

The effect of Sprawl on social bonds and sense of belonging:
Raleigh-Durham, North Carolina

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Course: The structure of Urban Regions [URBG 702]

INTRODUCTION

The topic of discussion for this paper is the effect Suburban Sprawl has on the 'social bonds and sense of belonging' in a metropolitan area. The area selected for the purpose of this paper is North Carolina Metropolitan Statistical Area. The total population of the area as of 2010 is 9,534,483 in an area of 53,819 sq-mi with a racial mix of 70% White American, 21.3% African American, 1.2% American Indian, and 6.5% are Hispanic or Latino¹. North Carolina has historically been a rural state, with most of the population living on farms or in small towns. However, over the last 30 years the state has undergone rapid urbanization, and today most of North Carolina's residents live in urban and suburban areas, as is the case in most of the United States.

The reason for selecting this area stems from a personal visit to the City of Cary, North Carolina and the initial observations I made during that time. The area consists mostly of residential housing and to exemplifies my notion of sprawl development. Some salient features include cluster of low density housing situated at great distant from each other. Lack of accessible facilities and amenities within walking distance. It takes no less than a 10 minutes car ride to reach the nearest grocery store, which means a minimum of 30 minutes walk time. Although, there is public transportation in terms of bus services it is not as frequent when compared to other areas such New York Metropolitan area. The commute from house to work is sometimes very long even if a person owns a car. Yet despite these inconveniences people still prefer living in the suburbs and sprawled urban landscape city. The aim of the paper is to argue that this lifestyle is creating numerous negative impacts in the area, especially when it comes to building social ties and developing a 'sense of belonging'.

This argument is put forth through this paper by examining urban sprawl based on definitions found in academic literature, discussion of the various issues related to urban sprawl especially in terms of social outcomes and how it relates to the context of Metropolitan Area of Raleigh-Durham, North Carolina. The paper will conclude by introducing solutions that aim to mitigate the issues related with urban sprawl.

DEFINITION: SPRAWL

Sprawl has long been explained as a consequence of unchecked development which consumes an excess of resources through land speculation and low-density dispersion. Researchers have linked it to diverse phenomena such as dependency on privately owned cars as a mode of transportation, lower public transit ridership, higher public infrastructure costs, increased electrical energy use as well as greenhouse gas emissions and localized pollution of air quality². Yet defining exactly what we should consider to be sprawl that to in the subgroup of “urban” or “suburban” has been more elusive.

The definition and effect of sprawl can be derived from the land use pattern of an area and how it relates to the overall density. From an Architectural point of view, it can be seen as the dispersion of the urban form in a geographical landscape. The fact of the matter is many authors have defined sprawl based on their perspective or area of specialization they want to analyze it. Be it from an economic, geographic, architectural or even political background the definition of sprawl has been multifaceted, often based on overlapping and sometimes even counteracting theories.

A simple definition of sprawl can be the process in which the spread of development across the landscape far outpaces population growth. The landscape sprawl creates is a scenario where a population is widely dispersed in low- density development; with rigid zoning regulations that separate homes, shops, and workplaces; with network of roads marked by huge blocks that provide poor linkage to these zones; which also inadvertently limits access to activity centers, such as downtowns and town centers².

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ISSUES RELATED TO SPRAWL

The negative outcomes of sprawl are, higher rates of driving and vehicle ownership, increased levels of ozone pollution, greater risk of fatal crashes, decrease in walking and alternative transport use and congestion delays on major roads.

A research published by 'Smart Growth America' indicates that in relatively sprawling regions, cars are driven longer distances per person than in places with lower-than-average sprawl. The study found that in the ten most sprawling metropolitan areas, there are on average 180 cars to every 100 households; whereas in the least sprawling metro areas, there are 162 cars to every 100 households. The ownership of cars is not simply a matter of greater or lesser affluence; rather it is based on the multiple needs for a car in a family household at the same time. The study also found that the degree of sprawl is more strongly related to the impact on ozone layers than per capita income or employment levels. The negative impact on ozone layers have serious health consequences, especially on children and other vulnerable members of society.

A much more fatal consequence of sprawl is that residents of more sprawling areas are at greater risk of dying in a car crash. According to the research, in Riverside CA (the nation's most sprawling region), 18 out of every 100,000 residents die each year in traffic crashes. On the other hand, in the eight least sprawling metro areas the traffic fatality rate is 8 deaths per 100,000². The higher death rates in more sprawled areas may be related to higher amounts of driving, or 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. Due to more dependency on private vehicles, in more sprawled places, people on their way to work are far less likely to take the bus or train or to walk. In fact, the rate of residents who use public transit in a 'less' sprawled area is twice compared to more sprawled areas. Finally, contrary to popular belief that 'sprawled regions mean less traffic congestion' the research found that sprawling metros exhibited the same levels of congestion delay as other regions, sprawled or



otherwise. Therefore, it is seen 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.

OTHER ISSUES: HEALTH AND OBESITY

There are even more complex issues that we do not usually associate directly with sprawl. Other than the health issues due to air pollution, increased rate in obesity has also been linked with it. Since there is a high dependency on private vehicles such as cars for any trip outside the house and nothing is available in walking distance, people are not accustomed to any sort of exercise. In the last four decades in the U.S. obesity prevalence has increased substantially from 13.44% to 32.2%, between the early 1960s and 2004³.

In their paper titled “Effects of Urban Sprawl on Obesity”, authors Zhenxiang Zhao and Robert Kaestner largely attribute the development and expansion of the Interstate Highway System in 1947 as a reason for the decline in population in urban areas, which people favored because they could easily commute to work and live in a more private area. As they found, however, living in secluded regions generally leads to worse health outcomes. Their findings indicate, that if such populations did not leave metropolitan areas, obesity rates today would have been reduced by 13%³. However, this estimate, does not take into consideration for people who may in the threshold between city centers and suburbs and are able access resources in both regions.

There are other articles that have examined the relationship between urban sprawl and the prevalence of obesity and proposed that mixed uses of building functions or land use pattern and improved walkability can counter the obesity crisis associated with sprawl⁴.

OTHER ISSUES: SOCIAL OUTCOMES

The issues in the previous sections dealt with tangible outcomes as a result of urban sprawl. However, one issue that is not often implied is the effect sprawl has on building social ties and 'sense of belonging' in a neighborhood. Authors such as Lance Freeman tried to incorporate this concept into the discussion when in 2001 Freeman published a paper that finds evidence that sprawl forces people into cars and inhibits face-to-face contact, thus undermining social ties among neighbors⁵. The purpose of the paper was to test the hypothesis 'whether low-density sprawl weakens neighborhood social bonds'. Freeman compared survey data on neighborhood social ties with the density and demographic characteristics of the census block groups in which the respondents lived. After controlling for poverty and other factors, he concluded that residential density is not significantly related to the formation of neighborhood social ties; however, such ties are affected by how much neighborhood residents rely on their cars (which is an effect of urban sprawl). The results showed that for every 1% increase in the proportion of individuals driving to work is associated with a 73% decrease in the odds of an individual having at least one neighborhood social tie⁵. However, Freeman also suggests that, whereas low densities may undermine social ties, at some point on the density scale higher densities start to have the same effect. If low density results few opportunities for interaction; high density also has a similar effect resulting in withdrawal from people. An example of which can be set in New York city, which has often been coined as the 'city for strangers'.

Other authors have suggested that while there isn't a strong correlation between overall sprawl with different dimensions of neighbor interaction; a statistical significant association was found between the use of public spaces and the type and frequency of neighbor interaction in such spaces. As such, the use of public parks and plazas, public libraries, and in some cases community centers is positively associated with neighborhood social interaction⁶. The problem with urban sprawl is that it reduces the scope for

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such interaction spaces due to zoning regulation, road networks and remoteness from residential areas. That is the public spaces are not within walking distance of residential areas. ✓

Therefore, it can be argued that factors related with urban sprawl, such as dependency on private vehicles, sharp zoning segregation and lack of public places in close proximity to residential areas do in fact have numerous negative impacts, especially on building community ties and developing sense of belonging in neighborhoods.

RALEIGH-DURHAM, NC: HOW SPRAWLED IS SPRAWL?

While my selection of the Metropolitan Statistical Area of Raleigh-Durham North Carolina as a sprawled area has been based on observation and speculation, it is important to determine how sprawled it really is and see how it ranks compared to other sprawled areas. An objective way of doing it is measuring the 'Sprawl Index' of Raleigh-Durham North Carolina.

As previously implied, the landscape sprawl creates has four dimensions: a population that is widely dispersed in low- density development; rigid separation of 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. Based on this understanding, a research was conducted to measure sprawl by creating a 'sprawl index' based on four factors that can be quantified and analyzed²:

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

The objective of this study was to go beyond a single ranking to look at the factors that create sprawl within a particular metro area. In particular, this research underscores the notion that sprawl is not merely density². 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. Then these scores were compiled to form the sprawl index. The observed final score in the sprawl index determines how sprawled an area really is and where it ranks amongst other areas.

MSA/PMSA Name	Complete Sprawl Index Scores and Rankings									
	Sprawl Index	Sprawl Index Rank (from most to least sprawling)	Density	Density Rank	Mix	Mix Rank	Centeredness	Centeredness Rank	Street Factor	Street Rank
Providence--Pawtucket--Woonsocket, RI NECMA	153.71	81	99.10	52	140.46	81	140.34	79	135.91	76
Raleigh--Durham, NC MSA	54.17	3	76.19	5	39.48	1	77.23	16	80.76	22
Riverside--San Bernardino, CA PMSA	14.22	1	93.53	40	41.50	2	41.42	2	80.52	20
Rochester, NY MSA	77.93	12	91.37	35	82.31	21	120.70	67	37.23	1
Sacramento, CA MSA	102.64	47	99.12	53	110.90	53	87.37	25	98.41	42
Salt Lake City--Ogden, UT MSA	110.92	61	99.50	54	103.16	42	93.84	30	117.04	62
San Antonio, TX MSA	107.76	54	95.04	46	100.62	38	108.39	53	102.97	45
San Diego, CA MSA	101.86	46	113.41	69	105.45	46	74.41	13	105.97	51
San Francisco, CA PMSA	146.83	80	155.19	81	107.34	49	128.62	74	139.82	81
San Jose, CA PMSA	109.70	57	124.80	76	96.63	35	93.87	31	125.22	69
Seattle, WA PMSA	100.91	44	103.62	61	79.42	16	98.01	37	117.07	63
Springfield, MA NECMA	122.49	69	86.29	19	115.74	59	148.60	82	87.29	27
St. Louis, MO--IL MSA	94.51	35	90.29	27	107.44	51	76.16	15	105.99	52
Syracuse, NY MSA	80.27	16	85.83	17	71.97	11	124.92	73	52.58	2
Tacoma, WA PMSA	105.88	50	90.76	31	85.62	24	122.67	69	111.20	57
Tampa--St. Petersburg--Clearwater, FL MSA	86.26	22	93.61	41	79.97	17	51.85	3	133.61	74
Toledo, OH MSA	107.19	53	91.32	34	119.63	68	112.17	58	77.57	17
Tucson, AZ MSA	109.13	56	90.38	29	121.77	71	106.42	51	88.04	29
Tulsa, OK MSA	99.06	43	82.71	11	88.00	27	114.97	61	96.20	37
Vallejo--Fairfield--Napa, CA PMSA	78.38	14	97.44	51	116.26	61	40.86	1	109.69	56
Washington, DC--MD--VA MSA	90.83	26	106.88	67	78.72	15	97.85	36	98.02	41
West Palm Beach--Boca Raton--Delray Beach, FL MSA	67.75	6	93.96	43	54.72	5	53.93	4	104.70	49
Wichita, KS MSA	110.09	58	84.37	13	113.06	55	131.37	75	78.56	18
Worcester--Fitchburg--Leonminster, MA										

Source: 'Measuring Sprawl And Its Impact', Smart Growth America-(www.Smartgrowthamerica.Org/), 2002,

In terms of 'Residential density' which is the most widely recognized indicator of sprawl Raleigh- Durham, NC is ranked 5th. When it comes to poor neighborhood mix of homes, jobs, and services area has performed the worst and is thus ranked 1st in that category. Because of this separation of land uses it requires every trip to jobs or other places to be made by car, and can result in a "jobs- housing imbalance" in which workers cannot find housing close to their place of work. The sense of place in an area is based on the strength of its activity centers such as downtowns or central business districts. Raleigh- Durham ranks 16th in the 'Centeredness of a place'. Which is a better than metro areas such as Vallejo, CA and Riverside, CA but when compared to rest of the 80 MSAs in the study it does not fare so well. Finally, in terms of accessibility of the street network Raleigh is ranked in 22nd in the chart. Busy arterials that are

fed by residential streets that end in cul-de-sacs are typical of sprawl; they create huge super-blocks that concentrate automobile traffic onto a few routes and hamper accessibility via transit, walking and biking and the area of Raleigh-Durham, North Carolina is not exempt from that.

The scores for the four factors were assimilated 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, Raleigh-Durham, NC ranks 3rd, with an Index value of 54.2. which means it is one of the most sprawled metropolitan statistical area in USA².

Most Sprawling Metropolitan Regions

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

Source: 'Measuring Sprawl And Its Impact', Smart Growth America-(www.Smartgrowthamerica.Org/), 2002,

SPRAWL SOLUTIONS BASED ON THE CONTEXT OF RALEIGH-DURHAM, NC

It is seen that the Metropolitan area of Raleigh-Durham, NC is one of the most sprawled areas in the U.S., therefore it is affected by issues such as higher rates of driving and vehicle ownership; increased levels of ozone pollution, greater risk of fatal crashes; decrease in walking and alternative transport use; traffic congestion on major roads; not to forget issues related obesity and the negative social impact it has on neighborhoods. The causes of such issues are intertwined by factors such as widely dispersed low- density development; rigid zoning regulations which result in segregated land use patterns of homes, shops, and

workplaces; poor connectivity between these zones; and finally limited access to activity centers, such as downtowns and town centers.

Therefore, to resolve these issues policy frameworks have to be made that promotes an urban development pattern characterized by high population density, walkable and bicycle friendly neighborhoods, preserved green spaces, mixed-use development (i.e., development projects that include both residential and commercial uses) and available mass transit. However, even if the policies need to be in a regional level the applications of these solutions will be based on the local context and adapting to the circumstances of the area.



An example of one of these planned communities is Southern Village, situated on 300 acres south of Chapel Hill, North Carolina. Launched in 1996, Southern Village features apartments, townhouses, single-family homes, and a conveniently located town center with a grocery store, restaurants, shops, a movie theater, a dry cleaner, common areas, offices, health care services, a farmer's market, a day-care center, an elementary school, and a church. Southern Village is a walkable community with sidewalks on both sides of the streets and a 1.3-mile greenway running through the middle of town. Southern Village residents have access to mass transit via Chapel Hill's bus system and can enjoy free outdoor concerts in the common areas. More than 3000 people live in Southern Village⁷.

The City of Raleigh also took steps to tackle sprawl in their first draft of the 2030 Comprehensive Plan. The city leaders and stream of experts have looked into transit oriented development, mixed use centers, developing vibrant neighborhoods to 'curb' the sprawled growth of the city. To reduce vehicle miles traveled and improve air quality, Raleigh's land use and transportation coordination policies focused on shortening trips and encouraging more pedestrian, bicycle, and transit-friendly communities within and adjacent to mixed-use centers and corridors and make them accessible via sidewalks, trails, or transit.

Mixed-use centers are proposed to be comprised of well-mixed and integrated developments that avoid segregated uses and have well planned public spaces that bring people together and provide opportunities for active living and interaction. A mixed-use center should provide services such as residences, offices, retail, service, entertainment, civic, and open space for the city people. In addition to the downtown regional center, the comprehensive plan identified seven such "city growth" centers. The intention of the plan is to promote the development of mixed-use activity centers with multi-modal transportation connections to provide convenient accessibility to residential and employment areas.

In the neighborhood level the plan proposes to accommodate growth in newly developing areas of the City through mixed-use neighborhoods with a variety of housing types along with common and usable open space for public interaction that preserves the natural landscape. It also encourages Traditional Neighborhood Development (TND) and planning for large undeveloped sites within the City's municipal boundaries to improve neighborhood and street connectivity. TND is an urban form characterized by compact, pedestrian-oriented design, which provides a variety of uses and diverse housing types within easy walking distance, and is anchored by a central public space and civic activity (school, library, church, or similar institutions)⁸.

CONCLUSION

In conclusion, it is my opinion that no matter how much changes and progress we make in terms of planning policy and technology one thing that needs to remain constant is the social bonds we have in a community. Planning, whether it is in the urban scale or regional scale should always make conscious efforts to ensure that the 'sense of belonging' and community remains intact in any Urban Setting. For that to be a success we have to look in to policies and solutions that provide a platform and spaces where social activities interactions can take place and community bonds can be formed.

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