



The Economic Benefits of Green Infrastructure

The following is an excerpt from :

Paying the Costs of Sprawl: Using Fair-Share Costing to Control Sprawl

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Without considering the public and social costs, sprawl makes more economic sense than infill redevelopment. One estimate conducted for the Bay Area in California suggests that the costs of sprawl to the developer are on the order of \$100-132 per square foot, while infill redevelopment costs come in at around \$163-191 per square foot -- about 50% more (Bragado, et al., 1995). The savings are associated with lower land, construction, and parking costs and lower permitting and design fees for developments in outlying areas (see Table 1). However, experience over the last 30 years, has shown us that the social costs of sprawl are significant -- primarily from loss of open space and agricultural lands, greater reliance on vehicles, blighting of urban centers, higher resource consumption (i.e. energy and water), greater infrastructure costs, and higher costs of services.

	Infill Development	Sprawl Development
Land	\$15-\$20	\$8-12
Site Preparation	\$5-10	\$5-10
Construction	\$60-65	\$45-55
Parking (sprawl in construction)	\$15-18	\$0
Soft Costs (permits, fees, etc.)	\$32-37	\$20-26
Contingency 5%	\$6-7	\$4-5
Subtotal	\$133-157	\$82-108
Profit 15%	\$20-23	\$12-16
Marketing	\$10-11	\$6-8
Total Cost	\$163-191	\$100-132
Source: Bragado, et al., 1995.		

Loss of Open Space and Agricultural Lands

With decentralization and sprawl development, our farmland is rapidly disappearing. A study by the American Farmland Trust has estimated that the U.S. is losing about 50 acres an hour to sprawling developments. If this trend continues, the Trust estimates that 13% of prime U.S. farmland could be redeveloped by 2050 (Longman, 1998). The consequences of this trend have been hotly debated. With increases in productivity, the U.S. has been able to grow more crops with less land and labor (Gordon, 1998). Part of the problem, however, is what land is being lost. Between 1982 and 1987, the Central Valley—California's leading agricultural region—lost almost a half-million acres of productive farmland (Bank of America, 1996). Some of this land can be replaced by bringing new land into agricultural production, but often at high economic and environmental cost. In addition, loss of agricultural land in close proximity to urban centers, represents a loss in efficiency and a loss in ability for small farmers to easily sell their fruits and vegetables in local markets. Out of a total of about 250 million acres of

cultivated farmland in the U.S. only 48 million areas are within 50 miles of the 100 largest urbanized areas (Nelson, 1992b).

Greater Reliance on Vehicles

Sprawl leads to an increase in vehicle dependence, which has both social and private costs. Since 1970, population density has been steadily declining in the U.S. With this decline in density, has come a greater reliance on the automobile. From 1970 to 1996, the mileage people drive has grown four times as fast as the population, and twice as fast as licensed drivers. The number of cars has also outgrown the population. During the same time period, the number of cars grew by more than 97 million, while the population increased only 61 million. (USA Today, January 16, 1998).

Table 2: Increase in population, vehicles, drivers and miles driven 1970-1996		
	1996 Total	% increase from 1970
Miles Driven	2.5 trillion	+123%
Vehicles	205.4 million	+90%
Drivers	179.5 million	+61%
Population	265.3 million	+30%
Source: USA Today (1/16/98)		

The U.S. is currently one of the most car dependent nations in the world, with private ownership rates about twice those of Western Europe. The cost of owning a car can be a financial burden on families. Owning and operating a car costs about \$3600 a year (Durning, 1996), which translates to about 16-20% of total household expenditures (Young, 1995). Put another way, a median income family would spend 27 hours a month working to pay for the 32 hours a month they spend on average in a car (Durning, 1996).

Living in the suburbs does not necessarily translate into more driving. With many industries and companies locating themselves in suburbs, most commuting now takes place suburb-to-suburb (Gordon, 1998). Nonetheless, studies show as much as a doubling of vehicles miles traveled (VMT) per capita for people living in sprawl-like development compared to older transit-oriented development (Calthorp, 1993). In addition, uses of other modes of transportation (i.e. biking, walking, using the bus or other forms of public transit), are significantly less in sprawl development. Some would argue this simply reflects that cars are a superior choice of transportation - neglecting the fact that more than 32% of the U.S. population can't drive (10% excluding children under 16) (Littman, 1998). Sprawl development can be designed to be more pedestrian, bike and public transit friendly, recognizing, however, that the viability of these alternate modes of transportation (beyond recreational uses) is highly affected by density, or the lack thereof.

Driving also has costs associated with loss of habitat, congestion, resource consumption, and a decline in air quality. The social costs of the increased reliance on the automobile in the U.S. have been estimated to be as much as \$184 billion a year (Cobb, 1998), which does not even include productivity losses from congestion or tax revenue losses from land used for roads. Cobb's estimate of damages includes \$36 billion in uncompensated damages from accidents, \$40 billion in road maintenance costs not covered by tolls and user fees, \$19 billion for defending oil supplies, and \$89 billion in environmental damages (see Table 3). Of the total environmental damages, \$62 billion are estimated to be from health effects, visibility loss, and crop damage resulting from air pollution. Traffic congestion is also costly in terms of fuel loss and time loss. The average worker now spends about 9 hours per week, or more than a full working day, traveling in a car due to increased commuting times and congestion.

<i>Direct Subsidies</i>		<i>Indirect Subsidies</i>	
Highway construction, maintenance and services (less user fees and tolls)	\$31	Accidents (uncompensated deaths, injuries, and medical expenses)	\$36
Local streets and services	\$9	Air pollution	\$62
Strategic Petroleum Reserve	\$1	Water pollution	\$6
Military protection of oil supplies	\$18	Noise pollution	\$8
Total Direct Costs	\$59	Global warming	\$13
TOTAL COSTS	\$184	Total Indirect Costs	\$125

Source: Cobb, 1998

Blighting of Urban Centers

The movement away from urban cores also has costs. Downs (1988) makes a strong argument for how government policies and peripheral growth have directly exacerbated problems of intensive concentrations of poor households in central portions of our metropolitan areas. Unlimited sprawl removes new jobs from accessibility by unemployed inner-core residents; fragmented controls over land use permit exclusionary zoning policies; and cities designed for cars deprive poor people and non-drivers of mobility (Downs, 1998). Urban disinvestment translates into lost sales and property tax revenues. Empty urban lots are also targets for arson, graffiti, and other types of crime. Surrounding businesses and properties often lose value due to the crime and stigma associated with vacant lots. Today, it's not just an issue of movement away from the urban core, many metropolitan areas are now seeing problems of blight and abandonment in areas of what policy experts call the inner-ring suburbs - suburbs developed 20-30 years ago now surrounded by new development. Lacking the newness of suburban development on the outside, and without the quality of housing stock and cultural amenities that help fuel downtown revitalization, experts fear some of these areas could become islands of urban decay (Anton, 1998).

Higher Resource Consumption

Energy consumption is affected by the size of homes and business spaces, as well as what is called the "shared-wall" phenomenon where townhomes and apartments can enjoy much lower heating bills than freestanding homes. Per capita water consumption, particularly in arid climates, goes up dramatically for homes with larger lots and lawns that need watering.

A recent study by the City of San Jose, California tried to estimate the savings associated with implementing growth restrictions to limit sprawl. If the city had not implemented an urban growth boundary, an estimated 3,000 homes would have been built in outlying areas. These homes would have resulted in 200,000 additional vehicle miles by commuters, 3 million additional gallons of water and 40% greater energy use for heating and cooling each day (Allen et al., 1996).

Higher Infrastructure Costs and Costs of Services

The cost of providing infrastructure and municipal services is higher with sprawl. Studies in California and Florida have shown these extra costs to be on the order of \$20,000 per residential unit (Nicholas, et al., 1991 as cited, p. 1). Similarly, study by Rutgers University comparing a sprawl development in New Jersey with a more compact infill development found a differential of about \$25,000 per residence (Bragado, et al., 1995). Another study, looking specifically at sewer hookups cost found that in Tallahassee, Florida, sewer hookups cost \$11,433 in suburban areas compared to \$4,447 for the mostly black, center-city neighborhoods nearest the sewage treatment plant. Despite this nearly \$7,000 difference in real cost, all households pay the same price of about \$6,000 for sewer connection. The urban residents paid \$2,000 extra in hookup costs, while suburban homes received a subsidy of \$5,000 (Longman, 1998).

Costs of services to different areas of a municipality are also influenced by location. Simply put, the further away developments are from the service centers that serve them, the more costly it usually is to provide those services. Another critical issue facing communities is whether new development occurs in areas where existing facilities, namely schools, libraries, parks and police stations can absorb capacity. Cities witnessing both rapid suburban growth and urban disinvestment at the same time can have situations where taxpayers are paying for new facilities while other facilities are being underutilized. Between 1970 and 1995, the number of public-school students in Maine declined by 27,000, yet the state spent more than \$338 million building new schools in fast-growing suburban towns (Longman, 1998).

Finally, street connectivity and route distance can be more influential than physical proximity. The maze-like effect of cul-de-sac development, for example, makes it more time consuming and expensive for police to watch neighborhoods on the beat. Rarely, however, do communities try to quantify these differences and make different areas pay appropriately. (See case study on Lancaster, California for a write-up on one community that has set up location-variable impact fees).