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Creating Sustainable Urban Land Use Patterns: A Comparison of Portland, Oregon and St. Louis, Missouri

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CREATING SUSTAINBLE URBAN LAND USE PATTERNS:
A COMPARISON OF PORTLAND, OREGON AND ST. LOUIS, MISSOURI.

By

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Geography and Environmental Resources, Political Science and International Relations
B.S., Southern Illinois University, 2011

A Research Paper
Submitted in Partial Fulfillment of the Requirements for the
Master of Science Degree

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CHAPTER 1: INTRODUCTION

The area needed to sustain an urban region does not lie within the jurisdictional boundaries of the urban area, but can be at least 100-300 times larger than the urban area in question (Rees 1992; Rees and Wackernagel 1994; Rees and Wackernagel 1996; Kenworthy 2006). The natural resources used to sustain urban areas come from either the surrounding hinterlands or are transported in from around the world. It is this land that is mostly considered to be part of urban sprawl, which is the phenomenon of unequal expansion of urban areas compared to population growth, which results in lower densities and larger urban land areas. This land outside of the jurisdictional boundaries is mostly low-density development that focuses on the automobile as the main source of transportation. The growth of urban areas in the manner of low-density development allows for excessive resource use, larger amounts of land use, and inner city decline all of which are incompatible with an urban area developing sustainably.

Arguably the most important aspect of any theory for sustainable urban development is that they promote urban compactness. Sustainable cities could be much more economically efficient and more benign environmentally, when concentrated human activities occur in confined spaces, which reduces the human footprint (Owen 2009). Environmental and economical benefits are not the only benefits that could come about from more compact urban areas. Possible social equity effects of compactness include: better access to facilities, better job accessibility, better public transportation, greater opportunities for walking and cycling, reduced domestic living space, reduced crime, lower levels of social segregation, possible reduction in livability in compact cities (Burton 2000). The effects of a sustainably designed urban area could have the impact to

change how humans interact with the environment and with each other. Urbanized areas cover approximately 3% of Earth's surface, yet they have extraordinarily large ecological "footprints" and complex, powerful, and often-indirect effects on ecosystems (Alberti et al 2003). With the rise of population and the increasing use of urban areas it will be a more balanced approach to critically assess the positive and negative effects of urban sprawl.

By understanding how our urban areas can contribute to sustainable development or respond to historical challenges, we can have more informed policies that have positive effects on the future of our environmental, economic, and social structures. It is therefore imperative that urban sprawl is understood and methods to mitigate the effects of sprawl are implemented.

Goals Of The Paper

The purpose of this research paper is to compare and analyze land use policies addressing the issue of urban sprawl in the urban metropolitan areas of Portland, Oregon and St. Louis, Missouri. Portland and St. Louis were examined due to the similarities in geography, and differences in land use policies. Both metropolitan areas have similar populations and both metropolitan areas lay within two separate states. The two goals of this research paper were accomplished by taking an extensive look at the literature and previous studies done on urban sprawl and urban sustainable development. The 1st goal was to identify what policies contribute to the regulation of land use in the metropolitan areas of Portland, Oregon and St. Louis, Missouri. The 2nd goal was to compare the individual policies and practices limiting urban sprawl of each metropolitan area.

According to the urban sprawl literature, limiting the growth of urban sprawl contributes to the sustainability of an urban area. Looking at the differences in policies will give a better understanding of why urban areas have been able to enact policies to effectively curb urban sprawl and why other areas have failed.

The first section describes previous literature on the effects of urban sprawl on metropolitan areas in the United States. The second section presents a case study of the policies of the Portland Metropolitan Area located in the states of Oregon and Washington. The third section analyzes the second case study of the St. Louis Metropolitan Area located in Missouri and Illinois. The fourth section is a comparison of policies and the effects of policies on the urban areas as well as some concluding remarks.

Metropolitan Urban Sprawl

Since the founding of the United States the percentage of the population that resides in urban areas has grown. “Various circumstances and driving forces have interacted over 225 years to reach a point where 80 percent of the Nation’s population now lives in metropolitan areas that occupy less than 20 percent of the land area” (Auch et al 2004, 2). It was not until 1920 that it was known that more people live in urban areas than in rural areas within the United States (Auch et al 2004). With the growing number of people residing in urban areas there is a trend of people moving out of the urban areas and into the suburbs. This trend is seen in Figure 1.1, which shows the population growth by decade between cities and suburbs. With larger suburban growth comes larger land requirements because “advances in technology that have allowed for the deconcentration

of population have also increased the size of geographic areas that are linked through social and economic integration, thus leading to sprawl” (Porter and Howell 2009, 610). There are five areas of urban land use that this section will discuss which are; 1. Discuss the definitions needed for an understanding of urban studies. 2. Discuss low-density development concerning leapfrog development and the consequences of widespread development. 3. Discuss the importance of the inner city or central city and the effects of low-density development on these areas. 4. Discuss the impacts of transportation on urban growth. 5. Discuss sustainable land uses and how they can be implemented into existing urban areas.

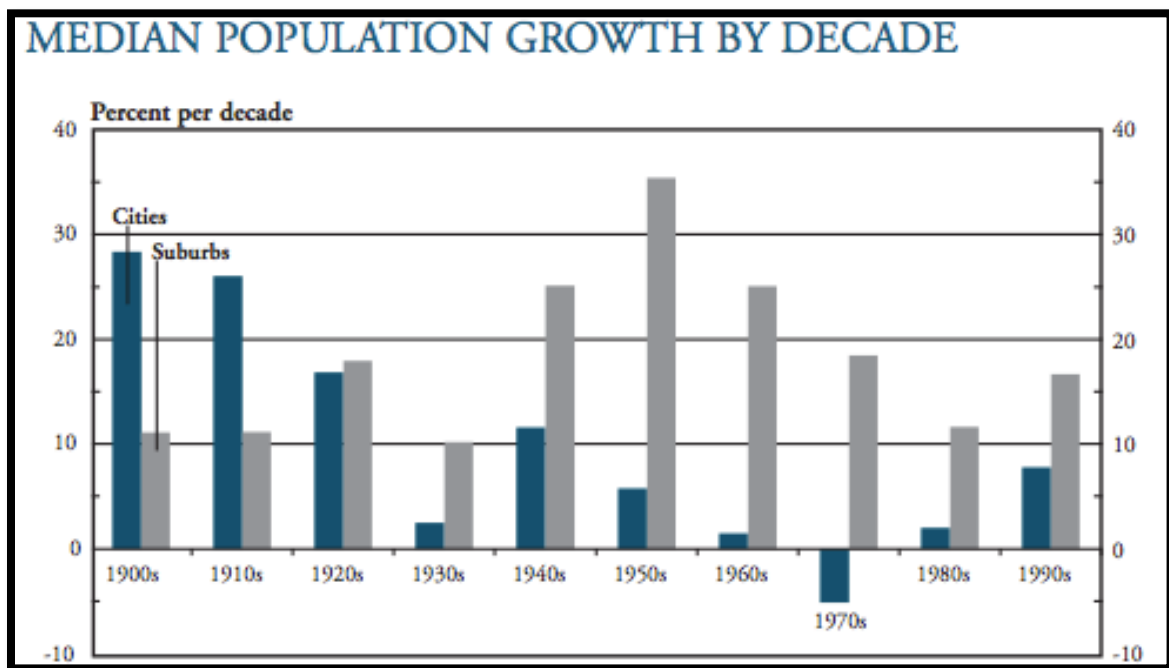


Figure 1.1 Median Population Growth By Decade
(Source: Rappaport 2005)

Definitions

In urban studies literature there are many definitions of what constitutes an urban area (Rappaport 2005; Wolman et al 2005; England 2010; Australia 2011; Federal Register 2011; Eurostat 2012). Since the case studies in this research paper are both within the United States, the definitions used to establish Metropolitan Areas comes from the United States Census Bureau as defined by the revisions made to the 2010 census. The Census Bureau definition of a Metropolitan Statistical Area (MSA) is a Core Based Statistical Area associated with at least one urbanized area that has a population of at least 50,000. The MSA comprises the Central County or counties containing the core, plus adjacent outlying counties having a high degree of social and economic integration with the Central County or counties as measured through commuting (Census Bureau 2010). These adjacent counties need to have a population of at least 2,500 people per square mile to be considered a part of the urban area. The reason for this is because any lower population density and the urban services such as water supply and wastewater treatment become uneconomical to the urban area (Bruegmann 2005). Plus at such low-density numbers, urban areas start to resemble rural areas.

The process of an area's population and infrastructure growing to accommodate for a population of more than 2,500 people per square mile is known as urbanization. Suburbanization is when an urban area is depopulating and the migrating population moves to the outer boundaries of the metropolitan area reducing urban densities. The United States Census Bureau defines a rural area as an area with 100 people per square mile or less (Federal Register 2011). Areas that are considered to be suburban have populations between 100 people per square mile and 2,500 people per square mile. Urban

sprawl generally takes place in suburban areas where land use policies are not regulated. According to the literature, urban sprawl is considered to be low density, automobile dependent development outside of city limits (Bruegmann 2005; Cutsinger et al 2005; Jaret et al 2006; Sultana and Weber 2007; Behan et al 2008; Owen 2009).

Urban studies literature provides a variety of definitions for sustainable development (World Commission 1987; Satterthwaite 1997; Burton 2000). The traditional definition for sustainable development is provided by the United Nations as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission 1987, 8). Therefore the definition for sustainable urban development is the growth of an urban area with a population of at least 50,000 people combined with a high interaction among the surrounding areas with a population of 2,500 people or more, that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Low-Density Development

It had been known that suburbanization was taking place prior to the 1920's however the national statistics did not categorize suburbanization until the 1950's when it stated to become more noticeable due to the increasing percentage of urban population residing in suburban areas (Rappaport 2005; Jaret et al 2006). Between 1950 and 1990, U.S. metropolitan areas grew in terms of land size by 100% (Alberti et al 2003). In the United States, 48% of metropolitan area residents lived in the central cities in 1950 when compared with 31% in 1990, which is a 17% decline (Baum-Snow 2007). This means that central cities were emptying out, however the percentage of population as stated

earlier has continued to increase since the beginning of the United States. Urban areas have been host to substantial suburbanization over the past 40 years.

In order to facilitate the return of veterans from World War II the federal government created two new agencies, which helped the returning veterans readjust to non-military life. The Federal Housing Administration and the Veterans Administration advocated for legislation to make the transition for returning veterans easier. Two pieces of legislation advocated by these new agencies were the GI Bill and mortgage-interest tax deductions, which allowed veterans to afford higher education and obtain places to live most of which were situated in suburban neighborhoods due to declining urban areas (Auch et al 2004; Rappaport 2005). The actions of the federal government along with the high level of affluence after World War II and the increased use of automobiles, allowed for a large portion of the United States urban population to live in single-family houses in the suburbs of urban areas (Bruegmann 2005). This explains the decline of the percent of urban dwellers living in the central cities.

Typical attributes of urban sprawl are low-density development, clusters of population and economic activities within the suburbs or fringe areas, and leapfrog development (Carrion-Flores and Irwin 2004; Fallah et. al 2011). Leapfrog development occurs when communities develop away from neighboring communities due to restrictions in zoning codes, natural land features, local taxes, and negative externalities associated with existing urban development (Wilson and Song 2011). Low-density and leapfrog development promotes an over reliance on automobiles, which causes traffic congestion due to an over abundance of personal transportation on the roadways.

Urban sprawl due to lack of planning, over abundance of automobiles, automobile infrastructure, and the allure of suburban life has facilitated numerous social, environmental, and health problems. Urbanized areas account for 80% of carbon emissions, 60% of residential water use, and close to 80% of the wood used for industrial purposes (Wu 2010). Urban areas consume vast amounts of land (for housing, food production, public services, etc.), water, habitat, oil/petroleum, metal, concrete, and energy (Dekay and O'Brien 2001; Wheeler, 2009; Wu 2010). Urban ecological footprints can be exponentially larger than the area inhabited (Rees 1992). Water consumption is used for drinking supply, sanitation, and for aesthetic purposes, which puts pressure on watersheds and aquifers. Habitat destruction comes in the form of urban expansion and the conversion of land uses from natural habitat to agricultural. While some of these issues are inherent with urbanized living, urban sprawl enhances these issues.

The low-density and leapfrog development also encourages a lack of centralized planning leading to wasteful expenditures on infrastructure (Fallah et al 2011). Land use is inefficient when it comes to building construction (Jacobs 1961). The reason is because buildings are planned for single purposes, not to interact with the urban area, limiting the use of the building and allowing for urban sprawl to take effect. Large-lot zoning has also been found to increase the sprawling nature of urban areas (Carrion-Flores and Irwin 2004). When a piece of land is developed and has a minimum lot size of an acre there will be less housing and more open space in between each house, in an area is zoned for minimum lot size of a $1/8^{\text{th}}$ of an acre there is more room for housing allowing for a smaller urban area. One study showed that the per capita cost of most services declines with density and rises with the spatial extent of urbanized land area (Carruthers and

Ulfarsson 2003). Areas that are more concentrated have more efficient utility services; also areas that exist on the outskirts of an urban area have less efficient services. It is when suburban areas are not planned that they can become a part of urban sprawl.

In a twisted turn of events, even what could be considered the one technology that has most facilitated the rise of the suburb has itself been cast aside. “Most families no longer park their cars in their garages, which they had converted into storage spaces for bikes, toys, outdoor furniture, athletic equipment, and other possessions they hardly ever use...even in a culture heavily shaped by cars, cars themselves come second to stuff” (Owen 2009, 196). Even garages have become a wasted investment considering that many are transformed into glorified storage closets.

Inner City

One indicator of an urban area’s health, before the use of automobiles, was the central core of the urban area. If the urban center was alive and profitable it was a good indication that the entire urban area was alive and profitable. The reason was because of the high integration of the core to the rest of the urban area. Most people traveled into these areas for work and leisure because that was where everything was concentrated. Large scale and rapid industrialization after the Civil War allowed for urban areas to start expanding due to increasing populations (Census 1975; Yeoh and Stansel 2013). People were drawn to the urban areas because of employment opportunities created by this industrialization. This caused densities to rise higher providing a large workforce in a small area.

High densities caused many problems in the central core of urban areas. People saw urban areas as a place where strikers, beggars, and criminals disturbed the public

order, and outdoor privies, polluted waterways, ill health, and overcrowding was allowed to prosper (Power 2001; Sloane 2006). However between the 1950's and 1990's there was a shift that occurred in the reasons why people migrated from urban areas into suburban areas. "People in early urban areas originally left due to overcrowding, disease, and destitution, currently people often leave cities because they have become too depleted" (Power 2001, 731). Through the continual migration of high and middle income people into the suburbs urban services have become depleted.

One of the consequences of urban sprawl has been the decline of the urban core. "Without a strong and inclusive central heart, a city tends to become a collection of interests isolated from one another. It falters at producing something greater, socially, culturally and economically, than the sum of its separated parts" (Jacobs 1961, 215). The isolation of housing and employment, the isolation of communities, and the isolation of people from each other cause serious harm to urban areas. Examples of inner city decline and the effects on surrounding areas can be found in cities such as Detroit and Atlanta.

There are three land use policies that have facilitated the decline of the inner city; dispersal, hidden subsidies to Greenfield development, and oversupply of building land (Power 2001). Of the three policies stated two (dispersal and oversupply of building land) are direct consequences of urban sprawl. When metropolitan areas disperse, people from the inner city are drawn out to the suburbs. High crime and more spacious living space two reasons why people migrate from urban areas. The decline of services because of the lack of people has facilitated even more abandonment of the inner cities. When developing in an urban area brownfield development or redevelopment is more common than Greenfield development due to the unavailability of Greenfield land in urban areas.

The cost of renovating or deconstruction and construction of new buildings can be high in urban areas especially when compared to the low cost of developing Greenfield land in the suburbs. The low cost of Greenfield land stems from subsidies given by local communities to attract development in order to help the growth of the community. The low cost of Greenfield land added to the availability of such land is what drives urban sprawl. Current land-use patterns work against small businesses and favor strip development and big box retail in suburban areas, taking away from retail stores in urban areas (Power 2001; Wheeler 2009). This also amplifies the decline of inner cities.

Transportation

A large amount of literature has been dedicated to the effects of transportation on urban growth (Anas et al 1998; Bertaud 2001; Lund 2003; Rappaport 2005; Kenworthy 2006; Baum-Snow 2007; Sultana 2007; Behan 2008; Owen 2009; Skidmore 2011).

Transportation in urbanized areas before the automobile was reduced to walking or horse and carriage. Effects of limited mobility greatly reduced the size of urban areas due to the need for everyone to live close to the central core of the city (Anas et al 1998). People who could afford to travel by horse and carriage could be located farther from the central core of the urban area but even horses had their limits to how fast someone could travel into the central city. The result was compact urban areas with large population densities.

As people wanted better access to work and leisure transportation modes were developed to accommodate for such needs. The pinnacle of inter-city transportation before the automobile was the streetcar (Skidmore 2011). The streetcar facilitated quicker access to the city. The quicker travel times allowed people to live farther from their

employment and the problems associated with the high-density development that was associated with central urban areas around the early 1900's. Urban areas grew along the routes of the streetcar causing urban areas to expand in land size, allowing for population densities to start declining. The success of the streetcar was short; as the automobile began to become profitable it took over the role of streetcars in urban areas.

“What happened to this thriving electric railway transportation? These systems likely were doomed from the beginning by government policy favoring highways, trucks, and cars; by the attractiveness to companies of systems that did not depend on fixed guide ways; by the lower costs to companies that could use public streets and highways rather than having to maintain rails and roadbeds; and above all, ultimately, by America's passion for the automobile (subsidized, to be sure, by parking spaces, toll-free roads, favorable laws, a huge infrastructure, and the like”
(Skidmore 2011, 168).

Intra-urban transportation was also constrained. Before the use of railroads and later highways transportation between cities was reduced to waterways limiting both direction of travel and destinations to travel to (Skidmore 2011). Early urban areas in the United States were located on waterways due to the use of boats and barges for heavy transportation. Because of the limits of intra-city transportation most urban areas were predominantly self-sufficient. Railroads, which soon became endorsed by the Federal Government through the Pacific Railroad Act of 1862, had the advantage of allowing for large scale transportation over land, was much more comfortable, and was much quicker than waterways (Skidmore 2011). The increasing use of railroad transportation allowed people to move farther from the urban area, which caused urban areas to expand along those railroads.

After World War II the Federal Government started to endorse the automobile instead of the railway, which came in part due to the experience of the autobahn in

Germany during World War II (Baum-Snow 2007). As stated previously the automobile was a large contributor to the decline of the streetcar, however with the backing of the federal government for highways the automobile started to take on the role of the railroads in cross-country transportation. The effects of roadway construction followed the pattern of railroads and streetcar lines in terms of the effect on urban growth. Urban areas continued to expand along roadways as they were built linking pre-existing, outlying communities together with the central city (Auch et al. 2004). The development of air transportation took up the slack from the dying railroad industry for inter-urban travel (Auch et al 2004; Skidmore 2011).

Transportation has an impact on urban spatial structures, however urban spatial structures have an impact on labor and consumer markets; therefore transportation has an indirect effect on labor and consumer markets (Bertaud, 2001; Horner 2007; Sultana 2007). The importance of this is heightened with the fact that most transportation is for leisure activities not for employment (Bertaud 2001). By sponsoring mass transportation in an urban area, the planners are allowing for people to choose which mode they would like to utilize (Anas et al 1998; Kenworthy 2006; Owen 2009). “In France and elsewhere in Europe, one may board a comfortable train, and step off if some four hundred miles away in only a little more than two and a half hours. In parts of Asia, including China, magnetic trains make a journey of the same length in less than two hours. It is true that America has Amtrak, but it faces constant struggles to preserve railroad passenger travel against entrenched opposition” (Skidmore 2011, 172). By maintaining a transportation infrastructure that is planned for efficiency and sustainability urban areas can plan for sustainable urban development.

Sustainable Land Use

“According to the national resources inventory, the amount of developed land nationwide has increased steadily over the past two decades, rising 8.3% between 1982 and 1987, 9.2% between 1987 and 1992, 12.8% from 1992 to 1997, 9.9% between 1997 and 2002, and 6.9% from 2002 to 2007” (U.S Department of Agriculture 2009). While growth is a necessary part of urban areas, too much growth without the increase in population creates sprawling cities that utilize land inefficiently. Some anti-sprawl policies advocate a no growth approach that halts any growth of an urban area. The problem with a no growth solutions is that it does not solve anything; the pressure of increasing populations still remains. What are needed are provisions for growth in urban planning so development does not expand further into the hinterlands (Kunstler 1993). Jepson in his review of these trends, created fourteen guidelines to summarize how sustainable urban development has an effect on urban areas. These fourteen guidelines are:

- | | |
|--|--|
| 1. Jobs-Housing Balance | 9. <i>Higher Density Residential Development</i> |
| 2. <i>Spatial Integration of Employment and Transportation</i> | 10. Protection of Natural and Biological Functions and Processes |
| 3. <i>Mixed Land Use</i> | 11. Resident Involvement and Empowerment |
| 4. Use of Locally Produced, Clean, and Renewable Resources | 12. <i>Social Spaces</i> |
| 5. Energy and Resource Efficient Building and Site Design | 13. Sense of Place |
| 6. <i>Pedestrian Access to Work and Leisure</i> | 14. <i>Inter-Modal Transportation Connectivity</i> |
| 7. Housing Affordability | |
| 8. <i>Housing Diversity</i> | |
- (Jepson and Edwards 2010)

Of these guidelines those italicized have a direct effect on sustainable urban land use. According to sustainable development theories, urban compaction and more mixtures of land use within urban areas would allow for a more balanced job to housing ratio (EPA 2006). Coupled with spatial integration of employment and transportation as well as integration between employment and housing would reduce the need for personal transportation. The reduction of personal transportation would contribute to the limitation of urban growth.

Commutes are longer in sprawling automobile dominated urban areas (Kenworthy 2006; Sultana 2007). It has also been shown that the longest travel times occur between development types (Sultana 2007). By reducing low-density development, travel times would be reduced and mass transportation would be more economical. The reduction of such development would also reduce the need to travel across development types decreasing the longest travel times. Decreasing sprawl would mean more modes of transportation become available to urban areas allowing people of all income levels to access the city. Also it would mean less need for personal transportation such as automobiles. Mass transportation modes such as trolleys, buses, and streetcars become more accessible with higher densities. The increase in mass transportation could only happen in more compact areas because making public transit widely used at the metropolitan scale would require large investments to the transit system at low-density levels (Wheeler 2009).

According to Jane Jacobs there are four indispensable conditions to generate diversity in an urban area.

“1. The district, and indeed as many of its internal parts as possible, must serve more than one primary function; preferably more than two. These must insure the presence

of people who go outdoors on different schedules and are in the place for different purposes, but who are able to use many facilities in common. 2. Most blocks must be short; that is, streets and opportunities to turn corners must be frequent. 3. The district must mingle buildings that vary in age and condition, including a good proportion of old ones so that they vary in the economic yield they must produce. This mingling must be fairly close-grained. 4. There must be a sufficiently dense concentration of people, for whatever purposes they may be there. This includes dense concentration in the case of people who are there because of residence.”

(Jacobs 1961, 196-197)

Ways to encourage pedestrian access to work and leisure would be to limit the use of private transportation via automobile. Policies that increase parking fees and/or introduces driving tax for access to the urban area would have the effect of limiting automobile transportation. The harder it is to find parking spaces, due to limits of the number of spaces, effects personal automobile use and encourages walking and bicycling. Allowing people and bicycles to walk in the streets would create more room for people and give better access to more areas. Not to mention sidewalks open up for other uses such as café's and meeting spots all, which encourage pedestrian access. “No one way is a good way to house a city neighborhood; no mere two or three ways are good. The more variations there can be, the better. As soon as the range and number of variations in buildings decline, the diversity of population and enterprises is too apt to stay static or decline, instead of increasing” (Jacobs 1961, 279).

City life, because of high densities, is optimal for contact between people due to social spaces; the suburbs strive to eliminate such human contact and social spaces (Kunstler 1993). To encourage social spaces an urban area needs to be designed for such spaces. A great example is the boulevard, “it defines space in a way that allows for multiple functions: motoring, strolling, shopping, business, apartment living, repose” (Kunstler 1993, 125). What planners and developers seem to fail to understand is that

people attract people, even the high-income people pay large rents to live in areas with a vibrant sidewalk life (Jacobs 1961). Therefore it is important to plan for social spaces by zoning for sidewalk life, encouraging garages to be placed in the back, encourage large front porches so people can interact with other people outside.

CHAPTER 2: PORTLAND POLICIES

Introduction: Portland

The city of Portland, Oregon is located in the Northwestern part of Oregon while the metropolitan area is considered to be in both the states of Oregon and Washington (Census 2010). As of the most recent census it was ranked 21st in terms of size and population among U.S. metropolitan areas, which is 6,684 square miles and more than 2.2 million people respectively (Census 2010). The metropolitan area comprises of seven counties, which are;

1. Clackamas County, Oregon
 2. Columbia County, Oregon
 3. Multnomah County, Oregon
 4. Washington County, Oregon
 5. Yamhill County, Oregon
 6. Clark County, Washington
 7. Skamania County, Washington
- (Census 2010)

Portland's metropolitan area is composed of 41 different cities of various sizes (Metro 2013). The largest is the city of Portland, which holds 500,000 people (U.S. Census 2010). First settled in the mid-1800 the city of Portland quickly grew in terms of size and population. Today it is considered to be the inner city of the metropolitan area and is also the main economic hub. Located in Multnomah County, Portland is the center of the Metropolitan area and helps to bridge the metropolitan areas that lay across the river in the state of Washington. The land total of the city of Portland is 144.92 square miles, which give the city a density of 4,028 people per square mile. Figure 2.1 gives a comparison of the population trends of both the City of Portland and the Portland Metropolitan area according to data given from Metro. The figure shows that even though the metropolitan area has been increasing its population drastically, the inner city has not

declined but has continued to increase its population as well. The data shows that both populations have been rising and there has been little draw from the inner city in terms of population allowing for both areas to grow in proportion to each other. However it is also shown that between 1950 and 1980 there was little increase in population, which allows the assumption that if the Urban Growth Boundary had not been put into place it is very likely that the City of Portland could have started to lose its population, as many other cities in the United States did at that time. The Urban Growth Boundary (UGB) is the boundary that has been placed to help revert development back into the current cities of the metropolitan area and reduce the effects of urban sprawl.

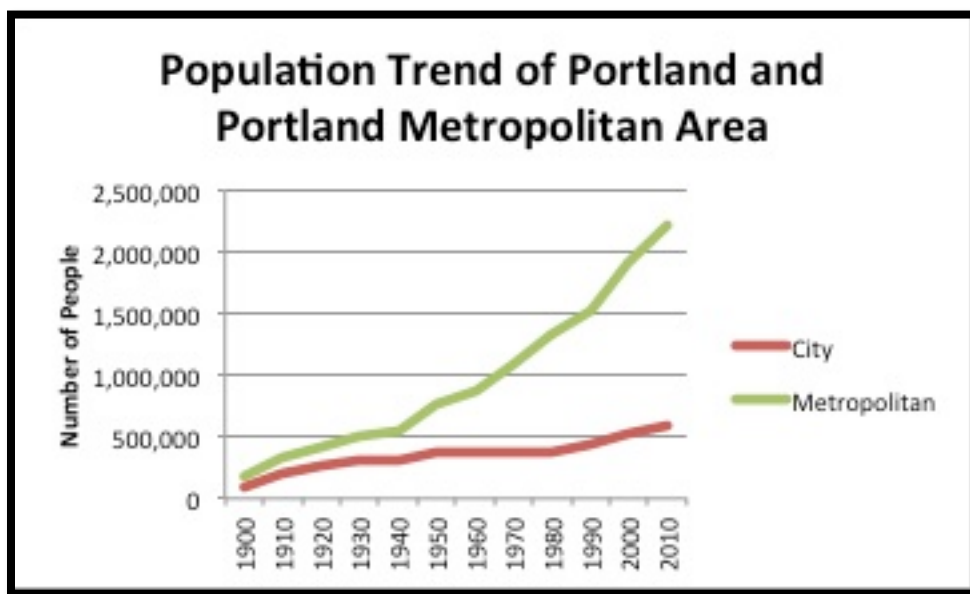


Figure 2.1 Population Trend of Portland and Portland Metropolitan Area (Data Source: Metro 2013)

Vancouver with a population of 165,500 people is the second largest city in the metropolitan area and the largest in Washington State (U.S. Census 2010). It is one of the nine regional centers defined by the 2040 Growth Concept plan, which is the regional

development plan for metropolitan Portland, and is the regional center for Clark County (Metro 2013). Vancouver is also one of the oldest areas in the metropolitan area (besides Portland) being incorporated in 1857. Vancouver began as Fort Vancouver, which was a base for the Hudson Bay Company in 1825, and was the center for fur trading in the Pacific Northwest (City of Vancouver 2012). In 1908 the first railroad reached Vancouver, by World War I the city held the largest spruce lumber mill for airplane construction (City of Vancouver 2012).

The third largest city in the Portland metropolitan area is Gresham, with a population of 105,594 people (U.S. Census 2010). Gresham, which was incorporated in 1905, serves as one of the regional centers in Multnomah County (City of Gresham 2012; Metro 2013). The other city that serves as a regional center for Multnomah County is the city of Gateway. The next two largest cities are located in Washington County, Oregon. Hillsboro is the fourth largest city with a population of 92,350 people, and Beaverton with a population of 90,267 people is the fifth largest city (U.S. Census 2010). Beaverton and Hillsboro were being incorporated in 1893 and 1876 respectively. Beaverton grew due to the development of a railroad and transportation industry in 1868, however much of the current industry comes from high-tech firms, which has given the area's nickname of Silicon Forest (City of Beaverton 2012). Hillsboro grew in part because of the Tualatin River, which allowed for riverboat transportation in the area. This expanded the agriculture areas that had started to flourish. Today Hillsboro is considered part of Silicon Forest due to high-tech companies such as Intel and SolarWorld (City of Hillsboro 2012).

Rest of the regional centers indicated by the 2040 Growth Concept are the cities of Tanasbourne/AmberGlen and Washington Square for Washington County, Oregon

City and Clackamas Town Center for Clackamas County. These towns and cities provide valuable services that connect the local towns to the larger metropolitan area. All of these cities are important parts of the metropolitan area and contribute both to the sustainability of the area and the potential for urban sprawl if not managed correctly. The U.S. Census Bureau adds another two counties to the metropolitan area, which have not yet been added to the jurisdiction of the Metro area.

World War II brought many industrial jobs into the Portland Area, many of which continued on in some form after the war effort ended. With the industrial sector came jobs, many of which were focused on the waterfront due to the concentration of wartime factories for shipbuilding. With the rise of personal computers the demand rose for computer components. Places like Silicon Valley (California) began popping up and prospering. By the 1990's, Silicon Forest had provided many jobs (42,000) for the cities of Beaverton, Hillsboro, and Aloha (Abbott 2001; Hume and Hardwick 2005). The employment brought by Silicon Forest is only about half of the manufacturing jobs in Portland, the rest belong to the aluminum, steel, and transportation equipment industries which employ 45,000 people (Abbott 2001). The growth of the high-tech industry in Portland can be attributed to two things, the initial low land cost and the proximity to Silicon Valley via air transport (Pack 2002). Another part of the economic variance is the brewery industry. Portland is host to a large selection of microbreweries, along with timid climate and beautiful scenery, which creates a large tourism draw to the area.

Portland, which is a predominantly Caucasian community (76.1% as of 2010), has a large amount of influence from different regions of the world. Before World War II there was a large population of Jewish people along with ethnic backgrounds from

Poland, Romania, Russia, Prussia, Germany, Ireland, China, Italy, and Japan (Cline 1987; Eisenburg 2000). After World War II and especially after the Civil Rights movement, more immigrants began settling in the United States. Many of these people came to Portland beginning to transform various areas into ethnic communities. Vietnamese, Cambodian, Laotian and Korean people were drawn to the communities of Beaverton, Hillsboro, and Aloha due to the Silicon Forest industries there. Poorer immigrants from countries such as Eritrea, Somalia, Liberia, and Democratic Republic of the Congo, Ethiopia, and Sierra Leone settled more into the inner-city areas of the City of Portland, Gresham, and Vancouver (Hume and Hardwick 2005). Currently the minority groups of Portland are composed of 6.3% black people, 7.1 % Asian, 1.0% Native American, and 9.4% Hispanic (Census 2010).

Because of unique land use policies as well as ability to encourage sustainable urban development the Portland Metropolitan Area is currently a leading area in the field of sustainable urban development within the United States. With a regional growth plan as a key development tool, and policies such as the UGB, Portland metropolitan area is provided many examples of how an urban area can grow in a sustainable fashion and continue to flourish economically. Concerning the attention of urban areas within the United States, Portland is considered as one of the most sustainable urban areas (Gillham 2002; Portney 2003; Wheeler 2004; Kenworthy 2006; Judd and Swanstrom 2012).

Portland Policies

2040 Growth Concept and Development Planning

A major contribution to the development process in Portland has been the regional growth plan called 2040 Growth Concept, which was written in the 1990's with the participation of thousands of different actors. The growth plan was created to ensure that the growth of the metropolitan area does not happen haphazardly but in a coordinated and planned fashion over the next fifty years. The regional plan advocates several fundamental values, which are:

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Encourage a Strong Local Economy 2. Encourage the Efficient Use of Land 3. Protect and Restore the Natural Environment 4. Maintain Separation Between the Metro Urban Growth Boundary and Neighboring Cities | <ol style="list-style-type: none"> 5. Provide a Balanced Transportation System 6. Enable Communities Inside the Metro Urban Growth Boundary to Preserve Their Physical Sense of Place 7. Ensure Diverse Housing Options for All Residents 8. Create a Vibrant Place to Live and Work |
|--|--|

(Metro 2011)

The plan divides up the metropolitan cities into several distinct groups. The first is the Central City, which is the city of Portland. Described by the plan as “the hub of business and cultural activity in the region. It has the most intensive form of development for both housing and employment, with high-rise development common in the central business district. Downtown Portland will continue to serve as the finance and commerce, government, retail, tourism, arts and entertainment center for the region” (Metro 2013). The second tier of cities is designated as Regional Centers. The regional centers are areas of commerce and government services as well as the center of transit and highway improvements, characterized by two to four story compact employment there are nine regional centers. Those nine centers are:

- | | |
|--------------------------|--------------------------|
| 1. Gateway | 6. Oregon City |
| 2. Downtown Hillsboro | 7. Clackamas Town Center |
| 3. Tanasbourne/AmberGlen | 8. Downtown Gresham |
| 4. Downtown Beaverton | 9. Downtown Vancouver |
| 5. Washington Square | |
- (Metro 2013)

The final tier of cities is labeled as Town Centers. These areas provide localized services within a small radius (2-3 miles); because of this localized provision of services there is a stronger sense of community identity. These areas are also well serviced by the metropolitan transit system to reduce the use of private automobiles within the metropolitan area (Metro 2013). Cities that are include as town centers are; Lake Oswego, Tualatin, West Linn, Forest Grove and Milwaukie and large neighborhood centers such as Hillsdale, St. Johns, Cedar Mill and Aloha.

The 2040 Growth Concept plan sets goals and limits for the entire metropolitan area, of which cities are forced to change their comprehensive growth plans to fit into this regional plan. Metro authority is granted by the State of Oregon and the volunteer willingness of the cities in Washington State allowing for regional planning for sustainable urban development across the metropolitan area. The 2040 Growth Concept plan is unique in that it coordinates growth between two different states and requires that cities and villages conform to the standards set within the document. Because of this, the entire metropolitan area can be managed instead of different communities planning development with no coordination. Instead of the chaotic mess that many metropolitan areas face with differing land use policies, the one regional government system of Portland coordinates the growth plans of each city to coincide with the regional growth plan.

The 2040 Growth Concept plan has allowed for a coordinated effort in terms of regional development for Portland, however this is not the first plan to be developed. Development planning in the Portland metropolitan area has had a long history with plans for development dating back to the 1912's for the City of Portland (McVoy 1945). On the other hand, the metropolitan area of Portland has been refining regional plans for more than 40 years (Wheeler 2004). The most recent plans being the 2040 Growth Concept plan for the metropolitan region. The interesting part of how Portland includes environmental protection into the development process is through the use of environmental overlays during zoning and land use planning. When planning for development environmentally sensitive areas are determined and included in the planning process to reduce the risk of development to environmentally sensitive areas such as wetlands. If development is continued in these environmental zones and transition areas around these environmental zones such areas are afforded special protection based on zoning codes (Portney 2003).

The history of considering environmental impacts has been a strong presence in Portland planning since the mid 1970's. Portland has vetoed several highway projects including a proposed Mount Hood Freeway as well as tearing up the six-lane Harbor Drive expressway to help rebuild the waterfront park in conjunction with the Portland Brownfields Initiative (Gillham 2002). Finally in 1991, the area adopted a Transportation Planning Rule (part of Statewide Legislation) that required local governments to amend land-use codes to encourage high density, mixed-use development around mass transportation lines (Gillham 2002).

Metro

The regional planning government for the Portland Metropolitan Area, which oversees the 2040 Growth Concept plan, is called Metro. Considered the best-known example of U.S. metropolitan regional planning governments, the strength of the government lays with the directly elected Metro Council and the myriad of successful initiatives that it currently maintains (Wheeler 2009). Metro began due to the Oregon state legislation that required metropolitan areas to manage the land use of such regions during the 1960s and 1970s (Bruegmann 2005). At the time of its inception Metro was the only directly elected regional government in the United States, and it included three counties (Clackamas, Multnomah, and Washington) and twenty-four municipalities (Gillham 2002). “Started as an advisory council of governments, but in 1979, the year that it adopted the growth boundary, it became a regional governmental body with elected councilors” (Bruegmann 2005, 205). Because of the statutes provided by the State of Oregon, Metro has authority over land use planning under its jurisdiction, which is uncommon in the United States (Wheeler 2009).

The responsibilities of the Metro are numerous. Metro oversees the implementation and maintenance of the UGB as well as the 2040 Growth Concept plan that regulates the land use, transportation, and various other regional concerns such as downtown revitalization and green space preservation (Wheeler 2009). Other Metro successes includes; the siting, construction, and operation of the Oregon Convention Center, maintenance of the Washington Park Zoo, maintenance and operation of the St. Johns Landfill as well as the opening and operation of the Clackamas County Transfer

Station, and the planning, construction, and operation of the Gilliam County Landfill site (Abbott and Abbott 2010).

The support of the State of Oregon for Metro has encouraged the growth of the government even though it lacks the authority to zone and impose subdivision regulations. Metro can require local governments to revise their plans and regulations if they do not coincide with the regional goals set forth in the 2040 Growth Concept (Song and Knaap 2004). Metro has a large presence in the Portland metropolitan area due to the accomplishments of the regional government. Without Metro there would be no managed UGB, no regional transportation plan, and no regional growth plan. Metro has helped to greatly increase the use of sustainable development in the Portland Metropolitan Area.

Urban Growth Boundary

The UGB was created from the 1973 Land Conservation and Development Act passed by the State of Oregon underneath the governance of Thomas McCall (Bruegmann 2005). The Land Conservation and Development Act stated “Uncoordinated use of lands within this state threaten the orderly development, the environment of this state and the health, safety, order, convenience, prosperity and welfare of the people of this state” (Senate Bill 100 1973). Section 2 of the bill explains what is required of cities and counties in the state of Oregon.

1. “Must be adopted by the appropriate governing body at the local and state levels;
2. Are expressions of public policy in the form of policy statements, generalized maps and standards and guidelines;
3. Shall be the basis for more specific rules, regulations and ordinances which implement the policies expressed through the comprehensive plans;
4. Shall be prepared to assure that all public actions are consistent and coordinated with the policies expressed through the comprehensive plans; and

5. Shall be regularly reviewed and, if necessary, revised to keep them consistent with the changing needs and desires of the public they are designed to serve.” (Senate Bill 100 1973)

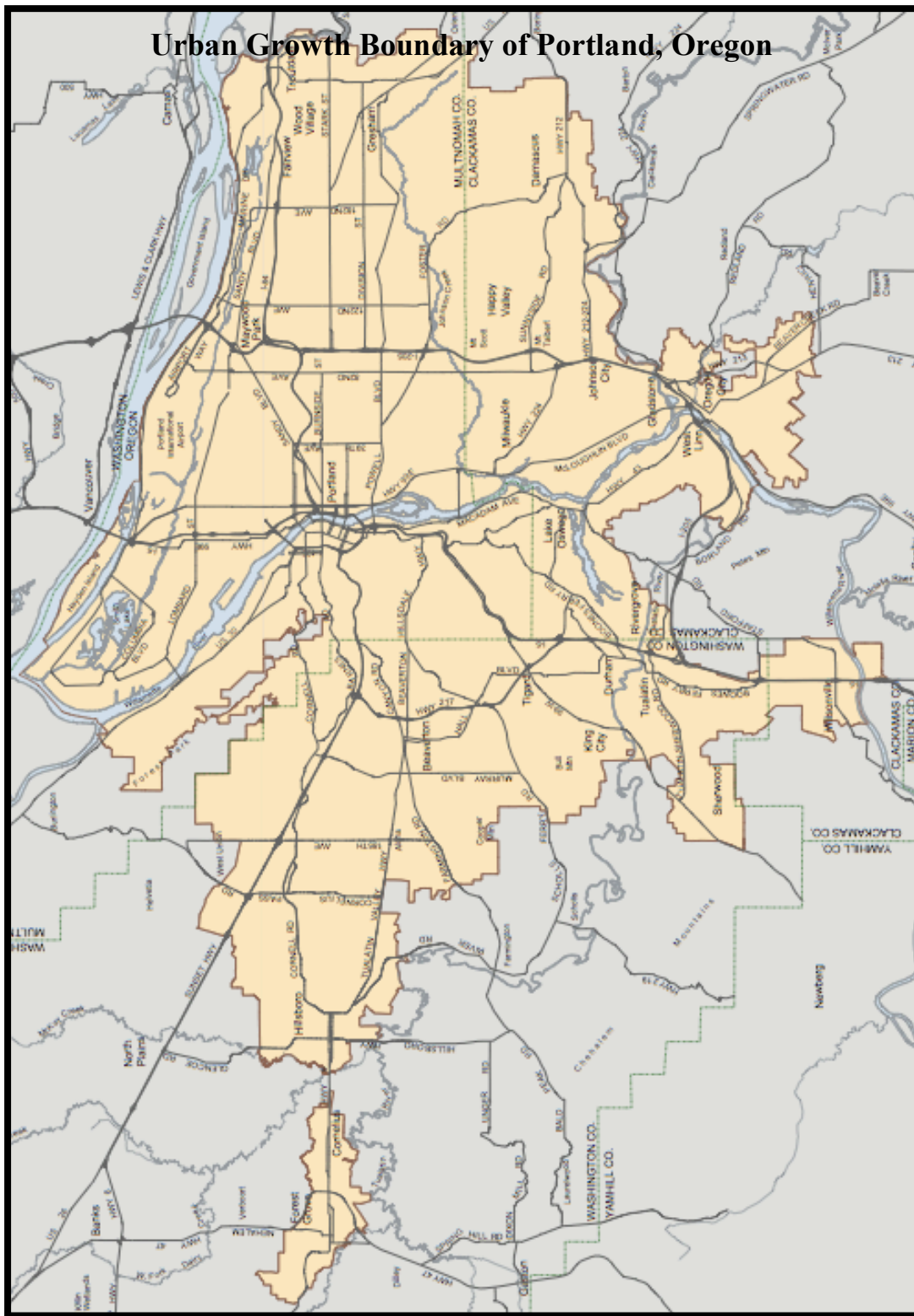
Seeing the need for urban areas to grow the bill was not designed to stop urban growth but to maintain that excessive urban sprawl did not take place, which is why the bill forced each area to maintain comprehensive plans for land management establishing a twenty-year supply of land for growth (Metro 2013). While the bill did not specifically imply that Metro was to maintain the UGB, it was the only agency suited for the task. The Metro government approved the UGB in 1979 in accordance to the Land Conservation and Development Act (Wheeler 2009). After the boundary was established Clackamas, Multnomah, and Washington counties adopted the comprehensive plans to match that of the UGB (Bruegmann 2005). The UGB was originally established far away from the central city, however this allowed suburban sprawl to take place inside the boundary prompting Metro and local governments to create urban design regulations to correct the problem (Wheeler 2009).

The current urban growth boundary (Figure 2.2) extends through three counties and includes more than 20 cities (Metro 2013). The Census gives the population density of the Portland Metropolitan area as 333 people per square mile (Census 2010). The problem is that this is not the density of the urban growth boundary, because the United States Census Bureau considers the Metropolitan Area to consist of six counties (much of which is unincorporated with the actual Metropolitan area. When considering the extent of the UGB, the population of the area that Metro has jurisdiction over is the land that needs to be examined. The land administered by Metro is 545.21 square miles and contains a population of 2,105,200. The new density is then 3,861 people per square mile,

which is much higher than the total given by the census bureau (Metro 2013).

Throughout the 30 years of the UGB there has been additions to the boundary as was planned through the comprehensive plan. The growth of the population of the metropolitan area inside the UGB has grown from 1,029,400 in 1979 to 1,667,500 in 2010, which is an increase of 638,100 people or 61% (U.S. Census 2010; Metro 2013). The increase of land inside the UGB has only been 12% over the past 30 years.

The key to success for the UGB has been the State of Oregon's willingness to allow the Metro government to dictate land use in this fashion to the local municipal governments (Judd and Swanstrom 2012). Despite some over allotments in the beginning of the UGB, densities have started to rise since the 1990's (Bruegmann 2005). This is an indication that the UGB has started to take effect, and help to redirect land development inside the UGB instead of allowing urban sprawl. The effect of the UGB for the Portland Metropolitan Area has had immense effect on curbing urban sprawl, by encouraging development inside the boundary instead of outside of it. Without this boundary, Portland could be more sprawled out resembling metropolitan areas such as Chicago and Los Angeles.



**Figure 2.2 Urban Growth Boundary of Portland
(Source: Metro 2013)**

Transportation

Advances in transportation have had profound impacts upon the Portland metropolitan area, as it has with all urban areas. The difference that has set Portland apart from most other urban areas in terms of transportation is the fact that Portland has been planning for urban transportation for decades. The most significant transit that Portland has been planning is the mass transportation system which includes buses, and the MAX light rail system (Kenworthy 2006). While planning for mass transportation Portland has simultaneously been putting restrictions on automobile travel and associated amenities to restrict the use of such transportation.

Planning for the MAX regional light rail system began in the 1970s during the examination and implementation of the UGB and Metro (Wheeler 2004). Using federal funds the fifteen-mile light rail system was built during the 1980s and fifteen years after opening the rail system and bus lines carried nearly 1/3 of all commuters to downtown (Gillam 2002). However Portland was not just designing a rail system, but was also designing communities that would grow around this rail system. “Portland, for example, has designated nodes of density along stations of its new MAX light rail system, and intensified corridors of development along heavily used Tri-Met bus lines. These transit lines radiate out from downtown Portland, creating a traditional star-shaped pattern” (Wheeler 2009, 141).

Neighborhoods have even been designed to be interactive with the mass transportation of Portland. Places like Orenco Station, which is a 190-acre town off of the Westside MAX line, designed to be transit friendly (Metro 2013). The small town was

built to be compact, mixed in its land use, and to be transit oriented (Gillham 2002). Orenco is a livable neighborhood that allows residents to walk to and around the town center because it is within a five-minute walk from most of the housing. All aspects of the community are located close to the town center to allow people access to the mass transportation options to travel around the Metro area. Orenco Station was built using Smart Growth features, and the area includes; efficient use of land, varied housing options (live/work units), light-rail station adjacent to development, close to employment opportunities, community parks and open spaces, and neighborhood shops and services. Orenco Station is built to be sustainable but the big draw for developers is that the sale of housing has commanded as much as 25% premium over other suburban homes around the area despite the fact that the other homes are larger in both square footage and in yards (NRDC 2013).

Portland has also taken initiative to help persuade commuters to use personal transportation less and make automobiles safer for pedestrians. One policy that Portland has used to reduce the amount of personal automobile use in the downtown area is to implement a cap on downtown parking spaces (Gillham 2002). By limiting the number of parking spaces, Portland limits the number of cars that can travel into the city. By making it hard for people to park, Portland has been encouraging the use of its mass transportation systems. There are many methods to calm traffic (implementing circles, humps, and bulbouts are most common) however the most common in Portland is the use of traffic circles to slow down traffic and help make drivers more cautious (Wheeler 2004). The planting of trees along streets, addition of mid-block chokers, and the

narrowing of streets also help to reduce vehicle speeds in urban and suburban areas (Wheeler 2009).

Effects of Policies

The Portland metropolitan area has had a stringent set of land use policies since the 1970's. These policies have helped to shape the current metropolitan area as well as the cities within. Policies such as the transportation policies have seen positive changes with little controversy. Other policies such as the UGB has shown positive benefits but with much controversy surrounding it. If these policies are to be replicated in other metropolitan areas there needs to be evidence suggesting the benefits of sustainable land use policies.

The effects of the regional planning and transportation policies have shown mixed results in terms of low-density development at the regional scale. Despite the urban growth boundary being in effect evidence of urban sprawl has still been witnessed in the Portland metropolitan area (Song and Knaap 2004). Population densities are still low for an urban area and there is still low density development occurring within the UGB. The reason is because the initial boundary for the UGB was set at too large of a land area (Bruegmann 2005). By setting the UGB too large development had to catch up with the boundary before the boarder could have any effect on the densities within. This growth did not catch up to the boundary until the mid 1990's. Since then there have been improvements in the population densities. Another fear with the UGB was that it would have negative effects on housing prices within the boundary. This has proven to be false, the UGB has had little effect on the personal housing prices (Jun 2006). The effects of the

UGB while delayed seem to have begun to act in a positive manner on the land use of the Portland Metropolitan Area.

The effects of the land use policies enforced by Metro have had positive effects on the inner-city health of the metropolitan region. Infill and redevelopment have become standard practices for the inner city. Projects such as the renovated waterfront, as well as the numerous buildings that have been restored for use, has helped to draw people into the city of Portland. Unlike most inner cities, the city of Portland has not seen a decline in population, but has in fact seen a steady increase in population figures as was shown in Figure 2.1. Despite the positive effects of Portland's land use policies there have also been failures. One example is the failure in some areas to reduce the poverty rates. There are still areas with significant poverty in the well-connected and accessible central city (Miles and Song, 2009).

The policies on transportation have also had many effects on the Portland metropolitan area. First, the transportation system has opened up much of the city to people who wish to use mass transportation, allowing for a reduction of automobile use for long trips into the city, which reduces the reliance of automobiles. With growing ridership on MAX regional light rail system the workforce increased by 67 percent in the downtown area and has added half a million square feet of retail space between 1972 and 2002 (Gillham 2002). Second the mass transportation of Portland has allowed for more internally connected and pedestrian friendly neighborhoods (Song and Knaap, 2004; Miles and Song, 2009). With more connectivity and pedestrian friendly neighborhoods more of the metropolitan area is opened up for multiple transportation options allowing for better access for more people.

In terms of the guidelines proposed by Jepson and Edwards 2010 and Jacobs 1961, Portland has done much in terms of implementing sustainable urban development principles. Portland's ability to implement regional growth plans has been strongly influenced by state legislation and the willingness of individual cities and counties to succeed development powers to the regional government. This in turn has allowed for the implementation of land use policies that favor high-density compact development over low-density sprawling development. The ideas and policies used by the Portland metropolitan region could be adopted in other areas to fit the needs of metropolitan areas that have urban sprawl issues.

CHAPTER 3: ST. LOUIS POLICIES

Introduction: St. Louis

The City of St. Louis is located in the middle of the State of Missouri along the Mississippi River. The St. Louis metropolitan area (Greater St. Louis) is located in the States of Missouri and Illinois. Greater St. Louis with a population of 2.8 million people is the 18th largest metropolitan area in the United States (Census 2010). With a land area of 8,458 square miles the density of the metropolitan area is 340 people per square mile. The metropolitan area contains eight counties in Illinois and nine counties in Missouri, which are:

- | | |
|-------------------------------|-------------------------------------|
| 1. Bond County, Illinois | 10. Jefferson County, Missouri |
| 2. Calhoun County, Illinois | 11. Lincoln County, Missouri |
| 3. Clinton County, Illinois | 12. St. Charles County, Missouri |
| 4. Madison County, Illinois | 13. St. Louis City County, Missouri |
| 5. Macoupin County, Illinois | 14. St. Louis County, Missouri |
| 6. Monroe County, Illinois | 15. St. Francois County, Missouri |
| 7. Jersey County, Illinois | 16. Warren County, Missouri |
| 8. St. Clair County, Illinois | 17. Washington County, Missouri |
| 9. Franklin County, Missouri | |

The St. Louis area was originally controlled by the Mississippian Indian Nation, it later fell to European rule. The late 1690s saw the establishment of local areas such as Cahokia and Kaskaskia in Illinois, but it was not until 1764 that the city of St. Louis was founded. In 1803, St. Louis became part of the United States through the Louisiana Purchase conducted by Thomas Jefferson. By the turn of the 20th century it was one of the largest urban areas in the United States.

The population of the City of St. Louis began at 575,238 people and has grown to a population of 856,796 people in 1950, which had declined 2010 to 319,294 people (U.S. Census 2010). The land area of St. Louis City has stayed a constant 66.2 square miles since 1876. This means that the density for the inner city has dropped from 12,942 people per square mile in 1950 to 4,823 people per square mile in 2010. In comparison the metropolitan area population has grown from 1,942,848 in 1950 to 2,812,896 in 2010 (U.S. Census 2010). These trends are illustrated in Figure 3.1, which shows the population trends of St. Louis city and Greater St. Louis.

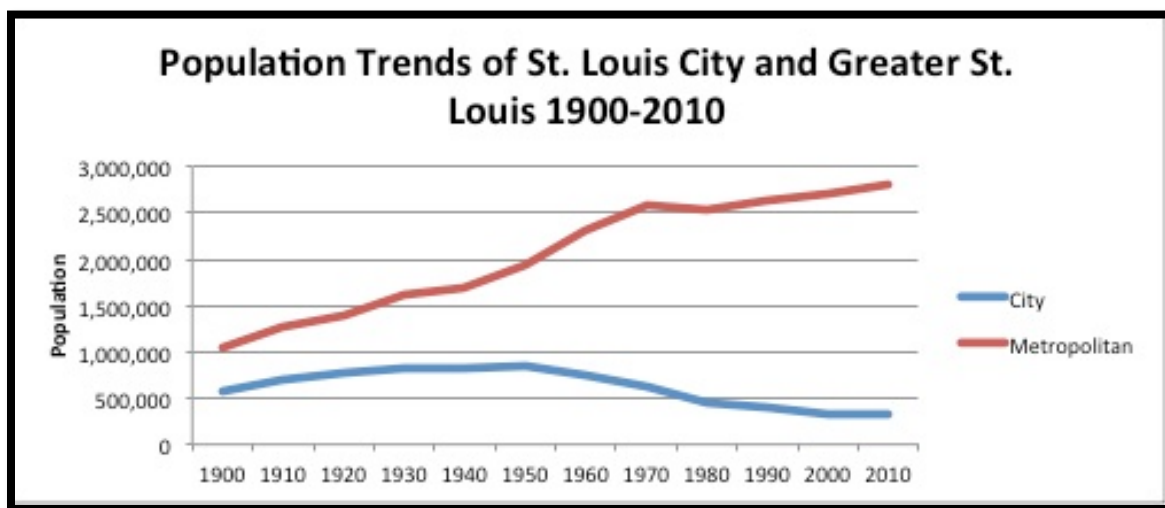


Figure 3.1 Population Trends of St. Louis City and Greater St. Louis: 1900-2010
(Data Source: U.S. Census Bureau 2010)

The land use policies that have been adopted by St. Louis City and Greater St. Louis are common examples in the literature of urban area planning in the United States. With emphasis on individual development plans with little interaction between other developments plans little communication and coordination is found in many urban

metropolitan areas in the United States. The policies of this area have been replicated throughout many urban areas allowing for low-density development to occur.

St. Louis Policies

Urban Redevelopment

The City of St. Louis has had a unique problem that few urban areas have to deal with. In 1876, St. Louis City faced the problem of urban expansion into rural areas, which limited the commercial business activity and tax base of the city (Phares 2007). To deal with the problem the City of St. Louis, which was located in St. Louis County, decided to limit its borders to protect the tax base and commercial business economy. Through the ratification of a new constitutional convention the City of St. Louis successfully separated from the St. Louis County, becoming its own county (Cropf and Swanstrom 2005). In doing so the City of St. Louis expanded from eighteen to sixty one square miles (deemed adequate to support future growth), however the constitution did not provide for any adjustment of the borders. After realizing the mistake, the City of St. Louis tried to ratify amendments to the constitution (1926: Consolidation of the City and Country under City Government, 1959: Creation of the Metropolitan St. Louis District, 1962: The Borough Plan, 1990 Board of Electors Plan), however for the past 137 years the amendments have all failed. “The inability to annex has been a major cause of the city’s population decline” (Cropf and Swanstrom 2005, 11).

Many of the problems that have plagued the City of St. Louis did not start until the 1950s when the city population was at its largest. Around this time the density of the inner city was high above 12,000 people per square mile. The reasons for decline included income growth, postwar housing and mortgage policies, deteriorating conditions

in the city, and the rise of the automobile in American culture (Blair 2007). About this time St. Louis was gaining national publicity for its receipt in the first federal funding for massive urban renewal programs (Judd and Swanstrom 2012, 182). Most of which went to the failed Pruitt-Igoe housing complex. In the 1970s, as de-industrialization peaked, St. Louis lost 27 percent of its population (U.S. Census 2010). “However, by the 1980s it became evident that downtown was losing much of its overall economic vitality. Plans to reverse this trend were developed but languished for almost a decade” (Cloar 2004, 22). Despite the application of those plans, St. Louis City still lost 12 percent of its population between 1990 and 2000 (Gillham 2002).

Transportation

On an average day the population of Greater St. Louis make more than ten million trips of which 88 percent utilizes the automobile as the transport of choice (Blair 2007). The Greater St. Louis highway system allows the population to move freely with little travel time due to the large amount of roadways (East-West Gateway 2011). The results of such travel has helped to increase the metropolitan area sprawl and facilitated the current population densities and land use in the regional area. The population of the metropolitan area saw the largest increases during the time of heightened highways (1950-1970) as well as the inner-city seeing the quickest decrease in population (see Figure 3.1). A large part of this is due to the increase of funding for highways after World War II. Much of the planning for Greater St. Louis has been based on automobile usage resulting in the limited functionality and the limited desirability to utilize the mass transportation system managed by the Bi-State Development Agency.

The mass transportation system extends through large portions of the Greater St. Louis area and incorporates the region in both Illinois and Missouri. The amount of mass transportation is astonishing given that it was created through the acquisition of fifteen privately owned transit firms in 1963 and then updated and expanded several years later (Blair 2007). Despite the amount of money and effort gone into developing the mass transportation system the East-West Gateway organization has suggested the “region’s transit system may not provide sufficient frequency and coverage for those households without cars” (East West Gateway 2011, 78).

Effects of Policies

Unfortunately in terms of sustainable urban development St. Louis and the Greater St. Louis Area has had more failures than successes in their attempts to develop sustainably and reduce urban sprawl. Whether it is through the mass transportation systems which despite major expenditures have seen diminishing usage, or housing and urban renewal projects such as the massive failure of Pruitt Igoe, St. Louis cannot seem to develop sustainably (Gillham 2002; Judd and Swanstrom 2012). Part of the reason is due to the past failures and limitations on the inner city. Other reasons include the fragmentation of government in the Greater St. Louis area that causes competition instead of cooperation between municipalities. The final reason is the failure of the people of Greater St. Louis to realize the impacts that they have on their region and the environment. Without motivation to reduce sprawl and create better neighborhoods the population of Greater St. Louis and the City of St. Louis will fail to implement projects

that could benefit them by increasing desirability to live there, increasing economic performance, and increasing the environmental quality.

Current land use trends have led to St. Louis becoming one of the most decentralized cities, which has experienced widespread abandonment of the central city for the more sprawled out suburbs (Bruegmann 2005). This has led to the below average metro area density and the higher than average population living in rural areas (East-West Gateway 2011). Continuing problems encountered by St. Louis include:

- Wide disparities in the number and extent of public services provided
- Substantial variation in tax base to finance essential services
- Some essential area-wide services are inadequate
- Some communities have failed to recognize their responsibility to the entire urban area.
- Competition among municipalities to increase their potential tax resources impedes planning for the entire area.
- Growth will occur in unincorporated St. Louis County and ad hoc annexations and incorporations will not provide an adequate solution.
- St. Louis County will have to provide an increasing amount of municipal services to unincorporated county residents due to urban sprawl

(Phares 2007)

A review conducted by the St. Louis Council of Governments recently stated “The St. Louis region continues to rank near the bottom among its peer regions in percent of population living in the urban core” (East-West Gateway 2011, 20).

The Greater St. Louis area is ranked as one of the top three U.S. metropolitan areas for overall number of units of government including city, municipal, state, regional, and special districts, generally ranked behind Pittsburgh, Pennsylvania (Krumenacher 2008; East West Gateway 2011). The U.S. Census Bureau gives the total number of governmental organizations in the Greater St. Louis area as 1,044 units. Figure 3.2 shows the breakdown of those governmental units in the Greater St. Louis Area. The

government units can be broken down into Cities, Townships, Counties, Villages, and Special Districts. “Less than half of local government units in the St. Louis region are general-purpose governments, such as counties, municipalities, and townships” (East West Gateway 2011, 82), the rest are special districts.

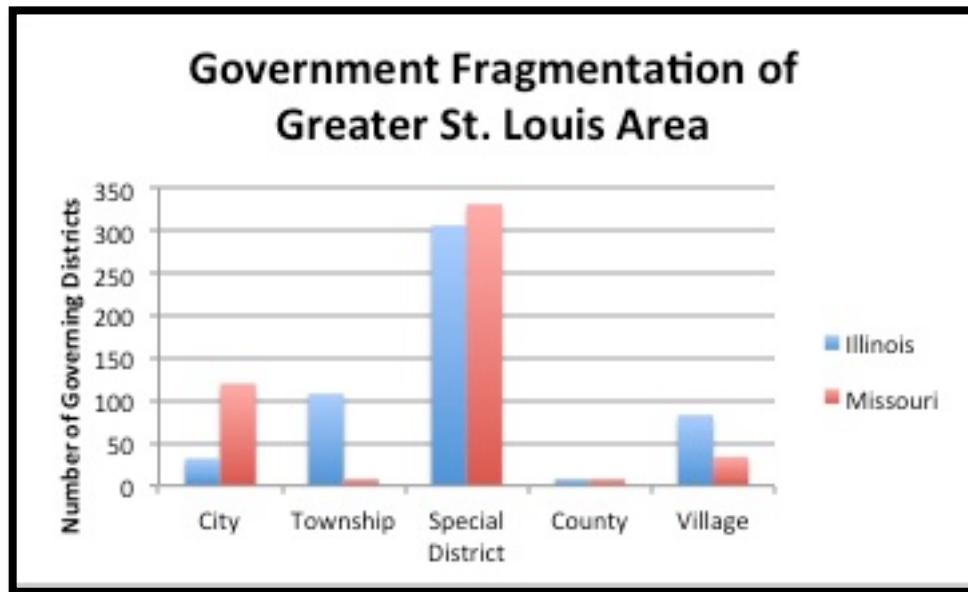
Fragmentation of local governments is necessary to some degree, to unburden city and municipal governments, however when there is an excess of local governments then confusion becomes a problem. Confusion on who has jurisdiction has created many issues in the metropolitan area. This allows for wide disparities of public services that are provided as well as the adequacy of those services in some areas (Phares 2007). In terms of metropolitan areas, fragmentation without a central leadership organization generally means that little occurs when it comes to regional issues. An example is the coordination of urban planning over the entire metropolitan area of Greater St. Louis. There is no oversight to this area, which allowed for the large amount of urban sprawl that has taken place. Competition amongst municipalities, cities, and special districts to increase their tax base has the negative effect of impeding planning for the entire area (Phares 2007). The large amount of special districts has also allowed for some environmental issues to be overlooked such as lead, and asbestos in certain areas (Berg 2010; East-West Gateway 2011).

There is even fragmentation in regional oversight. Governments that maintain data and encourage regional coordination include the East-West Gateway/Council of Governments, the St. Louis Regional Chamber, Bi-State Development Agency (Metro Transit), as well as the Missouri and Illinois state governments. Some of these

governments have more say in development such as the state governments and Metro Transit. The other groups have a less official roles in development such as encouraging regional economic growth (St. Louis Regional Chamber) or encouraging regional coordination in land-use and environmental issues (East-West Gateway).

In total, the number of local governments for the Greater St. Louis area is large. Because of fragmentation of the governments and little coordination between organizations there is a large difference between the policies of those differing areas of the Greater St. Louis metropolitan area. Coupled with the fact that some communities fail to recognize their importance and responsibility to the entire urban area has led to the failure of regional governance currently. This is evident by the large amount of urban sprawl, because in an area that is more coordinated densities are higher due to urban planning and development strategies.

The inner city is has been in decline for many years with numerous attempts to renovate and rejuvenate the city of St. Louis. Currently the population is only half of what it used to be, and occupies a larger land area (Dekay and O'Brien 2001). Greater St. Louis has become known as one of the most fragmented and sprawled cities in the United States (Dekay and O'Brien 2001; Bruegmann 2005; East-West Gateway 2011; Judd and Swanstrom 2012).



**Figure 3.2 Government Fragmentation of Greater St. Louis Area
(Data Source: Census 2010)**

Despite the decline in the inner city there have been large improvements to rehabilitate the city. In St. Louis many developers have taken to urban infill and rehabilitation of old buildings to revitalize the downtown area. Examples of revitalization projects include; Washington Avenue Streetscape, Renaissance Grand Hotel, Merchandise Mart Apartments, The Old Post Office, The Kiel Opera House, and the Westin Hotel (Cloar 2004). Another success has been the passing of the ordinance in 2010, granting development rights for a 1,500-acre regeneration project in North St. Louis and approving a tax increment financing (TIF) for a community project that will create a neighborhood that is connected to the light rail system (Berg 2010). This community will include a trolley loop through the site to connect people to the light rail transit system to ensure that the homes are within a fifteen-minute walk to mass transit. Also the community is planned to have at least 15% of the residents be able to walk to work.

While the current situations of both the downtown and the metropolitan region look grim, there are projects that are starting to help rehabilitate the area. With help from the Downtown Development Plan in 1999, the inner city has seen over 2.1 billion dollars in investments to the city (Cloar 2004). With development projects like the one passed in 2010 and the rehabilitation of historic buildings have begun to make the inner city more inviting, which is necessary if St. Louis is to start attracting people again to the city. Indications are that the City of St. Louis has begun to revitalize itself with a clear plan of the future (Cloar 2004). With aspects such as an Eco-village and public transportation, St. Louis is working towards developing sustainably but there are many aspects of this urban area that hinder such development.

There are few projects that have indicated any commitment to reducing sprawl and the region's impact on the environment. It is possible for Greater St. Louis to incorporate sustainable urban development techniques despite the lack of cohesion between governments (Krummenacher 2008). There are three steps needed to achieve such development. The first is a good knowledge base of the local policy. By understanding what policies are passed and how it will become easier to predict which policies will pass and how those policies are worded to gain the support of lawmakers and the public. The second is the building of relationships. Relationships in the form of homeowners and city managers can help developers understand what is needed and how to approach the public. The third is that public leadership and resources matter. Having a stake and being a part of the community is important but what are needed as well is the leadership capabilities to persuade the public that these goals are important for the future of the city and their communities. Also by bringing in resources into these communities

is shows an effort to be invested in the community to make it a better place to live.

However the efforts made to plan and enact initiatives for sustainable land use the gains made have been off-set by the absence of regional level actors to implement these plans across the metropolitan area.

CHAPTER 4: COMPARISON AND CONCLUSION

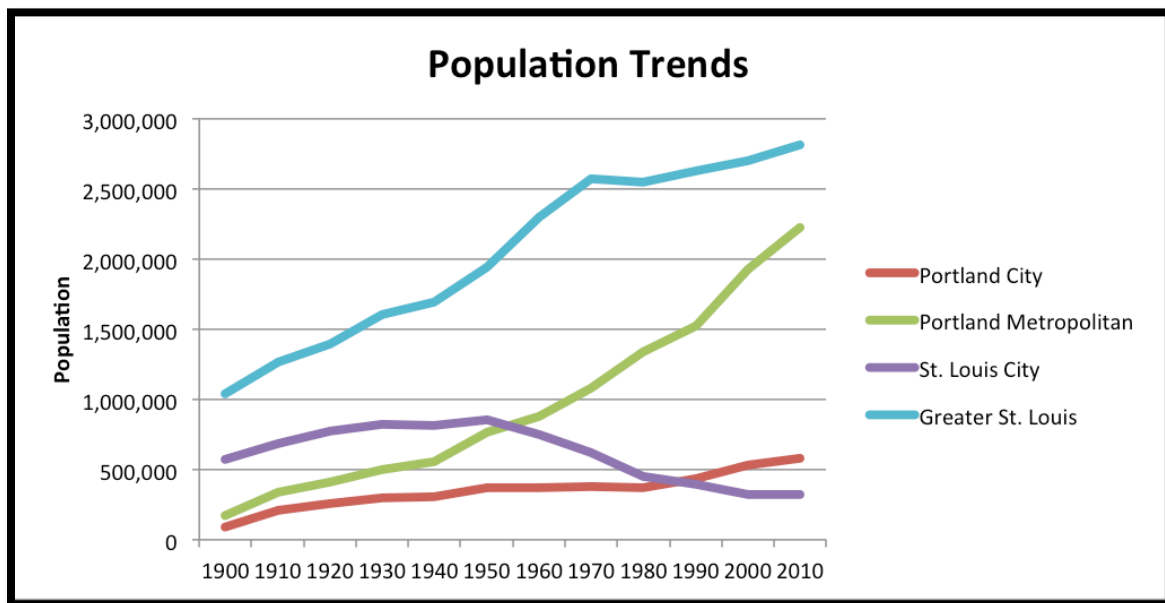
The Portland Metropolitan Area and the Greater St. Louis area have long histories of working with urban development and planning. In the case of Portland this planning has been to restrict the use of development planning tools that allow for low-density urban development. With restrictions on land use, transportation construction, and the concern for environmental issues Portland has created a planning and development toolkit that works to reduce low-density, automobile centered urban areas. St. Louis however has worked towards similar goals but have not had the support that has been witnessed in Portland. Their policies are not coordinated regionally. Greater St. Louis's transportation plans allow for a continued automobile centered urban area, which has the effect of expanding the land used and drawing population from the inner city into the suburbs.

Comparison of Portland and St. Louis

Both Portland Metro and Greater St. Louis are metropolitan areas that have more than 2 million people. Both metropolitan areas cross multiple boundaries; and both consist of multiple counties, which lay in two different states. Portland lays in both Oregon State and Washington State and consists of seven different counties, whereas St. Louis is in both the States of Missouri and Illinois and consists of seventeen counties. Both are ranked fairly close in the U.S. Census Bureau's rankings of Metropolitan Areas (Portland is 21, St. Louis is 17). The most important aspect is that both areas have had attempts at controlling urban sprawl. Some attempts have succeeded and some have failed. Table 4.1 compares information about Portland and St. Louis metropolitan areas.

Table 4.1		
Comparison of Portland and St. Louis		
City	Portland	St. Louis
Population	2,226,009	2,812,896
Land Area (sq. mi)	6,684	8,846
Population Density	333	318
Inner City Population	583,776	319,294
Inner City Land Area (sq. mi)	145.4	66.2
Inner City Population Density	4,015	4,823
Growth of Population City 2000-2010	10%	-8%
Growth of Population Metro 2000-2010	13%	4%
Is There A Comprehensive Land Use Plan Including Environmental Issues?	Yes	No
Is There A Metropolitan Regional Government?	Yes	No
Is Zoning Used to Delineate Environmentally Sensitive Growth Areas?	Yes	No

Portland's urban development strategies have been successful in limiting its urban sprawl whereas St. Louis has been unsuccessful in curbing urban sprawl. In 1980 when the urban growth boundary in Portland began to take effect the increase in the inner city population as well as the increase in the metropolitan population is pronounced in the graph. Also notice how this is not seen in the trends for St. Louis. In fact the opposite is noticeable. The reason is because urban sprawl was managed in Portland, by redirecting attempted urban growth back into the city. There was no such mechanism for St. Louis and the inner city declined drastically because of urban sprawl.



**Figure 4.1 Population Trends of Case Studies
(Data Source: U.S. Census 2010)**

The trend of urban sprawl can also be seen in the percentage of the metropolitan population that resides in the city. Portland has several land use controls for urban sprawl and has more percentage of population that lives in the inner city than St. Louis, which does not have land use controls for urban sprawl. It is the policies and the willingness of the population to correct for urban sprawl that dictate how well an urban area will perform in limiting such unsustainable land use.

Comparison of Policies

To prevent low-density development in Greater St. Louis, policies from the Portland Metro area could be of use. Policies such as: the urban growth boundary, transportation plans, and the spatial integration of work and transportation. Policies transplanted from one urban area to another can be useful when trying to replicate another areas policies, however caution must be used because some policies could have

negative repercussions if used improperly. An example could be of urban growth boundaries. If used without careful consideration and monitoring the policy can have negative social, economic, and environmental implications.

An important aspect to preventing low-density development is to have a firm and executable plan for the urban metropolitan area. Portland's regional 2040 plan allows for the establishment of goals and ways to monitor the progress. "In establishing the goals of a proposed intervention, one must move beyond the rhetoric of "fighting sprawl" to targeting the specific dimension(s) of land use that are putatively generating the undesirable outcomes. Moreover, one must consider whether the policy instrument being considered will avoid altering another dimension of land use besides those being targeted, thereby skirting potentially harmful, unintended consequences" (Cutsinger et al. 2005, p.257-258). By linking such plans to actual policies and monitoring the results has the effect of providing the intended consequences, and if there happens to be unintended consequences they are more easily reversible because the problems are generally caught early on in the development process. St. Louis fails in this respect because there are little metropolitan wide development plans and those that have been developed are generally not enforced. In the end having a good plan is the best way to monitor and implement sustainable urban development in the Greater St. Louis area.

Through the use of a regional plan such as Portland's 2040 Growth Plan, Greater St. Louis can plan and implement for more regional policies. Such policies should include an urban growth boundary modified to work for St. Louis, a transportation plan that allows for the integration of activities within the metropolitan area as well as allowing for multiple transit types that reduce the use of the personal automobile. To

implement such a plan the Greater St. Louis area would need a regional government with the ability to implement changes or ask for the implementation of changes to development plans. By having a regional government to oversee and enforce a metropolitan area growth plan each city inside the metropolitan area would be able to create how they develop but would have to conform to some regional standards to allow for more condensed and sustainable growth.

The inner cities of each metropolitan area show the importance of each area within the metropolitan regions. The city of Portland is the heart of the Portland metropolitan area, and is planned so according to the 2040 Growth Concept. In Portland Metro the city of Portland connects all of the smaller cities through integrated mass transportation and limitations on private automobile use. This allows for the population outside of the city of Portland to be a part of the inner city. The large connection has helped to maintain a steady increase in population and in the provision of services for the metropolitan area.

The city of St. Louis is considered to be the inner city for Greater St. Louis. However in terms of services the inner city has little to do with the metropolitan area. The city of St. Louis has been removed from the metropolitan area for more than one hundred years as stated earlier. Because of such policy the inner city has had little influence in the maintenance of a strong metropolitan region, which has led to the low-density development and governmental fragmentation. Even though the City of St. Louis has implemented sustainable land use measures without the support of the metropolitan area the policies have a diminished effect due to the loss of population and resources.

Methods and policies that help maintain a large degree of spatial integration of employment and transportation would bring benefit to Greater St. Louis. To discourage automobile use or to reflect the true costs of its use, policies that promote taxation for automobile owners/users would provide funds for an urban area and reduce the impacts of personalized automobiles (Owen 2009). Another method would be to limit parking spaces so that urban drivers are more reluctant to drive, schemes that make parking easier encourages people to drive (Owen 2009). A third policy would be to give incentives to employers that encourage or require mass transportation options for their employees such as bicycle options, carpooling, bus pass discounts, etc. The easier mass transportation is to use the more it encourages ridership among the population. In the end a large force in the development of urban areas is how the workforce travel to their places of employment. Using design strategies to intermix residential and job locations would have the positive effect of reducing local trip lengths (Horner 2007). Until businesses begin to encourage their employees to live closer to work and travel in more sustainable ways urban areas will continue to remain large and sprawled out. The policies of Portland to incorporate transportation concerns into the development strategy has helped to improve the accessibility of the city to more transportation options allowing for people to reduce their car use.

The numerous policies that affect how an urban area grows all need to be maintained to prevent unsustainable use of land and resources. It is through negligence or an unwillingness to consider such actions that allow for sprawling urban areas. It has been shown that enabling land use policies such as urban growth boundaries and building caps are a positive influence on economic performance and housing prices (Cervero

2001; Jun 2006). Even if an urban growth boundary is undesirable for a metropolitan area there are other ways that land use can be limited to reduce sprawl. Smart growth zoning ordinances that have been seen in Portland promote small lot sizes, close proximity of buildings to roads, limits public parking spaces, and promote walkable neighborhoods will help to revitalize urban areas and limit the spread of urban sprawl. The use of these zoning ordinances in the larger metropolitan area of St. Louis could have a large impact in utilizing sustainable land uses. However there needs to be an atmosphere in the Greater St. Louis area that allows for and encourages such sustainable land use codes.

First, charging the full cost of development on Greenfield sites (to reflect the environmental costs, loss of diversity to existing urban areas, and the true cost of building materials) development on brownfield sites or in vacant urban lots would become more profitable (Power 2001). By infilling urban areas with new buildings it helps to create diversity in buildings and in the age of buildings, which helps to create interest in the urban area and provides for richness in the urban experience. Mingling the age of buildings is important because in older buildings the rent is usually cheaper allowing for new businesses to begin. Once those businesses become profitable they move on to larger, newer buildings, and the cycle starts over. “If a city area has only new buildings, the enterprises that can exist there are automatically limited to those that can support the high costs of new construction” (Jacobs 1961, 244).

“Land use planning and control occurs at the local level, but many of the negative outcomes attributed to sprawl transcend jurisdictional boundaries” (Wilson and Song 2011, 6). A factor that helps to limit the negative outcomes of sprawl is the implementation of development plans, especially those that are regional in scale, is to

have a strong, regional, governance that can implement such plans (Rappaport 2005). Portland's Metro has the authority to enforce municipalities to create their comprehensive plans in conjunction with the regional growth concept. The Metro maintains that the municipalities, townships, and cities are on the same page when it comes to sustainable urban development. This is a factor that is sorely missed in Greater St. Louis. The fractured nature of the governance system in Greater St. Louis severely hampers any attempt to create an actionable regional plan that can be enforced. "Changing land use is not easy in areas used to sprawl development, especially without strong regional governance to regulate land use" (Wheeler 2009, 865). In the end it is a variety of policies and cooperation that will bring about sustainable urban development for an urban area as well as a determined population educated about the positive effects of such growth.

Conclusion

The effective efforts needed to deal with urban sprawl depend on the understanding of the nature and extent of such land use (Wolman et al. 2005). It has been shown that urban sprawl has had a long history in the United States. Through the introduction of new transportation technologies such as the steamboat, railroad, and the automobile, through the introduction of zoning ordinances, and the effects of the national economy, urban areas have changed and grown. The population worldwide has been increasing, as well as the proportion of population that resides in urban areas. All of these aspects have had effects on urban growth and in many cases has facilitated the unsustainable growth of urban areas. But by understanding why such growth has

occurred and because of which policies, urban Americans can prevent urban sprawl from affecting their cities.

The conclusions drawn from this paper is that the Greater St. Louis area could draw inspiration from the policies of the Portland metropolitan area. Through Portland's ability to adopt and implement regional plans, as well as the support given to these regional plans from State legislation and the willing implementation from cities and counties, has allowed for a successful regional growth plan. However the implementation of policies from Portland Metro to Greater St. Louis would be difficult currently. In spite of efforts at the local level, constraints from outdated legislation as well as the fractured nature of governance of the Greater St. Louis area would not be a welcoming environment for sustainable land use policies. Therefore to implement such policies Greater St. Louis would need to have a larger cooperation on the regional level.

It has been shown that Portland has become a beacon for sustainable land use development, however even this urban area is far from perfect. Concepts such as urban growth boundaries, comprehensive plans and metropolitan governments have been highly debated subjects in the literature of urban sprawl. Despite setbacks the policies of Portland have helped to transform the urban area and prevent large-scale urban sprawl to take effect. The negative effects of improper urban development policies have also been showcased through an examination of Greater St. Louis. The effect of limiting choices, through city/county legislation has had a large impact on their inner city. The mismanagement and fracture of the larger area governments has caused hardship in controlling for urban sprawl for Greater St. Louis. Finally the impacts of transportation have been highlighted by both case studies. The effectiveness of how highways can

create urban problems and the way that many problems can be fixed when a mixture of transportation options is given.

In conclusion, the path to sustainable urban development depends greatly on the urban area in question. Some policies will work well for certain cities and some will fail in other cities. What is most needed though are strong comprehensive plans, governments willing to enforce such plans, and the population educated in the ways to effect positive change into their communities. The lessons that have been learned from these case studies could be transferred to other urban areas but caution should be used so that negative consequences of improper development policies are reduced. In a world with growing populations and a rise in the percentage of urbanites, urban areas are becoming the largest battleground for sustainable development. If cities can become sustainable then there is hope that the people of the world can live in harmony with our planet and maintain a level of comfort.

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