**CHAPTER**

**6**

*Literature Synthesis*

# QUALITY OF LIFE

This subset of the literature, like the preceding subject areas, consists first of general investigations on the concept of "Quality of Life" (QOL) and how it can be measured, as well as specific studies that attribute both positive and negative QOL attributes to sprawl and its alternatives. As one would expect, there is no consensus on what QOL entails, so the review of the literature begins with numerous studies that grapple with defining the concept and monitoring its attributes.

While the vast majority of the literature on QOL deals generally with the overriding issue of what QOL is, a smaller number of studies focus specifically on the QOL–sprawl nexus. Some current studies add as a QOL critique that contemporary, single-use residential subdivisions, accessible primarily by the automobile, have lost their sense of "place." Others indicate that traveling through the congestion and aesthetics of sprawl is stressful.

Yet another group of studies points to the fact that sprawl development consumes unnatural amounts of energy, contributes to regional air pollution, and lessens the regional and national resources that might be devoted to historic preservation, cultural infrastructure provision, and the like.

The chapter concludes with a discussion of the premise that low-density living is preferred by most of the population: Outer-metropolitan locations separate them from the problems of the poor, reduce the costs of housing and public services, and are the locus of the greatest appreciation of housing values.

**Sprawl's Alleged Negative Impacts**

*Aesthetically Displeasing*
*Weakened Sense of Community*
*Greater Stress*
*Higher Energy Consumption*
*More Air Pollution*
*Lessened Historic Preservation*

**Sprawl's Alleged Positive Impacts**

*Preference for Low-Density Living*
*Lower Crime Rates*
*Enhanced Value or Reduced Costs of Public and Private Goods*
*Fosters Greater Economic Well-Being*

## SPRAWL'S ALLEGED NEGATIVE IMPACTS

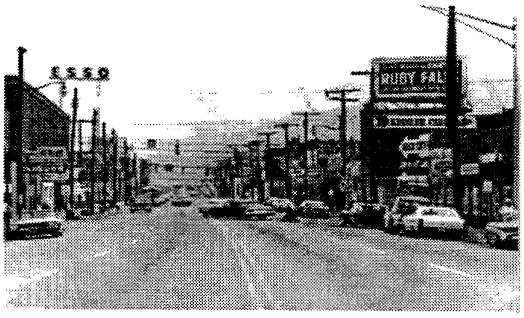
### Aesthetically Displeasing

*Allegation/Basis*

*Low-density patterns are less pleasing aesthetically and provide fewer cultural opportunities than high-density patterns.* An important element of the quality of life of any community is the aesthetic and cultural satisfaction of its residents in daily life. If the environment they normally encounter is dominated by the homogeneous architecture of subdivisions and strip malls, the absence of quality civic spaces and landmark buildings, and a lack of pedestrian-scale amenities, the aesthetic satisfaction people derive from their surroundings is reduced. Moreover, sprawl does not easily lend itself to the formation of communities that have a feeling of cohesiveness and can organize to support the arts or other cultural institutions.

*Literature Synthesis*

The aesthetically less-pleasing aspects of sprawl, such as visual uniformity, are often cited as a cost of this form of development (Nelessen 1994). Critics of sprawl often decry its ugliness. For example, Shore (1995) maintains that "spread city" is inherently ugly because the settlement pattern has no clear form; retail businesses located along highways must use "raucous" signs to attract passing motorists; and a significant portion of the land is given over to the automobile. Diamond and Noonan (1996) find a growing portion of suburbanites faced with "real burdens on the texture, continuity, and depth of social life, as well as on the diversity, beauty, and health of the surrounding landscape."




Strip commercial development along heavily traveled routes is both unappealing and unsafe.
*Source:* George Hull and W. C. King. The Chattanooga Times, Chattanooga, TN.

Low-density developments, however, are not necessarily less-pleasing aesthetically than more compact forms of development. The aesthetics vary from development to development. Some lowdensity residential developments, particularly high-income ones, have much more open space and elaborate landscape designs than high-density residential areas. In fact, defenders of sprawl often contend that the individually owned, discrete open spaces of sprawl make it more attractive than compact forms of development.

***Sprawl does not easily lend itself to the formation of communities that have a feeling of cohesiveness and can organize to support the arts or other cultural institutions.***

The literature reflects these two conflicting opinions. There is little evidence within the literature, however, to suggest that Americans find sprawl less attractive than more compact forms of development or that low-density living provides them with fewer cultural opportunities. Visual preference surveys have been used to gauge the reaction of Americans to sprawl, although such studies are often criticized for failing to make a distinction between sprawl and factors not typically associated with that form of development (e.g., architectural design). Moreover, survey research does

not consistently indicate that Americans overwhelmingly find sprawl to be aesthetically less pleasing than compact forms of development. When shown images of both sprawl and traditional communities, some surveys have revealed that individuals favor the latter by a wide margin (Neuman 1991). But some aspects of sprawl appear to appeal to Americans. Individuals were found to favor homogeneous neighborhoods over mixed neighborhoods by a margin of two to one (Bookout 1992). Survey research in Florida has suggested that individuals there have a strong preference for lowdensity or exurban living (Audirac and Zifou 1989).

***There is little evidence within the literature, however, to suggest that Americans find sprawl less attractive than more compact forms of development.***

On the subject of cultural activities, Shore (1995) contends that sprawl does not allow for the formation of communities that easily organize to support activities such as the arts. As a result, low-density residential communities may have fewer and lower-quality cultural activities than urban areas. Shore argues that a movement away from "spread city" and toward the restoration of downtown areas would result in more cultural activities and other services that are typically supported by large communities.

In general, few argue with the belief that an attractive and aesthetically pleasing community increases the overall quality of life. Within the economics and migration literature, it has been well documented that a community viewed as having a high quality of life will attract and retain individuals. Studies of migration patterns find that a community's scenery, natural environment, and outdoor recreational opportunities are important factors in attracting and retaining individuals. A survey study of migrants to and residents of 15 wilderness counties found that scenery and environmental quality were *more important factors* in attracting settlers than employment opportunities or cost of living (von Reichert and Rudzitis 1992). Two of the most important conditions that "lone eagles" (individuals who are able to live anywhere and telecommute to work) cited as influences on their decision to move to the state of Washington were the quality of the natural environment and the outdoor recreational opportunities found there (Salant et al. 1996). Cushing (1987) demonstrated that proximity to mountains and coastlines influenced population migration because of these natural resources' aesthetic qualities and the recreational opportunities that they provided. Empirical results indicated that interstate migrants were attracted to hilly terrain and major coastlines.

As noted, however, there is only some agreement about whether low-density developments are aesthetically less-pleasing than more compact development patterns. In particular, the literature fails to indicate a significant causal relationship between sprawl and aesthetically less-pleasing low-density development; there are numerous examples of unattractive higher-density inner suburbs in the Northeast and Midwest. What the literature does indicate, however, is that the aesthetics of low-density areas vary from place to place, and that the preferences of individuals vary from person to person.

*Literature Synthesis Matrix*

| | +2 *General Agreement* | +1 *Some Agreement* | 0 *No Clear Outcome* | –2 *Substantial Disagreement* |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | | X | |

## Weakened Sense of Community

*Allegation/Basis*

*Low-density development weakens households' connections* to both their immediate neighbors and to the larger metropolitan community, and encourages unsociable values. Sprawl weakens the linkages of residents—both among nearby neighbors, and among all other residents of their metropolitan area. Linkages with neighbors are reduced because low residential density, the heavy orientation toward car travel rather than foot travel, and the lack of neighborhood retail outlets and other meeting places diminish interpersonal contacts. Linkages with other residents throughout the metropolitan area are also diminished by the fragmentation of governance and fiscal resources that prevent commonality of purpose, and by the extreme diffusion of households and jobs throughout an area. The resultant loss of sense of community makes it difficult to generate support for region-wide attacks on social and other problems that cannot be solved by purely local policies and actions. Finally, because sprawl in its most pejorative manifestations is believed by most to be wasteful, unaesthetic, and antisocial, it does not nurture the important social values of ecology, sustainability, and community.

*Literature Synthesis*

Critics of sprawl often claim that a loss of "sense of community" is one of its greatest social costs (Ewing 1997). Defenders of low-density settlements, however, deny that residents experience any less "sense of community" than residents in big cities or more compact settlements (Gordon and Richardson 1997a). In fact, the evidence from as far back as 1954 (Herbert Gans as cited in Jacobs 1961) indicates that some dense areas lack community while some suburban areas have it. Much of the controversy arises because "sense of community" is difficult to define and even more difficult to measure.

In his review of the literature on "sense of community," Cochrun (1994) finds that the term has been used to describe a number of disparate elements, but the most comprehensive definition was developed by McMillan and Chavis (1986). McMillan and Chavis identified four factors that contribute to a sense of community:

1) membership;
2) influence;
3) integration and fulfillment of needs; and
4) shared emotional connection.

***"Sense of community" is difficult to define and even more difficult to measure.***

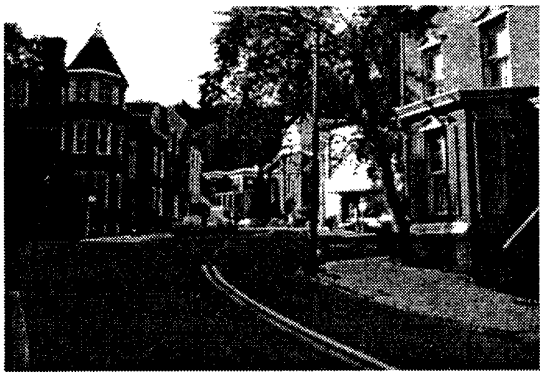
Cochrun offers a definition of "sense of community" that incorporates the four factors identified by McMillan and Chavis:

> People who have a strong sense of community feel like they belong in their neighborhoods, they believe they exert some control over what happens in their neighborhoods while also feeling influenced by what happens in them, and they believe that their needs can be met through the collective capabilities of their neighborhoods. (Cochrun 1994, 93)

In *Edge City: Life on the New Frontier,* Garreau (1991) searches for a definition of community, particularly within edge cities, and reaches the conclusion that community and neighborhood no longer mean the same thing. Instead, Garreau maintains that "mobility" and "voluntary" are two important terms that help to define community—individuals want to

be able to both join and leave communities at their choosing. Moreover, Garreau contends that a community should be a "social grouping" that is readily available to individuals and does not interfere with individual freedoms.

In partial contradiction, Lemann (1989), in an article examining changes in suburban Illinois, found that community-building efforts in Naperville, a fast-growing suburb of Chicago, were hindered by the high rate of turnover of its residents.



Curved streets and mixed uses help to create a sense of community.
*Source:* Courtesy American Planning Association.

Critics of sprawl argue that residents in mixed-use neighborhoods have more sense of community and social interaction than do residents living in low-density developments because they are more likely to walk from place to place and, consequently, they are more likely to have contact and interaction with others. Residents in low-density areas, on the other hand, rely more on their cars for shopping and recreation trips and, hence, are less likely to develop contacts and friendships with neighbors (Nasar and Julian 1995). Drawing on the work of Glynn (1981), Nasar and Julian assessed the psychological sense of community across different neighborhoods and housing conditions in northwestern Columbus, Ohio. They found that residents of mixed-use areas had significantly more sense of community than residents of single-use neighborhoods.

Opponents of sprawl also maintain that low-density development weakens a "sense of community" by segregating residents (Duany and Plater-Zyberk 1995; Kelbaugh 1993). According to Kelbaugh, suburban insularity breeds "ignorance, misunderstanding, and ultimately builds tension" among residents. Kelbaugh prefers high-density, mixed socioeconomic, racial, and ethnic neighborhoods because they allow individuals to "rub shoulders" with fellow residents on a daily basis and work out differences. Similarly, Duany and Plater-Zyberk contend that suburban housing fosters a breakdown of the larger community because it segregates residents by income into enclaves.

Kunstler (1996a) attacks suburban sprawl and the zoning laws that have created it. The allegation that low-density residential living lowers "sense of community" may be inferred from his remark that "The model of human habitat dictated by zoning is a formless, soulless, centerless, demoralizing mess. ... It corrupts and deadens our spirit." Like Duany and Plater-Zyberk (1995), Kunstler argues for development patterns that are mixed-use and provide housing for people with different incomes.

Sprawl may weaken not only neighborhood connections but also connections between family members who occupy the same residence. Some contend, for example, that sprawl reduces the amount of time parents spend with their children because more households must have two people working outside the home in order to pay for the multiple automobiles required by daily life.[1] This need to

[1] Some have argued that even if only one person working outside the home could support a one-car

support the household's transportation facilities may, in fact, even reduce the quality of child care provided by parents. Some contend that mothers working outside the home provide lower quality child care than those who stay at home. The subject is fraught with controversy (Joseph 1992). Meanwhile, Kelbaugh (1993) examines another potential noneconomic social cost associated with sprawl—the tensions that result from parents spending long hours commuting instead of with their children or each other.

***Sprawl may weaken not only households' connections to neighbors and the larger community, but it may also weaken connections between family members who occupy the same residence.***

The literature does not readily provide support for the opposite allegation—i.e., that low-density development strengthens households' connections to both their neighbors and larger community. Ewing suggests, however, that low-density development does not provide residents with any less "sense of community" than higher-density development. After reviewing extensive literature on sprawl, he concludes that there is not enough evidence to determine whether a lack of an identifiable community is associated with sprawl (Ewing 1994).

One further issue related to a lack of "sense of community" is the emergence of a "throw-away" mentality or, more elegantly, the lack of value for ecology and sustainable lifestyles. Some argue that sprawl encourages a "throw-away" mentality among households.

family, most residents of sprawl settlements need two cars for conducting daily family life. The lowdensity pattern of both housing and jobs makes use of public transit impractical for commuting and daily errand-running.

***Sprawl development may be seen as a continuation of the "prairie psychology" of early American settlers who believed they could change their current situation by leaving existing homes and problems behind and moving west onto vacant land.***

In a sense, sprawl development may be seen as a continuation of the "prairie psychology" of early American settlers who believed they could change their situation by leaving existing homes and problems behind and moving west onto vacant land (Delafons 1962). More recently, millions of American households have moved out of central cities and older inner-ring suburbs for the same reason—to escape the problems of those areas. They have left the problems behind for others to solve. Few, if any, studies of sprawl have dealt with this issue, and none have proposed any way to measure the "throw-away" mind-set.

*Literature Synthesis Matrix*

| | +2 *General Agreement* | +1 *Some Agreement* | 0 *No Clear Outcome* | –2 *Substantial Disagreement* |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | X | | |

**Greater Stress**

*Allegation/Basis*

*Because people spend more time driving, they have less free time and more stress.* This allegation has two components: first, that sprawl increases the time people spend in cars relative to higher-density forms of development and, second, that increased travel time leads to stress and other impacts. It has also been alleged that commuting through the aesthetically unattractive environments of commercial

strip development that are typical of sprawl produces more psychological stress on commuters than would commuting through environments dominated by trees and open space.

*Literature Synthesis*

Here, as with many of the topics evaluated in this report, there is substantial overlap with other topics and their alleged effects. In this case, the overlap is with transportation effects, which include allegations about traffic congestion and travel times.

Much of the debate about commute time has been based on data that compare travel times for residents of suburbs and central cities. There is little data on travel times associated with density of development. Ewing (1997), in his analysis of household travel patterns in a sprawling Florida county, purports to show that households living in the most accessible areas spend about 40 minutes less per day traveling by vehicle than do households living in the least accessible locations (Ewing 1995c; Ewing et al. 1994). Ewing states that this savings in travel time is due almost entirely to shorter auto trips, and that the significant land-use variable affecting travel times is regional accessibility, not local density (Ewing 1997).

There is also evidence that greater commuting time increases the stress of commuters. Novaco et al. (1990) found that increased travel impedance, as measured by commuting distance and time, is associated with increased measures of stress. Travel impedance was also found to have statistically significant effects on job satisfaction, work absences due to illness, and overall incidence of colds or flu. Subjective or perceived conditions of travel impedance were found to have statistically significant effects on mood at home in the evening and chest pain. Consequently, the study found that job change, in its sample, was primarily related to commuting satisfaction. The study validated results from the author's previous work, which had found that impedance characteristics of commuting raise stress levels, as measured by effects on blood pressure, tolerance for frustration, negative mood, and overall life satisfaction. This earlier work also found that the desire to change residence because of transportation conditions was related strongly to high impedance (Novaco et al. 1979; Stokols and Novaco 1981; Stokols et al. 1978). The physical stress effects of impedance have also been corroborated by a study of the effects of average commuting speed on blood pressure and frustration levels (Schaeffer et al. 1988).

***Increased travel impedance, as measured by commuting distance and time, is associated with increased measures of stress.***

Koslowsky and Krausz (1994) directly addressed the links among commuting time, stress, and workers' attitudes toward their jobs, in a statistical analysis of survey responses from more than 600 nurses. The researchers found that commuting is a possible source of recurrent stress, which can lead to undesirable organizational consequences. This study also found that the correlation between commuting time and stress was stronger for those who drove to work than for those who used public transit. But the authors do not rigorously explore the reasons for this difference. Koslowsky and Krausz do cite prior literature that found a relationship between the commuting experience and such organizational outcomes as absenteeism (Taylor and Pocock 1972), lateness (Gaffuri and Costa 1986), and turnover (Seyfarth and Bost 1986).

Although the link between commuting and stress is well established, the literature on the stress effects of commuting does not rigorously address the link between commuting stress and the density of development or urban form. Novaco et al. (1990) begin to address this link with their finding that stress effects are strongly associated with freeway travel and with road exchanges; they also assert that freeway travel in southern California has become increasingly congested because roadway capacity has not kept pace with continued growth.

***Literature on the stress effects of commuting does not rigorously address the link between commuting stress and the density of development.***

Although it has been alleged, as noted earlier, that commuting through the aesthetically unattractive commercial strip development typical of sprawl produces more psychological stress on commuters than does commuting through environments dominated by trees and open space, very little literature pertaining to this allegation exists. One study, however, claims to have tested commuters psychologically and arrived at a finding that supports this claim (Ulrich et al. 1991).

Other sections of this report comment in more detail on the evidence regarding sprawl and travel time. No conclusion is made here. The professional literature suggests, however, that commuting can be shown statistically to contribute to stress—a happy coincidence of science and common sense.

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | X | | |

## Higher Energy Consumption

*Allegation/Basis*

*Under sprawl, society consumes more scarce energy, especially imported oil.* Sprawl requires more travel overall and more of this travel is by energy-inefficient automobiles instead of more efficient modes of transit.

*Literature Synthesis*

Ewing (1997) and many other researchers contend that the evidence consistently demonstrates that automobile use, and hence energy use, is higher with sprawl. Yet, Gordon and Richardson (1997a) are not convinced that the link between vehicle miles of travel, energy use, and density is firmly established.

Americans are among the heaviest consumers of energy in the world. Although oil is primarily imported, the government subsidizes and reduces the cost of gasoline.
*Source:* Anton Nelessen, Rutgers University, Urban Design Studio.

Coloring this argument are the differing perspectives on energy availability.

Gordon and Richardson (1997a) speak of an energy glut and an OPEC cartel that has lost its clout, while Ewing (1997) cautions that energy sources are not unlimited, and reliance on foreign energy supplies is a continuing concern for United States foreign policy.

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | X | | |

## More Air Pollution

*Allegation/Basis*

*Sprawl worsens the overall air pollution in a metropolitan area.* Sprawl is alleged to generate more vehicle miles of travel than other forms of development and to produce more total vehicle emissions as a result. Under many local climatic conditions, this can generate a greater total amount of air pollution, even though it may result in less intense local pollution than would occur in some very highdensity portions of more compact regions.

***Sprawl can generate a greater total amount of air pollution, even though it may result in less intense local pollution.***

*Literature Synthesis*

Most, but far from all, observers agree that low-density settlements generate more total automotive travel than more compact settlements, other things being equal (see prior discussion). Therefore, low-density settlements are presumed to generate more auto-oriented emissions per 100,000 residents. However, the intensity of air pollution in each metropolitan area is affected by many factors, including the locations of major urban centers, prevailing winds, mountain barriers, temperature inversions, and general climate. Hence, there is substantive disagreement whether sprawl is a key factor in determining the degree of air pollution in each metropolitan area.

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Burchell, in the *Impact Assessment of the New Jersey State Development and Redevelopment Plan,* found that air pollution would be very similarly reduced in the future under either sprawl or compact development scenarios (Burchell 1992a). Most of the reduction would be due to more stringent emission controls that would affect the entire motor vehicle fleet of New Jersey, as opposed to the region where this fleet would be replaced. In other words, development pattern, at least in this instance, did not significantly influence air pollution levels. (The New Jersey *Impact Assessment* also considered effects on water pollution under trend [sprawl] and plan [compact] conditions. Plan conditions were found to generate about one-third less water pollution than trend, although heavy metals in urban stormwater runoff were increased under the plan development scenario.)

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | | | X |

## Lessened Historic Preservation

*Allegation/Basis*

*Sprawl makes it difficult to preserve historically significant older structures.* Sprawl encourages businesses and households to leave older cities and innerring suburbs by permitting them to move to the exurban areas without paying the full marginal costs of their doing so. Through publicly financed roads, water and sewer line extensions, and special tax benefits, taxpayers are often forced to subsidize sprawl-type development. Simultaneously, regulatory and policy barriers make it more difficult for developers to rehabilitate and revitalize existing communities. Therefore, the economic base supporting older structures of historical significance located in inner-city neighborhoods is weakened. Neighborhood conditions in the vicinity of such structures also worsen because of the increased concentration of poverty; historic structures located there are eventually consumed by these forces.

***Sprawl encourages businesses and households to leave older cities and inner-ring suburbs by permitting them to move to the exurban areas.***

*Literature Synthesis*

This allegation has been put forward mainly by the National Trust for Historic Preservation in its various publications attacking sprawl.

The following argument (Beaumont 1996a) summarizes the reasoning behind the professed association between sprawl and preservation. Beaumont is one of the few observers of sprawl who has commented on whether or not this association is valid.

As residents and businesses leave the urban areas, older buildings are often abandoned and begin to decay.
*Source:* Courtesy CUPR Press and HUD Photo Library.

According to Beaumont, sprawl affects historic preservation in five major ways:

1) Sprawl adversely affects older downtown areas and neighborhoods, where historic buildings are concentrated. When the economic vitality of a historic area suffers, the buildings in it often become underused or empty. Over time, many of them are "demolished by neglect" or torn down to make way for surface parking lots.

2) Sprawl destroys community character and the countryside. Cohesive main streets, old stone fences, historic trees, country roads—these and other features of the American landscape are rapidly being destroyed by sprawl development and the vast expanses of asphalt required to accommodate it.

3) Sprawl reduces opportunities for face-to-face interaction among people, thereby making it more difficult to create, or retain, a sense of community. By scattering the elements of a community across the landscape in a haphazard way, sprawl provides no town centers and reduces the sense of ownership—and therefore also the commitment—that people have toward their community.

4) Sprawl forecloses alternatives to the automobile as a means of transport, thereby adding to pressures to create or widen roads that often result in the demolition of historic resources or the degradation of their settings.

5) Sprawl leaves older cities and towns with excessively high concentrations of poor people with social problems, making these places a very difficult environment in which to revitalize communities. (Beaumont 1996a, 264)

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | | X | |

## SPRAWL'S ALLEGED POSITIVE IMPACTS

### Preference for Low-Density Living

*Allegation/Basis*

*Many households prefer low-density residential living.* Many consumer preference surveys reveal that a key part of the "American dream" is ownership of a detached, single-family home with attached private open space in the form of a backyard. More important than the stated preference, however, is the revealed preference: for the last 50 years, suburban development has been the primary form of metropolitan residential growth, and single-family housing units have been the dominant residential form. Consumers clearly choose low-density suburban living given existing alternatives and prices. Most housing developers consistently build low-density subdivisions because they are easier to market than higher-density developments. In order to make this low-density single-family, detached housing affordable to most people, it is generally built at the urban fringe where land prices are lower (Downs 1994).

*Literature Synthesis*

The suburbanization of population and jobs in the United States has been well documented. In 1950, almost 70 percent of the population of 168 metropolitan areas lived in central cities; by 1990 over 60 percent of the population of 320 metropolitan areas lived in the suburbs, and a majority of jobs in metropolitan areas were in the suburbs as well (Rusk 1993). The process of suburbanization has lowered average population densities in urban areas. Between 1950 and 1990, the number of residents in urbanized areas, with populations over one million in 1990, increased 92 percent, while average population density decreased 44 percent (Wendell Cox Consultancy 1996). The fact that so many Americans choose to live in low-density areas has been cited as strong evidence that Americans prefer that lifestyle.

***The fact that so many Americans choose to live in low-density areas has been cited as strong evidence that Americans prefer that lifestyle.***

People appear to be willing to pay for different land use and community forms. The most recent annual survey by Fannie Mae (1996) shows that homeownership is a top priority for 69 percent of Americans, and 73 percent desire a single-family detached house with a yard on all sides.

Another study that generated quality-of-life rankings for the fifty U.S. states over the period 1981-1990 found that sparsely populated, mountainous Western states such as Montana and Wyoming had a higher quality-of-life ranking than the

more densely populated states in the East and Midwest (Gabriel et al. 1996). Urban congestion has been cited by "lone eagles" (individuals who are able to live anywhere and telecommute to work) as a factor influencing their decision to move (Salant et al. 1996).

A 1997 issue of the *Journal of the American Planning Association* (Winter 1997) has two articles dealing with sprawl that summarize many of these arguments. Gordon and Richardson (1997a) revisit several issues relevant to the compact cities discussion, including residential density preferences. They maintain that consumers, given the choice between low-density suburban living and high-density urban living, overwhelmingly choose the former: "But that suburbanization itself should be an object of attack is amazing, given the expressed preferences of the majority of Americans for suburban lifestyles and the supposed sanctity of consumer sovereignty." Drawing on the literature, they attempt to dispel the belief that the choice of low-density residential living is a constrained choice, strongly influenced by government policies that promote suburbanization, including subsidized automobile use and zoning laws that restrict high-density development. Gordon and Richardson argue that more subsidies per user are given to public transit than to auto travel; hence, government policies do not necessarily promote low-density living over highdensity living. In response to the argument that developers are prevented by zoning and land-use regulations from building at higher densities, Gordon and Richardson maintain that developers just offer what the market demands: "The risks of building an unacceptable product are very high, and builders are well aware of the strong consumer preference for the single-family detached home."

The single-family detached home, with garage, in the suburbs is the preferred housing type in America.
*Source:* Florida DCA.

Though Ewing (1997) agrees with Gordon and Richardson (1997a) that the recent choice of U.S. households has been for low-density suburban living over high-density urban living, he contends that given a larger set of single family residential environments, consumers do not necessarily favor the former: "There is strong consumer preference for new single-family detached housing—a housing type concentrated in the suburbs. But most people could do without the rest of the suburban package" (Ewing 1997). Ewing maintains that compact development is capable of holding its own in the marketplace and cites evidence from the literature on consumer preferences. According to Ewing, the literature reveals several interesting facts:

1) The suburbs often rank below small towns, villages, and rural settings as a desirable place to live.
2) Home buyers, given a choice, are evenly divided on whether they prefer low- or medium-density residential settings.
3) Home buyers in high-priced housing markets often prefer small-lot houses.
4) The public, given a choice, is almost evenly divided on whether it prefers mixed- or single-use areas.

In his earlier study, "Characteristics, Causes, and Effects of Sprawl: A Literature Review," Ewing (1994) offered additional evidence to bolster his contention that consumer preference surveys do not clearly support low-density living over more compact forms of settlement. Surveys where people are shown images of both sprawl and traditional communities reveal that, for the most part, the latter are favored by wide margins (Neuman 1991). Some surveys, however, have found that people favor homogeneous neighborhoods over mixed-use neighborhoods by a margin of about two to one (Bookout 1992), and that people prefer low-density suburban or exurban living (Audirac and Zifou 1989).

***Recent choice of U.S. households has been for low-density suburban living over high-density urban living.***

Other surveys of consumer preferences have also shown mixed results. A September 1995 survey of people who shopped and ultimately bought units in planned communities indicated that 57 percent of the respondents agreed with the statement "I'm tired of living in the sterile uniformity of most suburbs." Yet, more than three-fourths of the respondents believed in the American dream of a big yard and a house set back from the street (Bradford 1996).

There may be something approaching universal agreement that U.S. residential patterns in metropolitan areas have become increasingly suburbanized (i.e., have lower density or sprawl). There is probably close to general agreement that many, if not a majority, of U.S. households prefer single-family detached housing given current options and prices—albeit observers raise the issue whether households would move in significant numbers if other options were available.

***Fifty-seven percent of the respondents agreed with the statement "I'm tired of living in the sterile uniformity of most suburbs." Yet, more than three-fourths of the respondents believed in the American dream of a big yard and a house set back from the street.***

The question about whether sprawl is strongly linked to these residential choices is a matter of interpretation. At one extreme, the choice of low-density housing is, in essence, the definition of sprawl, so the question of whether it is caused by sprawl is a circular one. Another interpretation is that the mere existence of the pattern (sprawl) and its accompanying low-density housing influences people's preferences, like the advertising of any product.

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | X | | | |
| Is it strongly linked to sprawl? | | X | | |

## Lower Crime Rates

*Allegation/Basis*

*Low-density development patterns have lower crime rates.* Households move out of central cities to escape the high rates of crime encountered there. Relatively high crime rates are statistically associated with very low-income areas, especially within large cities. Such areas also often have much higher population densities than the neighborhoods typical of sprawl development.

*Literature Synthesis*

Statistics appear to indicate that urban residents experience higher rates of crime than their suburban or rural counterparts. In 1994, the estimated rate (per 1,000 persons aged 12 and older) of personal victimization, which includes robbery, assault, rape, and personal theft, was highest for inhabitants of urban areas (67.6). Suburban areas experienced a rate of personal victimization of 51.8; rural areas had a rate of 39.8 (Pastore and Maguire 1996). Crime statistics released by the Federal Bureau of Investigation (FBI) for 1995 indicate that the Crime Index (comprised of selected violent and property offenses) was higher in Metropolitan Statistical Areas (MSAs) (5,761 per 100,000 inhabitants) than cities outside MSAs (5,315 per 100,000). Rural counties had the lowest index number—2,083 per 100,000 inhabitants (Federal Bureau of Investigation 1996).

***Research does not strongly indicate that the higher-density living commonly found in urban areas is associated with higher crime rates.***

Other research, however, does not strongly indicate that the higher-density living commonly found in urban areas is associated with higher crime rates. Using 1974 census data, Newman and Kenworthy (1989a) correlate density with crime statistics for 26 major U.S. cities. Simple linear correlations suggest that there is no significant relationship between crime and density. Similarly, correlational studies within the environmental psychology literature find no consistent relationship between population density and social pathologies (Sherrod and Cohen 1979).

Several studies indicate that communities with high quality-of-life rankings exhibit low crime rates (Roback 1982, 1988). The amount of crime in a community may also affect migration patterns for both workers and firms. Salant et al. (1996) and von Reichert and Rudzitis (1992) found that the amount of crime was a factor that influenced individuals' decisions to migrate to a community that they perceived would provide a better quality of life.

Results from the Salant et al. study also indicated that individuals were attracted to locations that provided a safe place to live. A study using data from the *1983 Annual Housing Survey*, however, found that few individuals moved to a particular neighborhood for greater safety (Spain 1988). The main reasons for moving that survey respondents reported were to find a less expensive place to live and to reduce their commuting times.

A study by Gottlieb (1995) concludes that firms in the high-tech sector are less willing to locate in areas characterized by high levels of violent crime.

Inner-city, high-density areas are believed by some to foster crime and decay.
*Source:* Courtesy CUPR Press and HUD Photo Library.

Other studies have found that perceptions of personal safety differ between residents of high-density urban areas and low-density suburban areas. A 1995 nationwide telephone survey of more than 1,400 adults attempted to discern how

safe individuals felt in their communities. When asked, "In the past year do you feel safer, not as safe, or about the same on the streets in your neighborhood?" 14 percent of suburban residents, compared to 22 percent of urban residents, felt less safe. On the other hand, 12 percent of urban residents, compared to 9 percent of suburban residents, felt their safety had increased over the past year (Pastore and Maguire 1996). Through interviews, Hummon (1990) determined that rural residents view danger as both an integral part of city life and an indicator of social problems. Urban residents, however, consider crime and danger to be more a factor of socioeconomic conditions and location than an integral part of city life. Using surveys of low-income, single mothers, Cook (1988) found that urban women were two times more likely than suburban women to indicate they felt unsafe in their apartments and neighborhoods.

***A low crime rate is one of the top 10 quality-of-life characteristics desired by* Money *magazine subscribers.***

Researchers within the criminal justice field conclude that perceptions of crime and security vary with site characteristics and socioeconomic conditions; thus, fear of crime does not always accurately reflect actual crime rates. Instead, fear of crime is often derived from incomplete knowledge of crime rates, observable evidence of disorder, and prejudices arising from neighborhood change (Skogan 1986). Other studies conclude that the direct effects of the physical environment on crime rates range from small to moderate (Taylor and Gottfredson 1986).

Within the popular literature, there appears to be agreement that crime reduces a community's overall quality of life. Studies from popular literature commonly use crime as one measure of a community's desirability. Quality-of-life rankings of cities in the *Places Rated Almanac* (Savageau and Boyer 1993), *Money* magazine's "Best Places to Live in America" (Fried et al. 1996), and *Fortune* magazine's "Best Cities: Where the Living is Easy" (Precourt and Faircloth 1996), all include some measure of crime as a component of a community's overall quality of life. In particular, Fried et al. found that a low crime rate is one of the top 10 quality-of-life characteristics desired by *Money* magazine subscribers.

In short, selected crime statistics obtained from the Federal Bureau of Investigation indicate that lower-density developments, such as suburban and rural areas, have lower crime rates than high-density urban areas. Empirical studies that have examined the relationship between crime and density, however, have found mixed results—increased density does not necessarily result in higher crime rates. The mixed results may be a factor of how individual studies define and measure crime and crime rates. There appears to be agreement that suburban residents perceive themselves to be safer than their urban counterparts.

Although the literature appears to demonstrate, at best, correlation between density and crime, it does not demonstrate causality between sprawl and low crime rates. Studies have found that the effect of physical environment on crime rates ranges from minimal to moderate and that crime is more a factor of socioeconomic conditions than density. An argument might be made that sprawl reduces crime rates in a roundabout way—sprawl is correlated with higher incomes which, in turn, are often correlated with greater spending on home protection and public safety. This

argument, however, does not demonstrate that sprawl causes lower crime rates.

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | | X | |

**Enhanced Value or Reduced Costs of Public and Private Goods**

*Allegation/Basis*

*Many households find the cost of public services and some private services in suburban locations a better value.* For the public sector, suburban locations often provide better services (especially schools) for an equivalent or lower tax burden. For private-sector goods and services, particularly retail sales, the lower land values in suburban areas allow land-intensive development formats, which include expansive ("big box") floor space and parking. These development formats, in turn, attract high-volume, low-cost retailers.

*Literature Synthesis*

The alleged benefit for *public* services substantially overlaps the alleged benefits reviewed under the heading Social Issues in this literature review. Two of the alleged benefits discussed there are germane here:

1) The ability of jurisdictions to define a relatively homogeneous population with relatively similar service needs (which also provides opportunities for both economies of scale and concentration), and the ability to drop services not needed by the homogeneous population (i.e., social services for low-income households).
2) The ability to have different tax levels and service qualities.

There is an ongoing professional debate about the institutional structures by which public services are most efficiently and fairly provided, and a large body of literature on the subject. Not surprisingly, the poles of the debate are occupied by those who believe in the efficiency of markets and those who believe markets operate imperfectly without government intervention. In the 1950s, Tiebout (1956) laid out the basic arguments for market choice (which, when applied to government, is sometimes referred to as "public choice"). He argued in favor of multiple small governments that allow households to "vote with their feet," choosing to live where the combination of public services, quality, and cost best meet their preferences.

***Multiple small governments allow households to "vote with their feet," choosing to live where the combination of public services, quality, and cost best meets their preferences.***

In contrast are those who argue (see, for example, Foster [1996]) that typical market failures in the provision of public goods require larger units of government so that external costs can be internalized, increasing the odds that sufficient public goods will be provided. Arguments are made for the improvement of both efficiency and equity.

Because this topic is considered elsewhere in this report, it is merely alluded to here. There is certainly no agreement on this subject. Nor is any likely, since to come to a conclusion would require, among other things, agreement on two issues on which people's opinions derive

as much from underlying philosophies as from the results of social science: 1) the proper scope of government intervention, and 2) the trade-offs between efficiency and equity.

For *private* goods, there is ample anecdotal evidence that big box retailers make their money by high volumes on low margins, which for consumers means low cost. The growth of these retailers (e.g., Wal-Mart, Home Depot, Costco) is evidence of demand and suggests that they are giving consumers more of what they want (Linneman 1995). Additional anecdotal evidence suggests that many people who would oppose such retailers in their neighborhoods are some of the same ones who drive, often substantial distances, to shop at these stores in other parts of a region.

The next question, however, is: To what extent are low-density development patterns essential for these cost savings? Recent work done to help evaluate the impacts of managed growth plans for metropolitan Portland, Oregon (ECONorthwest 1996) sheds some light on this issue. After quantifying vacant land supply, researchers conducted focus groups and work sessions with retail developers and brokers. Their opinion was that to satisfy today's consumers most retail development had to accommodate the automobile, and as a result, vacant, low-priced land in sizable parcels was critical to retail development, especially big box retail. High density areas are likely to have higher land values, less vacant land, smaller parcels, and more existing residents to oppose the new retail development.

A few central cities have seen new discount retailing. In most cases, however, the development has occurred on underutilized industrial parcels whose zoning either defines the retail uses as compatible or makes variances easy to receive. In these cases, low-value land is still the primary factor allowing the development to proceed.

***Market failures in the provision of public goods require larger units of government so that external costs can be internalized.***

There is reasonable evidence to conclude that people want goods at lower prices in lower-density parts of metropolitan areas. As with other effects, whether sprawl *causes* this effect is a matter of interpretation. On one hand, sprawl *is* the effect; the low-density retail pattern is what enables retailers to reduce prices. On the other hand, a pattern of sprawl may be causal if it implies more retail of the same type is desirable and allowable, and if it creates a pattern that allows more low-cost land to be developed more easily. Sprawl probably does both.

*Literature Synthesis Matrix*

| | +2 *General Agreement* | +1 *Some Agreement* | 0 *No Clear Outcome* | –2 *Substantial Disagreement* |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | | X | |

**Fosters Greater Economic Well-Being**

*Allegation/Basis*

*As an outcome of a free market, sprawl benefits from the market decisions made by individual households and firms to maximize their welfare* (as measured by utility or profit). By restricting these individual choices, efforts to limit sprawl will reduce the overall standard of living.

A central tenet of free-market economics is that individual households and firms act in ways to maximize their welfare, and the result of these individual decisions is to maximize welfare for society as a whole. In this context, sprawl is considered to maximize welfare for society because it represents the outcome of individual choices by households and firms about where to locate and how to build homes and businesses.

Critics of free-market economics point out that decisions are based solely on the costs and benefits faced by the individual household or firm, and so do not consider the costs or benefits to others that may result from their decision (the costs and benefits to others are referred to as *externalities*). Critics of sprawl point out the negative externalities—traffic congestion, increased public infrastructure costs, and accelerated development of farmland and open space, for example—and argue that these externalities reduce social welfare. Critics of sprawl often suggest policies to address the negative externalities of sprawl. It is the debate over these policies that the alleged impact on economic wellbeing is most often discussed.

There is also extensive debate about the level of negative externalities; whether these externalities are caused by sprawl, and the effectiveness of policies to address these externalities. This debate occasionally touches on whether the policies will affect the costs and benefits faced by individual households and firms.

A primary concern is whether policies to limit sprawl will increase the cost of housing—this impact is addressed elsewhere in this literature review. An argument that is also occasionally raised is whether policies to limit sprawl will in turn limit job growth in an area, thereby reducing income for area residents and limiting economic development opportunities. These are the impacts that are focused upon in this section.

*Literature Synthesis*

In the New Jersey impact assessment, Burchell (1992a) found that New Jersey could accommodate similar magnitudes of population and employment growth under both trend and plan development patterns. Distributional patterns would differ, however. Plan development would direct more jobs to urban and rural centers and fewer to suburban areas than trend.

Sheppard (1988) relates sprawl to the economic well-being of residents. Sheppard found that an increase in space available to a particular class of residents results in lower rents at all locations, increased "suburbanization" for all classes, and increased utility for all classes. Sheppard cautions the reader, however, that the results consider neither externalities nor the public good associated with the exercise of development controls.

Most authors argue simply that sprawl must maximize societal welfare because it results from free-market decisions (Gordon and Richardson 1997a). This obviously ignores the public contributions of both highway and arterial capacity. The benefits of sprawl that affect economic well-being are most often addressed in arguments against policies to limit sprawl. These arguments are based on the considerable literature that shows that increased density increases the cost of land. It is argued that an increase in density will reduce job growth and economic development opportunity by increasing the cost or limiting the number of sites available for commercial development, and by increasing the cost

of housing, which in turn will limit the supply of labor (ECONorthwest 1994).

### *Growth controls raise housing prices in communities where they are established.*

There is considerable evidence that measures to control growth cause the price of land to increase. Shilling et al. (1991) found that state land-use controls both restrict the supply and increase the demand for residential land, driving up its price. Brueckner (1990) cites a large empirical literature documenting the effects of growth controls on housing and land markets. His evidence points to the fact that growth controls raise housing prices in communities where they are established (Dowall and Landis 1982; Katz and Rosen 1987; Schwartz et al. 1981, 1989).

Most of the literature that addresses the impact of growth controls on land prices focuses on the residential land market. There appear to be very few articles that address the impact of sprawl, or measures to control sprawl, on commercial land markets, the level of employment growth, or wage income. While there are logical reasons to suspect that uninhibited growth fosters more employment and wage growth than limited growth, the literature does not document this at all.

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | -2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | X | | |

**CHAPTER**

**7**

# *Literature Synthesis*

# SOCIAL ISSUES

There are many social issues related to sprawl. Assembled for this review is literature focusing on how sprawl affects the places and the people that are not part of this phenomenon. This includes, as a starting point, studies on the "condition" or "health" of cities, especially relative to proximate suburban communities.

Examined next is a group of studies considering the historical development of suburbs with the recurring leitmotif of separation of, and exclusion from, the older urban center. Also considered are numerous recent studies that link the welfare of cities to the economic and social health of the overall metropolitan area and propose, in turn, that urban revitalization is futile without a closer integration of cities and their suburbs.

Conditions of cities and the interconnections between cities and suburbs are viewed in depth in this literature. Cities are considered not only as being important in their own right for retaining higher-order central place functions but are linked to suburbs as a necessary stabilizer of the overall metropolitan economy. In much of this literature, sprawl, which encourages outward movement of population and functions from cities, is cast as a detriment both to cities and ultimately to suburbs as well.

But there is an alternative view. Cities are viewed in this literature as relics that have lost much of their purpose as population and employment have suburbanized. Yet, for the urban poor and minorities, there was hope in the form of zones of emergence (Sternlieb and Beaton 1972). These were the better areas of cities and inner-ring suburbs which, as their more mobile populations left for the more vigorous outer-ring suburbs, offered themselves as places for the disenfranchised to emerge.

This view is analogous to the concept of filtering in housing. Filtering provides housing to the poor in the form of modest units that are vacated over time as former occupants seek housing with more amenities. Similarly, more affordable inner-ring suburbs filter down to become, over time, the suburban zone of emergence for urbanites and minorities. In this view, an unrestrained ability to move to the suburban outer ring—one of the characteristics of sprawl—is essential

to allow inner-ring neighborhoods and communities to filter down, much as the ability to consume better housing is the linchpin on which housing filtering rests.

**Sprawl's Alleged Negative Impacts**

*Fosters Suburban Exclusion*
*Fosters Spatial Mismatch*
*Foster Residential Segregation*
*Worsens City Fiscal Stress*
*Worsens Inner-City Deterioration*

**Sprawl's Alleged Positive Impacts**

*Fosters Localized Land Use Decisions*
*Enhanced Municipal Diversity and Choice*

## SPRAWL'S ALLEGED NEGATIVE EFFECTS

### Fosters Suburban Exclusion

*Allegation/Basis*

*Suburban exclusionary zoning increases the concentration of low-income households in certain neighborhoods.* Most low- and moderate-income households cannot afford to live in suburbs where exclusionary zoning raises housing costs; thus, such households become disproportionately concentrated within central cities and older inner-ring suburbs. Housing in many parts of these communities is generally older, smaller, more functionally obsolete, less well-maintained, and much less costly to occupy than housing in newer suburbs. Moreover, subsidized housing units—especially those in public housing projects—are heavily concentrated within older neighborhoods in central cities and inner-ring suburbs, because residents of other areas—including most suburbs—refuse to permit them within their boundaries. This further concentrates very low-income households both within central cities and older suburbs, and within particular inner-city neighborhoods. The concentration of high proportions of very poor residents within older, deteriorated neighborhoods fosters conditions that are adverse to the welfare of residents. These include high rates of crime, drug abuse, delinquency, births out of wedlock, welfare dependency, unemployment, alcoholism, and mental illness. In addition, the quality of education received in public schools in these areas, or where children from such areas dominate, is very low.

*Literature Synthesis*

There is some disagreement about the degree to which suburban exclusionary zoning is responsible for poverty concentrations in core-area neighborhoods. Some observers believe other factors are as important in producing such neighborhoods (Downs 1994). These other factors include negative behavior patterns among the residents that make them unwelcome elsewhere; the concentration of deteriorated, very low-cost housing in such neighborhoods which attracts people who cannot afford better accommodations; the concentration of public housing units in such neighborhoods; the lack of public transportation in suburban areas that makes it difficult for poor persons without cars to live there; and the desire of poor households to live together in neighborhoods where public services aiding the poor are more easily accessible.

In contradiction, recent findings in New Jersey from the New Jersey Council on Affordable Housing (COAH) and similar findings from the Gautreaux (Chicago) and Special Mobility Program (SMP)

(Cincinnati) studies indicate that those who occupy affordable housing in more suburban locations take on the employment characteristics, ambition levels, and success rates of the population of those jurisdictions (Davis 1993; Fischer 1991; Wish and Eisdorfer 1996). In New Jersey, close to 15,000 affordable housing units have been built and occupied as a result of legislation emanating from the series of *Mt. Laurel* cases challenging exclusionary zoning practices in that state. Occupants of these housing units are employed, doing well at local schools, and integrated without incident in neighborhoods they would not have had access to without the court decisions.

The Gautreaux and Special Mobility Program studies show that residents moving from the central city to the suburbs using housing vouchers have higher rates of employment and higher salaries, and their children have better school attendance and higher grades, than families who choose not to move. While the confounding issue of self-selection is clearly present here—i.e., the successful and ambitious families are the ones that opted to participate in the moves—a growing body of literature indicates that "place" matters. There is a "rub-off" effect of place wherein success patterns can be communicated by residents to newcomers who specifically wish to improve their current economic and social positions (Poisman and Botein 1993).

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | | | X |

**Fosters Spatial Mismatch**

*Allegation/Basis*

*The resulting "spatial mismatch" between where most new jobs are being created (far-out suburbs) and where many lowskilled workers must live (inner-city neighborhoods) aggravates high rates of unemployment in inner-city neighborhoods.* The unlimited extension of urbanized uses on the periphery of the metropolitan areas permits many employers to move to locations that are very far from inner-city neighborhoods. Consequently, unemployed workers living in those neighborhoods can neither readily learn about job opportunities in far-out locations nor afford to commute to such jobs even if they learn about and qualify for them. This mismatch aggravates both high rates of unemployment in inner-city neighborhoods and suburban shortages of unskilled labor.

*Literature Synthesis*

Kain (1992) was one of the first to examine whether a mismatch exists between the increase in lower-skilled and otherwise attainable jobs in the suburbs and the high levels of unemployment of residents in central cities who should be able to access these jobs.

Spatial mismatch has also been examined by sociologists Kasarda (1990) and Wilson (1987) and by economists Ihlanfeldt and Sjoquist (1990). Although the original literature related the mismatch to black workers of all ages, later studies focused on the spatial mismatch as it affected young black workers. Race as the causative agent is the main focus of inquiry throughout most of the studies mentioned above. In other studies by Harrison (1974) and Kasarda (1990), causes of the mismatch (which according

to them may not be spatial) are extended to the inadequate skills and education of young black workers, and limited transportation or access to transportation. Findings on spatial mismatch, although not always consistent in unearthing a spatial component (see Harrison [1974], Ellwood [1986], and Leonard [1987]), are persistent in their specification of a mismatch of some type (Pugh 1998).


Poor inner-city residents often cannot reach jobs located in the suburbs.
*Source:* Bob Deammrich Photography.

The reality of this mismatch is a population desiring to be employed in one location and available jobs going unfilled in another. Often, the unfilled jobs are lower-order jobs that are not worth accessing by public transit if the prospective worker must also pay for child day care services to retain the job.

Other jobs similarly located in the suburbs may require skills that applicants, even after training, cannot meet. Or they may be jobs that casual workers available during the summer or during college breaks can easily meet without training.

The confluence of elements that create spatial mismatch is so complex that sprawl versus more compact development patterns probably play only a minor role. Spatial mismatch will grow to be a major issue with significant consequences as workfare replaces welfare. Moreover, the relationship between sprawl and central city unemployment rates, the bottom-line issue of the above discussion, is even more complex than relationships between sprawl and spatial mismatch.

***The confluence of elements that creates spatial mismatch is so complex that sprawl versus more compact development patterns probably play only a minor role.***

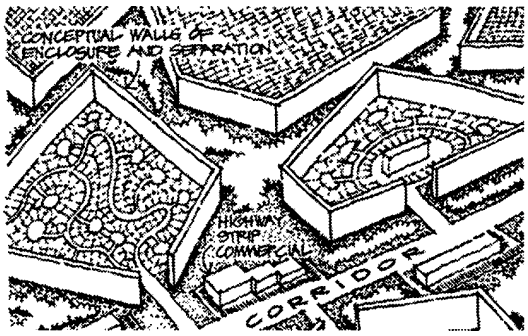
*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | X | | | |
| Is it strongly linked to sprawl? | | X | | |

**Fosters Residential Segregation**

*Allegation/Basis*

*Residential segregation by race and income is greater under sprawl than where less fragmented governance over land uses exists.* While socially segregated neighborhoods certainly exist in cities, exclusionary zoning by many outlying suburban communities inhibits the construction of relatively low-cost housing for low- and moderate-income households, most of whom are minorities. This occurs because residents of each community control land-use decisions therein. They usually take into account only their own interests in making such decisions—not the interests of the region as a whole or of citizens in other parts of it (Freilich and Peshoff, 1997). They have compelling economic motives for trying to minimize the number of low-cost housing units within their own communities. These include maintaining housing prices as high as possible and excluding households




Euclidean zoning by district can be used to foster homogenous neighborhoods with residents of similar incomes, profiles, and backgrounds.
*Source:* Illustration by Roger Lewis in *Growth Management Handbook* published by MSM Regional Council.

whose need for public services—especially schools—will cost the community more than the taxes these households will contribute to the community (Fischel 1985). Because Blacks and Hispanics tend to have much lower incomes, on average, than other major groups in American society, such income segregation is also an effective means of achieving ethnic segregation in many areas.

*Literature Synthesis*

There is only partial agreement about this allegation. Such a small number of metropolitan areas without fragmented governance over land uses exist in the United States that statistical testing of conditions in them versus conditions elsewhere probably are not valid.

Yet coming at this issue from another direction, those states and regions that have made overt efforts to provide affordable housing in locations where it has not before existed are achieving integration in those locations. In New Jersey, where a municipality must provide its fair share of affordable housing or lose its right to zone, racial and ethnic integration is taking place in what were once predominantly white outer-ring neighborhoods. New Jersey's affordable housing program requires that those who fill municipal quotas come from outside the municipality's boundaries but inside its commuting region. There are strict advertising and queuing requirements that ensure that minority households in central cities have an equal chance to occupy affordable housing in the suburbs. With these kinds of mandates, integration of neighborhoods moves quickly and directly (Wish and Eisdorfer 1996).

***Those states and regions that have made overt efforts to provide affordable housing in locations where it has not before existed are achieving integration in those locations.***

*Literature Synthesis Matrix*

| | +2 *General Agreement* | +1 *Some Agreement* | 0 *No Clear Outcome* | –2 *Substantial Disagreement* |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | | X | |

**Worsens City Fiscal Stress**

*Allegation/Basis*

*Under sprawl, central city governments become fiscally strapped or "squeezed,"* because they must provide costly services to large numbers of very poor households, while the properties owned, occupied, or patronized by such households produce relatively low per capita tax revenues. Low-income neighborhoods in particular have higher costs of crime and fire prevention, street cleaning, and public health and welfare services than middle- and upper-income neighborhoods. Yet the former produce lower property and sales tax revenues per capita than the latter. This situation forces city governments serving such communities to either raise taxes above

those in surrounding communities or to provide lower quality and quantities of key public services to their residents, or both.

*Literature Synthesis*

Only limited agreement exists on the extent to which sprawl is regarded as a major cause of fiscal stress. The concentration of very poor households within inner-city neighborhoods is surely not caused solely by suburban sprawl; many other causal factors largely unrelated to the specific form of growth within a metropolitan area also contribute to this result. Unfortunately, it is probably impossible to decide scientifically how to allocate "responsibility" for this outcome among these causal factors—a fact which presents an obstacle to "proving" that sprawl contributes significantly to this outcome.


As stores and offices move out, central cities must shift fiscal burdens onto those remaining, usually in the form of higher property taxes. *Source:* Teri Leigh.

The ability of households and employment to shift locations in a metropolitan area is virtually unrestrained. To the degree that households and employers seek safer and more aesthetically pleasing locations, even when these are found distant from the core, the households and employers will move there. If taxes are lower or tax incentives to relocate are offered, core-to-peripheral relocation will also take place.

If high-income residential and nonresidential properties are either "footloose" locationally or are being bid out of central locations to more distant locations, only those households and employers who are not footloose or are not bid out will remain. These are often the poorer households and businesses, which demand higher services and provide less revenues. The end result is a strain on public service districts in the form of higher service costs and reduced revenue receipts. When this happens, property taxes rise—sparking another wave of residential and nonresidential exodus (Sternlieb and Burchell 1977).

Most of the central city fiscal deterioration forces described above, although largely independent of development patterns, certainly need the defining characteristics of sprawl to operate. Fragmented governments in competition with each other for the "better" land uses create fiscal stress for those governments that cannot compete (Downs 1994).

***Most of the central city fiscal deterioration forces described above, while largely independent of development patterns, certainly need the defining characteristics of sprawl to operate.***

(See also Public/Private Capital and Operating Costs—Negative Impacts—More Adverse Public Fiscal Impacts.)

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | X | | |

## Worsens Inner-City Deterioration

*Allegation/Basis*

*A self-aggravating downward spiral of negative conditions and the consequent withdrawal of viable resources occurs in inner-city neighborhoods*, making them continually worse off. The presence of areas with deteriorating conditions in central cities tends to motivate many economically viable families and business firms to move elsewhere. The same conditions also discourage viable households and firms from moving into those cities in general, and into high-poverty neighborhoods in particular. As a result, the economic and social viability of the households and firms left residing in such communities deteriorates.

*Literature Synthesis*

There is only some agreement on the extent to which sprawl is a major cause of this downward spiral. The concentration of very poor households within inner-city neighborhoods is obviously caused by other factors largely unrelated to the specific form of growth within a metropolitan area.

A study of residential abandonment in cities nationally (Sternlieb and Burchell 1977) investigated numerous causal relationships including:

1) other abandoned structures on the block
2) race of tenant and owner
3) commercial use of part of the property
4) racial and economic characteristics of neighborhood and city.

The study found that the most significant causal relationship to central city abandonment was the amount of housing built outside the central city yet inside the city's metropolitan area (Sternlieb and Burchell 1977).

Row houses in Washington, D.C., lie decaying and empty as residents moved into surrounding suburbs.
*Source:* Ellis Herwig/Stock, Boston.

To the degree that significant amounts of housing are built farther out in the metropolitan area and the occupancy costs of this housing are comparable to, or cheaper than, existing housing, this new housing will be sought in preference to closer-in housing (Schafer 1975).

***The most significant causal relationship to central city abandonment was the amount of housing built outside the central city.***

Unfortunately, however, as with fiscal stress, it is probably impossible to decide scientifically how to allocate "responsibility" for this outcome among multiple causal factors.

(See also Quality of Life—Positive Impacts—Reduced Costs of Public and Private Goods).

### Literature Synthesis Matrix

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | | X | | |
| Is it strongly linked to sprawl? | | X | | |

## SPRAWL'S ALLEGED POSITIVE IMPACTS

### Fosters Localized Land Use Decisions

*Allegation/Basis*

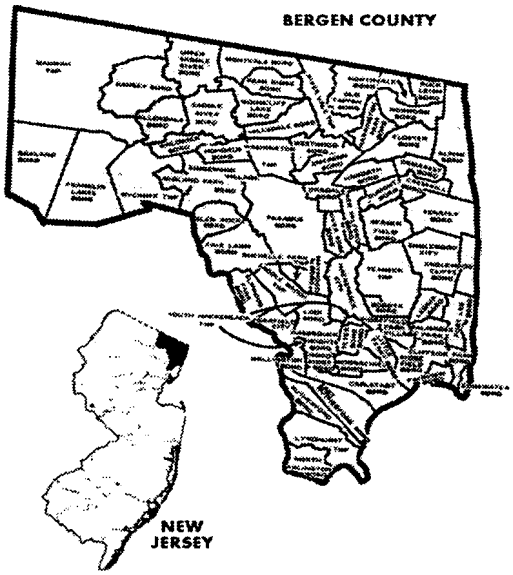
*Sprawl keeps government decisions about land use at the local level,* where individual citizens have much more chance of influencing the results than they do where regional decision making predominates. Because sprawl involves fragmentation of government powers among many relatively small localities, it keeps land-use decision making closer to the people most directly affected by it. This satisfies the strong American desire for local sovereignty. Like-minded citizens can pass zoning and other regulations that exclude types of development from their communities they do not like. This in turn allows them to prevent "socially undesirable" influences in their neighborhoods and schools. Such negative influences include potentially dangerous households with characteristics markedly different from their own, as well as region-serving land uses with negative local spillovers, like airports or incinerators.

*Literature Synthesis*

The literature dealing with the merit of local government praises its democratic responsiveness, as is illustrated in the following quotations:

> Others came to suburbs for better schools. This has been due, at least in part, to the responsiveness of these schools to parental expectations, rooted in turn in the smaller size of many suburban school districts. Indeed, in an age primarily given over to state centralization, the suburbs have encouraged a countervailing decentralization governance, forcing a healthy kind of competitiveness onto local governments. (Carlson 1996)

> The trend in many places has been for cities to incorporate their surrounding suburbs, creating mega-jurisdictions without local identity and administrative nimbleness. This is a bad idea. Instead, cities ought to be breaking themselves into smaller political units that enjoy a degree of social consensus where governing can be done flexibly and with less impersonality. (Kotkin 1996)




The State of New Jersey alone has more than 500 independent municipal governments.
*Source:* New Jersey (State of), *Statement of Financial Condition of Counties and Municipalities.*

Obviously, the literature is divided on this point. One statistic beyond refute is that there is little growth in regional governments on a national basis, and although municipalities or counties may be willing to join together to distribute one or another carefully selected public services, they appear unwilling to join together for common governance. Further, on a national basis, the number of regional school districts currently desiring to split apart is greater than the

number of school districts currently desiring to join together (Petersen 1996).

*Literature Synthesis Matrix*

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | X | | | |
| Is it strongly linked to sprawl? | | X | | |

## Enhanced Municipal Diversity and Choice

*Allegation/Basis*

*Sprawl provides citizens with a great variety of localities* with differing tax levels, public service qualities, and housing costs, thereby increasing the range of choice available. The many individual localities in a metropolitan area function like suppliers of "bundles" of tax levels, public services, and local amenities in a market. Competition among them provides households with many more choices of living environments than would exist if all key fiscal and land-use decisions were made centrally and applied similarly throughout the metropolitan area. This process, first conceptualized by Tiebout, (1956) is widely praised by economists for bringing many of the virtues of a free market to the public sector, thereby benefiting potential residents of suburban communities.

*Literature Synthesis*

There is reasonable agreement that housing costs, public services (primarily education), tax levels, and housing stock aesthetics of a community form the bundle of goods that is bid for in community selection. Within a metropolitan area, citizens have significant choices of communities, and within a fragmented metropolitan area, they have even more choices.

***Sprawl's contribution to diversity in choice is the massive amount of reasonable alternatives (not best or worst) that it offers the locational consumer.***

Those who "shop" for communities take all of the elements listed above into account before making a locational decision. Sprawl's contribution to diversity in choice is the massive amount of reasonable alternatives (not best or worst) that it offers the locational consumer. Some minor argument is found from those who contend that sprawl creates many similar communities, thus stifling diversity.

Fragmented governments, primarily supporting residential housing, offer infinite variations of the bundles of housing, public services, and tax structure described above. Most of the variations found at the periphery of metropolitan areas are superior in housing value, school systems, property tax levels, and housing amenities to locations found closer in. As such, these are the locations most often sought; the closer-in communities are the locations most often left behind. The most significant variables appear to be housing cost and housing appreciation, which in combination appear to be maximized in locations more distant from, as opposed to closer to, the urban core (Downs 1994).

### Literature Synthesis Matrix

| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | –2 Substantial Disagreement |
|---|---|---|---|---|
| Does this condition notably exist? | X | | | |
| Is it strongly linked to sprawl? | | X | | |

**CHAPTER**

**8**

*Literature Synthesis*

# OVERALL SUMMARY OF THE LITERATURE

This chapter is divided into two parts. The first part aggregates the information presented in chapters 3, 4, 5, 6, and 7. It attempts to detail how much of the sprawl literature is represented by a topic such as *public and private capital and operating costs* versus other topics like *transportation and travel costs, land/natural habitat preservation, quality of life, social issues,* and so on. The first portion of the chapter further details the share of the sprawl literature that employs a certain methodology or type of empirical analysis as well as how much of the literature relies on particular databases. Finally, it discusses inherent weaknesses in the sprawl literature.

The second part of the chapter links, in summary fashion, sprawl's defining characteristics to its potential impacts. This is done to determine which of sprawl's characteristics are most associated with positive and negative impacts. The upshot of this analysis is that the three most defining characteristics of sprawl—*leapfrog development, lowdensity,* and *unlimited outward extension*—are associated with *both* sprawl's negative and positive impacts.

## TOPICAL COVERAGE, DATABASES, METHODOLOGIES, DEFICIENCIES

### Necessary Disclaimers

One logical starting point for summarizing the literature and analysis of this chapter is to review the distribution of the studies by topic and determine where there is more or less topical coverage. This can be done quantitatively, that is, by examining bibliographies on the topic—such as the one assembled here (see References), or by Ewing (1997), Gordon and Richardson (1997a), or the Growth Management and Research Clearinghouse (1993).

An overview of the literature could also be made by tabulating the numerical distribution of studies by subject type. This procedure raises its own issues, however, such as bias in the respective bibliographies (i.e., those emphasizing studies critical versus supportive of sprawl) and differences that reflect the varying professional orientations of the bibliography compilers (i.e., traffic engineer or historic preservationist).

In doing a quantitative census of the literature and topical coverage of sprawl, there is also a question of how to count multiple studies by the same author of a similar type. Should the Altshuler criticism of *The Costs of Sprawl* methodology, originally enunciated in 1977 and then essentially repeated in a jointly authored monograph by Altshuler and Gomez-Ibanez (1993), count as one or two entries in this census? Should Downs's prolific publications involving the issue of suburban exclusion of minorities which in some cases cover similar materials be individually counted (Downs 1970, 1973, 1981, 1985, and 1994)? The same problem of counting arises with the parallel series of publications by Gordon and Richardson (1989a, 1994a, 1996, 1997a, 1997b), Ewing (1994, 1995a, 1997), and Burchell (1992a, 1992b, 1994, 1995, 1996, 1997a, 1997b).

Another issue in undertaking a numerical tally of the literature is whether all entries should be weighted similarly. Do *The Costs of Sprawl* (RERC 1974) and the New Jersey *Impact Assessment* (Burchell 1992a, 1992b)—both influential analyses of hundreds of pages each—"weigh" the same as briefer and less substantive discussions?

Over and above these questions, an attempt to quantify the topical coverage of the literature on sprawl is frustrated by such fundamental issues as what is meant by sprawl and what counts as literature on this subject. Often sprawl is not defined in the literature, and its full elemental characteristics are not universally agreed upon. Should the literature that is to be tabulated consist only of materials on sprawl per se (i.e., examinations of sprawl's effects on infrastructure costs), or should it include broader topics relevant to a discussion of sprawl? The quality of life (QOL) subset in this report is illustrative; there is very little literature directly dealing with QOL and sprawl. But there are many more studies on QOL that show impacts on quality of life by forces analogous to sprawl.

Even though there are persistent problems, some general census of the approximately 500 citations in the references is required. Since more than a year has been spent assembling, categorizing, and analyzing the literature, clearly some statements can and should be made concerning its topical concentration and, as well, methods and databases relied upon.

In the following analysis, except for related materials such as dictionaries and encyclopedias; economics, land use, housing, and zoning texts; and so on, all of the remaining 475 citations are included and counted equally. Citations are made part of the analysis whether or not they repeat information of another study or deal directly or indirectly with sprawl.

### Topical Coverage—Sprawl Literature

Given equal weighting, the following approximate distribution of the sprawl literature appears as follows:

| *Impact Category* | *Percent of the Literature* |
|---|---|
| I. Public and Private Capital and Operating Costs | ≈ 20% |
| II. Transportation and Travel Costs | ≈ 25% |
| III. Land/Natural Habitat Preservation | ≈ 10% |
| IV. Quality of Life | ≈ 20% |
| V. Social Issues | ≈ 25% |

Without providing a detailed statistical count but clearly paralleling concentrations found in the references, the literature is almost evenly distributed

between the "harder," more quantifiable categories: *transportation/travel* and *public and private capital and operating costs*; and the "softer," less quantifiable impact categories: *quality of life* and *social issues.* These two combined categories represent about 90 percent of the literature. Comprising the remaining 10 percent of literature is material dealing with either the *loss of land or natural habitats* related to sprawl, or growth management as an alternative to sprawl.

Clearly, then, both social and quality-of-life considerations are significantly part of the sprawl literature and are represented far more than these categories are usually given credit for.

**Methodologies—Sprawl Literature**

There are differences in the analytic quality of the literature, as is indicated in the table at the bottom of this page.

In terms of analytic methods employed, *transportation and travel costs* have the most quantitative analyses (columns 2 and 3), followed by *public and private capital and operating costs.* In reverse fashion, *land/natural habitat preservation* and *quality of life* have the least quantitative and the most descriptive analyses (column 1).

The more rigorous quantitative simulations are found in *public and private capital and operating cost* studies, whereas *transportation and travel costs* studies rely most on the U.S. Census, the Nationwide Personal Transportation Survey and other empirical data. The *social issues* studies also rely heavily on national census-type empirical data.

Beyond this gross categorization, little can be said except that studies in the "harder" impact categories appear to address *sprawl* directly and by that term, whereas studies in the "softer" impact categories typically address sprawl indirectly as a form of low-density exurban or fringe-suburban development.

**Examples of Data Employed by Impact Category**

The five impact literature categories into which this report is divided apply both common and subject-distinctive data sources. Across all categories, socioeconomic information from the decennial census (population and housing), the triennial *American Housing Survey* (AHS), and similarly broad databases are frequently tapped. Both published (e.g., printed census reports) and computerized (e.g., *Public Use Microdata Sample* of the decennial census) sources are accessed. Land-use information of

| *Impact Category* | *Levels of Analysis* (1) *Descriptive: Little or No Analysis* | (2) *Empirical: Census or Case Study* | (3) *Simulation: Econometric or Modeling* |
|---|---|---|---|
| I. Public and Private Capital and Operating Costs | ≈ 15% | ≈ 50% | ≈ 35% |
| II. Transportation and Travel Costs | ≈ 10% | ≈ 80% | ≈ 10% |
| III. Land/Natural Habitat Preservation | ≈ 45% | ≈ 35% | ≈ 20% |
| IV. Quality of Life | ≈ 40% | ≈ 50% | ≈ 10% |
| V. Social Issues | ≈ 30% | ≈ 60% | ≈ 10% |

various types is also employed across all literature categories. These include both descriptors of a gross or aggregate nature, such as population density derived from the *County and City Data Book*, and finer-grained land-use information, such as the neighborhood mix of land uses and urban design features that are found as part of local records (e.g., zoning maps) and individualized study surveys.

***Across categories, socioeconomic information from the decennial census (population and housing), the triennial American Housing Survey (AHS), and similar bases are frequently tapped.***

Supplementing this common socioeconomic and land-use information are data specific to the five literature categories. For the *public-private capital and operating costs* category, an array of engineering-infrastructure as well as financial information is utilized. Examples include the Institute of Transportation Engineers' *Recommended Guidelines for Subdivision Streets* (1984); DeChiara and Koppelman's *Manual of Housing Planning and Design Criteria* (1975); the Urban Land Institute, National Association of Home Builders, and American Society of Civil Engineers' *Residential Streets* (1976); the quinquennial *Census of Governments* (1992); and individual operating budgets from municipalities, counties, and school districts.

The other literature categories draw, in parallel, on sources pertaining to their respective disciplines and interests. Examples include the *Nationwide Personal Transportation Survey* for *transportation and travel costs*; the *Census of Agriculture* for *land/natural habitat preservation*; such guides as the *Places Rated Almanac* (Savageau and Boyer 1993) for *quality of life*; and the *County and City Data Book* and specific city distress measures from Bradbury et al. (1982) and Rusk (1993) for *social issues* that pertain to cities.

This overview cannot convey the variety and richness of the data sources that are tapped by the subsets of the literature. To provide some example of the depth and complexity of the data, the information accessed by just one of the categories—transportation and travel costs—is described in detail here. This body of literature draws upon databases relating to travel as well as information on household and land-use characteristics. Travel sources typically relied on include, as noted, the *Nationwide Personal Transportation Survey* (Pisarski 1992a; Richardson and Gordon 1989, as examples); travel and commuting information from the decennial census and *American Housing Survey* (Gordon and Richardson 1993; Parsons Brinckerhoff 1996b); and a variety of other sources such as *Highway Statistics* (Dunphy and Fisher 1994), travel diaries kept by households being surveyed (Kitamura et al. 1994), and automobile odometer readings from California smog inspections (Holtzclaw 1994).

Household information such as that related to age, income, and occupation of residents is derived from the decennial census and the *American Housing Survey* (Gordon and Richardson 1989a; Parsons Brinckerhoff and ECONorthwest 1996; Pisarski 1992b). Household surveys may supplement/update the national and regional databases.

Land-use information comes from local planning and zoning records as well as from other sources. Gordon and Richardson (1989b), for instance, measured density from the U.S. Geological Survey LANDSAT files.

The costs of travel studies incorporate a broad array of data sources on topics ranging from accident-related medical expenses, to armed forces spending (e.g., providing security for overseas petroleum sources), to global warming.

One final note: Much of the data in the sprawl literature is of a secondary nature—that is, collected by one party and reanalyzed or cited by another. *The Costs of Sprawl* neighborhood prototype data originally assembled by RERC in the early- to mid-1970s (see Table 1), for example, is still being relied upon some two decades later by commentators on the subject of sprawl (Altshuler and Gomez-Ibanez 1993; Ewing 1997; Gordon and Richardson 1997a).

**Examples of Methods Employed by Impact Category**

Multiple choices are available to the analyst when considering specific methods. As mentioned previously, one choice is *empirical*—that is, one that observes something tangible; another method is a *simulation*, wherein events are modeled rather than observed. Both types are found in the literature on sprawl, with the incidence varying by subject. In the *public and private capital and operating costs* literature, because development's effect on infrastructure is projected into the future, many studies are *simulations.* Among these simulation studies are *The Costs of Sprawl* (RERC 1974); Downing's (1977) capital extension supplement to RERC's original work; Peiser's (1984) analysis of infrastructure costs in a hypothetical large subdivision; and Burchell's (1992-1997) and Landis's (1995) analyses in New Jersey, the Delaware Estuary, Kentucky, and Michigan (Burchell) and California (Landis). Operating costs, including operating expenses per capita, are also simulated in these types of studies (although not necessarily linked to development pattern); other financial parameters, such as tax rates and levels of intergovernmental revenues, receive similar treatment. Ladd's (1991) regression analyses relating density to per capita government operational spending, and the DuPage County (1991) regression of observed nonresidential development to observed tax rates, are good examples.

As noted earlier, because travel information is routinely studied and counted, much of the literature on *transportation and travel costs* is empirical. Examples include Pushkarev and Zupan's study (1977) linking density and transit use in 100 urbanized areas; Cervero's (1989) study examining density and modal choice in 57 "suburban employment centers"; and Parsons and ECONorthwest's (1996) study examining the effects of density, urban design, and mixed use on the demand for transit in various locations, ranging from 11 metropolitan areas to individual cities (Chicago and San Francisco). At the same time, the *transportation and travel costs* literature, reflecting the underlying discipline of transportation engineering with its modeling prowess, also incorporates some large-scale *simulations*, such as the 50-year simulation by Metro (1994), and Downs's (1992) *Stuck in Traffic* modeling.

The remaining literature categories (*Land/Natural Habitat Preservation, Quality of Life, and Social Issues*), though they apply some simulations, such as *The Costs of Sprawl* modeling of land consumption in alternative neighborhood prototypes, are largely a combination of empirical and descriptive analyses. The *Green Index* of locations (Hall and Kerr 1991) incorporates more than 250 quality-of-life indicators related to environmental quality (e.g., air and water pollution, and community and

workplace health statistics). The literature on urban decline focuses mainly on such observed characteristics as unemployment, housing loss, and tax base decline (Bradbury, Downs, and Small 1982).

Some of the empirical work tends to be microanalysis. The case study and per capita engineering studies are commonly used to describe what occurred at one or more locations. Examples of this format include Duncan's (1989) analysis of infrastructure costs in a number of Florida developments; Ewing's (1995b) analysis of household travel patterns in a Florida county; and Ewing, Haliyur and Page (1994) and Cambridge Systematics (1994) examinations of travel in Palm Beach County, Florida, and Los Angeles, California, respectively. Not coincidentally, most of the case analyses and per capita engineering studies are focused on locations experiencing rapid growth—often Sunbelt locations. In fact, so many of the investigations of travel profile as it relates to urban design have taken place in California, especially around San Francisco and Los Angeles, that questions about the replicability of the results observed to the rest of the country are beginning to be raised by the research community.

Descriptive analyses are found in significant numbers in the impact categories of *land/natural habitat preservation, quality of life,* and *social issues.* These analyses include Arendt's various (1994a, 1996, 1997) guides to developing with open space; Kunstler's (1993) description of urban and suburban neighborhoods; and Moe and Wilkie's (1997) prescription for improved metropolitan areas.

Various quantitative skills are incorporated in the literature. The per capita infrastructure studies, for instance, are essentially arithmetic compilations; but higher-order applications are also found, especially within the transportation and travel costs analyses. These studies apply such statistical tests as analysis of variance—e.g., comparing travel behavior in auto-oriented versus transit-oriented neighborhoods (Handy 1995) and multivariate regression—e.g., using regression to show that much of the variation in transit use can be explained by density (Pushkarev and Zupan 1977). Even the most "statistical" of studies, however, are still cross-sectional. In the travel literature, for example, they show the correlation between current urban form (i.e., low to high densities, and segregated or mixed uses) and current travel behavior (i.e., mode choice or VMT). But they do not show how changes in urban form have influenced changes in travel choices. This is one of numerous deficiencies in the literature noted below.

**Limitations of the Literature on Sprawl**

1. *Almost no analyses of sprawl adequately define it.* Surprisingly, the landmark study, *The Costs of Sprawl* (RERC 1974), did not define sprawl explicitly, and the omission of a definition has continued throughout the literature. Where sprawl is defined, or at least characterized, reference is often made to a limited number of traits such as low-density or leapfrog scattered development (Ewing 1997). Many studies, however, omit several other defining traits that cause many of the alleged negative impacts of sprawl, such as dependence on the automobile and fragmentation of governmental land-use authority. These are admittedly difficult to quantify.

2. *Most analyses of sprawl focus too narrowly on only a few of its key*

*aspects.* An adequate definition of sprawl must include the causal elements that underlie sprawl's many alleged negative impacts in order for subsequent analysis to respond to those impacts effectively. Therefore, a key part of this literature search is to specifically relate the negative and positive impacts of sprawl to their defining characteristics.

***Almost no analyses of sprawl adequately define it.***

3. *Other definitional cum measurement questions remain.* Take, for instance, "density." Several studies focus on the density of a region and relate certain characteristics, such as travel behavior or infrastructure costs, to the region's density. However, densities vary widely within regions and the real question is: How does the density of the specific places where people live and work affect, say, their travel choices? The densities of these places may be substantially different from region-wide averages. For instance, Gordon and Richardson (1989b) use SMSAs as the unit of measurement in their analysis of densities and commuting times in 82 SMSAs. But is this meaningful, given that no SMSA has uniform density throughout? And at the SMSA level, perhaps density is a proxy for age of development, city size, or some other factor that affects travel behavior (i.e., transit use), as opposed to the variable density per se.

   In parallel are problems with the definition and measurement of "segregation of uses." What is the definition of "uses"? At which geographical scale is separation or integration measured? Cervero (1996) found that the job-housing (JH) balance at the city level was not significantly associated with the variation in external (to the community) commuting. Does this mean that land-use integration as reflected in the JH ratio does not affect travel behavior? Or does it mean that land-use integration really does affect travel behavior—but that the measure of land-use integration is lost when the JH is scaled at the community-wide, as opposed to a neighborhood, level?

   Quality-of-life measures also pose a definitional conundrum, as do other seemingly easier-to-ascertain effects. Take, for instance, land consumption. Although it is a tautology that development consumes land, does a single-family home built on a 50-acre farm "consume" all of those 50 acres? If it consumes only a fraction, on what basis is that fraction apportioned?

4. *Most critics of sprawl do not recognize that it provides substantial benefits to many households; hence, they do not take account of those benefits in their analyses.* Several critics of sprawl, such as Kunstler (1993), engage in rhetorical exaggeration to emphasize their negative views of sprawl. They present only one side of the issue instead of a balanced descriptions. This polemical rhetoric cannot be classified as a scientific—or accurate—observation about the reality of American suburbs. Significant exaggeration is also employed by some defenders of sprawl, such as Gordon and Richardson (1997a).

5. *Only a limited number of comprehensive empirical analyses have been undertaken.* There is much discussion on sprawl but far fewer

"facts" in the form of empirical, quantitative studies. The paucity of data is illustrated by the frequency of studies using "secondhand" or once-removed information. A good example, as noted earlier, is the reanalysis of *The Costs of Sprawl* (RERC 1974) neighborhood and community prototypes some 20 to 30 years after the fact by Altshuler and Gomez-Ibanez (1993). Frank's 1989 review and reorganization of prior studies conducted over three decades in his *Costs of Alternative Development* is yet another example. It is not that reanalysis or categorization per se is unimportant—on the contrary, it can be quite valuable. Rather, these studies point to the dearth of new empirical research on sprawl. In a parallel vein is the tendency of the empirical research to be of a case study nature. Case studies provide valuable insight, but they are place-specific. The ability to generalize from them is quite limited.

6. *Even when a quantitative analysis is attempted, the topical coverage is uneven, with much more attention paid to the "physical side" of infrastructure—transportation and land—and less attention paid to the service and social sides.* The reason is simple; far more complete and reliable data are available for physical costs (e.g., development-generated costs for roads, water systems, and sewer systems) than for service costs. An engineering manual, for instance, can provide guidance to the cost per linear mile of road, but there is scant literature on how road mileage affects police patrolling costs. And there is an even larger gap in our knowledge of social costs. Discussions of sprawl's effects on quality of life are often superficial if not polemical; large gaps abound concerning sprawl's effects on cities. What is the true social cost of higher unemployment rates in inner-city areas? What is the cost of the exclusion of low-income households from outlying suburbs—assuming such unemployment or exclusion is sprawl-related? Measuring these costs is extremely difficult. Nevertheless, some attempt must be made in order to include such costs in an overall analysis of sprawl.

7. *Most discussions of sprawl focus almost entirely on new growth areas.* This focus may result from the fact that sprawl itself occurs almost entirely in new-growth areas around the metropolitan periphery. True, recent discussions of sprawl, such as those described earlier by Downs (1994) and Rusk (1993), have begun to recognize that draining valuable resources away from close-in areas has serious negative impacts upon these areas and, therefore, upon society generally. No quantitative analyses of sprawl, however, have attempted to estimate the size of these social costs; most analyses simply ignore them conceptually.

***Most discussions of sprawl focus almost entirely on new growth areas.***

8. *The extant literature also has a limited scope in its time frame of analysis—looking only at effects over a few years rather than a longer span.* The concatenation of limited geographic scale (i.e., focusing only on newly developing areas) and limited time span may very well lead to an overestimation by the literature of the costs of leapfrog development, as noted below:

> Estimates probably overstate the added costs of leapfrog development in communities that expect continued growth and eventual infill development on the vacant land. Compared with the planned communities, the sprawl communities contain substantially more vacant land that is improved or semi-improved by some road and utility access. Developing improved vacant land in the future presumably would cost less than developing unimproved land. If infill development is expected, then a portion of the added costs of leapfrogging eventually will be recouped—the costs of sprawl would be the costs of supplying some infrastructure in advance of its eventual need and would be lower the more rapidly infill was expected. (Altshuler and Gomez-Ibanez 1993, 72)

9. *Most commentators do not recognize that two types of fragmented governance—those over land uses and over fiscal resources—are fundamental causes of many of the most widely attacked results of sprawl.* The main reason for this failing is that the analyses are not comprehensive enough. They focus on a few of the most obvious elements of sprawl and their consequences, rather than look at the entire relevant spectrum of elements and consequences. In addition, many observers hesitate to recommend changes in such fundamental American precepts as local control over land uses and separation of communities' fiscal resources. Several recent opponents of sprawl have recognized these connections quite explicitly, however, including Downs (1994), Richmond (1995), and Rusk (1993).

10. *Most opponents of sprawl fail to describe feasible alternative forms of metropolitan settlement to remedy sprawl's alleged negative conditions.* Like most social critics, they concentrate on describing what they dislike, not how to remove those faults in a realistic manner. Furthermore, the aspects of society they want to change are inextricably bound up with other fundamental elements—such as a lack of regional governments. The changes they call for might have many more widespread repercussions than their analyses recognize. Indeed, every critic's call to radically change social condition "X" implies the following conditions:

    a) X is socially undesirable because it imposes unacceptable costs on some people.
    b) Therefore, society should greatly alter or eliminate X in the future.
    c) X resulted from forces that could have been channeled differently; it was not an inevitable outcome of irreversible or uncontrollable forces.
    d) We know what those changeable forces are, and how to handle them differently to avoid X in the future.
    e) It is politically feasible to adopt other methods of handling those forces.
    f) We know what the disadvantages of using those other methods are, and how large the costs are, even if the disadvantages and costs are wholly unrelated to X.
    g) The future benefits of eliminating, or substantially altering, X are significantly larger than the costs and disadvantages of using those other methods.

All critics of sprawl postulate conditions (a) and (b), but many stop there. Some proceed through conditions (c) and (d) as part of their prescriptions for change. But few deal with condition (e), and almost none address conditions (f) and (g)—which require the ability to measure both the costs and benefits of X and its elimination. Yet, realistic social analysis requires meeting all observable conditions.

Even the most detailed quantitative analyses of sprawl's costs tend to define only one alternative to it, and compare the costs of future development under just those two scenarios. That limitation is present, for example, in the series of analyses directed by Robert W. Burchell (1992-1997). Sprawl is a complex phenomenon containing multiple future development scenarios, not just two. Therefore, an adequate analysis of sprawl's costs compared to the costs of alternative forms of settlement must allow for more than two alternatives. Conversely, no analysis can be useful if it presents dozens or hundreds of alternatives as equally plausible. The best approach is to define three or more (but less than ten) major alternative settlement patterns and to conduct multiple sensitivity analyses concerning key elements in each of those patterns—a very comprehensive and expensive process.

11. *The modeling of the analysis is often overly simplistic.* The per capita engineering studies, for instance, relate capital/operating costs linearly to lane-miles of roads and related factors. But they have been criticized (rightly) for not incorporating any information on how costs can increase as thresholds of density increase, due to congestion, public safety needs, and the like. Incorporating this dimension would increase the cost of compactness (Altshuler and Gomez-Ibanez 1993).

    Comparisons of sprawl and its alternatives are also criticized for not sufficiently addressing the qualitative differences in housing amenity. Most analyses oversimplify the differences, alleging that the amenities are uniformly superior for the detached units that characterize sprawl (Gordon and Richardson 1997a; Windsor 1979).

### *The modeling of the analysis is often overly simplistic.*

The limited depth of many analyses also renders the associations that are drawn open to question. Inadequately specified models or controls are part of the problem. For instance, Newman and Kenworthy (1989a) applied only a single variable—urban density—to explain automobile use, whereas other factors are clearly involved. These two authors, in analyzing per capita automobile dependence, used gasoline consumption per capita as a proxy for automobile dependence. That equivalence is questionable, given the fact that many other factors, such as gas prices and fuel efficiency characteristics, affect per capita gasoline consumption. Holtzclaw (1990) related density to VMT without controlling for income levels or other household characteristics that influence VMT. Cervero's (1989) analysis of 57 suburban employment centers did not control for the centers' transit availability or the quality of the pedestrian environment. Similarly, the Cambridge Systematics (1994) study of suburban work sites did not

control for these sites' level of transit service.

The difficulty in extrapolating the factors that influence these dynamics, and the difficulty in incorporating controls, are illustrated by the scholarly analyses of the effect of urban design. Many researchers are interested in whether neo-traditional design features (combined with a greater mix of uses) will result in travel behavior different from the pattern observed in typical suburban development. There has been too little experience with these new types of suburban development to answer the question. Therefore, studies look at older neighborhoods that have a more pedestrian-friendly environment and a finer-grain mix of uses. But it is not clear whether behavior of long-standing residents of older neighborhoods accurately predicts the behavior of residents of new neighborhoods, who in all likelihood are more accustomed to using cars.

Furthermore, the matched pairing of existing neighborhoods into "transit versus auto-oriented" or "traditional versus suburban" to test the effects of alternate design patterns on travel runs headlong into the practical difficulty of coming up with these pairings. Neighborhoods often don't slot neatly into those two polar categories. Even if this demarcation can be realized, variables other than overall design can affect the travel behavior equation—e.g., resident income, occupation, and age. Matched pairing is a difficult exercise to accomplish, since design preferences and household profiles often interrelate.

The cross-sectional nature of many studies compound all these problems. Infrastructure costs rise as development is effected in a sprawl pattern; thus, sprawl gets tagged with the heightened capital expenses. Clearly, however, many other factors, from rising income levels to changing amenity levels, are also at work (Altshuler and Gomez-Ibanez 1993). Gordon, Richardson, and Jun (1991) link decreasing commuting times to the suburban deconcentration of job and residences that has occurred at the same time. But does the former *cause* the latter, or is it merely coterminous? Similarly, Richardson and Gordon (1989) hypothesize that increases in nonwork trips are due to suburban decentralization. Again, this hypothesis could be true, or it could be unrelated to the spatial pattern and instead fostered by such influences as rising incomes, greater participation of women in the work force, and societal changes in leisure activities. In short, there is much peril attached to drawing conclusions from cross-sectional research—precisely the kind of research that characterizes many sprawl studies.

The obverse of these deficiencies must be employed to guide future research. As detailed elsewhere, sprawl and its alternatives must be explicitly and formally defined. This effort can build from the literature. As noted in Section II, some of the more recent studies on sprawl have differentiated it from other types of development. In *New Visions for Metropolitan America* (1994), Anthony Downs defined sprawl as characterized by low-density, primarily single-family, development, with widespread reliance on filtering to provide low-income housing. Henry Richmond's *Regionalism: Chicago as An American Region* (1995), brought forth eight components of sprawl (listed

earlier). To Richmond's sound base, this literature review adds two more—(1) the commercial strip development described by Richard Moe (1995), and (2) a dependence on the filtering process to provide housing for low-income households as indicated by Downs (1994). Altogether, then, sprawl must be viewed as a form of urban development that contains most of the following ten elements:

1. Low residential density
2. Unlimited outward extension of new development
3. Spatial segregation of different types of land uses through zoning regulations
4. Leapfrog development
5. No centralized ownership of land or planning of development
6. All transportation dominated by privately owned motor vehicles
7. Fragmentation of governance authority over land uses between many local governments
8. Great variances in the fiscal capacity of local governments because the revenue-raising capabilities of each are strongly tied to the property values and economic activities occurring within their own borders
9. Widespread commercial strip development along major roadways
10. Major reliance upon the filtering or "trickle-down" process to provide housing for low-income households.

The above definition both builds from the literature on sprawl and stands in marked contrast to the studies that either do not define sprawl or else characterize it too simply and/or pejoratively—e.g., as a "lack of continuity in expansion" (Clawson 1962); a "low-density ribbon or leapfrog development" (Harvey and Clark 1965); or an "awkward spreading out of a community" (Abrams 1971).

This literature review underscores the need for a comprehensive look at the effects of sprawl. To this end, a full menu of benefits as well as costs of the different development scenarios must be considered. These benefits and costs must span the range of physical as well as social consequences. Furthermore, the benefits and costs analysis must be territorially complete—encompassing urban, suburban, and exurban locations as well as developing and developed areas. The span of analysis must also be long enough to encompass the dynamic of shifts over time, to show what happens, for example, to areas initially leapfrogged under sprawl that are subsequently "filled in" by development. The analysis of costs and benefits must further incorporate the complexity of influences e.g., the varying threshold influences of density on capital-operating costs, and the recognition that varying density thresholds, as well as other factors, affect travel. Moreover, caution must be exercised so as to not ascribe causality when the underlying evidence is merely cross-sectional.

***This literature review underscores the need for a comprehensive look at the effects of sprawl.***

## ALLEGED NEGATIVE AND POSITIVE EFFECTS

### Linking Sprawl's Defining Traits to Its Alleged Impacts

With a detailed analysis of both the definition of sprawl (Section I) and its impacts (Section II), it now becomes possible to link the two. Tables 12 and 13

evaluate the linkages between sprawl's ten defining traits and its alleged 27 negative and 14 positive impacts. In each matrix, sprawl's defining traits are set forth from left to right as vertical columns. The impacts are set forth from top to bottom as horizontal rows, grouped into the five impact categories defined earlier.

Each cell in the matrix indicates a "score" that represents literature-influenced judgments concerning the degree of linkage of the defined trait (at the top of the column) to the specified impact (at the left of the row). The "scores" are reflected by the following symbols:

**+ 2** **Indicates that the trait has a major linkage to the alleged impact.**

**+ 1** **Indicates that the trait has a moderate or minor linkage to the alleged impact.**

**0** **Indicates that the trait has no linkage to the alleged impact.**

**- 2** **Indicates that the trait has a negative linkage to the alleged impact; that is, the trait tends to reduce the incidence of the impact.**

## The Importance of Sprawl's Defining Traits

Determining, in a rough manner, the relative linkage of a trait to its impacts can be achieved by examining the total scores of the trait in the matrix. For example, the column labeled "leapfrog development" in the negative impact matrix (see Table 12) contains sixteen "major linkage ratings," five "moderate or minor linkage ratings," and six "no linkage ratings." These sum to a total of 37 for this trait and rank it the most significant of all sprawl's traits. Similar observations, summations, and rankings have been carried out for the other nine defining traits. Based on these calculations, three of sprawl's defining traits appear especially linked to *negative* impacts. These are *leapfrog development, low density, and unlimited outward extension,* each of which score in the thirties in terms of linkages. Two other traits—the spatial segregation of land uses and variance in local fiscal capacity—both scoring 10, seem to exhibit relatively weak linkages. Among the remaining traits, widespread commercial strip development, highly fragmented land use governance, and no central ownership or planning (scoring in the low twenties or high teens), seem somewhat more strongly linked than transport dominance by motor vehicles or reliance on filtering for low-income housing (both scoring 15).

*Negative Impacts of Sprawl*

Some individual sprawl traits, more so than others, *negatively* affect the five potential impact areas (public and private capital and operating costs, transportation and travel costs, land/natural habitat preservation, quality of life, and social issues). For instance, *leapfrog development, low density, and unlimited outward extension* negatively affect *public and private capital and operating costs* (because residential development and nonresidential development are distant from the core and from each other, and thus are difficult to service).

Following the above, *transportation and travel costs* are negatively impacted by the same three traits plus transport dominance by motor vehicles, and widespread strip development (again, because development is distant, spread out, and expensive to access).

## TABLE 12

## LINKAGES BETWEEN CHARACTERISTICS OF SPRAWL AND ITS NEGATIVE EFFECTS

| NEGATIVE IMPACTS (27) | DEFINING CHARACTERISTICS OF SPRAWL: LOW DENSITY | UNLIMITED OUTWARD EXTENSION | LAND USES SPATIALLY SEGREGATED | LEAPFROG DEVELOPMENT | NO CENTRAL OWNERSHIP OR PLANNING | TRANSPORT DOMINANCE BY MOTOR VEHICLES | HIGHLY FRAGMENTED LAND-USE GOVERNANCE | GREAT VARIANCE IN LOCAL FISCAL CAPACITY | WIDESPREAD COMMERCIAL STRIP DEVELOPMENT | RELIANCE ON FILTERING FOR LOW-INCOME HOUSING |
|---|---|---|---|---|---|---|---|---|---|---|
| **PUBLIC-PRIVATE CAPITAL AND OPERATING COSTS** | | | | | | | | | | |
| Higher infrastructure costs | 2 | 2 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |
| Higher public operating costs | 2 | 2 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |
| More expensive private residential and nonresidential development costs | 2 | 1 | 0 | 2 | 1 | 0 | 2 | 1 | 1 | 0 |
| More adverse public fiscal impacts | 2 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 0 |
| Higher aggregate land costs | 2 | 1 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |
| **TRANSPORTATION AND TRAVEL COSTS** | | | | | | | | | | |
| More vehicle miles traveled (VMT) | 2 | 1 | 2 | 2 | 1 | 2 | 0 | 0 | 2 | 1 |
| Longer travel times | 2 | 2 | 1 | 2 | 0 | -2 | 0 | 0 | 0 | 1 |
| More automobile trips | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 0 | 2 | 1 |
| Higher household transportation spending | 2 | 2 | 1 | 2 | 0 | 2 | 0 | 0 | 2 | 1 |
| Less cost-efficient and effective transit | 2 | 2 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 0 |
| Higher social costs of travel | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 0 | 0 | 0 |
| **LAND/NATURAL HABITAT PRESERVATION** | | | | | | | | | | |
| Loss of agricultural land | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 |
| Reduced farmland productivity | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced farmland viability | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Loss of fragile environmental lands | 2 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 |
| Reduced regional open space | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| **QUALITY OF LIFE** | | | | | | | | | | |
| Aesthetically displeasing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Weakened sense of community | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 1 |
| Greater stress | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Higher energy consumption | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 |
| More air pollution | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 |
| Lessened historic preservation | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| **SOCIAL ISSUES** | | | | | | | | | | |
| Fosters suburban exclusion | 1 | 1 | 0 | 0 | 2 | 1 | 2 | 2 | 0 | 2 |
| Fosters spatial mismatch | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| Fosters residential segregation | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 2 |
| Worsens city fiscal stress | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 2 | 2 |
| Worsens inner-city deterioration | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 |
| **LINKAGES** | | | | | | | | | | |
| **SUM** | 33 | 31 | 10 | 37 | 17 | 15 | 18 | 10 | 21 | 15 |
| **IMPORTANCE** | 2 | 3 | 10 | 1 | 6 | 7 | 5 | 9 | 4 | 8 |

**Key:** **2 = Major linkage** **1 = Moderate or minor linkage** **0 = No linkage** **-2 = Negative linkage**

## TABLE 13

## LINKAGES BETWEEN CHARACTERISTICS OF SPRAWL AND ITS POSITIVE EFFECTS

| POSITIVE IMPACTS (14) | DEFINING CHARACTERISTICS OF SPRAWL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | LOW DENSITY | UNLIMITED OUTWARD EXTENSION | LAND USES SPATIALLY SEGREGATED | LEAPFROG DEVELOPMENT | NO CENTRAL OWNERSHIP OR PLANNING | TRANSPORT DOMINANCE BY MOTOR VEHICLES | HIGHLY FRAGMENTED LAND-USE GOVERNANCE | GREAT VARIANCE IN LOCAL FISCAL CAPACITY | WIDESPREAD COMMERCIAL STRIP DEVELOPMENT | RELIANCE ON FILTERING FOR LOW-INCOME HOUSING |
| **PUBLIC-PRIVATE CAPITAL AND OPERATING COSTS** | | | | | | | | | | |
| Lower public operating costs | 2 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| Less-expensive private residential and nonresidential development costs | 2 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fosters efficient development of "leapfrogged" areas | 1 | 1 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |
| **TRANSPORTATION AND TRAVEL COSTS** | | | | | | | | | | |
| Shorter commuting times | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 |
| Less congestion | 2 | 2 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 0 |
| Lower governmental costs for transportation | 2 | 2 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 |
| Automobiles most efficient mode of transportation | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 0 | 2 | 0 |
| **LAND/NATURAL HABITAT PRESERVATION** | | | | | | | | | | |
| Enhanced personal and public open space | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| **QUALITY OF LIFE** | | | | | | | | | | |
| Preference for low-density living | 2 | 1 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 |
| Lower crime rates | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| Reduced costs of public and private goods | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 |
| Fosters greater economic well-being | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 2 | 0 | 0 |
| **SOCIAL ISSUES** | | | | | | | | | | |
| Fosters localized land use decisions | 0 | 1 | 0 | 1 | 2 | 0 | 2 | 0 | 0 | 0 |
| Enhances municipal diversity and choice | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 |
| **LINKAGES** | | | | | | | | | | |
| **SUM** | 21 | 20 | 4 | 22 | 8 | 13 | 8 | 4 | 5 | 1 |
| **IMPORTANCE** | 2 | 3 | 9 | 1 | 6 | 4 | 5 | 8 | 7 | 10 |

**Key: 2 = Major linkage 1 = Moderate or minor linkage 0 = No linkage -2 = Negative linkage**

Basically similar to the above, *land and natural habitat preservation* seems to be negatively impacted by leapfrog development, unlimited outward extension, and low-density traits of sprawl (which consume significant amounts of land) yet by few others. *Quality of life* is worse (poor aesthetics of development and lack of sense of community) due to widespread commercial strip development and leapfrog development. *Social conditions* are worse (less affordable housing, smaller tax base per capita, and an absence of regionally provided services) due to sprawl's reliance on filtering for housing, great variance in local fiscal capacity, and highly fragmented land-use governance.

Obviously, the above are primarily inferences—but intuitively, these inferences appear to stand up.

*Positive Impacts of Sprawl*

The analysis further suggests (see Table 13) that the same three defining traits—*leapfrog development*, *low density*, and *unlimited outward extension*—appear to be the most important in causing *positive* impacts as well. The above three traits each score in the twenties and rank 1, 2, and 3 respectively. Next in relative importance is transportation dominance by private motor vehicles, followed by highly fragmented land-use governance, and no central ownership and planning. These range in score from a high of 13 to a low of 8. Least significant are the use of filtering for low-income housing, spatially segregated land uses, great variance in fiscal capacity, and widespread commercial strip development. These range from a low of 1 to a high of 5.

In terms of the positive effects of sprawl, *public and private capital and operating costs* are lower (because they are not as complex and there is less demand on them) due to leapfrog and low-density development, and unlimited outward extension. *Transportation and travel costs* are lower (due to suburban-to-suburban commutes, reduced inner-suburban congestion, and use of the automobile) as a result of the above three traits plus transport dominance by motor vehicles, spatially segregated land uses, and widespread commercial strip development. *Quality of life* is better (residents like where they live; communities have lower crime rates) again due to the above three traits (leapfrog development, low density, unlimited outward extension) as well as to transport dominance by motor vehicles. *Social conditions* are better (more municipal diversity and choice) due to highly fragmented land-use governance and no central ownership or planning.

Clearly, there is a great deal of similarity between the positive and negative matrices of sprawl (Tables 12 and 13) as shown in Table 14. Paradoxically, the traits that seem key causes of many of sprawl's negative impacts also appear to be key causes of many of its positive impacts. This is true for such impact categories as public-private capital and operating costs, transportation and travel costs, land and natural habitat preservation, and quality of life. The fact that sprawl can be simultaneously associated with both costs and benefits in relatively narrowly defined fields shows how complex the phenomenon of sprawl is. The literature synthesis is summarized in Table 15. Evident from Table 15 is that the field tends to be much more prolific on criticisms (27) leveled at sprawl rather than its defense (14). There are about twice as many allegations of sprawl's negative impacts as there are of its positive impacts.

With regard to recognition that *"costs" of development* exist, there is more agreement

**TABLE 14**

| *Categories of Alleged Negative Impacts* | *Key Defining Traits Underlying Those Impacts* |
|---|---|
| I. Public-Private Capital and Operating Costs | Leapfrog Development<br>Low Density<br>Unlimited Outward Extension |
| II. Transportation and Travel Costs | Leapfrog Development<br>Low Density<br>Unlimited Outward Extension<br>Transport Dominance by Motor Vehicles<br>Widespread Commercial Strip Development |
| III. Land/Natural Habitat Preservation | Leapfrog Development<br>Unlimited Outward Extension<br>Low Density |
| IV. Quality of Life | Widespread Commercial Strip Development<br>Leapfrog Development |
| V. Social Issues | Reliance on Filtering for Low-Income Housing<br>Great Variances in Local Fiscal Capacity<br>Highly Fragmented Land-Use Governance |
| ***Categories of Alleged Positive Impacts*** | ***Key Defining Traits Underlying Those Impacts*** |
| I. Public-Private Capital and Operating Costs | Leapfrog Development<br>Low Density<br>Unlimited Outward Extension |
| II. Transportation and Travel Costs | Leapfrog Development<br>Low Density<br>Unlimited Outward Extension<br>Transport Dominance by Motor Vehicles<br>Spatially Segregated Land Uses<br>Widespread Commercial Strip Development |
| III. Land/Natural Habitat Preservation | Leapfrog Development<br>Low Density<br>Unlimited Outward Extension |
| IV. Quality of Life | Leapfrog Development<br>Low Density<br>Unlimited Outward Extension<br>Transport Dominance by Motor Vehicles |
| V. Social | Highly Fragmented Land-Use Governance<br>No Central Ownership or Planning |

## TABLE 15

### MATRIX SYNTHESIS OF THE LITERATURE ON SPRAWL ORGANIZED BY SUBSTANTIVE AREAS

| Substantive Concern | Does Condition Notably Exist? | | | | Is It Strongly Linked To Sprawl? | | | |
|---|---|---|---|---|---|---|---|---|
| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | -2 Substantial Disagreement | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | -2 Substantial Disagreement |
| **Public-Private Capital and Operating Costs** | | | | | | | | |
| **Alleged Negative Impacts** | | | | | | | | |
| Higher infrastructure costs | X | | | | | X | | |
| Higher public operating costs | | X | | | | | X | |
| More expensive private residential/ nonresidential development costs | | X | | | | | X | |
| More adverse public fiscal impacts | | X | | | | X | | |
| Higher aggregate land costs | | X | | | | X | | |
| **Alleged Positive Impacts** | | | | | | | | |
| Lower public operating costs | | X | | | | | X | |
| Less-expensive private residential/ nonresidential development costs | | X | | | | X | | |
| Fosters efficient development of "leapfrogged" areas | | | X | | | | X | |
| **Transportation and Travel Costs** | | | | | | | | |
| **Alleged Negative Impacts** | | | | | | | | |
| More vehicle miles traveled (VMT) | X | | | | X | | | |
| Longer travel times | | | X | | | | X | |
| More automobile trips | X | | | | X | | | |
| Higher household transportation spending | | X | | | | X | | |
| Less cost-efficient and effective transit | X | | | | | X | | |
| Higher social costs of travel | | X | | | | X | | |
| **Alleged Positive Impacts** | | | | | | | | |
| Shorter commuting times | | | X | | | | X | |
| Less congestion | | | X | | X | | | |
| Lower governmental costs for transportation | | | X | | | | X | |
| Automobiles most efficient mode of transportation | | X | | | X | | | |

**TABLE 15** (continued)

**MATRIX SYNTHESIS OF THE LITERATURE ON SPRAWL ORGANIZED BY SUBSTANTIVE AREAS**

| Substantive Concern | Does Condition Notably Exist? | | | | Is It Strongly Linked To Sprawl? | | | |
|---|---|---|---|---|---|---|---|---|
| | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | -2 Substantial Disagreement | +2 General Agreement | +1 Some Agreement | 0 No Clear Outcome | -2 Substantial Disagreement |
| **Land/Natural Habitat Preservation** | | | | | | | | |
| **Alleged Negative Impacts** | | | | | | | | |
| Loss of agricultural land | X | | | | X | | | |
| Reduced farmland productivity | | X | | | | | X | |
| Reduced farmland viability | | | X | | | | X | |
| Loss of fragile environmental lands | X | | | | X | | | |
| Reduced regional open space | | | X | | | | X | |
| **Alleged Positive Impacts** | | | | | | | | |
| Enhanced personal and public open space | | X | | | | | X | |
| **Quality of Life** | | | | | | | | |
| **Alleged Negative Impacts** | | | | | | | | |
| Aesthetically displeasing | | X | | | | | X | |
| Lessened sense of community | | X | | | | | X | |
| Greater stress | | X | | | | X | | |
| Higher energy consumption | | | X | | | | X | |
| More air pollution | | X | | | | | | X |
| Lessened historic preservation | | X | | | | | X | |
| **Alleged Positive Impacts** | | | | | | | | |
| Preference for low-density living | X | | | | | X | | |
| Lower crime rates | | X | | | | | X | |
| Reduced costs of public and private goods | | X | | | | | X | |
| Fosters greater economic well-being | | X | | | | X | | |
| **Social Issues** | | | | | | | | |
| **Alleged Negative Impacts** | | | | | | | | |
| Fosters suburban exclusion | | X | | | | | | X |
| Fosters spatial mismatch | X | | | | | X | | |
| Fosters residential segregation | | X | | | | | X | |
| Worsens city fiscal stress | | X | | | | X | | |
| Worsens inner-city deterioration | | X | | | | X | | |
| **Alleged Positive Impacts** | | | | | | | | |
| Fosters localized land use decisions | X | | | | | X | | |
| Enhances municipal diversity and choice | X | | | | | X | | |

(general agreement and some agreement categories combined) in the areas of public and private capital and operating costs, quality of life, and social issues than there is in travel and transportation costs, and land/natural habitat preservation. That these "costs" are *linked specifically to sprawl* (holding aside the issue of causality), there is more agreement on public and private capital and operating costs, transportation and travel costs, and social issues than there is on land/natural habitat preservation and quality of life. Thus, more impact categories identify themselves as being affected by development; fewer categories identify themselves as being impacted by a type of development that is akin to "sprawl."

## Areas of Future Research

The literature clearly signals areas of future research thrusts. On the "harder," more quantifiable, physical/engineering side—that is, the issues of infrastructure, transportation, and land consumption—the studies, to date, point to multiple appropriate measures to be considered (e.g., vehicle miles traveled [VMT] and congestion), as well as important relationships to be examined (e.g., density's effect on modal choice and travel time). However, these analyses must be brought together more definitively, and areas of outstanding disagreement from prior work (e.g., are commuting times shorter or longer under sprawl) must be examined empirically so that answers can be had. The field must attempt to fill in the lingering gaps in knowledge concerning the effect of development patterns on operating costs, impact on productivity of farmland, and so on.

As to sprawl's effect on the "softer," less quantifiable, quality of life and social issues, the challenge to current research is even more formidable. Here, interrelationships are more complicated, measurement is more elusive, and the association with development pattern—whether sprawl or otherwise—much more obtuse.