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Author(s): Richard Peiser

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RICHARD PEISER

Decomposing urban sprawl

Urban sprawl has become the catch phrase for everything that is bad about urban growth today—congestion, blight, monotony, endless development, and ecological destruction. Beneath the hoopla, however, is a serious debate about how to manage urban growth effectively. This paper provides a framework for decomposing sprawl into its component parts. The paper's objective is to distinguish those aspects associated with sprawl that are truly bad from those that are not. It identifies fourteen outcomes that are associated with or blamed on sprawl, and then discusses which ones are truly deleterious and which ones are not. The paper concludes that sprawl is a complex, multi-faceted problem requiring multi-faceted solutions.

Urban sprawl has become the catch phrase for everything that is bad about urban growth today—congestion, blight, monotony, endless development and ecological destruction. Beneath the hoopla, however, is a serious debate about how to manage urban growth effectively. The serious issues are often lost in the rhetoric. Counterproductive measures become laws that create worse sprawl than before, such as Florida's concurrency requirements in the mid-1980s. The Concurrency Laws attempted to reduce sprawl by requiring infrastructure to be built in advance of development. This seemingly benign law resulted in development being pushed to rural areas where roads were less congested.

The biggest problem with urban sprawl is that the term has different meanings to different people. Many attempts to control urban sprawl are misguided because policy makers do not understand how the land market operates. Some aspects of sprawl, such as discontinuous growth, serve a beneficial purpose. Other aspects, such as ubiquitous, monotonous development and unusable open space, are indeed 'bad'. However, policy makers do not understand that many regulations designed to improve the landscape may in fact make sprawl worse.

The main purpose of this paper is to distinguish the truly objectionable

Richard Peiser is the Michael D. Spear Professor of Real Estate Development in the Department of Urban Planning and Design, Harvard Graduate School of Design, Cambridge, Massachusetts, USA.

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aspects of sprawl from those aspects which are misunderstood.¹ The paper provides a framework for decomposing sprawl into its component parts. It attempts to dispel the myths about sprawl and to join together the critical pieces that must be considered if the problems associated with sprawl are to be reduced—buyers' preferences for low-density single-family houses, infrastructure finance, lack of regional governance, growth control, environmental protection and escape from inner-city problems.

Sprawl is a world-wide phenomenon. Most industrialised countries have antiquated zoning laws which continue to segregate homes from jobs, shops and other activities, long after the need to protect them for public health reasons has disappeared. Many developing countries have imported these compartmentalised zoning laws.

The paper begins with a discussion of the current debate in the popular press, a literature review, and a summary of definitions and causes of sprawl. The second section presents the methodology and framework for analysis. The third section presents 14 outcomes that are associated with and often blamed on sprawl. This section decomposes the various outcomes into two main groups—those that are part of the process of development and those that are the end result of development. A fourth section examines where the market works and where it does not in connection with two core criticisms of sprawl. The penultimate section discusses three popular solutions for reducing sprawl—urban growth boundaries, regional governance and comprehensive state planning, and the final section presents conclusions.

Background

An article in the *Los Angeles Times* in January 1995 on a report entitled *Beyond Sprawl* (Fulton, 1995) ignited a debate in California about how the state has grown since the Second World War. The report, which was written by planning commentator William Fulton, was significant primarily because of who sponsored it—Bank of America, California Resources Agency, Greenbelt Alliance and The Low-Income Housing Fund. The report was roundly criticised because it was presented as a serious research study about the effects of sprawl rather than the opinion piece that it was. Nevertheless, the resulting debate indicated that it had struck a timely nerve.

Beyond Sprawl stated,

We can no longer afford the luxury of sprawl. Our demographics are shifting in dramatic ways. Our economy is restructuring. Our environment is under

¹ Arthur Nelson (correspondence with the author) argues that the literature fairly clearly characterises urban sprawl as the 'inefficient pattern of urban growth' (caused by both market failure and stupid policy distortions). While I agree that the term 'urban sprawl' is shorthand for inefficient urban growth to most planners, it is just as often misused by them to describe aspects of urban growth which are not bad at all but simply necessary steps along the course of urban development. Dispelling these misunderstandings is what this paper is about.

increasing stress. We cannot shape California's future successfully unless we move beyond sprawl. (Fulton, 1995, 1)

The report enumerated the forces that promote sprawl in California including:

- the perception that new suburbs are safer, more desirable and cheaper than urban alternatives;
- that suburbs are more friendly and flexible for businesses; and
- that fiscal incentives in the wake of Proposition 13 encourage local governments to 'cherry-pick' land uses based on tax considerations, especially retail uses which generate sales taxes—one of the few sources of additional income to municipalities.²

The report blames sprawl for making California less desirable for businesses to locate in. Sprawl is blamed for raising house prices, increasing traffic congestion and causing unnecessary infrastructure costs. The report does not present any support for the link between sprawl and housing costs, but it points out that numerous subsidies tend to promote sprawl. Sprawl is also blamed for hurting central cities and older suburbs, despoiling the environment, and compromising 'one of the most essential assets of California—the beauty and drama of its landscape' (Fulton, 1995, 8)

The re-emergence of sprawl on the national urban policy agenda is underscored by papers by Gordon and Richardson (1997a; 1997b) and Ewing (1997) and several letters to the editor that appeared in *Journal of the American Planning Association* in 1997. Gordon and Richardson attack the advocacy by many planners of 'compact cities' as an ideal. They conclude that policies which attempt to reverse existing urban development trends towards decentralisation and suburbanisation are neither feasible nor desirable (Gordon and Richardson, 1997a, 103). Ewing criticises Gordon and Richardson for equating compact development to high-density or monocentric development. Ewing claims that consumer preference and technological innovations help explain suburbanisation and decentralisation but they cannot explain the extent of dispersal nor the absence of mixed land uses, nor the loss of valuable natural areas. For that, he blames the market failures caused by all manner of subsidies (highways, cars), and that public goods such as open space tend to be under-supplied by the private market because of the 'free rider' problem—the inability to charge beneficiaries for the value they receive. Gordon and Richardson (1997b) respond by pointing out that Los Angeles, the exemplar for sprawl, has the highest population density of the 20 largest metropolitan regions. They present a 19 point rebuttal to Ewing emphasising among other points that no consistent

2 Proposition 13, known as the California Property Tax Revolt, was a California referendum passed in 1978 that limited property taxes to 1 per cent of property values and limited increases in taxes to 2 per cent per annum until a property was sold. It also gave the electorate much more control over bond issues by requiring a two-thirds majority vote to approve new spending. It effectively transferred control over local public finances to the State (Silva, 1999).

evidence has been assembled to demonstrate that most suburbanisation is 'wasteful'. They argue that most of Ewing's criticisms about the alternative to compact development have less to do with sprawl-related form than with other causes. The negative impact on environmentally sensitive lands, for example, should not occur if growth is properly guided.

More recently, presidential candidate Al Gore made urban sprawl part of his 'livability agenda' in an attempt to capture the suburban vote (Mitchell, 1999). Congress has also been examining how federal policy contributes to sprawl and what its role should be in an area that is normally the province of state and local regulation (NREO, 1999). The latest chapter in the sprawl debate is 'smart growth'. This term, popularised by an alliance between the Urban Land Institute and the Environmental Protection Agency, attempts to balance concerns about sprawl with growth. 'The goal of smart growth is sensible growth that balances our need for jobs and economic development with our desire to save our natural environment' (Glendening, in O'Neill, 1999, 4; Danielson et al., 1999).

WHAT IS SPRAWL?

The term 'urban sprawl' is so cloudy and confused that more precise language is needed to characterise what is bad urban growth. The term is used variously to mean the gluttonous use of land, uninterrupted monotonous development, leapfrog discontinuous development and inefficient use of land. Each of these definitions implies different remedies.

The 'gluttonous' use of land refers to development that consumes more land than it needs to—uniformly low-density development. This definition was originally used to attack low-density zoning on the east coast such as two-acre minimum lot zoning in wealthy New Jersey suburbs outside New York City. One of the most common definitions in the academic literature characterises sprawl as 'the lack of continuity in expansion' (Mills [1981], as adopted from Clawson [1962, 99]). As an area is developing, 'sprawl patterns imply that the urbanised area is larger than it otherwise would be because undeveloped tracts remain interspersed among developed subdivisions' (Peiser, 1989).

Ewing (1997, Fig. 1, 108) categorises the various definitions of sprawl. He claims that Gordon and Richardson's compact development pattern is an outmoded definition equating to high-density or monocentric development. Ewing recognises that 'high density is not the preferred living arrangement for most Americans and monocentric development is an anachronism ...' (Ewing, 1997, 108). Ewing claims that sprawl leads to higher costs resulting from excess travel, energy consumption and air pollution, infrastructure and public service costs, loss of farmland, impact on central cities and psychic costs. His cure for sprawl is 'active planning of the type practiced almost everywhere except the United States' (Ewing, 1997, 187). Levine (1997, 280) notes that 'What to one person is "sprawl" to another is his/her home'. He observes that if we are going to make policies for protecting open space, wilderness and other natural resources, then the consequences for housing supply should be equitable across the board.

One state that has attempted to codify sprawl is Florida. Rule 9J-5.003(140) of the Florida Administrative Code defines 'urban sprawl' as urban development or uses which are located in areas of interspersed rural and generally low-intensity urban uses, and which are characterised by:

- premature or poorly planned conversion of rural land to other uses;
- the creation of areas of urban development or uses which are not functionally related to adjacent land uses; or
- the creation of areas of urban development or uses which fail to maximize the use of existing public facilities and the use of areas within which public services are provided.

Urban sprawl typically manifests itself in one or more of the following patterns:

- leapfrog or scattered development;
- ribbon or strip commercial or other development; and
- large expanses of predominantly low-intensity and single-use development.

Other definitions of sprawl are less scientific. In the debate about how Florida should implement new anti-sprawl policies, one finds comments such as 'Sprawl is like obscenity; you can't define it but you know it when you see it' (Pelham, 1992). Nelson states that the words 'urban sprawl' are shorthand for conveying an undesirable development outcome (Nelson, 1990).

In some areas like Lancaster County, Pennsylvania, the leading edge of urban sprawl is seen as the arrival of Wal-Mart. Lancaster County is home to the Amish farms which present one of America's most appealing rural countrysides. Residents have encouraged the Historic Preservation Trust and other groups to fight Wal-Mart. They fear that Wal-Mart will help accelerate urban sprawl, will be a magnet for more land-hungry stores, subdivisions and roads, and will hasten the deterioration of the commercial centre (Berke, 1995).

The term 'urban sprawl' is thus applied to many different situations. It is used loosely to refer to all that is bad about urban growth, and narrowly to describe specific aspects of urban growth which are considered undesirable, such as discontinuous growth and growth in advance of urban infrastructure. The problem with some of these definitions is that they are based on misconceptions about how the land market operates. Since their premise is wrong, the policies they engender are often counter productive.

CAUSES OF SPRAWL

Boring, monotonous urban development results when developers build the same thing mile after mile. This occurs where planning is poor or non-existent, often where large areas are zoned for similarly sized lots. Without parks, apartments and other spaces to break the monotony, the landscape is indeed unappealing. Property values also tend to drop faster than in other communities with more interesting and varied environments. Cao and Cory (1981) find that mixed land uses increase the value of residential property. The Urban Land Institute (ULI)

finds evidence that money spent on landscape design helps both lenders and residents feel more secure about their financial investment in a project (ULI, 1994, 10).

How does such monotonous development occur? Everyone shares in the blame. Planners adhere too rigidly to zoning regulations that are out of date. Homeowners resist zoning changes that would allow apartments and higher-density housing which they fear will hurt property values. No one takes responsibility for planning and paying for functional open space, sensitive commercial development and other hallmarks of proper urban development. Developers build what is easiest and fastest—often more of the same. Areas of monotonous development tend to be dominated by a few large developers and landowners who control the market and have little incentive to change.

The relationship between land ownership and monotonous design has not been formally studied to my knowledge. Large-scale land developers tend to work with large-production home builders to speed the absorption of land. Large-scale production home builders have produced mile after mile of undifferentiated single-family tract homes. Minimum lot-size zoning requirements in the 1960s and 1970s have exacerbated these monotonous landscapes.

Critics of sprawl blame national policy that encourages single-family home ownership and construction of highways so essential to the mobility of the auto-dependent suburbanites. Federal policy has played a major role in promoting urban sprawl—through the interstate highway system and the Federal Housing Administration (FHA)'s policy (later picked up by Fannie Mae) to provide mortgage insurance only to low-density, single-family home subdivisions.³

Other forces have contributed to urban sprawl—the construction of infrastructure to serve the burgeoning suburbs; the proliferation of suburban governments which has resulted in competition for commercial, industrial and public-facility growth; and the mortgage interest deduction which has induced homebuyers to buy more housing (larger, lower density and more in number when low-density vacation homes are included). Also, American tastes contribute to sprawl—despite numerous efforts, planners have not been able to dissuade homebuyers from wanting the 'American dream', namely a single-family detached home.

Tony Downs's book, *New Visions for Metropolitan America* (1994), also focuses attention on urban sprawl. Downs reduces our common vision of how growth ought to occur to five elements. These elements help to explain why Americans' preferences actually lead to sprawl:

- Ownership of detached single-family homes on spacious lots.
- Ownership of automobiles.
- Low-rise workplaces—attractively landscaped, accompanied by free-parking lots.

³ Nelson (correspondence with the author) points out that Fannie Mae was so concerned about its involvement in distorting urban development patterns that it pledged \$1 trillion by the end of the century to assist inner-city housing opportunities of all housing types.

- Residence in small communities with strong local governments to control land use, public schools and other factors affecting the quality of neighbourhood life.
- An environment free of signs of poverty. This is not acknowledged or even consciously desired but results from two conditions of housing that are explicitly desired—no ‘substandard’ housing, and few subsidies for low-income households. The trickle-down process is the operative policy to house the poor. They live in older units formerly occupied by the non poor.

Downs does not advocate this common vision but rather uses it to explain why America has developed the way it has. He points out that low-density settlement requires much larger areas to accommodate a given population than high-density settlement. It also decreases the access of metropolitan area dwellers to open space. Some planners criticise urban sprawl because it encroaches into environmentally sensitive areas and swallows prime agricultural land. Local governments may set up parks for their own residents, but do not want to spend money on regional parks for people living in other municipalities.

The pressures of sprawl place new demands on planners. This is recognised even in England where the planning system has successfully prevented the kinds of development that characterise urban sprawl in the United States of America. As Davies writes:

the skills required of planners have extended beyond the more narrowly conceived design-based preparation of plans and blueprints into complex issues embracing social relationships and the economy, into city marketing or environmental management, or bargaining and negotiation in place of regulatory control by reference to standards and plans. Above all planners have to be more responsive to the market, the community, and local politics than was the case in 1947. (Davies, 1998, 150)

Methodology: framework for analysis

The main objective of this paper is to decompose sprawl into its many parts and to distinguish the truly objectionable aspects of sprawl from those aspects which are misunderstood. Some aspects of sprawl are part of the normal functioning of the land market—namely, discontinuous development and land speculation. Attempts to control them often make matters worse. Other aspects of sprawl are indeed bad—in particular, the gluttonous use of land, the absence of functional open space, and large expanses of low-density, single-use development.

The primary misunderstandings about sprawl result from the fact that anti-sprawl critics confuse land development ‘in-process’ with land development ‘at final completion’.

Development occurs in several waves. The first wave is characterised by isolated subdivisions, often large-lot homes or ‘gentlemen farms’ on septic tanks and water wells. The second wave brings smaller-lot subdivisions served by full utilities and internal roads, with some major road improvements. The third

Table 1 *Process versus end result of development*

<i>Process</i>	<i>End result</i>
Snapshot of development in progress	Land is fully developed
Land is in transition from undeveloped to developed	Vacant and agricultural land is gone

wave brings commercial and industrial uses and begins to fill in the interstices between older developments. The fourth wave continues the infill begun in the third wave. It resembles the third wave, but tends to be characterised by apartments and higher-density uses as the area is surrounded by newer development farther out. The fourth wave continues through subsequent economic cycles until the area is fully developed. The process may occur in a short period—within a decade—if the area is growing rapidly; or it may go on for 20 or more years. Of course, this is not the end. The cycle continues as redevelopment begins to occur on older sites that are underutilised or are attractive for gentrification, higher density, or change in use.

The process of land development refers to land that, by definition, is in transition—from a raw or agricultural state to urbanised development. When one views a snapshot of development during the early stages, scattered low-density single-family subdivisions do not necessarily lead to bad outcomes when the area is viewed in its fully developed state.

It is bad if the entire area is developed into uniformly low-density subdivisions. Critics rightfully decry the monotonous and ‘gluttonous’ consumption of land. However, low-density subdivisions are a normal part of the early phases

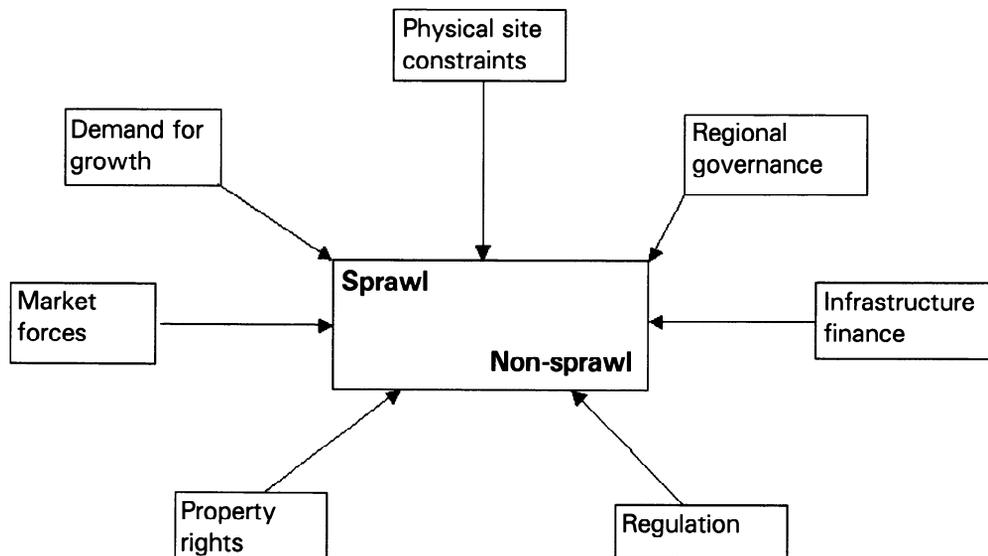


Figure 1 Factors affecting land use patterns

of development in an area. A healthy land market with proper regulatory mechanisms will foster land use patterns which are higher density in later stages of growth. Furthermore, early subdivisions such as Levittown, New York and Lakewood, California, which were described as monotonous when they were built, develop a character over time as homes are redesigned (Waldie, 1996). The resulting patterns of growth are no longer monotonous.

The key is finding the right combination of regulatory mechanisms to deal with the real problems of market failure—problems resulting from scale economies, externalities and public goods. Over-regulation can be as harmful as under-regulation. The land market naturally leads to higher densities and more intensive development on infill parcels as an area builds out because the infill parcels enjoy better proximity and the benefits of agglomeration from surrounding rooftops and development. If higher densities are prevented by exclusionary zoning, neighbourhood opposition, or other regulatory barriers then the benefits of a normal open land market are lost.

The public dialogue about sprawl goes off track when people focus on snapshots of development in progress. It is the end result that matters. Once an area is fully developed, correcting the failures associated with sprawl usually takes many years and is much more costly than ‘doing it right’ the first time. Policy makers should focus on whether the proper incentives and regulations are in place to accomplish two primary objectives:

- (1) to allow the full richness of densities and uses to occur in the area over time; and
- (2) to ensure that the infrastructure, road networks, open space and public services are being properly planned to support the ultimate build out.

Outcomes blamed on sprawl

This section examines the various outcomes associated with sprawl according to whether they are part of the process of land development or the end result at full completion. Primary attention should be devoted to those outcomes blamed on sprawl which are present at final completion.

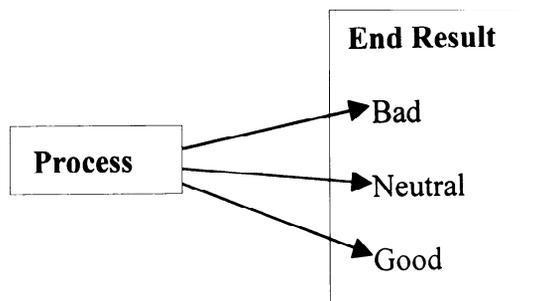


Figure 2 Development outcomes

Table 2 *Outcomes blamed on sprawl*

<i>Outcomes</i>	<i>End result causes</i>			<i>Comment</i>
	<i>Market failure (negative)</i>	<i>Regulatory failure (negative)</i>	<i>Development process (neutral)</i>	
PART OF DEVELOPMENT PROCESS				
Low-density development			x	Part of normal development process during early waves of development. Helps to reduce sprawl if higher-density infill development is encouraged. Increases sprawl if not.
Leapfrog development			x	Speculation raises housing prices when poor regulation reduces land supply and creates monopoly pricing for developable sites.
Scattered development			x	
Land speculation			x	
NEGATIVE END RESULTS				
Gluttonous use of land	x	x		Market failure contributes to inefficient development and poor open-space provision because developers cannot internalise benefits. Regulatory failure promotes gluttonous and monotonous development through large-lot zoning and failure to promote mixed-density and mixed-use development. Market and regulatory failure to protect environment as competition to produce lowest-cost product increases environmental degradation.
Monotonous development	x	x		
Environmental degradation	x	x		
Inefficient development: poor accessibility	x	x		
Inefficient development: poor infrastructure	x	x		
Underprovision of functional open space	x	x		
END RESULTS BOTH BAD AND NOT-BAD				
Strip development	x	x	x	Strip development is normal during early wave of growth but likely to be overdeveloped if uncontrolled. Big-box retail development saves consumers money but competition hurts older commercial areas.
Big-box retail development	x	x	x	
COMPLEX RESULTS				
Decaying inner city	x	x	x	Complex phenomenon exacerbated by sprawl which eases outmigration of residents and firms to suburbs.
Concentration of poor	x	x	x	Regulatory barriers reduce housing choice and increase concentration of poor in inner city.

Table 2 shows 14 outcomes of development that are associated with—and often blamed on—urban sprawl.

PROCESS OUTCOMES

Four outcomes are part of the process of development:

- low-density development;
- leapfrog development;
- scattered development; and
- land speculation.

While each of these may lead to other negative end-result outcomes, they do not necessarily produce negative results.

Discontinuous (leapfrog) development occurs naturally because property becomes available for development primarily for life-cycle reasons (farmers and other owners die or retire) rather than because it is next in line for development. Property owners tend to hold better located parcels off the market until such time as the market will support higher-intensity uses such as apartments, condominiums or commercial uses because they are worth more. Also, because of agglomeration, infill land tends to increase in value faster than land at the fringe. Thus, it is not only normal but beneficial to have discontinuous development.⁴

Leapfrog and scattered developments are criticised because they may lead to inefficient infrastructure investment. They do in fact cause greater investment in infrastructure during the early waves of development because utilities and roads must extend across greater distances. However, developers face a trade off between cheaper land and more expensive off-site infrastructure. Leapfrog and scattered development occur because the net profit to developers is often greater when they purchase land that is not contiguous to existing development. Furthermore, it is not necessarily 'bad' in the long run because the sites passed over are often developed at higher densities in subsequent waves of development than they otherwise would have been.

One of the basic principles of real estate is that density is positively correlated with land value. When land values increase, developers build at higher densities in order to hold down overall housing prices. Therefore, the land market automatically leads to higher-intensity development on land that remains undeveloped. Unless it is constrained by zoning or 'not in my back yard' (NIMBY) forces, infill parcels will naturally be developed at higher densities. When communities try to prevent leapfrog development through zoning requirements or by controlling utility availability, they actually are increasing the likelihood that densities will be lower than they would be if the land market were left to operate naturally. This is because the initial wave of development is

⁴ When developers are constrained to develop land that is contiguous to existing subdivisions, either through utility service or annexation policies, land prices are likely to be higher because landowners know that developers have no other choice. Such constraints on developable land create monopoly pricing opportunities for owners (Peiser, 1981; 1989).

lower density than later waves of development—the first wave is usually low-density, single-family detached housing on low-priced land. As noted in the ULI's *Residential Development Handbook*:

The strong demand for housing shifted development to the open land outside cities, often bypassing land closer in with more perceived constraints on development, varied topography, or higher land costs (ULI, 1990, 1).

Leapfrog development may have negative consequences if the development is spread over so large an area that the inefficiencies associated with sprawl outweigh any potential benefits from higher-density infill development (Peiser, 1989). The very first forms of urban-fringe development are often ranchettes or large-lot estates of one to two acres that are served by septic tanks and asphalt farm roads. Subdivisions with two to four units per acre ($\frac{1}{4}$ – $\frac{1}{2}$ acre lots) usually follow when sewer service becomes available. While internal subdivision roads may meet urban subdivision standards, arterial road improvements often lag behind because they depend on county or state highway funds. Developers in some communities have formed 'road clubs' to provide funding for arterial road improvements (Porter and Peiser, 1984).

Land speculation also is a natural component of urban development. Land speculators play an intermediary role, betting that they can sell land for more than they bought it. They are blamed for bidding up the price of land. In most cases, land speculators only reap part of the increase in value that otherwise would accrue to the previous landowner (Block, 1981; Adams and Lindeman, 1979). The ultimate land price to the home builder is determined by what the builder can afford to pay for land based on what he can sell the finished homes for. Speculation assists the land market by putting land into the hands of people ready to deal (Block, 1981, 720).

Ironically, in those cases where speculators do in fact bid up the price of land beyond its reasonable fair market value, the parcel remains undeveloped. While this may increase the discontinuity of development, it adds to the inventory of infill parcels that, in the absence of density restrictions, are likely to be developed at higher densities in the future. Attempts to reduce speculation such as taxing windfall profits may simply reduce the supply of land for development by reducing the incentive for farmers to sell to builders. As Adams and Lindeman (1979, 226) note, most of the lasting effects of land speculation have to do with restrictions on supply. They point out that speculation may hamper the market where speculative expectations turn out to be too high because real estate prices tend to be 'sticky'—they go up quickly but go downwards slowly. Prices eventually adjust as bankruptcies, foreclosures and high mortgage payments force owners to sell. However, the adjustment can be hindered by mortgage terms and contractual encumbrances on the land.

NEGATIVE END RESULTS

Six outcomes in Table 2 are often observable as an area is developing, but they become truly objectionable when they are still present after the area is fully developed:

- gluttonous use of land;
- monotonous development;
- environmental degradation;
- poor accessibility;
- poor infrastructure; and
- underprovision of functional open space.

They result from either market or regulatory failure, or both. The challenge for planners and others concerned about ‘bad’ sprawl is how to prevent them from being the end result of growth.

Gluttonous development

No one likes ‘gluttonous’ consumption of land—the consequence of uniformly low-density development. Gluttonous land consumption and monotonous development occur when developers mistakenly build a greater supply of homes on large lots than the market can support, or when bad planning or exclusionary zoning lead to vast expanses of land that have the same low density. Such development is in fact rarely the most profitable for developers who can make more money when land is developed at higher densities.

Monotonous development

Developers make more money when their land development projects have faster absorption. Market absorption for a given tract is greater when developers offer a variety of housing products at different densities (ranging from large, single-family homes to high-density town houses, cluster homes and apartments) serving different parts of the market segmented by income and demographic characteristics. Therefore, monotonous development of similar homes on large lots is not in the interest of developers and is not a natural consequence of the market. Historically the problem of monotonous development was exacerbated by the Federal Housing Administration and private lenders who favoured single-family, detached housing on quarter-acre or larger lots. However, that bias has been gone since the 1980s. Today, monotonous development occurs when either developers are ignorant about how to increase their profits through market segmentation or when zoning regulations or lengthy public approvals limit their flexibility in subdivision layout.⁵

Inefficient development: poor accessibility and infrastructure

This is an undesirable outcome associated with sprawl caused by a lack of planning. It tends to be worse in rapidly growing areas on the urban fringe where planning lags behind development—where transportation and infrastructure planning occurs on a piecemeal basis, development by development, rather than with a regional perspective in which the ultimate population is planned for (Porter and Peiser, 1984; Peiser and Chang, 1999).

⁵ When the real estate market crashed in the mid-1980s, Memphis, Tennessee for example had more than 40,000 planned but unbuilt quarter-acre and larger lots for single-family homes.

Builders in their attempt to deliver the most housing at the lowest possible price are always searching for the lowest-cost areas in which to build. These are usually found at the periphery—in communities that have not yet developed the regulatory sophistication found in more established communities.

Inefficient development is caused in part by many individual operators acting independently. Developers normally focus on their individual subdivisions and business parks. Someone must look out for the broader community if the problems of piecemeal development are to be avoided. Since this level of planning is seldom performed adequately at the subdivision level, I believe that the county and municipal elected officials must take responsibility for ensuring that broader planning is performed properly.

A distinction should be made between inadequate planning for roads and infrastructure and the problem of development occurring in advance of construction of roads and other infrastructure. The latter problem, which led to Florida's Concurrency Laws, leads to greater congestion and utility difficulties while an area is being developed, but if the infrastructure is ultimately built in accordance with a solid regional plan the difficulties may be short term rather than permanent.

The absence of functional open space

The absence of functional open space is indeed one of the worst aspects of sprawl. It is discussed later in the paper along with solutions to improve open space provision.

BAD AND NOT-BAD END RESULTS

Problems associated with suburban retail development in the form of strip development and big-box (large warehouse) discount department stores are often blamed on sprawl. They have characteristics that lead to both good and bad outcomes.

Strip development

Strip development is often the leading edge of urban fringe growth. It occurs simply because property along the roads is most readily accessible. It is unsightly, covering up the rural views from the road and often deteriorates more rapidly than other forms of development as larger shopping centres and residential projects are built. Strip development tends to occur when the property abutting the highways is divided into smaller parcels. Ironically, strip development is not in the interest of larger landowners who will save the more valuable frontage until later waves of growth occur, when they can attract higher-value (usually denser) uses such as larger shopping centres, apartments and commercial development. Strip development is difficult to prevent without utility, zoning or other development constraints. Limited amounts of strip development are normal and provide important retail services in the early stages of growth. Excessive amounts of strip development are a bad outcome, resulting from weak subdivision regulations and a failure to encourage larger-scale planning and development.

Big-box retail development

This type of development thrives because it is built upon very powerful economic forces of economies of scale and production that lead to lower costs for the consumer (NREO, 1999). Big-box retail development is criticised because the buildings and parking lots are ugly, and small 'Mom and Pop' stores in town have difficulty competing with them. Sprawl is associated with big-box retail development because the large vacant sites needed for development are typically found in developing areas on the edge of town. However, sprawl does not create big-box retail development—the economies of retail distribution and consumer preferences do. Big-box retail development is complicated by the fact that cities often covet them because of the revenue they generate. This raises a whole new set of issues with respect to the fiscalisation of land use⁶ that we do not have space to address properly here (Altshuler and Gomez-Ibanez, 1993; Kotin and Peiser, 1997). Because budget-deprived older suburbs want them, big-box stores are increasingly being developed in inner-city locations on large underutilised sites.

The legitimate criticism of big-box retail development is not that it is a consequence of sprawl, but that it is often ugly. The economies that big-box retail development provide can be retained in more attractive settings through better urban design and landscaping of parking lots. Also, in smaller towns, big-box retail development can be steered to downtown locations to reduce the negative impact that suburban locations have on downtown vitality.

COMPLEX RESULTS*Decaying inner city and concentration of the poor*

These elements are the result of very complex forces. Sprawl plays a role but it is not the sole cause. Suburban growth has made it easier for those who can afford it to move out of the city. David Rusk (1995) presents a convincing explanation of the push-pull factors that cause inner-city residents to move to the suburbs. In surveys of people who left the inner city, he found that good schools and safer neighbourhoods topped the list of 'pull' factors. Farther down the list were the characteristics of the homes that people were going to buy, the expectation that the new community would appreciate in value, and issues of comparative tax rates. Rusk argues that the 'push' factors of poor schools, high crime rates and deteriorating home values are substantially the product of the concentration of poverty in city neighbourhoods—'And that is very much tied up with the issue of race' (NREO, 1999). Three out of four poor black people live in neighbourhoods of concentrated poverty. Rusk notes that Federal public housing policy functioned for several decades to create economic segregation. The Hope Six programme is recreating public housing communities not only as architecturally attractive but also as mixed-income communities. Along with the

⁶ Fiscalisation of land use refers to the practice whereby cities favour land uses such as retail that improve the city's fiscal situation and discourage development of land uses such as apartments that are considered to be a drain on local finances.

rent voucher programme it is helping to reduce the concentration of public housing units in inner-city neighbourhoods.

Downs (1998, 4) reports that in an empirical study of 162 large metropolitan areas, 10 traits of sprawl exhibit no statistically significant relationship to measures of urban decline. Preventing sprawl, he argues, will not by itself cure the problems of the decaying inner city and the concentration of the poor there, but it will help to redirect investment into the inner city. Downs notes that most suburbanites would rather spend money on community development to improve core-area poverty neighbourhoods than help residents move to better neighbourhoods. David Rusk, however, finds that community development has in Downs's terms 'almost universally failed to prevent such neighbourhoods from falling further and further behind the region' (Downs, 1998, 5). Decentralising the location of low-income households through rent vouchers and other programmes is essential to reducing the problems generated by concentrated inner-core area poverty.

Two core criticisms of sprawl: where the market works and where it does not

Two of the core criticisms of sprawl are that it results from the market's tendencies to promote low-density development and under-provide functional open space. The first is simply not true; the second—a classic externality problem—is.

ACHIEVING HIGHER-DENSITY DEVELOPMENT

Planners have long sought to increase densities by promoting attached housing and cluster housing. Town houses and other forms of attached housing have met with only limited success in the market place. The American dream is a single-family home on its own lot, and that is what the great majority of home buyers prefer. Developers have responded to the market place by designing a new single-family product on smaller lots that achieve densities comparable to town houses.

Ironically, it is the building industry that has been a major champion of higher-density development, originally attacking the two-acre minimum lot zoning in wealthy New Jersey suburbs outside New York City. In the 1960s and 1970s, 7,000–7,500 square foot lots were the norm in many developing suburbs. This equates to about four units per acre. 'Rising land costs and changing locational preferences and lifestyles are driving suburban residential densities higher than ever before in major metropolitan areas' (ULI, 1990, 3).⁷ With

⁷ Contrary to popular belief, high-density development (40 units or more per acre) is more expensive than low-density development. The break point is determined by parking needs and the type of construction. High-rise buildings cost 50 per cent to 100 per cent more than low-rise buildings because of elevator, fire code and structural requirements. Structured parking, especially underground parking, can add \$20,000 or more per parking space to construction costs. Ladd (1992, 273) notes that higher-density development typically increases public sector spending as well.

skyrocketing home prices in the 1980s, densities have risen dramatically to 10–12 units per acre in specially designed single-family communities (NAHB, 1986; ULI, 1994). In high-priced communities like Southern California where affordability is a severe problem, developers have held down prices by building homes on 3,000–4,000 square foot lots.

Of course, local attitudes towards density dominate both zoning laws and what developers provide. If home buyers are accustomed to seeing homes on 6,000–10,000 square foot lots, then that is what local planning commissioners permit through zoning and what developers build. I believe that the only cure to this form of gluttonous land use is education—demonstrating to local commissioners and councillors and to the public at large that higher-density housing can be just as attractive as low-density housing (something the National Association of Home Builders has sought to do for two decades).

Demographic changes—the greying of ‘baby boomers’ and the increase in non-traditional households—presages higher demand in the future for condominiums and other forms of housing that require less owner maintenance (Lincoln Institute of Land Policy, 1995). To meet this demand developers will respond by offering more housing at cluster, town house and condominium densities (approximately 8–20 units per acre), thus helping to reduce sprawl.

To summarise, while market forces are often blamed for creating sprawl they work quite well to encourage higher densities. Where prices are high the nature of the land market itself promotes densities. In communities that allow small-lot zoning, developers are providing a product that economises on land while meeting home buyer preferences for detached single-family housing. However, NIMBYist forces must be held at bay if higher densities are to occur, especially in areas surrounded by older development.

IMPROVING FUNCTIONAL OPEN SPACE

People blame sprawl for causing the loss of open space. However, its absence is the result of many different features of American urban growth. The creation of more usable open space requires solutions that directly target it rather than lumping it in with all the ‘evils’ of sprawl.

Open space provision is a classic externality problem. The market place does not provide sufficient usable open space because it is viewed as a public good—everyone expects it to be provided by someone else. In developing communities, home buyers often view adjacent undeveloped parcels as open space for their enjoyment, forgetting that the parcels will eventually be developed. Voters do not want to pay directly for open space. They see the benefits of it, but a collective arrangement may be required to overcome the ‘free rider’ problem where people want to enjoy the use of open space provided and paid for by someone else (Fischel, 1985). Instead, voters have seized on the environmental movement, especially the Endangered Species Act and the Water Quality Act, to prevent development on large expanses of developable land. Downs (1994) notes that environmentalists oppose public purchase because taxpayers will not fund as many purchases as are socially desirable, so they prefer regulatory procedures.

Ewing (1997) observes that planned communities deliver open space that ‘is

not far off the mark' from the range of 18–57 per cent of total land area found in the Real Estate Research Corporation (RERC)'s hypothetical estimates in *The Costs of Sprawl* (1974). While I agree with Ewing that open space preservation is one benefit of large-scale planned development, there is no reason to believe that such large-scale planning is likely to occur any more often in the future than it has in the past.⁸

Preserving farmland is an increasingly popular device for preserving the feeling of open space and for stopping development (Volkman, 1987). The city of Ventura outside Los Angeles, for example, passed a ballot initiative (Measure I) in November 1995 that prevents development of farmland for 35 years without permission from a majority of voters in a city election. Although it is not available for public use, Measure I does manage to preserve open space. Unfortunately, it does so by benefiting one group (residents) at the expense of another group (farmers). Furthermore, the initiative actually increases sprawl by pushing development into outlying areas that have not yet passed similar anti-farmland conversion measures. As Nelson (1992) points out, all too often we see local/regional efforts aimed at open space protection without corresponding commitments to accommodate regional development needs elsewhere.

Some communities, especially those in mountainous regions, are able to preserve more open space because land is simply too steep to build on. Other communities like Houston and Dallas have no such natural advantages. They have no workable mechanism to preserve large amounts of open space.⁹ Current regulatory approaches which require developers to set aside open space in exchange for the right to develop their land effectively tax new home buyers for something that benefits everyone, and for which everyone should pay. Such approaches also lead to piecemeal parks.

The United States of America (USA) can learn from England, which has made open-space preservation a top priority. England takes a strategic approach, finding opportunities to create 'green chains and walks' and for developing green chains as strategic links between London's open spaces (Turner, 1992, 379).

The primary problem in the USA is how to pay for public open space. Many communities have park impact fees on new homes that place the financial burden for open space exclusively on new home buyers. However, unless existing parks fully provide for the open-space needs of the existing population, current residents should bear their fair share of the cost for more open space. While an impact fee is appropriate to cover some of the cost, the fairest approach may well be to create a regional park district that taxes everyone.

The Santa Monica Mountain Conservancy in Los Angeles has used one of the more creative approaches by bargaining with landowners to contribute mountain

⁸ New towns and other large-scale planned communities have a very poor track record of financial success. Developers who are doing community-scale development are aiming for projects that can be completed in 5–10 years—typically 500–1,000 acres at most (Peiser and Chang, 1999).

⁹ Dallas has used the Texas State's river authority to create large lakes that surround the metropolitan area. These have been built years in advance of development so land costs have been minimised.

land to the Conservancy in exchange for the Conservancy's support for the landowners' development of less environmentally sensitive parcels. The Conservancy is successful because Malibu is such a contentious area for development that the Conservancy's organisational support can make a considerable difference when developers try to obtain approval for their projects. In the absence of specific open-space preservation planning, the only workable solution under current American property rights law is either to set aside more money to buy open space or to accept the fact that open space in and around urban areas will disappear. If people want more open space, they must pay for it.

Solutions to sprawl

Each of the outcomes in Table 2 has a set of solutions. Considerable energy and many public policy initiatives are devoted to solving problems that do not necessarily lead to bad outcomes—such as policies to prevent leapfrog development. This section discusses three popular approaches to reducing sprawl; they do not necessarily lead to the desired results.

URBAN GROWTH BOUNDARIES

One approach that has successfully preserved open space is Portland's system of Urban Growth Boundaries (UGBs) (ULI, 1989). The boundary encompasses 365 square miles, 24 cities, 60 special service districts and was based on a projection of need for urban land in the year 2000. The boundary was never intended to be static. However, since 1979 only 2,515 acres have been added for urban land (Dunphy, 1997, 48).

While Portland's UGB has successfully contained some aspects of urban sprawl, it has failed to stop others. It is credited with helping to make Portland's downtown area one of the healthiest in the nation. Also, it has stopped piecemeal development outside the UGB. However, it has not succeeded in generating higher densities. Growth is occurring at only 70 per cent of planned density (Walsh, 1994), and although it is being directed to preferred areas it is not consuming less land.

Urban growth boundaries are not without their problems. Nelson (1992, 481) points out that by the time growth reaches the limits imposed by the UGBs, the land abutting the UGBs will have been developed and occupied by 'gentleman farmers'—affluent households capable of mounting serious opposition. UGB planners underestimated the demand for hobby farms and exurban development. Instead of requiring 10-acre minimum lot sizes which forced consumers of smaller farms to use up land more quickly, Nelson (1992) argues that it would have been far better to have allowed small, one or two acre tracts within the prescribed areas.

In order for UGBs to work they must provide sufficient land for future growth, or the growth will leapfrog beyond the UGB as it did in Portland. Downs (1994, 127) does not believe UGBs would work for Los Angeles. With Southern California's expected growth of some 43 per cent between 1985 and

2010, Downs concludes that the UGB would have to be drawn too far out in order to leave enough vacant land for expansion. If instead of peripheral development the newcomers went into existing neighbourhoods, average densities would need to rise by some 33–50 per cent to accommodate them. Yet most of these neighbourhoods want lower densities rather than higher densities. He concludes that the required increases are not likely to be approved by local government.

REGIONAL GOVERNANCE

Many aspects of sprawl are a consequence of America's system of urban governance—a plethora of small independent municipalities, each pursuing its own best interest. Wealthier communities are able to attract employers and retailers as well as exclude undesirable uses and fiscal drains (as apartments are believed to be). This capability to exclude others increases the disparity between rich and poor suburbs and saps the central city. Residents of wealthy suburbs gain at the expense of everyone else in the region. Their property values go up and their relative taxes go down, further enhancing their attractiveness and competitive position.

While wealthier suburbs are able to control their destiny by restrictive growth ordinances, they push development into other areas with less stringent protection. The growth has to go somewhere.

The problem is that no one is looking out for the interest of the whole. Nevertheless, the need for regional solutions is gaining slow recognition. Regional approaches that are being tried around the USA fall into four categories—sharing revenues, sharing revenues and services, public–private partnerships and regional planning.¹⁰ Regional agencies are being created to deal with problems such as air quality and transportation, recreation and open space.

A critical factor in Portland's ability to create UGBs was its regional governance structure, which is one of the oldest and strongest in the USA. The 'Metro' government was formed in 1978 to bring together the planning functions of the former Columbia Region Association of Governments (CRAG) and the regional services under the Metropolitan Service Commission (MSC). Metro slowly evolved to become a true regional government, whose members are as powerful as those in the Oregon House of Representatives:

Metro is governed by a 13-member council elected from council districts and an executive officer elected at large. The new government has (achieved) a general consensus that it is a positive force for the region. Because of this support, Metro has been able to take some formidable steps, including the establishment of regional growth boundaries. (Dunphy, 1997, 48)

¹⁰ Minneapolis–St Paul divides the increase in commercial and industrial property taxes between the home community (60 per cent) and the region (40 per cent). Denver and Pittsburgh have created 'regional asset districts' to manage regional facilities like parks, libraries, the zoo, sports stadium and cultural facilities (Hollis, 1997).

COMPREHENSIVE STATE PLANNING

Florida has attempted to control urban sprawl through a State review of local comprehensive plans and through the 'concurrency' statutes that are part of its Growth Management Act. The Concurrency Laws require that all infrastructure be in place before an area can be developed. They were intended to ensure that sufficient water, sewer, roads and drainage facilities were in place. However, planners were surprised to see sprawl development increasing rather than decreasing after they were passed in 1985. Since road congestion was one of the primary factors that determined whether an area could be developed, developers were prevented from building on infill sites until road capacities were increased. Development leapfrogged to rural sites where road capacity was not a problem. Planners should not have been surprised at this consequence. While concurrency is a worthy goal, rules have to allow flexibility in meeting standards such as low road congestion if development is to be channelled into existing urban areas.

Florida is the first state to pass specific 'anti-sprawl' legislation. Rule 9J-5 of the Florida Administrative Code requires all Florida communities to consider 'urban sprawl' in their planning. Each local comprehensive plan must contain a future land use map that discourages the proliferation of urban sprawl and which allocates only the amount of land needed to serve the jurisdiction's projected population during the planning period, usually 10 or 20 years (Pelham, 1992, 326). Further, the plan should contain policies governing utility provision that discourage sprawl. The Department of Community Affairs (DCA), the state land planning agency, must review local comprehensive plans for consistency with the Growth Management Act and anti-sprawl policies.

Like the Concurrency Laws, Florida's anti-sprawl rules are likely to have unintended consequences. The indicators are vague and subject to capricious interpretation. They specifically discourage leapfrog development, which as discussed earlier is counterproductive. Because the standards for sprawl are vague, builders will not know what is acceptable and what is not. Confusion leads to delay and delay causes prices to go up. Further, the rules will lead to unnecessary expenditures for consulting and lobbying by developers to get their plans approved. Trying to control sprawl through regulation as in Florida may be well intentioned, but such rules are likely to raise costs unnecessarily and are unlikely to produce higher densities since they address symptoms of the problem rather than the causes. One important element of any planning effort is swift resolution of planning disputes. The operation of Oregon's Land Use Board of Appeals combined with statutory deadlines on local government review of discretionary proposals means that land use disputes are presented, decided and resolved in most cases within one year. Oregon is the only State to require that discretionary permits be accompanied by clear and objective standards that are reasonable. Arthur C. Nelson observes that Florida's statutes fall way short of this idea when he comments: 'Oddly, Florida's substantive laws are quite similar to Oregon's, but its procedural laws guarantee frustration and ultimately failure of Florida's laws to meet their promise' (Nelson, personal communication).

Conclusions

Urban sprawl is back as a prominent issue on the USA national agenda and increasingly throughout the urbanised world. However, what should be done about it is confused because the term 'sprawl' has so many different meanings. Sprawl has come to embrace a very complex set of urban issues including both physical patterns of development and processes of urban growth. In order for land use policy towards sprawl to become more effective, individual problems associated with sprawl, such as how to preserve more open space, must be carefully delineated. More effective planning is a necessary part of the solution, establishing a set of rules and institutions (such as Montgomery County, Maryland's road clubs [Porter and Peiser, 1984]) to guide development and pay for infrastructure. This leads to better development at lower cost than establishing regulatory processes that broaden the number and scope of discretionary approvals—processes that leave the interpretation of the rules up to politicians.

Those who decry sprawl must understand the forces that contribute to it. NIMBY forces and exclusionary zoning may help to preserve one municipality but the growth must go somewhere; it cannot be stopped. Usually it is forced out to the fringe where land prices are cheapest. Policy makers need to have a better understanding of how the land market operates. Discontinuous development and land speculation go hand in hand with an open land market. In fact, they actually serve a beneficial purpose through a pricing mechanism that contributes to higher densities.

Urban fringe growth is often confused with sprawl because it is the leading edge of land consumption. However, it is merely the initial phase of a community's cycle of urbanisation. It is here that planning is most crucial, because the opportunities to preserve open space and to design appealing neighbourhoods and commercial centres are greatest. Unfortunately, most newly developing communities are ill equipped to provide the planning and development leadership required. The worst aspects of sprawl occur when no one is looking out for community interests as a whole—utility engineers try to minimise utility costs, developers minimise development costs, and short-term profits dominate long-term community welfare objectives. Solving the problems associated with sprawl requires complex, multi-facet solutions. Issues of regional governance and how to pay for public facilities and services must be addressed.

As Downs (1994) notes, the most problematic issue is what happens to the inner city. The notion that controlling sprawl will generate inner-city redevelopment has yet to be demonstrated. In fact, the growth appears more likely to go to areas with fewer constraints—as Southern California experienced with the flight of major companies to Arizona and Nevada. The problems associated with sprawl will persist as long as individual municipalities within a metropolitan area are able to maximise their own well being without regard to the consequences to other municipalities and the metropolitan area as a whole. Whether we like it or not, some form of regional management is a necessary part of the solution.

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