DEMOGRAPHIA

SMART GROWTH AND URBAN CONTAINMENT: MISGUIDED URBAN POLICY

The dominant strain of current urban and transport planning is "smart growth," which weeks to stop the geographical expansion of urban areas and make them more compact (more dense). Two of the most important strategies for making more urban areas more dense are land rationing, often through urban growth boundaries and other measures that severely limit the amount of land that can be used for development, such as development rationing through impact fees.

A number of economic and environmental rationales have been used to support densification and land rationing. However, not all agree that smart growth has conclusively demonstrated any imperative that justifies its proposed strategies. A group of academics and researchers believe that the "smart growth" movement has not identified any problem of sufficient imperative to justify a number of its strategies, including land rationing. They[1] have drafted a statement of market oriented land use principles, called the *Lone Mountain Compact*,[2] which asserts:

> *The most fundamental principle is that, absent a material threat to other individuals or the community, people should be allowed to live and work where and how they like.*

Arguments and counter-arguments follow.

Farmland and Open Space: In 2000, more than 400 years after the first European settlement, only 2.6 percent of the nation's land has been subjected to urban development (Figure 1) Moreover, there is no threat to the nation's ability to continue as a prolific agricultural producer.[3] Agricultural productivity has increased substantially over the past 50 years (Figure 2). This means that less land is required for farming, and more than 80 percent of the abandoned agricultural land has been returned to "open space," rather than having been developed. The nation has added open space in an amount equal to the land area of Texas and Oklahoma combined since 1950.[4]

Traffic Congestion: Traffic congestion *increases* with density. This can be seen in US Department of Transportation research indicating that traffic (vehicle miles) tends to

[1] Including this author.
[2] http://www.perc.org/lonemtn_txt.htm
[3] www.demographia.com/db-ag-urb.htm and US Department of Agriculture Economic Research Service, "Cropland Use and Utilization," October 26, 1996.
[4] www.demographia.com/db-ag-urb.htm.

increase 80 percent for each 100 percent increase in population density (Figure 3). Because more traffic in a confined area means slower traffic, the increase in time spent in traffic is even greater. An analysis of international data makes this even clearer. US urban population densities are considerably lower than elsewhere. According the International Public Transport Union *Millennium Cities Database,*[5] 1995 urban population densities exceeded 6,000 in Canada, 14,000 in Western Europe and 29,000 in Asia[6] --- compared to under 3,000 in the United States (Figure 4). And, despite the far higher public transit market shares, lower personal vehicle ownership rates, higher fuel costs, higher parking costs and lower incomes outside the United States, traffic congestion is much worse, nearly 30 percent higher in Canada, 100 percent higher in Western Europe and 200 percent higher in the Asian urban areas. Vehicle miles per square mile are lower in Australia, which has urban population densities somewhat higher than the United States (Figure 5).[7]

And, despite the fact that travel times are increasing, US automobile travel is considerably faster than in other nations. US urban travel speeds average 20 percent faster than either Canada or Australia, which have only rudimentary urban freeway systems. US speeds are 60 percent faster than that of European urban areas and nearly double that of Asian areas (Figure 6). This is the result of the higher density of automobiles and traffic and the lower capacity of international roadway systems (Image 1). As a result, traffic intensity measured in vehicle hours is lowest in the United States. European rates are more than three times that of the United States, while Asian rates are more than five times that of the United States (Figure 7). Even smaller international urban areas have intense traffic congestion. For example, Geneva, with an urban population of approximately 400,000, has double the vehicle hours per square mile of America's most congested urban area, Los Angeles, with approximately 12,000,000 residents (Figure 8). At least 80 US urban areas are larger than Geneva. Palm Bay-Melbourne, Florida, for example, has approximately the same population as Geneva, but vehicle hours per square mile are estimated at well less than 1/10 that of Geneva.[8]

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[5] International Union of Public Transport, *Millennium Cities Database*, Brussells: 2001.
[6] Higher income urban areas (Tokyo-Yokohama, Osaka-Kobe-Kyoto, Sapporo, Hong Kong, Singapore, Seoul and Taipei).
[7] The actual traffic intensity differences are even greater. The available international traffic data does not include commercial vehicles, such as trucks. Trucks are a substantially larger percentage of urban traffic in Western Europe and Asia, and, on average, they consume considerably more road space than cars. As a result, this analysis understates the actual extent of traffic congestion in the more dense international urban areas.
[8] Based upon estimated national average urban roadway speed, using Federal Highway Administration data.

Image 1: Traffic in Narrow Streets in Center: Paris

Still, 73 percent of US workers travel less than 30 minutes to work, and 95 percent travel less than 60 minutes (Figure 9).[9] Further, except in Asia, public transit travel speeds are considerably slower than automobile speeds. As a result, travel times are 80 percent longer on transit in the United States than by automobile and 32 percent longer in Western Europe. Outside Asia, transit tends not to be an attractive alternative for most trips (Figure 10).[10]

Air Pollution: It is not a well-known fact, but air pollution has declined markedly in recent decades, largely due to the improvements in vehicle emission technology. From 1970 to 1998, actual pollution reductions were as high as 60 percent, despite a 130 percent increase in driving (Figure 11). As vehicle speeds are slowed by traffic congestion, and vehicles "stop and go" more often, air pollution emissions rise inordinately. This means that the greater traffic congestion associated with higher densities also produces higher levels of air pollution (Figure 12).

"Jobs-Housing Balance:"

Achieving a better "jobs-housing balance" is one of the principal objectives current urban planning. The assumption is that development patterns in the 20th century created an artificial separation between jobs and residences that has unnecessarily lengthened commute distances and travel times, while intensifying traffic congestion and air pollution. The purpose is to plan urban areas so that jobs are closer to employment.

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[9] 2000 US Census.

[10] Indeed, most trips are not served by transit. Except for Tokyo-Yokohama, Osaka-Kobe-Kyoto and Hong Kong, transit systems provide little automobile competitive service except to the urban cores. There is little, if any automobile competitive service to the suburban areas in which most population and employment growth has been for decades (and continues to be). The faster Asian transit speeds are largely the result of the fact that road speeds are so much slower, rather than transit speeds being faster than automobiles by US standards.

n the United States, the average commuter travels 13 miles to work each day.[11] In a large urban area of average employment density, there is likely to be up 750,000 jobs within a 13 mile radius of a residence. Even in a less dense urban area, there will be more than 100,000 jobs within a 13 mile commuting radius, even if the employee lives near the edge of the urban area (Figure 13). The average commuting distance of 13 miles translates into a commuting area of approximately 530 square miles --- an area larger than all but 23 of the nation's urban areas.and more than one-half the size of all but eleven. Within an area this size there is likely to be a balance of jobs and housing.

In Atlanta, perhaps the world's most sprawling urban area, more than 300,000 jobs are within the 13 mile radius. Or, in Los Angeles, wrongly thought by many to be the world's most sprawling urban area (as the *most* dense in the US or Canada),[12] more than 1,500,000 jobs are within the average 13 mile radius. The situation is no different in Western Europe or Japan. Tokyo-Yokohama commuters travel nearly the same distance to work as in Los Angeles (nearly 11 miles), though it takes nearly twice as long. Outside the Yamanote Loop central business district (the world's largest), there are, on average, more than 2,000,000 jobs within the average commuting radius (not counting the downtown jobs). In Paris, the number is more than 700,000.

People do not travel an average of 13 miles to work because there are no closer jobs. They work farther from home than they need to for a number of reasons. A physician is not likely to be inclined to seek a job at the convenience store-filling station within walking distance of home. Similarly a high-school drop-out is unlikely to be offered a position as a surgeon at the nearby hospital. People often commute from the same household in disparate directions.

The job that meets the particular requirements and preferences of the employer and the employee is often not next door. For the jobs-housing balance to work, other balances have to be present as well, such as a jobs-interest balance, a jobs-education balance and a jobs-skills balance..

The entire philosophy behind the jobs-housing balance misses an important dynamic --- modern metropolitan areas as large labor markets made up of geographically dispersed jobs and workers. These large labor markets are more economically efficient. University of Paris professor Remy Prud'homme and Chang Woong Lee have found that as the geographical area that can be acccesed in a particular amount of time by the labor force increases (percentage), the overall productivity of an urban area increases by a factor of 1.2.[13]

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[11] Calculated from US Department of Transportation Nationwide Personal Transportation Survey, 1995.
[12] Based upon 2000 US Census and 2001 Census of Canada.
[13] Remy Prud'homme and Chang Woong Lee, *Size, Sprawl, Speed and the Efficiency of Cities*, Observatoire de' l'Economie et des Institutions Locale (University of Paris XII), 1998. A 10 percent increase in labor market access was found to be associated with a 12 percent increase in urban area productivity.

Finally, data from the latest US Census Bureau American Housing Survey indicates that convenience to employment was the most important reason for neighborhood choice only 22 percent of the time.[14] If the data is weighted to reflect the actual distribution of all owner-occupied and rental housing, the number falls to 18 percent (Figure 14). No planning construct will be successful if 80 percent of the people violate it. The Census Bureau data makes it clear that that people do not regard and optimal geographical jobs-housing balance as very important. Often they are balancing job and housing locations in a manner that obtains them the most agreeable living conditions (according to their preferences) in exchange for a longer commute.

Nonetheless, there are difficulties with the present spatial arrangements. For example, in US urban areas, the less than 10 percent of households without access to cars are disproportionately concentrated in urban cores, while most new job creation is far away in the suburbs. The transit system that could provide mobility for inner city residents to these highly dispersed opportunities simply does not exist and cannot be afforded.[15]

Consumer Expenditures: US Bureau of Labor Statistics Consumer Spending Survey data indicates that average expenditures are lowest in the lowest density urban areas, and highest in the highest density urban areas (Table 1 and Figure 15).[16]

Infill Development: It is suggested that communities with existing infrastructure have the capability of handling additional residential demand. It is presumed that they can assume population growth with smaller increments of infrastructure expansion and smaller staff size additions.

But this is at problematic assumption. Urban infrastructure is often not adequate to handle material increases in population.

As is indicated above, traffic congestion and air pollution tend to rise with urban densities. Thus, as more people move into the same area, there will be a need to significantly improve the street and highway system so that the additional traffic can be handled more effectively. Moreover, vehicle operating speeds need to be kept higher and more constant. But, virtually no dense central city is likely to invest in the infrastructure that would be necessary. Streets would have to be widened. Double-decking of some freeways and major arterial streets would have to occur.[17] Other new freeways would have to be constructed. With respect to transportation, central cities may be politically capable of meeting the demand of higher population only by retarding travel times, increasing congestion and increasing air pollution emissions. In fact, some areas adopting compact city or densification policies, such as Portland, Oregon, have also adopted traffic

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[14] Calculated from US Census Supplemental Survey (2001).
[15] Wendell Cox, "The Illusion of Transit Choice," *Veritas*¸ Spring 2002 (Texas Public Policy Foundation).
[16] http://www.demographia\db-ce2000.htm
[17] There has been significant core area double decking of streets in Tokyo-Yokohama, Osaka-Kobe-Kyoto and some other Asian urban areas. The higher densities and vehicle use have more than overwhelmed the ability of these improvements to meet the demand, and traffic congestion is generally worse. Environmental regulations and political reality make such improvements virtually impossible in the urban areas of western nations.

congestion standards that will allow worse traffic congestion to occur before additional capacity is provided.

Table 1 Consumer Expenditures per Household by Density Category				
TRANSPORTATION				
Density Category	Population per Square Mile	Total	Compared to Least Dense	% Difference
Most Dense	4,500 & Over	$8,714	$1,281	17.2%
Less Sprawl	3,500-4,499	$7,816	$384	5.2%
Less Dense	2,500-3,499	$8,036	$603	8.1%
Least Dense	1,500-2,499	$7,433	$0	0.0%
HOUSING				
Density Category	Population per Square Mile	Total	Compared to Least Dense	% Difference
Most Dense	4,500 & Over	$13,886	$4,175	43.0%
Less Sprawl	3,500-4,499	$12,042	$2,331	24.0%
Less Dense	2,500-3,499	$11,217	$1,506	15.5%
Least Dense	1,500-2,499	$9,711	$0	0.0%
FOOD AT HOME				
Density Category	Population per Square Mile	Total	Compared to Least Dense	% Difference
Most Dense	4,500 & Over	$6,466	$1,276	24.6%
Less Sprawl	3,500-4,499	$5,718	$528	10.2%
Less Dense	2,500-3,499	$5,673	$483	9.3%
Least Dense	1,500-2,499	$5,190	$0	0.0%
TRANSPORTATION, HOUSING & FOOD AT HOME EXPENDITURES COMBINED				
Density Category	Population per Square Mile	Total	Compared to Least Dense	% Difference
Most Dense	4,500 & Over	$29,066	$6,731	30.1%
Less Sprawl	3,500-4,499	$25,576	$3,242	14.5%
Less Dense	2,500-3,499	$24,927	$2,592	11.6%
Least Dense	1,500-2,499	$22,334	$0	0.0%
Calculated from US Department of Labor Bureau of Labor Statistics Consumer Expenditure Survey 1999-2000				

There are similar problems with other infrastructure. For example, the Environmental Protection Agency lists more than 700 wastewater systems in the nation that have "combined sewer and storm water" systems.[18] These systems collect sewage and storm water and, under normal conditions, deliver it to wastewater treatment plants. However, heavy rains can cause these systems to overflow into adjacent rivers or other bodies of water. This problem is particularly concentrated in some of the nations older central cities. For example, among the cities that have more than 50 combined overflow outfalls into bodies of water are Chicago, Indianapolis, Louisville, Detroit, New York, Cleveland, Cincinnati, Portland (Oregon), Pittsburgh, Providence, Seattle, Milwaukee and Buffalo.

[18] www.epa.gov/npeds/pubs/cso_cities.pdf.

Densification of these cities could exacerbate this problem by increasing the demand on combined systems.

In other communities, older schools that might have appeared to be theoretically capable of taking additional students have fallen into disrepair, been sold, been torn down or would require significant, expensive retrofits.

And, as the analysis above indicates, older more dense communities are associated with higher, not lower public service expenditures. The “economies of scale” that would permit a larger population to be served at a lower per capita operating cost do not result, perhaps because of the political strength of interests that have evolved over a long period of time, such as strong bureaucracies and strong employee organizations that may make the local government less inclined to implement innovative and cost reducing strategies, such as competitive contracting, design/build, labor saving measures or improved management strategies.

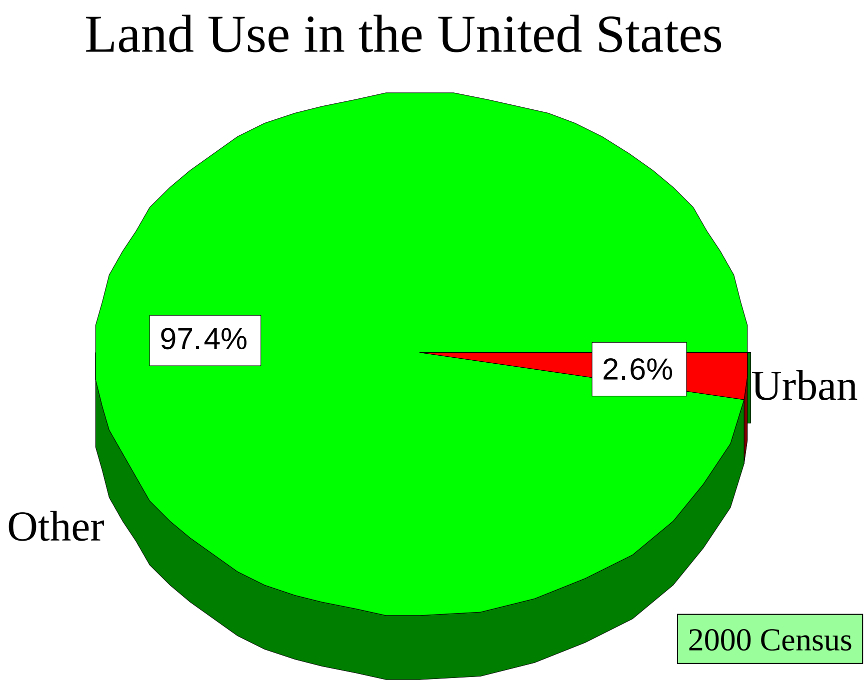

Figure 1

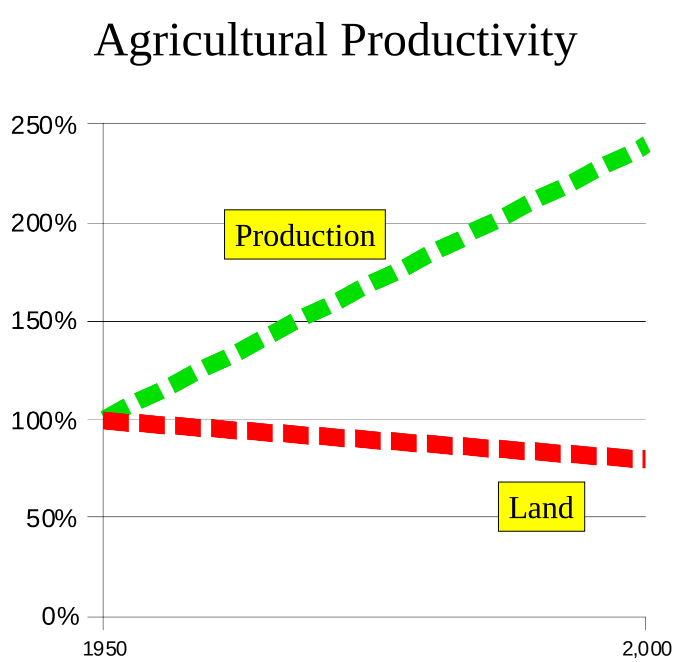

Figure 2

Traffic Intensity by Density: US

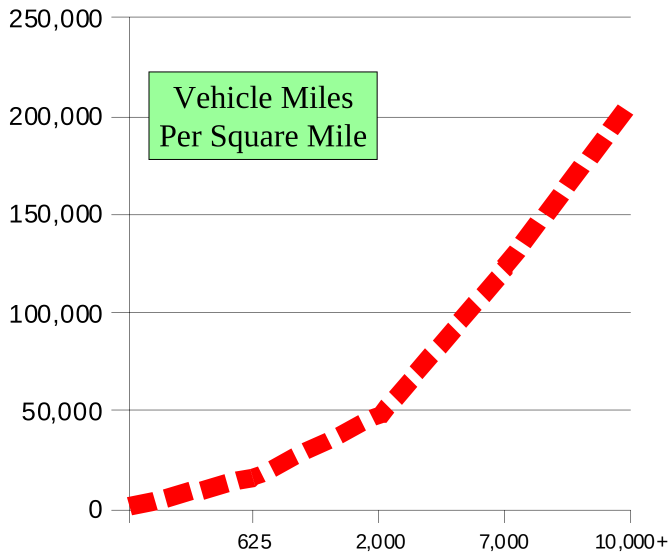

Figure 3

Urban Population Density

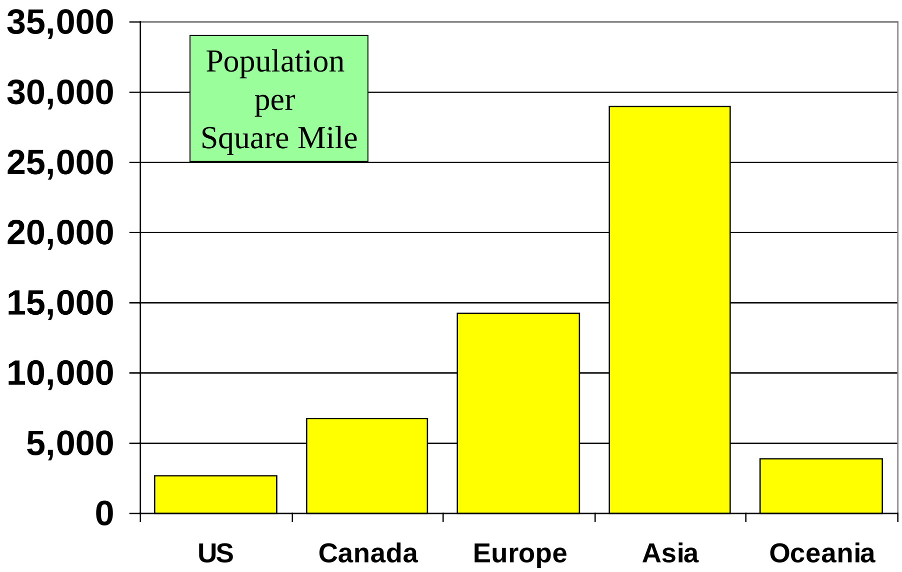

Figure 4

International Urban Traffic Intensity

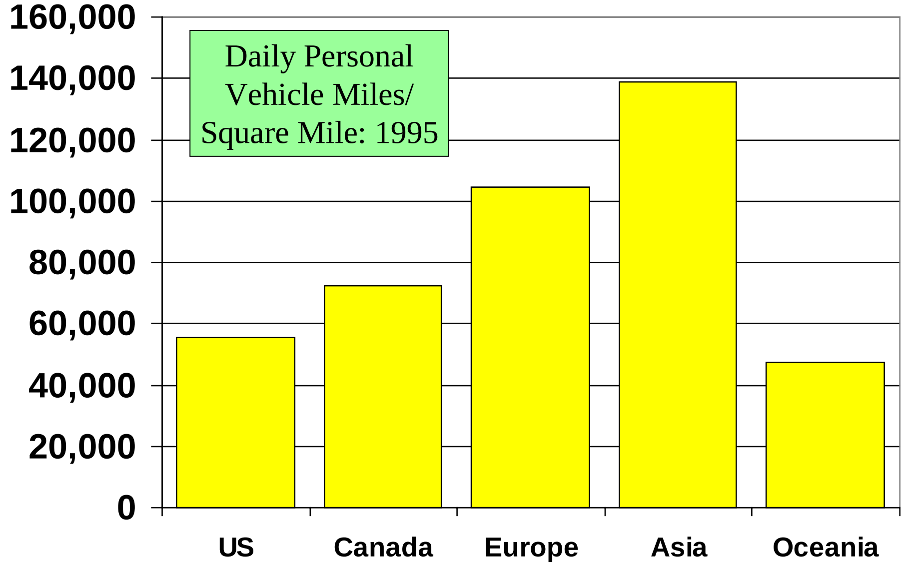

Figure 5

International Urban Traffic Speed

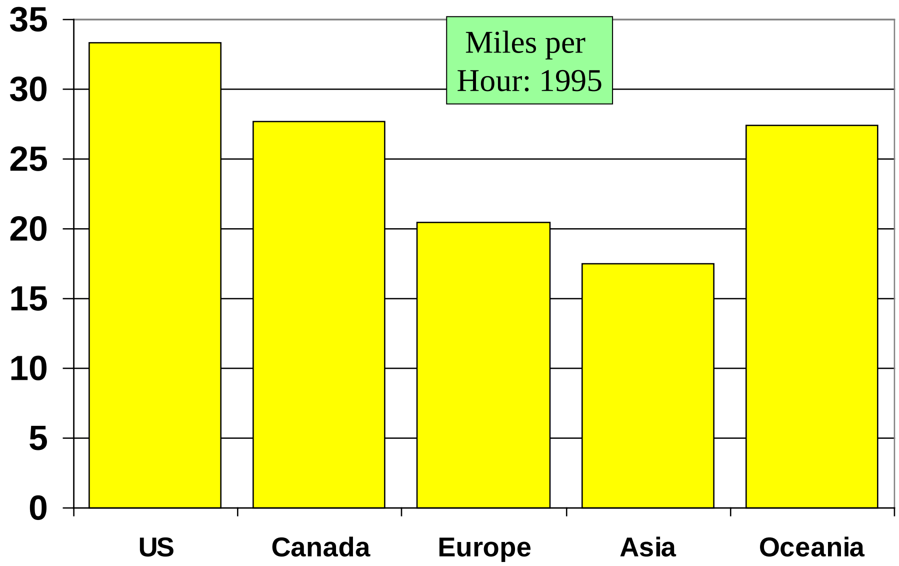

Figure 6

International Urban Traffic Time Intensity

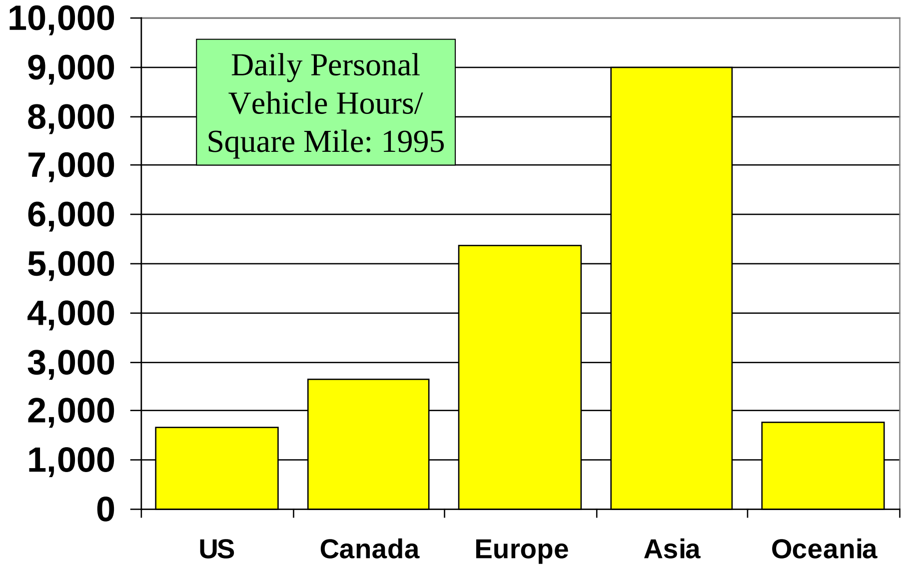

Figure 7

Vehicle Hours/Square Mile: Geneva & L.A.

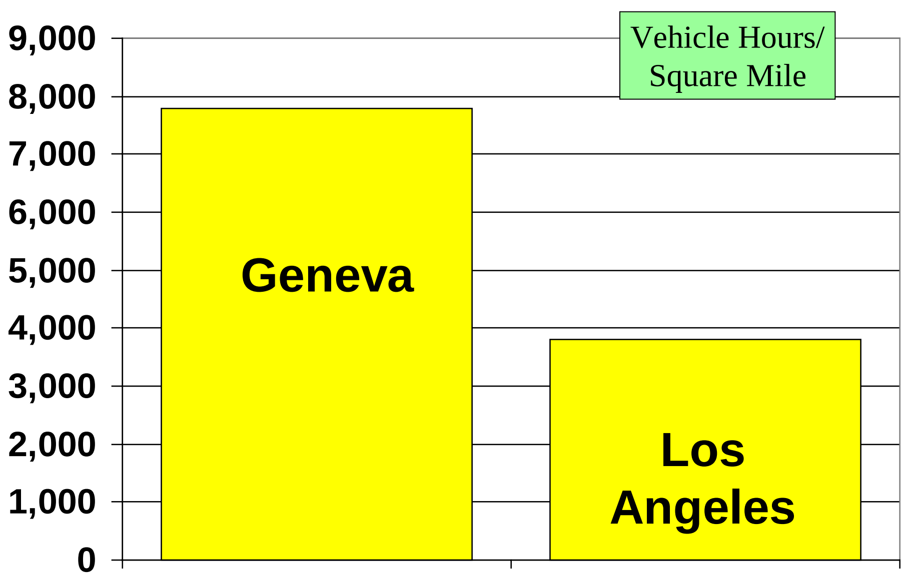

Figure 8

Average Work Trip Time

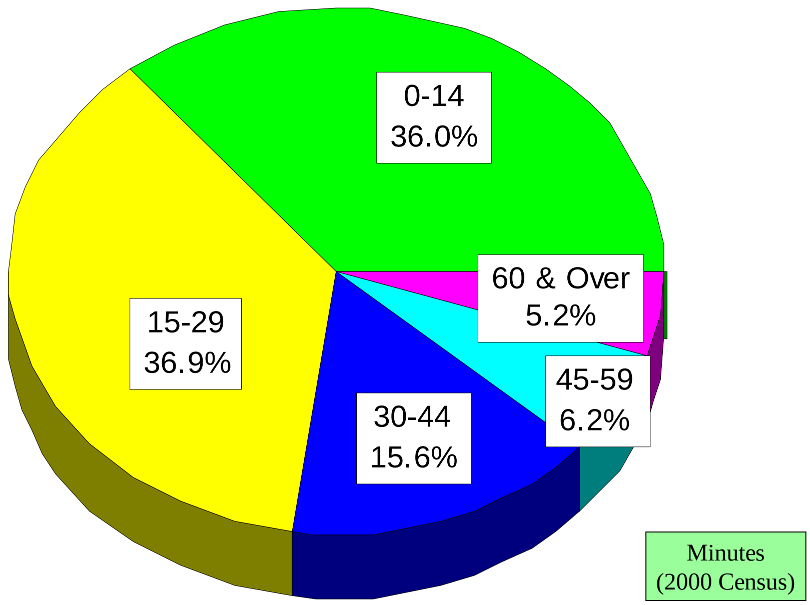

Figure 9

Transit Travel Times Compared to Auto

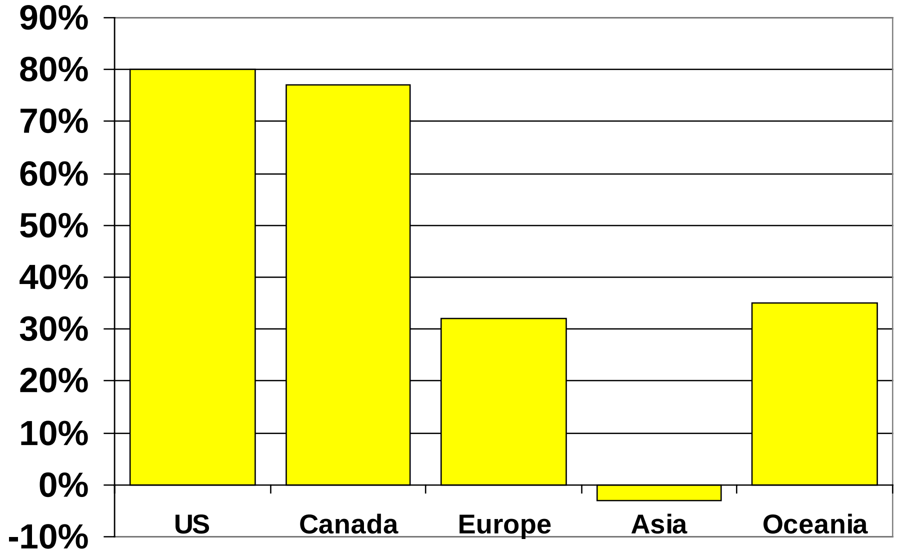

Figure 10

Air Pollution Emissions: US Trend

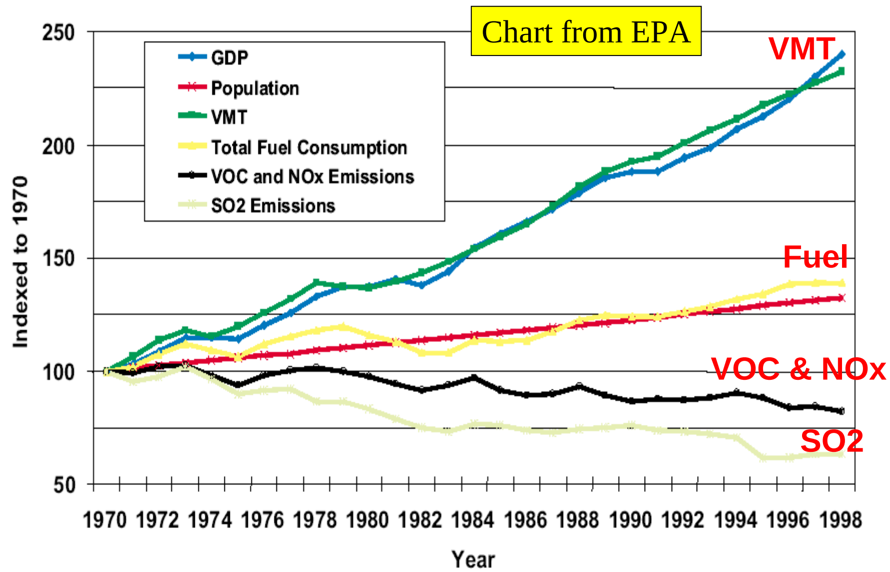

Figure 11

Roadway Speed & Pollution: US

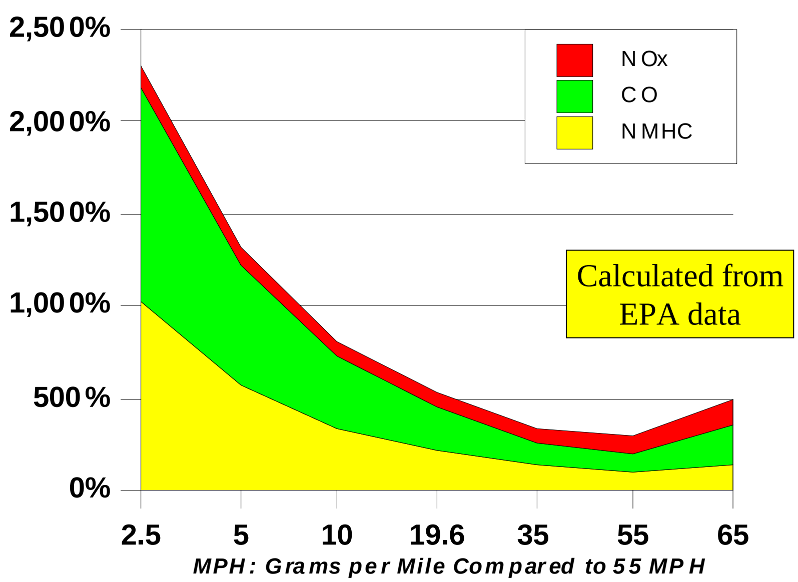

Figure 12

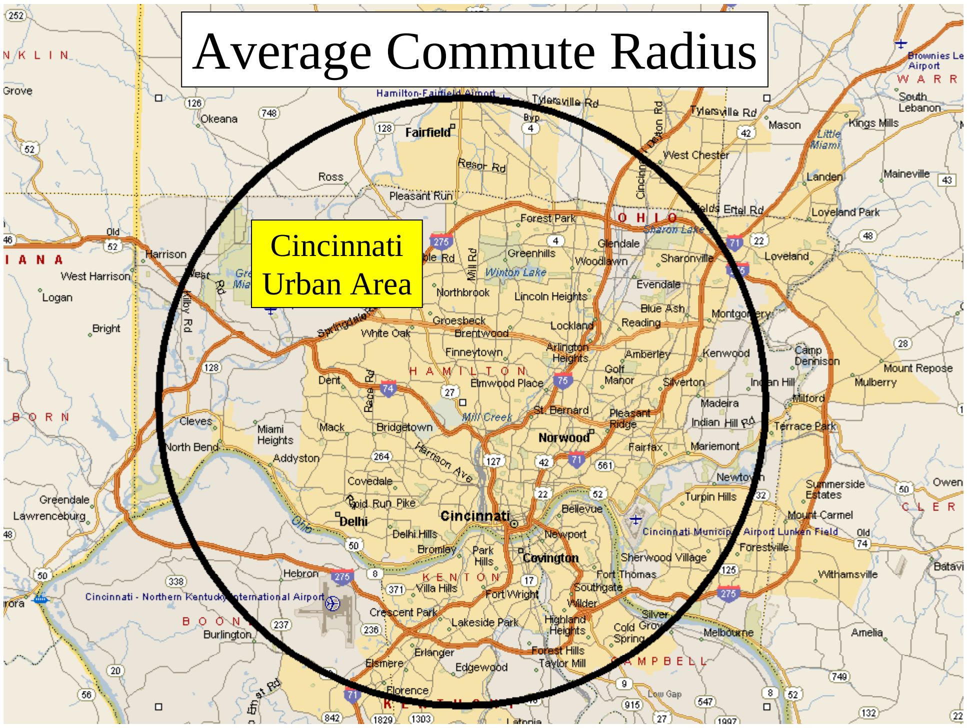

Figure 13

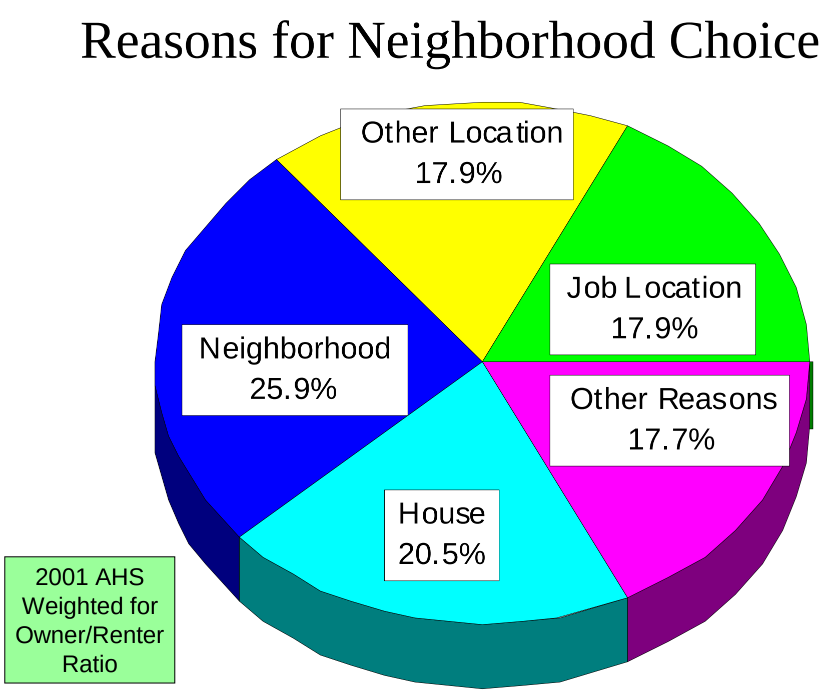

Figure 14

Consumer Expenditures and Density

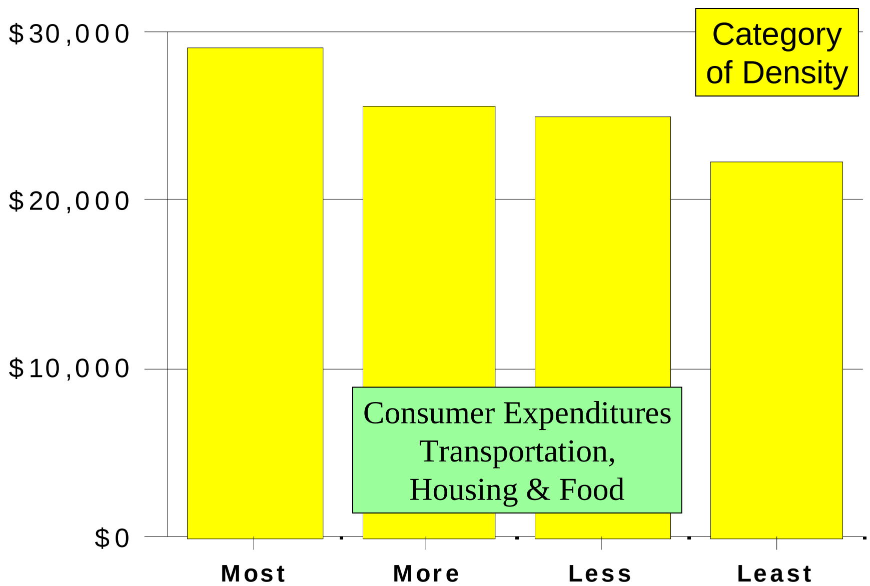

Figure 15

http://www.demographia.com