

*Montreal
Economic Institute
Research Papers*

Wendell Cox

Housing and Transportation in Montreal

How suburbanization is improving the region's competitiveness

July 2006



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Housing and Transportation in Montreal

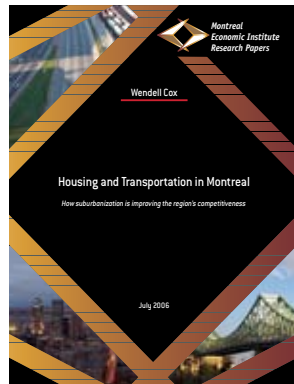
How suburbanization is improving the region's competitiveness

Executive Summary

Montreal is not generally considered one of the world's most competitive urban areas. For example, a recent report by the Organization for Economic Cooperation and Development (OECD) ranked Montreal 44th in gross domestic product per capita out of 65 international metropolitan regions. However, this could be changing. Superior transport infrastructure and its land use policies are giving Montreal a new advantage over competitors that have taken "wrong turns."

There is a strong relationship between suburbanization (pejoratively called "urban sprawl"), automobile use and the strong economic growth that has occurred in high-income nations since World War II. Millions of Canadian households were able to stop renting and begin accumulating their own equity as a result of the lower cost houses built on the less expensive land on and beyond the urban fringe. They were able to take advantage of a much larger array of employment and shopping opportunities because they could get anywhere in the metropolitan region in a comparatively short period of time, rather than the limited destinations that could be reached quickly on transit. In short, a world or a Montreal without cars or suburbs would be far less affluent.

Nonetheless, a strong lobby has arisen to oppose both suburbanization and the automobile. Much of its critique is simply wrong. Suburbanization is no threat to agriculture; in fact, the geographic spread of urban areas is only a fraction of the farmland removed from use because of improving productivity. The lower densities of the suburbs do not increase traffic congestion or air pollution, they dilute it. There is no prospect for urban planning to create an improved "jobs-housing balance" in which travel distances are minimized because proximity to employment is not a principal reason people use in choosing their neighborhoods. There is virtually no hope of transferring material amounts of automobile demand to transit,



simply because automobile competitive transit is not available for most trips, and cannot be provided at a price that can be afforded by society.

One of Montreal's emerging advantages is in housing affordability. The factor used to measure housing affordability is the "median multiple," which is the median house price divided by the median household income. The median multiple in Montreal is estimated at 3.5. This is below Toronto's 4.4 median multiple and well below Vancouver's 6.6, demonstrating Montreal's generally more affordable housing.

Historically, median multiples have tended to be 3.0 or below, and remain so in Quebec City, Edmonton, Winnipeg and many US markets. In many other markets, however, housing affordability has deteriorated markedly in recent years. The highest median multiples are above 10 (Los Angeles, San Diego and Honolulu). The metropolitan areas with significant constraints on land have experienced a median multiple increase five times that of those without such policies from 1995 to 2005.

This huge divergence in the price of housing relative to incomes cannot be explained by national market or demographic factors. Without exception, the markets with the highest median multiples have land shortages, virtually all of which stem from public policies. In most cases, land scarcity is created by anti-suburban policies, which limit the availability of land for development. This increases the price of land, which is reflected in higher house prices relative to incomes.

The Montreal area has not adopted the anti-suburban policies that have contributed so much to destroying housing affordability in many metropolitan areas. In contrast, Montreal's principal competitor, Toronto, is implementing some of the most radical land rationing policies and it seems likely that its median multiple will go much higher in the

future. There are already early indications that the most unaffordable housing markets in the United States are experiencing significant domestic migration losses to areas that are more affordable. All of this makes Montreal more attractive both for businesses and households wishing to own their own homes.

Anti-suburban policies generally call for seriously constraining the expansion of highways. This has the inevitable impact of increasing traffic congestion. Further, the densification that anti-suburban policies would seek to create also increases traffic congestion and the intensity of air pollution. International data indicates that lower density urban areas have less intense traffic congestion.

Montreal has a highly competitive transportation system. The Montreal urban area has the highest expressway density (kilometers per square kilometer) of any urban area with more than 1,000,000 population in Canada, the United States, Australia and New Zealand. Further, Montreal ranks sixth in expressway density among the 30 urban areas with more than 3,000,000 population in the high-income world.

Nonetheless, significant improvements are required to the expressway system. Perhaps the most important are the need to provide an alternative to the Metropolitan Boulevard and more river crossing capacity. Transports Québec has adopted a program that will result in significant mobility improvements,

including an expressway bypass of Montreal Island through the South Shore. These improvements are likely to extend Montreal's competitiveness as other urban areas implement dead-end policies that can only make the transportation situation worse.

Transit is also important, principally for travel to the central business district and within the core of the city of Montreal. Transit's advantage results from the intense density of employment in the central business district, a phenomenon that simply does not exist elsewhere in the region. Additional transit investments should be undertaken where they reduce hours of delay at a lower government cost than other alternatives. However, transit has virtually no capability for reducing automobile use or attracting material amounts of demand from cars for the large majority of trips that do not begin or end in the Montreal core.

In Montreal, as in virtually all other high-income world urban areas, most, if not all of the growth in travel demand will continue to be by car. Thus, the choice is not between transit and roadways. The choice is rather between more and less traffic congestion. It is also between more and less economic growth.

While other urban areas pursue policies that restrict mobility and raise housing prices, Montreal's competitive position is likely to improve. Montreal is on the right course and faces a brighter future.

INTRODUCTION

An important recent report found Montreal to be comparatively uncompetitive. The Organization for Economic Cooperation and Development (OECD), which may be the premier international economic analysis organization, came to this conclusion in a 2004 report.¹ The report ranked the Montreal Census Metropolitan Area (CMA) 44th in real GDP per capita out of the 65 largest OECD metropolitan areas.² The OECD lists lower productivity and an insufficient supply of skilled workers as principal reasons for Montreal's low ranking. The other two Canadian CMAs in the report were Toronto, which ranked 30th and Vancouver, which ranked 38th.

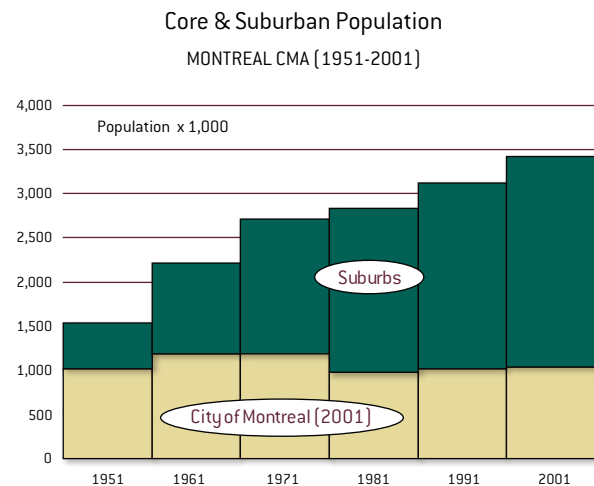
Even so, the OECD analysis indicates positive factors, especially in the growing field of information technology. Overall, the most competitive metropolitan areas are Boston, San Francisco and Seattle, which have long been leaders in information technology. The OECD notes that Montreal has risen to rank fifth in information technology out of 13 large North American metropolitan areas.³

Montreal has other advantages that position it well for future competition. The metropolitan area has superior housing affordability and one of the best urban transport systems (road and transit) in the world. These two factors were not included in the OECD analysis. Nonetheless, housing affordability and transport are crucial to economic competitiveness. And these issues cannot be discussed outside the phenomenon of “suburbanization” or “urban sprawl,” a trend that is centuries old but that has been accelerated by the availability of motorized personal mobility, through the automobile.

Montreal, like virtually every other high-income area in the world, has decentralized and is continuing to decentralize. It is Canada's second largest CMA,⁴

with an estimated population of 3.6 million in 2005. About one-half live on Montreal Island, most in the city of Montreal. The pre-amalgamation city of Montreal contained approximately 1,040,000 residents in 2001, a two percent increase from 1951, but down 15 percent from the 1966 peak of 1,222,000. Since 1951, the suburbs (that is, municipalities outside of the City of Montreal as it was in 2001) have added more than 1,800,000 residents, accounting for 99 percent of the CMA's growth (see Figure 1).⁵ This pattern is typical of metropolitan areas in Canada and the rest of the high-income world. Approximately 90 percent of urban growth in recent decades has been suburban in Canada, the United States, Western Europe and Japan.

Figure 1



Source: Calculated from Statistics Canada data (City of Montreal refers to 2001 Boundaries).

The highest urban population densities are in the core boroughs of Montreal. The borough of Le Plateau-Mont-Royal had 13,100 persons per square kilometer in 2001. However, population densities fall off sharply. The next highest borough density is 30 percent lower. The rest of the pre-amalgamation city had a density of 5,300, falling further to 2,500 in the rest of the island and to 1,100 in the urban area outside the island (see Figure 2). Overall, the Montreal urban area had a population density of 1,851 per square kilometer.

Montreal has a typical population density profile for a high-income world urban area. The most dense

1. Organization for Economic Cooperation and Development, *OECD Territorial Reviews (Montreal, Canada)*, February 2004, available at http://www.oecd.org/document/49/0,2340,en_2649_37429_6375025_1_1_1_37429,00.html.

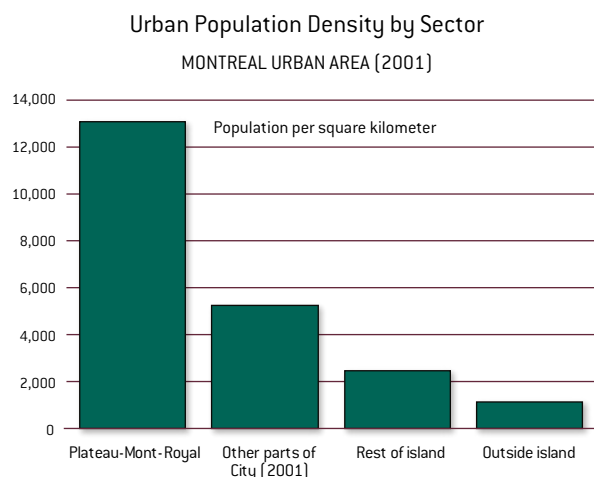
2. The OECD includes Canada, the United States, Western Europe, some Eastern European countries, Japan, Turkey, Australia, New Zealand, South Korea and Mexico.

3. A number of metropolitan areas ranking above Montreal, such as Washington, Paris, London, Rome and Madrid, are national capitals, which tend to have higher gross domestic products per capita, in part due to the government led mix of employment which exhibits generally higher rates of employee compensation.

4. A metropolitan area is a labor market area. An urban area is the continuous urbanization within the metropolitan area. In 2001, the urban area had a population of 3.2 million in 1,738 square kilometers, for a density of 1,851 per square kilometer (urban area data are available only for census years).

5. There were small additions to the boundaries of the City of Montreal between 1951 and 2001.

Figure 2



Source: Estimated from Statistics Canada and City of Montreal data.

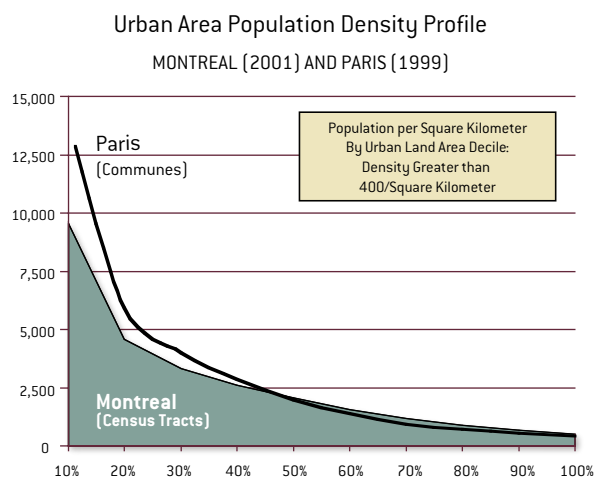
10 percent of land area in the Montreal urban area has approximately 9,500 persons per square kilometer (see Figure 3). The density of the least dense 80 percent of the urban area is virtually the same as the least dense 80 percent of the Paris urban area. This illustrates the fact that low-density suburbanization is the rule, rather than the exception among high-income world urban areas.

Similarly, job growth has been concentrated in the suburbs. From 1987 to 2003, nearly 85 percent of employment growth was outside Montreal Island (see Figure 4). All of the Island's job growth was downtown. Downtown remains by far the largest and most concentrated employment center, with more than 250,000 jobs in an area of just a few square kilometers. Nonetheless, only approximately 20 percent of employment is downtown. These figures are consistent with the international pattern. Downtowns tend to have 25 percent or less of metropolitan employment, and have been losing employment market share. For example, one international database indicates that downtown areas have captured only four percent of new jobs created in urban areas in recent decades.⁶

The relationship between greater affluence, suburbanization and automobile use is not universally appreciated. Montreal is at a crossroads and could lose these advantages if they are not properly understood. Pressure is mounting to adopt policies that threaten housing affordability and to invest in transportation choices that will cost a lot and deliver very little improvement.

The first section of this Research Paper presents the case for competitiveness by explaining the advantages of suburbanization and answering its critics. The

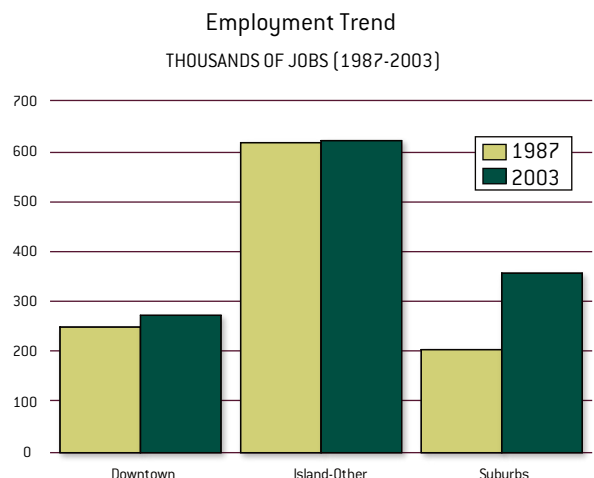
Figure 3



Source: Calculated from Statistics Canada and INSEE (France) data.

6. *International Central Business District Market Share Trends*, available at <http://www.demographia.com/db-intlcbd-trend.htm>. This is a website of Wendell Cox Consultancy.

Figure 4



Source: Calculated from data in Daniel Bergeron and Kim McDonough, *Constat sur la mobilité des personnes dans la grande région de Montréal. Faits saillants révélés par l'enquête Origine-Destination 2003*, April 2005, available at <http://www.amt.qc.ca/corpo/presentations.asp>.

second section discusses the issue of home ownership and housing affordability, and puts Montreal's situation in perspective with other metropolitan centers. The third section is devoted to mobility and transport and discusses in particular Montreal's highway infrastructure.⁷

7. The term "highway" as used in this document includes both expressways and principal arterials. Expressways are fully grade separated, having no cross traffic or traffic signals. Expressways are also called freeways, autoroutes (Quebec and France) and motorways (Great Britain and Australia). Expressways may operate with or without tolls. Principal arterials are all other main roads and have cross-traffic and traffic signals.

1. SUBURBANIZATION AND ITS CRITICS

The case for competitiveness

The modern trends of suburbanization and automobile use have been associated with unprecedented income growth throughout the high-income world. At the same time, there has been an unprecedented shift of the population, in Canada and elsewhere, from small towns and rural areas to the large metropolitan areas.

It may seem like today's modern affluent society has been a fact of life for many generations. But the wealth of high-income nations, whether Canada, the United States, Japan or the countries of Western Europe, is of relatively recent vintage.

By today's standards, it was not long ago that average incomes in Canada were at or below today's low-income levels. For example, at the beginning of World War II (1940) per capita incomes (inflation adjusted) were approximately 20 percent below the 2000 per capita low-income cutoff (approximately \$8,100).⁸ Since that time, incomes have risen more than four times. A similar income escalation has occurred throughout the high-income world.

In 2000, personal income per capita in Canada was nearly \$27,400 (see Figure 5).⁹ This was approximately 3.5 times the low-income cutoff.

A number of factors have contributed to this economic progress. One of the most important is the comparatively liberal economic markets that have developed and operate in the high-income world. This relationship emerges strongly from reports by the Fraser Institute and the Heritage Foundation.¹⁰ Technological advances have also been important, especially in transportation and telecommunications.

Urban growth is another important factor in rising incomes. Today's large urban areas are larger than ever before. For example, in 1950, Montreal was the only CMA in Canada with more than 1,000,000 residents. Today, there are six such areas (Montreal, Toronto, Vancouver, Ottawa-Gatineau, Calgary and Edmonton). These CMAs have drawn people from rural areas and

8. This is applicable to a member of a household of three in an urban area having a population between 100,000 and 499,999 inhabitants, before tax.

9. Statistics Canada, *Selected economic indicators, provincial economic accounts, annual*, available at http://cansim2.statcan.ca/cgi-win/cnsmcgi.exe?Lang=E&Accessible=1&ArrayId=V923&ResultTemplate=CI\1\SNA___&RootDir=CII&Interactive=1&OutFmt=HTML2D&Array_Retr=1&Dim=#HERE.

10. James Gwartney and Robert Lawson, *Economic Freedom of the World: 2004 Annual Report*, Vancouver, Fraser Institute, 2004 and Marc A. Miles, Edwin J. Fuelner and Mary Anastasia O'Grady, *2005 Index of Economic Freedom*, Washington, Heritage Foundation, 2005.

Figure 5

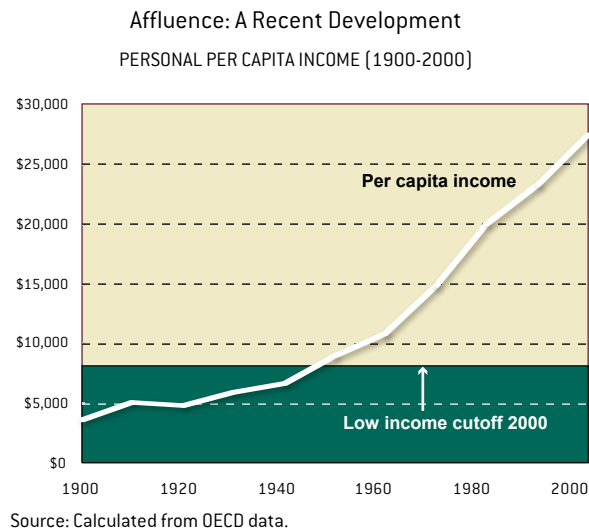
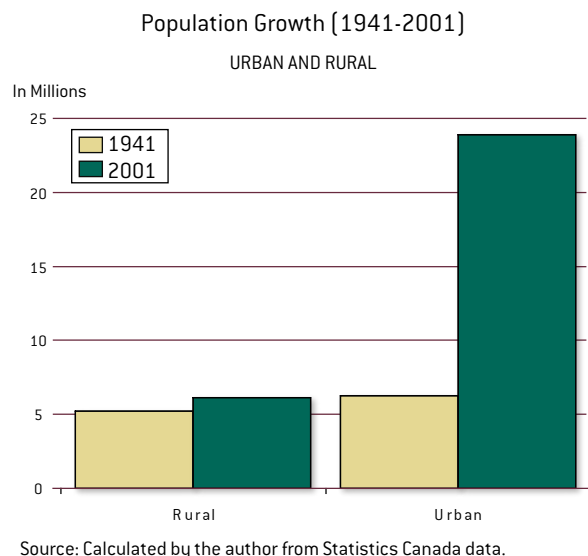


Figure 6

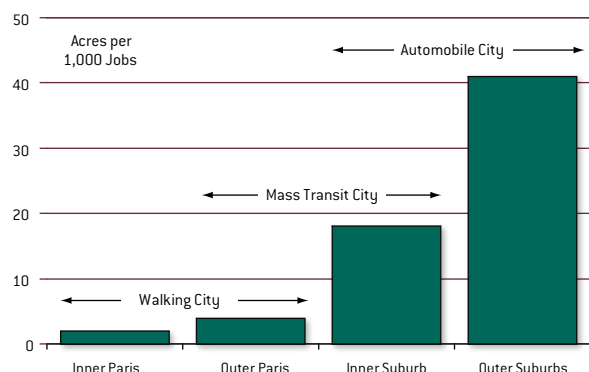


small towns because of their greater economic opportunities. Even so, agriculture continues to dominate land use in Canada and Quebec. Agriculture accounted for 82 percent of the total urban and agricultural land in the province in 2001.¹¹

Suburbanization has occurred for a number of reasons. Population growth has been important, but it is not often recognized that nearly all population growth

11. Calculated by the author from Statistics Canada data available at <http://www40.statcan.ca/lo1/cst01/agrc25f.htm>.

Figure 7
Commercial Area Per 1,000 Jobs
PARIS (ILE-DE-FRANCE) AREA (1999)



Source: Calculated from data in *Commercial Land Use Per Job: Paris Metropolitan Area (Île-de-France) (1999)*, available at <http://www.demographia.com/db-paris-comm1.htm>.

in Canada has been urban since 1941. As a result, urban areas have had to accommodate far more new residents than might have been expected. In 1941, urban areas contained 54 percent of the population. Between 1941 and 2001, urban areas captured 95 percent of the population growth (see Figure 6).

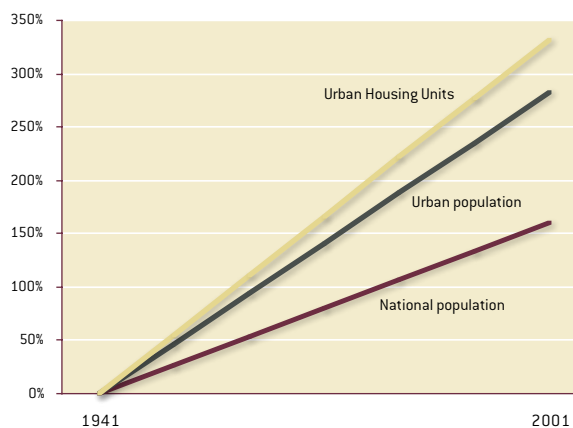
At the same time, employment growth was considerably greater than the rate of population growth. A principal cause was the entry of women into employment markets. Moreover, the nature of the new commercial development was much different. Large commercial buildings and factories became more horizontal, often spread out (sprawling) in single-story configurations. This generally made manufacturing and commercial operations more efficient, ultimately lowering product prices for consumers. The more horizontal structures required more land, which was available at much lower prices in the surrounding countryside than in the core or even the inner suburbs.

This was true not only in North America, but even in compact urban areas such as Paris, where the automobile oriented outer ring suburbs that have developed since 1950 have commercial development that occupies more than twice the land area per employee as in the inner ring mass transit oriented suburbs that largely developed in what was the pre-automobile era in France between 1920 and 1950 (see Figure 7).¹²

Further, average household sizes have shrunk, making it necessary to build even more housing units. This takes more land. The number of urban households has grown at twice the rate of the Canadian popula-

12. Calculated from data in *Commercial Land Use Per Job: Paris Metropolitan Area (Île-de-France) (1999)*, available at <http://www.demographia.com/db-paris-comm1.htm>.

Figure 8
Urban & Household Growth
(1941 - 2001)



Source: Calculated by the author from Statistics Canada data.

tion (see Figure 8). Finally, as people have become more affluent, they have sought a higher quality of life in the suburbs, with larger houses and larger yards.

Low cost suburban housing has attracted more people to urban areas. As urban areas have suburbanized, home ownership rates have increased, especially on the urban fringe. In Montreal, as in other high-income world urban areas, home ownership rates generally rise from comparatively low rates in the core to high rates in the outer suburbs.

Home ownership is a principal mechanism for creating individual or household wealth. There is a fundamental difference between purchasing a home and paying rent. By purchasing a home, a household adds to its wealth. Part of the monthly mortgage payment is used to reduce the amount owed and becomes a part of the owner's equity in the home. In contrast, all of the money paid to rent a home that the household does not own goes to the property owner. There is no potential equity for the renter in the rented home.

Statistics Canada data indicates that a household owning its home outright will tend to have a net worth nine times that of a renting household, while a household with a mortgage will have a net worth four times as high. Approximately 38 percent of household wealth is in house equity.¹³

Home ownership broadens and deepens affluence. An economy is richer because of home ownership. This recognition has been at the base of public policies intended to expand home ownership around the world. It is important to the economy of the nation and the

13. Statistics Canada, *The Assets and Debts of Canadians: An Overview of the Results of the Survey of Financial Security*, Ottawa, Minister of Industry, 2001, available at <http://www.statcan.ca/english/freepub/13-595-XIE/13-595-XIE1999001.pdf>.

metropolitan area for home ownership rates to remain high and to increase.

The automobile has brought much larger areas within reach of most households. This has substantially improved the efficiency of urban areas by improving the match between people and jobs, while making it possible to choose from a larger number of competing retail outlets for shopping. Before the automobile, people could accept jobs only where transit or walking could take them. Now people can access nearly all jobs in an urban area by car. Before the car, shopping opportunities were much more restricted. Shoppers had a smaller selection of stores from which to choose and had to make more shopping trips. The car makes it possible to buy much more on a single shopping trip, as shoppers are no longer captive to small “corner grocery” stores and other local retail outlets that charge higher prices.

Mobility is important to the competitiveness of metropolitan areas. For example, Rémy Prud’homme and Chang-Woon Lee of the University of Paris XII found that more mobile labor markets are associated with greater economic productivity. Their research indicates that as people can access more jobs in a particular amount of time (such as 30 minutes), an urban area’s economic output improves by an estimated factor of 0.18.¹⁴

The Prud’homme-Lee thesis can be illustrated as follows. In an urban area with demographic characteristics similar to Montreal, a commuter can access approximately 950,000 jobs in a 30 minute automobile trip (at an average of 40 kilometers per hour). If speeds could be improved so that the average commuter could access 10 percent more jobs—1,045,000 jobs—the economic output of the area would be increased 1.8 percent ($10\% \times 0.18$).

Our own analysis further suggests an association between urban mobility and urban economic prosperity. An econometric analysis of data from 99 international urban areas indicates that gross per capita product has an especially strong relationship with (1) the extent of economic liberalism (economic freedom) and (2) annual travel (automobile plus mass transit) per capita in kilometers. A negative relationship was indicated between the amount of travel by transit and the gross per capita product.¹⁵

Despite the relationship between economic growth and automobile use, urban and transport planning literature is filled with condemnations of suburbanization and automobile use. Rarely, if ever, does this literature consider the economic implications of policies that would seek to restrict these phenomena. Nonetheless, the connection is clear. More competitive urban areas have higher levels of home ownership (associated with suburbanization) and have greater mobility.

The policies discussed below represent a “case against competitiveness,” because each would leave the metropolitan area less competitive.

Fighting “urban sprawl”

Suburbanization, pejoratively called “urban sprawl,” has occurred not only in Canada, but also in all large urban areas in the high-income world. The urban planning literature of recent years is filled with condemnation of suburbanization and strategies that are claimed to be able to contain it. For example:¹⁶

- *Loss of Agricultural Land.* Urban land area growth is charged with consuming an inordinate amount of agricultural land, thereby threatening the food supply. Yet, even after 400 years of urbanization, urbanization represents only a small portion of the land use in Canada’s agricultural belt (approximately three percent). Much more agricultural land has been withdrawn over the past one-half century than is used for urban areas.
- *Consumption of Open Space.* It is claimed that urban land area growth consumes large amounts of open space. However, as indicated above, more productive agriculture has returned far more land to open space than has been consumed by urbanization (this is not to suggest that environmentally sensitive or otherwise special land should not be preserved in reasonable amounts).
- *Traffic Congestion and Air Pollution.* Urban land area growth is purported to make traffic congestion and air pollution worse. The opposite is true. Traffic congestion and air pollution are intensified by higher densities and generally moderated by lower densities.
- *Higher Government Costs.* Many anti-sprawl studies indicate that government costs are higher in less dense suburbs than in the more dense urban cores. In the United States, the actual data indicates virtually the opposite. The newer, less dense suburbs have lower expenditures per capita than

14. Rémy Prud’homme and Chang-Woon Lee, “Size, Sprawl, Speed and the Efficiency of Cities”, *Urban Studies*, Vol. 36, No. 11, 1999, p. 1849.

15. Wendell Cox, *Public Transport Competitiveness: Implications for Emerging Urban Areas*, presentation to the Cooperation for Urban Mobility in the Developing World (XI Congress), Bucharest (Romania), 2004, available at <http://www.codatu.org/english/publications/proceeding/conference/codatu11/Papers/cox1.pdf>. Economic freedom and per capita travel were statistically significant at the 99 percent level of confidence. Transit travel was significant at the 95 percent level of confidence. The other variables were not statistically significant (population, population density, transit service intensity). The R2 was 0.74.

16. A more complete discussion of these issues will be found in Wendell Cox, *Myths About Urban Growth and the Toronto Greenbelt*, Vancouver, Fraser Institute, 2004, available at <http://www.fraserinstitute.ca/admin/books/files/UrbanGrowth&TorontoGreenbelt.pdf>.

the more dense central cities.¹⁷ Urban planner and former Australian National University professor Patrick Troy reviewed the “suburbs versus core” literature on which much of Australian anti-sprawl policy is based and found it to be wanting. He notes that the studies included private costs, such as the user charges residents pay for water and sewer service, which are not costs of government at all. Troy also notes that some studies included the theoretical costs of additional travel time, which even if accurate cannot be considered a government cost by any stretch of the imagination.¹⁸

- **Obesity.** Over the past years, an intense public relations effort has accompanied publication of academic studies purporting to demonstrate that urban land area growth is a principal cause of obesity. It is suggested that lower population densities and suburban land use discourage walking, thereby increasing weights. There are at least two strong reasons to doubt the sprawl-obesity connection. Food intake has increased markedly during the same period that obesity has accelerated. Further, the large reductions in population density and walking occurred before the rise in obesity.¹⁹

Greenhouse gas emissions

A more recent argument against suburbanization is the role of land use planning in greenhouse gas reductions. The assumption is that if suburban development is limited, people will use transit more and their cars less, resulting in lower greenhouse emissions.

The mere mention of greenhouse gas emissions can often trump all arguments. Rarely is any further analysis provided. Local newspaper columnists routinely condemn any major highway improvement because of an assumption that the result will mean greater

greenhouse gas emissions. In fact, however, cars play a comparatively small role in greenhouse gas emissions and local transportation and land use policies can have but miniscule impacts.

Cars and light trucks (including sport utility vehicles, or SUVs) produce only a small part of greenhouse gas emissions. In 2003, cars and light trucks emitted only 12 percent of Canada’s greenhouse gases—93,000 kilotons of CO₂ equivalent greenhouse gases out of a total 740,000 kilotons. If the whole country were to stop using cars and light trucks, the savings in greenhouse gas emissions would be barely enough to cover *one-half* of Canada’s committed reduction under the Kyoto Accords.²⁰

Moreover, there are indications that land use strategies have little or no potential for reducing greenhouse gas emissions. If it is assumed that automobile and light truck use will continue to rise at the current rate in the Montreal urban area, greenhouse gas emissions will increase 27 percent by 2030.²¹ There is little potential of reducing this amount through land use policies. A report by researchers at the US Oak Ridge National Laboratory estimates that doubling urban population densities would reduce greenhouse gas emissions from personal vehicles by approximately five percent.²²

It is inconceivable for an urban area to double its density because that would mean the abandonment of up to one-half of the urban form, with the suburban evacuees forced into an already crowded urban core. At the more moderate densification rate projected under Toronto’s recently adopted greenbelt policies, there would be little change in greenhouse gas emissions. If Montreal were to densify at the rate projected in Toronto, greenhouse gases would increase 26.6 percent, a rate of increase little different than the one projected above without densification.²³

On the other hand, the Oak Ridge report concluded that fuel economy measures were an effective strategy for reducing automobile and light truck greenhouse gas emissions. If the Oak Ridge fuel economy estimates were applied to Montreal, 2030 greenhouse gas emissions from automobiles and light trucks could be 2.1

17. See Wendell Cox and Joshua Utt, *The Costs of Sprawl Revisited: What the Data Really Show*, Washington, Heritage Foundation, 2004, available at <http://www.heritage.org/Research/SmartGrowth/loader.cfm?url=/commons/spot/security/getfile.cfm&PageID=65819> and Wendell Cox, *Growth, Economic Development and Government Structure in Pennsylvania*, Enola (PA), Pennsylvania State Association of Township Supervisors, 2005, available at http://www.psats.org/local_gov_growth_report.pdf.

18. Patrick N. Troy, *The Perils of Urban Consolidation*, Annandale (Australia), The Federation Press, 1996, pp. 55-76.

19. Between 1960-62 and 1976-80, the US obesity rate increased from 13.3% to 15.1%. From 1976-80 to 1988-94, the rate increased to 23.3 percent and by 1999-2000 to 30.9 percent. The annual increase rate since 1976-80 has been four times the 1960-62 to 1976-1980 rate. According to US Census Bureau data, urban densities declined 28 percent from 1960 to 1980 and have increased slightly since that time. If the suburbanization/obesity connection were valid, the opposite relationship would be required—as densities were declining, obesity rates would have increased the most. For obesity rates, see <http://www.cdc.gov/nchs/data/hus/tables/2002/02hus070.pdf>.

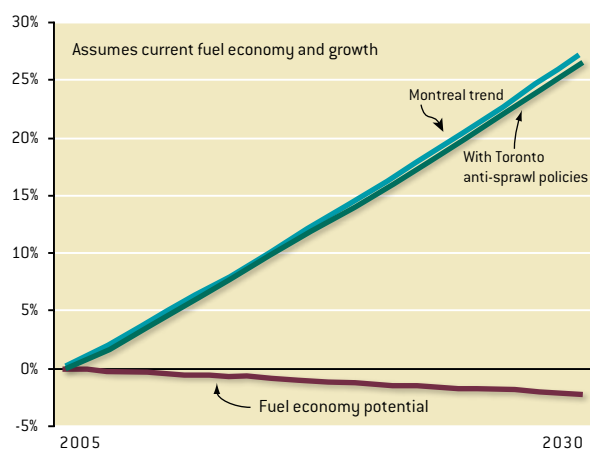
20. Canada’s Kyoto target is to reduce greenhouse gas emissions to a level six percent below 1990 by 2012. In 2003, cars and light trucks produced 93,000 kilotons, compared to the 180,000 kiloton reduction that would be required to achieve the Kyoto target. See Environment Canada, *Canada’s 2003 Greenhouse Gas Inventory (Summary)*, available at http://www.ec.gc.ca/pdb/ghg/inventory_report/2003summary/2003summary_e.cfm.

21. This assumes no improvement in fuel efficiency, and is thus a conservative estimate.

22. David L. Greene and Andreas Schafer, *Reducing Greenhouse Gas Emissions from US Transportation*, Arlington (VA), Pew Center on Global Climate Change, May 2003, available at <http://www.pewclimate.org/docUploads/ustransp%2Epdf>.

23. Estimated by the author using data in IBI Group (in association with Metropole Consultants and Dillon Consulting Limited), *Toronto Related Region Futures Study: Sketch Modeling of Four Alternative Development Concepts*, Toronto, Neptis Foundation, 2003.

Figure 9
Greenhouse Gas Emissions (2005-2025)
AUTOMOBILES & LIGHT TRUCKS



percent below present levels and nearly one-quarter below the Montreal trend and Toronto densification projections for 2030 (see Figure 9).

Jobs-housing balance

It is often suggested that the demand for travel in urban areas could be reduced materially by placing jobs in closer proximity to housing. In fact, attempts to accomplish this objective have routinely failed.

In the United Kingdom, “self sufficient” new towns (such as Milton Keynes and Stevanage) were built in the exurbs with sufficient employment for the new residents. The jobs and the residents came, but the shorter travel distances did not. The 2001 census shows that residents of the new towns travel to work, on average, a distance twice the diameter (distance across) of the new towns they live in.²⁴ A large share of the residents work in other towns or in the large cities.

Urbanologist Peter Hall made similar findings with respect to Stockholm’s satellite communities. Despite planning intentions similar to those in the UK, the overwhelming majority of people work elsewhere.²⁵

In hyper-dense Hong Kong, much of it 40 times the density of the Montreal urban area, it would seem reasonable to presume that a jobs-housing balance might have been achieved that would minimize work trip travel distances. Indeed, jobs and housing are close together in Hong Kong. However, the average work trip

in Hong Kong is eight kilometers. For whatever reason, Hong Kong residents choose to work at locations that are farther away from home than hundreds of thousands, if not millions of closer jobs.²⁶

Proximity to work is not the principal consideration in choosing where to live. The 2000 US Census Supplemental Survey found that only one-fifth of households that have recently moved chose their neighborhood based upon employment proximity.

People choose where they live based upon many factors, of which employment location is just one. Factors such as proximity to relatives, the house itself, schools, the neighborhood, balancing the commuting requirements of more than one worker and others are considered in making the housing location decision. Closer jobs may not match the qualifications and preferences of the employee.

Modern urban areas necessarily exhibit a strong jobs-housing balance based upon the mobility provided by the automobile. In Montreal for example, more than 60 percent of employees work in the same geographic sector as their residence.²⁷

Substituting automobile use with transit

There are both claims and inferences in the planning literature that mass transit can be substituted for a material share of present automobile use. However, the same literature virtually never provides a practical “blueprint” for achieving this objective. This is because the modern urban area is dependent upon automobiles and transit is not a substitute for most urban trips.

Before the car, urban residents were dependent on walking and mass transit, which took longer. Much of the urban area was beyond practical reach for people by transit, because of fixed schedules, slow speeds, congestion on tramway lines and having to transfer from one line to another to get anywhere but downtown.

The car made it possible to travel throughout the urban area far more quickly and less expensively than had been possible before. Before the car, transit limited where people could go and when they could go. The car liberated people to go where they wanted when they wanted. This democratization of mobility contributed substantially to the democratization of prosperity.

To return to an era in which mass transit is the dominant mode of urban transport, or even practically available for most trips, would require a radical restructuring of the urban area. The mass transit oriented,

24. Southeast England New Towns Commuting Distance and Urban Area Geographical Size, available at <http://www.demographia.com/db-seuknewtowns.htm>.

25. Peter Hall, *Cities in Civilization*, New York, Pantheon Books, 1998, pp. 842-887.

26. International Union of Public Transport, *Millennium Cities Database for Sustainable Transport*, 2001.

27. Calculated from data in *Plan de gestion des déplacements. Région métropolitaine de Montréal. Pour une décongestion durable*, Quebec Ministry of Transport, April 2000, available at <http://www1.mtq.gouv.qc.ca/fr/publications/regions/montreal/plan/durable.zip>.

pre-automobile urban areas were far more dense and centrally oriented than today's automobile oriented areas. For example, in 1900, when there were few automobiles, the world's largest urban areas, London, New York and Paris, had population densities of 15,000 to 25,000 per square kilometer. Much more of the employment base was in the core. Today, the same urban areas have densities of 5,000 or less.

As late as 1931, the Montreal urban area contained a population of less than 1,000,000, concentrated in an area of approximately 160 square kilometers.²⁸ The urban population density was nearly 6,000 per square kilometer, more than three times the present 1,851 persons per square kilometer.

Even within the much smaller 1931 urban area, mass transit was unable to provide the rapid point to point mobility throughout the urban area that the automobile provides today. To restore pre-automobile densities in Montreal would require abandoning more than two-thirds of the urban form, while moving suburban residents into the remaining one-third. A high-quality rapid transit system that could provide such effective service could cost more, each year, than the annual economic output of a metropolitan area.²⁹

Perhaps the reason that expectations about transit substituting for car use are never converted into serious proposals is that they cannot be. Modern urban areas, whether Montreal, Paris or Phoenix, are simply too large geographically for transit to provide competitive service, except to highly dense destinations such as some central business districts. A recent state of Washington report made this point, finding that total hours of travel delay in Seattle would more than double under a transportation program focusing on transit improvements rather than highway improvements (by 2025).³⁰ Policies that are based upon the hope of moving material amounts of demand from cars to transit inevitably result in a misallocation of resources. The result is that too much money is spent for too little gain on transit, while not enough is spent on the roadway systems that carry most people and all trucks.

Building roadways: pent up demand, not induced demand

It has been argued that roads should not be expanded because of the theory of "induced traffic." Research is cited to demonstrate that new roads

"induce" so much new travel that it is impossible to "build out of" traffic congestion. A picture is painted of a populace that would spend their whole lives behind the wheel if only enough roads were built.

There are two US urban areas where an induced traffic effect should have been demonstrated. In the early 1980s, Phoenix had a severely underdeveloped expressway system compared to other major urban areas in the United States. The view of local and state officials was that they did not want to "become another Los Angeles." However, increasing traffic congestion was to convince them that there was something worse—becoming another Los Angeles, but without its expressway system. As a result, Phoenix undertook construction of new expressways. Phoenix has built more in new urban expressways than any other major urban area in the last two decades.

Based upon the induced traffic theory, it would be expected that Phoenix area traffic volumes would have increased inordinately compared to other areas. In fact, the opposite occurred. Car use in the Phoenix area increased 20 percent per capita from 1984 to 2002. This is well below the national urban average increase of 32 percent. Perhaps even more significant, Portland, with its adopted anti-highway and anti-automobile policies, experienced a 52 percent per capita increase in car use over the same period.

Houston provides further evidence. Houston had the worst traffic congestion in the United States as late as 1985. Since then, major expressway and principal arterial expansions have been undertaken. In fact, per capita roadway travel increased only 10 percent from 1984 to 2002, less than one-third the national rate. More significantly, per capita roadway travel increased less than one-fifth the rate of Portland, with its anti-highway policies.

What roadway opponents call induced demand would more properly be classified as "pent up demand." New roads do not induce people to travel more as much as the failure to build new roads creates pent up demand that is released when capacity is expanded. By not providing enough roadway capacity, metropolitan areas become unnecessarily congested and more polluted, while positioning themselves less well for the challenges of the future.

What if there had been no suburbanization?

To have prevented suburbanization would have required planning prohibitions even stronger than the heavy-handed policies now being implemented in Portland, Sydney or Toronto. Much of the development that has occurred would need to have been prohibited.

Before the start of World War II, home ownership was generally much lower than today. If serious

28. Estimated by the author using historical street maps.

29. See, for example, Wendell Cox, "The Illusion of Transit Choice", *Veritas*, Vol. 3, No. 2, March 2002, p. 34, available at <http://www.texaspolicy.com/pdf/2002-3-2-veritas-transit.pdf>.

30. Washington Department of Transportation, *Congestion Relief Analysis: Central Puget Sound Area Report*, March 2006, available at <http://www.wsdot.wa.gov/Mobility/4chapter2pugetsound.pdf>.

limitations had been placed on suburban development, housing prices would have been higher. Many households would have been forced to find housing in more crowded urban cores. This would have rarified urban core housing markets, leading to even higher prices. Home ownership rates would undoubtedly have been much lower, and households less prosperous, being denied the wealth that they would have accumulated from buying a house rather than paying rent.

The larger number of renters would likely have paid a price as well. The higher property prices would have driven the cost of rent up. Without high levels of home ownership, economic growth would have been stunted. All in all, in this less affluent society, there would have been more poverty and fewer opportunities for everyone.

The story in mobility would have been little different. Car ownership would have remained beyond the means of many. The limited space for garaging cars in the dense urban area would have raised the cost of car ownership. More people would be captive to mass transit, which *cannot* provide the comprehensive mobility throughout an urban area that the automobile affords.

The longer travel times and inconvenience of mass transit could very likely have kept many women from joining the workforce. Mass transit simply cannot provide the convenient mobility necessary to deliver

children to schools or day care centers. It is likely that many women who did enter the work force would have had diminished career prospects because of transportation difficulties. It is likely that economic growth would have been less with fewer women with fewer good jobs. Again, this would have increased poverty rates.

Traffic congestion would be worse. There would have been fewer automobiles. But the density of cars and traffic would have been greater, requiring operation for many more hours, traveling slower, stopping more frequently (perhaps “going” less frequently would be more accurate) and emitting more pollutants.

Infrastructure costs would have been higher as the already overcrowded rail transit systems serving dense cores would have required hugely expensive expansions far beyond any expansions ever seriously considered. Water and sewer systems would have had to be extensively rebuilt to handle additional demand in expensive urban environments.

Consumer prices would have been higher, because the retail innovations that have occurred where land is cheap would have been precluded. And, without broad automobile ownership, people would be captive to nearby retail outlets that would have the freedom from competition to charge higher prices. A world or a Montreal without suburbs would be considerably less prosperous.

2. HOME OWNERSHIP AND HOUSING AFFORDABILITY

Housing affordability trends and policies

Conscious government policies appear to be at the heart of the excessive housing cost escalation occurring in some urban areas. The problem lies in strategies intended to contain “urban sprawl,” principally measures that ration land and extract large impact fees for development. These may be called “smart growth,” “urban consolidation” or “compact city” policies. These land rationing strategies are typically establishment of greenbelts, urban growth boundaries and other measures that prohibit new housing on large amounts of land.

University research supports the general contention that land use restrictions increase the price of housing. Edward Glaeser and Joseph Gyourko,³¹ reported that the principal cause of differences in housing affordability between US metropolitan areas is zoning and land regulation. This is a particularly stark finding, since average house prices in US markets range from more than US\$745,000 in the San Francisco Bay area to less than US\$150,000 in Midwestern and Southern metropolitan areas, such as Dallas-Fort Worth, Houston, Cincinnati and Indianapolis.³²

Glaeser and Gyourko concluded, based upon their findings, that there was no national housing affordability crisis.³³ Nonetheless, housing costs have escalated substantially in a number of urban areas. Most of these areas also have land rationing policies that have driven up housing prices by creating scarcity. A United States Department of Housing and Urban Development report refers to “misuse of smart growth:”

*A number of communities, however, have used smart growth rhetoric to justify restricting growth and limiting developable land supply, which lead to housing cost increases.*³⁴

Not surprisingly, research is already indicating that anti-suburban land use regulations are leading to

lower levels of economic growth. A paper by Raven Saks, published by the John F. Kennedy School of Government at Harvard, concluded that “metropolitan areas with stringent development regulations generate less employment growth than expected given their industrial bases.”³⁵

William Lewis of the McKinsey Global Institute outlined the choices with respect to excessive land use regulations:

*Most people consider the ‘social objectives’ motivating zoning laws... to be ‘good.’ However, we can’t have it both ways. These measures distort markets severely and limit overall productivity growth, slow overall economic growth and cause unemployment.*³⁶

Perhaps the best measure of housing affordability is the “median multiple,” which compares the median priced house³⁷ to the median household income. The median multiple is the number of years of income it would take for the median income household to purchase the median priced home.

Throughout Canada, the United States, Australia and New Zealand, the median multiple has historically been approximately three (3.0). Today, many markets in these countries have median multiples far above their historical level. This is indicated in our *Second Annual Demographia International Housing Affordability Survey* which provides information for markets in six countries.³⁸

There is a strong association between higher median multiples, or reduced housing affordability, and anti-suburban policies. The extremely high median multiples now evident in some urban areas have developed only in recent years. This is illustrated by an examination of U.S. markets with more than 500,000 residents:³⁹

31. Edward L. Glaeser and Joseph Gyourko, “The Impact of Zoning on Housing Affordability”, *FRBNY Economic Policy Review*, June 2003, available at <http://www.newyorkfed.org/research/epr/03v09n2/0306glae.pdf>.

32. National Association of Realtors, *Median Sales Price of Existing Single-Family Homes for Metropolitan Areas*, available at <http://www.realtor.org/Research.nsf/files/RELo6QiT.pdf/sFILE/RELo6QiT.pdf> (1st quarter 2006 prices).

33. Glaeser and Gyourko, *op. cit.*, p. 35.

34. Office of Policy Development and Research, *Why Not in Our Community? Removing Barriers to Affordable Housing*, Washington, US Department of Housing and Urban Development, 2005, p. 5, available at <http://www.huduser.org/Publications/pdf/wnioc.pdf>.

35. Raven E. Saks, “Job Creation and Housing Construction: Constraints on Employment Growth in Metropolitan Areas”, *Joint Center for Housing Studies*, December 2004, available at http://www.jchs.harvard.edu/publications/markets/w04-10_saks.pdf.

36. William W. Lewis, *The Power of Productivity: Wealth, Poverty, and the Threat to Global Stability*. Chicago, University of Chicago Press, 2004.

37. The median price is the “middle” price, not the average (or mean price). For example, if on three successive days the high temperature were 20, 21 and 34, the median temperature would be 21 (while the average would be 25).

38. *Second Annual Demographia International Housing Affordability Survey*, Demographia and Pavletich Properties, Ltd., 2006, available at <http://www.demographia.com/dhi-ix2005q3.pdf>.

39. *Major Market Housing Affordability: United States (1995-2005)*, available at <http://www.demographia.com/db-haff19952005us.htm>.

- In 1995, the highest median multiple in the nation was 4.3, in Honolulu. By 2005, the highest median multiple was 11.2, in Los Angeles. San Diego and Honolulu also had median multiples above 10.0.
- In 1995, no markets had median multiples higher than 5.0. By 2005, 18 markets were above 5.0.
- Among markets with strong anti-suburban policies, there was an average increase of 3.5 in the median multiple from 1995 to 2005. Among markets without such policies, the increase was 0.7, one-fifth the amount in the anti-suburban policy markets.

A number of urban areas in the United States have serious housing affordability problems. The worst median multiples are in Southern California, in Los Angeles (11.2) and San Diego (10.8) and Ventura County (9.6). Honolulu has a median multiple of 10.6. Other high US median multiples are found elsewhere on the Pacific Coast and in the Northeast corridor, from Washington, DC to Boston.

It is a well-established economic principle that shortages lead to higher prices. Each of the most unaffordable US states has a shortage of land available for development. Various factors can create land shortages. The most important appear to be public policy and geography.

- The land scarcity is associated with state or local government policy in California markets, Portland, Seattle and Denver. In each of these markets, conscious land rationing policies have been adopted, which are characterized as “smart growth.” The most typical strategy is delineation of an urban growth boundary, inside of which urban development must take place and outside of which no urban development is permitted. Other smart growth policies, such as excessive development impact fees, also raise the price of housing.
- The land scarcity is also associated with government policies throughout Massachusetts, New York, New Jersey and Rhode Island. In these states, the problems are large-lot zoning and age-exclusive development. Large-lot zoning requires suburban development to consume more land than would be supported by the market, materially raising land prices, which makes housing more expensive. Age-exclusive communities are developments that require residents to be 55 or more years of age. Both of these strategies tend to limit new housing to households without children or households with very high incomes.

There are indications that the more affordable markets are attracting new domestic (non-immigrant) migrants. Between 2000 and 2005, the net domestic migration in major US metropolitan areas with median

multiples of 4.0 or more was minus 1,700,000 inhabitants (-1.7 percent relative to their 2000 populations), while markets with lower median multiples gained 460,000 inhabitants (+0.7 percent).⁴⁰ The balance of the domestic migrants moved to smaller areas, the overwhelming majority of which have far better housing affordability and lack the land rationing policies typical of the unaffordable areas.

The situation is similar in other unaffordable international housing markets. Australasian urban areas have generally adopted land rationing policies, including urban growth boundaries and excessive development impact fees. For example, in the Sydney area, development impact fees for a new housing unit can be nearly enough to purchase the average house in Montreal.

Canada’s most unaffordable major market, Vancouver, also has strong land rationing policies. The Ontario government has enacted a land-rationing policy for the Toronto area and the other “Golden Horseshoe” CMAs of Hamilton, Oshawa and St. Catharines-Niagara Falls. It seems likely that, as in other areas with strong land rationing policies, housing affordability will be undermined even more in Toronto, as the greenbelt policy is implemented.

Housing affordability in Montreal

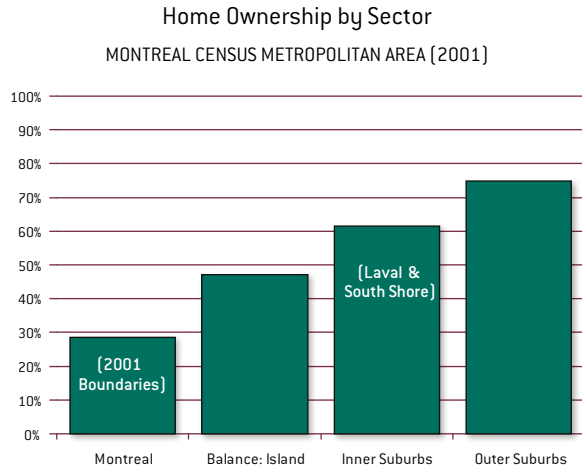
Housing is generally affordable in the Montreal CMA, both by national and international standards. At the same time, home ownership in Montreal is low compared to national rates. In 2001, 65.8 percent of Canadian households owned their own homes, compared to 50.2 percent in the Montreal CMA. Montreal’s home ownership rate is the lowest among Canadian CMAs.

Montreal CMA home ownership is much higher in the suburbs than in the core. In the city of Montreal (pre-amalgamation), the home ownership rate was 29 percent in 2001. Inner suburban rates were 47 percent on Montreal Island and 62 percent in Laval and the South Shore⁴¹. Home ownership rates were the highest in the outer suburbs, at 75 percent (see Figure 10). This mirrors the situation in other urban areas. In Montreal, as in other metropolitan areas, the housing units built on less expensive land in the suburbs have made home ownership a reality for more households, while substantially improving their quality of life.

40. *Domestic Migration & Housing Affordability: US Metropolitan Areas over 1,000,000: 2000-2005*, available at <http://www.demographia.com/db-metmigramm.htm>.

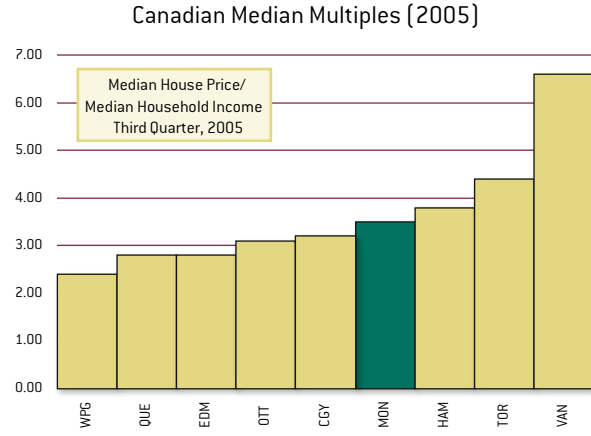
41. South Shore refers to the Champlain census division (comprising the cities and former cities of Longueuil, St-Hubert, St-Lambert, Brossard, Le Moine and Greenfield Park).

Figure 10



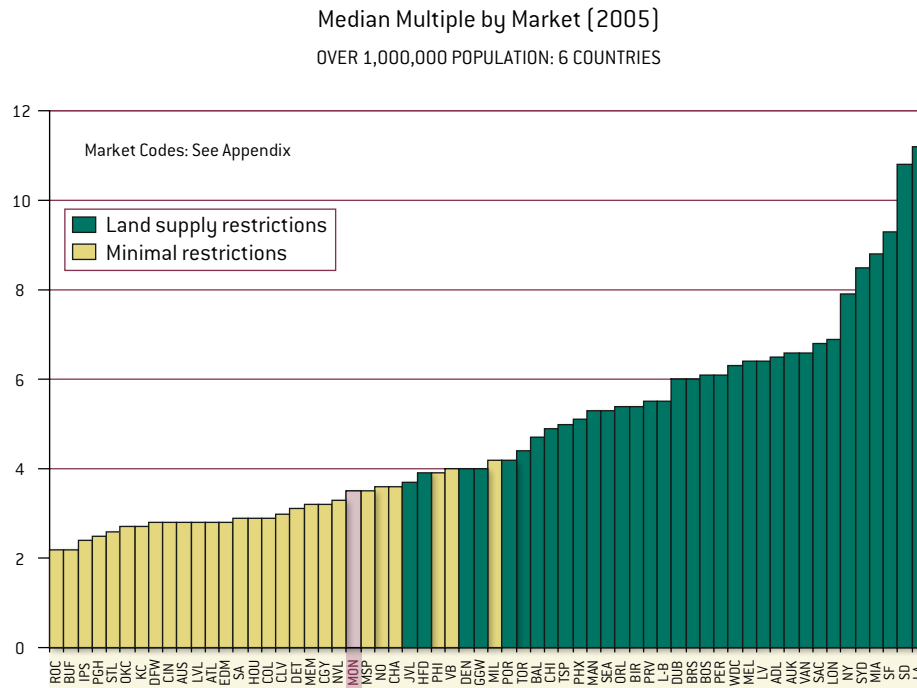
Source: Calculated from Statistics Canada data.

Figure 11



Source: 2nd Annual Demographia International Housing Affordability Survey: 2006, available at <http://www.demographia.com/dhi-ix2005q3.pdf>.

Figure 12



Source: 2nd Annual Demographia International Housing Affordability Survey: 2006, available at <http://www.demographia.com/dhi-ix2005q3.pdf>.

In 2005, the Montreal CMA had a median multiple of 3.5, slightly above the historical norm of 3.0. The nation's best housing affordability in CMAs over 500,000 was in Winnipeg, at 2.4, Quebec City at 2.8, Edmonton at 2.8, Ottawa⁴² at 3.1 and Calgary at 3.2.

Toronto, Montreal's principal competitor, had a median multiple of 4.4, meaning that owner-occupied housing costs one-fourth more in relation to house-

hold incomes than in Montreal. Vancouver's housing was even less affordable, with a median multiple of 6.6, approaching double Montreal's housing cost relative to income (see Figure 11).

Montreal also rates well in housing affordability compared to international urban areas.⁴³ A number of Canadian (as noted above) and US markets are more

42. Portion of the market in Ontario only.

43. Demographia International Housing Affordability Rankings, available at <http://www.demographia.com/dhi-ix.htm>.

affordable. For example, Buffalo's median multiple was 2.1, nearly one-third lower than Montreal's. Perhaps the most notable more affordable markets are Atlanta (2.8), Dallas-Fort Worth (2.8) and Houston (2.9), which as the first, third and fourth fastest growing large urban areas in the high-income world⁴⁴ have extraordinary housing demand. Nonetheless, the median multiples in these areas remain very competitive, because the market is allowed to produce the volume of housing required to keep up with demand.

However, a number of urban areas are particularly uncompetitive in housing affordability. All of the six largest markets in Australia and New Zealand had median multiples greater than 6.0, together with London and Dublin. The most unaffordable market outside California and Hawaii is Sydney, with an 8.5 median multiple. Housing is nearly 2.5 times as expensive in Sydney relative to household income as in Montreal (see Figure 12).

Montreal's superior housing affordability can be illustrated by comparing the effect of different median multiples. If Montreal's housing affordability were at the Vancouver level (6.6), instead of the actual 3.5, the median house price in 2004 would have been nearly \$320,000, instead of the estimated \$170,000, or \$150,000 more. The higher Vancouver median multiple would have required an additional \$11,500 in average income simply to pay the higher mortgage.⁴⁵

Competitiveness in housing affordability: prospects for Montreal

Montreal's comparatively affordable housing market provides important competitive advantages. Housing costs are generally the largest household expenditure item. As a result, differences in housing

costs contribute significantly to differences in the cost of living. Lower housing costs and a lower cost of living make a metropolitan area more attractive for new businesses, business expansion and potential new residents. Montreal's superior housing affordability could help to attract new residents, addressing the shortage of skilled labor cited by the OECD.

Montreal has not implemented the land rationing policies that are associated with seriously deteriorating housing affordability in Australasia, parts of the United States and Vancouver. As a result, the prospects are that housing affordability will improve relative to markets in which land is rationed, especially Toronto.

Historically, Toronto and Montreal have been the nation's principal metropolitan competitors. Toronto has been more successful than Montreal in recent decades. However, recent public policy enactments in Toronto seem likely to worsen its competitive position. The land rationing policies being implemented by the Ontario provincial government are likely to provide the impetus for shifting some economic growth to Montreal. The likely erosion of housing affordability could make Montreal more attractive to middle income households whose hopes of home ownership are extinguished by Toronto's scarcity of land for development.

There is a further imperative for avoiding Toronto style land rationing policies in Montreal. The Montreal CMA has a very low home ownership rate. A higher home ownership rate would be beneficial not only to new owning households, but it could also make it possible for the metropolitan economy to grow more quickly.

Montreal's housing affordability, combined with a continuation of its less restrictive land use practices, promise to better position the metropolitan area in national and international economic competition.

44. *High-Income World Urbanized Areas: Growth and Population Density*, available at <http://www.demographia.com/db-econ-uaintl.htm>.

45. Assumptions: 25-year amortization, 6.0 percent interest.

3. MOBILITY AND TRANSPORT

Traffic congestion and land rationing

Traffic congestion is exacerbated by anti-sprawl policies that ration land. This is because higher population densities are associated with more intense traffic congestion. The slower speeds result in an even greater percentage increase in vehicle operating hours than in vehicle kilometers traveled. For example, international urban areas with more than 8,000 persons per square kilometer have vehicle hour traffic intensities 4.9 times (see Figure 13) that of urban areas with between 1,000 and 1,999 persons per square kilometer (a size category that includes Montreal).⁴⁶

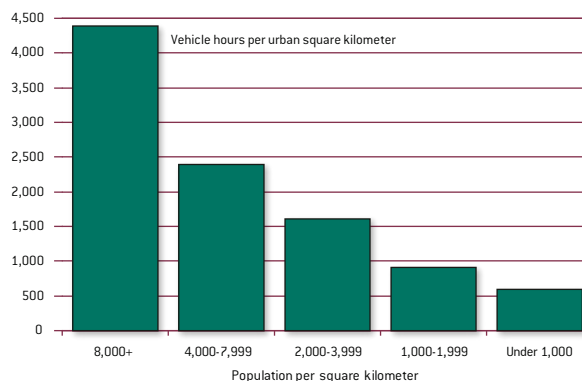
The 4,000 to 7,999 category includes the highest density urban areas of Western Europe, while most such areas are in the 2,000 to 3,999 category.⁴⁷ These are frequently cited as examples for Canadian urban areas to follow, especially because their automobile market share is somewhat smaller⁴⁸ and there is more transit use. Even so, Western European urban traffic volumes tend to be higher than in Canada.⁴⁹

Much of what people believe about transportation in Western European countries is in fact based upon misimpressions and misinformation. For example, Canadian travelers who visit Western European urban areas tend to visit the urban cores, where transit services are more intense and effective. Yet, each of the Western European urban areas is surrounded by suburban areas of little tourist interest, in which the great bulk of travel is by automobile.

Higher densities are also associated with greater peak period travel delays in US urban areas. Among urban areas with densities above 1,500 per square kilometer, the average peak period trip takes 51 percent longer than in uncongested conditions. In urban areas with below 750 persons per square kilometer, the average delay is 23 percent longer (see Figure 14).⁵⁰

Figure 13

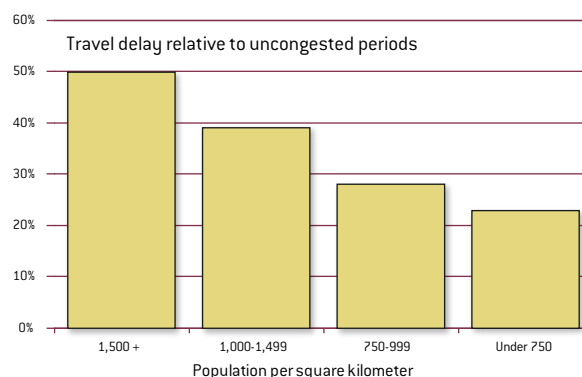
Traffic Intensities and Density
INTERNATIONAL URBAN AREAS (1990)



Source: Calculated by the author using data from Jeffrey Kenworthy, Felix B. Laube and Peter Newman, *An International Sourcebook of Automobile Dependence in Cities, 1960-1990*, Boulder, University of Colorado Press, 1999.

Figure 14

Peak Period Travel Delay by Density
US URBAN AREAS OVER 1,000,000 (2003)



Source: Calculated from Texas Transportation Institute data.

46. Calculated by the author using data from Jeffrey Kenworthy, Felix B. Laube and Peter Newman, *An International Sourcebook of Automobile Dependence in Cities, 1960-1990*, Boulder, University of Colorado Press, 1999.

47. World urban population densities can be found at *Demographia World Urban Areas (World Agglomerations). Population and Density Estimates*, available at <http://www.demographia.com/db-worldua.pdf>.

48. US automobile market shares are approximately 98 percent of the total automobile plus transit market. In large Western European urban areas, the average automobile market share is 80 percent (*Millennium Cities Database for Sustainable Transport*). However, this comparison, based upon the available international data, tends to overstate transit market shares in Western Europe compared to the United States. Transit market shares tend to be lower in smaller Western European urban areas. There is no comprehensive reporting of smaller urban area data.

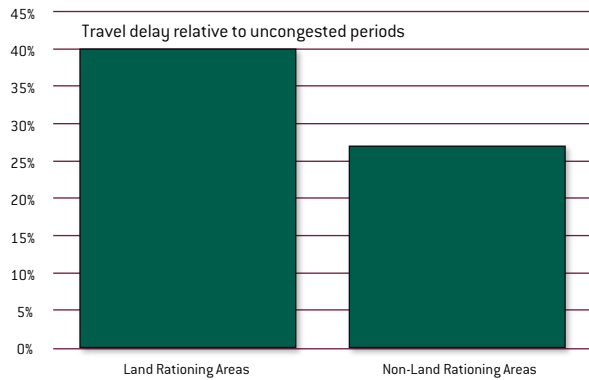
49. Wendell Cox, *Public Transport Competitiveness: Implications for Emerging Urban Areas*, op. cit.

50. Calculated from Texas Transportation Institute data.

Further, research for the United States Department of Transportation indicates that traffic volumes increase with density. The data indicates that areas with double the average urban density in the United States have traffic volumes (vehicle kilometers) that are approximately 1.9 times as great.⁵¹

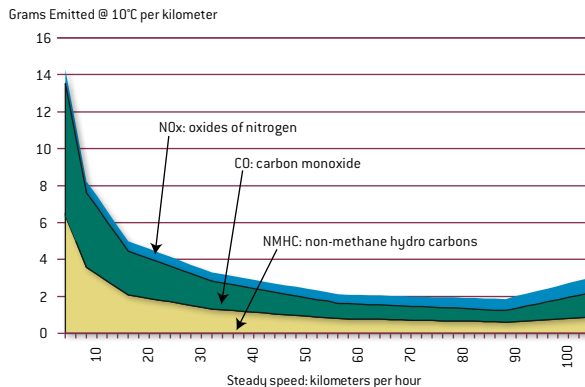
51. Calculated by the author from US Census Bureau data and Catherine E. Ross and Anne E. Dunning, *Land Use Transportation Interaction: An Examination of the 1995 NPTS Data*, US Department of Transportation, October 1997, available at <http://npts.ornl.gov/npts/1995/Doc/landuse3.pdf>.

Figure 15
Peak Travel Delay & Land Rationing
US URBAN AREAS OVER 1,000,000 (2003)



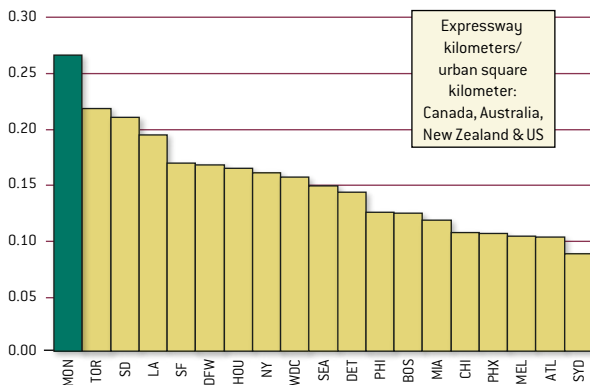
Source: Calculated from Texas Transportation Institute data.

Figure 16
Air Pollution Emissions & Speed
SLOWER SPEEDS: GREATER EMISSIONS



Source: Calculated from US Environmental Protection Agency data.

Figure 17
Expressway Access: New World
URBAN AREAS OVER 2,500,000



Source: USA, Canada, Australia & New Zealand Urban Areas: Freeway Access and Capacity, available at <http://www.publicpurpose.com/ut-4colfwy.htm>.

Moreover, US data indicates that urban areas with land rationing policies tend to have longer average peak period travel delays. Land rationing urban areas had an average peak period delay of 40 percent, compared to 27 percent for urban areas not rationing land (see Figure 15). Since 1982, average delays have increased 73 percent more in land rationing urban areas than in urban areas not rationing land.⁵²

Finally, the more intense local traffic volumes produced by higher density, combined with the resulting slower speeds, tends to increase local area air pollution emissions (Figure 16). Generally, the principal vehicle pollutants tend to be associated with slower speeds, and especially with the “stop and start” travel conditions that are typical of more intense traffic.

Mobility in Montreal

One of the most enduring myths of international urban planning is that Canadian urban areas do not have expressways. For decades, planners in the city of Vancouver have proudly touted the fact that their city has only a small stretch of expressway. In fact, however, the Vancouver urban area has many kilometers of expressways, though it is less well served than most urban areas its size. The Calgary and Edmonton urban areas have comparatively little length of expressway. Winnipeg may be the only high-income world urban area with more than 500,000 residents and no expressways. However, the patterns of roadway development are much different in central Canada than in the Prairie and Western provinces.

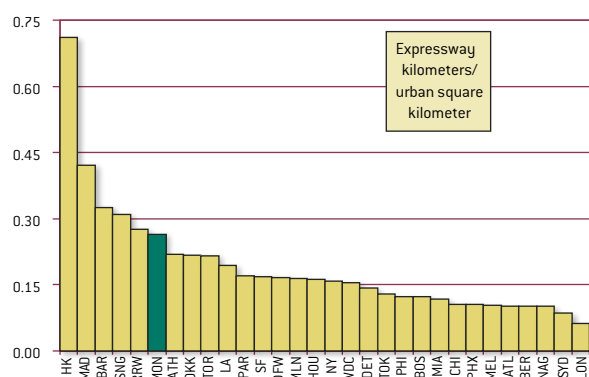
Roads: Montreal ranks first in expressway density among the urban areas of more than 1,000,000 inhabitants in Canada, Australia, New Zealand and the United States.⁵³ Montreal has an estimated 0.26 expressway density factor (route kilometers of expressway per urban square kilometer) (see Figure 17). Toronto ranks fifth, with a 0.22 expressway density factor. Montreal has the sixth highest expressway density among 30 high-income urban areas with more than 3,000,000 residents; Toronto ranks ninth. Even Los Angeles, perceived as the expressway capital of the world, has lower expressway density than Montreal and Toronto, with a 0.19 expressway density factor. As would be expected, Vancouver has a low expressway density, at 0.17. But surprisingly, Vancouver ranks ahead of Atlanta, which has some of the widest expressways in the world, but has the largest expanse of suburbanization in the world

52. Analysis based upon 1982-2003 urban mobility data from the Texas Transportation Institute, available at <http://mobility.tamu.edu>. Travel delay calculated from Travel Time Index.

53. USA, Canada, Australia & New Zealand Urban Areas: Freeway Access and Capacity, available at <http://www.publicpurpose.com/ut-4colfwy.htm> (This is a website of Wendell Cox Consultancy).

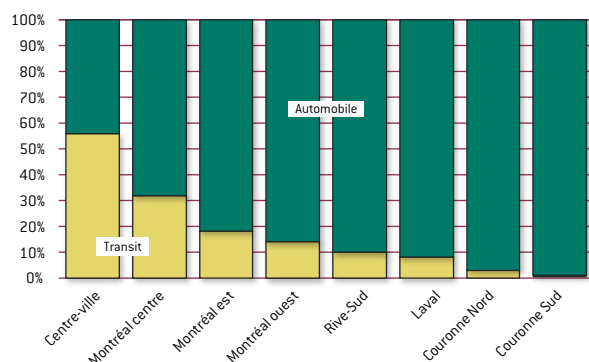
Figure 18

Expressway Access: High-Income World
URBAN AREAS OVER 3,000,000



Source: Major High-Income World Urban Areas: Freeway Access and Capacity, available at <http://www.publicpurpose.com/ut-worldfwy.htm>.

Transit & Auto Market Shares
BY DESTINATION: AM PEAK PERIOD (2003)



Source: Origin-Destination Studies.

without lateral (cross-town) expressways (see Figure 18).⁵⁴

Trucks: The importance and role of trucks are often overlooked in urban transport planning. Yet, the high volume of trucks on the Metropolitan Boulevard (Autoroute 40 or Expressway 40 on Montreal Island) or other area expressways testifies to the substantial impact that trucks have on traffic conditions. Further, the slower truck operations that occur in traffic congestion increase operating costs, which are passed on to customers in product prices. Of course, this is an impact felt throughout the country, not just in the CMA. Nonetheless, lower levels of traffic congestion will tend to make an area more competitive for the location of businesses that rely on trucks.

54. Wendell Cox and Alan Pisarski, *Blueprint 2030: Affordable Mobility and Access for all Atlanta and Georgia*, June 2004, available at <http://cipr.com/ul/gbt/atl-report-20040621.pdf>.

Trucks consume considerable amounts of road space. US Federal Highway Administration data indicate that a combination truck (truck with one or more trailers) consumes up to 3.5 times the space on a congested urban expressway used by the average passenger car. Generally, throughout North America, truck traffic is increasing faster than automobile traffic. This trend will increase the necessity for providing additional roadway capacity. Failing to provide such capacity can undermine the competitiveness of an area. For example, in the late 1990s Dell Computer Company located a new facility in Nashville, Tennessee, because of traffic problems in Austin, Texas, where it had been founded and where all of its previous facilities had been built.⁵⁵ Worsening traffic congestion in Portland, caused by a combination of the area’s densification and anti-automobile policies, led Sysco to open a new distribution center in Spokane and, according to Metro, the Portland regional land use planning agency, others are following suit.⁵⁶

Mass Transit: Montreal has an effective and competitive mass transit system. However, both transit ridership and transit’s share of travel have been in long-term decline. In 2003, daily morning transit ridership was 360,000, down from 395,000 in 1987. Over the same period, car trips increased from 1,368,000 to 1,660,000. This 21 percent gain in car use and eight percent loss in transit use combined to reduce transit’s market share by 20 percent. More recent data indicates that transit’s market share stabilized between 1998 and 2003.

Moreover, transit’s impact is concentrated in the core and relatively slight elsewhere. In 2001:

- 56 percent of weekday morning travel to the downtown area was by transit;
- 22 percent of weekday morning travel was by transit in the entire metropolitan area;
- In the outer suburbs, the share of travel by transit was as low as one percent (see Figure 19).⁵⁷

In 1998, two-thirds of transit destinations in the morning were in the Centre-de-l’Île, including downtown. The rest of the CMA, which contains nearly two-thirds of residences and approximately 85 percent of the urban (developed) land accounted for one-third of transit destinations.

55. John Pletz, “Dell will remain area’s biggest private employer”, *Austin American-Statesman*, May 25, 2001, available at http://www.statesman.com/business/content/business/stories/archive/052501_dell.html.

56. Economic Development Research Group Inc., “The Cost of Congestion to the Economy of the Portland Region”, December 2005, available at http://www.metro-region.org/library_docs/trans/coc_exec_summary_final_4pg.pdf.

57. Calculated from Agence métropolitaine de transport, *Enquêtes Origine-Destination métropolitaines - Mesure de la mobilité dans la grande région de Montréal*, April 26, 2005, available at <http://www.amt.qc.ca/docs/expose/Equiterre%20-%20OD03.ppt>.

Transit policy necessarily targets downtown and central area markets. Metro, commuter rail and bus services provide an important alternative to the automobile for travel to the central business district, and to a lesser extent within the dense urban core.

- Approximately 29 percent of work trips to the parts of Centre-de-l'Île outside downtown were on transit in 1998, well below the downtown figure.
- In the balance of the area, outside Centre-de-l'Île, the share of workers arriving by transit was only 12 percent.⁵⁸

These comparisons illustrate both the strengths and weaknesses of transit. Transit is unrivaled in its ability to provide quick trips to large, highly concentrated employment locations, such as downtown Montreal. But downtown is a relatively small geographic area and its density of employment land use is far above levels in the rest of the CMA. The largest skyscrapers of downtown are concentrated in a small area. With such a high concentration of employment activity, it makes sense to provide high levels of transit service. On the other hand, there is not enough concentrated demand in other areas to justify the rapid, frequent transit service that would be necessary to effectively compete with the automobile. More than three-quarters of the area's jobs are outside downtown, spread throughout more than 1,700 square kilometers (see Figure 20).

Despite the attention being received by plans for expanding commuter rail service, this too is a downtown oriented strategy. As distances increase, a smaller share of workers commute to downtown. For example:⁵⁹

- More than 20 percent of workers living in the center and on the South Shore commute to downtown;
- Only 8 percent of workers living in the more distant Vaudreuil-Soulanges and North Shore commute to downtown.

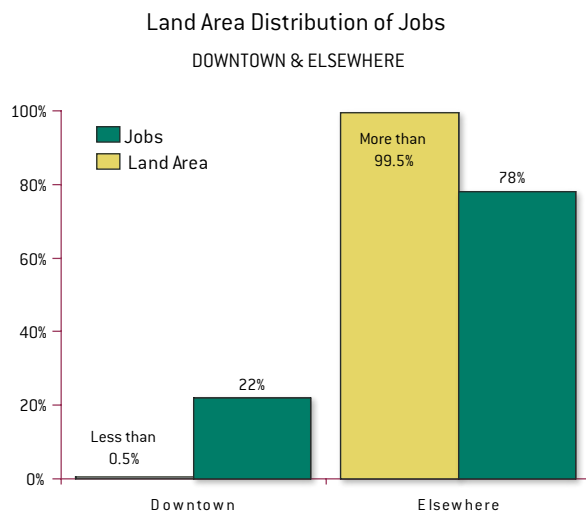
It might be suggested that transit's share of travel could be increased by substantially increasing the number of jobs located in downtown. But there are two problems with this approach.

The first problem is that traffic congestion would be significantly increased, because the additional jobs would attract additional automobile traffic to an already overstrained roadway system. The second problem is that there is already insufficient transit capacity. During peak periods, many transit services are at capacity or overcrowded. If, for example, downtown employment were to double, it might be necessary to double transit

58. Calculated by the author from Transports Québec data.

59. *Idem*.

Figure 20



Source: Calculated from data in Daniel Bergeron and Kim McDonough, *Constat sur la mobilité des personnes dans la grande région de Montréal. Faits saillants révélés par l'enquête Origine-Destination 2003*, April 2005, available at <http://www.amt.qc.ca/corpa/presentations.asp>.

capacity, which would require more metro lines, which are particularly expensive.

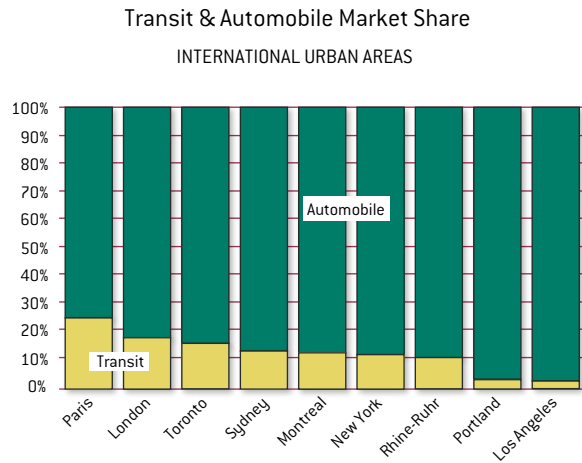
Montreal's situation is similar to that of other high-income world metropolitan areas that have effective mass transit systems. Core areas are well served, but transit service to areas outside the core is limited and generally not competitive with the automobile. For example, Paris has one of the world's best transit systems. Suburban new towns have been developed along the RER rail lines that have the most frequent commuter rail service in the western world. Yet, in the new towns, the share of jobs that can be reached within one hour by car is double that of transit.⁶⁰

As in the case of Montreal, static or declining mass transit market shares are the rule rather than the exception among high-income world urban areas.⁶¹ Despite considerable and expensive strategies to attract automobile users to mass transit, no major high-income world urban area is reported to have reduced the share of automobile travel by as much as two percentage points. Today, the automobile accounts for the overwhelming majority of urban travel throughout Canada, Western Europe and the United States (see Figure 21). Transit's difficulty in other urban areas is the same as in Montreal. For most travel, mass transit is simply not competitive with the car.

60. Calculated from Vincent Fouchier and Sylvain Michelon, "Isochrones autour des villes nouvelles aux heures de pointe," March 1999, available at http://www.villes-nouvelles.equipement.gouv.fr/base/presg/P4_Bilan/3_Mobil/2_Isoch-Tx/Isoch.html.

61. *Public Transport Market Share Trends: International Urban Areas from 1980*, available at <http://www.publicpurpose.com/ut-intlmt95.htm>.

Figure 21



Source: *Public Transport Market Share Trends: International Urban Areas from 1980*, available at <http://www.publicpurpose.com/ut-intlmkt95.htm>, and *Public Transport and Roadway Market Share: 2003 Estimated*, available at <http://www.publicpurpose.com/ut-uspt2003share.pdf>.

This is not to suggest, however, that there is no potential for expanding transit service. Higher levels of transit service would attract more ridership, especially in and to the core. This would improve mobility in the core, which would make it a more attractive place for residents and businesses.

Transit services levels could be increased by more cost effective operation. Around the world, transit systems have been converted to public-private partnerships, which are characterized by competitive private operations under the policy auspices of the transit authority.⁶² This strategy, called competitive tendering, reduces expenditures per kilometer or hour of service, making additional funding available to expand service. Competitive tendering has saved from 20 percent to 50 percent in applications around the world. Transit systems have been converted to competitive tendering in Stockholm, Copenhagen, London,⁶³ Adelaide, Perth and elsewhere.

Nonetheless, there is virtually no prospect that transit can attract a material number of car users throughout all of the Montreal area, with the possible exception of downtown oriented trips.

62. See Valentin Petkantchin, *The road to renewing public transit*, Montreal, Montreal Economic Institute, August 2004, available at <http://www.iedm.org/uploaded/pdf/augusto4.pdf>.

63. This refers only to the competitive tendering program that has been applied to the London bus system, the largest public bus system in the world. Costs per kilometer have declined approximately 40 percent (inflation adjusted) since implementation began in 1985. The same results in Montreal would have made it possible to expand transit service at least 64 percent without increasing public expenditures. Since implementation, the London competitive tendering system is estimated to have saved nearly C\$18 billion (See *London Transport Bus Competitive Tendering Results from 1984/5*, available at <http://www.publicpurpose.com/ut-lonct.htm>).

Mobility trends and policies

Important improvements have been made to the Montreal expressway system in recent years. On a number of routes, capacity has been significantly increased. The Quebec Ministry of Transport plans for expressway building and expansion will result in substantial mobility improvements, for both residents and freight traffic.

For example, long needed improvements are proposed to complete Route 25 from Montreal Island to Laval and to upgrade Route 132 on the South Shore. A concern has been raised that the Route 25 bridge could encourage people to move out of Montreal. In fact, however, the presence or absence of expressways appears to have little impact on the flight of residents from the core to suburbs. For example, Sydney suburbanized in a manner little different than Canadian and US urban areas long before its meager (and recently built) expressway system was put in place. As a matter of policy, Phoenix minimized freeway development until the middle 1980s, only to experience suburban development no different from that found in urban areas that built comprehensive freeway systems.

Sydney and Montreal have been unique among the largest high-income world urban areas in not having an expressway bypass of the central city. A bypass has just opened in Sydney and one is planned for Montreal. Perhaps the most important proposed expressway improvement is completion of a bypass of Montreal Island through the South Shore, along Route 30 from Châteauguay to Route 20 in Vaudreuil. The new route will provide a severely needed alternative to the Metropolitan Boulevard, which cuts through the core of Montreal Island. For decades, virtually all traffic and most importantly, all truck traffic along the Quebec to Windsor corridor has been forced to use this expressway, creating a greater infrastructure maintenance and replacement burden. As a result, traffic congestion has increased and air pollution has been far more intense than would have been the case if through traffic could have bypassed the island.

Current plans call for the completion of Route 30 to involve a public-private partnership. This means that the route will likely be tolled. There is the potential that the cost of the tolls may keep some truck traffic from using the bypass, while continuing to use an untolled Metropolitan Boulevard. Modern electronic tolling technology provides an alternative that would provide the necessary revenues, while providing sufficient incentives for truck traffic to bypass the island. Automatic electronic tolls could be charged for through trucks only on the Metropolitan Boulevard, while free truck operation could be allowed on the tolled portion of Route 30. The Metropolitan Boulevard truck toll

receipts could be used to offset the Route 30 truck toll losses. At the same time, the technology would permit cars, local trucks and trucks beginning or ending their journeys on the island to retain free access to the Metropolitan Boulevard.

Another important expressway improvement should be made on the periphery of the metropolitan area. There is no direct expressway connection to the Boston area, which is the seventh largest metropolitan area in Canada or the United States and larger than Toronto. Boston is also closer to Montreal than Toronto. There is currently an approximately 40 kilometer expressway gap between Saint-Jean-sur-Richelieu and the United States border, from which Interstate 89 provides expressway access to Boston. Completion of this expressway gap could add to Montreal's competitiveness.

River crossings

As in New York and Hong Kong, the ease of travel in Montreal is significantly limited by water barriers. The transportation capacity shortage is most pronounced on the St. Lawrence River side of Montreal Island. It would be helpful to the economy of the Montreal area to increase crossing capacity, and to do so in the most efficient manner.

Mass transit is a part of the solution, consistent with its potential cost effective contribution. The metro provides effective mobility to downtown with its South Shore yellow line. The new Bombardier car order could increase capacity by more than 20 percent. There has been discussion of adding a new light train line on the ice control structure, upstream from the Champlain Bridge. It is likely that this could be most cost effectively accomplished through the use of exclusive bus lanes, which have proven capable of carrying more than 20,000 passengers in each direction per hour during peak periods, a volume that seems unlikely to be exceeded in the Montreal environment.

There is a critical need for more automobile capacity across the St. Lawrence River. A large share of the bridge and tunnel traffic from the South Shore, nearly two thirds according to estimates, is destined for locations other than downtown.⁶⁴ Unlike its capabilities with respect to the downtown market, transit is generally unable to provide an automobile competitive alternative to the car to the more dispersed locations on Montreal Island from the South Shore.

Moreover, the potential for capturing even downtown oriented bridge traffic is likely limited, since so large a share—almost half—of downtown travel is already by transit. It is likely, for example, that many downtown commuters who endure the bridge congestion do so because they need their cars at work.

There have been studies (most recently, the "Nicolet Commission"⁶⁵ whose report was issued in 2003) of the need for new river crossings and some locations have been proposed. If it is not possible to finance the needed new crossings from conventional government revenues, public-private partnerships may hold the best hope of early relief. Tenders could be used to seek proposals from private developers for new river crossings, which might be either bridges or tunnels.

As is generally recommended below, highways and transit projects that require government funding, including river crossings, should be prioritized based upon their cost per reduced travel delay hour.

Planning for competitiveness

As is typical in virtually any public service, there is greater demand for improvements and expansion than there is a supply of funding. Minimizing travel delay facilitates greater mobility, employment access and economic growth. Montreal will be better served if transport improvements are best prioritized. This could be reliably achieved by prioritizing projects that require government funding based upon their cost per reduced travel delay hour.

In this regard, the recently announced new commuter train service between downtown and Mascouche, which is expected to carry 5,500 passengers daily following a \$300-million investment, may be a case in point. Such a commitment should not be made unless rigorous examination has shown such a project to be both (1) superior in cost per delay hour reduced to all alternatives that would serve the same need and (2) the most pressing use throughout the metropolitan region of such funding for transport.

Montreal's plans to maintain and improve its roadway system are somewhat unique among urban areas. Currently similar, if not more aggressive, programs have been begun in Texas urban areas and Atlanta, where public officials are beginning to manage roadway systems using traffic congestion reduction objectives. More recently, officials in Vancouver and Portland have recognized the inevitability of rapidly increasing highway traffic volumes and are calling for highway capacity improvements to avert the serious economic losses that would be caused by greater traffic

64. Calculated from *Présentation de l'AMT à la Commission de consultation sur l'amélioration de la mobilité entre Montréal et la Rive-Sud*, Table 4, February 12, 2002, available at www.amt.qc.ca/corpo/documents/memoires/Memoire_AMT2.pdf.

65. Commission de consultation sur l'amélioration de la mobilité entre Montréal et la Rive-Sud.

congestion.⁶⁶ These strategies are different from those of many urban areas, which seek to discourage roadway expansion in favor of transit expansion.

“Mass transit instead of roadway” strategies might be rational if they were accompanied by plans that anticipated material shifts from cars to transit that would, at the same time, preserve or improve mobility. However, despite considerable talent and generous planning expenditures, no urban area has proposed any transit system that would materially transfer demand from automobiles to transit.

Thus, the choice is not between transit and roadways. The choice is rather between more and less traffic congestion. The plans being undertaken in Montreal and a few other urban areas in North America would provide greater mobility, less traffic congestion, lower levels of air pollution and greater economic output using the only means to that end—accommodating the inevitable increase in automobile and truck traffic that will occur. The only question is how well it will be accommodated.

Strategies that maximize mobility, combined with liberal land use policies, could provide a further competitive advantage for Montreal, especially with respect to urban areas with counterproductive policies, such as Toronto. With one of the world’s best expressway systems and plans to make it better, Montreal is well positioned for the future.

CONCLUSION

Despite conceptions to the contrary, efforts to contain the geographic growth of urban areas inevitably produce what economists call “negative externalities.” Anti-sprawl policies tend to drive people to move further away from urban centers, which results in longer, not shorter work trips. The land shortages created by such policies drive up housing costs relative to incomes and promise to render urban areas less affluent in the future. On the contrary, the automobile has been associated with an unprecedented expansion of affluence throughout the high-income world and thanks to it, a democratization of prosperity has occurred.

Montreal stands in an enviable position of comparative advantage, both in transportation and land use. It has one of the best transportation systems in the world. Its superior expressway system provides effective service throughout the metropolitan area. Moreover, needed improvements are under way that will ease through truck traffic on the island, while improving mobility in the suburban area, where most residential and commercial growth is occurring. Montreal’s mass transit system provides high levels of mobility to downtown and within the urban core. At the same time, Montreal’s comparatively liberal development regime avoids the land rationing that has made home ownership unaffordable to many households in Vancouver and promises to do the same in Ontario’s Golden Horseshoe.

While other urban areas pursue policies that restrict mobility and raise housing prices, Montreal’s competitive position is likely to improve. Montreal is on the right course and, as a result, faces a brighter future.

66. See http://www.gvvc.org/pdfs/SW1040_FinalReport_Revised2.pdf and http://www.metro-region.org/library_docs/trans/coc_exec_summary_final_4pg.pdf.

APPENDIX

Market codes used in Figures 11, 12, 17 & 18

| | | | | | | | |
|-----|------------|-----|--------------------|-----|----------------------|-----|----------------------|
| ADL | Adelaide | DFW | Dallas-Forth Worth | MIA | Miami | QUE | Quebec City |
| ATH | Athens | DUB | Dublin | MIL | Milwaukee | ROC | Rochester |
| ATL | Atlanta | EDM | Edmonton | MLN | Milan | RRW | Rhine-Ruhr-Wupper |
| AUK | Auckland | GGW | Glasgow | MON | Montreal | SA | San Antonio |
| AUS | Austin | HAM | Hamilton | MSP | Minneapolis-St. Paul | SAC | Sacramento |
| BAL | Baltimore | HFD | Hartford | NAG | Nagoya | SD | San Diego |
| BAR | Barcelona | HK | Hong Kong | NO | New Orleans | SEA | Seattle |
| BER | Berlin | HOU | Houston | NVL | Nashville | SF | San Francisco |
| BIR | Birmingham | IPS | Indianapolis | NY | New York | SNG | Singapore |
| BOS | Boston | JVL | Jacksonville | OKC | Oklahoma City | STL | St. Louis |
| BRS | Brisbane | KC | Kansas City | OKK | Osaka-Kobe-Kyoto | SYD | Sydney |
| BUF | Buffalo | L-B | Leeds-Bradford | ORL | Orlando | TOR | Toronto |
| CGY | Calgary | LA | Los Angeles | OTT | Ottawa | TOK | Tokyo-Yokohama |
| CHA | Charlotte | LON | London (UK) | PAR | Paris | TSP | Tampa-St. Petersburg |
| CHI | Chicago | LV | Las Vegas | PER | Perth | VAN | Vancouver |
| CIN | Cincinnati | LVL | Louisville | PGH | Pittsburgh | VB | Virginia Beach |
| CLV | Cleveland | MAD | Madrid | PHI | Philadelphia | WDC | Washington, D.C. |
| COL | Columbus | MAN | Manchester | PHX | Phoenix | WPG | Winnipeg |
| DEN | Denver | MEL | Melbourne | POR | Portland | | |
| DET | Detroit | MEM | Memphis | PRV | Providence | | |



BIOGRAPHY

Wendell Cox is principal of Wendell Cox Consultancy (Demographia), an international public policy firm in the St. Louis metropolitan region. Demographia sponsors three internet websites, including www.demographia.com, www.publicpurpose.com and www.rental-cartours.net. Wendell Cox serves as a visiting professor at the Conservatoire National des Arts et Métiers in Paris and served on the Los Angeles County Transportation Commission and the Amtrak Reform Council. His contacts with the Montreal area go back centuries. Pierre Gautier, on his mother's side, moved to Montreal Island from Roquefort, France in 1665 and the family lived there until moving to the United States in 1827.



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