Prosperity or death by a thousand cuts?

A comparative analysis of subnational population trends in Canada and the United States

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Abstract

The importance of comparing population trends in Canada and the United States lies in the identification of commonalities and differences. These two countries, while sharing many common attributes such as similar history, traditions, and levels of development, are also divided in the important aspects of geography and climate, population size and distribution, and political structures. A considerable amount of study has been done on population volatility in the United States, and some on Canada, but the comparative literature in the field is lacking. This study aims to fill that gap to the extent possible, with an analysis of the dynamics of population trends in Canada and the United States. While the comparison of data across borders and over time can be difficult due to data constraints, several trends are nonetheless evident. In both Canada and the United States, economically depressed non-metropolitan areas have been losing population, especially young professionals, to more economically viable metropolitan areas. This phenomenon has increased levels of regional disparities within both countries.

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1.0 Introduction

A comparison of population trends between the United States and Canada is an important area of research that has received little attention, despite a long common border, close bilateral relations and many similarities such as a shared past, mostly common language, similarly structured institutions, an enduring democratic tradition and reliance on the market as the engine of growth.[1] Bilateral trade between the two countries surpasses that of any other pair of sovereign nations, and both countries accept many of the other's immigrants every year. Immigration and internal migration have had the effect of altering the distribution of population in both countries, with some areas growing faster than others. While much has been written about population trends in the two countries individually, little comparative work has been done. This study will work towards filling that void.

A comparative analysis of the jurisdictional growth and decline of populations in Canada and the United States requires that the period of comparison for the two countries be as similar as possible. The 50-year period chosen for the United States begins in 1960 and for Canada in 1961. The match is imperfect because the US Census Bureau conducts censuses every decade on the decade; Statistics Canada, on the other hand, conducts censuses every five years, on years that end in 1 and 6, of which those ending in 1 were studied. It is important to note that although the periods are off by one year, the information used is no less relevant. Because the study is long-term, the accuracy of the 50 year period of comparative analysis and the identification of major long-term trends will not suffer from the one year discrepancy. Schnore and Petersen (1958) also used census years in their comparison of patterns in population distribution for the United States (1870 – 1950) and Canada (1871 – 1951). Bourne's (1995) use of U.S. (1950 – 1990) and Canadian (1951 – 1991) census data for purposes of comparison follows the same pattern.

While the measurement of decennial changes in population might appear to be relatively straightforward, these trends are affected by a number of factors: the changing definition of metropolitan areas over time, changes in the actual boundaries of metropolitan areas from one census

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[1] Notable differences include Canada's parliamentary system of governance, higher taxes and relatively larger public sector, lower economic inequality and universal health care. In terms of relative economic size, the gross domestic product of the United States – the highest in the world at $15 trillion per annum – is almost ten times that of Canada.

to another, availability of data in a consistent manner and so forth. The study therefore looks at trends in population growth and decline at a number of levels.

First, it tracks trends in the population of large metropolitan areas without reference to the changing size of these metropolitan areas over time. This approach provides a broad sweep, but it masks mergers and amalgamation of metropolitan areas with adjacent areas or the breakup of metropolitan areas. This problem is partially solved by considering population densities as a second way of tracking population change. Comparing population densities over time is helpful because it removes the issue of changing boundaries, but here, again, significant changes in land area between censuses tend to alter the true characteristics of the metropolitan area. In addition to mergers and amalgamation, land area is also inconstant due to changes in measurement technology and due to land being lost or reclaimed for natural or other reasons. A third approach is to look at the large counties within metropolitan areas, since the county boundaries, being political in nature, change much less frequently and much more minimally than the boundaries of metropolitan areas, which are drawn for convenience.

The study finds considerable volatility in the growth of metropolitan areas even after correction for various discrepancies or inconsistencies in the data.

1.1   Motivation

The focus of this paper is on trends in population growth and decline because, ultimately, in mature economies like those of the United States and Canada, the number of people is the principle driver of change and economic development. People are the drivers of economic sustainability. The number of people is also the crux of the challenge when there is a population explosion or a significant hollowing out of population from an area (Siddiq & Babins, 2012).

1.2   The Importance of Metropolitan Areas

It is important to explain why the study of metropolitan areas is central to any discussion of population trends. Metropolitan areas are a developed country's hotbeds for economic, political and social activity. What's more, due to the population-dense nature of metropolitan areas, they account for a far greater fraction of the populous than equivalent rural areas. Nearly 7 out of 10 Canadians lived in a Census Metropolitan Area in 2011, according to the census (Statistics Canada, 2011a). "Metropolitan areas represent the critical geographic lens through which to understand a changing American society" (Brookings Institute, 2010, p.16).

To facilitate comparison between the two countries, this study aims to capture major trends in as straightforward a manner as possible. Therefore, metropolitan areas are not subdivided into different settlement types as in Morrill's 2012 study. On the one hand, finer divisions provide additional details regarding spatial volatility of subnational jurisdictions; on the other, significant variations in the basic

building blocks and in the definitions of the finer divisions render meaningful comparison of population trends in subnational jurisdictions rather tenuous. The focus of this study is therefore on a comparison of overarching trends in the United States and Canada.

The literature that exists on Canada-U.S. comparisons is varied. Bunting et al (2007) compared Canada's CMAs with U.S. metropolitan statistical areas. In Goldberg and Mercer's seminal book, The Myth of the North American City[2], the authors compared U.S. metropolitan areas and Canadian principal metropolitan areas as defined by Statistics Canada. Goldberg and Mercer included census agglomerations to adjust for the fact that CMAs at the time of the study were based on metropolitan cores of 100,000 as compared with 50,000 as used in the U.S. Their impetus was to prove that the notion of continentalism was wrong. In other words, they sought to prove that U.S. and Canadian metropolitan areas were shaped by different forces. England and Mercer (2006), in their update to Goldberg and Mercer's book, simply state that the U.S. defines metropolitan in one way and Canada does in another way. They also occasionally focused on central cities versus surroundings. Using country-specific definitions allows one to draw on the research that has already been done in the two countries, thereby enriching the study (Goldberg and Mercer, 1986). Data is also easily accessible and readily available if country-specific definitions are used. The limitation of country-specific definitions is that it hinders perfect international comparisons.

Complete tables providing the census data used are available in the Appendix: Appendix Tables 1 through 3.2 include data on the major metropolitan areas, as well as national and regional (in the case of the U.S.) totals. Appendix Table 1 shows populations; Appendix Table 2 shows land areas; and Appendix Tables 3.1 and 3.2 compares land areas, populations, and population densities. Appendix Table 4 shows changes in county boundaries over time in select metropolitan areas in the United States. Appendix Table 5 is supplementary, and shows data for the 41 largest metropolitan counties in the United States. This data is referred to repeatedly throughout the paper, as it is the foundation of the study.

A thorough review of the existing literature on U.S. and Canadian population volatility is outlined in section 2, including a summary of Canadian general and economic trends, a summary of U.S. general and economic trends and a synopsis of the similarities and differences between trends in the two countries. Section 3 explains the data sources and methodology used for this paper, including detailed discussion of several issues with comparability between Canadian and U.S. data sources. This discussion is essential to the understanding of the trends displayed in the data and their reliability. Section 4 provides information on the definitions and characteristics of "metropolitan areas" in the respective countries, including case studies and specific data constraints involved in time-series comparisons of certain cases in both countries. This section also provides a glimpse into alternative approaches that might be used to improve the accuracy of comparison over time and between regions and countries.

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[2]This book from 1986 was the first time the development of Canadian cities was analyzed through a North American lens. Prior to the publication of this book, Canadian planners made decisions based on US-centric models.

2.0 Background and Review of the Literature

2.1 Summary of Canadian trends

General

In developed nations, population changes are the drivers of the local economy. With stable birth and death rates and barring changes caused by international immigration, internal migration of population is the dominant factor affecting regional and local population change and distribution (Anderson & Papageorgiou, 1992), and is thus a major factor in economic changes.

Canada's population has reached an advanced stage of demographic transition, such that the natural rate of reproduction (births minus deaths) is not high enough to maintain a stable population; each province requires in-migration to sustain its population (Edmonston, 2009). Substantial immigration has brought the population to a modest increase (Slack et al, 2003; Bourne and Simmons, 2004), but a province-by-province analysis of immigration reveals high levels of variation. Immigration flows are highly concentrated geographically, in large metropolitan areas. Four percent of new immigrants chose to live in rural areas as compared to 20 percent of the entire population (Malenfant et al, 2007). Specifically, Toronto, Montreal and Vancouver have been the destination for 75 percent of new arrivals (Slack et al, 2003; Wulff and Vineberg, 2008).

These challenges are not unique to Canada. In Australia, the population of Sydney and Melbourne combined make up 38 percent of the nation's total and in New Zealand 49 percent of the national population lives in the three most populous centres of Auckland, Wellington and Christchurch. The major metropolitan centers of these countries also attract disproportionate numbers of immigrants: 54 percent of immigrants to Australia go to Sydney and Melbourne, and 54 percent of new arrivals in New Zealand go to Auckland alone. As do Australia and New Zealand, Canada must enact policies to attract new arrivals to less populated regions if they hope to maintain healthy societies there (Wulff, Carter & Vineberg, 2008).

Aside from immigration, which tends to augment population only in select immigration gateway cities, interprovincial migration increases provincial differences in standard of living, redistributing human capital from the relatively poor provinces to the relatively rich provinces with large metropolitan areas because the most mobile component of the population is the educated youth (Coulombe, 2006). Nonetheless, Simmons, Bourne and Canots (2004) discovered that while some metropolitan centers are undeniably growing at higher rates than the rest of the country, metropolitan growth is far from universal. Many metropolitan areas are stagnant or losing population.

In an analysis of the 2001 Canadian census, Bourne and Simmons (2003) found trends of decline in nearly half the metropolitan areas they identified, including several smaller metropolitan areas. Most metropolitan areas that exhibited growth grew only minimally. In nonmetropolitan areas, whose economies provide fewer job opportunities, significant population has been lost to metropolitan areas, especially those in other provinces (Malenfant et al, 2007).

A study by Polese and Shearmur (2006) looked at five peripheral regions in Quebec between 1971 and 2001.[3] They found that the country's declining rates of growth caused a "zero-sum demographic game" (Polese & Shearmur, 2006) in which the various regions and provinces must compete for migrants. For example, almost all Canadian provinces lost population to Alberta between the years 1966 and 1982 (Anderson & Papageorgiou, 1992).

Metropolitan growth in Canada has been fueled in large part by suburban growth. However, areas with strong central business districts to feel the effect of suburbanization less than economically declining CMAs (Bunting and Filion, 2001). Suburban areas near major metropolitan centers are attractive to migrants due to a higher quality of life associated with such areas. Housing costs are lower, allowing potential migrants to afford a nicer house; many people perceive a more "rural" lifestyle and landscapes as better; and yet, proximity to the metropolitan center provides easy access to infrastructure and amenities when they are needed. Canada's outer suburbs had strong population growth and above average fertility. Accordingly, between 1971 and 2001, growth was concentrated in the country's largest metropolitan areas and in the areas on which they had a strong influence. Elsewhere growth diminished (Malenfant, 2007).

A notable exception to the trend of growth in major metropolitan areas is that of Quebec in the 1960s, where the rise of Québécois nationalism and political favoritism of francophone residents drove many non-francophones to migrate to neighboring Toronto, ON (Bernard, Finny & St-Jean, 2008). While Montreal lost population, contrary to the general trend, Toronto still fit the bill for growth: large metropolitan area.

Smaller cities are susceptible to a number of factors that larger cities are not. For one, the impacts of Canada's aging society are most strongly felt in smaller and slow-growing cities that are less able to respond to the service needs of their resident population. Furthermore, while large metropolitan areas are adept at attracting international immigrants, who provide higher levels of workforce-age residents, CAs receive far fewer immigrants. Those cities and city-regions that fail to attract international immigrants face probable decline in the coming years. This causes administrative difficulties for province-level authorities, who must cater to highly varied needs across very different sizes of community (Slack, Bourne & Gertler, 2003). A major fiscal challenge is to provide services to the aging populations at a reasonable tax rate on the shrinking work force (Slack, Bourne & Gertler, 2003b).

Non-metropolitan communities have small populations, market size, and labor supply, and are physically isolated from other population centers in remote and in Canada, usually harsh climates. In some regions, such cities have large aboriginal populations. Economically, such cities are relatively homogenous and offer relatively limited employment opportunities. The poor economic climate, coupled with the limited range of public and private services available and high production and servicing costs, offers extremely limited attractiveness for in-migrants or new capital investment (Slack, Bourne & Gertler, 2003b). Generally, the more remote and isolated the community, the worse its economic performance in terms of small business generation. Recent data on entrepreneurial activity (small businesses with 1-49 employees) in Ontario's cities and towns illustrates that economic vitality varies according to a very similar geography (Slack, Bourne & Gertler, 2003b).

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[3] Peripheral was defined as outside one hour of travel time from a major metropolitan centre (500,000+ residents)

Slack, Bourne and Gertler (2003b) placed particular emphasis on the unevenness of population and social change in recent decades. They predict that only a few areas of a province – the ones that draw the most Canadian-born migrants and overseas immigrants – will be able to sustain growth in the future. Outside major metropolitan regions and their suburbs, most populations are declining (Slack, Bourne & Gertler, 2003b).

While Polese and Denis-Jacobs (2010) acknowledge some truth to the idea that large metropolitan areas have inherently entrenched advantages due to their size, they also find arguments against this idea. As a country's economy advances, it might change from an emphasis on manufacturing to an emphasis on services, and before the manufacturing strong-hold can remodel its economy, a new metropolitan area emerges with an emphasis on services. To that note, growth thanks to natural resources is also subject to change: while today, oil is the most valued natural resource, it was once coal, and before coal, wood was the most highly valued fuel. Such changes in a country's economic trends can cause decline in some large metropolitan areas and the rise of new metropolitan areas.

Economic

According to a study by Bernard, Finnie and St-Jean (2008), for provinces with lower demographic growth, the issue of interprovincial migration is more important. Recent literature suggests that higher levels of interprovincial mobility, while beneficial to national economic performance, increases economic inequalities between provinces, including interprovincial provincial skills disparities (Coulombe and Tremblay 2006) and a redistribution of human capital from poorer to richer provinces (Coulombe 2006).

Nonetheless, evidence gathered by Bernard, Finny and St-Jean (2008) suggests that internal migration rates have declined between 1971 and 2004, although they began to rise slightly between 2004 and 2008. Most of the migrants were young people, who pursue economic opportunities with relative ease. In fact, the majority of migration that has taken place seems to be a result of individuals leaving provinces with poor local labor market performance for provinces with better labor market prospects. Oil, a long-time provider of economic opportunities, has been associated with increasing population since 1950, as demonstrated by growth in Benin City, Dammam, Calgary and Dallas (Polese and Denis-Jacobs, 2010).

Economic opportunity and migration are not inextricably linked, however. In a study of 15 CMAs – Toronto, Montreal, Vancouver, Ottawa, Calgary, Edmonton, Quebec City, Winnipeg, Hamilton, London, Kitchener, St. Catherines, Halifax, Victoria and Windsor – a major trend was revealed. Over the past 27 years, the relationship between job creation and population growth in the studied CMAs has weakened. This can be explained in part by the fact that job creation is more variable over time than population growth. That is to say, while a lack of job opportunities in one metropolitan area may cause out-migration, there will always be some who choose to remain in their location in spite of diminished economic prospects. Likewise, a boom in job opportunities will, of course, draw migrants to a CMA, but a number of these jobs will also be absorbed by the local unemployed (Simmons, Bourne & Canots, 2004).

2.2   Summary of U.S. trends

General

In 1900, 62 percent of the U.S. population lived in the Northeast or Midwest regions of the country. In 2000, 58 percent lived in the South or West. The population in the West grew faster than the population in each of the other three regions in every decade of the 20th century. This movement of the population from the Northeast and the Midwest to the South and the West is therefore a phenomenon that has been underway for over a century. Regional trends are compounded by general trends, such as metropolitanization. The westward and southward drift of the population, the growth of major metropolitan populations coupled with the decline of non-metropolitan areas and the aging of the population are not new. What stands out, however, is the rapidity of change that cannot simply be explained by the aging population and changing fertility, important as these factors are.

The population of the United States' Northeastern Megalopolis, covering various metropolitan areas from northern Virginia to Massachusetts, has decreased from over 20 percent of the country's total population to just over 17 percent. On the one hand, while this indicates a decline in the percentage of U.S. population centered there, 17 percent of the population located on only 1.4 percent of the country's land area still constitutes an immensely important population center (Vicino, Hanlon & Short, 2007). In 2000, the population density of the Northeast still far exceeded the densities of the other regions (US Census Bureau, 2002). The Northeast had the highest percent of population living in metro areas for the entire 20th century. However, the overall strength of the megalopolis masks the decline of several metropolitan centers, including Baltimore and Philadelphia. Baltimore, for instance, lost significant population to suburban areas of southern Maryland (Vicino, Hanlon & Short, 2007). From 1910 to 2000, suburbs accounted for most of the growth of metropolitan areas across the country (US Census Bureau, 2002).

The Midwestern Megalopolis displayed similar trends of suburbanization and decline in percentage of the country's population, while nonetheless remaining a significant population center. Both these megalopolises lost population to the South and the West.

Within the rapidly-growing West, changes also took place. While the historical population centers in the Western United States have been the metropolitan areas surrounding Los Angeles and San Francisco in California, new population centers are emerging in the mountain states, such as Las Vegas, Nevada, and in the Pacific Northwest, such as Seattle, Washington (Henrie & Plane, 2008). In fact, a majority of interstate migrants between 1965 and 1990 resettled in new metropolitan areas, rather than older ones (Elliot & Perry, 1996).

Several of these newer metropolitan areas cropped up in the South. Speculation varies as to why this region saw so many emerging metropolitan areas. A popular theory implies that migrants chose to settle in the south and the West because they preferred the warm climate there, and associated living in these areas with a better quality of life (Rappaport, 2009): a movement from the "Snowbelt" to the "Sunbelt." Other researchers find growth in the South to be independent of temperatures. Glaeser and Tobio (2008) assert that, while the South grew undeniably after World War II, the growth of the Sunbelt

had little to do with the climate itself. Instead, they claim that growth in the economy and housing market attracted a large quantity of migrants.

The case of snow-to-sun migration is especially relevant concerning the migration of retirees, whose fixed income is not influenced by their location, to the sun-belt to take advantage of the warmer weather. There is a general tendency for retirees to move not only to warmer areas, but also to less densely-populated areas (Malenfant et al, 2007). Part of this motivation is due to the increased emphasis for a better quality of life (Hudson, 2007) seen by many in rural or suburban living in a warmer climate. The result is that retirees move into nonmetropolitan areas and the outer suburbs of metropolitan areas with their pension and investment income (Nelson, 2005). A move to coastal areas is also viewed as one to improve the quality of life (Rappaport, 2009). On the other hand, a move to cities can occur due to a preference for amenities such as restaurants and theatres (Glaeser et al, 2001 in Rappaport, 2009). Increases in older age groups moving down the urban hierarchy, to less densely-populated areas, are offset by flows of younger age groups (20-29) moving up the urban hierarchy, to more densely-populated areas (Newbold, 2011).

Among other findings, a 2010 study (Brookings Institution, 2010) reported that there are now over 100 million U.S. baby boomers and seniors. Between 2000 and 2008, large metropolitan areas experienced a 45 percent increase in the population demographic aged 55 to 64 (Brookings Institution, 2010). This aging population will soon have important ramifications in economics and regional distribution of mobile income, when they reach retirement age.

As increasing numbers of retirees migrate to nonmetropolitan areas to attain a perceived higher quality of life, they bring with them mobile income. Although there is a pattern of slower income growth in counties with higher concentrations of residents ready to retire (Henderson and Akers, 2009), the income of retirees is still an important factor of many economies. While younger adults flock to denser metropolitan areas, many retirees move to less densely-populated areas to improve their perceived quality of life. The mobile income of retirees can help to maintain the economies in these nonmetropolitan areas, which are suffering from an outflow of working-age population as younger adults move to more metropolitan areas (Nelson, 2005).

According to a study by Cantrell (2007), the only real exception to the pattern of non-metropolitan decline in Nebraska was found in the ten micropolitan core counties, which exhibited economic and population growth amidst the declining rural areas that surrounded them. These micropolitan areas are unique and follow distinct development paths, but many can benefit from the mobile income of retirees. Micropolitan areas vary in ways that affect opportunities, life chances, and prospects for development (Brown, Cromartie & Kulcsar, 2004).

The trends displayed over nine years studied by the Brookings Institute (2010) are consistent with the findings of many other demographers who studied a longer time period. By studying changes in population and economic indicators, Cantrell (2007) found that the metropolitan share of Nebraska's economy was growing, driven in large part by suburban growth. Amongst working-age people, especially those old enough to be raising children, a reflection of migrants' increased emphasis on improving their quality of life is the increasing suburbanization of U.S. metropolitan areas. Between

2000 and 2009, metropolitan areas grew by a combined 10.5 percent, compared to only 5.8 percent growth in non-metropolitan areas of the country. But these rapidly growing metropolitan areas continued the process of suburban sprawl, as outer suburbs grew much faster than population cores and inner suburbs (Brookings Institute, 2010).

Suburbanization is not the only thing changing U.S. cities. In fact, metropolitan areas are growing and changing in many aspects of their demographic makeup, but they are often changing independently of one another. According to research published by the Brookings Institute, large metropolitan areas have became more differentiated from one another in the 2000s, making it essential to understand American cities from more individualized perspectives. The country's metropolitan areas can no longer be grouped easily into Snowbelt vs. Sunbelt or East vs. West; rather in seven different categories of metropolitan area that Brookings outlines.

Metropolitan areas with higher-than-average population growth, education and diversity are considered "Next Frontier" metropolitan areas. Eight of the nine Next Frontier metro areas are west of the Mississippi River, with Washington, DC standing out as the sole eastern Next Frontier city. Its western counterparts include Houston, Dallas, and Austin, TX, Denver, CO and Seattle, WA.

Fast-growing, highly educated population centers with below-average Asian and Latino populations have been dubbed "New Heartland" metropolitan areas. The New Heartland areas are emerging population centers in the South, where African-Americans are the dominant minority group, like Atlanta, GA, or mostly white population centers throughout the Midwest and West, like Des Moines, IA or Provo, UT.

The largest metropolitan areas in the country, New York, Los Angeles and Chicago, fall into the category of "Diverse Giant," along with major costal anchors like San Francisco, San Diego and Miami. These areas exhibit high levels of education and diversity, but below-average growth, due to their historically massive size.

Located primarily in southern Border States, "Border Growth" metropolitan areas are, as the name implies, singular in the significant and growing presence of Latin American immigrants. All Border Growth areas are in the southern half of the United States, and besides Orlando, FL, all lie west of the Mississippi, ranging from eastern Texas to California's Central Valley.

Metropolitan areas that have experienced high levels of growth but smaller Asian and Latino populations and lower levels of education are considered "Mid-Sized Magnet" metropolitan areas. Most of the Mid-Sized Magnet areas are located in the southeast, with exceptions like Allentown, PA and Boise, ID. Many Mid-Sized Magnet locations suffered severe economic downturns with the housing crash of the late 2000s.

"Skilled Anchors" are metropolitan areas with above-average levels of education and below-average levels of growth and diversity. Many of these metropolitan centers are home to important medical or educational strongholds. Most of these areas are located in the Northeast or Midwest, and can be large, like Boston, or smaller, like Akron.

Older industrial centers in the Midwest, Northeast and Southeast comprise a somewhat disadvantaged group of "Industrial Cores." These metropolitan areas experience slow growth, low levels of diversity

and education, and older average age than the rest of the country. The aggregate population of the Industrial Cores declined in the 2000s.

Diversification of all kinds has changed the nature of metropolitan areas across the United States. The changing mix of population between urban cores and suburbs has meant an increasing diversification of major racial groups now living in suburbs. Additionally, over the past decade and especially in the aftermath of the housing crash, the suburban poor population has grown at five times the rate of the city poor population (Brookings Institution, 2010). What's more, a 2011 study of growth patterns and levels of inequality indicated that compact metropolitan areas exhibited lower levels of socio-economic disparity, and those metropolitan areas with higher levels of suburban sprawl displayed higher levels of socio-economic disparity (Lee, 2011).

This has raised questions about the ways of addressing the needs of the rapidly aging population, family and labour market issues, the role of immigration, the standard of living and the future of democratic institutions. Hudson (2007) argues that social and environmental equity play an essential role in economic development. Social and economic issues of inequality, especially with regards to housing, education and income levels in metropolitan areas will have to be confronted if the benefits of growth are to be shared equitably.

Research suggests that economic disparity brought on by economic growth will be tolerated only temporarily. While lower-income individuals perceive their higher-income neighbors as an expectation of their own futures, they may even welcome increases in the income of others. However, if the inequality persists, uneven growth will set in motion forces that will seek to restore balance even if it leads to dampening the growth process itself (Ray, 2010).

The typical American household saw its inflation-adjusted income decline by more than $2,000 between 1999 and 2008—and probably even further by 2009 when the economy hit the bottom of its decline. Low-wage and middle-wage workers lost considerable ground, but high-wage workers saw earnings rise. The number of people living below the poverty line increased as well. The large metropolitan areas stood at the vanguard of these troubling trends. By 2008 high-wage workers in large metropolitan areas out-earned their low-wage counterparts by a ratio of more than five to one, and the number of their residents living in poverty had risen 15 percent since 2000.

Rising inequalities in the spatial distribution of highly educated individuals have contributed to the concurrent rise in inequalities in economic opportunity. In contrast to more classical theories, Domina (2006) suggests that areas with concentrations of highly educated human capital generate more economic opportunities because of the concentrations of education, rather than economic opportunities attracting highly educated residents. What's more, educational disparities are magnified across generations, because the educational prospects of children are highly influenced by their access to local educational resources. This results in an "intensification of the reproduction of social and economic inequality across the generations" (Domina, 2006). Moreover, educational inequality is also divided along racial boundaries. The African-American and Hispanic groups in large metropolitan areas still lag behind their white and Asian counterparts: 30.7 percent of White adults and 49.7 percent of Asian adults held bachelor's degrees in 2008, compared to only 17.5 percent of Black and 12.9 percent of Hispanic adults (Brookings, 2010). This educational inequality is a key issue given the importance of human capital in a modern economy.

Economic

The economic fortunes of the large metropolitan areas have ebbed and flowed throughout the 20th century. It should be noted that such regional trends are not necessarily caused by any kind of economic spillover effect. Economic growth in one state is not necessarily related to economic growth in its neighboring states. That is to say, economic growth is not geographically contagious; rather region-wide trends exist due to established similarities in neighboring states, such as an agreeable climate in the Sunbelt, or a historical clustering of automobile manufacturers in the Midwest (Gittell et al, 2000).

Depending on the region and the decade, shifts up and down the urban hierarchy have taken place in the U.S. (Henrie & Plane, 2008). Many factors have contributed to these trends, but certain circumstances make changes more likely. Pandit (1997) emphasizes the importance of demographic and economic cycles on patterns of migration. Population surges, he argues, such as the baby boomers entering the workforce, have decreased numbers of subnational migrations. Migration increases, on the other hand, during periods of economic expansion, and decreases during times of economic contraction.

Nonetheless, if an economic contraction is strictly regional, that region is likely to lose a large portion of its population. In the late nineteenth century, regional economic specialization began to rise as industries became more localized, most notably with emerging concentrations of the steel industry in the Northeast and automobile manufacture in the Midwest. Since World War II, the trend has been reversed, with increasing industry dispersion and de-specializing regions (Kim, 1995).

Pittsburgh aptly illustrates the rise and fall of regional specialization. Historically, the Pittsburgh metropolitan area was a stronghold of the steel industry. In the 1980s, however, it became evident that that industry was in ongoing decline. Changes in the distribution of income and increasing income inequality in Pittsburgh in the 1980s can be explained by the resultant industrial restructuring (Beeson and Tannery, 2004). It also led to a continuation of population declines in the decades following. Areas excessively reliant on a single industry such as steel in Pittsburgh and computer technology in the Silicon Valley are more vulnerable to population shifts if the dominant industry declines over time. This decline is exacerbated if there is limited potential for restructuring, which in turn will have implications for future growth patterns. This finding contradicts previous studies by Katz and Murphy (1992) and Bound and Freeman (1992) that indicated that industry shifts played a relatively minor role nationally.

This contrast emphasizes two points. First, losses in one area or region may be offset by gains in another, which means that national-level data mask important impacts at the local level – a view strongly supported by the findings of the present study. Second, changes in the distribution of wages of those entering and leaving the labor market, relative to wages of other workers, contributed especially to the increased disparity of earnings, particularly at the lower end of the wage distribution.

As discussed above, wage distribution is increasingly polarized in the United States. A major cause of this income disparity may be the increasing inequality of education. Educational attainments in the United States are uneven. A study by the Brookings Institute (2010) indicated that while overall levels of four-year degree holding adults were increasing, said degrees were being attained later in life. Furthermore, educational disparities exist in geographic distribution as well. In the middle of the twentieth century, college graduates, while fewer, were more evenly distributed across the country than in 2000. Metropolitan areas that have historically had higher rates of post-secondary education, such as Boston,

New York City, San Diego and San Francisco continued to rank highly in education. The gap between the most- and least-educated cities grew between 1990 and 2008 (Brookings, 2010).

2.3   Population volatility in Canada and the U.S. – a Comparison of the Literature

In 2010, the United States Census Bureau registered 308,745,538 residents in the 3,531,905 square miles that made up the country. In 2011, Statistics Canada recorded 33,476,688 residents in Canada's 3,855,100 square miles (9,984,670 square km) (Statistics Canada, 2013). The population of the United States, while far from perfectly even, is dispersed relatively evenly throughout its more temperate terrain, with population-sparse states like Wyoming still registered 5.8 residents per square mile in 2010 (US Census Bureau, 2010). On the other hand, the harsh climate of Canada's northern regions pushes the majority of its residents to its southern border; in fact, it is estimated that 75 percent of Canadians live within 100 miles of the United States (National Geographic, n.d.). The population density of Nunavut, a territory in the northeast of Canada, was approximately 0.04 residents per square mile in the 2011 census (Statistics Canada, 2011b), and the population density of the Northwestern Territories was similarly miniscule.

It is clear that the United States and Canada, while in many ways similar, are divided by considerable geographic differences. Because of this, some differences in population trends also arise. To begin with, the smaller population of Canada – about one tenth of that of the United States – makes its major metropolitan areas fewer and smaller. What's more, the movement to the Sunbelt, while prominent in the United States, is irrelevant in Canada, because even the warmest regions of the country experience below-freezing temperatures. As mentioned above, Canadian population is already clustered in the warmer southern part of the country. Finally, as detailed in section 2.1, the linguistic divide between Quebec's majority of Francophones and the majority of Anglophones in the rest of the country has occasionally given rise to population movements.

In spite of these differences, however, Canada and the United States have much in common. In both the United States and Canada, many of the same trends and factors are involved in population volatility. These two countries are in similar stages of demographic transition, have similar historical backgrounds and have highly inter-related cultural identities.

Although more dramatic in Canada, growth patterns in the United States and Canada both display core-periphery relationships. At the national level, "core-periphery relationships remain extremely relevant within the United States… Spatially the core is bicoastal, and it brackets a 'periphery' constituted by the interior of the country" (Henrie and Plane, 2008). With the notable exception of a few large cities like Chicago and Houston, the majority of the major metropolitan areas in the United States is located on the two coasts – Boston, New York, Philadelphia, Washington DC, and Miami stand out in the east, and

Seattle, Portland, San Francisco, Los Angeles and San Diego in the West. In Canada, the core is not bi-coastal; instead, the majority of its population is located in metropolitan areas in Western and Central Canada – especially in its three major cities of Montreal, Toronto and Vancouver.

In both the United States and Canada, regions outside of the core are more likely to decline (Polese and Shearmur, 2006). Between 1971 and 2001, growth was concentrated in metropolitan areas (Malenfant et al, 2007). In a case study of Ontario, Canada, Slack et al (2003b) found that most of the province outside of the major metropolitan regions and their adjacent hinterlands was declining. The sharpest contrast was found between communities in the north, which is less populated and more remote, and the south of the province, where its major cities are located; and this north-south divide between the periphery and the core is growing. The remote communities have lost population and become less economically viable as bigger, central communities thrive (Slack et al, 2003b).

Growth in these core metropolitan areas is further driven by immigration (Slack et al, 2003; Bourne and Simmons, 2004). In both Canada and the United States, immigration flows are highly concentrated geographically. In the words of Henrie and Plane (2008) "shifts in the loci of immigrant gateway cities have also played a part in the overall distribution of population within the United States." In Canada, the concentration of international migration in a handful of large cities further exacerbated the issue of uneven population growth (Newbold, 2011), while in the U.S., new immigrants cause fewer population distribution problems.

More revealing than immigration patterns are internal migration patterns. The factors that motivate migration from one city to another often reflect economic or social situations either driving residents away from a declining city or attracting new residents to a thriving one.

As mentioned in both sections 2.1 and 2.2, internal migration is often age dependent. Migration is more common among young adults than other age groups (Audas and McDonald, 2004; Rothwell, Bollman, Tremblay, and Marshall, 2002; Tremblay, 2001 as cited in Malenfant et al, 2007; Bernard et al, 2008; Coulombe, 2006). This is because young adults are often more flexible and have fewer established ties in their original cities. Furthermore, younger adults are more likely to migrate in order to chase economic opportunities.

Especially in the case of younger people seeking economic benefit, migration redistributes people from poorer to richer areas and increases interprovincial human capital/skill inequalities (Bernard et al, 2008; Coulombe, 2006). In Canada, heavy out-migration from certain provinces to other areas of the country accelerates the population decline in those provinces (Edmonston, 2009; Bourne and Flowers, 2009). This compounds the problem of lower fertility rates, leaving even fewer people of labour force participation age remaining in the area (Bunting and Filion, 2001).

The interrelationship between population and the economy is not fixed. Rather, it is dependent on the age structure and labour participation rates (Easterlin, 1968 in Landis, 2009). In fact, although many demographers suggest that population increases as a result of economic growth, some sources

indicated that the opposite can also be true: economic growth is largely influenced by migration patterns (Henderson and Akers, 2009; Landis, 2009). At the other end of the spectrum, Simmons et al (2004) found that the relationship between job creation and population growth has generally weakened over the last 30 years. Bunting and Filion (2001), however, stated that "people follow jobs". The findings of Henderson and Akers (2009) support this: "Demographic change is a cornerstone of economic growth. At its very core, economic growth is driven by the number of people in a community, the proportion that work, and how productive they are when they work" (Henderson & Akers, 2009).

Mobility rates in the United States declined in the 1970s due to the entry of baby boomers into the labour force, a phenomenon that was not observed in Canada. This caused decreasing rates of migration in the United States, because large cohorts tend to migrate less than small cohorts. Nonetheless, the general pattern has been one of higher migration rates in periods of economic expansion, when employment opportunities are more plentiful than during times of recession or periods of economic slowdown (Pandit, 1997).

Geography is relatively less important in influencing migration than economic and political forces, demographic trends and preferences, and state policies. The most significant indicators of change in the United States were energy price changes (Gittell et al, 2000), movement from the Snowbelt to the Sunbelt (Gittell et al, 2000; Sternlieb and Hughes, 1977; Vicino et al, 2007), federal defense expenditure (Gittell et al, 2000; Short, 2006 in Vicino et al, 2007), and housing production (Glaeser and Tobio, 2008). Rayer (2001) and Lonsdale and Archer (1997) found that job-related and socio-economic wellbeing were the more consistent determinants of inter-county migration in the U.S.

The literature is divided on the importance of the sun/warmth in the United States. Glaeser and Tobio (2008) found little evidence. Rappaport (2009) found a positive correlation between population growth and warm winters/cool summers. Of course, as discussed above, the sun/warmth factor is not as relevant in Canada. Calgary, Canada's fastest growing metropolitan area between 1961 and 2011, has an average mean temperature of -9 degrees Celsius in the month of January.

> "In this regard, the Canadian and U.S. systems differ significantly: in the US, the highly demographically effective flows of empty-nester/retirement migration to amenity locations, including warmer micropolitan and rural areas, contributed heavily to the overall net downward directionality….Canada, of course, lacks the climactic diversity of the US, altering the context of amenity oriented migrations among older adults" (Newbold, 2011, p.146).

Nonetheless, in provinces like Ontario, population has increased in the south, largely as a result of migrants leaving the more remote, northern parts of the province.

Both Canada and the United States have experienced fluctuations up (concentration) and down (dispersion) the urban hierarchy. In the United States, the direction depended on the decade (Plane and Henrie, 2008). Overall movement, however, was up the urban hierarchy since the percentage of the population living in metropolitan areas increased in every state from 1910 to 2000. In 2000, the majority of the population in 37 of the 50 states lived in metropolitan areas (US Census, 2002). Canada

exhibited similar trends (Anderson, and Papageorgiou, 1992). Newbold (2011) however, found that some of the largest uni-directional flows in his study were downward in the US and upward in Canada. In terms of densely-populated metropolitan areas, Black and Henderson (1999) found that "upward mobility [on the urban hierarchy scale] is promoted by coastal location, good climate, and being in a region with high market potential" (p.327).

3.0 Data Sources and Methodology

The quantitative data in this study, such as data on land area, actual population numbers, and population densities within specific geographical boundaries comes from two sources. In the case of U.S. data, it comes from the US Census Bureau, specifically the eighteenth, nineteenth, twentieth, twenty-first, twenty-second and twenty-third censuses, in the years 1960, 1970, 1980, 1990, 2000 and 2010. In Canada, such data comes from Statistics Canada, specifically the censuses taken in 1961, 1971, 1981, 1991, 2001 and 2011. Note that the Canadian censuses studied are not successive, as is the case for U.S. censuses, as censuses are taken in Canada every five years; in the United States, they are taken every 10 years.

This hard data was supplemented with extensive qualitative research from numerous different sources. This qualitative research helps to explain the underlying causes and outcomes of the trends exhibited in an analysis of the quantitative data.

3.1   Issues with Comparability

The principal issue in comparing metropolitan areas across international borders arises due to discrepancies in the unit of analysis. Differences in the definition of a specific metropolitan area can include: varying administrative boundaries, continuity and size of the building blocks, and functional measures used to determine such areas as commuter sheds (OECD, p.1). Perhaps in one institution defines a metropolitan area as including all possible suburbs, while another defines that same metropolitan area as including on the closest communities surrounding the core.

The OECD (Organization for Economic Cooperation and Development) created a database of metropolitan regions according to their definition of metropolitan. The problem with this analysis is that they only delineated three metropolitan regions in Canada – Montreal, Toronto and Vancouver. Were this data to be used, the present analysis would be more internationally comparable, but would not allow as in-depth a scope of study. The other problem is that the information as per these definitions would only be available from 1981 to 2007. Another characteristic of the OECD database is that the population-dense core needed at least one million inhabitants with a total population greater than 1.5 million in the metropolitan area, something not required by many other categorizations. The

system's commuter rates and densities also differ from other definitions. Further fundamental problems arise due to changing measurement technologies across borders and over time. So many discrepancies indicate that the building block of the metropolitan area as defined by the OECD may no longer be valid (Soja, 2000; Adams, 2011).

When assessing the comparability of two systems, it is important, of course to look at the similarities. Puderer (2008) notes that while both Canada and the United States define a metropolitan area as having a large population nucleus with surrounding communities that are closely linked to the densly-populated core, both countries are silent with regards to large metropolitan areas with multiple cores. Finally, both Canada and the US define metropolitan areas as those with a core of at least 50,000 and being surrounded by near-by areas with high population densities from which and to which a high number of workers commute. Adjustments are also made to reflect unique characteristics based on expert opinion and historical trends. From here, the two countries' systems diverge.

3.2   Comparison of Geographic Building Blocks

The federal statistics agencies for Canada and the U.S. – Statistics Canada and the US Census Bureau – collect information using different classifications and categorizations. The census building blocks are often based on historical political boundaries that are inconsistent within and between the two countries. In response to Goldberg and Mercer, Ewing (1992) showed that if one factored out the effects of the different definitions of *metropolitan*, the dynamics of Canadian and US cities can be seen as converging.

At the risk of oversimplification and the fact that some metropolitan areas extend beyond state boundaries, for which adjustments have to be made, the United States Census Bureau (2010) provides the following classification:

> *A Core Based Statistical Area* (CBSA) is an area associated with at least one core whose population is at least 10,000. It also has adjacent territory that is linked to the core by commuting ties, and social and economic integration. There are two categories of CBSAs: Metropolitan Statistical Areas and Micropolitan Statistical Areas.

> *Metropolitan Statistical Area*—A Metropolitan Statistical Area is a CBSA that consists of at least one urban area with a population of at least 50,000. There is a central county (or counties) within the Metropolitan Statistical Area as well as outlying counties, which are connected to the urban core through social and economic integration as measured through commuting.

> *Micropolitan Statistical Area*— A Micropolitan Statistical Area has at least one urban area (often called an urban cluster) with a population of at least 10,000, but less than 50,000. The Micropolitan Statistical Area consists of a central county (or counties) containing the core as well as outlying areas, which are connected to the urban area through social and economic integration as measured through commuting.

> *Outside Core Based Statistical Areas* — These areas are counties that do not qualify for inclusion either as Metropolitan or Micropolitan Statistical Areas.

The basic building block in the vast majority of the United States is the county, a political division that acts as an extension of the state government to fulfill responsibilities that vary from social services to road maintenance from state to state. Counties are used in all states of the United States, except for the six that comprise New England, as the building block for metropolitan and micropolitan areas, although there are county subdivisions (CSDs). In 2010 there were 36,363 county subdivisions within the United States' 3,142 counties. Of these counties, 1,100 were spread across 366 metropolitan areas, 688 in 576 micropolitan areas with the remaining 1,354 counties lying outside CBSAs (i.e., neither within metropolitan nor micropolitan areas).

For Canada, the basic building block is the census subdivision, a term used for statistical purposes to mean municipalities or equivalent areas. There were 5,253 census subdivisions in 2011. Of these census subdivisions, 469 were in 33 CMAs (census metropolitan areas), 460 were in 117 CAs (census agglomerations) with the remaining 4,223 in MIZs (metropolitan influenced zones) and 101 in territories. Since counties cut across CMAs, CAs and MIZs, some counties are primarily metropolitan while others are primarily non-metropolitan.

The equivalent Canadian classification from Statistics Canada (2008) is as follows[4]:

Census Metropolitan Area— A Census Metropolitan Area (CMA) is a large area, economically and socially integrated with adjacent urban and rural areas, having a population of at least 100,000 (based on the previous census) of which at least 50,000 live in the urban core. Each CMA has one or more census subdivisions (CSDs) which lie completely or partly within the urbanized core; or at least 50 percent of the employed labour force living in the CSD works in the urbanized core; or at least 25 percent of the employed labour force working in the CSD lives in the urbanized core. Generally speaking, CMAs consist of one or more municipalities situated around a major urban core.

Census Agglomeration — A Census Agglomeration (CA) must have an urban core population of at least 10,000, below which it is retired. A CA as in the case of CMAs is formed by one or more adjacent municipalities centred on a large urban area known as the urban core. Whereas a CMA must have a total population of at least 100,000 of which at least 50,000 must live in the urban core, a CA must have an urban core population of at least 10,000. To be included in a CA, other adjacent municipalities must have a high degree of integration with the central urban area, as measured by commuting flows derived from census place of work data.

Metropolitan Influence Zone — A Metropolitan Influence Zone (MIZ) is a census subdivision that lies outside CMAs and CAs, but are influenced by them. It is a category assigned to a municipal unit **not included** in either a CMA or a CA.[5]

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[4]The basic building block used by Statistics Canada is the census subdivision (CSD). Census Subdivisions are municipal units that are deemed to be the equivalent of municipalities by Statistics Canada. The complication lies in that CSDs do not always follow political and administrative county boundaries and in some instances include incorporated towns, regional municipalities, subdivisions of county municipalities, Indian Reserves, and municipal districts. Statistical Area Classification aggregates CSDs according to a separate set of criteria in order to study the urban continuum in Canada. These criteria create distinct geographic units called census metropolitan areas (CMA), census agglomerations (CA), CMA/CA influenced zones and territories (or, more generally, metropolitan influenced zones (MIZ)).

[5]More generally and unless otherwise specified, the term *metropolitan areas* shall henceforth be used to refer to Metropolitan Statistical Areas in the United States and Census Metropolitan Areas in Canada. Similarly, *non-*

The fact that the defining terms of metropolitan areas in the two countries are different is problematic and a source of concern in a comparative analysis of both countries. Puderer (2008) notes that the unit selected is based on historical relevance, available data, consistency and stability. Neither the county nor the CSD is nationally consistent in geographic terms, nor are they stable, since their boundaries can change over time. Of particular concern is that municipal restructuring in Canada – especially mergers and amalgamations – adversely impacts the stability of metropolitan delineations. In the United States, for example, CBSAs can be reclassified, but only at the time of the decennial censuses. In Canada, growth of new CMAs and adjustment for boundary changes are documented every five years.[6]

The caveats noted above notwithstanding, the following chart compares the standard measurements in Canada and the United States, showing census subdivisions and counties as the basic building blocks in the two countries, respectively.

Chart 1: Building Blocks in Canada and the U.S.
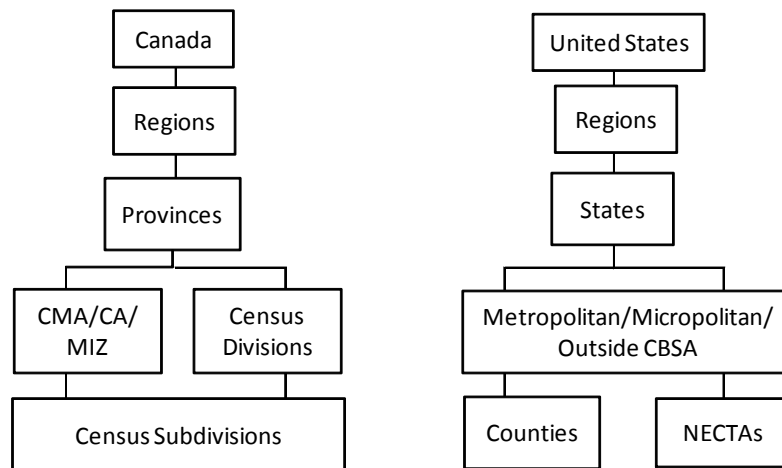
Source:

The comparison of the geographic building blocks in the United States and Canada discussed above are summarized in the table below:

United States (2010)[7]
- 3,142 counties

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metropolitan areas shall collectively refer to Micropolitan Areas and Outside Census Based Statistical Areas in the United States and Census Agglomerations and Metropolitan Influenced Zones in Canada.

[6] For an excellent comparison of population thresholds, population nuclei, the target core, hinterland and commuting thresholds, mergers, consolidations, grandfathering and updating between the United States and Canada, refer to Puderer (2008).

[7] OMB Bulletin No.10-02. December 1, 2009. Metro area number confirmed with Brookings Institute State of Metropolitan America publication.

- 36,363 county subdivisions[8]
- 366 metropolitan areas (1,100 counties)
- 576 micropolitan areas (688 counties)
- 1,354 counties outside of CBSAs

Canada (2011)[9]
- 5,253 census subdivisions
- 33 Census Metropolitan Areas
- 117 Census Agglomerations
- 4,324 in MIZs (4,223) territories (101)
- 293 census divisions[10]

Comparisons

Table 1: Divisions in Canada and the U.S. and their Ratios Relative to One Another

Division	US	Canada	Difference	Ratio
Population (2010 US & 2011 C)	308,745,538	33,476,688	275,268,850	9.22 times
Counties/ Census Divisions	3,142	293	2,849	10.72 times
Metropolitan/CMA	366	33	333	11.09 times
Micropolitan/CA	576	117	459	4.92 times
US-CSD/Canada-CSD	36,363	5,253	31,110	times

Source:

That the population of the United States is nine times the size of Canada's is reflected in the relative numbers of subdivisions, metropolitan and non-metropolitan areas in the two countries: the United States has seven times as many county subdivisions (36,363 as opposed to 5,253 CSDs for Canada), 11 times as many metropolitan areas (366 versus 33 CMAs for Canada) and five times as many micropolitan areas (576 compared to 117 CAs for Canada).

It is important to note that the ratio of counties to census divisions is roughly aligned with the ratio of metropolitan areas to census metropolitan areas, reinforcing the similarities in these units of measure. Nonetheless, the ratio of census agglomerations to micropolitan areas was relatively lower, indicating that these two terms are not as well matched.

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[8]http://www.census.gov/geo/www/geoareas/cousubtable.html
[9]http://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/select-Geo-Choix.cfm?Lang=Eng&GK=CMA&PR=10
[10]http://www12.statcan.ca/census-recensement/2011/ref/dict/table-tableau/table-tableau-4-eng.cfm

4.0 Volatility of Growth and Decline in Large Metropolitan Areas in the United States and Canada

4.1   Summary of trends

This study, in large measure for the reasons noted above, focuses its analysis on metropolitan areas. In the last 50 years, the interpretation and application of the definitions of metropolitan by the U.S. Office of Management and Budget and by Statistics Canada have changed, as have the definition criteria themselves. The basic concept, however, has remained the same.

Fundamentally, a metropolitan area is comprised of two components – a core and a hinterland. The core is composed of a single or multiple large, population-dense nuclei. The hinterland is composed of contiguous adjacent areas – with varying degrees of population density – that are socially, economically, and geographically integrated with the core and that share a similar character (Puderer, 2008; Paddison, 2001).

Metropolitan areas that reached a population greater than one million by 2011/2010 in Canada and the United States constitute a large and growing proportion of the total populations of both these countries. The total population of United States metropolitan areas with over one million residents grew substantially, from 42 percent of the total population in 1960 to 54 percent in 2010; in Canada, equivalent metropolitan areas grew from 32 percent of the total population in 1961 to 46 percent in 2011. The one notable difference is that the proportion of the large metropolitan areas in the United States grew rapidly, to 53 percent, by 1980, but only one percent for the remaining three decades of the study, reaching 54 percent. For Canada, the growth rates have been more consistent, rising to 37 percent by 1981 and to 46 percent in 2011, reflecting a trend towards convergence. Furthermore, by 2010/2011, the proportion of population living in large and small metropolitan areas in the United States had risen to 84 percent and in Canada to 69 percent. The population story in both countries is therefore increasingly the story of people living in metropolitan areas, while the populations in non-metropolitan areas dwindle.

In both Canada and the United States, several trends are evident. First of all, an increase in aggregate metropolitan population in each country, and even in each region of the United States, is undeniable. As shown in Appendix Table 1, aggregate Canadian metropolitan population in 1961 (total CMAs) was only 8,163,986; by 2011, it had rocketed to 23,123,441. This growth of 166 percent was substantially higher than that of non-CMAs, 3 percent, or even the total growth of Canada, 84 percent. A steep increase in metropolitan population contrasts sharply with an extremely gradual increase in non-metropolitan population in Canada.

In the U.S., the population of large metropolitan areas more than doubled over the 50-year period studied, and that of smaller metropolitan areas nearly tripled. The total population of the U.S. grew 72 percent, thanks to a decline of 24 percent in non-metropolitan population. The aggregate population of metropolitan areas in the Northeast of the U.S. increased from 26.1 million in 1960 to 36.8 million in 2010; in the Midwest from 20.4 million to 32.0 million; in the South from 17.0 million to 55.8 million; and in the West from 16.5 million to 43.9 million over the 50 years studied. These regional differences

highlight another important trend: historically dense population centers in the Northeast and Midwest were much slower to grow than their newer metropolitan counterparts in the South and West.

In addition to the population growth experienced in Canada and the United States, the metropolitan areas of these countries underwent numerous changes in their physical boundaries, primarily expansion. The aggregate land area within the boundaries of metropolitan areas in Canada grew 423 percent between 1961 and 2011. The most notable increase was from 1961 to 1971, in which aggregate land area spiked 172 percent in just ten years. While U.S. metropolitan areas' physical boundaries barely changed between 1980 and 1990, every other decade studied saw at least a 20 percent increase in aggregate metropolitan land area in the United States. Overall, metropolitan land area increased 194 percent in the U.S. over the time studied, with especially large increases in the South (216 percent) and the Midwest (213 percent).

The increasingly wide boundaries of metropolitan areas in both countries reflect a trend of suburbanization, or suburban sprawl, experienced on both sides of the Canada-U.S. border. Some differences remain evident, however. Metropolitan areas in Canada remain much more compact in spite of suburbanization, with an average population density of 646 per square mile in 2011; in U.S. metropolitan areas, population density had reached only 283 in 2010. Accordingly, populations in Canada's non-metropolitan areas are extremely sparse, with a density of just 3 residents per square mile in 2011; and in the United States, non-metropolitan populations are slightly higher, with a density of 19 residents per square mile in 2010.

4.2   Definitions and Characteristics of Metropolitan Areas in Canada

The classification "census metropolitan area" was first used by Statistics Canada in 1951, describing population cores of at least 50,000 residents with total populations (including hinterlands and adjacent communities) of at least 100,000. CMAs were defined in 1971 as central labor market areas, but delineated depending on other criteria, such as population growth, accessibility and labor force details. In the same year, the CMA of Saint John, NB was "grandfathered" (Statistics Canada, 2011a). In 1976, the peripheral communities of CMAs were delineated with the consideration of commuting data for the first time, using data from the previous decennial census.

Communities with at least 40 percent forward commuting and 25 percent reverse commuting were included as part of the CMAs. These same commuting thresholds were used to delineate CMAs and CAs in the 1981 census. 1986 saw the forward commuting threshold raised from 40 percent to 50 percent, in an attempt to control for differences in data processing in previous censuses whose data were used to determine the levels of commuting. Furthermore, a minimum of 100 commuters for forward and reverse commuting was put in place for both CMAs and CAs beginning with the 1986 census (Statistics Canada, 2011a).

For the 2006 census, Statistics Canada returned to the original criteria for CMAs as introduced in 1951: instead of requiring a core population of at least 100,000, a CMA needed only a core population of

50,000, with a total population of at least 100,000 (Statistics Canada, 2011a). Thanks to this change in criteria, the total number of CMAs rose from 27 in 2001 to 33 in 2006 (where it remained through 2011), as Ontario gained the CMAs of Barrie, Guelph, Brantford and Peterborough, New Brunswick gained Moncton and British Columbia gained Kelowna (Statistics Canada, 2006).

In 2002, the CMA of Ottawa-Hull became Ottawa-Gatineau and the CMA of Chicoutimi-Jonquière became Saguenay (Statistics Canada, 2002). The names of two CMAs were changed in the 2011 census: Abbotsford in British Columbia became Abbotsford-Mission and Kitchener in Ontario became Kitchener-Cambridge-Waterloo (Statistics Canada, 2011a).

What are now called "census agglomerations" were originally denominated "major urban areas." In 1971, CAs were introduced, indicating entities with core population of at least 2000, including the largest city and its surroundings, and a population density of at least 1000 residents per square mile (386 per square kilometer). In 1981, the minimum CA core population was increased from 2000 to 10,000 residents (Statistics Canada, 2011a). Five new CAs were created in 2011: Steinbach in Manitoba and High River, Strathmore, Sylvan Lake and Lacombe in Alberta. On the other hand, two CAs – La Tuque in Quebec and Kitimat in British Columbia – were retired that same year because their populations dropped below the minimum required core population of 10,000 in the previous census in 2006 (Statistics Canada, 2011a).

In 1986, the concepts of consolidated versus primary CMAs and CAs were introduced. These concepts are described by Statistics Canada: "Adjacent CMAs and CAs that had sufficient commuting interchange (35 percent or more) and were merged were identified by the terms 'primary census metropolitan area (PCMA)' and 'primary census agglomeration (PCA).' The terms 'consolidated census metropolitan area (CCMA)' and 'consolidated census agglomeration (CCA)' described the sum of the component CMAs and CAs. Census data were disseminated for these areas."

To improve data comparability over time, two changes were made in 1996. First, it was determined that CAs could be consolidated with CMAs, but CMAs could not be consolidated with other CMAs. Second, primary census agglomerations (PCAs) could not be retired from consolidated CMAs or CAs, with the exception of physical changes in the structure of the population centers (Statistics Canada, 2011a).

A number of changes were made in 2001. The 2001 census was the first to include Nunavut, annexed from the Northwestern Territories in 1999, but since Statistics Canada recognizes no CMAs or CAs in the remote northern territory, this change has little effect on the research of this study (Statistics Canada, 2011a).

More pertinently, the minimum core population of a census metropolitan area was increased in 2001 to 100,000 residents or more. Consolidated CMAs ceased to be defined for dissemination purposes, which meant that primary CMAs and primary CAs were no longer defined either. This rule caused no significant or substantive changes to the methodology of defining CMAs, and no change at all to the limits of CMAs. The terms "primary census metropolitan area," "primary census agglomeration,"

"consolidated census metropolitan area" and "consolidated census agglomeration" were not used in the 2001 census standard dissemination program (Statistics Canada, 2011a).

Two new areas – Kingston, ON and Abbotsford, BC – were promoted from CAs to CMAs in 2001, making 27 total CMAs in Canada (Murphy & Puderer, 2002). Six of the 17 total CMAs in 2001 – Halifax, NS, Ottawa-Hull, ON/QB, Kingston, ON, Greater Sudbury, ON, London, ON and Windsor, ON – were affected substantially by municipal restructuring (Statistics Canada, 2011a; Murphy & Puderer, 2002). Most drastically, 529 CSD dissolutions and 168 CSD incorporations brought the total number of CSDs in Ontario from 947 in 1996 down to 586 in 2001. In Quebec, 232 CSD dissolutions and 109 incorporations brought the total CSDs of the province down from 1599 in the 1996 census to 1476 in the 2001 census. In Nova Scotia, 14 dissolutions and four incorporations brought the total number of CSDs in the province down from 110 in 1996 to 98 in 2001 (Murphy & Purderer, 2002).

Data constraints – Case Studies

Changes in data, all too frequent between censuses, stem largely from the fact that "from a purely empirical point of view, the concept of region one retains is often intrinsically linked to the availability of data" (Behrens & Thisse, 2006, p.459). This means that the concept itself of a region or area is often highly volatile. The historically changing definitions and criteria for major metropolitan areas in Canada cause inconsistencies in data collected over time, making time series comparisons difficult.

Every one of Canada's six largest metropolitan areas (those that reached a population of at least one million by 2011) experienced changing geographical boundaries at some point between 1961 and 2011. Table 2 below, an excerpt from the more detailed Appendix Table 2, shows percentage changes between decennial censuses.

Table 2: Growth Rate of Land Area in Canadian CMAs, 1961-2011

	Land area growth rate (%)					
	1961-1971	1971-1981	1981-1991	1991-2001	2001-2011	1961-2011
Canada - large metros	172	2	76	3	4	423
Montréal, QC	109	0	25	15	5	216
Ottawa-Gatineau, ON/QC	370	0	29	4	18	639
Vancouver, BC	115	0	0	3	0	123
Toronto, ON	81	0	49	6	0	185
Edmonton, AB	663	7	130	-1	0	1,761
Calgary, AB	4	21	907	0	0	1,166
Non-CMAs	0	0	0	-2	-1	-4
All CMAs	208	2	61	19	17	606
Total Canada	0	0	0	-2	-1	-3

Source: Appendix Table 2

Differences in the land area considered to be part of a given metropolitan area affects not only the official number of people living there (naturally, more land mass means more population), but it also affects data on population density in the metropolitan area. Populations are denser in the nuclei of metropolitan areas and become more dispersed as one travels outward from the nuclei, thus the inclusion of more peripheral hinterlands drags down the population density.

The data for all changes in population density, as well as corresponding land areas and population for each decennial census is outlined in Appendix Tables 3.1 and 3.2. Of course, some areas undergo more boundary changes than others – Vancouver, BC, after a large increase of 115 percent from 1961 to 1971, stayed approximately the same for the rest of the study, from 1971 to 2011. On the other hand, the most drastic example is that of Edmonton, AB between the censuses of 1961 and 1971. Between the two censuses, the land mass included as part of the metropolitan area expanded 663 percent from 196 square miles to 1,492 square miles. Accordingly, the population density decreased from 1,726 residents per square mile in 1961, when only the population-dense nucleus was included in the metropolitan area, to a mere 332 residents per square mile in 1971, when the more sparsely-populated hinterlands and surrounding areas were included as part of the metropolitan area. This was in spite of the fact that the actual number of residents grew by 158,134 during those 10 years. Between 1961 and 2011, after a staggering 1,761 percent increase in land area, population density in the Edmonton metropolitan area decreased from 1,726 to only 319 residents per square mile, in spite of a net population growth of 822,301 residents during that time.

The data collected on other metropolitan areas displays similar, if less drastic effects of changing metropolitan boundaries. After a 1,166 percent increase in land area over the 50 years between 1961 and 2011, Calgary, AB showed a decrease of population density from 1,791 to 616 residents per square mile, in spite of population growth of 935,777. The land mass included in Ottawa-Gatineau, ON/QC (previously known as Ottawa-Hull) increased by 639 percent over the 50 years studied. This led to the misleading decrease of population density from 1,308 to 509 residents per square mile, in spite of a net population gain of 806,574. Data for all six major metropolitan areas in Canada, as well as the aggregate of CMAs, non-CMAs and the country as a whole is displayed in Table 3 below, an excerpt from Appendix Tables 3.1 and 3.2.

Table 3: Land Area vs. Population Density in Canadian CMAs, 1961 and 2011

	1961		2011	
	land area (sq. mi)	population density (residents/sq. mi)	land area (sq. mi)	population density (residents/sq. mi)
Montréal, QC	520	4,058	1,644	2,326
Ottawa-Gatineau, ON/QC	329	1,308	2,427	509
Vancouver, BC	499	1,582	1,113	2,079
Toronto, ON	799	2,282	2,280	2,448
Edmonton, AB	196	1,726	3,640	319

Calgary, AB	156	1,791	1,972	616
Canada - large metros	2,499	2,309	13,077	1,172
Non-CMAs	3,555,170	3	3,425,741	3
All CMAs	5,068	1,611	35,773	646
Total Canada	3,560,238	5	3,461,514	10

Source: Appendix Tables 3.1 and 3.2

For places like Vancouver, whose land area increased only minimally, population density still increased over the 50-year period studied. For others, like Edmonton, the increase in land area was so drastic that population density plummeted by 2011. The total land area of all large metropolitan areas in Canada rose more than 500 percent, from just 2,499 square miles in 1960 to 13,077 square miles in 2011. Because of this, population density was cut almost in half, in spite of the fact that the aggregate population of all large metropolitan areas in Canada rose from 18,238,000 in 1961 to 33,476,688 in 2011.

As metropolitan areas have grown in population, they have also grown disproportionately in geographic size. This reflection of increasing suburban sprawl has caused difficulty in the comparison of the data from any metropolitan area over time. Furthermore, as Statistics Canada's definition of "metropolitan area" has changed, so have the boundaries and number of metropolitan areas in Canada. Data discrepancies stemming from changing definitions and boundaries hinder time-series comparisons in Canada, and are no less common in the United States data.

4.3   Definitions and Characteristics of Metropolitan Areas in the U.S.

To ensure that the concept of metropolitan was consistent with the availability of U.S. census data as well as being sufficiently comprehensive, Frey and Speare Jr. (1988) required the following criteria to qualify as a Metropolitan area for the analysis of regional and metropolitan growth and decline from 1950 to 1980:

1. "Metropolitan areas should include all large concentrations of cities and their suburbs.
2. The metropolitan area should be delineated in terms of existing geographical units for which census data are tabulated – and which do not change over time – so that it is possible to assemble data for the beginning and end of a decade using the same territory.
3. These areas ought to approximate labor market areas since they contain both the place of residence and place of work for most of their population" (p. 20).

They argued that while the OMB's definition of a Statistical Metropolitan Area in 1980 was not perfect, the definition did fit their criteria. Their study, however, differed from this study in that they used constant boundaries for intra-metropolitan analysis and census boundaries for large metropolitan area trend analysis. They also used New England County Metropolitan Areas (NECMAs) for New England.

While constant boundaries have the advantage in that the same geographic area is used, it does not take into account the natural expansion of towns and cities over time to include suburban areas. In that sense, it differs from the census characterization of metropolitan areas from one decennial census to another.

Over the years there have been a number of notable changes to the U.S. definition of metropolitan. Some of these changes have been captured by Paddison (2001). In 1971, changes were made to nearby city population requirements. A 1980 interpretation included areas of 50,000 residents, not necessarily in close proximity to a larger central city, in the definition of "urban core," so long as the metropolitan area had a population of 100,000 or more (Paddison, 2001, p. 28). In 1980, the minimum agricultural residence and employment criteria were replaced with "a sliding scale combining integration and metropolitan character" (Paddison, 2001, p. 28).

In addition to changing boundaries, various name changes occurred throughout the 50-year period. At different times, different terms have been used to capture the concept of the metropolitan area. The Standard Consolidated Area (SCA), an aggregate unit, was introduced in 1960, which was followed by the Standard Consolidated Statistical Area (SCSA) in 1975. The Standard Metropolitan Area (SMA) was introduced in 1949, which in 1959 was replaced by the Standard Metropolitan Statistical Area (SMSA), which in turn was used until the Metropolitan Statistical Area (MSA), Consolidated Metropolitan Statistical Area (CMSA) and Primary Metropolitan Statistical Area (PMSA) were introduced in 1983. Consolidated Metropolitan Statistical Areas (CMSA) are metropolitan areas with a population of over one million, spanning two or more counties and whose definition is generally supported by local opinion. The component parts of CMSAs were called Primary Metropolitan Statistical Areas (PMSA). In 2000, commuting minimums were raised to 25 percent from 15 percent to reflect increases in the practice of commuting since 1960 (Office of Management and Budget, 2000). The practice of grandfathering metropolitan statistical areas that no longer qualify was discontinued.

In June 2003, an additional classification was introduced: Metropolitan Division, which is part of a larger Metropolitan Statistical Area, consisting of one or more counties with a distinct employment area and often characterized by a unique socio-cultural and/or economic identity. For example, the Los Angeles-Long Beach-Santa Ana metropolitan area consists of the metropolitan divisions of Los Angeles-Long Beach-Glendale and Santa-Ana-Anaheim-Irvine while the Boston-Cambridge-Quincy metropolitan area consists of the metropolitan divisions of Boston-Quincy, Cambridge-Newton-Framingham, Peabody and Rockingham County-Strafford as of the 2010 census. For the 2010 census, use of the Primary Metropolitan Statistical Area was discontinued in favor of Metropolitan Divisions. While there are potential similarities between it and Metropolitan Divisions[11] the two are not the same. Given these changes in terminology, some of which can be quite confusing, one needs to be cautious in comparing metropolitan area data from different dates.[12] Thus, the analysis of demographic and economic patterns, trends, and processes within large Metropolitan Statistical Areas should take into consideration data for specific Metropolitan Divisions. Research and analyses that previously made use of data for Primary Metropolitan Statistical Areas have since given way to data for Metropolitan Divisions.[13]

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[11] http://www.whitehouse.gov/sites/default/files/omb/assets/bulletins/b10-02.pdf
[12] Appendix II Metropolitan Areas: Concepts, components, and population.
http://www.census.gov/prod/3/98pubs/98statab/saappii.pdf
[13] http://www.whitehouse.gov/sites/default/files/omb/assets/bulletins/b10-02.pdf

To summarize, the geographic area for the United States referred to loosely in this study as *metropolitan area* is the Standard Metropolitan Statistical Area as defined in the censuses of 1960, 1970 and 1980 and the Metropolitan Statistical Area as defined in the censuses of 1990, 2000 and 2010. The definitions, however, of both SMSAs and MSAs have changed significantly from one decennial census to another, making comparisons over time rather problematic. This is best exemplified when the land area of an SMSA (or MSA) changes dramatically from one census to another suggesting that the territory constituting that SMSA/MSA is also changing.

Data constraints – Case Studies

While decade-to-decade comparisons provide useful information over long periods of time, these comparisons are constrained by periodic changes in the composition of the metropolitan areas. Sometimes counties are added to a metropolitan area; at other times they are removed. The shaded areas in Appendix Table 4 are the county populations corresponding to nine of the large metropolitan areas that have experienced significant addition/deletion of counties from one decennial census to another. The challenge is to track the population growth (or decline) of particular jurisdictions (for example, specific metropolitan or nonmetropolitan areas) in a consistent manner over time.

This problem is particularly acute for some of the larger metropolitan areas. Nine in particular deserve attention after a number of counties were added or removed from to their official metropolitan area boundaries, summarized below:

- Metropolitan Areas with significant changes:

  - Philadelphia: Beginning in the 1960 census, the Philadelphia metropolitan area consisted of Bucks County, Chester County, Delaware County, Montgomery County, and Philadephia County, PA and Burlington County, Camden County and Gloucester County, NJ. In the 2000 census, the metropolitan area gained Salem County, NJ; in the 2010 census, the Philadelphia metropolitan area lost Burlington County, Camden County and Gloucester County, but gained New Castle County, DE, Cecil County, MD and Camden, NJ (Camden, Gloucester and Burlington Counties)

  - New York: In 1960 and 1970, the New York metropolitan area consisted of the relatively central counties of Bronx, Kings, New York, Queens, Nassau, Suffolk, Westchester, Putnam, Richmond and Rockland, NY. Bergen County, NJ was added in 1980, but was removed for the 1990 and 2000 censuses. In the 2010 census, Bergen County was once again added to the New York metropolitan area, along with Passaic and Hudson Counties, NJ, the city of Newark, NJ (Essex, Morris, Sussex, Union, Warren and Hunterdon Counties, NJ and Pike County, PA) and the city of Edison-New Brunswick, NJ (Monmouth, Ocean, Middlesex and Somerset Counties, NJ).

  - Hartford: For the censuses of 1960 and 1970, Hartford metropolitan area consisted of the core counties of Hartford, Middlesex and Tolland, CT. For 1980, Middlesex and Tolland were dropped while Bristol, Middleton and New Britain (included on Appendix Table 4 as "other") were added. For the 1990 census the Hartford metropolitan area included the same counties as it did in 1960 and 1970 with the addition of Litchfield, New London and Windham Counties, relatively small additions, due to an increase in the

population of Hartford County included in the area. 2010 saw a return to the exact same inclusions of 1960 and 1970: Hartford, Middlesex and Tolland Counties.

o Cleveland: The 1960 census included only Cuyahoga and Lake Counties as part of the Cleveland metropolitan area. In 1970, Geauga and Medina Counties were added, and these four counties comprised the metropolitan area for 1980 and 1990 censuses as well. In 2000, two more counties were added, Ashtabula and Lorain, although Ashtabula was withdrawn for the 2010 census.

o Miami: Miami presents an interesting case, as it is one of the few in which the political county experienced an administrative change. In 1960 and 1970, Miami, FL consisted only of Dade County, FL. In 1980, other areas were added to the metropolitan area, and in 1990 Dade County became Miami-Dade County, the sole component of the Miami metropolitan area. In 2010, Broward and Palm Beach Counties were finally included in the official metropolitan area.

o Norfolk: In 1960, the Norfolk metropolitan area consisted of Norfolk City, South Norfolk City, Portsmouth City, Virginia Beach City, Norfolk County and Princess Anne County. The 1970 census only included Norfolk City, Portsmouth City and Virginia Beach City, with the addition of Chesapeake City. The four cities included in 1970 were joined by Currituck County, NC and Suffolk city, VA in 1980. In 1990, Currituck County was excluded while Newport News-Hampton (Newport News City, Hampton City, York County, VA), Gloucester County, James City County, Poquoson city and Williamsburg city, VA were added to the previous decade's inclusions. By the 2000 census, the greater Norfolk metropolitan area included Norfolk-Portsmouth, VA (Chesapeake City, Norfolk City, Portsmouth City and Virginia Beach City), Newport News-Hampton, VA (Newport News City, Hampton City and York County), Gloucester, Isle of Wight, James City and Mathews Counties, and Poquoson, Suffolk and Williamsburg Cities, VA and Currituck County, NC. In 2010, the addition of Surry County, VA was the only change in the composition of the metropolitan area.

o San Francisco: The 1960 census included Alameda, Contra Costa, Marin, San Francisco, San Mateo and Solano Counties as part of the San Francisco Bay metropolitan area. For the 1970 census, Solano County was dropped. The 1980 census added a minimal area of "other" nearby population. The 1990 census showed a significant decrease in population in the San Francisco metropolitan area due to the exclusion of Alameda and Contra Costa Counties, the two of which totaled over two million in population that year. The same composition as 1990 kept San Francisco metropolitan population lower similarly low in 2000. In 2010, however, Alameda and Contra Costa Counties were included once more, and the total population of the metropolitan area shot back up, to 4.34 million.

o Los Angeles: The 1960 census included Los Angeles County and Orange County in the L.A. metropolitan area. While the 1970 census did not include Orange County, the total population of the metropolitan area was not greatly affected because at the time, Orange County was only a fraction of the size of Los Angeles County. However, while none of the censuses for 1980, 1990 and 2000 included Orange County as part of the Los Angeles metropolitan area, the Orange County's population grew substantially, so

that when it was finally reintroduced to the metropolitan area in the 2010 census, it's inclusion boosted the total population by approximately 30 percent, accounting for nearly all of the growth between 2000 and 2010.

   o Salt Lake City: In the 1960 census, Salt Lake County accounted for 100 percent of Salt Lake City metropolitan area. In the 1970 census, Davis County was also included in the metropolitan area. 1980 saw the addition of Weber and Tooele Counties, substantially augmenting the population increase in the metropolitan area. However, Tooele County was not included in the 1990 or the 2000 censuses, which only consisted of Salt Lake, Davis and Weber Counties. The 2010 census included Salt Lake County, Summit County and Tooele County, but *not* Davis or Weber Counties.

Due to significant changes in the county makeup of the metropolitan area on a decennial basis, the comparison is tenuous. Only broad conclusions can be made. Additional discrepancies lie in the occasional changes in naming conventions found in the historical data. The naming convention used in the large metropolitan area tables (Appendix Tables 1-3.2) is based on the names used in the 2010 census. The populations included in the table are based on published census data, with constraints as discussed above.

The names of the metropolitan areas in Appendix Tables 1-3.2 are from the 2010 census. These names, however, are not necessarily representative of the makeup of the counties in previous censuses, due to the expansion/contraction of metropolitan areas to include different counties at the times of different censuses.

Table 4: Composition of the Miami Metropolitan Area, 1960-2010

Year	Metropolitan Areas	Components	Population
1960	Miami	Dade County	935,047
1970	Miami	Dade County	1,267,792
1980	Miami-Fort Lauderdale	Dade County, Broward County	2,643,766
1990	Miami-Fort Lauderdale	Miami-Dade County, Broward County	3,192,582
2000	Miami-Fort Lauderdale	Miami-Dade County, Broward County	3,876,380
2010	Miami-Fort Lauderdale-Pompano Beach	Miami-Dade County, Broward County, Palm Beach County	5,564,635

Source:

For example, in 1960 and 1970, Miami metropolitan area consisted of just Dade County. In 1980, Miami-Fort Lauderdale was expanded to include Hialeah, FL. For 1990 and 2000, Miami-Fort Lauderdale was comprised of Miami-Dade County. A further expansion took place for the 2010 census, such that the Miami-Fort Lauderdale metropolitan area included Broward County and Palm Beach County within the newly formed Miami-Fort Lauderdale-Palm Beach metropolitan area.

When a metropolitan area extends beyond state or regional boundaries, the area is attributed to the state or region where the majority of the population of the metropolitan area resides. By selecting large metropolitan areas that exceed 1 million according to Census 2010, certain metropolitan areas can be excluded, like Palm Beach County. However, these metropolitan areas are often merged with other

large metropolitan areas by 2010, so the information is not lost. This leads to difficulty in time-series (decennial vs. decennial) comparisons.

Having addressed several country- and area-specific cases and the constraints involved therein, it is then important to consider more general issues in the large metropolitan area data. In spite of many constraints in the data, certain trends are nonetheless quite clear, and several conclusions can be drawn.

4.4   General Data Issues Affecting Large Metropolitan Areas

The growth of large metropolitan areas in the United States has not been uniform: population growth in the South and the West has surpassed that in the Northeast and the Midwest. As shown in Appendix Table 1, the Northeast had ten metropolitan areas in 1960, but only eight by 2010 and the Midwest maintained 11 metropolitan areas in all six censuses reviewed. The South had 25 metropolitan areas in 1960, but only 22 by 2010; the West had 12 metropolitan areas in 1960 and, after some fluctuation, 12 metropolitan areas again in 2010. Some of these changes came due to changing boundaries, as metropolitan areas were agglomerated.

Only New York, Chicago and Los Angeles had population levels greater than five million in 1960. The population of nine metropolitan areas exceeded this level by 2010 with Philadelphia in the Northeast, and Washington, Houston, Miami, Atlanta and Dallas-Fort Worth in the South joining this list.

For Canada, only Montreal and Toronto had populations in excess of one million in 1961. By 2011, four other areas – Vancouver, Ottawa-Gatineau, Edmonton and Calgary – were included amongst such large metropolitan areas. There were no areas with a population in excess of five million in 1961. By 2011, Toronto's population crossed that mark, with 5,583,064.

Of the areas with a population level greater than 10 million in all of the United States and Canada, only New York's population exceeded this mark in 1960. By 2010, New York's population had risen to almost 19 million while Chicago's population had grown from 6 million in 1960 to 9.5 million in 2010, a growth of 52 percent over the 50-year period.

While most metropolitan areas in the United States grew substantially over the past 50 years, there were two that saw their population decline. While the sum total population of all large metropolitan areas grew 129 percent between 1960 and 2010 and the population of the United States as a country grew 72 percent, the metropolitan areas of Buffalo-Niagara Falls and Pittsburgh, both in the Northeast, declined by 13 percent and two percent, respectively. Even more notable is that during this period Pittsburgh's land area rose from 3,051 to 5,281.5 square miles – an increase of 73 percent – and yet its population still dropped. No large metropolitan area in the three other regions of the U.S. declined in population.

In Canada, high levels of disparity are seen in population growth and decline even within a single province. Most of the change in population levels in Canada is determined by migration and immigration. The three largest cities – Toronto, ON, Montreal, QB and Vancouver, BC – have been growing much faster than the rest of the major metropolitan areas, thanks to both interprovincial and intra-provincial relocation of Canadians to these cities, as well as a strong inflow of international

immigrants (Siddiq & Babins, forthcoming). Indeed, as explained above in section 4.1, 75 percent of newly arrived immigrants in Canada have settled in one of these cities (Slack et al, 2003; Wulff and Vineberg, 2008). This exacerbates the increasing disparity between massive – and growing – metropolitan centers like Toronto, Montreal and Vancouver and the declining neighbor regions like the now-abolished district of Timiskaming, ON, or Le Rocher-Percé, QB and Stikine, BC, all of whom lost significant population during the period studied.

These trends, however, are affected by the changing definition of a metropolitan area over time, changes in the actual boundaries of metropolitan areas from one census to another, availability of data in a consistent manner and so forth. These issues are addressed in more detail in the paragraphs below.

First, metropolitan areas are often inconsistent from census to census. For example, an area may qualify as a MSA in 1990, then be merged (in category, not politically) with another MSA in 2000. The area would then only exist as a stand-alone MSA for one census. The table below demonstrates a case of high volatility, showing the frequent changes in the designated location of Orange County from one decennial census to another:

Table 5: Composition of the Los Angeles Metropolitan Area, 1960-2010

Census	Location of Orange County, CA
1960	Los Angeles-Long Beach SMSA
1970	Anaheim-Santa Ana-Garden Grove SMSA
1980	Anaheim-Santa Ana-Garden Grove SMSA
1990	Anaheim-Santa Ana PMSA
2000	Orange County PMSA
2010	Los Angeles-Long Beach-Santa Ana MSA

Source:

Second, land area considered is not consistent due to changes in measurement technology and in some cases to land being lost or reclaimed due to natural or man-made causes. In the table below, the official land area of the United States dropped from 3,548,974 square miles in 1960 to 3,531,905 square miles in 2010:

Table 6: Land Area of the United States (square miles)

Census	Land Area of the United States of America
1960	3,548,974 square miles
1970	3,536,855 square miles
1980	3,539,289 square miles
1990	3,536,338 square miles
2000	3,537,438 square miles
2010	3,531,905 square miles

Source: Appendix Table 2

Third, there is no clearly defined standard for a *metropolitan area*, therefore alternative characterizations of metropolitan areas evolved, such as metropolitan statistical areas, standard metropolitan statistical areas and primary metropolitan statistical areas (PMSA). These alternative characterizations had to be carefully considered. For example, the PMSA does not perfectly match the definition of a metropolitan area in the traditional sense, because it requires a minimum population of one million. It is, however, only one criterion removed from CMAs, as opposed to consolidated

metropolitan statistical areas (CMSAs), which not only have to reach a minimum population of one million, but also need to be composed of PMSA. The different standardizations of metropolitan areas as defined by the US Census Bureau are given below:

> A *Consolidated Metropolitan Statistical Area* (CMSA), or "an area that meets the requirements to qualify as an MSA and also has a population of one million or more becomes a CMSA if component parts of the area are recognized as PMSAs."

> A *Primary Metropolitan Statistical Area* (PMSA) is "a subarea [that] may be defined within an area that meets the requirements to qualify as an MSA and also has a population of one million or more. The definition of these subareas…requires meeting specified statistical criteria and having the support of local opinion. A PMSA consists of a large urbanized county or a cluster of counties (cities and towns in New England) that demonstrate strong internal economic and social links in addition to close ties with the central core of the larger area."

> The relationship between CMSAs and PMSAs is as follows: "Upon the recognition of PMSAs, the entire area of which they are parts becomes a CMSA. All territory within a CMSA is also within some PMSA." [14]

The components of Canadian census metropolitan areas are too small to meet the minimum criteria for consolidated metropolitan statistical areas. For example in 2011, the largest census subdivisions for the three largest CMAs were:

Table 7: Components of Canadian Census Metropolitan Areas in Toronto, Montreal and Vancouver (2011)

Geographic Area	Population
Toronto	5,583,064
City of Toronto	2,615,060
County of Mississauga	713,443
Montreal	3,824,221
City of Montreal	1,649,519
City of Laval	401,553
Vancouver	2,313,328
County of Vancouver	603,502
County of Surrey	468,251

Source:

Fourth, inconsistent availability of online information impedes the collection of data in a systematic manner. The 1980 census is barely legible online. For example, *Volume I Characteristics of the Population: U.S. Summary Chapter A Number of Inhabitants* (Tables 1-13) is not available on the 1980 Census of Population and Housing publication page of the US Census Board website. Chapter A is available elsewhere online; however, the source document was poorly scanned. Information must therefore be retrieved from the physical census books.

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[14] http://www.census.gov/geo/www/GARM/Ch13GARM.pdf Metropolitan Areas, Classification of Metropolitan Areas, Chapter 13

Finally, the definitions of the metropolitan areas change with each census, thereby changing the boundaries (US Census Bureau, 1999). There were eleven such changes in the application of definitions between November 1960 and June 2010.

Notwithstanding the above, certain conclusions can still be made about the regional growth in the size of metropolitan areas with reasonable accuracy. Appendix Table shows that the combined size of large metropolitan areas in each of the four US regions and in Canada grew quite substantially over the 50-year period. The growth, however, from decade to decade and from region to region has not been uniform. In the Northeast the combined populations grew from 26 million to 37 million, a growth of 41 percent; in the Midwest from 20 million to 32 million, a growth of 57 percent; in the South from 17 million to 56 million, a growth of 228 percent; and in the West from 17 million to 44 million, a growth of 166 percent. For Canada, the growth of the large metropolitan areas was from six million to 15 million, a growth of 166 percent. The population of the large metropolitan areas in the South have grown much more rapidly compared to the others regions, especially the Northeast and the Midwest. Perhaps more significant is the fact that whereas in 1960 the Northeast and the Midwest led the other two regions in the size of their combined large metropolitan populations, by 2010 it was the South that led the way followed by the West, the Northeast and the Midwest.

For the United States as whole, the proportion of the population living in large metropolitan areas grew from 45 percent in 1960 to 55 percent in 2010. For Canada, the growth of the large metropolitan areas was even more impressive with the proportion growing from 32 percent of the Canadian population in 1961 to 46 percent in 2011. These trends must be explained, but it is clear that an increasing proportion of the population in both countries, almost one-half in Canada and more than one-half in the United States, are occupying a small fraction of the land area in each of the two countries.

4.5   Alternative Approaches to the Study of Population Volatility in Metropolitan Areas in Canada and the U.S.

The numerous data constraints explored above demonstrate that, while the most head-on way to approach the problem, an analysis of population changes in metropolitan areas is fraught with discrepancies thanks to continually changing boundaries and criteria. One alternative way of addressing the issue of changing boundaries of metropolitan areas is to look closely at the population density to explore the magnitude of rising and falling densities over time. As noted in section 4.1's subsection "Data Constraints," even a comparison of population densities can be affected by changing boundaries over time, if more or fewer dispersed populations far away from a metropolitan core are included in the analysis.

This approach is only reasonable then, if the areas in question do not change substantially from one census to another, as changing geographic boundaries would dilute the measurement of densities over time. The greater the change in the land area of a jurisdiction over time, the less reliable the calculated change in density measure, so for the purposes of this study, if the size of the area expanded or contracted by more than 20 percent between two censuses, the change in density was classified as not sufficiently reliable. This provides a reasonable degree of accuracy in drawing conclusions about trends in density of jurisdictions that have not undergone a significant change in size.

Before exploring trends in density of metropolitan areas over time, it might be helpful to look at the density issue for each census from 1960 to 2010.

Population density data for Canadian metropolitan areas was analysed in section 4.1. In the U.S., regional trends emerged. In 1960, the combined large metropolitan areas in the Northeast (1,834.5/sq. mi) were the most densely populated followed by the Midwest (1,224.7/sq. mi), the South (518.9/sq. mi) and the West (231.5/sq. mi). This pattern has continued for each successive census, but the gap has narrowed substantially such that by 2010, the densities in the Northeast (1,329.9/sq. mi) and Midwest (615.5/sq. mi) had fallen while the densities in the South (538.4/sq. mi) and West (441.8/sq. mi) had risen. These figures, however, mask the continued growth in the land area of the large metropolitan areas in all four regions. The total land area of metropolitan areas in the Northeast grew from 14,251 square miles in 1960 to 27,653 square miles in 2010. From 1960 to 2010, total metropolitan land area grew from 16,633 to 52,013 square miles in the Midwest; from 32,823 to 103,737 square miles in the South; and from 71,476 to 99,477 square miles in the West.

This shows that the land mass that constituted the large metropolitan areas in all regions continued to grow in size with each successive census. As was the case with the expansion of Canadian metropolitan areas, the true population density was diluted because the nature of metropolitan areas is for population density to be greater in the nucleus.

It is then clearly established that the difficulty associated with the changing boundaries of the large metropolitan areas from one census to another makes the comparison of population trends over time problematic. While comparing population densities over time is helpful because it removes the issue of changing boundaries, here, again, significant changes in land area between censuses tends to alter the true characteristics of the metropolitan area.

An alternative approach, at least in the United States, is to look at the large counties within metropolitan areas. Since the county boundaries are political boundaries, operating as branches of the state governments, and not arbitrary categorizations drawn for the sake of data collection, they change much less frequently and much less drastically than the boundaries of metropolitan areas (National Association of Counties, 2013).

There were 41 counties in the United States that had reached a population of one million by 2010 or in a previous census. Of these counties, 10 were in the Northeast (one in Massachusetts, two in Pennsylvania and seven in New York), seven in the Midwest (one each in Illinois, Minnesota and Missouri, and two each in Michigan and Ohio), 11 in the South (five each in Florida and Texas, and one in Virginia) and 13 in the West (one each in Arizona, Nevada, Utah and Washington, and nine in California). Seven of the 41 counties were in the New York-Northern New Jersey-Long Island metropolitan area, two were in the Detroit-Warren-Livonia metropolitan area, three in Miami-Fort Lauderdale-Miami Beach, two in Dallas-Fort Worth-Arlington, two in Los Angeles-Long Beach-Santa Ana and two in Riverside-San Bernardino-Ontario. The remaining 23 counties fell within 23 metropolitan areas, one in each. The details of this distribution along with the decennial census population and growth rates over the period 1960-2010 are presented in Appendix Table 5.

The large metropolitan counties in the Northeast and the Midwest grew five and four percent respectively between 1960 and 2010. This growth appears paltry in comparison to that in the South and the West, regions which grew 216 and 163 percent respectively over the same period. Analysis at the

county level reflects highly volatile changes and regional trends: five of the largest 10 counties in the Northeast and two of seven in the Midwest lost population while even the counties registering the least growth more than doubled in the South and grew by over 60 percent in the West. Such massive regional differences deserve to be considered in detail.

These changes in population show unambiguously that not only are the South and the West growing much more quickly than the Northeast and the Midwest, a phenomenon that has been previously documented, but within these regions there are significant areas of decline in large metropolitan areas in the Northeast and the Midwest. These declines have most notably affected the metropolitan areas of Pittsburgh and Philadelphia in the Northeast and Detroit and Cleveland in the Midwest.

5.0 Summary and Conclusion

While comparing data from different data collection systems in different countries is no easy task, the importance of a comparison of population trends in Canada and the U.S. lies in the identification of commonalities and differences. Canada and the U.S., while sharing many common attributes such as a similar history, culture and level of development, are also divided in the important aspects of geography/climate, population and land magnitude, and politics. Accordingly, this study aims to provide a thoroughly comprehensive analysis of the dynamics of population trends in Canada and the United States.

Much of the existing literature concerning population dynamics in Canada emphasizes a phenomenon that could be described as a zero-sum population game. Canada's natural population growth is no longer strongly positive, and so the country relies on a welcome stream of immigrants to maintain economic momentum. This national-level story, however, masks significant regional disparities. In fact, immigration is highly concentrated in Toronto, Montreal, Vancouver and other major metropolitan areas that also receive internal migrants from other parts of Canada. This means that while a few metropolitan areas enjoy growing populations of educated young people, more remote, non-metropolitan areas suffer from declining populations and economies. As immigrants and migrants move to metropolitan areas, those that can afford it often move to surrounding hinterlands: increasing suburban growth is also an important phenomenon observed in many Canadian cities.

The United States' population is larger and more diverse than that of Canada, and as the Brookings Institute expressed, its metropolitan areas cannot be easily grouped. They created a classification system of U.S. metropolitan areas based on growth, education and diversity levels, and found that geography sometimes, but by no means always, played a role. Nonetheless, several regional trends did emerge in much of the existing literature. The Northeastern and Midwestern megalopolises were observed losing significant population, but remain significant population centers, nonetheless. New population centers emerged in the West, which, along with the south may have benefited from more appealing climate in some areas.

The idea of migration from Snowbelt to Sunbelt, while disputed, highlights an important increase in the importance of perceived quality of life to U.S. migrants. Another reflection of this was the increasing trend of suburbanization that, as it did in Canada, reshaped metropolitan areas. Some literature found that as retirees moved to non-metropolitan areas, families moved to suburbs and young adults flocked to metropolitan centers, seeking economic opportunities. Economic opportunities were a strong incentive of migration within the United States in cases of regional economic decline; on the other hand, in cases of national economic slump, migration decreased as people sought to conserve their resources.

Canada and the United States differ in several aspects, the most important being the differences in the magnitude of the countries' land area and population. Canada's physical territory is much more extensive, but much of it is too remote to host thriving communities on a large scale – its relatively small population tends to cluster around the country's southern border. On the other hand, the United States has less physical territory, but a larger population spread out over a range of more hospitable climates. In spite of these differences, to some extent both countries exhibit core-periphery relationships; strong population growth in metropolitan areas, much of which is suburban growth; concentrated immigration in gateway cities; and often age-related internal migration.

A fresh and comparative analysis of Canadian and U.S. censuses revealed similar trends. Both the population and the percentage of national population increased drastically in Canadian and U.S. metropolitan areas. At the same time, the land area of metropolitan areas in both countries grew significantly, reflecting previously mentioned trends of suburbanization. The United States experienced strong growth in newer metropolitan areas, especially in the South and West, and slower growth or even decline in older metropolitan areas in the Northeast and Midwest. In Canada, though such regional trends are not as strong, newer metropolitan areas such as Calgary have experienced faster growth than long-time population hubs like Montreal.

These trends have been identified after accounting for a number of constraints. Of course, the comparison between Canadian and U.S. census data was made as accurate as possible, but nonetheless, accuracy can be affected by changing definitions, changing physical boundaries, and inconsistencies in data from one census to another.

Both countries define metropolitan areas in similar terms: a core population center of at least 50,000 residents, and the surrounding hinterlands or suburbs that provide both workers to jobs in the core and jobs to core residents. The countries differ, however, in that they have not adopted a uniform method of dividing the geography and its population data; that is to say, the two countries present different geographical building blocks.

Statistics Canada breaks the geography down into Census Metropolitan Areas (CMAs), Census Agglomerations (CAs), Metropolitan-Influenced Zones (MIZs), and non-MIZs. The US Census Bureau, on the other hand, breaks the geography into two categories – Core Based Statistical Area and Outside Core Based Statistical Area – of which one, Core Based Statistical Area, can be further categorized as either a

Metropolitan Statistical Area or a Micropolitan Statistical Area, depending on the size of its population center.

Some categories can be more easily compared while others are relatively incomparable. Statistics Canada's CMA can be roughly compared with the US Census Bureau's Metropolitan Statistical Area and Canada's CA with the U.S.'s Micropolitan Statisitical Area. The U.S. does not differentiate between Outside CBSAs that are and are not influenced by nearby metropolitan areas, however, largely due to the fact that it lacks the vast almost entirely uninhabited tracts of land featured in Canada's northern territories. As a result, comparisons are more difficult between the two countries for MIZs and non-MIZs with Outside CBSAs.

Even after correction for data constraints stemming from international systemic differences, additional problems can arise within a single country from discrepancies in data collection over time. Changing boundaries and other inconsistencies from census to census can make time-series comparison difficult, even regarding a single metropolitan area.

Regardless of the variety of constraints on the comparison of data in this study, several trends stand out in the analysis. Increasing metropolitanization took place in both countries between 1960/1961 and 2010/2011. Canada transforming from a country in which a majority of residents lived in non-metropolitan areas to one in which 70 percent of the population lived in metropolitan areas, and the percent of the U.S. population living in metropolitan areas rose from 63 percent in 1960 to 84 percent in 2010. What's more, extensive suburban sprawl changed the shape of metropolitan areas in Canada and the U.S. over the period studied – and indeed, most of the post-war period – as the land area of many metropolitan areas increased with almost every census.

In spite of these significant and important findings, other methods of comparative analysis should be considered in an effort to reduce the number of data constraints. An analysis of population densities is one possible method, but its accuracy is hindered by many of the same problems as those that arise in the comparison of population size. For time series comparisons, a study of large metropolitan counties affords an analysis relatively free from limitations caused by changing boundaries, because county boundaries change very little, and when they do change, these changes are generally very minimal. While this method does drastically improve the accuracy of time-series comparison, unfortunately, it is only applicable to a study of the United States.

Appendix Table 1: Population of Large Metropolitan Areas in the United States (1960 - 2010) and in Canada (1961 - 2011)

Geographic Area	Population						Growth rate (%)					
	1960	1970	1980	1990	2000	2010	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2010	1960 - 2010
Northeast - large metro area	26,143,258	28,566,658	27,743,168	29,442,873	33,276,652	36,774,204	9	(3)	6	13	11	41
Boston, MA	2,589,301	2,753,700	2,763,357	2,870,669	3,406,829	4,552,402	6	0	4	19	34	76
Buffalo, NY	1,306,957	1,349,211	1,242,826	968,532	1,170,111	1,135,509	3	(8)	(22)	21	(3)	(13)
Hartford, CT	525,207	663,891	726,114	767,841	1,183,110	1,212,381	26	9	6	54	2	131
Middlesex, NJ	-	-	-	1,019,835	1,169,641	-	N/A	N/A	N/A	15	N/A	N/A
Monmouth-Ocean, NJ	-	-	-	986,327	1,126,217	-	N/A	N/A	N/A	14	N/A	N/A
Nassau-Suffolk, NY	-	-	2,605,813	2,609,212	2,753,913	-	N/A	N/A	0	6	N/A	N/A
New York, NY	10,694,633	11,571,899	9,120,346	8,546,846	9,314,235	18,897,109	8	(21)	(6)	9	103	77
Newark, NJ	1,689,420	1,856,556	1,965,969	1,824,321	2,032,989	-	10	6	(7)	11	N/A	N/A
Passaic, NJ	1,186,873	1,358,794	447,585	1,278,440	1,373,167	-	14	(67)	186	7	N/A	N/A
Philadelphia, PA-NJ	4,342,897	4,817,914	4,716,818	4,856,881	5,100,931	5,965,343	11	(2)	3	5	17	37
Pittsburgh, PA	2,405,435	2,401,245	2,263,894	2,056,705	2,358,695	2,356,285	(0)	(6)	(9)	15	(0)	(2)
Providence, RI-MA	816,148	910,781	919,216	654,854	1,188,613	1,600,852	12	1	(29)	82	35	96
Rochester, NY	586,387	882,667	971,230	1,002,410	1,098,201	1,054,323	51	10	3	10	(4)	80
Midwest - large metro areas	20,371,124	24,027,526	24,813,166	24,958,332	29,696,958	32,015,654	18	3	1	19	8	57
Chicago, IL	6,220,913	6,978,947	7,103,624	6,069,974	8,272,768	9,461,105	12	2	(15)	36	14	52
Cincinnati, OH-KY	1,071,624	1,384,851	1,401,491	1,452,645	1,646,395	2,130,151	29	1	4	13	29	99
Cleveland, OH	1,796,595	2,064,194	1,898,825	1,831,122	2,250,871	2,077,240	15	(8)	(4)	23	(8)	16
Columbus, OH	682,962	916,228	1,093,316	1,377,419	1,540,157	1,836,536	34	19	26	12	19	169
Detroit, MI	3,762,360	4,199,931	4,353,413	4,382,299	4,441,551	4,296,250	12	4	1	1	(3)	14
Grand Rapids, MI	363,187	539,225	601,680	688,399	1,088,514	774,160	48	12	14	58	(29)	113
Indianapolis, IN	697,567	1,109,882	1,166,575	1,249,822	1,607,486	1,756,241	59	5	7	29	9	152
Kansas City, MO-KS	1,039,493	1,253,916	1,327,106	1,566,280	1,776,062	2,035,334	21	6	18	13	15	96
Milwaukee, WI	1,194,290	1,403,688	1,397,143	1,432,149	1,500,741	1,555,908	18	(0)	3	5	4	30
Minneapolis-St. Paul, MN	1,482,030	1,813,647	2,113,533	2,464,124	2,968,806	3,279,833	22	17	17	20	10	121
St. Louis, MO	2,060,103	2,363,017	2,356,460	2,444,099	2,603,607	2,812,896	15	(0)	4	7	8	37
South - large metro areas	17,030,611	22,995,051	29,954,409	37,640,125	47,218,048	55,847,435	35	30	26	25	18	228
Atlanta, GA	1,017,188	1,390,164	2,029,710	2,833,511	4,112,198	5,268,860	37	46	40	45	28	418
Austin, TX	212,136	295,516	536,688	781,572	1,249,763	1,716,289	39	82	46	60	37	709
Baltimore, MD	1,727,023	2,070,670	2,174,023	2,382,172	2,552,994	2,710,489	20	5	10	7	6	57
Birmingham, AL	634,864	739,274	847,487	907,810	921,106	1,128,047	16	15	7	1	22	78
Charlotte, NC	272,111	409,370	637,218	1,162,093	1,499,293	1,758,038	50	56	82	29	17	546
Dallas, TX	1,083,601	1,555,950	2,974,805	2,553,362	3,519,176	6,371,773	44	91	(14)	38	81	488
Fort Lauderdale, FL	333,946	620,100	1,018,200	1,255,488	1,623,018	-	86	64	23	29	N/A	N/A
Fort Worth, TX	573,215	762,086	-	1,332,053	1,702,625	-	33	N/A	N/A	28	N/A	N/A
Greensboro, NC	246,520	603,895	827,252	942,091	1,251,509	723,801	145	37	14	33	(42)	194

Geographic Area	Population						Growth rate (%)					
	1960	1970	1980	1990	2000	2010	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2010	1960 - 2010
Houston, TX	1,243,158	1,985,031	2,905,353	3,301,937	4,177,646	5,946,800	60	46	14	27	42	378
Jacksonville, FL	455,411	528,865	737,541	906,727	1,100,491	1,345,596	16	39	23	21	22	195
Louisville, KY-IN	725,139	826,553	906,152	952,662	1,025,598	1,283,566	14	10	5	8	25	77
Memphis, TN	627,019	770,120	913,472	981,747	1,135,614	1,316,100	23	19	7	16	16	110
Miami, FL	935,047	1,267,792	1,625,781	1,937,094	2,253,362	5,564,635	36	28	19	16	147	495
Nashville, TN	399,743	541,108	850,505	985,026	1,231,311	1,589,934	35	57	16	25	29	298
New Orleans, LA	868,480	1,045,809	1,187,073	1,238,816	1,337,726	1,167,764	20	14	4	8	(13)	34
Norfolk, VA	578,507	680,600	806,951	1,396,107	1,569,541	1,671,683	18	19	73	12	7	189
Oklahoma City, OK	511,833	640,889	834,088	958,839	1,083,346	1,252,987	25	30	15	13	16	145
Orlando, FL	318,487	428,003	700,055	1,072,748	1,644,561	2,134,411	34	64	53	53	30	570
Raleigh, NC	169,082	228,453	531,167	735,480	1,187,941	1,130,490	35	133	38	62	(5)	569
Richmond, VA	408,494	518,319	632,015	865,640	996,512	1,258,251	27	22	37	15	26	208
San Antonio, TX	687,151	864,014	1,071,954	1,302,099	1,592,383	2,142,508	26	24	21	22	35	212
Tampa, FL	772,453	1,012,594	1,569,134	2,067,959	2,395,997	2,783,243	31	55	32	16	16	260
Washington, DC-MD-VA	2,001,897	2,861,123	3,060,922	3,923,574	4,923,153	5,582,170	43	7	28	25	13	179
West Palm Beach, FL	228,106	348,753	576,863	863,518	1,131,184	-	53	65	50	31	N/A	N/A
West - large metro areas	16,545,995	21,385,258	25,769,302	31,797,370	38,459,782	43,948,083	29	21	23	21	14	166
Anaheim, CA	-	1,420,386	1,932,709	2,410,556	-	-	N/A	36	25	N/A	N/A	N/A
Denver, CO	929,383	1,227,529	1,620,902	1,622,980	2,109,282	2,543,482	32	32	0	30	21	174
Las Vegas, NV	127,016	273,288	463,087	741,459	1,563,282	1,951,269	115	69	60	111	25	1,436
Los Angeles, CA	6,742,696	7,032,075	7,477,503	8,863,164	9,519,338	12,828,837	4	6	19	7	35	90
Oakland, CA	-	-	-	2,082,914	2,392,557	-	N/A	N/A	N/A	15	N/A	N/A
Santa Ana, CA	-	-	-	-	2,846,289	-	N/A	N/A	N/A	N/A	N/A	N/A
Phoenix, AZ	663,510	967,522	1,509,052	2,122,101	3,251,876	4,192,887	46	56	41	53	29	532
Portland, OR-WA	821,897	1,009,129	1,242,594	1,239,842	1,918,009	2,226,009	23	23	(0)	55	16	171
San Bernardino-Riverside, CA	809,782	1,143,146	1,558,182	2,588,793	3,254,821	4,224,851	41	36	66	26	30	422
Sacramento, CA	502,778	800,592	1,014,002	1,481,102	1,628,197	2,149,127	59	27	46	10	32	327
Salt Lake City, UT	383,035	557,635	936,255	1,072,227	1,333,914	1,124,197	46	68	15	24	(16)	193
San Diego, CA	1,033,011	1,357,854	1,861,846	2,498,016	2,813,833	3,095,313	31	37	34	13	10	200
San Francisco, CA	2,783,359	3,109,519	3,250,630	1,603,678	1,731,183	4,335,391	12	5	(51)	8	150	56
San Jose, CA	642,315	1,064,714	1,295,071	1,497,577	1,682,585	1,836,911	66	22	16	12	9	186
Seattle, WA	1,107,213	1,421,869	1,607,469	1,972,961	2,414,616	3,439,809	28	13	23	22	42	211
Large Metropolitan Areas	80,090,988	96,974,493	108,280,045	123,838,700	148,651,440	168,585,376	21	12	14	20	13	110
Other Metropolitan Areas	32,794,190	42,444,318	61,150,578	80,101,998	83,928,500	89,732,387	29	44	31	5	7	174
Total Metropolitan Areas	112,885,178	139,418,811	169,430,623	203,940,698	232,579,940	258,317,763	24	22	20	14	11	129
Rest of US	66,437,997	63,816,487	57,115,182	44,769,175	48,841,966	50,427,775	(4)	(11)	(22)	9	3	(24)
Total United States	179,323,175	203,235,298	226,545,805	248,709,873	281,421,906	308,745,538	13	11	10	13	10	72
Canada - large metros	5,770,535	7,955,134	9,062,600	11,475,348	13,508,515	15,331,645	38	14	27	18	13	166

Geographic Area	Population						Growth rate (%)					
	1960	1970	1980	1990	2000	2010	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2010	1960 - 2010
Montréal, QC	2,109,509	2,743,208	2,828,300	3,213,207	3,507,424	3,824,221	30	3	14	9	9	81
Ottawa - Gatineau, ON/QC	429,750	602,510	718,000	952,153	1,102,911	1,236,324	40	19	33	16	12	188
Vancouver, BC	790,165	1,082,352	1,268,100	1,648,733	2,076,098	2,313,328	37	17	30	26	11	193
Toronto, ON	1,824,481	2,628,043	2,998,700	4,036,287	4,883,834	5,583,064	44	14	35	21	14	206
Edmonton, AB	337,568	495,702	656,900	856,266	961,475	1,159,869	47	33	30	12	21	244
Calgary, AB	279,062	403,319	592,600	768,702	976,773	1,214,839	45	47	30	27	24	335
Large CMAs	5,770,535	7,955,134	9,062,600	11,475,348	13,508,515	15,331,645	38	14	27	18	13	166
Other CMAs	2,393,451	3,919,619	4,596,344	5,190,012	5,788,411	7,791,796	64	17	13	12	35	226
Total CMAs	8,163,986	11,874,753	13,658,944	16,665,360	19,296,926	23,123,441	45	15	22	16	20	183
Non-CMAs	10,074,014	10,087,246	11,161,449	11,366,034	11,724,325	10,353,247	0	11	2	3	(12)	3
Total Canada	18,238,000	21,961,999	24,820,393	28,031,394	31,021,251	33,476,688	20	13	13	11	8	84

Notes:

Naming convention: Since the names & components of the metropolitan areas changed over the six censuses. The most frequent name was selected. Large metropolitan area names are simplified to reflect the largest central city. The exception was Passaic, NJ.

Sources:
CANADA
1991 Census
 Statistics Canada. Table 051-0022 - Estimates of population, census divisions and census metropolitan areas, 1991 census boundaries, annual (persons) (table), CANSIM (database), , Using E-STAT (distributor).
http://estat.statcan.gc.ca/cgi-win/cnsmcgi.exe?Lang=E&EST-Fi=EStat/English/CII_1-eng.htm

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2011 Census
Statistics Canada. 2012. Population and dwelling counts, for census metropolitan areas, 2011 and 2006 censuses (table). Population and Dwelling Count Highlight Tables. 2011 Census.
Statistics Canada Catalogue no. 98-310-XWE2011002. Released February 8, 2012.

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1961 Census
Table 10. Population of census metropolitan areas and components parts, 1961, 1956, 1951 (areas of 1961)

1971 Census
Canadian Census 1971 Profile Tables - Tract Level

1981 Census
 Statistics Canada. Table 051-0030 - Estimates of population, census divisions and census metropolitan areas (component method), 1981 census boundaries, annual (persons) (table), CANSIM (database), , Using E-STAT (distributor).

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2001 Census
Statistics Canada. Table 051-0034 - Total population, census divisions and census metropolitan areas, 2001 Census boundaries, annual (persons) (table), CANSIM (database), , Using E-STAT (distributor).
http://estat.statcan.gc.ca/cgi-win/cnsmcgi.exe?Lang=E&EST-Fi=EStat/English/CII_1-eng.htm

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UNITED STATES
1960 Census
Table 34 – Land area and population per square mile, for standard metropolitan statistical areas of the united and the commonwealth of Puerto Rico: 1960

Census of Population - 1 – Part 1 – United States Summary [US1 CM120-6OC26], United States Summary – Number of Inhabitants

Table 12 - Area, 1960, and population per square mile, by regions, divisions, and states, and for the commonwealth of Puerto Rico, 1910 to 1960

Table 31 - Population of Standard Metropolitan Statistical Areas and Component Areas in the United States and the Commonwealth of Puerto Rico: 1940 to 1960

Table 18 - Population of the United States by Type of Residence, by Regions, Divisions, and States, 1960

1970 Census
Table 32 - Population of Standard Metropolitan Statistical Areas: 1950 to 1970

Table 35 - Land Area and Population per Square Mile of Standard Metropolitan Statistical Areas: 1970

Table 8 - Population of the United States and Puerto Rico: 1790 to 1970
Table 11 - Area, 1970, and Population per Square Mile, 1920 to 1970

1980 Census
Table 30 Land Area, Population, and Population Density for Standard Metropolitan Statistical Areas (SMSA's): 1960 to 1980, p. 1-184 to 1-222

Table 11 Area, 1980, and Population Density, 1960 to 1980

1990 Census
Table 2 Land Area, Population, and Density for Metropolitan Areas: 1990
http://www.census.gov/population/www/censusdata/files/90den_ma.txt
Table 1 Land Area, Population, and Density for States and Counties: 1990

http://www.census.gov/population/www/censusdata/files/90den_stco.txt

2000 Census
1 GCT-PH1-R-Geography-United States: Population, Housing Units, Area, and Density (geographies ranked by total population): 2000 - Geography: State -- County - United States
http://www.census.gov/population/www/censusdata/density.html
2 GCT-PH1-Geography-United States: Population, Housing Units, Area, and Density: 2000 - United States -- Region, Division, and States; and Puerto Rico

2010 Census
GCT-PH1-Geography-United States: Population, Housing Units, Area, and Density: 2010 - United States -- Metropolitan Statistical Area; and for Puerto Rico

Table 1: Population change for the United States, Regions, States, and Puerto Rico: 2000 to 2010

http://www.census.gov/prod/cen2010/briefs/c2010br-01.pdf
2010 Census State Area Measurements and Internal Point Coordinates
http://www.census.gov/geo/www/2010census/statearea_intpt.html

Appendix Table 2: Large Metropolitan Area Land Area in Square Miles in the United States (1960 - 2010) and in Canada (1961 - 2011)

Geographic Areas (N1)	Land Area in Square Miles						Growth rate (%)					
	1960(N2)	1970 (N3)	1980 (N4)	1990 (N5)	2000 (N6)	2010 (N7)	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2010	1960 - 2010
Northeast - large	14,251	16,110	17,894	20,479	24,804	27,653	13	11	14	21	11	94
Rochester, NY	673	2,315	2,936	2,932	3,426	2,928	244	27	(0)	17	(15)	335
Boston, MA	969	987	1,238	1,760	2,022	3,487	2	25	42	15	72	260
New York, NY	2,149	2,137	1,382	1,148	1,142	6,687	(1)	(35)	(17)	(1)	486	211
Hartford, CT	514	672	1,033	1,074	1,677	1,515	31	54	4	56	(10)	195
Providence, RI-MA	634	680	757	612	1,141	1,587	7	11	(19)	87	39	150
Pittsburgh, PA	3,051	3,049	3,054	3,400	4,626	5,281	(0)	0	11	36	14	73
Philadelphia, PA-NJ	3,549	3,553	3,532	3,518	3,855	4,602	0	(1)	(0)	10	19	30
Buffalo, NY	1,587	1,590	1,572	1,045	1,567	1,565	0	(1)	(34)	50	(0)	(1)
Newark, NJ	698	701	1,005	1,220	1,578	-	0	43	21	29	(100)	(100)
Passaic, NJ	427	426	187	419	419	-	(0)	(56)	124	0	(100)	(100)
Middlesex, NJ	-	-	-	1,046	1,044	-	N/A	N/A	N/A	(0)	(100)	N/A
Monmouth-Ocean, NJ	-	-	-	1,108	1,108	-	N/A	N/A	N/A	0	(100)	N/A
Nassau-Suffolk, NJ	-	-	1,198	1,198	1,199	-	N/A	N/A	-	0	(100)	N/A
Midwest - large	16,633	25,774	32,660	34,889	43,752	52,013	55	27	7	25	19	213
Indianapolis, IN	402	3,072	3,077	3,071	3,523	3,854	664	0	(0)	15	9	859
Columbus, OH	537	1,492	2,462	3,579	3,141	3,967	178	65	45	(12)	26	639
Cincinnati, OH-KY	730	2,149	2,139	2,125	3,342	4,392	194	(0)	(1)	57	31	502
Kansas City, MO-KS	1,642	2,768	3,332	4,988	5,406	7,827	69	20	50	8	45	377
Grand Rapids, MI	862	1,420	1,429	1,422	2,758	2,785	65	1	(0)	94	1	223
Cleveland, OH	688	1,519	1,520	1,512	2,707	1,997	121	0	(1)	79	(26)	190
Minneapolis-St. Paul, MN	2,111	2,108	4,609	5,051	6,063	6,027	(0)	119	10	20	(1)	186
St. Louis, MO	3,187	4,119	4,968	5,331	6,392	8,623	29	21	7	20	35	171
Detroit, MI	1,965	1,952	3,939	4,466	3,897	3,888	(1)	102	13	(13)	(0)	98
Chicago, IL	3,714	3,719	3,724	1,884	5,062	7,197	0	0	(49)	169	42	94
Milwaukee, WI	795	1,456	1,461	1,460	1,460	1,455	83	0	(0)	(0)	(0)	83
South - large	32,823	47,076	69,100	74,871	87,646	103,736	43	47	8	17	18	216
Nashville, TN	532	1,609	4,060	4,073	4,073	5,689	202	152	0	(0)	40	969
Richmond, VA	726	1,196	2,137	2,945	2,944	5,685	65	79	38	(0)	93	683
Memphis, TN	751	1,363	2,308	2,303	3,006	4,578	81	69	(0)	31	52	510
San Antonio, TX	1,247	1,960	2,516	2,520	3,326	7,313	57	28	0	32	120	486
Charlotte, NC	542	1,169	1,524	3,379	3,377	3,085	116	30	122	(0)	(9)	469
Houston, TX	1,711	6,285	6,752	5,322	5,920	8,827	267	7	(21)	11	49	416
Atlanta, GA	1,723	1,728	4,342	5,122	6,124	8,339	0	151	18	20	36	384
Birmingham, AL	1,118	2,718	3,369	3,982	3,187	5,280	143	24	18	(20)	66	372
Louisville, KY-IN	908	908	1,402	2,266	2,072	4,111	-	54	62	(9)	98	353
Austin, TX	1,015	1,012	2,804	2,792	4,224	4,220	(0)	177	(0)	51	(0)	316

Geographic Areas (N1)	Land Area in Square Miles						Growth rate (%)					
	1960(N2)	1970 (N3)	1980 (N4)	1990 (N5)	2000 (N6)	2010 (N7)	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2010	1960 - 2010
Jacksonville, FL	777	766	3,220	2,636	2,635	3,201	(1)	320	(18)	(0)	21	312
Norfolk, VA	667	682	1,344	1,685	2,348	2,630	2	97	25	39	12	294
Washington, DC-MD-VA	1,485	2,353	2,810	3,967	6,509	5,598	58	19	41	64	(14)	277
Greensboro, NC	651	2,208	3,188	3,452	3,881	1,994	239	44	8	12	(49)	206
Orlando, FL	1,237	1,215	2,558	2,538	3,491	3,478	(2)	111	(1)	38	(0)	181
New Orleans, LA	1,118	1,967	1,907	2,309	3,399	2,960	76	(3)	21	47	(13)	165
Oklahoma City, OK	2,137	2,124	3,504	4,247	4,247	5,512	(1)	65	21	(0)	30	158
Miami, FL	2,054	2,042	1,955	1,945	1,946	5,077	(1)	(4)	(1)	0	161	147
Raleigh, NC	864	858	1,552	2,016	3,489	2,118	(1)	81	30	73	(39)	145
Dallas, TX	3,653	4,508	8,326	4,471	6,186	8,928	23	85	(46)	38	44	144
Tampa, FL	1,304	1,303	2,071	2,555	2,554	2,513	(0)	59	23	(0)	(2)	93
Baltimore, MD	1,807	2,259	2,247	2,609	2,609	2,601	25	(1)	16	(0)	(0)	44
Fort Lauderdale, FL	1,218	1,219	1,211	1,209	1,205	-	0	(1)	(0)	(0)	(100)	(100)
Fort Worth, TX	1,600	1,601	-	2,497	2,918	-	0	(100)	N/A	17	(100)	(100)
West Palm Beach, FL	1,978	2,023	1,993	2,034	1,974	-	2	(1)	2	(3)	(100)	(100)
West - large	71,476	73,245	81,610	77,899	112,925	99,477	2	11	(5)	45	(12)	39
Salt Lake City, UT	764	1,061	8,541	1,618	1,617	9,555	39	705	(81)	(0)	491	1,151
Sacramento, CA	983	3,434	3,402	5,094	4,081	5,094	249	(1)	50	(20)	25	418
Denver, CO	3,665	3,660	4,646	3,761	3,761	8,346	(0)	27	(19)	(0)	122	128
San Jose, CA	1,302	1,300	1,293	1,291	1,291	2,679	(0)	(1)	(0)	(0)	108	106
Portland, OR-WA	3,657	3,650	3,653	3,743	5,028	6,684	(0)	0	2	34	33	83
Phoenix, AZ	9,226	9,155	9,127	9,204	14,573	14,566	(1)	(0)	1	58	(0)	58
Seattle, WA	4,234	4,226	4,226	4,216	4,424	5,872	(0)	-	(0)	5	33	39
Los Angeles, CA	4,842	4,069	4,070	4,060	4,061	4,848	(16)	0	(0)	0	19	0
San Bernardino-Riverside, CA	27,308	27,293	27,279	27,270	27,260	27,263	(0)	(0)	(0)	(0)	0	(0)
Las Vegas, NV	7,927	7,874	7,881	7,911	39,369	7,891	(1)	0	0	398	(80)	(0)
San Diego, CA	4,255	4,261	4,212	4,205	4,200	4,207	0	(1)	(0)	(0)	0	(1)
San Francisco, CA	3,313	2,480	2,482	1,016	1,016	2,471	(25)	0	(59)	(0)	143	(25)
Anaheim, CA	-	782	798	3,053	789	-	N/A	2	283	(74)	(100)	N/A
Oakland, CA	-	-	-	1,458	1,458	-	N/A	N/A	N/A	(0)	(100)	N/A
Total United States	3,548,974	3,536,855	3,539,289	3,536,338	3,537,438	3,531,905	(0)	0	(0)	0	(0)	(0)
United States (metro)	310,233	387,616	566,148	581,931	705,790	912,992	25	46	3	21	29	194
United States (non-metro)	3,238,741	3,149,239	2,973,141	2,954,408	2,831,649	2,618,913	(3)	(6)	(1)	(4)	(8)	(19)
Total Northeast	163,593	163,269	162,745	162,274	162,257	161,912	(0)	(0)	(0)	(0)	(0)	(1)
Northeast (metro)	35,650	41,382	54,603	61,515	65,719	70,407	16	32	13	7	7	97
Northeast (non-metro)	127,943	121,887	108,142	100,759	96,537	91,505	(5)	(11)	(7)	(4)	(5)	(28)
Total Midwest	754,485	751,824	752,093	751,519	751,426	750,523	(0)	0	(0)	(0)	(0)	(1)

Geographic Areas (N1)	Land Area in Square Miles						Growth rate (%)					
	1960(N2)	1970 (N3)	1980 (N4)	1990 (N5)	2000 (N6)	2010 (N7)	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2010	1960 - 2010
Midwest (metro)	59,328	82,951	118,197	119,079	131,337	174,637	40	42	1	10	33	194
Midwest (non-metro)	695,157	668,873	633,896	632,440	620,089	575,885	(4)	(5)	(0)	(2)	(7)	(17)
Total South	876,935	873,743	873,005	871,070	870,804	868,418	(0)	(0)	(0)	(0)	(0)	(1)
South (metro)	87,834	121,097	196,577	201,364	229,961	301,807	38	62	2	14	31	244
South (non-metro)	789,101	752,646	676,428	669,706	640,843	566,611	(5)	(10)	(1)	(4)	(12)	(28)
Total West	1,753,961	1,748,019	1,751,446	1,751,475	1,752,951	1,751,053	(0)	0	0	0	(0)	(0)
West (metro)	127,421	142,186	196,790	199,973	278,772	366,142	12	38	2	39	31	187
West (non-metro)	1,626,540	1,605,833	1,554,656	1,551,502	1,474,180	1,384,912	(1)	(3)	(0)	(5)	(6)	(15)
Canada - large metros	2,499	6,805	6,946	12,215	12,606	13,077	172	2	76	3	4	423
Montréal, QC	520	1,086	1,087	1,355	1,563	1,644	109	0	25	15	5	216
Ottawa - Gatineau, ON/QC	329	1,544	1,544	1,984	2,053	2,427	370	(0)	29	4	18	639
Vancouver, BC	499	1,076	1,076	1,076	1,111	1,113	115	(0)	0	3	0	123
Toronto, ON	799	1,445	1,445	2,156	2,279	2,280	81	(0)	49	6	0	185
Edmonton, AB	196	1,492	1,599	3,681	3,637	3,640	663	7	130	(1)	0	1,761
Calgary, AB	156	162	195	1,964	1,963	1,972	4	21	907	(0)	0	1,166
Non-CMAs	3,555,170	3,543,508	3,537,452	3,527,737	3,449,104	3,425,741	(0)	(0)	(0)	(2)	(1)	(4)
All CMAs	5,068	15,619	15,991	25,706	30,554	35,773	208	2	61	19	17	606
Total Canada	3,560,238	3,559,127	3,553,442	3,553,442	3,479,658	3,461,514	(0)	(0)	0	(2)	(1)	(3)

Notes:

1 – Naming convention: Since the names & components of the metropolitan areas changed over the six census. The most frequent name was selected. Large metropolitan area names are simplified to reflect the largest central city. The exception was Passaic, NJ.

2 – Census 1960: Metropolitan area of San Francisco-Oakland, includes Oakland; Los Angeles-Long Beach contains Orange county. Orange county includes Anaheim city. Passaic is part of the Paterson-Clifton-Passaic, NJ Metropolitan area.

3 – Census 1970: Metropolitan area of Los Angeles no longer includes Anaheim.

4 – Census 1980: Nassau-Suffolk gained Metropolitan status. Fort Worth was combined with Dallas.

5 – Census 1990: Middlesex and Monmouth-Ocean gained Metropolitan status. Large metropolitan areas show drops due to the use of PMSA data. Fort Worth became a stand-alone metro area again. San Francisco was divided into Oakland and San Francisco.

6 – Census 2000:

7 – Census 2010: Primary Metropolitan Statistical Areas were replaced with Metropolitan Divisions. Data for divisions should be used for consistency with prior year data, however, the information was not available.

Used unconsolidated amounts where available.

Recommendation:
To offset the changes, use Frey and Speare Jr.'s technique of keeping counties consistent.
UNITED STATES
1960 Census
Table 34 – Land area and population per square mile, for standard metropolitan statistical areas of the united and the commonwealth of Puerto Rico: 1960

Census of Population - 1 – Part 1 – United States Summary [US1 CM120-6OC26], United States Summary – Number of Inhabitants
Table 12 - Area, 1960, and population per square mile, by regions, divisions, and states, and for the commonwealth of Puerto Rico, 1910 to 1960
Table 31 - Population of Standard Metropolitan Statistical Areas and Component Areas in the United States and the Commonwealth of Puerto Rico: 1940 to 1960

Table 18 - Population of the United States by Type of Residence, by Regions, Divisions, and States, 1960

1970 Census
Table 32 - Population of Standard Metropolitan Statistical Areas: 1950 to 1970
Table 35 - Land Area and Population per Square Mile of Standard Metropolitan Statistical Areas: 1970
Table 8 - Population of the United States and Puerto Rico: 1790 to 1970
Table 11 - Area, 1970, and Population per Square Mile, 1920 to 1970

1980 Census
Table 30 Land Area, Population, and Population Density for Standard Metropolitan Statistical Areas (SMSA's): 1960 to 1980, p. 1-184 to 1-222
Table 11 Area, 1980, and Population Density, 1960 to 1980

1990 Census
Table 2 Land Area, Population, and Density for Metropolitan Areas: 1990
http://www.census.gov/population/www/censusdata/files/90den_ma.txt
Table 1 Land Area, Population, and Density for States and Counties: 1990
http://www.census.gov/population/www/censusdata/files/90den_stco.txt

2000 Census
1 GCT-PH1-R-Geography-United States: Population, Housing Units, Area, and Density (geographies ranked by total population): 2000 - Geography: State -- County - United States
http://www.census.gov/population/www/censusdata/density.html
2 GCT-PH1-Geography-United States: Population, Housing Units, Area, and Density: 2000 - United States -- Region, Division, and States; and Puerto Rico

2010 Census
GCT-PH1-Geography-United States: Population, Housing Units, Area, and Density: 2010 - United States -- Metropolitan Statistical Area; and for Puerto Rico

Table 1: Population change for the United States, Regions, States, and Puerto Rico: 2000 to 2010
http://www.census.gov/prod/cen2010/briefs/c2010br-01.pdf
2010 Census State Area Measurements and Internal Point Coordinates

http://www.census.gov/geo/www/2010census/statearea_intpt.html

1961 Census
Table 20 Area and Density of population for counties and census divisions, 1961

1971 Census
Census of Canada. 1976. Volume 1. Population: Geographic Distyributions.
Table 6. Population, land area and population density for census metropolitan areas and census agglomerations, urbanized core and fringe with components, 1971 and 1976

1981 Census
Statistics Canada. Catalogue 95-943 Volume 3 - Profile Series B)
Census metropolitan areas with components. Table 1: Selected Population, Dwelling, Household and Family Distributions, showing selected social and economic characteristics, for census metropolitan areas with components, 1981

1991 Census
Statistics Canada. 1991, 2A Profile, 1991 - Provinces and Territories in Canada (table), 1991 (2A) basic questionnaire, Provinces to Municipalities (database), Using E-STAT (distributor).
http://estat.statcan.gc.ca/cgi-win/cnsmcgi.exe?Lang=E&EST-Fi=EStat\English\SC_RR-eng.htm
(accessed: September 19, 2012)

2001 Census
Population Counts, Land Area, Population Density and Population Rank, for Census Metropolitan Areas and Census Agglomerations, 2001 Census - 100% Data

http://www12.statcan.ca/english/census01/products/standard/popdwell/Table-CMA-N.cfm?T=2&SR=1&S=1,1&O=A

2011 Census
Statistics Canada. 2012. Population and dwelling counts, for census metropolitan areas, 2011 and 2006 censuses (table). Population and Dwelling Count Highlight Tables. 2011 Census.
Statistics Canada Catalogue no. 98-310-XWE2011002. Released February 8, 2012.
http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/hlt-fst/pd-pl/File.cfm?T=205&SR=1&RPP=50&PR=0&CMA=0&S=3&O=D&LANG=Eng&OFT=CSV
(accessed September 19, 2012)

Appendix Table 3.1: Large Metropolitan Areas Density in the United States (1960 - 1980) and in Canada (1961 - 1981)

Geographic Area	1960			1970			1980		
	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density
Northeast - large metro area	14,251	26,143,258	1,834	16,110	28,566,658	1,773	17,894	27,743,168	1,550
Boston, MA	969	2,589,301	2,672	987	2,753,700	2,790	1,238	2,763,357	2,232
Buffalo, NY	1,587	1,306,957	824	1,590	1,349,211	849	1,572	1,242,826	791
Hartford, CT	514	525,207	1,022	672	663,891	988	1,033	726,114	703
Middlesex, NJ	-	-	-	-	-	-	-	-	-
Monmouth-Ocean, NJ	-	-	-	-	-	-	-	-	-
Nassau-Suffolk, NJ	-	-	-	-	-	-	1,198	2,605,813	2,175
New York, NY	2,149	10,694,633	4,977	2,137	11,571,899	5,415	1,382	9,120,346	6,599
Newark, NJ	698	1,689,420	2,420	701	1,856,556	2,648	1,005	1,965,969	1,956
Passaic, NJ	427	1,186,873	2,780	426	1,358,794	3,190	187	447,585	2,394
Philadelphia, PA-NJ	3,549	4,342,897	1,224	3,553	4,817,914	1,356	3,532	4,716,818	1,336
Pittsburgh, PA	3,051	2,405,435	788	3,049	2,401,245	788	3,054	2,263,894	741
Providence, RI-MA	634	816,148	1,287	680	910,781	1,339	757	919,216	1,214
Rochester, NY	673	586,387	871	2,315	882,667	381	2,936	971,230	331
Midwest - large metro areas	16,633	20,371,124	1,225	25,774	24,027,526	932	32,660	24,813,166	760
Chicago, IL	3,714	6,220,913	1,675	3,719	6,978,947	1,877	3,724	7,103,624	1,908
Cincinnati, OH-KY	730	1,071,624	1,468	2,149	1,384,851	644	2,139	1,401,491	655
Cleveland, OH	688	1,796,595	2,611	1,519	2,064,194	1,359	1,520	1,898,825	1,249
Columbus, OH	537	682,962	1,272	1,492	916,228	614	2,462	1,093,316	444
Detroit, MI	1,965	3,762,360	1,915	1,952	4,199,931	2,152	3,939	4,353,413	1,105
Grand Rapids, MI	862	363,187	421	1,420	539,225	380	1,429	601,680	421
Indianapolis, IN	402	697,567	1,735	3,072	1,109,882	361	3,077	1,166,575	379
Kansas City, MO-KS	1,642	1,039,493	633	2,768	1,253,916	453	3,332	1,327,106	398
Milwaukee, WI	795	1,194,290	1,502	1,456	1,403,688	964	1,461	1,397,143	956
Minneapolis-St. Paul, MN	2,111	1,482,030	702	2,108	1,813,647	860	4,609	2,113,533	459
St. Louis, MO	3,187	2,060,103	646	4,119	2,363,017	574	4,968	2,356,460	474
South - large metro areas	32,823	17,030,611	519	47,076	22,995,051	488	69,100	29,954,409	433
Atlanta, GA	1,723	1,017,188	590	1,728	1,390,164	805	4,342	2,029,710	468
Austin, TX	1,015	212,136	209	1,012	295,516	292	2,804	536,688	191
Baltimore, MD	1,807	1,727,023	956	2,259	2,070,670	917	2,247	2,174,023	968
Birmingham, AL	1,118	634,864	568	2,718	739,274	272	3,369	847,487	252
Charlotte, NC	542	272,111	502	1,169	409,370	350	1,524	637,218	418
Dallas, TX	3,653	1,083,601	297	4,508	1,555,950	345	8,326	2,974,805	357
Fort Lauderdale, FL	1,218	333,946	274	1,219	620,100	509	1,211	1,018,200	841
Fort Worth, TX	1,600	573,215	358	1,601	762,086	476	-	-	-
Greensboro, NC	651	246,520	379	2,208	603,895	274	3,188	827,252	260
Houston, TX	1,711	1,243,158	727	6,285	1,985,031	316	6,752	2,905,353	430

Geographic Area	1960			1970			1980		
	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density
Jacksonville, FL	777	455,411	586	766	528,865	690	3,220	737,541	229
Louisville, KY-IN	908	725,139	799	908	826,553	910	1,402	906,152	646
Memphis, TN	751	627,019	835	1,363	770,120	565	2,308	913,472	396
Miami, FL	2,054	935,047	455	2,042	1,267,792	621	1,955	1,625,781	832
Nashville, TN	532	399,743	751	1,609	541,108	336	4,060	850,505	210
New Orleans, LA	1,118	868,480	777	1,967	1,045,809	532	1,907	1,187,073	623
Norfolk, VA	667	578,507	867	682	680,600	998	1,344	806,951	600
Oklahoma City, OK	2,137	511,833	240	2,124	640,889	302	3,504	834,088	238
Orlando, FL	1,237	318,487	258	1,215	428,003	352	2,558	700,055	274
Raleigh, NC	864	169,082	196	858	228,453	266	1,552	531,167	342
Richmond, VA	726	408,494	563	1,196	518,319	433	2,137	632,015	296
San Antonio, TX	1,247	687,151	551	1,960	864,014	441	2,516	1,071,954	426
Tampa, FL	1,304	772,453	592	1,303	1,012,594	777	2,071	1,569,134	758
Washington, DC-MD-VA	1,485	2,001,897	1,348	2,353	2,861,123	1,216	2,810	3,060,922	1,089
West Palm Beach, FL	1,978	228,106	115	2,023	348,753	172	1,993	576,863	289
West - large metro areas	71,476	16,545,995	231	73,245	21,385,258	292	81,610	25,769,302	316
Anaheim, CA	-	-	-	782	1,420,386	1,816	798	1,932,709	2,422
Denver, CO	3,665	929,383	254	3,660	1,227,529	335	4,646	1,620,902	349
Las Vegas, NV	7,927	127,016	16	7,874	273,288	35	7,881	463,087	59
Los Angeles, CA	4,842	6,742,696	1,393	4,069	7,032,075	1,728	4,070	7,477,503	1,837
Oakland, CA	-	-	-	-	-	-	-	-	-
Orange County, CA	-	-	-	-	-	-	-	-	-
Phoenix, AZ	9,226	663,510	72	9,155	967,522	106	9,127	1,509,052	165
Portland, OR-WA	3,657	821,897	225	3,650	1,009,129	277	3,653	1,242,594	340
San Bernardino-Riverside, CA	27,308	809,782	30	27,293	1,143,146	42	27,279	1,558,182	57
Sacramento, CA	983	502,778	512	3,434	800,592	233	3,402	1,014,002	298
Salt Lake City, UT	764	383,035	501	1,061	557,635	526	8,541	936,255	110
San Diego, CA	4,255	1,033,011	243	4,261	1,357,854	319	4,212	1,861,846	442
San Francisco, CA	3,313	2,783,359	840	2,480	3,109,519	1,254	2,482	3,250,630	1,310
San Jose, CA	1,302	642,315	493	1,300	1,064,714	819	1,293	1,295,071	1,002
Seattle, WA	4,234	1,107,213	262	4,226	1,421,869	337	4,226	1,607,469	380
Canada - large metros	2,499	5,770,535	2,309	6,80	7,955,134	1,169	6,946	9,062,600	1,305
Montréal, QC	520	2,109,509	4,058	1,08	2,743,208	2,527	1,087	2,828,300	2,603
Ottawa - Gatineau, ON/QC	329	429,750	1,308	1,54	602,510	390	1,544	718,000	465
Vancouver, BC	499	790,165	1,582	1,07	1,082,352	1,006	1,076	1,268,100	1,179
Toronto, ON	799	1,824,481	2,282	1,44	2,628,043	1,818	1,445	2,998,700	2,075
Edmonton, AB	196	337,568	1,726	1,49	495,702	332	1,599	656,900	411
Calgary, AB	156	279,062	1,791	16	403,319	2,494	195	592,600	3,039

Geographic Area	1960			1970			1980		
	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density
Non-CMAs	3,555,170	10,074,014	3	3,543,50	10,087,246	3	3,537,452	11,161,449	3
All CMAs	5,068	8,163,986	1,611	15,61	11,874,753	760	15,991	13,658,944	854
Total Canada	3,560,238	18,238,000	5	3,559,12	21,961,999	6	3,553,442	24,820,393	7

Issues:
Canada: 1961 based on 1966 land boundaries. 1971 based on 1976 land boundaries. 1981 based on 1986 boundaries.

1961 and 1971 land area appear close to 1966 and 1976.

Notes:
Naming convention: Since the names & components of the metropolitan areas changed over the three census. The most frequent name was selected. Large metropolitan area names are simplified to reflect the largest central city. The exception was Passaic, NJ.

See sources from Tables 1 and 2.

Appendix Table 3.2: Large Metropolitan Areas Density in the United States (1990 - 2010) and in Canada (1991 - 2011)

Geographic Area	1990			2000			2010		
	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density
Northeast - large metro area	20,479	29,442,873	1,438	24,804	33,276,652	1,342	27,653	36,774,204	1,330
Boston, MA	1,760	2,870,669	1,631	2,022	3,406,829	1,685	3,487	4,552,402	1,305
Buffalo, NY	1,045	968,532	927	1,567	1,170,111	747	1,565	1,135,509	726
Hartford, CT	1,074	767,841	715	1,677	1,183,110	705	1,515	1,212,381	801
Middlesex, NJ	1,046	1,019,835	976	1,044	1,169,641	1,120	-	-	-
Monmouth-Ocean, NJ	1,108	986,327	890	1,108	1,126,217	1,016	-	-	-
Nassau-Suffolk, NJ	1,198	2,609,212	2,178	1,199	2,753,913	2,297	-	-	-
New York, NY	1,148	8,546,846	7,448	1,142	9,314,235	8,159	6,687	18,897,109	2,826
Newark, NJ	1,220	1,824,321	1,496	1,578	2,032,989	1,289	-	-	-
Passaic, NJ	419	1,278,440	3,049	420	1,373,167	3,274	-	-	-
Philadelphia, PA-NJ	3,518	4,856,881	1,381	3,855	5,100,931	1,323	4,602	5,965,343	1,296
Pittsburgh, PA	3,400	2,056,705	605	4,626	2,358,695	510	5,282	2,356,285	446
Providence, RI-MA	612	654,854	1,071	1,141	1,188,613	1,042	1,587	1,600,852	1,009
Rochester, NY	2,932	1,002,410	342	3,426	1,098,201	321	2,928	1,054,323	360
Midwest - large metro areas	34,889	24,958,332	715	43,752	29,696,958	679	52,013	32,015,654	616
Chicago, IL	1,884	6,069,974	3,221	5,062	8,272,768	1,634	7,197	9,461,105	1,315
Cincinnati, OH-KY	2,125	1,452,645	684	3,342	1,646,395	493	4,392	2,130,151	485
Cleveland, OH	1,512	1,831,122	1,211	2,707	2,250,871	832	1,997	2,077,240	1,040
Columbus, OH	3,579	1,377,419	385	3,141	1,540,157	490	3,967	1,836,536	463
Detroit, MI	4,466	4,382,299	981	3,897	4,441,551	1,140	3,888	4,296,250	1,105
Grand Rapids, MI	1,422	688,399	484	2,758	1,088,514	395	2,785	774,160	278
Indianapolis, IN	3,071	1,249,822	407	3,523	1,607,486	456	3,855	1,756,241	456
Kansas City, MO-KS	4,988	1,566,280	314	5,406	1,776,062	329	7,827	2,035,334	260
Milwaukee, WI	1,460	1,432,149	981	1,460	1,500,741	1,028	1,455	1,555,908	1,070
Minneapolis-St. Paul, MN	5,051	2,464,124	488	6,063	2,968,806	490	6,027	3,279,833	544
St. Louis, MO	5,331	2,444,099	459	6,392	2,603,607	407	8,623	2,812,896	326
South - large metro areas	74,871	37,640,125	503	87,646	47,218,048	539	103,737	55,847,435	538
Atlanta, GA	5,122	2,833,511	553	6,124	4,112,198	672	8,339	5,268,860	632
Austin, TX	2,792	781,572	280	4,224	1,249,763	296	4,220	1,716,289	407
Baltimore, MD	2,609	2,382,172	913	2,609	2,552,994	979	2,602	2,710,489	1,042
Birmingham, AL	3,982	907,810	228	3,187	921,106	289	5,280	1,128,047	214
Charlotte, NC	3,379	1,162,093	344	3,377	1,499,293	444	3,085	1,758,038	570
Dallas, TX	4,471	2,553,362	571	6,186	3,519,176	569	8,928	6,371,773	714
Fort Lauderdale, FL	1,209	1,255,488	1,039	1,205	1,623,018	1,347	-	-	-
Fort Worth, TX	2,497	1,332,053	534	2,918	1,702,625	584	-	-	-

Geographic Area	1990			2000			2010		
	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density
Greensboro, NC	3,452	942,091	273	3,881	1,251,509	323	1,994	723,801	363
Houston, TX	5,322	3,301,937	621	5,920	4,177,646	706	8,828	5,946,800	674
Jacksonville, FL	2,636	906,727	344	2,635	1,100,491	418	3,201	1,345,596	420
Louisville, KY-IN	2,266	952,662	420	2,072	1,025,598	495	4,111	1,283,566	312
Memphis, TN	2,303	981,747	426	3,006	1,135,614	378	4,578	1,316,100	288
Miami, FL	1,945	1,937,094	996	1,946	2,253,362	1,158	5,077	5,564,635	1,096
Nashville, TN	4,073	985,026	242	4,073	1,231,311	302	5,689	1,589,934	280
New Orleans, LA	2,309	1,238,816	537	3,400	1,337,726	394	2,960	1,167,764	395
Norfolk, VA	1,685	1,396,107	828	2,349	1,569,541	668	2,630	1,671,683	636
Oklahoma City, OK	4,247	958,839	226	4,247	1,083,346	255	5,512	1,252,987	227
Orlando, FL	2,538	1,072,748	423	3,491	1,644,561	471	3,479	2,134,411	614
Raleigh, NC	2,016	735,480	365	3,489	1,187,941	341	2,118	1,130,490	534
Richmond, VA	2,945	865,640	294	2,945	996,512	338	5,685	1,258,251	221
San Antonio, TX	2,520	1,302,099	517	3,326	1,592,383	479	7,313	2,142,508	293
Tampa, FL	2,555	2,067,959	810	2,554	2,395,997	938	2,513	2,783,243	1,107
Washington, DC-MD-VA	3,967	3,923,574	989	6,509	4,923,153	756	5,598	5,582,170	997
West Palm Beach, FL	2,034	863,518	425	1,974	1,131,184	573	-	-	-
West - large metro areas	77,899	31,797,370	408	112,925	38,459,782	341	99,477	43,948,083	442
Anaheim, CA	3,053	2,410,556	790	-	-	-	-	-	-
Denver, CO	3,761	1,622,980	432	3,761	2,109,282	561	8,346	2,543,482	305
Las Vegas, NV	7,911	741,459	94	39,369	1,563,282	40	7,891	1,951,269	247
Los Angeles, CA	4,060	8,863,164	2,183	4,061	9,519,338	2,344	4,849	12,828,837	2,646
Oakland, CA	1,458	2,082,914	1,429	1,458	2,392,557	1,642	-	-	-
Orange County, CA	-	-	-	789	2,846,289	3,606	-	-	-
Phoenix, AZ	9,204	2,122,101	231	14,573	3,251,876	223	14,566	4,192,887	288
Portland, OR-WA	3,743	1,239,842	331	5,028	1,918,009	382	6,684	2,226,009	333
San Bernardino-Riverside, CA	27,270	2,588,793	95	27,260	3,254,821	119	27,263	4,224,851	155
Sacramento, CA	5,094	1,481,102	291	4,081	1,628,197	399	5,094	2,149,127	422
Salt Lake City, UT	1,618	1,072,227	663	1,617	1,333,914	825	9,555	1,124,197	118
San Diego, CA	4,205	2,498,016	594	4,200	2,813,833	670	4,207	3,095,313	736
San Francisco, CA	1,016	1,603,678	1,579	1,016	1,731,183	1,705	2,471	4,335,391	1,755
San Jose, CA	1,291	1,497,577	1,160	1,291	1,682,585	1,304	2,679	1,836,911	686
Seattle, WA	4,216	1,972,961	468	4,424	2,414,616	546	5,872	3,439,809	586
Canada - large metros	12,215	11,475,348	939	12,606	13,508,515	1,072	13,077	15,331,645	1,172
Montréal, QC	1,355	3,213,207	2,372	1,563	3,507,424	2,244	1,644	3,824,221	2,326
Ottawa - Gatineau, ON/QC	1,984	952,153	480	2,053	1,102,911	537	2,427	1,236,324	509
Vancouver, BC	1,076	1,648,733	1,533	1,111	2,076,098	1,868	1,113	2,313,328	2,079

Geographic Area	1990			2000			2010		
	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density	Land area (sq. mile)	Pop'n	Density
Toronto, ON	2,156	4,036,287	1,872	2,279	4,883,834	2,143	2,280	5,583,064	2,448
Edmonton, AB	3,681	856,266	233	3,637	961,475	264	3,640	1,159,869	319
Calgary, AB	1,964	768,702	391	1,963	976,773	498	1,972	1,214,839	616
Non-CMAs	3,527,737	11,366,034	3	3,449,104	11,724,325	3	3,425,741	10,353,247	3
All CMAs	25,706	16,665,360	648	30,554	19,296,926	632	35,773	23,123,441	646
Total Canada	3,553,442	28,031,394	8	3,479,658	31,021,251	9	3,461,514	33,476,688	10

Notes:

Naming convention: Since the names & components of the metropolitan areas changed over the three census. The most frequent name was selected. Large metropolitan area names are simplified to reflect the largest central city. The exception was Passaic, NJ.

See sources from Tables 1 and 2.

Appendix Table 4: Examples of significant changes in the composition of Large Metropolitan Areas in the United States, 1960-2010

Metropolitan area & counties	1960	1970	1980	1990	2000	2010
Philadephia-Camden-Wilmington, PA-NJ-DE-MD						5,965,343
Philadelphia, PA-NJ	4,342,897	4,817,914	4,716,559	4,856,881	5,100,931	4,008,994
Bucks County, PA	308,567	415,056	479,180	541,174	597,635	625,249
Chester County, PA	210,608	278,311	316,660	376,396	433,501	498,886
Delaware County, PA	553,154	600,035	555,023	547,651	550,864	558,979
Montgomery County, PA	516,682	623,799	643,377	678,111	750,097	799,874
Philadephia County, PA	2,002,512	1,948,609	1,688,210	1,585,577	1,517,550	1,526,006
Burlington County, NJ	224,499	323,132	362,542	395,066	423,394	
Camden County, NJ	392,035	456,291	471,650	502,824	508,932	
Gloucester County, NJ	134,840	172,681	199,917	230,082	254,673	
Salem County, NJ				65,294	64,285	
Wilmington, DE-NJ-MD	366,157	499,493	523,221	513,293	586,216	705,670
New Castle County, DE	307,446	385,856	398,115	441,946	500,265	538,479
Salem County, NJ	58,711	53,291	64,676			66,083
Cecil County, MD		60,346	60,430	71,347	85,951	101,108
Camden, NJ						1,250,679
Camden County, NJ						448,734
Gloucester County, NJ						513,657
Burlington County, NJ						288,288
New York-Northern New Jersey-Long Island, NY-NJ-PA						18,897,109
New York-White Plains-Wayne, NY-NJ						11,576,251
New York, NY-NJ			9,120,346			
New York, NY	10,694,633	11,571,899	8,274,961	8,546,846	9,314,235	
Bronx County, NY	1,424,815	1,471,701	1,168,972	1,203,789	1,332,650	1,385,108
Kings County, NY	2,627,319	2,602,012	2,231,028	2,300,664	2,465,326	2,504,700
New York County, NY	1,698,281	1,539,233	1,428,285	1,487,536	1,537,195	1,585,873
Putnam County, NY			77,193	83,941	95,745	99,710
Queens County, NY	1,809,578	1,986,473	1,891,325	1,951,598	2,229,379	2,230,722
Richmond County, NY	221,991	295,443	352,029	378,977	443,728	468,730
Nassau County, NY	1,300,171	1,428,080				
Rockland County, NY	136,803	229,903	259,530	265,475	286,753	311,687
Suffolk County, NY	666,784	1,124,950				
Westchester County, NY	808,891	894,104	866,599	874,866	923,459	949,113
Bergen County						905,116
Passaic County						501,226
Hudson County, NJ						634,266
Newark, NJ	1,689,420	1,856,556	1,879,147	1,915,928	2,032,989	2,147,727
Essex County, NJ	923,545	929,986	851,304	778,206	793,633	783,969
Morris County, NJ	261,620	383,454	407,630	421,353	470,212	492,276
Sussex County, NJ			116,119	130,943	144,166	149,265
Union County, NJ	504,255	543,116	504,094	493,819	522,541	536,499
Warren County, NJ				91,607	102,437	
Pike County, PA						57,369
Hunterdon County, NJ						128,349
Paterson-Clifton-Passaic, NJ	1,186,873	1,358,794				
Bergen County	780,255	898,012	845,385	825,380	884,118	905,116
Passaic County	406,618	460,782	447,585	453,060	489,049	501,226
Nassau--Suffolk, NY PMSA			2,605,813	2,609,212	2,753,913	2,832,882
Nassau County			1,321,582	1,287,348	1,334,544	1,339,532
Suffolk County			1,284,231	1,321,864	1,419,369	1,493,350
Edison-New Brunswick, NJ						2,340,249

Metropolitan area & counties	1960	1970	1980	1990	2000	2010
Monmouth County						630,380
Ocean County						576,567
Middlesex County						809,858
Somerset County						323,444
Hartford-West Hartford-East Hartford, CT						**1,212,381**
Hartford, CT	**525,207**	**663,891**	**726,114**	**1,157,585**	**1,183,110**	
Hartford County, CT (part)	501,466	607,617		849,917	855,171	894,014
Middlesex County, CT	6,780	7,400		96,996	104,442	165,676
Tolland County, CT	16,961	48,874		128,087	135,671	152,691
Litchfield County (part)				37,712	37,163	
New London County (part)				17,021	21,458	
Windham County (part)				27,852	29,205	
Hartford, CT PMSA			715,923			
Other			10,191			
Cleveland-Elyria-Mentor, OH						**2,077,240**
Cleveland-Lorain-Elyria, OH					2,250,871	
Cleveland, OH	**1,796,595**	**2,064,194**	**1,898,825**	**1,831,122**		
Ashtabula County				99,821	102,728	101,497
Cuyahoga County, OH	1,647,895	1,721,300	1,498,400	1,412,140	1,393,978	1,280,122
Lake County, OH	148,700	197,200	212,801	215,499	227,511	230,041
Lorain County, OH				271,126	284,664	301,356
Geauga County, OH		62,977	74,474	81,129	90,895	93,389
Medina County, OH		82,717	113,150	122,354	151,095	172,332
Akron, OH	513,569	679,239	660,328	657,575	694,960	703,200
Portage County		125,868	135,856	142,585	152,061	161,419
Summit County	513,569	553,371	524,472	514,990	542,899	541,781
Miami-Fort Lauderdale-Pompano Beach, FL						**5,564,635**
Miami-Hialeah, FL			**1,625,781**			
Miami, FL	**935,047**	**1,267,792**		**1,937,094**	**2,253,362**	
Dade County, FL	935,047	1,267,792	1,625,509			
Miami-Dade County, FL				1,937,094	2,253,362	2,496,435
Other			272			
Broward County, FL	333,946	620,100	1,018,257	1,255,488	1,623,018	1,748,066
Palm Beach County						1,320,134
Virginia Beach-Norfolk-Newport News, VA-NC						**1,671,683**
Norfolk--Virginia Beach--Newport News, VA--NC MSA			**806,951**	**1,396,107**	**1,569,541**	
Norfolk-Portsmouth, VA	**578,507**	**680,600**				
Chesapeake City		89,580	114,486	151,976	199,184	222,209
Norfolk City	305,872	307,951	266,979	261,229	234,403	242,803
South Norfolk City	22,035					
Portsmouth City	114,773	110,963	104,577	103,907	100,565	95,535
Virginia Beach City	8,091	172,106	262,199	393,069	425,257	437,994
Norfolk County	51,612					
Princess Anne County	76,124					
Newport News-Hampton	**224,503**	**292,159**				
Newport News City	113,662	138,177	144,903	170,045	180,150	180,719
Hampton City	89,258	120,779	122,617	133,793	146,437	137,436
York County	21,583	33,203	35,463	42,422	56,297	65,464
Currituck County, NC			11,089	13,736	18,190	23,547
Gloucester County, VA			20,107	30,131	34,780	36,858
Isle of Wight County, VA				25,053	29,728	35,270
James City County, VA			22,339	34,859	48,102	67,009
Mathews County, VA				8,348	9,207	8,978
Poquoson city, VA			8,726	11,005	11,566	12,150

Metropolitan area & counties	1960	1970	1980	1990	2000	2010
Suffolk city, VA			47,621	52,141	63,677	84,585
Williamsburg city, VA			10,294	11,530	11,998	14,068
Surry County, VA						7,058
San Francisco-Oakland-Fremont, CA						**4,335,391**
San Francisco-Oakland, CA	**2,783,359**	**3,109,519**	**3,250,630**			
San Francisco, CA				**1,603,678**	**1,731,183**	
Alameda County	908,209	1,073,184				1,510,271
Contra Costa County	409,030	558,389				1,049,025
Marin County	146,820	206,038	222,592	230,096	247,289	252,409
San Francisco County	740,316	715,674	678,974	723,959	776,733	805,235
San Mateo County	444,387	556,234	587,329	649,623	707,161	718,451
Solano County	134,597					
Oakland, CA			**1,761,710**	**2,082,914**	**2,392,557**	
Alameda County			1,105,379	1,279,182	1,443,741	
Contra Costa County			656,331	803,732	948,816	
Other			25			
Los Angeles-Long Beach-Santa Ana, CA						**12,828,837**
Los Angeles-Long Beach, CA	**6,742,696**	**7,032,075**	**7,477,503**	**8,863,164**	**9,519,338**	
Los Angeles County	6,038,771	7,032,075	7,477,239	8,863,164	9,519,338	9,818,605
Orange County	703,925		1,932,921	2,410,556	2,846,289	3,010,232
Other			264			
Salt Lake City, UT						**1,124,197**
Salt Lake City--Ogden, UT MSA			936,255	1,072,227	1,333,914	
Salt Lake City, UT	**383,035**	**557,635**				
Salt Lake County	383,035	458,607	619,066	725,956	898,387	1,029,655
Davis County		99,028	146,540	187,941	238,994	306,479
Weber County			144,616	158,330	196,533	231,236
Summit County, UT			10,198			36,324
Tooele County, UT			26,033			58,218

Notes:

Used primary metropolitan areas when data available. This may account for significant increase in population between 2000 and 2010 for certain metropolitan areas.

Sources:

1960
Table 24 - Population of Counties in the United States and the Commonwealth of Puerto Rico: 1960 and 1950
Part 1, United States Summary

1970
Table 24 - Population of Counties: 1970 and 1960
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1980
Table 17 - Land Area, Population, and Population Density for Counties: 1960 to 1980
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1980 counties
http://www.census.gov/popest/data/counties/totals/1980s/tables/e8089co.txt
1980 county components
http://www.census.gov/population/metro/files/lists/historical/83mfips.txt

1990 & 2000

Table 1: Metropolitan Areas and their Geographic Components in Alphabetic Sort, 1990 and 2000 Population,
     and Numeric and Percent Population Change: 1990 to 2000

2010
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2010 counties
http://www.census.gov/prod/2010pubs/10smadb/2010smadb.pdf
table 211

Appendix Table 5: Counties with a Population Greater than 1 Million in the United States, 1960 – 2010

State name	Metro area	County name	Population						Percentage Change (%)					
			1960	1970	1980	1990	2000	2010	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2010	1960 - 2010
Northeast														
Massachusetts	Boston, MPA (Cambridge)	Middlesex County	1,238,742	1,397,268	1,367,034	1,398,468	1,465,396	1,503,085	13	(2)	2	5	3	21
New York	New York, NY	Bronx County	1,424,815	1,471,701	1,168,972	1,203,789	1,332,650	1,385,108	3	(21)	3	11	4	(3)
New York	Buffalo, NY	Erie County	1,064,688	1,113,491	1,015,472	968,532	950,265	919,040	5	(9)	(5)	(2)	(3)	(14)
New York	New York, NY	Kings County	2,627,319	2,602,012	2,230,936	2,300,664	2,465,326	2,504,700	(1)	(14)	3	7	2	(5)
New York	Nassau-Suffolk, NY	Nassau County	1,300,171	1,428,080	1,321,582	1,287,348	1,334,544	1,339,532	10	(7)	(3)	4	0	3
New York	New York, NY	New York County	1,698,281	1,539,233	1,428,285	1,487,536	1,537,195	1,585,873	(9)	(7)	4	3	3	(7)
New York	New York, NY	Queens County	1,809,578	1,986,473	1,891,325	1,951,598	2,229,379	2,230,722	10	(5)	3	14	0	23
New York	Nassau-Suffolk, NY	Suffolk County	666,784	1,124,950	1,284,231	1,321,864	1,419,369	1,493,350	69	14	3	7	5	124
Pennsylvania	Pittsburgh, PA	Allegheny County	1,628,587	1,605,016	1,450,085	1,336,449	1,281,666	1,223,348	(1)	(10)	(8)	(4)	(5)	(25)
Pennsylvania	Philadelphia, PA-NJ	Philadelphia County	2,002,512	1,948,609	1,688,210	1,585,577	1,517,550	1,526,006	(3)	(13)	(6)	(4)	1	(24)
Midwest														
Illinois	Chicago, IL	Cook County	5,129,725	5,492,369	5,253,655	5,105,067	5,376,741	5,194,675	7	(4)	(3)	5	(3)	1
Michigan	Detroit, MI (Warren)	Oakland County	690,259	907,871	1,011,793	1,083,592	1,194,156	1,202,362	32	11	7	10	1	74
Michigan	Detroit, MI	Wayne County	2,666,297	2,666,751	2,337,891	2,111,687	2,061,162	1,820,584	0	(12)	(10)	(2)	(12)	(32)
Minnesota	Minneapolis-St. Paul, MN	Hennepin County	842,854	960,080	941,411	1,032,431	1,116,200	1,152,425	14	(2)	10	8	3	37
Missouri	St. Louis, MO	St. Louis County	703,532	951,353	973,896	993,529	1,016,315	998,954	35	2	2	2	(2)	42
Ohio	Cleveland, OH	Cuyahoga County	1,647,895	1,721,300	1,498,400	1,412,140	1,393,978	1,280,122	4	(13)	(6)	(1)	(8)	(22)
Ohio	Columbus, OH	Franklin County	682,962	833,249	869,132	961,437	1,068,978	1,163,414	22	4	11	11	9	70
South														
Florida	Fort Lauderdale, FL	Broward County	333,946	620,100	1,018,200	1,255,488	1,623,018	1,748,066	86	64	23	29	8	423
Florida	Tampa, FL	Hillsborough County	397,788	490,265	646,960	834,054	998,948	1,229,226	23	32	29	20	23	209
Florida	Miami, FL	Miami-Dade County	935,047	1,267,792	1,625,781	1,937,094	2,253,362	2,496,435	36	28	19	16	11	167
Florida	Orlando, FL	Orange County	263,540	344,311	471,016	677,491	896,344	1,145,956	31	37	44	32	28	335
Florida	West Palm Beach, FL	Palm Beach County	228,106	348,753	576,863	863,518	1,131,184	1,320,134	53	65	50	31	17	479
Texas	San Antonio, TX	Bexar County	687,151	830,460	988,800	1,185,394	1,392,931	1,714,773	21	19	20	18	23	150
Texas	Dallas, TX	Dallas County	951,527	1,327,321	1,556,390	1,852,810	2,218,899	2,368,139	39	17	19	20	7	149
Texas	Houston, TX	Harris County	1,243,158	1,741,912	2,409,547	2,818,199	3,400,578	4,092,459	40	38	17	21	20	229

State name	Metro area	County name	Population						Percentage Change (%)					
			1960	1970	1980	1990	2000	2010	1960 - 1970	1970 - 1980	1980 - 1990	1990 - 2000	2000 - 2010	1960 - 2010
Texas	Fort Worth, TX	Tarrant County	538,495	716,317	860,880	1,170,103	1,446,219	1,809,034	33	20	36	24	25	236
Texas	Austin, TX	Travis County	212,136	295,516	419,573	576,407	812,280	1,024,266	39	42	37	41	26	383
Virginia	Washington, DC-MD-VA	Fairfax County	275,002	455,021	596,901	818,584	969,749	1,081,726	65	31	37	18	12	293
West														
Arizona	Phoenix, AZ	Maricopa County	663,510	967,522	1,509,052	2,122,101	3,072,149	3,817,117	46	56	41	45	24	475
California	Oakland, CA	Alameda County	908,209	1,073,184	1,105,379	1,279,182	1,443,741	1,510,271	18	3	16	13	5	66
California	Oakland, CA	Contra Costa County	409,030	558,389	656,380	803,732	948,816	1,049,025	37	18	22	18	11	156
California	Los Angeles, CA	Los Angeles County	6,038,771	7,032,075	7,477,503	8,863,164	9,519,338	9,818,605	16	6	19	7	3	63
California	Santa Ana, CA	Orange County	703,925	1,420,386	1,932,709	2,410,556	2,846,289	3,010,232	102	36	25	18	6	328
California	San Bernardino-Riverside, CA	Riverside County	306,191	459,074	663,166	1,170,413	1,545,387	2,189,641	50	44	76	32	42	615
California	Sacramento, CA	Sacramento County	502,778	631,498	783,381	1,041,219	1,223,499	1,418,788	26	24	33	18	16	182
California	San Bernardino-Riverside, CA	San Bernardino County	503,591	684,072	895,016	1,418,380	1,709,434	2,035,210	36	31	58	21	19	304
California	San Diego, CA	San Diego County	1,033,011	1,357,854	1,861,846	2,498,016	2,813,833	3,095,313	31	37	34	13	10	200
California	San Jose, CA	Santa Clara County	642,315	1,064,714	1,295,071	1,497,577	1,682,585	1,781,642	66	22	16	12	6	177
Nevada	Las Vegas, NV	Clark County	127,016	273,288	463,087	741,459	1,375,765	1,951,269	115	69	60	86	42	1,436
Utah	Salt Lake City, UT	Salt Lake County	383,035	458,607	619,066	725,956	898,387	1,029,655	20	35	17	24	15	169
Washington	Seattle, WA	King County	935,014	1,156,633	1,269,749	1,507,319	1,737,034	1,931,249	24	10	19	15	11	107

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