing groups within the state can make local residents believe they have sympathizers in the rival party. Internal discord among local residents, however, is less important, because whatever their internal differences, local residents tend to take coherent actions when colliding with the state (Park 1996: 271). For this reason studies of locational conflict often focus on the state's internal discord more than that of local residents.

b) The local government's role is an important situational parameter because the local government is a channel through which residents can express their views. The role that the local government plays in conflicts between the state and their residents varies with place and time: i) it may side with its residents against the state; ii) it may mediate or arbitrate between the state and its residents as a third party; or iii) it may not play any role at all. Whereas conflict is inclined to intensify in the first case, it augurs well for settlement in the second case. In the last case, of course, the local government has no influence.

c) External circumstances are also a situational parameter. External circumstances include external social movements (groups and organizations that are not local, such as national environmental groups), which can be important factors in determining the degree

of conflict. Media coverage is similarly an external circumstance, as it can either deepen or reduce tensions.

Effects of Conflict between the State and Local Residents

Pondy (1967) suggested that *productivity*, *stability*, and *adaptability* are the criteria by which a conflict's effect on a society and its organizations can be measured.

Productivity refers to the economic efficiency of the organization affected by conflict. Pondy (1967: 308) emphasized that productivity should be "measured in both quantitative and qualitative terms." This means that both the cost and the innovation derived from conflict should be simultaneously appraised.

Stability is a criterion by which we can measure

Potential Determinants	The objective gap of interests The perceived gap of interests
Manifest Determinants	Local residents' trust in the state The state's response to local residents' discontent The strength of local civic groups
Situational Parameters	The state's internal discord The role of the local government The influence of external circumstances

Table 1: Determinants of the degree of conflict between the state and local residents

changes in the "cohesiveness" and "solvency" of an organization. In other words, organizational stability represents how closely the members of that organization are united. Finally, *adaptability* is a measure of how much an organization "improves performance and adapts to changing internal and environmental pressures." This is the criterion by which we can measure the flexibility of an organization due to conflict.

These three criteria can be affected in different ways by conflict between the state and local residents. With respect to productivity, while conflict generates additional social cost in the short term, it can also give rise to social innovation,⁴ and increase benefits in the long run. It is true that conflict can bring about a project's delay and increase costs, but if discontent is sufficiently expressed, conflict in the present can prevent its recurrence in the future, thereby reducing costs overall. In terms of stability, conflict itself means social unsettlement. Conflict can, however, improve an organization's cohesiveness and solvency by allowing latent discontent to be expressed and openly resolved. With respect to adaptability, conflict generally effects positive changes by expanding communication routes, reducing the exercise of power, and promoting technical development.

Because conflict can cause both positive and negative effects, its outcomes are difficult to measure. Therefore the estimation of conflict's effects should be based not on a priori judgment, but on contextual situations through detailed case studies.

Brief History of Conflicts over NPPs in South Korea

Conflict over the construction of nuclear power plants (NPPs) in South Korea dates back to 1972, when Kori Unit 1, the first NPP in the country, was built. At that time local residents protested primarily against the state's appropriation of land (MCIE and KEPCO 1995: 65), and showed little, if any, concern about the safety of NPPs and environmental issues—the safety issue had not attracted public attention in Korea. Consequently, the electric power corporation expediently embarked on the plant's construction (Lee 1992: 82).

From that time until the mid-1980s, the issue of NPPs received no more attention from the Korean people than did other Korean environmental issues (Lee 1992: 82-84). A significant conflict over NPPs did not arise until 1985, when local residents demanded compensation for damage resulting from the operation of NPPs in Yeonggwang. These local residents' movements were not part of the anti-nuclear movement, which did not develop until later. The local residents did not object to the NPPs themselves, but rather made claims based on specific damages they alleged the NPPs to have caused (Park 1995: 132).

When the Chernobyl accident occurred in the former Soviet Union in 1986, concern about the safety of NPPs intensified worldwide. Around that same time NPP-related accidents occurred in South Korea as well. A worker at one of the Kori NPPs died of lymph gland cancer. Heavy water (deuterium oxide)

leaked from the Wolsung NPPs, and in 1988 the Ulchin NPPs were shut down. These events sparked violent protests by local residents in the areas affected by the NPPs. Moreover, in 1988 numerous environmental organizations entered the debate, siding with local residents and causing turbulence in all of Korean society (Lee 1992: 92-96).

Conflicts over NPPs continued in 1989 on a national scale. In particular, a movement against the construction of Yeonggwang Units 3-4 gave rise to anti-nuclear organizations nationwide. The rapid organization of this movement reflected the anti-nuclear sentiment that was spreading across the country. Several more accidents cast additional doubts on the safety of NPPs. A few NPP workers claimed they gave birth to deformed children, and local residents near NPPs died of cancer allegedly related to radiation from the power plants. These incidents made Yeonggwang residents oppose the construction of Units 3-4 on safety grounds. The emphasis on safety made Yeonggwang a departure from previous conflicts. Nevertheless, the conflict was relatively peaceful, and its scale was insignificant compared to the conflict over Units 5-6 in 1996.

In the first half of the 1990s conflicts over nuclear power began to get more violent. Initially these conflicts focused less on the construction of NPPs and more on the locations of radioactive waste disposal sites. In 1990, opposition to the selection of Anmyon Island as a radioactive waste disposal site led to organized and violent actions. In 1995, the selection of Goolup Island did the same. These con-

flicts were much more violent than any that had previously arisen over the construction of NPPs.

In 1996, controversy over Yeonggwang Units 5-6 showed that conflict over the construction of NPPs could be very fierce and violent. The residents of Yeonggwang made a collective civil appeal to the local government, and the governor of Yeonggwang County, who had been elected by popular vote, canceled the Yeonggwang Units 5-6's building permit. The local government remained in conflict with the central government for the next eight months. Eventually, in the ninth month of the controversy, the governor withdrew the cancellation of the building permit and the intergovernmental conflict came to an end. The episode, however, left an indelible mark on NPP construction in South Korea.

Case Studies of Conflicts over Building the Yeonggwang NPPs

In this study, I will measure the degree of conflict in terms of three criteria—the number of its participants, its duration, and the frequency and mode of conflict behavior. Comparing the conflict over building Yeonggwang Units 3-4 and the one over the Yeonggwang Units 5-6, I show that the latter was more severe.

The number of participants was much greater in the conflict over Units 5-6 than in the conflict over Units 3-4. In the case of Units 3-4, participants on the state's side included only KEPCO and Ministry of Commerce, Industry and Energy (MCIE). The Unit 5-6 case involved these agencies, but also involved

Conflict Behavior	Units 3-4 Frequency	Mode	Units 5-6 Frequency	Mode
Statement	6	Legal	23	Legal
Press Interview	0	-	2	Legal
Distributed Pamphlets*	11	Legal	17	Legal
Use of Local Autonomy	0	-	1	Partly Illegal**
Demonstration***	2	Legal	22	Legal & Illegal
Signature-Collecting Campaign	2	Legal	3	Legal
Administrative Litigation	0	-	1	Legal
Holding Public Hearing	0	-	1	Legal

Table 2: the frequency and mode of the conflicts over the Yeonggwang NPPs

*The distributed pamphlets do not include statement papers.

**The illegality of the use of local autonomy - the cancellation of the building permit is not judicially concluded, but the Board of Audit and Inspection judged that it was partly illegal.

***If a demonstration endured for longer than one day, I counted its frequency as one. In the case of Units 5-6, the total days of demonstration reached 72.

the Ministry of Science and Technology (MOST). On the side of the local residents during the controversy over Units 3-4 case was Yeonggwang's local civic organization, the Yeonggwang Anti-Nuke Association (YANA). The conflict over Units 5-6 involved not just local civic groups but residents of the adjacent region, Kochang County, as well. Moreover, the Ministry of Environment (ME) and the local government also played roles, albeit indirect ones, during the latter conflict. Finally, while about 1,000 people were involved in the Units 3-4 case, about 15,000 were involved in the Units 5-6 case.

With respect to duration, the conflict over Yeonggwang Units 5-6 was more severe than that over Units 3-4. The Units 5-6 conflict lasted about

three years and three months, while the earlier conflict lasted only a year.

In terms of the frequency and mode of conflict behavior, the conflict over Yeonggwang Units 5-6 was much more intense and frequent than it was for Units 3-4. The frequencies and modes of the two cases are shown in Table 2.⁵ The second conflict was also more violent.

Analysis of the Extended Conflict's Causes

Why was the conflict over Yeonggwang Units 5-6 more severe than that over Units 3-4? This section will investigate the possible causes of the extended conflict.

Possible Potential Determinants

There is little difference between the two cases in terms of potential determinants, such as the objective and the perceived gap of interests.

Although the objective interests are the most fundamental cause of conflict over the construction of NPPs, these were basically the same in the two cases. The local economic concerns were rooted in damage that resulted from the spread of warm water being discharged from the NPPs. The marginal damage from building additional NPP units in both cases is comparable. In terms of social interests, regional stigma is the most significant factor, because public perceptions of NPPs are negative. However, as Yeonggwang County was not a new NPP site, the marginal effect, in this regard, is the same for the two cases. Since Units 5-6 were constructed by experienced personnel who had accumulated skill during the construction of Units 3-4, the environmental and security interests could be deemed less problematic for Units 5-6 than for Units 3-4.

Second, the polls conducted by Gallup Korea show the perceived gap of interests to be roughly the same across the two cases. This result swerves from the a priori conjecture that perceptions of damage increase over time as people become more sensitive to their own interests. The lack of difference between the two cases may be explained by the fact that some problematic events⁶ over NPP safety raised the awareness of interests even during the conflict over Units 3-4 in 1989.

Possible Manifest Determinants

Differences in the strength of local civic groups were influential in producing a difference between the two conflicts. Other manifest determinants had little impact.

Yeonggwang residents' trust in the state was similar in both cases. The 1989 poll, conducted when conflict was occurring over Units 3-4, showed that 19 percent of the local residents trusted the state (the central government and KEPCO). The 1995 poll, conducted when conflict was taking place over Units 5-6, showed the degree of trust slightly higher, at 21 percent. This result arose from the fact that residents' trust in the central government had increased much more dramatically than their trust in KEPCO had decreased in the intervening years. This is because while democratization in South Korea gave legitimacy to the government, previous conflicts over the operation of Yeonggwang NPPs between KEPCO and the local residents weakened their trust in the electric power company.

The state's behavior was similar in both cases. The state behaved negatively by showing disregard for local concerns, and by censoring and denouncing its opponents. During the controversy over Units 5-6, the state did respond positively by allowing residents to participate in discussions and by taking some pollution-control measures; at the same time, however, it demonstrated a greater willingness to employ repressive tactics, including physical oppression. Such adverse actions led residents to perceive the state's behavior as substantially the same in both cases.

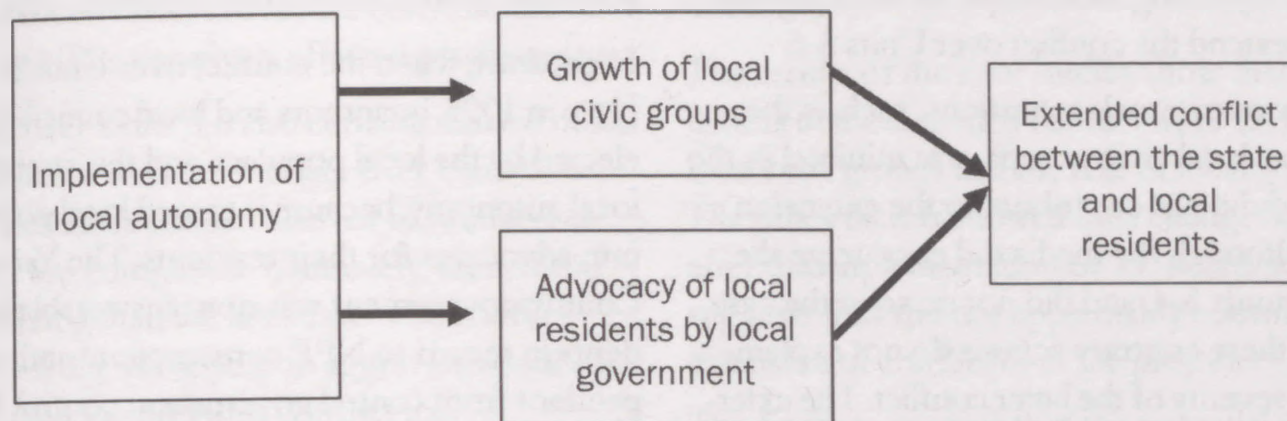


Figure 1: The relationship between local autonomy and extended conflict

The strength of the local civic groups played a significant role in both cases. YANA, which played a leading role in the conflict over Units 3-4, had been troubled by internal discord, a shortage of funds, and absence of leadership. In contrast, the Yeonggwang Anti-Nuke Conference (YANC), which led the anti-nuclear movement during the conflict over Units 5-6, proved superior with respect to resource mobilization, internal cohesiveness, strategy and tactics, and leadership. This expansion of the local civic group's strength helped deepen the conflict over the Yeonggwang NPPs.

Possible Situational Parameters

With respect to situational parameters, only the role of the local government was significant.

The internal discord of the state was essentially the same in both cases, and its influence on the degree of conflict was similar. The internal discord took place between KEPCO and the National Assembly during the controversy over Units 3-4, while it occurred between KEPCO and the Ministry of Environment in the Units 5-6 case. In both cases, however, the effect was the same: the state revealed negative information about the projects to the local residents.

The local government played different roles in the two cases. While it was essentially a bystander in the conflict over Units 3-4, it played an important role as an advocate for local residents in the conflict over Units 5-6. In the latter case, the local council directly led demonstrations and negotiated with KEPCO,

and the local governor cancelled the building permit for Units 5-6. By taking these steps the local government helped extend the conflict over Units 5-6.

The influence of external institutions, such as the media and non-local civic groups, was minimal in the two cases, and did not contribute to the extension of conflict. Although the media did encourage the conflict over units 3-4, and did not do so in the case of Units 5-6, these contrary actions do not explain the increased severity of the latter conflict. The external civic organizations supported the local residents' movements equally in both cases.

Analysis of the Results

The extended conflict between the state and Yeonggwang residents over building the NPPs was caused primarily by a change in the status of local civic groups and local government. This change was in turn caused by a reform of the system of local governance in South Korea. While the power and status of local civic groups and local government had increased since 1991,⁷ the state's attitude toward implementing projects did not change appreciably. Such inconsistency led to a deepened and longer conflict over the building of Yeonggwang NPPs Units 5-6.

When the conflict over Units 3-4 took place in 1989, Yeonggwang County's government lacked autonomy. The local government functioned only as an intermediary between the state and local residents. It had no influence over the construction of NPPs and consequently was passive during the conflict. At the

same time, local civic groups were in an inchoate stage and their strength and influence were limited.

In contrast, when the conflict over Units 5-6 took place in 1995, governors and local councilors were elected by the local populace and this strengthened local autonomy, because it turned local governments into advocates for their residents. The Yeonggwang County government was now answerable to its residents in regard to NPP construction⁸ and more independent from central government control.⁹ Consequently, the local government could oppose the state and side with its residents. The reforms of local government also increased the influence of local civic groups, who could take action through their elevated status in local politics.

Figure 1 illustrates the above discussions. The implementation of local autonomy did not directly contribute to extending the conflict over building NPPs. However, it did bring about changes in the position of both local civic groups and local governments, and so created favorable conditions for the extension of conflict.

By analyzing the effects of the extended conflict over the construction of the Yeonggwang NPPs in terms of the three aforementioned criteria—productivity, stability, and adaptability—we recognize that the effects were not entirely negative.

The conflict over Units 5-6 delayed their construction for nine months and accordingly escalated costs. But the conflict also prevented the probable recurrence of similar conflicts by leading to some level of agree-

ment. Comparing the benefits with the costs, however, the extended conflict over the construction of Yeonggwang NPPs negatively affected productivity.

The conflict over Units 5-6 also certainly caused more social disturbance than the conflict over Units 3-4. However, the earlier conflict also led to similar conflicts after it was completed. Ultimately, then, it was no less unsettling than the later case. The conflict over Units 5-6 did not appear to aggravate social stability more than the previous conflict did.

In terms of adaptability, the conflict over Units 5-6 brought about better overall effects than did the conflict over Units 3-4. While the earlier case did not contribute to social adaptability, the latter case did, because it ended with an agreement to authorize the Nongovernmental Environment Watching Organization (NEWO), and to prepare measures for the reduction of discharged warm water.

In conclusion, the effects of the extended conflict over the construction of the Yeonggwang NPPs were negative in terms of productivity but positive in terms of stability and adaptability. In particular, with respect to adaptability, which is connected to democratization, the conflict led to noticeable positive results.

Conclusion

This article examined the determinants and the effects of the extended conflict over the construction of the Yeonggwang NPPs, a typical state project in South Korea, by comparing two cases—one before

and one after the implementation of local autonomy in 1995.

The results of the case studies show that the decisive factors in the extended conflict were the influence of local civic groups and the role of local government. The other factors showed little change before and after the implementation of local autonomy, which suggests they did not appreciably contribute to the extension of conflict over the project.

The findings suggest that the potential determinants are not significantly influenced by the degree of local autonomy. This may be because the gap of interests between local residents and the state is maintained regardless of the local polity. Thus, these factors do not explain the extended conflict, although the manifest determinants and the situational parameters are susceptible to the political situation in two ways. First, local autonomy has favorably impacted local civic groups. As these groups have grown so too has their influence. Second, as the responsibility of local governments to their residents has increased, their role has changed. No longer intermediaries appointed by the central government, local governments are instead beholden to, and advocates of, their residents. They are more susceptible to the pressures of residents and civic groups. This new role contributes to the extension of conflict over state projects.

The effects of local autonomy have been both positive and negative. This study compared the effects of two conflicts in terms of productivity, stability and

adaptability. In so doing, its results showed that the extended conflict brought positive effects in terms of stability and adaptability, and negative effects in terms of productivity.

From these results, one may draw several policy implications. If the extension of local autonomy is both natural and desirable, then both the growth of local civic groups and the change in the role of local government are inevitable. As such, the state should change the existing implementation process for state projects accordingly. If it recognizes the new power of local governments, the state can devise procedures that will avoid or minimize conflict with local residents. In the past the Korean government has forcibly executed its policies without any agreement from local residents. This practice is no longer appropriate for today's situation of local autonomy. In the future the state should build a cooperative relationship with local residents and local governments.

As the effects of conflict are not always negative, the state should neither deny nor evade it. Conflict may, of course, give rise to additional social cost, but in the long run it is also likely to contribute to social stability and adaptability. Therefore, once conflict takes place, the state should cope with it actively and openly.

This conclusion can also be applied to other countries that are experiencing the extension of local autonomy and severe locational conflicts over state projects. Local autonomy means the decentralization of power from the central government to local gov-

ernments and local residents. As local power grows, the possibility of colliding with the state also increases if the state does not acknowledge this changed reality. If the trend toward decentralization is natural, the state should reform its policy implementation process. This is particularly important for controversial projects that affect local land use. These projects should be more open-minded and transparent.

Notes

¹ In this study, the concept of the state includes KEPCO, a national enterprise, as well as the Ministry of Commerce, Industry and Energy (MCIE).

² Economic interests are those interests that are connected with "the use and distribution of material goods and resources" (Duke 1976: 269). Social interests are those that deal with "the promotion of status, reputation, and personality." Environmental and security interests are those that address human health and life.

³ According to the resource mobilization theory, all of society experiences discontent or tension that can lead to social movements, but the movements can be aroused only when there are organizations that can concentrate individuals into collective protest (Institute of Society and Culture 1993: 191).

⁴ Innovation is "an unprecedented intellectual constitution to achieve the purpose of an organization with a new method or to achieve quite new a purpose" (Yang 1992: 589).

⁵The results of Table 2 are totaled on the basis of various kinds of pamphlets, statements and newspapers I collected. Therefore, they may be different from the results of official statistics.

⁶Refer to pages 9-10.

⁷At that time, the local council system, which had been abrogated by the military dictatorship since 1961, was restored in South Korea.

⁸Bong-yeol Kim, the governor of Yeonggwang County at that time, said at the parliamentary inspection of government offices on October 4, 1996, "As the long-awaited local autonomy is being implemented, I think that rejecting the residents' opinion would fade the essence of local autonomy. Such an urgent idea made me accept residents' opinion and cancel the building permit" (National Assembly of the Republic of Korea 1996).

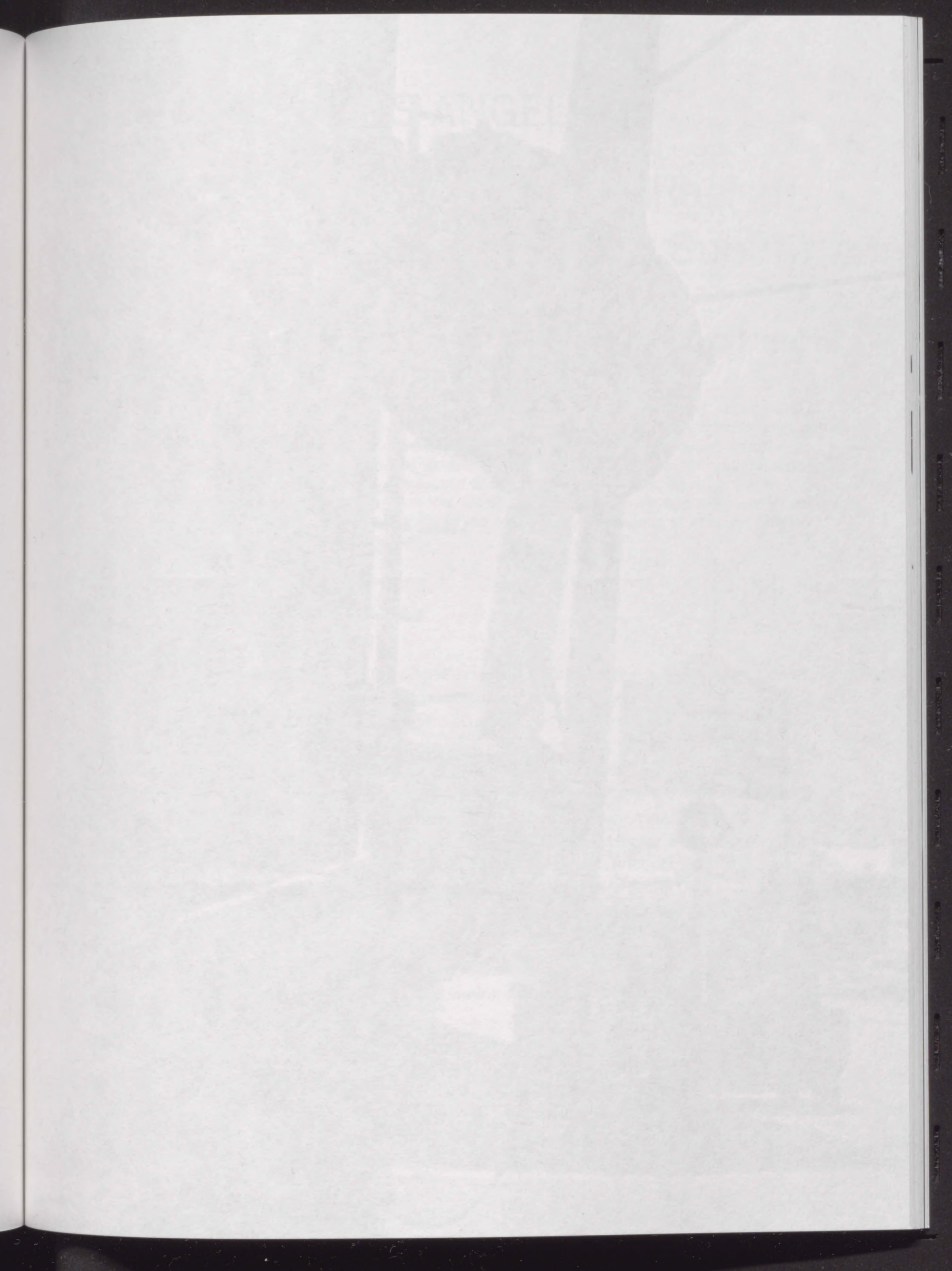
⁹Concerning the construction of Yeonggwang NPPs, a kind of state project, the local government had restricted autonomy only. Bong-yeol Kim, the governor of Yeonggwang County, said at the parliamentary inspection of government offices on September 10, 1996, "I felt responsible for helping this project, which the central government was implementing as a state policy, since I am a government employee." However, in comparison to the governor during the previous period, he must have had relatively more autonomy from the central government (National Assembly of the Republic of Korea 1996).

References

- Coser, Lewis. 1956. *The Function of Social Conflict*. Glencoe: Free Press.
- Dahrendorf, Ralf. 1959. *Class and Class Conflict in Industrial Society*. Stanford: Stanford University Press.
- Duke, James T. 1976. *Conflict and Power in Social Life*. Provo, UT: Brigham Young University Press.
- Fink, Clinton F. 1968. Some Conceptual Difficulties in the Theory of Social Conflict. *Journal of Conflict Resolution* 12 (4):412-460.
- Gallup Korea. 1989. *Survey on Public Opinion for Nuclear Power Plants*. Seoul: Gallup Korea.
- Gallup Korea. 1995. *Survey on Public Opinion for Nuclear Power Plants*. Seoul: Gallup Korea.
- Gurr, Ted Robert and Desmond S. King. 1987. *The State and the City*. Chicago: University of Chicago Press.
- Hong, Won Pyo. 1997. A Study on a Residents' Movement to Cope with Regional Decline: Case of Taebak. Master's Thesis, Seoul National University.
- Institute of Society and Culture 1993. *Social Movements*. Seoul: Institute of Society and Culture.
- Kim, Ko Woon. 1998. The Role of an Environment Movement Organization in an Interregional Environmental Conflict. Master's Thesis, Seoul National University.
- Lee, Deuk Yeon. 1992. The Development Process and the Meaning Formation of Residents' Environment Movements: Focused on the

- Movements against Nuclear Plants. Ph.D. diss., Yonsei University.
- Ministry of Commerce, Industry, and Energy (MCIE) and Korea Electric Power Corporation (KEPCO). 1990/1991/1995/1996/1998. *White Paper of Nuclear Power*.
- National Assembly of the Republic of Korea. 1996. Parliamentary Inspection Minutes of Commerce, Industry and Energy Committee. Seoul: The National Assembly of R.O.K.
- Park, Ho Sook. 1996. *Theory and Practice of Conflict Management by a Local Government*. Seoul: Dasan Press.
- Park, Jae Mook. 1995. Local Anti-Nuke Movements and Residents' Participations: The Comparison between the Movements in the 4 Regions of Nuclear Facilities. Ph.D. diss., Seoul National University.
- Pondy, Louis R. 1967. Organizational Conflict: Concepts and Model. *Administrative Science Quarterly* 12(2):296-320.
- Schmidt, Stuart M., and Thomas A. Kochan. 1972. Conflict: Toward Conceptual Clarity. *Administrative Science Quarterly* 17(3): 359-370.
- Yang, Chang Sam. 1992. *Organization Theory*. Seoul: Pagyoun Press.
- Yoo, Hae Woon., Yeong Gil Kwon, and Chang Taek Oh. 1997. *Environmental Conflict and NIMBY*. Seoul: Sunhak Press.

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REPORT FROM LOS ANGELES

South Gate, CA: Environmental Racism Defeated in a Blue-Collar Latino Suburb

Alvaro Huerta

South Gate is a primarily Latino, working-class community in South East Los Angeles (SELA). Located in one of the most polluted areas in the country, SELA is not only contaminated with numerous polluting facilities and major freeways, but it is also overburdened with heavy diesel, train and air traffic. This paper details a successful fight for environmental justice in South Gate, which focused on a proposed 550-megawatt power plant. By defeating this megaproject, community organizers and residents sent a clear message: residents already disproportionately exposed to pollutants should not carry the burden of additional major pollution sources.

Introduction

As the largest minority ethnic group in the country, Latinos confront serious environmental quality issues on a daily basis. In 2004, the Sierra Club published a report which documented what many Latinos already accept as part of their reality: "The Hispanic community," the Sierra Club said, "is disproportionately at risk. Study after study has shown that Hispanic communities are located in the most polluted areas of the cities. Three out of every five Latinos [nationally] live in communities near uncontrolled toxic waste sites" (Sierra Club 2004: 4). While many low-income Latinos, and especially recent immigrants from impoverished nations that have minimal environmental regulation, are resigned to living in such conditions, residents of South Gate, California—a city in South East Los Angeles (SELA)¹—in 1999 challenged the location of a 550-megawatt power plant in their community. In 2001, after a contentious battle, the project was scrapped. By defeating this megaproject, community organizers and local residents sent a clear message: South Gate residents, who are already heavily exposed to pollution, should not be burdened with additional sources of toxic emissions.

The idea of "environmental racism" and the environmental justice (EJ) movement gained traction in the mid-1980s and early 1990s when scholars, community organizers and concerned community members began to take note of the disproportionate concentration of pollution sources in low-income communities of color

(Gottlieb 1993; Pulido 1996; Matsuoka 2001; Wolch et al. 2004). The location of incinerators, landfills, and other undesirable facilities became a civil rights issue; the burdens of pollution, EJ advocates argued, should be reduced, not saddled unfairly on poor minorities.

The debate over environmental justice is a contentious one. In the court of public opinion, activists and advocates square off against industry and pro-business organizations, with the former often calling for government intervention and the latter decrying EJ concerns as alarmist (Shrader-Frechette et al. 2002). In the academy, researchers remained divided over the precise relationship between socioeconomic status and toxic facility location. In some places toxic facilities existed before low-income residents moved in. In others it seems the reverse is true. There is almost no disagreement, however, that minority and low-income populations are disproportionately exposed to environmental hazards. The case-by-case uncertainty also extends to the desirability of toxic facilities. Some models suggest that the benefits of toxic facilities (i.e., jobs and an increased tax base for cities) outweigh their costs (i.e., the health risks associated with emissions). Many do not. These arguments are important, but they can often seem abstract to people on the ground—especially those confronted with a new source of pollution that is to be located in their backyard.

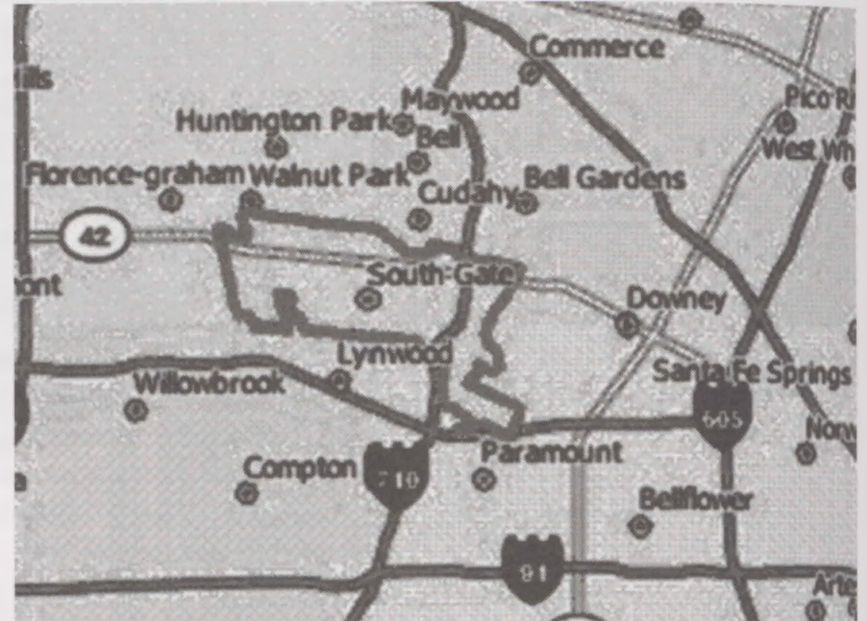


Figure 1: Regional map of South Gate.

Source: Neighborhood Knowledge California. <www.nkca.ucla.edu>. (2005).

Southeast Los Angeles and the City of South Gate

Southeast Los Angeles, where South Gate is located, is a predominantly poor and minority area, and also one of the most polluted areas in the country (Bacon et al. 1998: 10; Huerta 2001: 44; Reede 2000). In a 1998 report, *Holding Our Breath*, researchers for Communities for a Better Environment (CBE), a California environmental justice organization, documented the disproportionate amount of environmental hazards in the region. "Southeast Los Angeles," the CBE researchers wrote, "contains *hot spots*. There are residential areas located near clusters of factories which pose a health hazard to the community" (Ba-

con et al. 1998: 18). The researchers also noted that the area contains a significant amount of transportation infrastructure, such as highways and rail lines, which further degrades the quality of the local environment. Lastly, SELA is beneath a major flight path for Los Angeles International Airport, which is about 12 miles away.

The city of South Gate, located 12 miles southeast of downtown LA and 16 miles from the Port of Long Beach (Figure 1), is an excellent example of the dynamics that trouble SELA as a whole. South Gate has a population of 96,375; Latinos are 92 percent of the total, and only six percent of the residents are white (U.S. Census 2000; Neighborhood Knowledge California 2005). South Gate's residents have an income lower than the state average. Forty-nine percent of local residents have an annual household income of less than \$35,000, compared to 35 percent of residents statewide (Neighborhood Knowledge California 2005). South Gate residents have a median household income of \$35,695, less than that of the Los Angeles County at \$42,189 (Los Angeles Almanac 2005).

South Gate also hosts a disproportionate amount of transportation infrastructure. Apart from the recently built Alameda Corridor—a massive rail project designed to move freight from the ports of Los Angeles and Long Beach to downtown LA—the city has two active railroad companies operating within its jurisdiction, the Southern Pacific and Union Pacific. In the early twentieth century the railroads provided infrastructure that helped attract major compa-

nies like Firestone Tire and Rubber and General Motors, both of whom opened large plants in South Gate (Nicolaides 2002). Heavy manufacturing left the Los Angeles region in the 1970s and 1980s, however, and both plants are now closed.

A number of the companies that remain in South Gate are large producers of pollution. The city has fifteen facilities that combine to release (or dispose on-site) 134,132 pounds of air toxins each year (U.S. Environmental Protection Agency 2005).² The three facilities that release or dispose of the most air pollutants are Armstrong World Industries (57,627 pounds), Hon Company (41,578 pounds) and Arco Vinvale Terminal (34,996 pounds). The presence of these facilities seems to correlate with the city's low percentage of white residents. In the nearby city of Downey, where Latinos are 58 percent of the population and whites are almost a third, there are only two facilities registered with the Environmental Protection Agency (EPA) as major sources of air pollution, and these facilities combine to release or dispose 35,594 pounds of air toxins per year. A still greater contrast is the affluent city of Santa Monica, where Latinos are 13 percent of the population and whites 72 percent. Santa Monica has no facilities tracked by the EPA (Neighborhood Knowledge California 2005; U.S. Environmental Protection Agency 2005). Santa Monica also has far less transportation infrastructure and heavy freight traffic than South Gate.

The Proposed Power Plant Project

Given the socioeconomic status of South Gate residents, and the heavy environmental burden the city already carries, it is perhaps not surprising that the idea of building a massive natural gas power plant there—one the size of Dodger Stadium—caused community organizers and local residents to suspect environmental racism (Cabrales 2005; Huerta 2001).

The conflict began on March 8, 2000, when Sunlaw Energy Corporation filed an Application For Certification (AFC) with the California Energy Commission (CEC) to build the Nueva Azalea Power Plant (California Energy Commission 2005).³ According to the CEC, the proposed plant was to be built, at a cost of \$256 million, on a 13.5-acre site occupied by a diesel truck depot on the eastern edge of the city. While Sunlaw officials did not explicitly say why they selected South Gate for the plant's location, community organizers and local leaders speculated that South Gate was chosen because of its relatively inexpensive land (compared to higher-income communities); its proximity to local energy transmission lines (another source, incidentally, of hazardous exposure for local residents); its high number of low-income Latinos, a group that historically has lacked the resources to defeat unwanted land uses; and the fact that it was already more contaminated than affluent communities (Cabrales 2005; Ruvalcaba 2005). Xochilt Ruvalcaba (2005), a former mayor of South Gate and a city councilman during the power plant controversy, suggests that Sunlaw was drawn to South Gate not just because costs were low, but also

because the city—like other financially troubled municipalities—has long courted industry in order to spur economic development:

It was a cost savings decision. [The truck depot] is centrally located near the gas hook up, not to mention other utilities. It would have cost Sunlaw millions of dollars to hook up elsewhere. Also, the use of water was less costly in South Gate as compared to elsewhere. South Gate officials—before and after my service—have always been industry friendly, and disregard the environment and the negative health impacts to the local population.

Sunlaw officials argued that because the power plant would be run on relatively clean-burning natural gas, and would replace a diesel truck depot, it could actually make the air in South Gate cleaner. But opponents pointed out that the power plant would have emitted over 140 tons of pollution per year, including particulate matter (PM10) and other emissions (California Energy Commission 2000). In an article published in *New England Journal of Medicine*, researchers found PM10 to be linked to premature deaths, asthma, bronchitis, and other breathing problems (Samet et al. 2000).

The emissions were projected to be significant at a 6-mile radius from the plant, meaning the facility would have negatively affected hundreds of thousands of people in an area that included schools, parks, hospitals and housing for the elderly. The CEC's staff was aware of the possible deleterious health effects of the plant, particularly since the power plant's pollution would be combined with

emissions from existing facilities. The staff, in the "Issues Identification Report," released as part of the plant's certification process, observed that:

The potential exists for significant adverse cumulative PM impacts from the proposed project and other existing sources. A mixture of industrial, commercial and residential development, as well as a major freeway [I-710] that passes adjacent to the proposed site characterizes the existing environment. Additionally, there are a considerable number of toxic facilities, Superfund sites, and toxic waste treatment, storage, or disposal facilities in the vicinity of the proposed project (Reede 2000: 5).

Opposition

Shortly after Sunlaw filed its application with the CEC, organizers from the CBC and local residents began a campaign to educate the public about the power plant and its potential environmental and



Figure 2-3: South Gate City Hall community protests.

Source: Jesus Torres, 2001.



health risks (Cabrales 2005). To fight the project, the opposition conducted a grassroots campaign. Organizers and local leaders held educational community forums, marches and protests. These activities included an educational community forum at South Gate High, a march against the power plant (Figure 2), a protest at South Gate City Council Meeting (Figure 3), a youth-led Festival Against the Power Plant, a massive flier and poster distribution campaign in the community, and the staging of several "return of the power plant" protests.⁴

The opposition also petitioned the adjacent SELA city councils to pass resolutions against the power plant project. The city councils of South Gate, Huntington Park, and Paramount all passed resolutions against the power plant. Targeting local cities and elected officials helped the opposition attract the media, which in turn gave it a platform from which it could articulate its argument of environmental racism. The media exposure helped galvanize political and public opposition to the project (Cabrales 2005; Huerta 2001).

The opposition's events and lobbying were building toward a citywide advisory referendum, Measure A, which was to be held on March 6, 2001.⁵ Measure A was essentially a vote on the power plant. Although technically non-binding, Sunlaw had agreed to abide by its results; if the residents voted in favor of the plant, it would likely be built. If they voted it down, it would go.⁶

In the run-up to the election the opposition gained support from powerful elected officials like Congresswoman Maxine Waters and then-State Senator Betty Karnette, who also represented the Sierra Club of Southern California (Blomquist 2001; Karnette 2001). In her letter to the California Energy Commission, Senator Karnette (2001) wrote:

The citizens of this area have already experienced enough threats to their quality of life in the course of maintaining the quality of life for the rest of the state and nation. The ever-present trucks and trains which pound along the area's freeways and railways (spewing so many noxious diesel fumes that the AQMD [Air Quality Management District, the agency that monitors Southern California's air pollution] has determined this region to have the most cancerous air pollution within its district) carry essential life-saving goods meant for residents elsewhere.

Supporters

Sunlaw officials cited numerous benefits from the proposed power plant. The company argued that the plant would provide affordable electricity and prevent blackouts.⁷ It would also provide over 400 well-paying union jobs and between \$3 to \$7 million in annual tax revenue for the city. In addition, Sunlaw promised scholarships for local youths and investments in other community benefits. Lastly, the company said that constructing a natural gas plant would set a statewide precedent for the use of clean sources of electricity ("They're Trying to Silence Us" 2001).

In its effort to prevail in Measure A, Sunlaw outspent its opposition by hundreds of thousands

of dollars, and also relied on the support of some powerful lawmakers and leaders. Among its backers were the California Latino Legislative Caucus and its leaders, State Senator Martha Escutia and then-State Assembly Member Marco Firebaugh; Miguel Contreras, Secretary-General of the Los Angeles County Federation of Labor;⁸ Barry R. Wallerstein, Executive Director of the Air Quality Management District (AQMD); several mainstream environmentalists, including V. John White of the Center for Energy Efficiency and Renewable Energy (CEERT);⁹ and local leaders and business interests (Contreras 2001; Escutia and Firebaugh 2001; Wallerstein 2000).

Escutia and Firebaugh were particularly important allies for Sunlaw. As prominent Latino politicians and leaders of the California Latino Caucus, their support could be used to counter allegations of environmental racism. In a letter to environmental groups, Escutia and Firebaugh (2001) wrote, "As strong supporters for environmental justice and the protection of children's health against environmental hazards, we respectfully request your support of the Nueva Azalea Power Plant project."

Escutia and Firebaugh's credibility came into question, however, when Sunlaw donated \$25,000 to the Latino Caucus' fundraising arm, the California Latino Friends PAC (Huerta 2001). Escutia's legitimacy took an additional hit when the *Los Angeles Times* revealed that her husband, Leo Briones, had worked for Sunlaw as a public relations subcontractor throughout the Measure A campaign. On July 8, 2004, the *Los Angeles Times* reported that Sunlaw

paid Briones \$150,000 for professional services related to the proposed Nueva Azalea project (Morian 2004: A20).

Conclusion

On Election Day South Gate residents resoundingly rejected the Nueva Azalea Power Plant, voting it down by a two-to-one margin. Sunlaw had promised to abide by this decision, and the community immediately pressured the company to keep its word. On November 5, 2001, attorneys for Sunlaw officially withdrew the Nueva Azalea's application for certification with the CEC (California Energy Commission 2005). Shortly thereafter the CEC issued an order of termination of proceedings, thereby closing Docket Number 00-AFC-3.

Notes

¹ SELA includes predominately low-income, Latino cities: Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, South Gate and Vernon.

² The U.S. Environmental Protection Agency tracks major sources of pollution through its Toxic Releases Inventory (TRI). The TRI does not, however, include all sources of hazardous exposure found in local communities.

³ As California's primary energy policy and planning agency, the CEC has jurisdiction over local agencies regarding the approval of power plant projects over 50-megawatts. The usual review schedule for power plant certification is about one year.

⁴ The campaign received wide coverage in both Spanish and English media from October 2000 through October 2001.

⁵ Measure "A" was originally introduced by then-Council Member Xochilt Ruvalcaba for the November 7, 2000 local ballot election (Ruvalcaba 2005). After a closed session, according to Ruvalcaba (2005) and Council Minutes, then-Mayor Hector De La Torre amended the motion, changing the election date to March 6, 2001—only one day after the CEC was scheduled to rule on Sunlaw's application for certification (Regular City Council Minutes 2000). The Council unanimously passed the amended motion.

⁶ On January 10, 2001, the Los Angeles Times published an article, "Proposed South Gate Power Plant Faces Fierce Opposition," by Hugo Martin, where Sunlaw founder and spokesperson Robert Danziger promised to comply with the election results.

⁷ Given that California faced blackouts during the 2000–2001 energy crises, the need for additional source of energy became a key point in Sunlaw's outreach efforts.

⁸ Sunlaw had committed to using union labor for the construction of the power plant. Contreras (2001) not only wrote a letter to South Gate residents for their support, but also made reference to his close relations with the late civil rights leader Cesar Chavez in his appeal for this megaproject.

⁹ While V. John White was quoted directly supporting the proposed Nueva Azalea power plant in Sunlaw campaign materials, other mainstream environmentalists like Tim Charmichael of the Coalition for Clean Air were quoted primarily supporting the power plant's technology ("Fueled by Mother Earth" 2001). While Charmichael never took a public position supporting this project, he also never denounced the use of his name in Sunlaw campaign materials (Cabralles 2005).

References

- Bacon, David, Shipra Bansal, and Sam Davis. 1998. *Holding Our Breath: The Struggle for Environmental Justice in Southeast Los Angeles*. Los Angeles: Communities for a Better Environment.
- Blomquist, Jim. 28 Feb. 2001. Letter from Southern California Sierra Club to California Energy Commissioners in opposition to the Nueva Azalea power plant project in South Gate.
- Cabralles, Robert. 24 Feb. 2005. Interview with community organizer and former South Gate resident by author. South Gate, CA.
- California Energy Commission. 2005. <www.energy.ca.gov/sitingcases/Nuevaazalea/index.html> (11 Feb. 2005).
- _____. 2000. Intervenor Communities for a Better Environment Data Request. 24 October 2000. <<http://www.energy.ca.gov/sitingcases/nuevaazalea/documents/index.html#applicants>> (11 Feb. 2005).

- Contreras, Miguel. Feb. 2001. Letter from leader of Los Angeles County Federation of Labor in support of Nueva Azalea Power Plant Project.
- Escutia, Martha, and Marco Firebaugh. 21 Feb. 2001. Letter from California State officials to Sierra Club and League of Conservation Voters in support of the Nueva Azalea Power Plant Project in South Gate.
- "Fueled by Mother Earth." 2001. Political campaign mailer by Friends of Measure A. Sponsored by Sunlaw Energy.
- Gottlieb, Robert. 1993. *Forcing the Spring: The Transformation of the American Environmental Movement*. Washington DC: Island Press.
- Huerta, Alvaro. July - August 2001. 44-45 Los Angeles, CA. David v. Goliath in SE Los Angeles. *Z Magazine* July/August: 44-45.
- Karnette, Betty. 2 March 2001. Letter from California State Senator to California Energy Commission in opposition to power plant project.
- Los Angeles Almanac. 2005. Median & Per Capita Income in Cities & Unincorporated Areas. Communities, Los Angeles County, 2000. <www.losangelesalmanac.com/topics/Employment/em12htm>. (4 March 2005).
- Matsuoka, Martha M. 2001. The Emergence of the Environmental Justice Movement and Its Challenges to Planning. *Critical Planning* 8: 4-14.
- Morain, Dan. 2004. "As Lawmaker Rises, Her Spouse Prospers." *Los Angeles Times*, July 8.
- Neighborhood Knowledge California (NKCA). 2005. Census data and neighborhood maps of South Gate. <www.nkca.ucla.edu/>. (11 Feb. 2005).
- Neighborhood Knowledge Los Angeles (NKLA). 2005. Census data and neighborhood maps of South Gate. <www.nkla.ucla.edu>. (2 March 2005).
- Nicolaides, Becky M. 2002. *My Blue Heaven: Life and Politics in the Working-Class Suburbs of Los Angeles, 1920 - 1965*. Chicago: University of Chicago Press.
- Pulido, Laura. 1996. *Environmentalism and Economic Justice: Two Chicano Struggles in the Southwest*. Tucson: The University of Arizona Press.
- Ramirez, Roberto R., and G. Patricia de la Cruz. 2002. *The Hispanic Population in the United States*. Current Population Reports, P20-545, U.S. Census Bureau, Washington, DC: March 2002.
- Reede, James W. 2000. Issues Identification Report. Docket (00-AFC-3). California Energy Commission. Regular City Council Meeting Minutes. 25 July 2000. Approved 8 Aug. 2000. City of South Gate, CA.
- Ruvalcaba, Xochilt. 24 March 2005. Interview with former South Gate Council Member and Mayor by author. South Gate, CA.
- Samet, Jonathan M., et al. 2000. Fine Particulate Air Pollution and Mortality In 20 U.S. Cities, 1987-1994. *The New England Journal of Medicine* 343(24). <www.nejm.org/content/2000/0343/1742.asp>. (11 Feb. 2005).

Shrader-Frechette, et al. 2002. *Environmental Justice: Creating Equality, Reclaiming Democracy*. New York: Oxford University Press.

Sierra Club 2004. *Latino Communities at Risk: How Bush Administration Policies Harm Our Communities*. Washington, DC 2004: Sierra Club.

South Coast Air Quality Management District Web Site. 2005. <www.aqmd.gov/aqmp/atcpch_ii.html#intro>. (11 Feb. 2005).

They're Trying to Silence Us. 2001. Political campaign mailer by Friends of Measure A. Sponsored by Sunlaw Energy.

U.S. Census Bureau. 2000. Profile of General Demographic Characteristics: 2000 for the South Gate. American Factfinder.

<www.factfinder.census.gov/home/saff/main.html?lang=eng>. (11 Feb. 2005).

U.S. Environmental Protection Agency (EPA). 2005. Toxic Release Inventory Explorer.

<<http://www.epa.gov/tri/>>. (2 March 2005).

Wallerstein, Barry R. 14 Dec. 2000. Letter from Executive Officer of the South Coast Air Quality Management District to the California Energy Commission in support of Nueva Azalea Power Plant in South Gate.

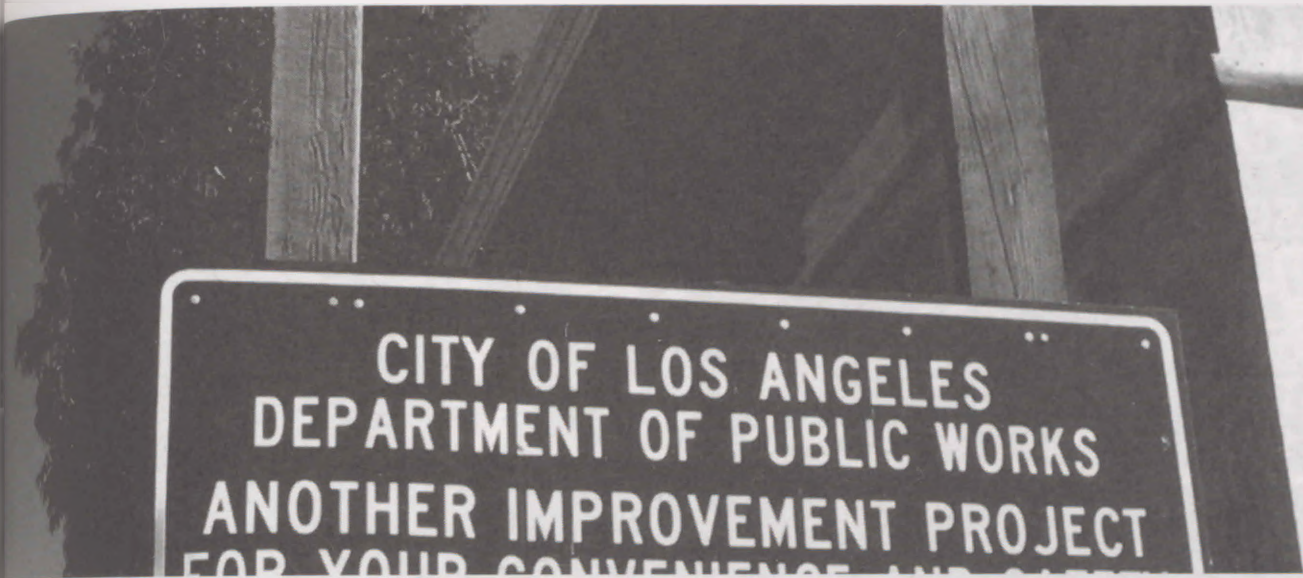
Wolch, Jennifer, et al. 2004. *Up Against the Sprawl: Public Policy and the Making of Southern California*. Minneapolis: University of Minnesota Press.

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BOOK REVIEW

Waste Not, Want Not

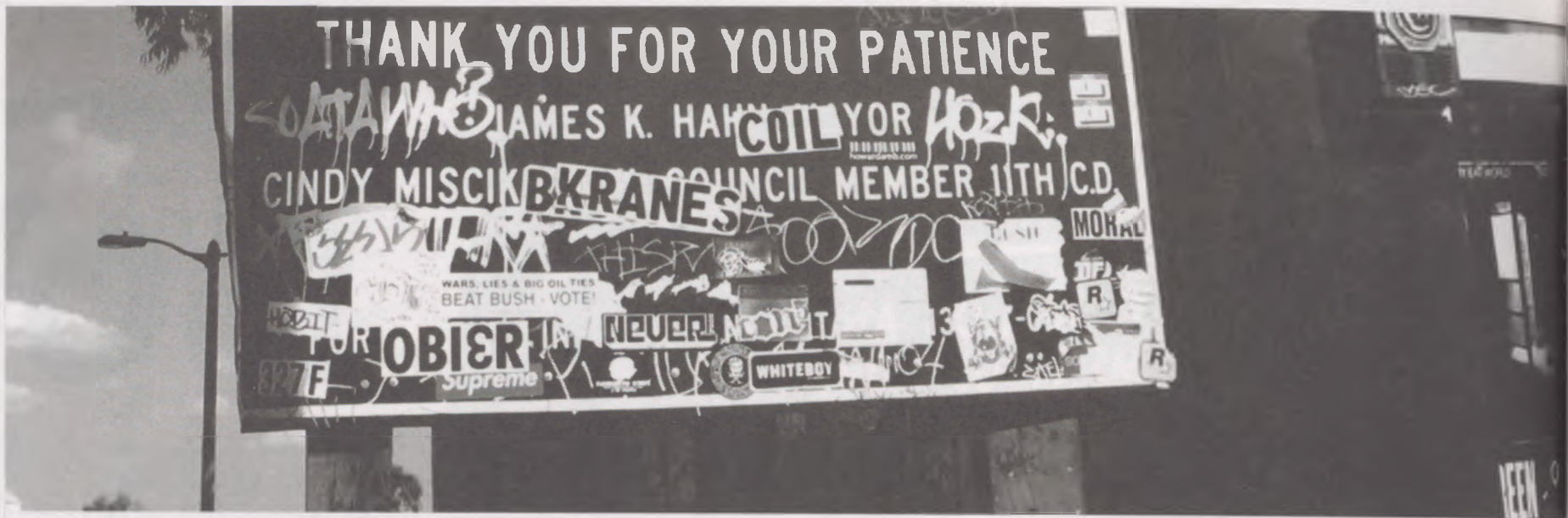
David Friedman



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BOOK REVIEW

Waste Not, Want Not

Daniel Freedman

Pacific Institute. 2003. *Waste Not, Want Not; The Potential for Urban Water Conservation in California*. Oakland, CA. <http://www.pacinst.org/reports/urban_usage/waste_not_want_not_full_report.pdf>.

When the Spanish missionaries first settled Southern California, water presented some of the most complex problems the missions had to face. The problems were not only of scarcity, but also of flash flooding and pollution; in time the missionaries created an intricate system of laws and regulations that attempted to assure at least minimal water availability during dry months.

But this delicate balance was only temporary. California's explosive growth caused its problems with water to escalate. Increased pressures on the limited water supply came from multiple sectors. Rivers and streams were captured for hydraulic mining in the Sierras, polluting water downstream from these mines and often making it undrinkable. Population increases in urban areas forced city governments to seek new sources of water. Los Angeles looked east, to Owens Lake, which it emptied. San Francisco looked north, to the Hetch Hetchy Valley, which it flooded. And all the while, the booming agricultural sector required increasingly large amounts of water.

The struggle for water in California continues still, and evidence of the struggle is carved into the land. The state and federal governments have invested billions of dollars in aqueducts and irrigation systems, transforming the desert into agricultural land and the semi-arid southern part of the state into a sprawling metropolis. Rivers have been diverted, valleys dammed, towns submerged. In some places water is literally pumped over mountains. Through the development of elaborate water systems consisting of aquifer pumping, aqueduct development, damming, and subterranean storage, California has dramatically reshaped its natural environment.

But the days of large-scale water projects seem now to be over, for two main reasons. First, the state is running out of places to *put* new projects: almost all of California's rivers already have some form of dam or diversion in place. Second, the costs—both environmental and economic—have skyrocketed. It is extremely unlikely that Southern California's growing population will have its water needs met by another aqueduct.

This leaves the state with a dilemma: if it can't store or divert more water, and if the population keeps growing, then where is Southern California's future water going to come from? The Pacific Institute, a Northern California think tank, offers a deceptively simple solution in their recent report, *Waste Not, Want Not*: why doesn't Southern California just use less water to begin with?

A History of Neglect?

The Pacific Institute is hardly the first to recognize that the problem of water is one of increasing demand and limited supply. In her book *The Last Oasis* (1997), Sandra Postel proposes a series of policy reforms built around a market-oriented pricing system for water. She argues that the devaluation of water as a commodity fuels its inefficient use. "Modern society," Postel says, "has come to view water only as a resource that is there for the taking ... masking scarcity [has been the] principle aim of water development" (Postel 1997: 18).

Water resources are not managed or priced in a way that accounts for the full costs of their consumption. Water is, in fact, underpriced, and this underpricing creates a false perception of abundance. Postel emphasizes that when water is priced appropriately, people use it more efficiently.

The impact of correct prices is illustrated well by comparing California's cities with its agricultural industry. The agricultural industry is California's biggest consumer of water, and it has long bought water at prices far below market. Perhaps unsurprisingly,

it has also been historically reluctant to conserve. The cities, by contrast, pay more for their water. Not only have they been more willing to conserve, they have been willing to pay the farmers to conserve. The Metropolitan Water District of Southern California (MWD), which represents the cities, struck a deal with farmers whereby the cities paid for various agricultural conservation projects—such as the lining of irrigation canals to prevent leaks—on the condition that the cities received any water the farms saved. As a result, Postel says, the MWD acquired 100,000 acre-feet of water at a price "far lower than MWD's best new supply option" (Postel 1997: 174).

What led to the devaluation of water in the first place? How did we arrive in a state where massive farms in the desert get water at below-market prices? One of the best (and surely the most entertaining) places to find the answer is Mark Reisner's *Cadillac Desert*, a comprehensive and rollicking history of water development in the west and the role that federal agencies played subsidizing it. Reisner describes the almost-frenzied competition between the Bureau of Reclamation and the Army Corps of Engineers as the two agencies surveyed every valley, canyon and river for opportunities to build dams.

Cadillac Desert is a story of greed, hubris and bureaucracy run amok. Reisner recounts how the agencies, which often had questionable ties to land owners and developers, would give away huge parcels of land and then construct massive water projects to provide the land with water. The water would then be sold for pennies on the dollar. The agencies em-

ployed a variety of tricks to make these maneuvers legal: the Army Corps would develop dams ostensibly for flood control, and then dispense the water to large farms at no charge. The Bureau of Reclamation would purposefully underestimate farms' ability to pay for water—even if the “farms” were giant agribusiness complexes—and provide them water at subsidized rates. Other project costs were written off, falsely, as beneficial to wildlife. “The effect of everything,” Reisner writes, “according to the economists, is that a few thousand farmers will, over the course of fifty years, receive a billion and a half dollars of taxpayer generosity that was never supposed to be theirs” (Reisner 1993: 483).

Such an edifice of subsidies and new construction is no longer sustainable. The glory days of building, damming and lying are over. In *Waste Not, Want Not*, the Pacific Institute makes a renewed demand for market- and technology-based conservation measures. The institute argues that pricing water properly and planning for conservation will not only improve efficiency, but also provide a source of new water for a thirsty California: “Our best estimate is that one-third of California's current urban water use—more than 2.3 million acre-feet (AF)—can be saved with existing technology. At least 85 percent of this can be saved at costs below what it would cost to tap into new sources of supply and without the many social, environmental, and economic consequences that any major water project will bring” (Pacific Institute 2003: 1).

Indoor Residential Uses

While the report investigates savings opportunities in multiple urban consumption sectors, most of the potential for savings is in the residential sector. Existing conservation methods, if implemented properly, could reduce residential consumption by 40 percent. The Pacific Institute sees potential savings in many areas.

Toilets

Toilets are one of the best opportunities for conservation. According to the Pacific Institute, toilets use anywhere from 28 to 40 percent of indoor residential water, which is actually a sharp decline from previous years. Before 1980, toilets used an average of 6 gallons per flush (gpf). Further advances lowered this usage to 3.5 gpf, and in 1992 the National Energy Policy Act reduced the maximum gpf to 1.6 (Pacific Institute 2003). Efficiency increases of this sort mean that California will use less water for toilets in 2020 than it does now, even accounting for population growth. With campaigns to replace existing high-gpf toilets, savings will be even greater.

Showers

The second largest source of residential indoor water use is showers, which also have great potential for water conservation. Showers use about 22 percent of all indoor home water. The 1992 National Energy Policy Act, which reduced the flow of toilets, also required showerheads to have a maximum flow of 2.5 gallons per minute (gpm). The resulting savings are significant. On average, a 2.5 gpm showerhead

uses 17 gallons less per shower than a 5 gpm shower, which translates into over 4000 gallons of water saved each year (Pacific Institute 2003). An external benefit from reduced shower flows is reduced energy consumption. If shower flow is reduced, so is the use of energy-intensive water heaters. The Pacific Institute also estimates that if all shower heads were replaced with modern low-flow heads, by 2020 California showers would consume the same volume of water as in 2000.

Washing Machines

Residential washing machines, which use about 330,000 acre feet of water per year, have also been targeted by the state for regulation. In 2002 the California legislature passed a bill limiting all washing machines in the state sold after 2007 to a maximum of 9.5 gallons per cubic foot of laundry (Water Factor WF), down from the average water factor of 13.3.

Increased penetration of efficient machines can create extensive savings. Water efficient machines can reduce usage by as much as 40 to 50 percent. And because washing machines, like showers, use hot water, efficient machines also reduce energy usage by between 50 and 65 percent.

Other Indoor Savings Opportunities

Dishwashers, while only a small fraction of total indoor water usage, could still have a significant impact on water conservation if new highly efficient machines were adopted on a large scale. According to the Pacific Institute, in 2000 energy efficient machines would have reduced the water consumed by dish-

washers by over half. Faucets have also had their flows regulated by the federal government in order to increase conservation; as of 1994, faucet flow rates were capped at 2.5 gpm. The wide range of uses for faucets, however, makes quantifying the benefits of such regulations difficult. For example, a faucet with reduced flow rate doesn't save any water when it is being run to fill a pot to a set point, but it could produce savings when a person leaves the faucet running as they brush their teeth.

Finally, in many cases significant water savings could be achieved by simply fixing leaks. On average, leaks account for 5 to 13 percent of water use. Leak rates differ greatly from house to house; often times very few houses can be responsible for a majority of leaks. In some houses the amount of water lost to leaks is greater than the amount of water used by all faucets. In most cases, the heaviest amount of water lost through leaks is due to toilets.

Outdoor Residential Uses

Like indoor uses, residential outdoor uses consume vast amounts of water every year. Precise estimates vary widely, due to ambiguities in the available data as well as to the high variability in outdoor water use among households, but it is generally accepted that outdoor uses consume about 50 percent of all water used by residences. Some residences, depending on location, use up to 70 percent of their water outdoors. Outdoor uses vary, but landscaping is the most common use. Within that 70 percent, there is enormous potential for savings. Under some circumstances, outdoor water uses can be almost eliminated

with no loss of aesthetics or functionality. The Pacific Institute outlines three significant determinants in available methods for conserving outdoor residential water: education, technology, and pricing.

Education

Homeowners would prefer to spend less money on water, but often believe they need to spend heavily in order to have an aesthetically pleasing lawn or garden. In California, many people landscape their homes with non-native plant species that require heavy and consistent watering. Often these plants are used because homeowners are not aware of drought resistant species that require a fraction of the water but supply an equally appealing aesthetic. In fact, substituting drought resistant species for more traditional landscape plants has been shown to achieve the most significant outdoor water savings of any conservation method.

Other educational elements can play a large role as well. Awareness of seasons and annual water cycles can help homeowners manage their irrigation systems. One experiment found that simply monitoring the scheduling and hardware of an irrigation system can reduce outdoor water consumption by as much as 20 percent.

Lastly, education can be of benefit in that many water conservation technologies that exist are unknown to most homeowners. Similarly, homeowners may be aware of some conservation techniques but find them daunting or confusing. Education can help homeowners and irrigators adopt simple and effective conservation methods.

Technology

Many technological advances have made outdoor water irrigation systems extremely efficient. The main consideration for homeowners is which tools to use and when to use them. Some tools are extremely simple and provide modest savings, while others may be expensive and provide more impressive results. Inexpensive tools such as soil moisture monitors are cheap and easy to find, but require some training to operate effectively. Simply monitoring irrigation timing to soil moisture can provide modest levels of conservation. Even straightforward tools, like rain monitors that shut off irrigation systems automatically, require no maintenance and can produce up to 10 percent savings.

Other technologies require a bit more consideration, but can produce substantially more savings. Some irrigation systems can be set up with sensors that automatically read soil moisture levels, and apply water only when and where it is needed. This technology can create savings of about 30 percent, and once installed requires little maintenance. More complicated are approaches such as drip irrigation, which can be expensive to install, but which is also the most efficient water delivery method available today. Drip irrigation can increase irrigation efficiency by up to 50 percent.

Lastly, two options exist that can achieve up to 100 percent savings. First, homes can use gray water systems, which recycle indoor water for use in outdoor landscaping. Second, homes can use barrels or catch basins to trap water that runs off roofs during high

rains, and apply the water to landscaping during dry periods.

One other development expected to produce significant savings is the introduction of irrigation systems connected via satellite to weather stations. Based on information gathered at the weather station, a signal is sent to the irrigation system, telling it when to run and when to shut down. While this technology is still new, it could produce tremendous results, especially if it is incorporated into large new residential developments.

Pricing

Pricing provides the crucial incentive to conserve. Often times, no matter how efficient the technology becomes or how educated a homeowner may be, if the owner does not see the impact of excessive water use in their checkbook, there is no incentive to conserve.

Pricing has worked effectively. In times of severe drought, raising the price rates during peak usage times has caused residents to decrease wasteful and unnecessary uses. In addition, multi-tiered pricing schemes, which charge different rates for certain volumes consumed, can also be effective at getting homeowners to try and reduce water usage to achieve the pricing offered at the lower tiers.

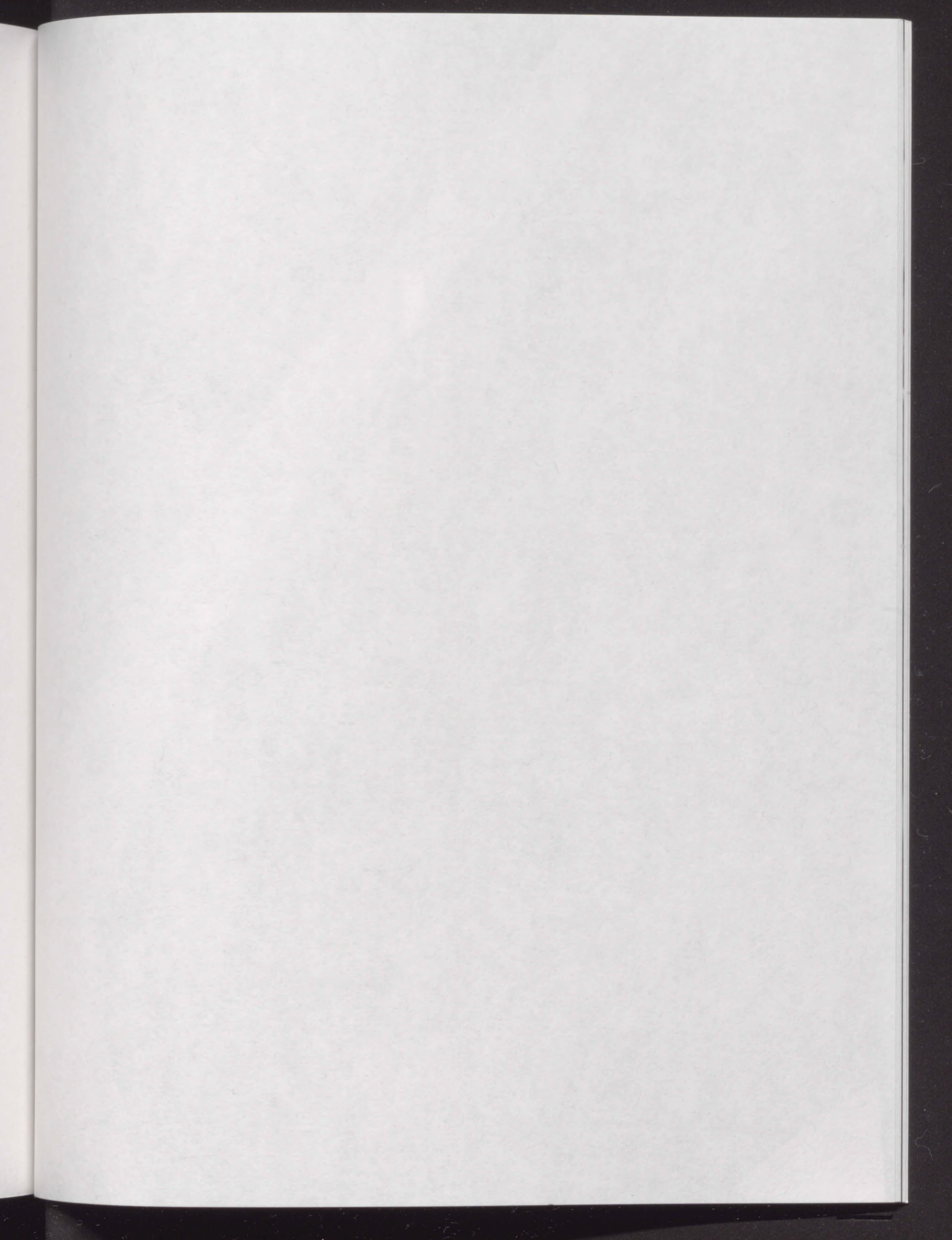
Simply installing meters dedicated to outdoor water use gives water suppliers the option of charging different rates for water used indoors and outdoors. These separate rates can have a significant impact on water usage, especially in dry desert regions where water intensive landscapes are inappropriate.

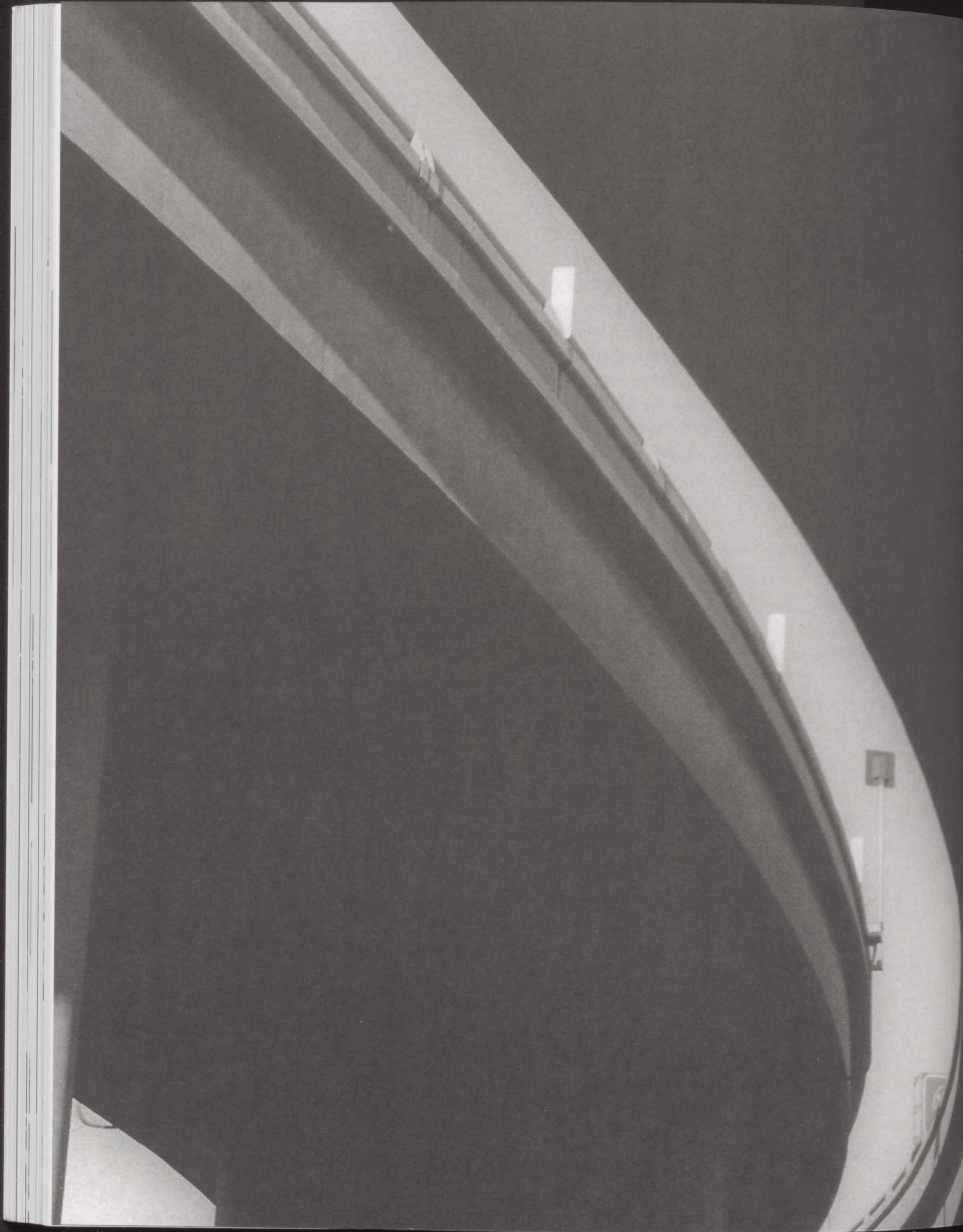
The key to bringing residential conservation to its true potential in the future is through providing users of water with a means to an end, and then an incentive to use those means. To really be effective, efficient and complicated technologies such as drip irrigation and gray water systems should be standard in all new homes. While this may raise the initial purchase cost of a house, the increased cost would be offset over time through lower water bills. For older homes, rebate programs should be expanded, and advertised to an even greater extent. More modest steps, such as providing free replacement toilet bowl flappers, discounted soil moisture testers, or even planting guides for drought resistant landscapes, can also help advance conservation.

With everyday that passes, the population of California grows, and with every day passed, the importance of water conservation increases that much more. As we progress and our economy grows, we must continue to look at how efficiently we use our resources. Chances are, the harder we look the more we will find.

References

- Postel, Sandra. 1997. *Last Oasis: Facing Water Scarcity*. New York: Norton.
- Reisner, Mark. 1993. *Cadillac Desert: The American West and Its Disappearing Water*. New York: Penguin Books.
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BOOK REVIEW

Imaginary and Banal Spaces: Guides for Contemplating Cities and Technology

Enrique Gualberto Ramirez

A Field Guide to Sprawl

Dolores Hayden (with aerial photographs by Jim Wark)

New York: W.W. Norton and Co., 2004, 128 pp. ISBN 0393731251

The Digital Sublime: Myth, Power, and Cyberspace

Vincent Mosco

Cambridge: MIT Press, 2004, 211 pp. ISBN 026213439X

In *Imaginary Magnitude* (1981), the Polish science fiction author Stanislaw Lem took a critical hammer to the very genre he perfected and concocted a series of opening chapters to books that were never written. The underlying idea was perhaps not too subtle: that science fiction writing very rarely delivered what it promised, namely, a helpful critique of contemporary society viewed through the lens of an all-too-distant and technologically-savvy future. Technology can indeed be the stuff of dreams. The individuals we associate with society-altering technology—the Edisons, Fords and Gateses—have an air of optimism about them. Each imagines a society transformed and enriched by dint of their innovation.

The rhythm of new technologies is commonly one of hype, crash and finally banality, as the once-vaunted invention gets immersed in daily life. And only when it is immersed does a technology achieve its truest and most lasting power. This theme is pervasive in sociologist Vincent Mosco's latest book, *The Digital Sublime: Myth, Power, and Cyberspace* (2004). The book is faulty in the same way that Lem's never-written chapters in *Imaginary Magnitude* are. *The Digital Sublime* fails to outline exactly how cyberspace achieves its power through banality, and focuses instead on the creation of baseless hype by the Internet's most breathless advocates. The book is, however, a very readable and selective critique of Internet boosterism, and in it Mosco argues that the 'Net's mythical ability to cure pervasive societal ills actually reinforces these ills. The Internet, that most democratic of technologies, is actually not so democratic at all. Mosco therefore examines Internet myth-making in

order to uncover the Internet's deeper political economy. For architects and urban designers, *The Digital Sublime* is an unsettling *memento mori* of the Internet's and cyber culture's promise to forever transform our cities.

Mosco begins by surveying works that give insight into the power and allure of myth. Although he later criticizes Internet hype, Mosco first offers that myths are not fictions so much as important conceits.

Myths "give meaning to life, particularly by helping us to understand the seemingly incomprehensible, to cope with problems that are overwhelmingly intractable, and to create in vision or dream what cannot be realized in practice" (Mosco 2004: 14). The connection between myth, technology, and political economy then becomes the touchstone of his analysis. In his words, "I eschew determinism to demonstrate how an analysis founded on myth can build a bridge to a political economic understanding, indeed is mutually constituted with political economy. Myth is the starting or entry point to a valuable understanding of computer communication, but it leads to, requires, and ... is constituted with a political economic perspective" (Mosco 2004: 7).

With this theoretical lens in place, the author begins his critiques of the myth of cyberspace. For Mosco, the rise of new communication technologies, primarily the Internet, the World Wide Web, and cyberspace, cannot be understood apart from their guiding myths. Those elaborate metaphors play a central role in the development of the technologies themselves, "both for what they reveal (including a genuine desire for community and democracy) and

for what they conceal (including the growing concentration of communication power in a handful of transnational media businesses)" (ibid, p.19.). Drawing on historical examples such as electrification and the advent of broadcasting and telecommunications systems, Mosco finally leads the reader to the notion that technology achieves its truest and greatest expression of power once it becomes banal. For communications technologies, as with other innovations, banality accompanies ubiquity. Computers were novel when only a handful of them existed, in universities and government offices; today they are powerful because millions of people have them and rarely give them a second thought. The mark of a banal technology is not that we want it, but that we cannot imagine being without it. It is ironic that no one calls the 21st century "The Age of Television" "The Age of Radio" or "The Age of Telephone," although these technologies are more widespread, and thus more powerful, than ever.

Mosco does not, unfortunately, probe further into the Internet's powerful banality. Rather he embarks on a detailed explanation of the myths associated with these technologies. The rise of cyberspace, Mosco argues, has been accompanied by a dyad of unfulfilled promises, which he handily titles "The End of History" and "The End of Politics." Promulgated in popular writings during the late 1980s and early 1990s, when the Internet was first being introduced to mainstream society, these theses portrayed cyberspace as a motor of democracy and equality. Mosco, in his analysis of these writings, shows how their authors (often people of great influence)

ignored or underestimated the potential inequities of the technology they celebrated.

Any discussion of a communication-technology-driven 'end of history' must begin with Francis Fukuyama's book of the same title. In *The End of History and the Last Man* (1992), Fukuyama declared that the collapse of communism and the victory of liberal democracies signalled the "end" of history. For Fukuyama, the historical record was a document of struggle whose natural end point was the triumph of liberal democracy. Mosco argues that the myth of cyberspace, generated by the animistic and sublime urgings of the Internet's and World Wide Web's most outspoken boosters, claims the same end result. Yet the notion that these technologies have created or contributed to liberal democracy is the subject of dispute. Academics and practitioners may have crafted initiatives that use technology to increase the political and human capital of disadvantaged or disenfranchised citizens, yet many of these lofty goals remain unrealized. Mosco also targets the writings of Bill Gates, Nicholas Negroponte, and Esther Dyson, who similarly describe the utopian potential of the Internet and World Wide Web. The current situation with respect to these technologies' liberalizing tendencies is well known. Cyberspace has been commercialized, its democratizing potential undercut by the portfolio of corporate and financial interests that parcel out digital space to the highest bidder.

Mosco continues his critique by analyzing another myth attributed to the Internet and the World Wide Web. In a chapter entitled "Loose Ends: The Death of Distance and The End of Politics," Mosco takes

on the claim, common among Internet boosters, that the logistical convenience brought about by the World Wide Web will transform the political climate in positive ways. Just as proponents of telegraph and radio technology in the late 19th and early 20th century promised greater access to goods and services via a breakdown of geographical barriers, gurus like Negroponte and Dyson describe the Internet's similar ability to provide access to goods and services in quasi-religious terms.

In furthering this line of argument, Mosco relies on two historical examples that precede the Internet, and that show how myths are created to justify technological advances or imperatives: the Strategic Defense Initiative ("SDI" or "Star Wars") and the promulgations of the neo-conservative Progress and Freedom Foundation (PFF). The controversial SDI system—a network of missiles, satellites and radar installations whose purpose was to track down and destroy incoming nuclear missiles—was itself born in a moment of mythical proportions: a gruff Ronald Reagan (then candidate for President of the United States) touring the Dr. Strangelove-esque facilities at NORAD and being informed of America's inability to repel a potential Soviet attack. Reagan vowed on the spot to sponsor a system that would resolve the problem. The subsequent and oft-publicized malfunctions that plagued SDI, as well as its cost overruns and the impasses it spawned in Congress, did little to erode the myth behind the system: that technology could negate the threat of an incoming nuclear attack, and render obsolete the Cold War's nervous doctrine of mutually-assured destruc-

tion. There are, of course, subtle dimensions to this. Does technology policy obviate foreign policy, or is it foreign policy?

The interplay between technology and policy becomes even more evident in Mosco's analysis of the Progress Freedom Foundation. The PFF, a think tank started by Gingrich in 1993, began issuing Alvin Toffler-like prognostications about the World Wide Web's ability to transform society. For Mosco, the PFF's rhetoric demonstrates how new information technologies can be calibrated as vessels of neo-conservatism:

With the help of information technology, capitalism is presumed to have the power to end all injustice and create a world where are all equally free to pursue life as entrepreneurs. With injustice gone, the state is made superfluous and will crumble under the weight of its own uselessness. (2004: 105-6)

As the architects of the Cold War policy relied on technologies like SDI to render the need for international détente unnecessary, so did the framers of the PFF conceptualize emergent information technologies in a way that dodged political issues. The PFF's particular vision of technology viewed information technologies as a type of private good. When seen in this way, the Internet thus becomes subject to market forces. A purportedly democratic technology now is no longer tied to issues of public resource allocation.

As the framers of SDI's and PFF's policies demonstrate, technology thus has an aspect of the transcen-

dent. But there remains a palpable disconnect between mythmaking and technological reality. As Mosco demonstrates, technology policies are at best incomplete. This level of policymaking depends even more on the perceived, as opposed to the actual, abilities of technologies to address putative social problems.

This is not to deny the power of actual technology to reshape policy. This is a redoubtable undercurrent in urban historian Dolores Hayden's latest book, *A Field Guide to Sprawl* (2004). This field guide reads like a dictionary, yet it is a dictionary more in the spirit of Ambrose Bierce's *The Devil's Dictionary* than with, say, Voltaire's *Philosophical Dictionary* or even Denis Diderot's *Encyclopaedia*. Like Bierce, Hayden plays with the form of the discourse in order to create a distinct viewpoint.

Hayden's attendant issue is the proper documentation of sprawl. She believes that to properly combat sprawl's vicissitudes, urbanists, architects, and planners must be able not just to describe it, but also to see it. Her dictionary format thus becomes a necessary field guide for those whose charge is the proper management of the built environment, a "Visual Dictionary of Sprawl" comprised of 52 entries arranged in alphabetical order and replete with ravishing photographs. It provides a lexicon which is not only descriptive ("Tire Dump"), but also politically charged ("Ball Pork," "Mansion Subsidy") and often humorous ("Sitcom Suburb," "Litter On a Stick," "Putting Parsley Around The Pig").

In an introduction that presents a brief history of the reality and ideology of sprawl, Hayden picks up

on a current that Mosco ignored. If technology becomes more powerful when it becomes banal, then perhaps it is the banal technologies, and not the much-hyped new and experimental ones, that we should look to for help in combatting society's ills. Thus the camera, that ubiquitous and signature device of modernity, takes a central role in Hayden's polemic. In explaining the inclusion of Jim Wark's aerial photography, Hayden writes:

When people struggle to interpret their local landscapes, aerial photographs reveal the scale of existing and new development. In an era when a truck stop can be larger than a traditional town, aerial images convey the vast spread of much twenty-first-century development and can bring up-to-the-minute data on the progress of construction. Also, aerial photographs can be understood by people without technical training, in a way that zoning maps, zoning codes, satellite surveys, and traditional site plans cannot. If shot at altitudes from 1,000 to 2,000 feet, they can show building facades as well as site massing. Although they rarely include recognizable people, when aerial images are shot at oblique angles and at relatively low altitudes, showing land and buildings together, they entwine natural and constructed elements. Low-level, oblique-angle pictures can establish a complete visual inventory of a town because they can show inaccessible places such as wetlands or steep terrain, and reveal hidden sites such as dumps or gated communities. (2004: 14-15)

The banal technology is aimed at the banal landscape with startling results. The photographs show the physical symptoms of sprawl: over-paved areas, wasted spaces, low-density tracts. The pictures show the all-too-apparent misuses that the field guide documents.

The actual text that accompanies the field guide leaves much to be desired. One wonders, for instance, about the selection process. Hayden sets her sights on only some aspects of sprawl, generally its deleterious effects and overlooked causes. Hayden may sound a klaxon in her introduction, reiterating calls for "better, not bigger" developments. But despite this broad advocacy of sustainable development and reinvigorated urbanism, her field guide feels incomplete.

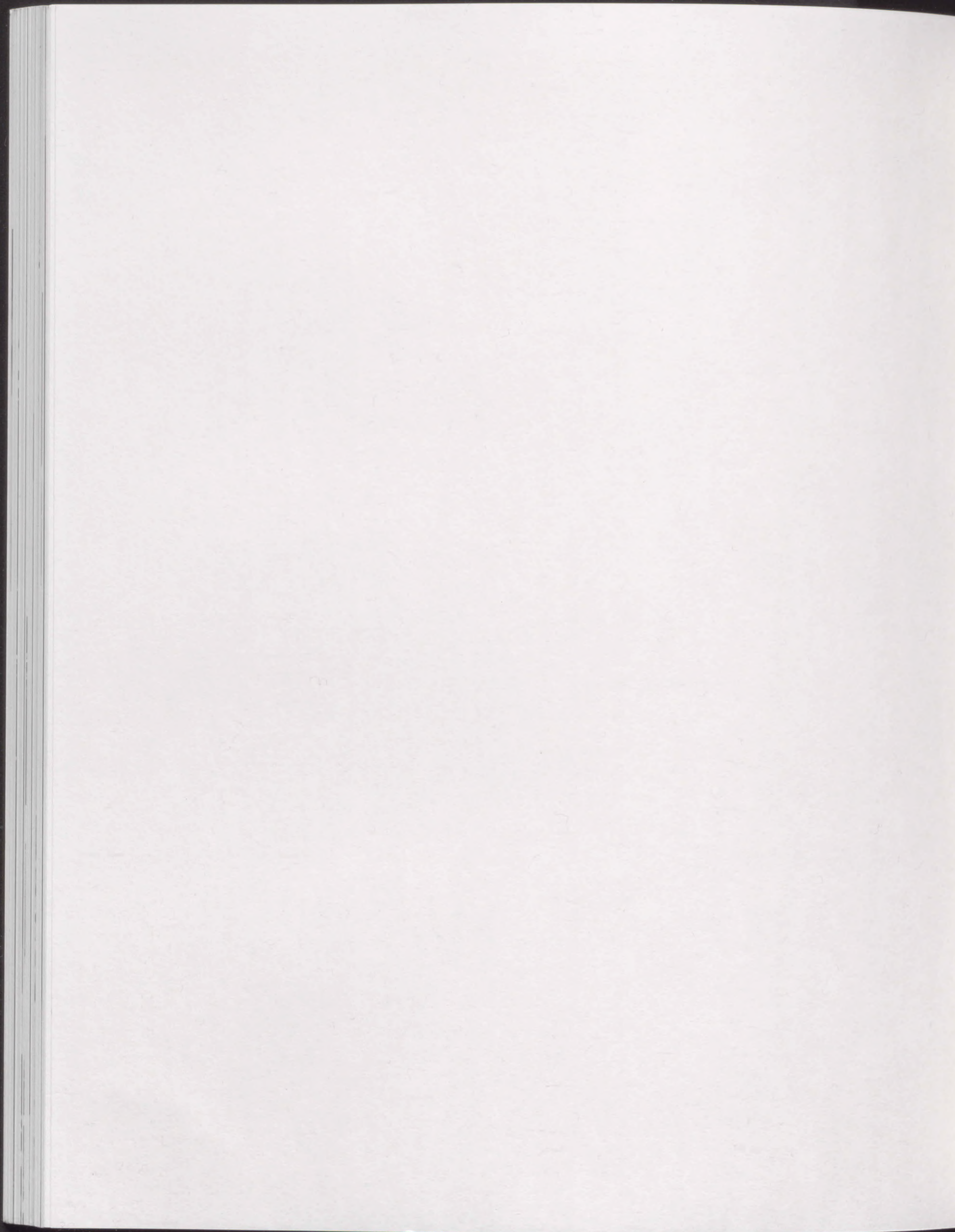
In the end, the works of Mosco and Hayden, though incomplete on their own, complement each other well. As Mosco does not delve deeply into how technologies become more vital and lasting despite their so-called "banality," as *The Digital Sublime* asks us to consider how mythmaking is inseparable from policy making, Hayden uses banal technologies as a complement to anti-sprawl sentiments. Although technology has become a *sina qua non* of everyday urban life, these two works provide urbanists, planners and architects with an arsenal of tools that will enable them to ask the right questions and approach the issue of smart growth in a sensible way.

References

Fukuyama, Francis. 1992. *The End of History and the Last Man*. London: Hamish Hamilton.

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