



COMMENTARY/COMMENTAIRE

Mobility and Prosperity in the City of the Future

By Wendell Cox

Any discussion of mobility and prosperity in the city should begin with the fundamentals: Understanding what the city is and declaring its purpose.

What is the City?

BELIEVE IT OR NOT, "CITY" IS AN AMBIGUOUS WORD. A city may be a municipality, such as the ville de Laval or the city of Abbotsford. It can be an urban area, an area of continuous urbanization, such as the Calgary population center (Statistics Canada's new term for an urban area). It can be the metropolitan area, which includes the population centre and the labor market surrounding it, much of it rural territory. Finally, the city can be a region or a prefecture, principally in China or Vietnam. Whenever there is a mention of cities in China, be aware that they are nothing like what would be perceived as a city in Canada. They are far larger. The "city" of Chongqing, for example, covers more land area than New Brunswick (and has a smaller share of its population in rural areas).

For this discussion, the city is the urban form, of which there are two.

There is the physical form (or the urban footprint), which is defined by the lights one might see in an area from an airplane or satellite flying high overhead. This organism is not defined by political boundaries, not even provincial boundaries. It is the physical expansion of urbanization within a labor market (metropolitan area). A good example of this is Ottawa - Gatineau, which stretches across the river from Ontario into Québec and like many other major urban areas of the world, is in more than one province or state (though urban areas and metropolitan areas can cross international boundaries only if there is free movement of labor, such as between the continental nations of the European Union or by special treaties, such as in the Geneva area, between France and Switzerland).

There is also the functional form of the city, or the metropolitan area. This is the economic manifestation of the city, which includes the physical expanse of urbanization as well as areas beyond from which the population centre attracts workers.

There are those who would like to believe that the city is for example, the city of Vancouver, not the Vancouver urban area or the Vancouver metropolitan area; or that the city is the ville de Montréal when in fact it stretches many kilometers to the north, south, east, and a few to the west. This is a typical view of many urban planners,

who disparage the lower density suburbs as a lower form of urbanism. In fact, however, the majority of people in most first world urban areas now live in suburbs and the suburbs are just as much a part of the city as the Burrard Peninsula, Yonge and Bloor, or McGill University.

Anyone interested in more information on urban areas can consult our Demographia World Urban Areas¹, which is the only regularly produced compendium of population, land area, and density data for the approximately 850 world urban areas with more than 500,000 population.

Cities Through History

MASSIVE URBANIZATION IS NEW TO THE WORLD. As late as 1800 less than 5 percent of the world lived in urban areas. The other 95 percent lived in the countryside, or what called rural areas (any area that is not urban is rural). In the intervening 200 years, billions of people have moved to cities and their share of the world's population now exceeds 50 percent. The number is substantially higher in the high-income world, where urbanization tends to be approximately 80 percent or more of the population, such as in Canada. City growth is continuing. By 2050, urban areas are likely to comprise nearly 70 percent of the world's population.

Large cities are relatively new phenomenon. There are varying reports of cities reaching 1 million population or more in ancient times. Some reports suggest that Rome reached that level. Constantinople and Baghdad are reported to have reached 1 million and in China, Beijing, Keifang, and Xi'an, terminus of the Silk Road, all reached 1 million population. Perhaps the largest pre-modern city was the Southern Song capital of Hangzhou, in China, which, when Marco Polo was posted there by Kublai Khan, boasted a population of more than 1.1 million people. There were others as well. All of these million plus cities of the past have this in common: They lost much or virtually all population before they became, at least in some cases, the large cities that they are today.

In 1800, there was one city with more than 1 million population in the world: Beijing, which fell below that population for most of the 19th century. During the 1820s, London became the first city of more than 1 million to hold its population, at least to the present. By 1900, the world's largest city, London, had 7 million people. New York was the largest in 1950, at 12 million and Tokyo is the largest today at more than 35 million.

The Purpose of Cities

WHAT IS THE PURPOSE OF CITIES? I have heard urban planners claim that the purpose of cities is for people to gather together, or for them to be better citizens. Any such notion betrays a fundamental misunderstanding of the reason cities arose and why they grew.

Large cities have a single reason for existence: Economics. Cities were established, grew and were sustained because people moved there to obtain a better life. Modern affluence is strongly associated with the city, which was where the economic and technical advances of the 18th century occurred, with the Industrial Revolution and political systems that permitted people to seek their own advantage with less constraint.

As former principal planner Alain Bertaud of the World Bank put it, "large labor markets are the only raison d'être of large cities." The fundamental conditions that propelled the growth of cities are of recent vintage. Without improved urban transport, the modern large city and its attendant affluence could not have occurred. Transportation fuels were crucial in this, as the limits of animal power had constrained the growth of cities for millennia before 1800.

The late Angus Maddison of the OECD compiled gross domestic product data for most of the world's nations from AD 1500. On an inflation-adjusted basis, the richest nation between AD 1500 and 1800 never reached a GDP per capita of more than approximately \$3500.

Things were to change markedly in the 1800s, with income shooting up from the second decade. By 1900, the richest country in the world had a gross domestic product per capita of approximately \$7000, double the peak in the previous three centuries. These gains had much to do with urban transport advances, as such horse cars, cable cars, and electrified streetcars. These made it possible for people to access job opportunities throughout a much larger geographical area than had been possible in the previous centuries, when walking was the exclusive means of transport for virtually all but the very rich.

The advances of the 1800s were but a minor bump compared to the affluence that occurred in the 1900s. The motor car expanded mobility to a much greater degree and put even larger areas within reach of people not only for employment, but also for seeking the lowest commercial prices and adding materially to the ability to efficiently use leisure time. By the end of the century, in 2000, the highest GDP per capita in the world was over \$40,000 (2000\$). It would have been inconceivable for this to happen without cars and trucks. At the same time, this greater affluence permitted people to live how they preferred, with more room, often in detached suburban housing.

Of course, transport advances are necessarily related to energy. It is fair to suggest that modern urbanization is the result of energy advances. At the same time, however, there are powerful interests that understand neither the importance of continuing to improve affluence nor the necessary relationship of sustained affluence to urban mobility.

Destructive Metropolitan Transport and Land Use Policies

THE AUTOMOBILE ORIENTED, SUBURBAN LIFESTYLE THAT IS THE NORM ACROSS THE NATION IS AN OFFENSE TO MUCH OF THE URBAN PLANNING PROFESSION, which has been successful in convincing policy makers in a number of metropolitan areas to implement destructive policies.

This is not just a Canadian phenomenon. Around the world, there are attempts to reshape urban areas in ways that are likely to reduce economic growth,² constrain the growth of discretionary incomes, and result in poverty levels that are higher than they need be. The philosophy goes by a number of names, including compact city policy, smart growth, livability, growth management, and others. The philosophy may be best labeled as "radical densification," because it is intended to materially increase urban densities not just within urban growth boundaries, but at favored places that have been anointed in the plans.

Among the two most basic underlying philosophies are an interest in reducing travel by automobile and an intent to force people into more dense living conditions, at least in part by not allowing further expansion of the urban area. The planners have been successful in characterizing "urban sprawl" as a cardinal sin, making it almost impossible to objectively discuss the natural growth patterns of cities.

The desire for draconian interventions into the lives of people and cities is not new among urban theorists. For more than one half-century, much of this has been the principal planning philosophy of the United Kingdom, while the philosophy was exported in the 1960s and 1970s to places like Vancouver and Portland, Oregon. In the 1970s, planners indicated that it would be necessary for people to live in high densities and to abandon their cars and use transit to solve what was a very serious air pollution problem. In fact, technology solved the problem far better than could have been anticipated and both suburbanization and the use of cars continued to increase, while air pollution literally "dropped like a rock."

But now, planners have the ultimate justification to herd people into the cores of cities and force them out of their cars. The concern about climate change and the policy imperatives to reduce greenhouse gas emissions are

being used as the rationale for radical urban planning policies from Sydney to California to Toronto and Vancouver.

Radical densification has gone well beyond the urban growth boundary. This is illustrated, for example, by a proposal to build a 26 story multiunit residential building in low-density Newmarket, a northern suburb of Toronto. In Toronto,³ Vancouver, and Montréal,⁴ at a minimum, regional plans call for not only forcing all development within urban growth boundaries, but also centralizing it near transit stations. This means, that new development in much of the area inside the urban growth boundary will be just about as impossible as outside the urban growth. This more intensive picking of winners, once limited to areas outside the urban form, would now become routine within the urban form. It is likely to become virtually impossible to build the attached or semi-attached housing that most Canadians prefer.

Behind in this attempt to concentrate new housing near transit stops throughout the urban area is an illusion that by forcing people into higher densities, they will use cars less. There is little hope of this. A recent Statistics Canada report indicates that once the distance from downtown exceeds 10 kilometres, the travel behavior of residents is virtually the same, whether they live in low-density housing or high-rise housing.

Obviously, this can lead to malicious incentives. As land owners compete for the scarce right to develop their parcels, there can be incentives to inappropriately influence decisions on which land can and cannot be developed. In some areas, such as US municipalities with a tradition of political corruption, public officials are not always above having their decisions being influenced by the politics of money.

Further, planners seek to stop building roadway capacity, and indeed, would prefer to take some away, as the ill conceived and continuing campaign to dismantle the Gardiner Expressway in Toronto illustrates.

The problem is that no metropolitan area can afford to provide a transit system that can compete with the automobile, except to downtown. We have completed research that shows that a truly automobile competitive transit system would require such an intensity of infrastructure and service that its annual operating and debt service expenditures could exceed the gross domestic product of any urban area that tried to implement such a system.⁵

Prosperity in the City of the Future

MOBILITY AND ACCESS ARE CRUCIAL TO THE PROSPERITY OF CITIES. The planners would have us believe that transit is an alternative for travel throughout the urban area. However, as the gridlocked traffic along the Don Valley Parkway in Toronto indicates, with high capacity GO Transit trains crossing above, transit does not go everywhere that people need to go. More importantly, where it does go, it usually takes much longer than by car. For the most part, it is not possible to make the vast majority of work trips or other trips to areas outside of downtown in an amount of time that is competitive with the automobile.

The old cliché about time and money is true in urban areas. Research indicates that the larger the area people can access in a particular period of time, such as 30 minutes, the greater the labor market efficiency, its job creation, and economic growth. Further, there are studies that indicate that low-income households who do not have access to cars have particularly higher unemployment rates than those who do, because most of the jobs in the modern urban area could not be reached by transit, walking, or bicycles.

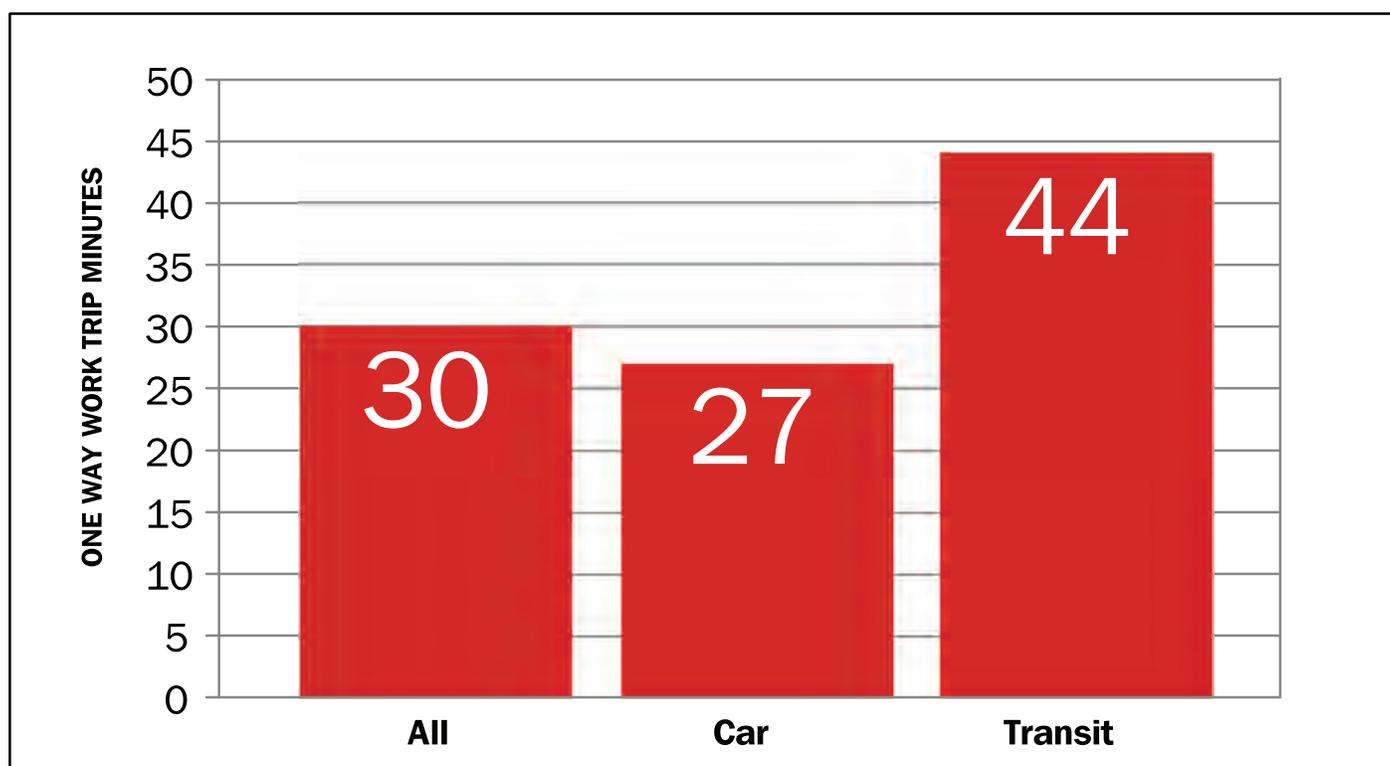
Various organizations, such as the Toronto Board of Trade, the Canadian Urban Transit Association (CUTA), and the Federation of Canadian Mayors (FCM) have noted that the competitiveness of metropolitan areas is being substantially diminished by the comparatively long work trip travel times in the major metropolitan areas. The latest data indicates that, generally, Canadian metropolitan areas have longer travel times than those of similarly

sized metropolitan areas elsewhere in the high-income world. The comparison is particularly stark with respect to the United States.

Perhaps not surprisingly, organizations such as CUTA and FCN think that the answer is more transit⁶ and in their publications imply that the comparatively long work trip travel times that make Canadian metropolitan areas more congested and less competitive can be shortened by adding more times and services.

Nothing could be further from the truth. In fact, among the six major metropolitan areas (those over 1,000,000 population: Toronto, Montreal, Vancouver, Ottawa-Gatineau, Calgary, and Edmonton), transit work trips are more than 50 percent longer than automobile trips (Figure 1). Forcing more people onto transit will not reduce work trip travel times, it will lengthen them and it will not make Canadian metropolitan areas more competitive.

Figure 1. Transit times in six major metropolitan areas



The same dynamic is at work in Western European metropolitan areas that have a reputation for superior transit systems. For example, few would argue with the proposition that Paris has the best transit system in the Western world. Yet people who live near suburban stations of the Paris RER regional rail system (a far larger, more comprehensive, and well patronized system than what operates in Toronto, Montréal, or Vancouver) can reach only 40 percent of metropolitan area jobs within one hour by transit. The same people can reach 80 percent of the jobs in the metropolitan area by car in one hour.

A Brookings Institution study in the United States found that, on average, only 6 percent of the jobs in metropolitan areas with more than 2 million population are accessible by transit to the average resident in 45 minutes (one way).⁷ No similar data is available for Canada. Of course, US transit systems are less comprehensive than those in Canada. But, given the hundreds of billions of dollars that have been spent to operate an expanded transit in recent decades, it might be thought that it would be more readily available than that. By comparison, the average work trip travel time in the United States is considerably shorter, at 25 minutes.

And things are getting more challenging for Canada's metropolitan areas. Between 2001 and 2006, Statistics Canada data indicates that 94 percent of the Toronto metropolitan area's job creation occurred outside the central municipality, 70 percent occurred outside the ville de Montréal, and more than 75 percent were created outside the city of Vancouver.

The attempt to increase densities in metropolitan areas has another consequence often denied by planners. Yet the data is clear. Around the world, as population densities increase, traffic congestion also increases. Thus, in Hong Kong, where more than 80 percent of travel is on transit and where the urban population density is the highest in the first world (nearly 10 times that of Toronto), traffic congestion is worse than in Los Angeles. Yet, in Los Angeles barely 2 percent of travel is on transit and the population density is one-10th that of Hong Kong.

Transit is about downtown. That is the destination for the most frequent and rapid services, and is also the destination for transit riders who also have a car. Today's metropolitan areas are no longer dominated by downtowns. In all of the six major metropolitan areas (over 1,000,000 population) of Canada, transit provides good access to downtown. However, downtown is not so important as a travel destination as the skyscrapers would lead you to believe. Overall, approximately 14 percent of the employment is downtown, and 86 percent is located elsewhere. Downtown is the only place where there is a large concentration of employment, which is a prerequisite to efficient transit services.

The lack of dominance by downtown areas could not be better illustrated than in Toronto, which has the largest downtown area in all of Canada. Yet, downtown Toronto is not the largest employment center in the metropolitan area. That honour goes to the Pearson airport employment center, which stretches over 120 square kilometers and contains more than 350,000 jobs. By contrast, downtown Toronto has approximately 325,000 employees who are crowded together in 6 square kilometers, all within walking distance of transit. In fact, more than 95 percent of trips on the GO Transit commuter rail system start or end at Union Station. In Montréal, there is also a very large and spread out employment center in and around Dorval airport.

The bottom line on mobility is that transit is incapable of replicating the metropolitan area access of the automobile. Any attempt to intensify densities will lead to greater traffic congestion, and slower travel with likely less economic growth. And as always happens when the economic growth lags, low-income households pay the greatest price.

Discretionary Income in the City of the Future

PEOPLE HAVE BEEN MOVING TO LOWER DENSITY FOR DECADES. Since the 1960s, the overwhelming majority of population growth in the major metropolitan areas of Australia the United States, Western Europe, Japan and Canada has been in suburban areas. Between 2006 and 2011 census data indicated the same continuing trend.⁸ Approximately 90 percent of the growth in the Toronto metropolitan area was outside the former city of Toronto, 95 percent of Montréal's growth was outside the 1951 boundaries of the ville de Montréal, and 87 percent of Vancouver's growth was outside the city of Vancouver.

Of course this continuing growth means that urban areas continue to expand physically, if permitted to by public policy. As was indicated above, a principal strategy of urban planning policy is the urban growth boundary, drawing a line around the urban area and not permitting development to occur on the outside. Vancouver has one of the strictest urban growth boundaries in the world, with Toronto following closely, and even land wealthy Calgary has an urban growth boundary.

The fundamental problem with urban growth boundaries (and with designating only some areas within them for development) is that they ration land. This, of course, raises land prices and housing prices. Urban planners

routinely deny this association. To believe this, it is necessary to assume that OPEC decisions on production have nothing to do with the price of oil. Basic economics says otherwise.

As former governor of the Reserve Bank of New Zealand Donald Brash indicates, "the affordability of housing is overwhelmingly a function of just one thing, the extent to which governments placed artificial restrictions on the supply of residential land."⁹

Hugh Pavletich of Christchurch, New Zealand and I have been producing the Demographia International Housing Affordability Survey¹⁰ for eight years. Each year we rate housing affordability based upon the median multiple, which is calculated by dividing the median house price by the median household income. Our latest issue covers metropolitan markets in Canada, the United States, the United Kingdom, Australia, Ireland, and New Zealand, as well as Hong Kong.

For most of the post-world war period, the median multiple has been 3.0 or below. However, over the past two decades, house prices have nearly doubled (or more) relative to household incomes in the United Kingdom, Australia and New Zealand (and Vancouver¹¹).

Considerable concern has been expressed about rising house prices in Canada. There are good reasons for this, since Vancouver has emerged as the most unaffordable major market outside of Hong Kong in our annual survey. House prices in Vancouver are more than three times the level that would be expected based upon incomes.

But other metropolitan areas are also experiencing large increases in house prices. In particular, Toronto and Montréal have house prices that are at least 60 percent higher than the 3.0 median multiple standard, while Calgary reached nearly as high in 2008. The Bank of Canada has expressed reservations about rising house prices. However, the Bank of Canada, renowned for its adult conduct compared to the US Federal Reserve Board, has no power to control the rising house prices in places like Toronto, Montréal, Calgary, Vancouver, and other metropolitan areas implementing the strategies of land rationing. The Bank's focus on monetary supply misses the crucial role of land supply.

Toronto now forces all development to be inside a green belt, despite the fact that there is plenty of land available for development inside the Niagara escarpment, which could provide a competitive safety valve on the land price increases that are making it increasingly difficult for households to make ends meet. In Montréal, the now obsolete agricultural limit is interfering with the ability of the urban area to expand and pushing prices higher. In Vancouver, a combination of factors has driven prices even higher. The strength of the urban growth boundary has, of course, driven house prices up. However, the strong demand in the 1990s from Hong Kong and the current strong demand from mainland Chinese are exacerbated an already overheated housing market. In fact, with the limits it has placed on development, Vancouver might as well hang a sign from the Lyons Gate Bridge saying "Welcome Speculators."

Research by the New York Federal Reserve Bank found that speculative activity was particularly intense in the highly destructive California housing bubble as a source of house price increases. California's underlying housing demand was less than in areas of the nation where prices barely increased at all, but which did not have the overly restrictive land-use policies that are now creating difficulties in Vancouver, Toronto, Montréal and elsewhere.

Strong land-use policies have been identified with hampering economic growth in studies in the Amsterdam-Rotterdam-The Hague (Randstad) conurbation of the Netherlands, and in the United Kingdom. Raven Saks, an economist with the Federal Reserve Board, documented a similar outcome in the United States.

Thus, in addition to increasing traffic congestion and hampering economic growth, radical densification policies raise the price of housing and reduce the discretionary income of residents.

Sustainability in the City of the Future

THE UNFORTUNATE THING ABOUT THESE POLICIES IS THAT THEY ARE NOT NECESSARY TO SUFFICIENTLY REDUCE GREENHOUSE GAS (GHG) EMISSIONS. It is not necessary to force people out of cars. Nor is it necessary to force them into densified urban cores. Even in Europe, with its strong commitment to GHG emission reductions, the European Conference of Ministers of Transport has noted that policies seeking to move people from cars to transit are much less effective than policies to improve the fuel efficiency of cars.

A report by the McKinsey Company and the Conference Board in the United States, cosponsored by the National Resources Defense Council and the Environmental Defense Fund, found that sufficient opportunities were available to cost-effectively reduce GHG emissions without downsizing cars, driving less, or forcing people into denser housing. In fact, it is clear that technological advances in automobiles have the potential to reduce GHG emissions from automobiles many times more than any potential that the promoters of radical densification claim is possible.

A report by the US National Academy of Sciences found that smart growth policies would have only marginal impacts on GHG emissions over the next 40 years. A report by Transport Canada showed that as traffic speeds slow down and become more congested, fuel efficiency is seriously retarded. The net effect can be to cancel out part or all of the greenhouse gas emission reduction as a result from less driving.

There are also health consequences to radical densification. As traffic congestion increases, traffic slows down and there is more stop and go traffic. Air pollution along congested corridors intensifies with negative health impacts on those living nearby. US data indicates that air pollution levels are strongly correlated with higher densities.

Radical Densification: Hopeless Outcomes

RADICAL DENSIFICATION POLICIES CAN BE CHARACTERIZED AS HOPELESS. This is illustrated by regional planning in San Diego. There, officials have adopted a plan through 2050. The plan uses more than one half of all of the transportation money on transit. Yet little gain would be achieved for this huge expenditure. Today, under 2 percent of all travel in the San Diego metropolitan area is on transit, while the planning authorities project that transit share will remain under 4 percent in 2050. Thus, transit will receive 10 times or more its proportionate share of funding based upon its usage. At the same time, San Diego and other California metropolitan areas are taking steps to force most new houses to be built at 20 to 40 to the acre (see commentary in *The Wall Street Journal*, "California Declares War on the Suburbs"¹²).

Comparing Urban Outcomes in Toronto and Dallas-Fort Worth

The conventional assumptions on urban planning favor higher urban densities, greater use of transit, and geographic constraints on development. The outcomes of these policies can be illustrated by comparing the Toronto urban area and the Dallas-Fort Worth urban area. The 2011 population of Toronto was 0.2 percent more than the population of Dallas-Fort Worth. Toronto was much more compact, with a developed land area 62 percent less than that of Dallas-Fort Worth. The result was that Toronto's density was 164 percent above that of Dallas-Fort Worth. Further, only 2 percent of travel to work in Dallas-Fort Worth was by transit, compared to 21 percent, in Toronto – more than 10 times as much.

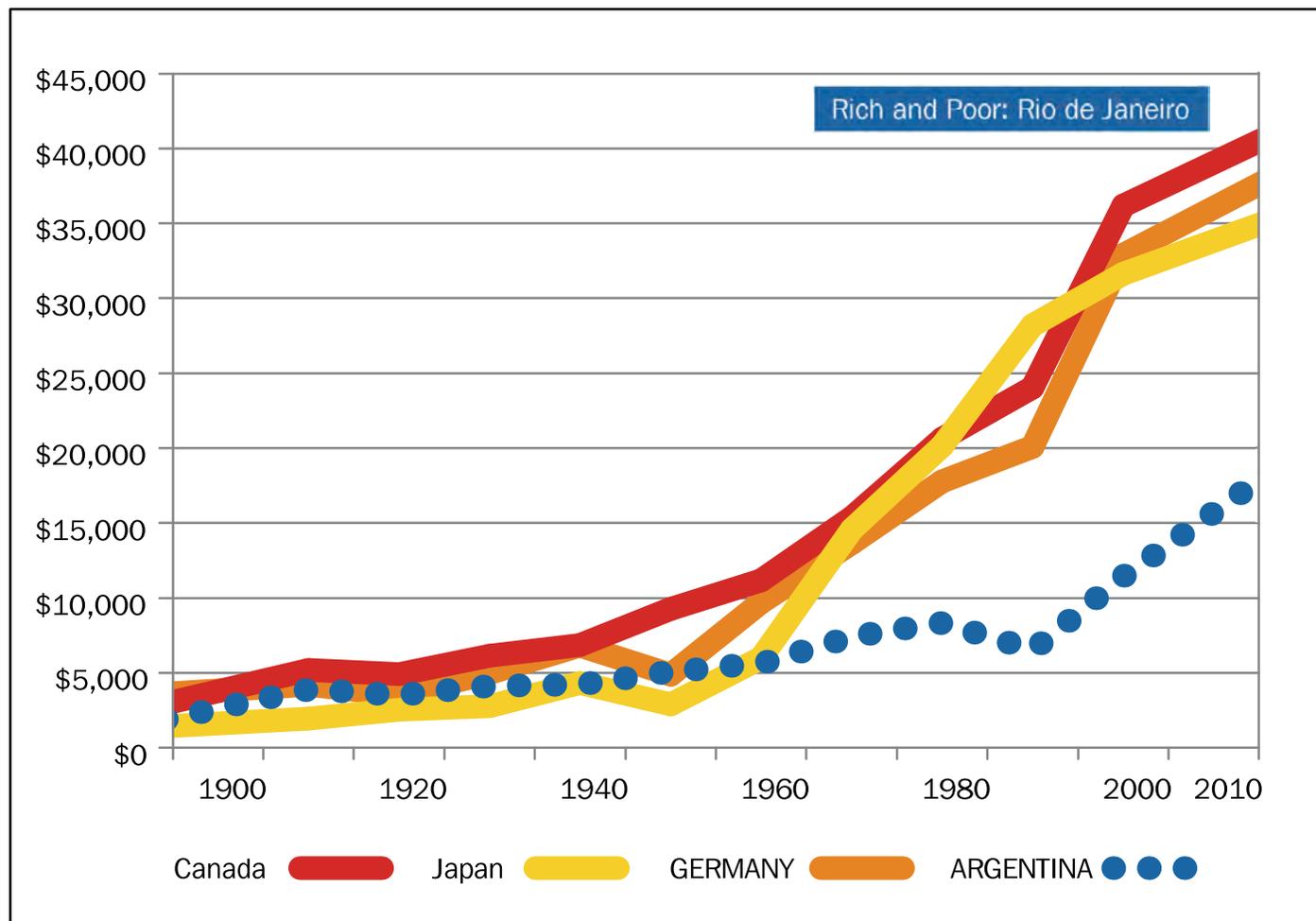
With all of these positive attributes, at least according to radical densification theory, it would be expected that commuters would get to work up more quickly in Toronto. Yet, the opposite is true. The average one-way work for travel time in Toronto was 33 minutes in 2010, while it was only 26 minutes in Dallas-Fort Worth. This illustrates the value of dispersed job locations, adequate freeway and arterial systems, and low-density living for keeping a metropolitan area fluid and mobile.

Further, Toronto has an urban growth boundary, while Dallas-Fort Worth does not. The median house price in Toronto is 5.5 times the median household income, or nearly double that of the 3.0 standard. Housing costs are significantly less in Dallas-Fort Worth, where the median house price is 2.9 times the median household income.

The Importance of Economic Growth

ECONOMIC GROWTH IS IMPERATIVE FOR BOTH PROSPERITY AND SUSTAINABILITY. There may be a tendency to presume that the continuing economic prosperity of Canadian urban areas is inevitable. However, there are a number of examples indicating that poor public policy can lead to economic stagnation. During the 1930s, Argentina was one of the world's most affluent nations. However, within just a few decades after the coming of Peronism, Argentina had become a third world nation, where it remains today (Figure 2). One can readily observe shantytowns in Argentina. Parts of the European Union could be headed in the same direction, where economic growth could well become a thing of the past in Greece, Spain, Portugal, and Italy. Things are not so positive in the United States, where a long list of unfunded liabilities (such as government employee pensions) are beyond the ability of the electorate to pay and beyond the ability of the political system to cope.

Figure 2. Gross domestic product/capita (PPP): 2010\$



Further, people have choices. In the United States, for example, there was a migration of more than 3 million people from the metropolitan areas with more restrictive land-use regulation during the 2000 to 2010 decade to less expensive areas. Housing affordability is the most important element in cost of living differences between

metropolitan areas. Metropolitan areas that pursue policies to avoid the destructive policies of radical densification are likely to be rewarded with lower house prices, less traffic congestion, more healthful air, and more residents seeking refuge from metropolitan areas where the conventional wisdom hampers economic growth.

Indeed, this is the key to achieving the purpose of cities. A well-governed metropolitan area will have policies that seek to minimize the cost of living, maximize discretionary incomes, minimize traffic congestion, and thereby improve economic growth. In so doing, a metropolitan area best serves its citizens. Cities that do not perform their purpose will do less well in the future than those that do.

The Golden Horseshoe, from Niagara to Hamilton, Kitchener, Barrie, Toronto, and Oshawa accounts for nearly 25 percent of the nation's population. This is a comparatively large share of the population. Only Japan among G8 nations has a larger share of its population living in a single urban extent. By comparison, the largest urban area in the United States, New York, contains only 7 percent of the population. This is important because radical densification policy can retard economic growth. This means that the land-use and transportation policies of the Golden Horseshoe are far more important to the Canada economy than the policies of New York are to the United States economy or the policies of the Rhine-Ruhr are to Germany.

Happily, it is not all a sad story, as Florida has recently repealed its radical land-use planning laws.¹³ More jurisdictions need to follow. There is an important need for education and advocacy with respect to land use and transportation. There is also a need for greater understanding of the critical role of transportation fuels, which so efficiently move the city and without which the city of today could not have produced the unparalleled affluence that we enjoy.

ABOUT THE AUTHOR

Wendell Cox is the principal of Wendell Cox Consultancy (Demographia), an international public policy firm that specializes in urban policy, transport, and demographics. He has provided consulting assistance to the United States Department of Transportation and was certified by the Urban Mass Transportation Administration as an "expert" for the duration of its Public-Private Transportation Network program (1986-1993). He has consulted for public authorities in the United States, Canada, Australia, and New Zealand and for public policy organizations and lectured widely. He serves as visiting professor at the Conservatoire National des Arts et Metiers (a national university) in Paris, where he lectures on transport and demographics.

Endnotes

- 1 Available at <http://www.demographia.com/db-worldua.pdf>.
- 2 See <http://www.newgeography.com/content/002324-the-costs-smart-growth-revisited-a-40-year-perspective>.
- 3 For more information, see <http://www.demographia.com/db-ryerson201110.pdf>.
- 4 For more information, see <http://www.montrealgazette.com/business/Land+plan+will+make+Montreal+expensive+congested/6338370/story.html>.
- 5 See: <http://www.publicpurpose.com/ut-wctrs2007.pdf>
- 6 See <http://www.torontosun.com/2011/06/14/money-for-public-transit-wont-help-traffic-congestion>.
- 7 For more information, see <http://www.newgeography.com/content/002251-transit-the-4-percent-solution>.
- 8 Availble at <http://www.newgeography.com/content/002672-special-report-census-2011-urban-dispersion-canada>.
- 9 Full text available at <http://demographia.com/dhi4-preface.pdf>.
- 10 Available at <http://www.demographia.com/dhi.pdf>.
- 11 For more information, see <http://www.newgeography.com/content/001415-unlivable-vancouver>.
- 12 Available at http://online.wsj.com/article/SB10001424052702303302504577323353434618474.html?mod=rss_com_mostcommentart.
- 13 See <http://www.newgeography.com/content/002471-florida-repeals-smart-growth-law>.