

Commentary

Urban Sprawl as a Link to Sustainable Development: Negative Health Effects

Talya D. Thomas, Ph.D.¹
Angeline Walton¹

¹Jackson State University

Introduction

Since the 21st century is upon us, there has been popular attention given to the undesirable effects of urban development, primarily in suburban areas, referred to as “sprawl.” “Urban Sprawl” has recently become a debate from governmental bodies and nonprofit organizations. This paper is a view of the current research and applications regarding the impacts of urban sprawl as it relates to sustainable development.

According to HUD, many voters have attempted to pass measures to limit the rate of development in suburban areas and to preserve green space (U.S. Department of Housing and Urban Development, 1999). There have been numerous reports that have highlighted negative impacts of sprawl such as increased traffic congestion and air pollution. Research conducted by Norman Orfield has drawn much attention to the negative political and fiscal impacts of suburban sprawl not just in the areas that are experiencing sprawl, but inner cities and inner-ring suburbs that are losing population to our suburban areas. The issues that will be brought forward in this paper for discussion will be: what is urban sprawl, reasons for urban sprawl, the health effects of urban sprawl, and the environmental impacts of urban sprawl.

What Is Urban Sprawl?

Sprawl can be defined in a variety of ways. According to The Sierra Club, sprawl is a “low-density development beyond the edge of service and employment, which separates where people live from where they shop, work, recreate and educate—thus requiring cars to move between zones (Sierra Club, 1999; 1).” The U.S. Department of Housing and Urban Development defines sprawl as “a particular type of suburban development characterized by very low-density settlements, both residential and non-residential; dominance of movement by use of private automobiles, unlimited outward expansion of new subdivisions and leapfrog development of these subdivisions; and segregation of land uses by activity (U.S. Department of Housing and Urban Development, 1999; 33).”

All of the definitions presented previously have been the subject of extensive debate for sometime now. For example, as Hayward and O’Toole pointed out, increases in automobile usage are not synonymous with increases in commuting times, and neither of these is necessarily synonymous with low-density development. Burchell et al. synthesizes 40 years of research on urban sprawl’s impacts and concludes that the three conditions that define the negative impacts of sprawl—leapfrog development, low density, and unlimited outward expansion—are the same ones that define positive aspects of sprawl as well. Definitions of sprawl are difficult, and not easily quantified, as some metropolitan areas may have, but not all of the characteristics of sprawl. In any case, it seems clear that “sprawl” is a phenomenon of interest because of the high level of automobile usage, segregated land uses, disparities in fiscal capacities of local governments, and development

that alternates relatively low-density land uses and undeveloped land in a rather haphazard fashion. Finally, “sprawl” and “nonsprawl” are more likely to be directions on a continuum than fixed categories.

Since, urban sprawl has been loosely defined over the years, thus the definitions may cause confusion and attribute negatively toward urban sprawl. For this paper, urban sprawl will be defined as an overall pattern of development across a metropolitan area where substantial percentages of the population live in lower-density residential areas. Lopez (2004) suggested that causes of urban sprawl are households that purchase larger houses on larger lots, cultural values that reject urban living and emphasize automobile use, inexpensive land values that support urban sprawl-dependent lifestyles, and government policies that promote urban sprawl. The consequences of urban sprawl include increased reliance on automobile transportation and decreased ability to walk to destinations, decreased neighborhood cohesion, and environmental degradation (e.g. greenhouse gas emissions and destruction of open space).

Reasons For Urban Sprawl

There are a number of land use strategies that include sprawl as well as certain alternatives to sprawl. The term “edge cities” was first used by Joel Garreau in his book titled *Edge Cities: Life on the New Frontier*. “Edge Cities” are essentially regions with sprawl-type development that are dense enough and populous enough to be considered “cities” even though these regions may comprise a number of autonomous municipalities. Edge Cities are defined by the concentration of nonresidential clusters at the intersection of major beltways and interstates outside the central city that are eventually joined by high-density residential development and become relatively self-sufficient (Garreau 1991). “Transit-oriented development” defined as compact, mixed-use development within walking distance of a transit station – has emerged in recent years as a key strategy for fostering quality neighborhoods and reducing auto dependence (Center for Transit-Oriented Development, 2013). Transit-oriented development does not require that mass transit be used for all trips, but that residents may have mass transit as an alternative to an automobile, and that mass transit stations and the areas around them allow riders to combine work and non-work trips.

Urban growth boundaries, is one antidote to sprawl. Kelly Kolakowski, defines this antidote as a successful way to manage urban sprawl by not allowing public infrastructure to support development beyond the boundary. Areas beyond the urban growth boundary that are off-limits to suburban development include farms, environmentally fragile watersheds, and parks. Urban growth boundaries are intended to reduce local government’s costs, promote open space and farmland, increase affordable housing and create better public transportation (Kolakowski et al., 2000). For example, Oregon has enacted a law requiring the use of an urban growth boundary around the Portland metropolitan area as a way of managing the rate of growth of residential and commercial development, and increased the use of mass transit system, and to encourage “infill” development of inner-ring suburban areas as opposed to developing as far away from the central city as possible. Success at smart growth is very evident in Portland, Oregon. Portland has instituted urban growth boundaries and encourages contiguous development and increasing density. They have a popular light rail system that connects people with jobs, schools, and recreation in the densely organized city. They have also made it a point to preserve green spaces within the city and to collect local floral before construction begins to preserve and replace it. Portland’s light rail success has led to similar projects in other cities including Denver and Phoenix. The investment into the light rail system alone with the concurrent development along the rail lines is a step in the right direction for the sprawling Phoenix metropolitan area. The city has launched a sustainability green initiative which includes alternatively fueled public transit, a government preference for

office equipment that meets energy star standards. All new government buildings are designed for adherence to strict green standards. Phoenix is also investing in protecting historical neighborhoods and the preservation and restoration of historic downtown buildings for contemporary use.

Different variations of urban growth boundaries have been explored by other states under the rubric of “Smart Growth.” Many U.S. states have subscribed to the use of smart growth. Oregon, Florida, and Washington have been the most successful at implementing policies that help realize the smart growth model. Smart Growth plans focus on revising land use controls to make them more sensitive to problems that lack housing diversity, traffic congestion, and environmental degradation. The intended result of these land use changes is greater growth in areas that have existing infrastructure, acquiring certain open spaces, and increased social equity (Burchell et al., 1998, O’Neill, 1999, Stoel, 1999). Smart Growth incorporates the transit-friendly, mixed-use design of transit-oriented development. These plans may be more appealing politically than urban growth boundaries because there is no fixed limit to growth, instead incentives are designed to produce results that are similar to those derived from an urban growth boundary. The “sustainable development” strategy, derived in large part from the World Congress on Sustainable Development held in Rio de Janeiro in 1992, is designed to “limit growth to the degree that public facilities and services are in place to accommodate this growth (Burchell et al., 1998; 37).” Some twenty-one communities in the U.S. have passed sustainable development ordinances, which are basically growth management programs under another name.

In 2007, the peer reviewed journal, *Urban Studies*, analyzed the successes and failures of states that have implemented some kind of smart growth initiative. They found that the strongest state approaches at land management have a significant impact on the negative effects of sprawl. One important feature of successful growth management is infrastructure concurrency. This means that growing communities must prove that they have adequate water, sewage, roads, and other public infrastructure in place before they are allowed to expand.

Various Federal commissions and agencies have designed sustainable development objectives that funded programs must observe, ensuring that capital projects respect the local environment as well as limiting associated growth to locations that have infrastructure to support that growth (Burchell et al., 1998). Another development strategy lies in stark contrast to the ones listed above; it relies on land use deregulation, reductions in fuel taxes and local control of land use and transportation investment decisions. This strategy assumes that residents and businesses can best make land-use decisions without interference from planning agencies or state and Federal bodies (Hayward, 1998, O’Toole, 1999).

Downs (1994) discussed four regional growth regimes that incorporate the policies that are useful in generalizing the discussion of development alternatives. The first, which can be considered the status quo, is called “unlimited low-density growth.” In this regime, local zoning and building codes alone define market provision of housing and jobs, the dominant residential pattern is owner-occupied, single family detached homes, transportation is almost exclusively provided by private automobiles, low-rise workplaces dominate employment alternatives and affordable housing is available almost entirely through the trickle-down effect. Edge Cities and the extreme free-market approach listed above would fall under this planning scheme. The next regime, a moderate alternative to the status quo, is called “limited-spread, mixed-density growth.” Here, urban growth boundaries are encouraged, but not mandated and the dominant residential pattern is clusters of high-density housing amid larger areas of lower density housing, with some affordable housing made available through housing subsidies and lower regulatory barriers. Transit use is encouraged primarily through ridesharing, and employment may be concentrated in nodes through voluntary incentives. Local governments

have limited cooperation in land use planning. The third regime, incorporating more aggressive planning initiatives, is called “new greenbelts and communities”. Growth boundaries are designed and enforced, but only for certain corridors, new towns and metro areas. Residential growth is concentrated in a few planned communities featuring mixed-use, mixed-density development, and there is an explicit emphasis on mass transit as an alternative to the automobile. Regulations and incentives encourage jobs to cluster in new centers and encourage municipalities to plan for growth in a regional framework. Transit-oriented development, sustainable development and Smart Growth all incorporate aspects of these two alternatives to the status quo. The last regime, called “bounded high-density growth”, incorporates extensive land-use and employment planning so that all future growth is limited to an urban growth boundary. Residential densities are raised in both new and existing communities, a regional government supersedes many local government functions, and mass transit is strongly emphasized through subsidies and transit-oriented development. Affordable housing is available in this regime as entitlement, counteracting the effects of higher housing prices brought about by a restricted supply of developable land.

Health Effects of Urban Sprawl

In the United States, obesity rates and being overweight are increasing daily. In 2000, approximately 20 percent of the adult population was obese and 37 percent was overweight. The National Health and Nutrition Examination Survey (1999-present) found that the percentage of obese adults increased from 23 percent between 1988 and 1994 to 31 percent between 1999 and 2000. Childhood obesity rates also increased between 1988 to 1994 and 1999 to 2000 from 7 percent to 10 percent among children aged 2 to 5 years (Garden and Jalaludin, 2008). The southern states were the first to have more than 20 percent of their adult populations obese, and from this center, higher rates of obese and overweight adults have spread to all areas of the country. Many of the metropolitan areas that have the highest levels of urban sprawl are located in the South (Garden and Jalaludin, 2008). This association was the first true link between urban sprawl and the risk of being obese or overweight.

According to the World Health Organization deaths from infectious diseases, maternal and prenatal conditions, and nutritional deficiencies combined are projected to increase by 17%. As a result, it is estimated that of the projected 64 million deaths worldwide in 2015, 41 million (64%) will result from chronic diseases—unless urgent action is taken. Obesity is a risk factor for various chronic diseases such as cardiovascular diseases, hypertension, type 2 diabetes, and possible cancer. Over the past decades, the prevalence of obesity has increased in the United States and more noted in urban areas. Urbanization and socioeconomic transformation comes with increased access to energy-dense foods and less strenuous jobs, resulting into many people having a positive energy balance, and hence becoming overweight or obese (Ziraba, Fotso, and Ochako, 2005). Other factors that have been shown to be associated with a higher risk of overweight and obesity include genetic predisposition, metabolic disorders, gender, and physical environment factors among others. Rapid urbanization amidst poorly performing economies has resulted into a large proportion of urban residents being poor with limited access to social amenities (Ziraba, Fotso, and Ochako, 2005). In spite of poverty in urban areas, access to cheaper food with high amounts of fat and sugar among the poor in urban areas is easier than rural residents. With increasing urbanization, there might be a current shift of the obesity burden to the poor urban population, who may not have the knowledge and financial resources to adopt healthier lifestyles. Overall, poverty and social inclusion are likely to increase the risks of developing a chronic disease, but more importantly the poor are also more likely to develop and die of complications of chronic diseases due to their inability to afford treatment and care (Ziraba, Fotso, and Ochako, 2005).

Environmental factors may also play a role in obesity. Environments that are rich in sources of high calorie foods, poor street patterns, lack of pedestrian amenities, difficult to access destinations, and neighborhood perceptions all have contributed to the decreasing of physical activity and promote the development of obesity. The Centers for Disease Control and Prevention (CDC) released a report that connected urban sprawl and obesity. Other scholars contend that urban sprawl contributes to obesity, but little research has been provided to support these claims. However, other scholars have suggested that urban sprawl is not associated with obesity and do argue the fact that affluence and lower-population densities encourage physical activity (Lopez, 2004).

The American Journal of Public Health and Journal of Regional Science both found a correlation between population density and obesity. A move to the city corresponds with a drop in body mass index (BMI) while a move to suburbs often coincides with increase in BMI. People in suburbs depend mostly on automobiles for transportation which results in less walking and other physical activities. On the other hand, moving to the suburbs won't make you any healthier. Will it make you safer? No. A 2006 study published in the Journal of Economic Issues found that dense urban areas have fewer fatal traffic crashes than suburban areas. The American Journal of Public Health and the U.S. Dept. of Health and Human Services agree that traffic and pedestrian fatalities are directly connected to sprawl.

Using Mississippi as an example, most people that live in the suburbs still travel to the City of Jackson to work and some are even City of Jackson employees. This commute to Jackson increases traffic congestion and air pollution from the release auto emissions. Upon reviewing the City Council minutes from January 30, 2014 for the City of Jackson, an ordinance was adopted that requires all new and prospective City of Jackson employees to maintain their principal place of residence within the City of Jackson and certify it in writing to the director of personnel management. This ordinance will prevent these employees from receiving payroll from the City of Jackson while paying property taxes to another city. A lot of people may have conflicting views on this ordinance, but this will decrease the suburban sprawl of the City of Jackson employees.

Environmental Impacts of Urban Sprawl

Researchers have generally focused on those communities whose development is the source of the sprawl phenomenon in order to identify environmental impacts of urban sprawl. From the perspective mentioned above, the following environmental impacts are listed below.

- Loss of fragile environmental lands
 - Reduced regional open space
 - Greater air pollution
 - Higher energy consumption
 - Decreased appeal of landscape
 - Loss of farmland
 - Increased storm water runoff
 - Increased risk of flooding
 - Excessive removal of native vegetation
 - Residential visual environment
 - Absence of mountain views
 - Presence of ecologically wasteful golf courses
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- Ecosystem fragmentation

These impacts can be divided into those that pose immediate human risks as opposed to those for which the associated human risk is not fully known. These risks can also be divided into those that primarily affect the appeal of an area as opposed to those that affect the ecosystem. An alternative viewpoint for environmental impacts of sprawl is that of environmental justice, whereby poor and minority communities suffer disproportionately from urban disinvestment and/or hazardous land uses. Both of these outcomes can be viewed as it correlates to urban sprawl. Urban sprawl incorporates a transfer of people and resources from the inner city and inner-ring suburbs to more distant suburbs, and such transfer is performed with very tight local control over land uses (Downs, 1994). Such impacts include:

- Toxic and hazardous wastes from abandoned brownfields
- Toxic and hazardous wastes from landfills located in least-desirable areas
- Toxins such as lead and asbestos persisting in older buildings because of disinvestment in inner cities.

These impacts may pose a more direct threat to human health than those associated directly with suburban development, yet these are less likely to be remedied in a timely manner than those associated with suburban development. This may be because the cost of making changes may be borne by those who own land in these areas, owners such as urban municipalities, factories who have relocated, and those who have fewer available resources than growing suburban municipalities. Although environmental impacts of sprawl are seemingly numerous, in many cases are straightforward to observe, and are much more difficult to measure. A suggested way to address this problem is to define a baseline level of particular environmental quantities that may be affected by sprawl. Markandya has suggested defining a set of “indicators of environmental resources,” for example physical stocks of resources (1992). But it is not truly clear what a baseline level is. Second, it may be difficult to measure environmental impacts directly, in physically meaningful units; an example is the extent to which a particular impact is present. If the environmental impact is associated with environmental toxins, then it is especially important, according to Lippman. He identifies the levels of toxins, their proximity to citizens, and the physiological effects of these toxins, yet in many cases such measurement is an open research issue (1992). Third, it may be difficult to construct aggregate measures of multiple environmental impacts occurring together and at different levels. Even for non-toxic environmental impacts, it is not easy to devise a single scale that incorporates impacts and those with specific ecological effects. Moreover, when different stakeholder groups are affected by sprawl (ex. lower-income city dwellers versus higher-income suburban dwellers), calculating aggregate impacts requires intergroup comparisons of utility.

Fourth, even if environmental impacts of sprawl may be measured, alone, in combination, associated with specific human outcomes, and perceptions of the risk associated with these environmental impacts may vary widely among individuals (i.e. experts versus ordinary citizens). Finally, for planning purposes it is not enough to measure environmental impacts of sprawl; one must construct models in order to evaluate potential environmental impacts of alternative development strategies, including the status quo, both in the current region of interest as well as other regions in which sprawl’s impacts are currently absent. Such models require a variety of assumptions with which different observers may disagree, and require a presentation mechanism, such as Geographic Information Systems (GIS) to enable meaningful communication of results. Urban sprawl is agreed to have a set of specific environmental impacts that vary according to the stakeholder group affected, the

immediacy of human risk, the physical effects, and that some of these effects may be meaningful to ordinary citizens.

Conclusion

Urban Sprawl definitely has impacted on sustainable development. This paper has addressed numerous ways that urban sprawl has enhanced growth of suburban as well as metropolitan areas. In my opinion, the common argument of sprawl is simply an expression of consumer preferences and that the government should respond to these preferences rather than attempt to try and control them. If the government would listen to the consumer, future planners may be able to control sustainable development. With regards to the current research and applications that relate to the impacts of urban sprawl, this does relate to keeping a community/neighborhood sustainable. For much of America's history, growth has meant growth out of land, but land is a finite resource. The exploration of land and resources by sprawl is approaching critical mass. It's time to start thinking about growth in sustainable terms. Issues relating to sustainability will be a bigger focus in public policy and it will be in the hands of the American voters to determine our course.

What can we do to limit sprawl? We can't just stop growing in terms of population, but we can grow smart. We can:

- Look inside city limits for places to live before you start planning that sprawl stay (outside city limits)
- Living where you work and play will relieve sprawl; it builds a stronger community
- Take advantage of city public transportation (when and where available)
- Encourage local government representatives to invest more in city planning

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