



MEASURING SPRAWL AND ITS IMPACT

The Character & Consequences of Metropolitan Expansion

Executive Summary

Much as Justice Potter Stewart said of pornography, most people would be hard pressed to define urban sprawl, but they know it when they see it.

Increasingly, however, that is not good enough. As more and more metropolitan areas debate the costs and consequences of poorly managed expansion, there is an increasing need to be clear about the terms of the discussion. Politicians and planners aiming to contain sprawl also must have an agreed-upon way to define and measure it in order to track their progress. Beyond that, it is important for policy makers to be able to demonstrate how, and to what degree, sprawl has real implications for real people.

The study underlying this report, the product of three years of research by Reid Ewing of Rutgers University, Rolf Pendall of Cornell University, and Don Chen of Smart Growth America represents the most comprehensive effort yet undertaken to define, measure and evaluate metropolitan sprawl and its impact. This report is the first in a series of findings to be issued based on the ongoing analysis of that work.

Sprawl Defined

Beginning with an exhaustive review of the existing academic and popular literature, the researchers identified sprawl as the process in which the spread of development across the landscape far outpaces population growth. The landscape sprawl creates has four dimensions: a population that is widely dispersed in low density development; rigidly separated homes, shops, and workplaces; a network of roads marked by huge blocks and poor access; and a lack of well-defined, thriving activity centers, such as downtowns and town centers. Most of the other features usually associated with sprawl—the lack of transportation choices, relative uniformity of housing options or the difficulty of walking—are a result of these conditions.

Creating an Index of Metropolitan Sprawl

Based on this understanding, the researchers set about creating a sprawl index based on four factors that can be measured and analyzed:

- Residential density;
- Neighborhood mix of homes, jobs, and services;
- Strength of activity centers and downtowns;
- Accessibility of the street network.

Each of these factors is in turn composed of several measurable components, a total of 22 in all. Residential density, for example, includes the proportion of residents living in very

spread-out suburban areas, the portion of residents living very close together in town centers, as well as simple overall density and other measures. Before being included, each variable was tested through technical analysis to ensure that it added something unique to the overall portrait of sprawl.

The information assembled for each of 83 metropolitan areas (representing nearly half of the nation's population) produced a richly textured database that offers the most comprehensive assessment of metropolitan development patterns available to date. This study is the first to create such a multidimensional picture of the sprawl phenomenon and analyze related impacts.

Comparing and Evaluating Metro Regions

Based on its performance, each metro area earned a score in each of the four factors, indicating where it falls on the spectrum relative to other regions. Much of the value of this study is in this ability to look at the particular ways in which individual regions sprawl.

Some metro areas were found to sprawl badly in all dimensions. These include Atlanta, Raleigh and Greensboro, NC. A few metros did better than other regions in all four factors; among them are San Francisco, Boston, and Portland, Oregon. Other metro areas are more of a mixed bag; in those cases, the individual factor scores can tell us more about the characteristics of individual metro areas. For example, while the Columbia, SC or Tulsa, OK metro areas contain large swaths of low-density development, the presence of a number of strong centers bring them up in the overall ranking. And while San Jose, California, has slightly higher density than most metro areas, its lack of centers of activity pulls it down in the overall ranking.

The scores for the four factors were combined to calculate the overall Four Factor Sprawl Index, ranking the most and least sprawling metropolitan areas. On the Index, the average is 100, with lower scores indicating poorer performance and more sprawl, while higher scores show less sprawl. Using this Index, the most sprawling metro area of the 83 surveyed is Riverside, California, with an Index value of 14.22. It received especially low marks because:

- it has few areas that serve as town centers or focal points for the community: for example, more than 66 percent of the population lives over ten miles from a central business district;
- it has little neighborhood mixing of homes with other uses: one measure shows that just 28 percent of residents in Riverside live within one-half block of any business or institution;
- its residential density is below average: less than one percent of Riverside's population lives in communities with enough density to be effectively served by transit;
- its street network is poorly connected: over 70 percent of its blocks are larger than traditional urban size.

In the overall national ranking, Riverside is followed by Greensboro, NC; Raleigh, NC; Atlanta, GA; Greenville, SC; West Palm Beach, FL; Bridgeport, CT; Knoxville, TN; Oxnard-Ventura, CA; and Ft. Worth, TX.

Metropolitan Region	Overall Sprawl Index Score	Rank
Riverside-San Bernardino, CA PMSA	14.2	1
Greensboro-Winston-Salem-High Point, NC MSA	46.8	2
Raleigh-Durham, NC MSA	54.2	3
Atlanta, GA MSA	57.7	4
Greenville-Spartanburg, SC MSA	58.6	5
West Palm Beach-Boca Raton-Delray Beach, FL MSA	67.7	6
Bridgeport-Stamford-Norwalk-Danbury, CT NECMA	68.4	7
Knoxville, TN MSA	68.7	8
Oxnard-Ventura, CA PMSA	75.1	9
Fort Worth-Arlington, TX PMSA	77.2	10

At the other end of the scale, the metro area with the highest overall score is, not surprisingly, New York City, closely followed by Jersey City just across the Hudson River. (New York and Jersey City are such extreme “outliers” that they were excluded from most of the comparative analysis discussed later in the report.) Providence, San Francisco, and Honolulu round out the top five most compact metros, followed by Omaha, NE, Boston, Portland, OR, Miami, and New Orleans.

Sprawl’s Impacts on Quality of Life

This initial report examines several transportation-related measures and impacts and finds that people living in more sprawling regions tend to drive greater distances, own more cars, breathe more polluted air, face a greater risk of traffic fatalities and walk and use transit less. Although this study was not designed to prove that land-use patterns cause those conditions, sprawl and its component factors were found to be a greater predictor than numerous demographic control variables that were also tested.

Among the impacts of sprawl found:

- *Higher rates of driving and vehicle ownership.* The research indicates that in relatively sprawling regions, cars are driven longer distances per person than in places with lower-than-average sprawl. Over an entire region, that adds up to millions of extra miles and tons of additional vehicle emissions. Also, the study found that in the ten most sprawling metropolitan areas, there are on average 180 cars to every 100 households; in the least sprawling metro areas (excluding New York City and Jersey City, which are outliers), there are 162 cars to every 100 households. The research indicates that this is not simply a matter of greater or

lesser affluence; even controlling for income, households are more likely to bear the expense of additional vehicles in more sprawling areas.

- *Increased levels of ozone pollution.* The study found that the degree of sprawl is more strongly related to the severity of peak ozone days than per capita income or employment levels. The difference in ozone peaks appears significant enough to potentially mean the difference between reaching or failing to meet federal health-based standards. Failing to reach the standard not only imperils the health of children and other vulnerable populations, but also subjects regions to a raft of rigorous compliance measures.
- *Greater risk of fatal accidents.* Residents of more sprawling areas are at greater risk of dying in a car crash, the research indicates. In the nation's most sprawling region, Riverside CA, 18 of every 100,000 residents die each year in traffic crashes. The eight least sprawling metro areas all have traffic fatality rates of fewer than 8 deaths per 100,000. The higher death rates in more sprawling areas may be related to higher amounts of driving, or to more driving on high-speed arterials and highways, as opposed to driving on smaller city streets where speeds are lower. Speed is a major factor in the deadliness of automobile crashes.
- *Depressed rates of walking and alternative transport use.* In more sprawling places, people on their way to work are far less likely to take the bus or train or to walk. Twice the proportion of residents take public transit to work in relatively non-sprawling metro areas versus those with below-average scores. Likewise, thousands more residents walk to work in regions that sprawl less.
- *No significant differences in congestion delays.* The research found that sprawling metros exhibited the same levels of congestion delay as other regions. This finding challenges claims that regions can sprawl their way out of congestion.

Policy Recommendations

This study shows that sprawl is a real, measurable phenomenon with real implications for peoples' everyday lives. Regions wishing to improve their quality of life should consider taking steps to reduce sprawl and promote smarter growth. Based on this research, Smart Growth America offers six policy recommendations:

- 1) Reinvest in Neglected Communities and Provide More Housing Opportunities**
- 2) Rehabilitate Abandoned Properties**
- 3) Encourage New Development or Redevelopment in Already Built Up Areas**
- 4) Create and Nurture Thriving, Mixed-Use Centers of Activity**
- 5) Support Growth Management Strategies**
- 6) Craft Transportation Policies that Complement Smarter Growth**

