

Settlement Patterns in the U.S. and Canada: Similarities and Differences—Policies or Preferences?

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ABSTRACT

Smart Growth advocates in the U.S. and elsewhere worry about urban sprawl and typically advocate new controls on urban growth, including tougher land use planning and regulation. Yet, is auto-oriented development the market's way of meeting widely held lifestyle preferences? Or, is it (as some critics claim) attributable to policies that favor such development? For the case of the U.S., critics suggest that policies are the problem and Smart Growth is the solution. Yet, if U.S.-type development (suburbanization and widespread auto use) can be observed in non-U.S. policy settings, the critics may really be objecting to people's preferences. Comparing recent U.S. and Canadian settlement and travel trends suggests a test. Cultural differences are minor but urban policy differences are significant. How do settlement patterns and urban transportation choices compare? Our analysis of recent data shows substantial similarities. Preferences appear to trump policies. The Smart Growth platform may have to be reconsidered.

1. INTRODUCTION

A recent World Bank study concluded that if Atlanta could somehow be remade into Boston, its annual vehicle miles traveled (VMT) would fall by 25 percent (Bento, et al., 2002). Left unsaid was the fact that, in 1990-2000, the Boston metro area grew by 6.7 percent while the Atlanta metro area grew almost six times that, 38.9 percent. Like the World Bank study, a sizeable literature has accumulated in recent years to suggest that something is seriously wrong with the way U.S. cities are developing. Critics of America's "urban sprawl" see considerable waste in the growth of modern cities.

Advocates of "smart growth" in the U.S. usually add that the problem can be traced to various market failures and/or various policy failures. Those who claim that existing controls prevent them from innovating emphasize the policy failures; many others want there to be more controls to limit market forces which they blame for the developmental outcomes that they object to.

These discussions challenge the view that observed U.S. trends result from consumer choice. Many assert that the travel and residential location choices made by Americans are impacted by powerful and peculiar U.S. policies. These include widespread large-lot residential zoning, exceptionally favorable treatment of home ownership and mortgages in tax laws, comparatively low taxes on gasoline and auto use, comparatively lax land use controls and extensive highway investments.

The simplest way to illustrate the potency of people's lifestyle preferences and the extent to which these are expressed is to look abroad. There is growing evidence that suburbanization is the dominant settlement trend not just in the U.S., but also in many other developed nations. Wendell Cox (www.puplicpurpose.com) reports that since the 1950s, Paris has suburbanized as much as Philadelphia and that similar transformations are underway in Stockholm, Toronto, Tokyo and other places. These are all cities that have the transportation systems and land use controls that most U.S. planners dream of. Yet, consider Sir Peter Hall's discussion of the 1952 General Plan for Stockholm: "It proposed establishing new suburban districts, each for 10,000 to 15,000 inhabitants, strung like beads along the lines of a new subway system. Within them, apartment blocks were to be built within 500 yards of subway stops; single-family houses, constituting no more than 10-15 percent of housing units in each district, were to be built within 1000 yards of the stops but no further ... the city's policy was that each station on the subway should generate enough traffic to make it self-supporting" (p. 862,3). Things did not work out as planned. Hall notes that, "... surveys in the late 1970s reaffirmed the fact that 90 percent of people preferred single-family homes" (p. 876). Not surprisingly, a more recent Swedish development is described as follows: "... a vast linear edge City of business parks and hotels and out-of-town shopping centers, stretching along the E4 highway, for twelve miles and more towards the Arlanda Airport. It is almost indistinguishable from its counterparts in California and Texas" (Hall, 1998; p. 878).

Stories such as this suggest that many people's preferences regarding residential lifestyles are fairly clear and strong enough to overcome the various policies

designed to overcome them, here and abroad. If so, the claim that U.S. development patterns are simply the response to peculiar pro-low density U.S. policies would be undermined.

There already exists a growing literature comparing travel trends and development patterns in Western Europe and the U.S. (Richardson and Gordon, 1999, Giuliano and Narayan, 2003 re UK; Dieleman et al. 1997 and 1999, re Holland). Many of these highlight similarities in terms of increased suburbanization and auto use, suggesting that policy differences matter less than might be expected.

This paper reports on a test of whether policies or preferences (in this case, some lifestyle choices) dominate. The approach is to study cross-country comparisons using available aggregate data sources from both countries, which in this case are similar enough to warrant the comparisons. This sort of international near-compatibility is unusual and presents us with a research opportunity. Also, it is best to make comparisons where policies differ but where cultural differences are relatively minor.ⁱ Again, analyzing settlement trends in the U.S. and Canada fits the bill.

The relevant policy differences are well known. Canadian gasoline prices are usually one-third higher than in the U.S.; most of the differences are due to differences in applicable taxes, which are 50 percent higher in Canada.ⁱⁱ The less centralized Canadian federal system obviates the importance of federal tax policy and its effect on home ownership. The role of government at all levels is quite different; local government and local planning are less “balkanized” than in the U.S. In a comparison of the Canadian Provinces with the U.S. States along an “Economic Freedom” continuumⁱⁱⁱ; the Canadian Provinces place at the bottom of the ranking. Local government land use planning in Canada is much more potent than in the U.S.^{iv}

The plan of this paper is to a) briefly review what is known about U.S. settlement and urban travel trends; b) consider some relevant precursor literature; c) discuss some U.S.-Canada settlement and travel comparisons; and d) offer some conclusions and suggestions for further research

2. U.S. METROPOLITAN DEVELOPMENT AND TRAVEL TRENDS

What do we know about U.S. urban structure and urban travel? The general land use-transportation trends in the U.S. are clear: increasing suburbanization (and exurbanization) of jobs and housing along with ever-more use of private automobiles (Gordon and Richardson, 2000). In fact, the two seemingly reinforce each other. Higher incomes prompt the demand for personal transportation and for residential space. Both of the latter accommodate and are accommodated by suburbanization. Auto-oriented development is, then, a more accurate descriptor than “sprawl”. But, many other forces contribute and are complementary. Communications and travel costs have been falling for many years. More industry is locationally footloose, making it possible for jobs to follow people into the suburbs, rather than people having to locate where industry had chosen to settle. Agglomeration economies have not disappeared.

Rather, they are apparent in numerous suburban agglomerations with a wider spatial ambit brought about by lower costs of transportation and communication.

Data from the 2000 U.S. census confirm that the suburbanization of the population continues. Figures 1a and 1b show the 90-year trend. The suburbs now house 50 percent of the population, up from 7 percent in 1910. Trends like this continue to take place against a background of ever more growth controls and accompanying efforts to influence the direction of settlement and development away from low-density and peripheral areas, throughout most of the U.S. It appears that these have not had their intended effect.

There are several data sources that reinforce this point. The recently released 2000 Census of Population reported ten-year population growth for the nation of slightly more than 13 percent. Most of the large metro areas did not keep up although most of their suburbs grew as fast or faster. Of the top 50 cities, only 13 significantly beat national growth (only nine in the top 20); predictably most of these were in the Sunbelt states. None of this is really surprising because city-to-suburb and frostbelt-to-sunbelt migrations have been going on for some time. Both are explained by the lifestyle choices made by large numbers of people, facilitated by new technologies, especially falling communications and transportation costs. Indeed, accumulating electronic advances have caused communications costs to plummet to such an extent that some commentators have wondered why clustering of any sort persists.

As always, however, the details are complex and hard to reduce to just one story. Table 1 includes some recent metro area employment trends as well as concurrent population trends. These are unfortunately not available for all the same geographic units. With respect to *population*, we note that areas outside the central cities of metro areas (“Rest of Metro”) usually grew fastest. The same pattern is apparent for all of the size and geographic groupings of MSAs (bottom of the table). There were also exceptions: population growth in eight CBDs of the top-20 metros outpaced the surrounding central cities as well as the surrounding suburbs. Yet, CBD population growth constituted a small share of metro area growth even in these eight places.

Yet, for seven of these eight metros, suburban county *employment* growth beat core county job growth (San Diego is not counted because the MSA does not have a suburban county). Almost everywhere, suburban counties added jobs at a faster rate than their core counties. Downtown (CBD) *job* growth data are from County Business Patterns zip code files which limit us to a three-year look. Also, these CBD definitions necessarily vary from the ones used to measure ten-year population growth. Yet, it is worth noting that metro area job growth (County Business Patterns definitions) for the 19 areas covered for the three-year period was 8.7 percent. Only seven CBDs surpassed this rate.

To try to make sense of a complex pattern, the rest of this section focuses on trends. We examine the 31-year series made available by the Regional Economic Information System (REIS) by the Bureau of Economic Analysis (BEA, of the U.S. Department of Commerce) for the 3132 counties of the U.S. that describes population

and employment and income for seven major economic sectors for all counties for the years 1969-2000. The employment data cover both full-time and part-time jobs.

We sought geographic divisions that would help us to study the evolution of agglomeration economies. People may choose to live and work in clusters for many reasons. They may enjoy social interaction with others and/or they may profit from economic interactions, e.g. in markets as buyers and as sellers. Economists and others have made much of agglomeration economies as a source of economic growth because ideas are spawned and developed as a result of interactions facilitated by proximity (geographic features that contribute to connectivity also favor the subsequent spread of ideas; Diamond, 1999).

Economic development and urbanization have reinforced each other over the years. Yet the operational definition of proximity continues to change. Social coordination via markets (transactions) has been facilitated when distances are small; social coordination via the exchange of ideas is likewise augmented. The latter has both economic and community consequences. Both of these may also be costly because clustering, if too dense, can result in costly congestion. The benefits of dispersal are expanded by increased connectivity, i.e., cheaper modes of moving people, goods and (especially) ideas. The marginal costs of moving the latter are now close to zero. This fits the data, which reveals substantial decentralization, much of it away from metropolitan areas in general and especially from their cores.

We divided the 831 metropolitan counties in five ways: i. the core counties of the largest (i.e. > 3 million population) metro areas (MSAs or CMSAs); ii. their suburbs (noncore counties); iii. the core counties of middle-sized (1-3 million) metro areas; iv. their suburbs; and v. those counties constituting the small (less than 1-million) metro areas. All data aggregations based on political boundaries are problematic. With this in mind, we often refer to noncore areas as “suburbs,” although it is clear that there are also many areas in core counties that exhibit suburban characteristics.

The nonmetro counties were divided into seven groups, using the USDA’s 1993 Urban Influence Codes (see also discussion of simplified codes, below). If counties are adjacent to metro areas, there is a four-way partition: adjacent to larger metropolitan areas (defined for the nonmetro analysis as larger than 1 million) or to small metro areas, and with or without a city of 10,000-plus people. If counties are *not* adjacent to a metro county, there are three types: with a city of 10,000 or more, with a city of 2,500 to 9,999, or without an urban place greater than 2,500. The first four of these nonmetro counties may be considered as exurban while the last three may be defined as rural.^v

The dominant trends in U.S. settlement patterns are well known to include the following:

- i. The westward movement of population and employment, in more recent decades to the Sunbelt.
- ii. Persistent rural-urban migration of jobs and people to the cities.
- iii. Suburbanization (and, more recently, exurbanization^{vi}) out of cities.

However, the more detailed analysis made possible by the huge REIS data set (over one million observations on employment alone) suggests a more complex picture. Although only the highlights are discussed here, they are revealing.^{vii} In some of the tables that follow, the highest growth rates in each period are marked in bold, while those that exceed the national rate for the period are shaded.

It appears that there have been distinct cycles of employment growth in which, either, the metro counties or the non-metro counties alternatively dominated (Figure 2). Applying our more detailed categorization of counties, Table 2 shows that the most recent period, 1995-2000, continues the pattern of suburban-exurban dominance and the relative decline of the core counties of the largest metros. Table 3 shows that the same is true for private sector job growth. Suggestions that growth controls have made a difference in recent years are not apparent. The data confirm that most thirty-year population and job growth occurred in the suburbs of the mid-sized metro areas. The pattern held for each of the major industries except manufacturing which is known to have been de-urbanizing for many years (Appendix Table A-5^{viii}; see also Carlinio, 1985^{ix}).

Population growth was greatest in the suburbs of the 1-3 million metros throughout, usually followed by growth in the suburbs of the largest metros. It surpassed national growth in the suburbs of the largest metros, in the core counties of the middle-sized metros, in the small metro areas and in exurban counties adjacent to the larger metros. It lagged in the core counties of the largest metros. There is clearly a pattern of continued dispersion.^x

The literature on the geography of U.S. population growth has reported various cycles of deconcentration and re-urbanization over the past 30 years. The 1970s were thought to be a time of deconcentration with nonmetropolitan growth rates surpassing metropolitan rates. The reversal reversed in the 1980s which were reported to be a time of urban revival. As already suggested, many have pointed to the recent years as a period of central city revitalization.

Turning to U.S. urban travel patterns, the trends are also well known. The increasing use of automobiles is consistent with the settlement patterns just described; as already mentioned, they are mutually reinforcing. The share of *worktrips* by transit fell from 12.6 percent in 1960 to 4.7 percent in 2000; auto's share rose to 88 percent from 67 percent (Table 4a). In 2001, public transport accounted for less than 2 percent of *all* urban travel (Table 4b). The widespread nature of the decline in transit commuting is documented in Table 4c. Auto-owning households rose to 92% in 2001; 59% owned two or more vehicles. In the U.S., there are more autos than children per household. There are also more autos than drivers per household. Auto travel and dispersed development continue to complement and reinforce each other.

What makes the recent travel trends interesting is that they persisted in spite of ever-more policies designed to favor "compact" development and higher densities and to "get people out of their cars."

3. THE CANADA CASE

Literature

Interestingly, there is substantial disagreement over how U.S. settlement and urban transportation trends compare to other developed nations', especially Canada's. Consider the following sampling of views, some of them evoking stark contrasts with the U.S.:

"Urban transportation planning in Canada contrasts so sharply with that in the U.S. that it can serve to place the issue in perspective ... Canadian and American cities differ markedly and across well-defined dimensions" (Goldberg and Mercer, 1986).

"Canadian cities have been quite successful in avoiding the crisis situations facing many cities in the USA. Canada's progressive land use and transportation policies have produced cities and urban transport systems distinctly different from those in the USA." (Pucher and Lefevre, 1996).

" ... the Vancouver CBD accessibility gradient is increasing sharply while the exact opposite trend is most pronounced in Los Angeles. This provides at least strong anecdotal evidence in support of the Goldberg-Mercer hypothesis of a distinct, more compact, urban form in Canada than in the U.S., and calls for further research ..." (Hamilton and Heikkila, 1997).

" ... the facts are clear. Suburbanization, defined as flattening density-distance functions, has pervaded U.S. MSAs for at least 50 years and has characterized every metropolitan area in the world for which density patterns and trends have been measured during a half century of pervasively rising incomes and transportation improvements." (Mills and Lubuele, *JEL*, 1997).

"Tax expenditures associated with deductibility of mortgage interest and property taxes make housing less expensive relative to other goods and, hence, the quantity of housing and residential land purchased and lower density of urban areas. ... the mere presence of the federal housing tax expenditures decentralization ..." (Gyourko and Voith, 1997)

"Consider the Toronto example. In 1951 the greater Toronto area (the GTA) had 1.5 million residents; by 1996 it had over 4.6 million, a massive threefold increase. Yet, over the same period, the physical size of the urban region grew by a staggering six or seven times, as population densities declined and almost all urban activities consumed more space. The principal contributor to this increase in land consumption per capita, and the dominant physical expression of postwar urban development, has been suburbanization ..." (Bourne, 2000, p. 34).

" ... the greater dispersion of America's population in vast, sprawling metropolitan areas with few transport options other than the car. This is partly the result not of private choice but of public policy, such as subsidies to suburban

motorways and a starving of public transport, or local zoning laws that limit the minimum size of residential developments ..." (*The Economist*, Feb 8, 2003).

Interestingly, the latest commentary, text accompanying the recently released 2001 Canadian census (see below), echoes those authors that emphasized U.S.-Canada similarities.

Canadian Settlement Patterns Compared to the U.S

Comparing some U.S.-Canada national aggregates suggests many similarities (see Table 5a). As per capita GDP differences are subject to exchange rate fluctuations, the indicated U.S. lead may be misleading. The two countries' labor force participation rates are almost identical. U.S. autos per capita are only 10 percent above Canada's but Canada has more highways per capita, perhaps partly explained by its slightly larger area. Homeownership rates are virtually identical. Twenty-year urbanization trends for the two countries are also almost identical (Table 5b).

The rough index of urbanized area population densities suggests only minor differences. Table 5c shows that in the most recent years, and perhaps contrary to expectations, Toronto and Montreal did *not* dominate all U.S. urbanized areas in terms of gross population density.

What about comparisons of the spatial distributions of activities? We are helped by the fact that Statistics Canada's population and employment data are also reported by Census Divisions, which are county-equivalent spatial units. Thus, population and employment data by counties or county equivalents in both the U.S. and Canada can be grouped by a simplified version of Urban Influence Codes. We aggregated metropolitan counties into three groups: i. the core counties of large (i.e. > 1 million population) metro areas; ii. non-core counties of large metro areas; iii. and those counties constituting small (less than 1 million) metro areas. The non-metro counties were divided into two groups: iv. those counties adjacent to metro areas; v. and those counties that are not adjacent to metro areas.

Census Metropolitan Areas (CMAs) and Census Agglomerations (CAs) in Canada are the equivalents of U.S. Metropolitan Statistical Areas (MSAs). The general concept of a metropolitan area in both countries is that of an urban core with a substantial population size, together with adjacent communities socio-economically integrated with the core. However, different size criteria of the urban core in each metropolitan area definition are used: a U.S. MSA must have at least one urban core of 50,000 population or more; while the urban core of Canada's CMAs and CAs must have a population of at least 100,000 and 10,000, respectively. For this reason, following Baldwin et al. (2001), only those CMAs and CAs with a population greater than 50,000 are classified as metropolitan areas in this paper.

Table 6a repeats some of the U.S. population growth data elaborated in the previous section but spatially aggregated so that fairly direct comparisons with the Canadian spatial units are possible. For both countries, the fastest growing areas are

the suburbs of the metro areas larger than 1 million. This is consistently the pattern for all of the periods for which comparisons can be made.

Table 6b shows that the suburbs of Canada's major cities added more people than the central cities in each of the two periods for which data are available. This was true for all ten in the early 1990s and for nine of the ten in the late 1990s.

The two countries' population distributions for the five years for which such data are available for both countries are shown in Table 6c (we did not have the 2001 data for the U.S. at this writing and show the 2000 data instead). The third panel of the Table shows the *differences* between the two countries' distributions. The bottom row indicates the least number of people that would have to be redistributed for the two distributions to be identical. Consistent with our theme, distribution differences by this measure have been steadily declining.

Similar comparisons are possible for the two countries' employment by place-of-work distributions although Canadian data were only available for two years, 1981 and 1996. The same two conclusions hold as for the population comparisons: a) Most growth was in the suburbs of both countries' areas with population over 1 million; and b) The difference between the two countries' distributions declined (Table 7). Not surprisingly, the proportion of suburb-to-suburb commuting in Canada has been increasing, just as in the U.S. In fact, over the last ten years, the shares of commuting between all four pairs of origin and destination types have moved in the same direction (Table 8).

Public Transit Use

The settlement trends identified can be described as auto-oriented development. Whereas the overwhelming number of workers in both countries rely on the auto for their daily commute, transit use in Canada is higher than in the U.S. Of greater interest is the Canadian trend. Table 9a shows that over a recent ten-year stretch, transit use per capita fell in 13 of 15 of Canada's largest metro areas. The overall drop was greater than 22 percent. Table 9b shows the transit share of commuting for Canada's top 18 cities in 1996 and 2001; these data indicate a leveling off of the decline in the most recent years. Similar data for the top 39 U.S. metro areas for the last three census year are shown in Table 9c; much less of a leveling off is apparent.

The two distributions are probably more similar than different. Cox (1999) reports a study of overall transit performance in the U.S. and Canada over the period 1987-1997. While per capita transit ridership in Canada was higher than in the U.S. for both years, and both countries' ridership fell, Canada's fell much faster.

Table 10 shows 1996-2001 Canadian commuting mode choice comparisons. Canadian transit use has recently edged up but very slightly and this has mainly been

outside the CMAs, where the base of service had been low. The U.S. data from this source reveal a moderate increase in transit use.

Recent Canadian Reports

Recent reports by *Statistics Canada* from the 2001 Canadian Census highlight the most recent settlement and commuting trends in Canada. Most of their conclusions support our case.

Consider these highlights:

“... workers are no longer concentrated primarily in core municipalities, but are spreading across suburban municipalities.”

“... the employed population whose usual place of work was within a census metropolitan area in 2001 was 7.9 million, an increase of 1.5 million over 1981. ... only about 25% of the new employed workers were located in the central municipalities ... many industries have created hubs of employment in suburban municipalities ... the percentage employed in the central municipalities dropped from 71% to 62% between 1981 and 2001.”

“The number of workers in suburban municipalities has ... been growing at a much faster pace over the last 20 years than those working in core municipalities. In 1981, about 1.8 million people worked in suburban municipalities. By 2001, this number jumped by 63% to 3.0 million. ... the number of workers in central municipalities increased by only 7% during this 20-year period, from 4.6 million in 1981 to 4.9 million in 2001.”

“Canadians are traveling farther to get to their usual workplace locations in 2001 than in 1996 ... median commuting distance was 7.2 km, compared with 7 km in 1996.”

“More Canadian commuters used public transportation to get to work in 2001 than in 1996Even so, the vast majority still settled behind the wheel for their daily commute ... about 10.5% of employed Canadians used public transportation to get to work, up marginally from 10.1% in 1996 ... more than 9.9 million people drove to work in a car, truck or van. Data from the 2001 Census show that nearly 74% of Canadian commuters drove to work in 2001, up from 73.3% in 1996.”

“The increase in proportions of people driving to work can be partly explained by the decrease in proportions of workers who commuted to work as passengers in a car, truck or van between 1996 and 2001. About 6.9% of workers rode as passengers in 2001, down from 7.4% in 1996.”

It appears that the most recent Canadian data weigh in on the side of U.S.-type urban development – in spite of Canadian policies, many designed to avoid this outcome. It is difficult to reject the idea that preferences trump policies. This conclusion holds with the possible caveat that policy differences can explain a lag,

whereby U.S-type development in Canada is simply slowed a bit. Contrary to the views of authors such as Goldberg and Mercer, it may appropriate to consider the modern North American city after all. In fact, it may even be possible to think in terms of the modern international developed country city.

4. DISCUSSION

When planners anywhere prescribe higher density settlement, they have no answer to the question of: How high? Indeed, there is no body of theory that is applicable to guide them. Top-down planning is subject to planners' knowledge problem, as famously pointed out by Hayek. Land markets and cities are no exception.

Holcombe (2002) has suggested that city planners' vast task be simplified by having them focus on infrastructure planning, publishing these plans as the land market "rules of the game", and letting free land markets work. Yet, the extent to which top-down large-scale infrastructure planning can meet the Hayekian criticism is unclear. Even if it could, infrastructure planning usually involves large public expenditures and is inevitably politicized. To be sure, the move towards infrastructure privatization also involves politics and has not been easy.

We have presented evidence of increasingly similar settlement patterns in the U.S. and Canada to suggest that lifestyle preferences trump policies in both countries. This further complicates the "Smart Growth" agenda in the U.S. Perhaps its goals must be rethought or policies much more potent than the ones now in use in the U.S. and Canada must be discovered and invoked. Yet, to pursue the latter would be to run up against Hayek's formidable critique.

Twentieth-century socialism (Progressivism in the U.S.) has been depicted as an Industrial Counterrevolution. It was brought on by the disorientation caused by unprecedented rapid change and responsible for much more harm than good (Lindsey, 2002). In the twenty-first century, we are much more skeptical of claims for "scientific planning". Land markets should not be an exception. Prescriptions for more top-down land use controls just as most of the world is moving away from them must be taken with a lump of salt. The evidence presented in these pages helps to make that case.

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ⁱ Goldberg and Mercer (1986) do elaborate and stress cultural differences between the two countries.

ⁱⁱ "Fuelling discontent", *The Economist* (May 17, 2001).

ⁱⁱⁱ This index attempts to capture contrasts in, "size of government, takings and discriminatory taxation, and labor market flexibility," Karabegovic, et al. (p. 6).

^{iv} Goldberg and Mercer report that, "In a technical sense no individual or corporate entity in Canada owns land. The Queen, as monarch, through federal, provincial and local crown ownership is the sole 'owner' of land in Canada. Individuals and corporations do own interests in land such as fee simple rights to occupy, use and sell land, consistent with societal controls, and can also hold leasehold rights and other legal interests such as easements. However, ownership, and the implied right to use and develop land for private purposes that flows from ownership, is vested with the Crown in its several manifestations. As a result, in Canada the control and use of land is a societal or crown responsibility from the start. Interestingly, the *Canadian Charter of Rights and Freedoms* (enacted in 1982) explicitly excluded property rights from the enumerated and protected rights ... This treatment of land contrasts markedly with that in the United States, where property rights are explicitly vested in the individual owner through the fifth and fourteenth amendments to the U.S. Constitution, which ensure that real property rights cannot be taken away and that real property can only be taken under eminent domain with due process and due cause." (pp 91-92).

^v Spatial economic analysis is usually constrained by data problems. The analysis in this paper is based on County-level data. The discussion would clearly benefit from data for smaller spatial units. But these are only available sporadically, for example, from the decennial Census and or from the

quinquennial Economic Censuses. County Business Pattern data at the zip code level are available on an annual basis but only since 1994 (see Glaeser and Kahn, 2001, for a use of zip code data with similar results to those found in this research). The zip code files offer no sectoral detail and less coverage than the REIS data used in this paper (for example, nonfarm proprietors are absent from the CBP totals). Moreover, they suffer from numerous zip code redefinitions, making them much harder to use. Finally, the recent change in industrial classifications from SICs to the NAICS (North American Industrial Classification Scheme), and the difficulty of constructing correspondence tables, limit investigations (especially time series analysis) that require sectoral detail.

^{vi} Recently release U.S. Census migration data reveal that, "Between 1995 and 2000, more people moved into nonmetropolitan territory from metropolitan areas than vice versa", p3, U.S. Department of Commerce (2003).

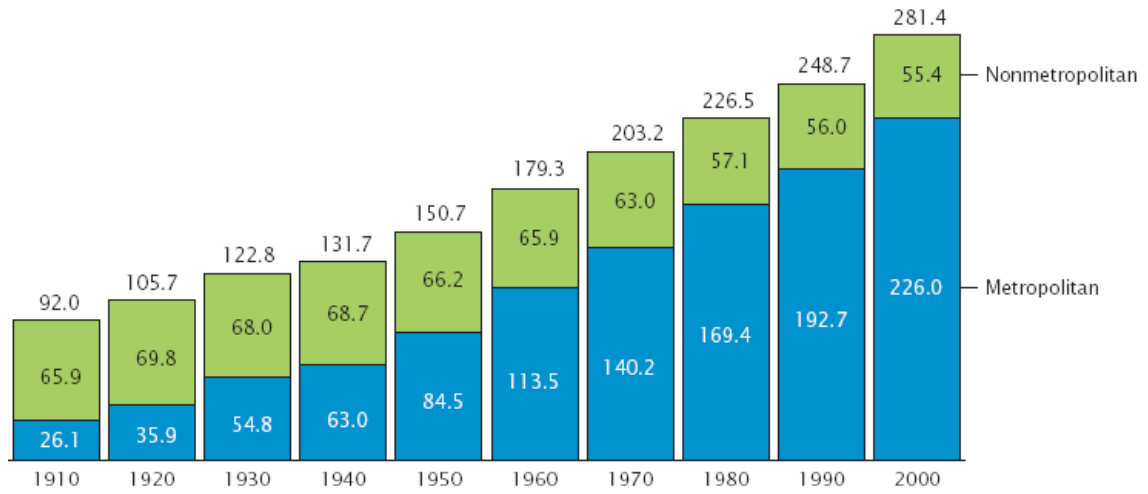
^{vii} A more detailed analysis of the REIS data employment trends is included in Gordon, Richardson (forthcoming).

^{viii} The sectoral discussion in Gordon and Richardson (forthcoming) shows that manufacturing job growth was greatest in the rural counties. As may be expected, wholesale employment grew where manufacturing grew although it did not de-urbanize, growing beyond the national pace everywhere except the core counties of large and mid-sized metros. All of the major sectors' growth rates in the core counties of the largest metros lagged their national growth rates.

^{ix} In 1999, manufacturing led all sectors in the volume of commerce shipments (www.census.gov/estats).

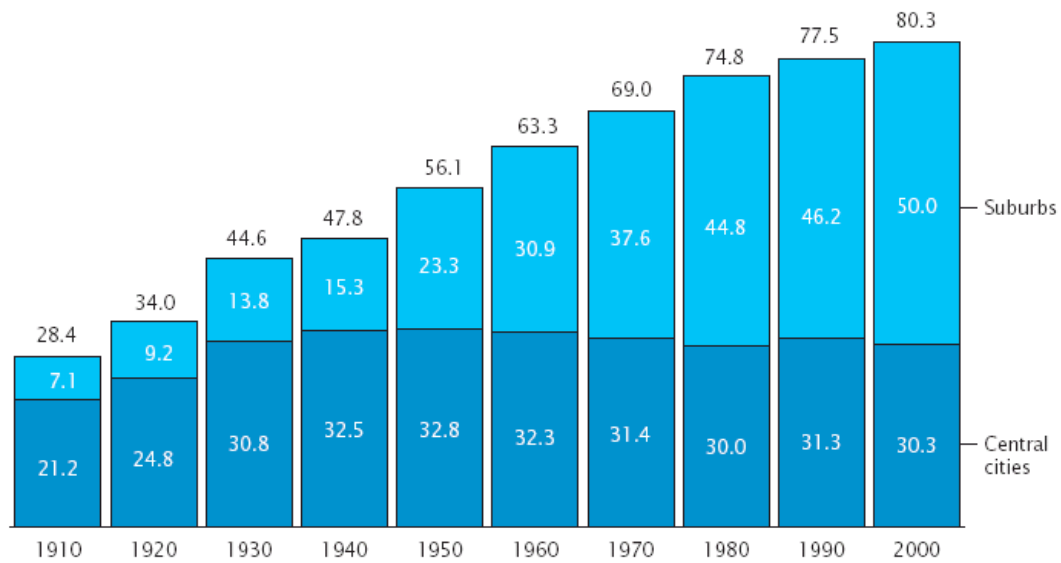
^x Appendix Tables A1-A4 show population and job growth trends in Sunbelt and Frostbelt counties. As might be expected, the suburbanization and exurbanization trends are most pronounced in the more recently developed Sunbelt areas.

Figure 1a. U.S. Metropolitan and non-metropolitan population, 1910-2000 (in millions)



Source: Hobbs, Frank and Nicole Stoops. 2002. *Demographic Trends in the 20th Century*. U.S. Census Bureau, Census 2000 Special Reports, Series CENSR-4.

Figure 1b. Percent of total population living in metropolitan areas and in their central cities and suburbs, 1910-2000 (%)



Source: Hobbs, Frank and Nicole Stoops. 2002. *Demographic Trends in the 20th Century*. U.S. Census Bureau, Census 2000 Special Reports, Series CENSR-4.

Table 1. U.S. Metropolitan growth performance in the 1990s

METRO AREA(S)	1990-2000 Pop Growth						1990-1999 Job Growth		1994-1997 Job Growth
	Metro	Core Central City	All Other CCs > 100k Pop	Rest of Metro	Core CBD	CBD Share of Metro Growth	Private Jobs Metro	Private Jobs Noncore Counties	Core CBD***
New York CMSA	8.4%	9.4%	0.8%	7.2%	10.9%	1.02%	8.0%	9.1%	7.4%
Los Angeles CMSA	12.7%	6.0%	13.9%	14.9%	5.7%	0.11%	7.4%	21.3%	-0.8%
Chicago CMSA	11.1%	4.0%	20.0%	14.4%	30.0%	1.83%	15.1%	32.7%	2.2%
Washington CMSA	13.1%	-5.7%	-11.5%	18.6%	4.0%*	0.12%	15.7%	18.0%	6.0%
San Francisco CMSA	12.6%	7.3%	12.1%	13.8%	32.3%	1.35%	18.8%	21.1%	13.8%
Philadelphia CMSA	5.0%	-4.3%	na	8.4%	4.9%	1.24%	9.2%	13.9%	-6.2%
Boston CMSA	6.7%	2.6%	3.8%	7.5%	4.7%	1.00%	13.3%	14.1%	10.1%
Detroit CMSA	5.2%	-7.5%	-4.5%	9.1%	2.1%	0.28%	14.8%	24.2%	-9.7%
Dallas CMSA	29.3%	18.0%	22.5%	37.3%	28.2%	0.28%	33.6%	40.9%	-7.7%
Houston CMSA	25.2%	19.8%	na	29.3%	7.6%	0.06%	27.4%	43.3%	1.6%
Atlanta MSA	38.9%	5.7%	na	44.0%	25.1%	0.37%	42.3%	51.0%	37.6%
Miami CMSA	21.4%	1.1%	2.0%	25.2%	31.6%	0.70%	21.5%	30.6%	-24.1%
Seattle CMSA	19.7%	9.1%	15.0%	22.7%	54.4%	1.14%	23.7%	27.8%	3.6%
Phoenix MSA	45.3%	34.3%	35.3%	68.8%	-9.1%	-0.06%	52.2%	28.8%	12.2%
Minneapolis MSA	16.9%	3.9%	-12.2%	26.2%	-16.6%	-1.40%	24.1%	31.1%	9.4%
Cleveland CMSA	3.0%	-5.4%	-2.7%	5.6%	32.2%	2.71%	13.9%	22.4%	9.2%
San Diego MSA	12.6%	10.1%	22.9%	13.9%	16.1%	0.78%	22.4%	na	3.0%
St. Louis MSA	4.5%	-12.2%	na	7.6%	-17.5%	-1.44%	12.5%	11.3%	2.9%
Denver CMSA	30.4%	18.6%	na	34.0%	51.4%	0.24%	40.7%	51.7%	10.1%
Tampa MSA	15.9%	8.4%	5.8%	19.6%	11.6%	na	32.7%	26.1%	na
TOP 10	11.5%	6.7%	9.0%	13.7%	11.3%	0.65%	13.5%	17.8%	5.6%
TOP 20	13.7%	7.6%	9.5%	16.5%	11.6%**	0.52%	17.1%	20.6%	8.7%
TOP 50	14.7%	9.0%	9.9%	17.5%	na	na	18.4%	22.8%	na
SUNBELT (30)	22.0%	15.6%	15.8%	25.6%	na	na	22.0%	31.7%	na
FROSTBELT (20)	8.4%	3.4%	-2.0%	11.0%	na	na	8.3%	17.3%	na
FROSTBELT less NY	8.4%	-0.6%	-3.1%	11.8%	na	na	14.7%	21.3%	na

*Baltimore CBD growth = 5.1% ** no CBD data for Tampa-St. Petersburg *** Defined by zip codes

Sources: 1) MSA and cities population data from www.census.gov; 2) CBD population data from E.L. Birch. 2002. "Having a longer view on downtown living" *Journal of the American Planning Association* 68(1); 3) REIS employment data from the Bureau of Economic Analysis, U.S. Department of Commerce; 4) CBD employment data from Zipcode Business Patterns, U.S. Department of Commerce.

Table 2. U.S. Population growth rates, 1969-2000

Area Group		N*	69/00	69/76	76/88	88/95	95/00	
U.S. Total		3132	1.09	1.12	0.98	1.23	1.16	
Metro Areas with more than 3 million Population	Core	14	0.80	0.34	0.87	0.92	1.07	
	Non-Core	155	1.27	1.07	1.21	1.38	1.52	
Metro Areas with 1-3 million Population	Core	34	1.01	0.71	0.98	1.29	1.15	
	Non-Core	180	1.68	1.84	1.48	1.78	1.76	
Small Metro Areas with fewer than 1 million Population		448	1.18	1.48	1.03	1.29	0.94	
Non-Metro Areas	Adjacent to Large Metro Areas	with a City of 10,000 +	62	1.11	1.17	0.92	1.33	1.18
		without a City of at least 10,000	122	1.25	1.47	0.95	1.32	1.54
	Adjacent to Small Metro Areas	with a City of 10,000 +	182	0.81	1.25	0.58	0.85	0.71
		without a City of at least 10,000	621	0.96	1.27	0.66	1.06	1.09
	Not Adjacent to a Metro Area	with a City of 10,000 +	225	0.79	1.30	0.56	0.87	0.52
		with a City of 2,500 to 9,999	560	0.63	1.23	0.30	0.67	0.53
with no City or a City < 2,500		529	0.33	0.74	-0.06	0.44	0.53	

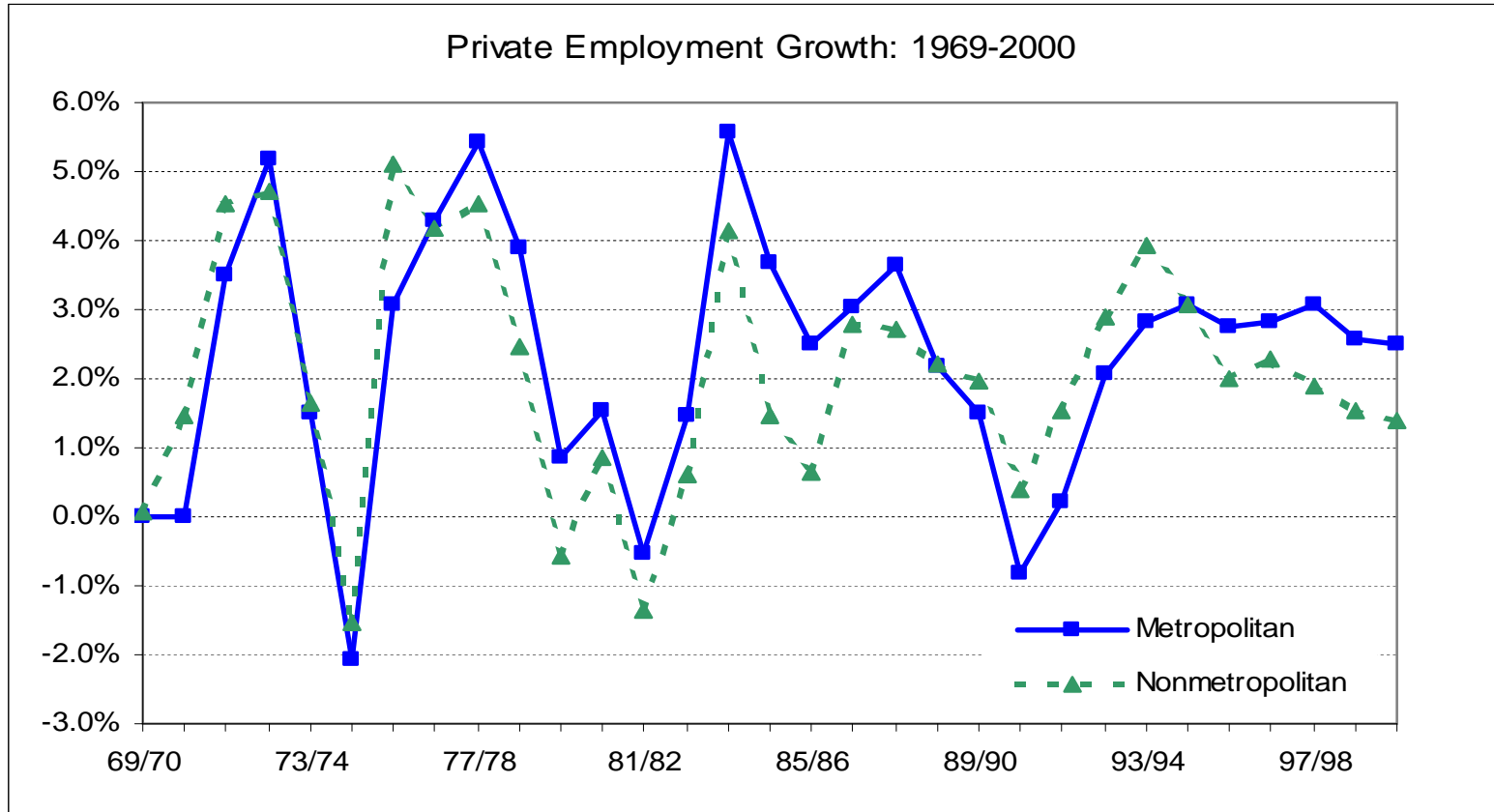
* N : number of counties

** 1993 USDA Urban Influence Codes were used to determine which non-MSA group the various non-metro counties belong to; 2000 population data and 1999 MSA definitions were used to determine which counties are MSAs and which metro category each belongs to.

*** Growth rates are in percentage and are average annual growth rates during each period.

Source : Calculated from “Regional Economic Information System 1969-2000”, Bureau of Economic Analysis, US Department of Commerce, May 2002.

Figure 2. U.S. Private employment growth rates, metropolitan and non-metropolitan counties, 1969-2000



Source: Calculated from “Regional Economic Information System 1969-2000”, Bureau of Economic Analysis, US Department of Commerce, May 2002.

Table 3. U.S. Private employment growth rates, 1969-2000

Area Group		N*	69/00	69/76	76/88	88/95	95/00	
U.S. Total		3132	2.26	1.72	2.76	1.69	2.59	
Metro Areas with more than 3 million Population	Core	14	1.48	0.20	2.40	0.31	2.71	
	Non-Core	155	2.59	1.76	3.66	1.31	2.99	
Metro Areas with 1-3 million Population	Core	34	2.39	1.59	2.96	1.84	2.93	
	Non-Core	180	3.07	2.59	3.35	2.92	3.25	
Small Metro Areas with fewer than 1 million Population		448	2.37	2.38	2.54	2.16	2.24	
Non-Metro Areas	Adjacent to Large Metro Areas	with a City of 10,000 +	62	2.14	1.84	2.16	2.48	2.08
		without a City of at least 10,000	122	2.45	2.20	2.27	2.75	2.81
	Adjacent to Small Metro Areas	with a City of 10,000 +	182	1.83	1.81	1.90	1.85	1.66
		without a City of at least 10,000	621	2.09	2.10	2.01	2.31	1.96
	Not Adjacent to a Metro Area	with a City of 10,000 +	225	2.18	2.66	1.92	2.47	1.74
		with a City of 2,500 to 9,999	560	2.01	2.73	1.58	2.31	1.63
with no City or a City < 2,500		529	1.92	2.52	1.41	2.39	1.68	

* N : number of counties

** 1993 USDA Urban Influence Codes were used to determine which non-MSA group the various non-metro counties belong to; 2000 population data and 1999 MSA definitions were used to determine which counties are MSAs and which metro category each belongs to.

*** Growth rates are in percentage and are average annual growth rates during each period.

Source : Calculated from “Regional Economic Information System 1969-2000”, Bureau of Economic Analysis, US Department of Commerce, May 2002.

Table 4a. U.S. Trends in modal split for the journey to work, 1960-2000

Mode of Transportation	1960*	1970	1980	1990	2000
All	100	100	100	100	100
Total Auto	66.9	77.7	84.1	86.5	87.9
SOV	na	na	64.4	73.2	75.7
HOV	na	na	19.7	13.4	12.2
Public Transit	12.6	8.9	6.4	5.3	4.7
Walk	10.3	7.4	5.6	3.9	2.9
Bicycle	na	na	0.5	0.4	0.4
Work at Home	7.5	3.5	2.3	3.0	3.3
Others	2.6	2.5	1.1	0.9	0.8

* 1960 Census work trip survey included a category called “not reported,” which accounted for 4.3% of all 1960 responses. To make the 1960 distributions comparable with those of later years, the 1960 reported modal shares were scaled up by a factor of 1.045 so that their total would equal approximately 100%. Sources: U.S. Decennial Census, Supplemental Survey: Journey to Work, various census years, 1960 to 2000, as tabulated by Alan Pisarski and reported in A. Pisarski, *Commuting in America III*. Washington, DC: Eno Transportation Foundation, forthcoming in 2003. Reprinted from Pucher, John and John L. Renne. 2003. “Socioeconomics of Urban Travel: Evidence from the 2001 NHTS.” *Transportation Quarterly* 57 (3): 49–77.

Table 4b. U.S. Trends in modal split for daily travel, 1960-2001

Mode of Transportation (%)	1969*	1977	1983	1990	1995	2001
All	90	100	100	100	100	100
Auto**	81.8	83.7	82.0	87.1	86.5	86.4
Public Transit	3.2	2.6	2.2	2.0	1.8	1.6
Walk**	na	9.3	8.5	7.2	5.4	8.6
Bicycle	na	0.7	0.8	0.7	0.9	0.9
Others***	5.0	3.7	6.5	3.0	5.4	2.5

* The 1969 NPTS did not sample walk and bike trips, thus artificially inflating the modal split shares of the motorized modes compared to the NPTS surveys in later years. To ensure some degree of comparability, we adjusted downward the reported motorized shares of trips in 1969 by 10%, using the percentage of walk and bike trips in 1977. That is why the column adds to 90% and not 100%. Our adjustment is rough, but otherwise, the 1969 and later NPTS modal split distributions would be completely incomparable.

** The decrease in auto mode share from 1995 to 2001, and the corresponding increase in walk mode share during the same period, are due to a change in sampling methodology that captures previously unreported walk trips.

*** The “others” category includes mainly school bus trips, which account for roughly 2-3% of all trips in each of the survey years. It also includes taxicabs, ferries, airplanes, and helicopters.

Source: Federal Highway Administration, Nationwide Personal Transportation Surveys 1969, 1977, 1983, 1990, and 1995; and National Household Transportation Survey 2001. Reprinted from Pucher, John and John L. Renne. 2003. “Socioeconomics of Urban Travel: Evidence from the 2001 NHTS.” *Transportation Quarterly* 57 (3): 49–77.

Table 4c. Public transit share of Journey to Work in selected U.S. CMSA/MSAs: 1980-2000

1990 Rank	Metropolitan Area	1980 (%)	1990 (%)	2000 (%)	Percentage Change (%)		
					1980-1990	1990-2000	1980-2000
1	New York	28.0	26.6	24.9	-5.0	-6.4	-11.1
2	Washington	14.8	13.7	9.4	-7.4	-31.4	-36.5
3	Chicago	16.5	13.7	11.5	-17.0	-16.1	-30.3
4	Boston	11.7	10.6	9.0	-9.4	-15.1	-23.1
5	Philadelphia	12.5	10.2	8.7	-18.4	-14.7	-30.4
6	San Francisco	11.2	9.3	9.5	-17.0	2.2	-15.2
7	Pittsburgh	11.0	7.9	6.2	-28.2	-21.5	-43.6
9	New Orleans	10.4	7.3	5.6	-29.8	-23.3	-46.2
10	Seattle	8.2	6.3	6.8	-23.2	7.9	-17.1
11	Portland	8.1	5.4	5.7	-33.3	5.6	-29.6
12	Minneapolis	8.6	5.3	4.5	-38.4	-15.1	-47.7
13	Milwaukee	7.1	4.9	4.0	-31.0	-18.4	-43.7
14	Atlanta	7.3	4.7	3.7	-35.6	-21.3	-49.3
15	Buffalo	6.6	4.7	3.5	-28.8	-25.5	-47.0
16	Los Angeles	5.1	4.6	4.7	-9.8	2.2	-7.8
17	Cleveland	7.8	4.6	3.4	-41.0	-26.1	-56.4
18	Miami	4.9	4.4	3.9	-10.2	-11.4	-20.4
19	Denver	6.2	4.2	4.3	-32.3	2.4	-30.6
20	Houston	3.0	3.8	3.3	26.7	-13.2	10.0
21	San Antonio	4.6	3.7	2.9	-19.6	-21.6	-37.0
22	Cincinnati	5.7	3.7	2.9	-35.1	-21.6	-49.1
23	Hartford	5.4	3.7	2.8	-31.5	-24.3	-48.1
24	San Diego	3.3	3.3	3.4	0.0	3.0	3.0
25	Rochester	5.2	3.2	3.1	-38.5	-3.1	-40.4
26	St. Louis	5.7	3.0	2.4	-47.4	-20.0	-57.9
27	Salt Lake City	4.9	3.0	3.0	-38.8	0.0	-38.8
28	Columbus	4.2	2.7	2.3	-35.7	-14.8	-45.2
29	Providence	4.0	2.6	2.5	-35.0	-3.8	-37.5
30	Detroit	3.7	2.4	1.8	-35.1	-25.0	-51.4
31	Dallas	3.5	2.4	1.8	-31.4	-25.0	-48.6
32	Sacramento	3.4	2.4	2.7	-29.4	12.5	-20.6
33	Norfolk	4.6	2.2	1.9	-52.2	-13.6	-58.7
34	Indianapolis	3.2	2.1	1.3	-34.4	-38.1	-59.4
35	Phoenix	2.0	2.1	2.0	5.0	-4.8	0.0
36	Kansas City	3.8	2.1	1.3	-44.7	-38.1	-65.8
37	Charlotte	2.6	1.8	1.4	-30.8	-22.2	-46.2
38	Tampa	1.7	1.5	1.4	-11.8	-6.7	-17.6
39	Orlando	1.7	1.5	1.7	-11.8	13.3	0.0
<hr/>							
All CMSA/MSAs							
US		6.4	5.3	4.7	-17.2	-11.3	-26.6

Sources: Cox, Wendell. 1999. Overview of public transport in Canada and the United States, Presentation to the Sixth International Conference on Competition and Ownership in Land Passenger Transport, Cape Town (www.publicpurpose.com/ut-t6-canus.pdf). Updated by the authors using 2000 U.S. Census.

Table 5a. Selected aggregates compared, U.S. and Canada

	POP (000)	GDP (billion)	GDP/ POP	Civilian Employ- ment (000)	LFPR (%)	Autos/ POP	Roads (Km/1,000 pop)	POP density, Densest urban area (pop/km ²)	No. Metro areas	% Metro POP
US	2000	2000	2000	2000	2000	1998	1998	2000, Los Angeles	2000, CMSAs/ MSAs	2000
	275,372	9,896	35,937	135,793	49	487.7	23.34	2,729	276	82.1
Canada	2000	2000	2000	2000	2000	1998	1998	2001, Toronto	2001, CMAs/ CAs	2001
	31,278	689	22,028	14,910	48	439.7	31.29	2,679	140	79.4

Table 5b. Urbanization in the U.S. and Canada

US	1980		1990		2000	
	POP	%	POP	%	POP	%
Total	226,542,199	100	248,709,873	100	281,421,906	100
Urban	167,050,992	73.7	187,053,487	75.2	222,360,539	79.0
Rural	59,494,813	26.3	61,656,386	24.8	59,061,367	21.0
Canada	1981		1991		2001	
	POP	%	POP	%	POP	%
Total	24,343,181	100	27,296,859	100	30,007,094	100
Urban	18,435,927	75.7	20,907,135	76.6	23,908,211	79.7
Rural	5,907,254	24.3	6,389,724	23.4	6,098,883	20.3

Sources: U.S. Census Bureau, Census 1980, 1990, 2000; Statistics Canada, Census 1981, 1991, 2001

Table 5c. Densest urbanized areas in the U.S. and Canada

Country	Urbanized Area	Population	Miles ²	Population /Mile ²
U.S.	Los Angeles--Long Beach--Santa Ana, CA	11,789,487	1,667.9	7,068.3
Canada	Toronto, ON	4,366,508	638.8	6,835.2
U.S.	San Francisco--Oakland, CA	3,228,605	526.7	6,130.3
U.S.	San Jose, CA	1,538,312	260.1	5,914.1
U.S.	New York--Newark, NY--NJ--CT	17,799,861	3,352.6	5,309.3
U.S.	New Orleans, LA	1,009,283	197.8	5,101.5
Canada	Montreal, QC	3,215,665	671.9	4,786.1
U.S.	Honolulu, HI	718,182	154.1	4,659.9
U.S.	Las Vegas, NV	1,314,357	285.9	4,597.1
Canada	Hamilton, ON	618,820	139.9	4,422.7
U.S.	Miami, FL	4,919,036	1,116.1	4,407.4
Canada	Ottawa - Hull, ON-QC	827,854	189.3	4,373.0
Canada	Vancouver, BC	1,829,854	432.4	4,231.7
U.S.	Fresno, CA	554,923	138.6	4,003.2
U.S.	Denver--Aurora, CO	1,984,889	498.8	3,979.1
U.S.	Chicago, IL--IN	8,307,904	2,122.8	3,913.6
U.S.	Mission Viejo, CA	533,015	136.9	3,893.7
U.S.	Salt Lake City, UT	887,650	230.7	3,847.3
U.S.	Sacramento, CA	1,393,498	369.0	3,776.1

* 2000 data for the U.S. urbanized areas; 2001 data for the Canadian urbanized areas.

Source: www.publicpurpose.com

Table 6a. Population growth in the U.S. and Canada: 1981-2000

		Percentage Change (%)					Annual Growth Rate (%)***				
		81-86	86-91	91-96	96-00/ 96-01	81-00/ 81-01*	81-86	86-91	91-96	96-00/ 96-01	81-00/ 81-01*
US Total		4.65	5.35	6.49	4.73	22.95	0.91	1.05	1.27	1.16	1.09
Metro Areas with 1 million +	Core	5.65	5.20	5.52	4.52	22.59	1.11	1.02	1.08	1.11	1.08
	Non-Core	6.50	7.79	7.65	6.60	31.74	1.27	1.51	1.49	1.61	1.46
Metro Areas with fewer than 1 million		4.33	5.47	6.48	3.79	21.61	0.85	1.07	1.26	0.93	1.04
Non-Metro Areas	Adjacent to Metros	1.94	2.93	6.51	3.92	16.14	0.38	0.58	1.27	0.97	0.79
	Not Adjacent to Metros	0.34	0.24	4.92	1.88	7.51	0.07	0.05	0.97	0.47	0.38
Canada** Total		3.90	7.88	5.68	3.89	23.07	0.77	1.53	1.11	0.77	1.04
Metro Areas with 1 million +	Core	3.79	6.74	6.09	4.96	23.37	0.75	1.31	1.19	0.97	1.06
	Non-Core	12.14	20.82	11.36	10.02	66.00	2.32	3.86	2.18	1.93	2.57
Metro Areas with fewer than 1 million		3.87	7.94	4.95	3.94	22.29	0.76	1.54	0.97	0.78	1.01
Non-Metro Areas	Adjacent to Metros	1.30	5.11	5.10	1.12	13.16	0.26	1.00	1.00	0.22	0.62
	Not Adjacent to Metros	-0.36	0.45	1.70	-2.84	-1.10	-0.07	0.09	0.34	-0.57	-0.06

* 1981-2000 for the U.S.; 1981-2001 for Canada.

** Canada's 288 Census Divisions are classified into five county groups using Baldwin et al. (2001)'s modified Beale code provided by Ray Bollman from Statistics Canada; Each year's census geography is adjusted to 1996 Census Division boundary in Canada.

*** Annual growth rate is calculated with beginning value (B) and ending value (E) of each period: $R = (E/B)^{(1/n)} - 1$.

Sources: The U.S. data are calculated from "Regional Economic Information System 1969-1999", Bureau of Economic Analysis, US Department of Commerce, May 2001. Canada data are calculated from Statistics Canada, Census 1981, 1986, 1991, 1996, and 2001 20% sample data.

Table 6b. Population growth in top 10 Canadian metropolitan areas in the 1990s

	1991-1996 (%)			1996-2001 (%)		
	Metro	Central City	Rest of Metro	Metro	Central City	Rest of Metro
Toronto	9.4	2.9	10.6	9.8	4.0	17.2
Montreal	3.7	-0.1	5.4	3.0	2.3	3.3
Vancouver	14.3	8.9	16.5	8.5	6.2	9.4
Ottawa-Hull	7.3	3.0	9.5	6.5	7.3	4.3
Calgary	9.0	8.1	23.8	15.8	14.4	35.5
Edmonton	2.6	-0.1	9.8	8.7	8.1	10.3
Quebec	4.1	-0.2	5.6	1.6	1.1	1.8
Winnipeg	1.0	0.5	7.7	0.6	0.2	6.4
Hamilton	4.1	1.2	7.4	6.1	4.8	9.9
London	4.5	4.5	4.4	3.8	3.3	5.5
Top10 Total	7.0	2.8	9.5	7.0	5.3	8.9

* For each period, CMA and central city boundaries are adjusted to the recent ones.

Sources: Calculated from Statistics Canada, Census 1991, 1996, and 2001.

Table 6c. Population distribution in the U.S. and Canada

		Population Shares				
		1981	1986	1991	1996	2000/01*
US		1.0000	1.0000	1.0000	1.0000	1.0000
Metro Areas with 1 million +	Core	0.2409	0.2433	0.2429	0.2407	0.2402
	Non-Core	0.3082	0.3137	0.3209	0.3245	0.3303
Metro Areas with fewer than 1 million		0.2357	0.2350	0.2352	0.2352	0.2331
Non-Metro Areas	Adjacent to Metros	0.1175	0.1144	0.1118	0.1118	0.1109
	Not Adjacent to Metros	0.0977	0.0937	0.0891	0.0878	0.0854
Canada**		1.0000	1.0000	1.0000	1.0000	1.0000
Metro Areas > 1 million	Core	0.2346	0.2344	0.2319	0.2328	0.2352
	Non-Core	0.1193	0.1287	0.1442	0.1519	0.1609
Metro Areas with fewer than 1 million		0.3843	0.3842	0.3844	0.3817	0.3819
Non-Metro Areas	Adjacent to Metros	0.1006	0.0981	0.0956	0.0950	0.0925
	Not Adjacent to Metros	0.1612	0.1546	0.1440	0.1385	0.1296
US – Canada		Population Share Differences				
Metro Areas with 1 million +	Core	0.0063	0.0089	0.0110	0.0079	0.0050
	Non-Core	0.1889	0.1849	0.1768	0.1725	0.1694
Metro Areas with fewer than 1 million		-0.1486	-0.1492	-0.1492	-0.1465	-0.1488
Non-Metro Areas	Adjacent to Metros	0.0169	0.0163	0.0162	0.0168	0.0185
	Not Adjacent to Metros	-0.0635	-0.0609	-0.0548	-0.0507	-0.0441
		0.2121	0.2101	0.2040	0.1972	0.1929

* 2000 for the US; 2001 for Canada.

** Canada's 288 Census Divisions are classified into five county groups using Baldwin et al. (2001)'s modified Beale code provided by Ray Bollman from Statistics Canada; Each year's census geography is adjusted to 1996 Census Division boundary in Canada.

Sources: The U.S. data are calculated from "Regional Economic Information System 1969-1999", Bureau of Economic Analysis, US Department of Commerce, May 2001. Canada data are calculated from Statistics Canada, Census 1981, 1986, 1991, 1996, and 2001 20% sample data.

Table 7. Employment growth and distribution in the U.S. and Canada

	Total Employment and Shares				Percentage Change (%)	Annual*** Growth Rate (%)
	1981	Share	1996	Share		
US Total	115,304,000	1.0000	152,607,200	1.0000	32.35	1.89
Metro Areas with 1 million +	34,734,536	0.3012	44,007,587	0.2884	26.70	1.59
Core Non-Core	31,822,659	0.2760	45,191,177	0.2961	42.01	2.37
Metro Areas with fewer than 1 million	27,079,066	0.2348	36,263,350	0.2376	33.92	1.97
Adjacent to Metros	11,475,264	0.0995	14,532,525	0.0952	26.64	1.59
Not Adjacent to Metros	10,192,475	0.0884	12,612,561	0.0826	23.74	1.43
Canada* Total**	11,032,810	1.0000	12,258,675	1.0000	11.11	0.70
Metro Areas with 1 million +	3,251,185	0.2947	3,451,885	0.2816	6.17	0.40
Core Non-Core	1,012,100	0.0917	1,584,755	0.1293	56.58	3.03
Metro Areas with fewer than 1 million	4,337,655	0.3932	4,712,085	0.3844	8.63	0.55
Adjacent to Metros	935,290	0.0848	1,008,920	0.0823	7.87	0.51
Not Adjacent to Metros	1,496,580	0.1356	1,501,030	0.1224	0.30	0.02
US – Canada	Employment Share Differences					
Metro Areas with 1 million +		0.0066		0.0068		
Core Non-Core		0.1843		0.1669		
Metro Areas with fewer than 1 million		-0.1583		-0.1468		
Adjacent to Metros		0.0147		0.0129		
Not Adjacent to Metros		-0.0473		-0.0398		
		0.2056		0.1866		

* Canada's 288 Census Divisions are classified into five county groups using Baldwin et al. (2001)'s modified Beale code provided by Ray Bollman from Statistics Canada; 1981 census geography is adjusted to 1996 Census Division boundary in Canada.

** Employment in Canada in the tabulation includes the employed labor force with a usual place of work and working at home. Total employment including all employed labor force with no workplace address and working outside Canada was 11,167,915 in 1981 and 13,318,740 in 1996.

*** Annual growth rate is calculated with beginning value (B) and ending value (E) of each period: $R = (E/B)^{(1/n)} - 1$.

Sources: The U.S. data are calculated from "Regional Economic Information System 1969-1999", Bureau of Economic Analysis, US Department of Commerce, May 2001. Canada data are calculated from using Statistics Canada, Census 1981 and 1996 20% sample data.

Table 8. Commuting to work by type of commute in the US and Canada Metropolitan Areas

	Number of commutes		Change (%)	Percentage of all commutes (%)			
	1990	2000	1990-2000	1990	2000		
US							
All commutes*	82,808,059	95,044,217	14.8	100.0	100.0		
Central city to Central city	26,893,195	27,642,480	2.8	32.5	29.1		
Central city to Suburb	6,321,570	8,039,798	27.2	7.6	8.5		
Suburb to Central city	16,393,031	18,359,868	12.0	19.8	19.3		
Suburb to Suburb	33,200,263	41,002,071	23.5	40.1	43.1		
Canada	1981	1991	2001	1981-2001	1981	1991	2001
All commutes*	6,393,060	7,465,820	7,929,555	24.0	100.0	100.0	100.0
Central city to Central city	3,561,505	3,772,815	3,658,195	2.7	55.7	50.5	46.1
Central city to Suburb	401,995	472,085	590,790	47.0	6.3	6.3	7.5
Suburb to Central city	1,001,540	1,264,150	1,283,010	28.1	15.7	16.9	16.2
Suburb to Suburb	1,428,025	1,956,770	2,397,570	67.9	22.3	26.2	30.2

* Total commutes in the table account for only those who lived and worked in the same MSA/PMSA (U.S.) or in the same CMA (Canada).

Sources: Calculated from the U.S. Census 1990 and 2000 Summary File 3. Statistics Canada. 2003. "Where Canadians work and how they get there." 2001 Census: analysis series, Catalogue no. 96F0030XIE2001010.

Table 9a. Per capita transit ridership (*all trip purposes*) largest Canadian CMAs

	1984	1993/1994	Change
Calgary	74.1	65.4	-11.7
Edmonton	56.7	44.1	-22.2
Hamilton	57.0	36.4	-36.1
Halifax	51.6	47.8	-7.5
Kitchener	49.9	32.7	-34.5
London	58.1	30.2	-48.0
Montreal	149.9	117.5	-21.6
Ottawa-Hull	119.8	82.9	-30.8
Quebec	65.3	54.4	-16.8
Regina	54.3	41.7	-23.3
St. Catherines	18.8	12.2	-34.9
Saskatoon	77.8	54.8	-29.5
Toronto	142.8	105.8	-25.9
Vancouver	68.5	71.2	4.0
Victoria	50.7	51.1	0.8
Total	103.8	80.8	-22.1

* Public transit includes metro, regional rail, tram, bus and trolley bus.

** Annual passenger journeys (linked trips) per capita.

Source: www.publicpurpose.com

Table 9b. Public transit share of Journey to Work in selected Canada CMAs: 1996-2001

1996 Rank	Census Metropolitan Area	1996 (%)	2001 (%)	Percentage Change (%)	Population Change (%)
1	Toronto	22.0	22.4	1.8	9.8
2	Montréal	20.3	21.7	6.9	3.0
3	Ottawa-Hull	17.1	18.5	6.9	6.5
4	Winnipeg	14.4	13.2	-8.3	0.6
5	Vancouver	14.3	11.5	-19.6	8.5
6	Calgary	12.6	13.2	4.8	15.8
7	Halifax	10.9	9.9	-9.2	4.7
8	Victoria	9.9	9.7	-2.0	2.5
9	Québec	9.3	9.8	5.4	1.6
10	Edmonton	9.0	8.6	-4.4	8.7
11	Hamilton	8.0	8.0	0.0	6.1
12	London	6.1	6.0	-1.6	3.8
13	Oshawa	5.6	7.1	26.8	10.2
14	Sherbrooke	5.3	5.6	5.7	2.8
15	Saskatoon	5.1	4.1	-19.6	3.1
16	Greater Sudbur	5.0	4.9	0.0	-6.0
17	Regina	5.0	4.4	-12.0	-0.4
18	Saint John	4.6	4.3	-0.1	-2.4
All CMAs		14.8	14.8	0.0	6.2
Canada		10.1	10.5	4.0	3.9

Sources: Cox, Wendell. 1999. Overview of public transport in Canada and the United States, Presentation to the Sixth International Conference on Competition and Ownership in Land Passenger Transport, Cape Town (www.publicpurpose.com/ut-t6-canus.pdf). Updated by the authors using Statistics Canada, Census 2001 20% sample data.

Table 10. Mode of Transportation to Work in the U.S. and Canada

	Auto	Transit	Walk	Others*
1995				
US	90.6%	3.5%	2.3%	3.6%
CMSAs/MSAs	89.7%	4.4%	2.4%	3.5%
2001				
US	92.1%	3.9%	2.9%	1.2%
CMSAs/MSAs	91.0%	4.7%	3.1%	1.2%
1996				
Canada	80.7%	10.1%	7.0%	2.2%
CMAAs	77.5%	14.8%	5.8%	2.0%
2001				
Canada	80.7%	10.5%	6.6%	2.3%
CMAAs	77.4%	14.8%	5.7%	2.1%

* Other includes bicycle, motorcycle, taxicab, and all other modes of transportation.

Sources: Statistics Canada, Census 1996 and 2001 20% sample data. Federal Highway Administration, Nationwide Personal Transportation Surveys 1995; and National Household Transportation Survey 2001.

Appendix

Table A-1. Sunbelt region population growth rates, 1969-2000

Area Group		N*	69/00	69/76	76/88	88/95	95/00	
U.S. Total		3132	1.09	1.12	0.98	1.23	1.16	
Region Total		1831	1.77	1.96	1.74	1.73	1.63	
Metro Areas with more than 3 million Population	Core	8	1.59	1.26	1.86	1.43	1.61	
	Non-Core	71	2.60	2.64	2.80	2.37	2.37	
Metro Areas with 1-3 million Population	Core	21	1.94	1.83	1.99	2.01	1.90	
	Non-Core	97	2.45	3.04	2.29	2.27	2.26	
Small Metro Areas with fewer than 1 million Population		273	1.69	2.16	1.60	1.69	1.27	
Non-Metro Areas	Adjacent to Large Metro Areas	with a City of 10,000 +	34	1.68	1.64	1.62	1.84	1.68
		without a City of at least 10,000	71	1.73	1.84	1.49	1.74	2.16
	Adjacent to Small Metro Areas	with a City of 10,000 +	104	1.18	1.69	0.94	1.22	1.01
		without a City of at least 10,000	398	1.18	1.45	0.92	1.24	1.36
	Not Adjacent to a Metro Area	with a City of 10,000 +	125	1.11	1.67	0.89	1.17	0.76
		with a City of 2,500 to 9,999	350	0.87	1.56	0.55	0.86	0.70
with no City or a City < 2,500		279	0.56	1.00	0.19	0.61	0.79	

* N: number of counties

** 1993 USDA Urban Influence Codes were used to determine which non-MSA group the various non-metro counties belong to; 2000 population data and 1999 MSA definitions were used to determine which counties are MSAs and which metro category each belongs to.

*** Growth rates are in percentage and are average annual growth rates during each period.

Source : Calculated from "Regional Economic Information System 1969-2000", Bureau of Economic Analysis, US Department of Commerce, May 2002.

Table A-2. Frostbelt region population growth rates, 1969-2000

Area Group		N*	69/00	69/76	76/88	88/95	95/00	
U.S. Total		3132	1.09	1.12	0.98	1.23	1.16	
Region Total		1301	0.41	0.38	0.21	0.65	0.60	
Metro Areas with more than 3 million Population	Core	6	-0.31	-0.68	-0.48	0.06	0.09	
	Non-Core	84	0.63	0.47	0.46	0.82	0.98	
Metro Areas with 1-3 million Population	Core	13	-0.04	-0.30	-0.14	0.34	0.04	
	Non-Core	83	0.94	0.86	0.69	1.25	1.19	
Small Metro Areas with fewer than 1 million Population		175	0.46	0.66	0.25	0.67	0.41	
Non-Metro Areas	Adjacent to Large Metro Areas	with a City of 10,000 +	28	0.49	0.74	0.19	0.74	0.54
		without a City of at least 10,000	51	0.72	1.11	0.40	0.83	0.79
	Adjacent to Small Metro Areas	with a City of 10,000 +	78	0.44	0.85	0.23	0.47	0.37
		without a City of at least 10,000	223	0.65	1.03	0.32	0.80	0.70
	Not Adjacent to a Metro Area	with a City of 10,000 +	100	0.38	0.86	0.15	0.44	0.16
		with a City of 2,500 to 9,999	210	0.25	0.74	-0.10	0.37	0.24
with no City or a City < 2,500		250	0.05	0.44	-0.35	0.22	0.21	

* N : number of counties

** 1993 USDA Urban Influence Codes were used to determine which non-MSA group the various non-metro counties belong to; 2000 population data and 1999 MSA definitions were used to determine which counties are MSAs and which metro category each belongs to.

*** Growth rates are in percentage and are average annual growth rates during each period.

Source : Calculated from “Regional Economic Information System 1969-2000”, Bureau of Economic Analysis, US Department of Commerce, May 2002.

Table A-3. Sunbelt region private employment growth rates, 1969-2000

Area Group		N*	69/00	69/76	76/88	88/95	95/00	
U.S. Total		3132	2.26	1.72	2.76	1.69	2.59	
Region Total		1831	3.07	3.07	3.54	2.24	3.10	
Metro Areas with more than 3 million Population	Core	8	2.53	2.04	3.51	0.87	3.17	
	Non-Core	71	4.22	4.14	5.43	2.41	3.95	
Metro Areas with 1-3 million Population	Core	21	3.46	2.97	4.05	2.61	3.90	
	Non-Core	97	4.08	4.33	4.53	3.23	3.86	
Small Metro Areas with fewer than 1 million Population		273	2.95	3.40	3.07	2.56	2.60	
Non-Metro Areas	Adjacent to Large Metro Areas	with a City of 10,000 +	34	2.66	2.54	2.81	2.69	2.40
		without a City of at least 10,000	71	2.85	2.78	2.67	2.98	3.19
	Adjacent to Small Metro Areas	with a City of 10,000 +	104	2.18	2.49	2.15	2.22	1.75
		without a City of at least 10,000	398	2.12	2.26	2.04	2.35	1.80
	Not Adjacent to a Metro Area	with a City of 10,000 +	125	2.41	3.11	2.06	2.71	1.86
		with a City of 2,500 to 9,999	350	2.13	3.15	1.67	2.32	1.56
with no City or a City < 2,500		279	2.05	2.70	1.77	2.23	1.56	

* N : number of counties

** 1993 USDA Urban Influence Codes were used to determine which non-MSA group the various non-metro counties belong to; 2000 population data and 1999 MSA definitions were used to determine which counties are MSAs and which metro category each belongs to.

*** Growth rates are in percentage and are average annual growth rates during each period.

Source : Calculated from "Regional Economic Information System 1969-2000", Bureau of Economic Analysis, US Department of Commerce, May 2002.

Table A-4. Frostbelt region private employment growth rates, 1969-2000

Area Group		N*	69/00	69/76	76/88	88/95	95/00	
U.S. Total		3132	2.26	1.72	2.76	1.69	2.59	
Region Total		1301	1.50	0.64	2.02	1.09	2.01	
Metro Areas with more than 3 million Population	Core	6	0.25	-1.54	1.04	-0.54	1.95	
	Non-Core	84	1.84	0.90	2.83	0.68	2.37	
Metro Areas with 1-3 million Population	Core	13	1.31	0.49	1.89	0.92	1.63	
	Non-Core	83	2.17	1.33	2.27	2.58	2.55	
Small Metro Areas with fewer than 1 million Population		175	1.67	1.29	1.89	1.62	1.73	
Non-Metro Areas	Adjacent to Large Metro Areas	with a City of 10,000 +	28	1.64	1.21	1.51	2.24	1.72
		without a City of at least 10,000	51	2.02	1.62	1.84	2.49	2.35
	Adjacent to Small Metro Areas	with a City of 10,000 +	78	1.52	1.23	1.68	1.50	1.57
		without a City of at least 10,000	223	2.06	1.91	1.99	2.26	2.16
	Not Adjacent to a Metro Area	with a City of 10,000 +	100	1.90	2.14	1.75	2.17	1.58
		with a City of 2,500 to 9,999	210	1.84	2.15	1.44	2.29	1.74
		with no City or a City < 2,500	250	1.78	2.32	0.98	2.58	1.82

* N: number of counties

** 1993 USDA Urban Influence Codes were used to determine which non-MSA group the various non-metro counties belong to; 2000 population data and 1999 MSA definitions were used to determine which counties are MSAs and which metro category each belongs to.

*** Growth rates are in percentage and are average annual growth rates during each period.

Source: Calculated from "Regional Economic Information System 1969-2000", Bureau of Economic Analysis, US Department of Commerce, May 2002.

Table A-5. U.S. Industrial sector growth rates by area groups, 1969-2000

Area Group		Population	Private Employment	Proprietor Employment	Services	FIRE	Construction	Retail	Wholesale	Transportation and Public Utilities	Manufacturing	
U.S. Total		1.09	2.26	2.68	3.81	2.70	2.55	2.32	2.01	1.76	-0.20	
Metro Areas with	Core	0.80	1.48	3.28	3.14	1.74	1.68	1.39	0.58	1.05	-1.29	
3 million +	Non-Core	1.27	2.59	3.41	4.36	3.37	2.90	2.42	3.06	2.14	-0.42	
Metro Areas with	Core	1.01	2.39	3.27	4.19	2.89	2.29	2.35	1.68	2.03	-0.62	
1-3 million	Non-Core	1.68	3.07	3.55	4.70	3.85	3.75	3.36	3.76	2.41	0.54	
Small Metro Areas with fewer than 1 million		1.18	2.37	2.78	3.81	2.76	2.57	2.66	2.13	1.84	-0.01	
Non-Metro Areas	Adjacent to Large Metro	with a City of 10,000 +	1.11	2.14	2.17	3.43	2.41	2.87	2.43	2.87	1.58	0.47
		without a City of 10,000	1.25	2.45	1.87	3.90	3.15	3.10	2.35	3.35	1.96	0.78
	Adjacent to Small Metro	with a City of 10,000 +	0.81	1.83	1.65	3.08	2.25	2.27	2.20	2.42	1.21	0.26
		without a City of 10,000	0.96	2.09	1.36	3.07	2.47	2.87	2.03	2.61	1.92	0.72
	Not Adjacent to a Metro	with a City of 10,000 +	0.79	2.18	1.79	3.30	2.26	2.28	2.39	2.18	1.33	0.71
		with a City 2,500- 9,999	0.63	2.01	1.27	3.00	2.37	2.35	1.90	2.59	1.49	0.85
with a City < 2,500		0.33	1.92	0.73	2.85	2.14	2.44	1.18	3.12	1.95	0.80	

** 1993 USDA Urban Influence Codes were used to determine which non-MSA group the various non-metro counties belong to; 2000 population data and 1999 MSA definitions were used to determine which counties are MSAs and which metro category each belongs to.

*** Growth rates are in percentage and are average annual growth rates during each period.

Source : Calculated from “Regional Economic Information System 1969-2000”, Bureau of Economic Analysis, US Department of Commerce, May 2002.