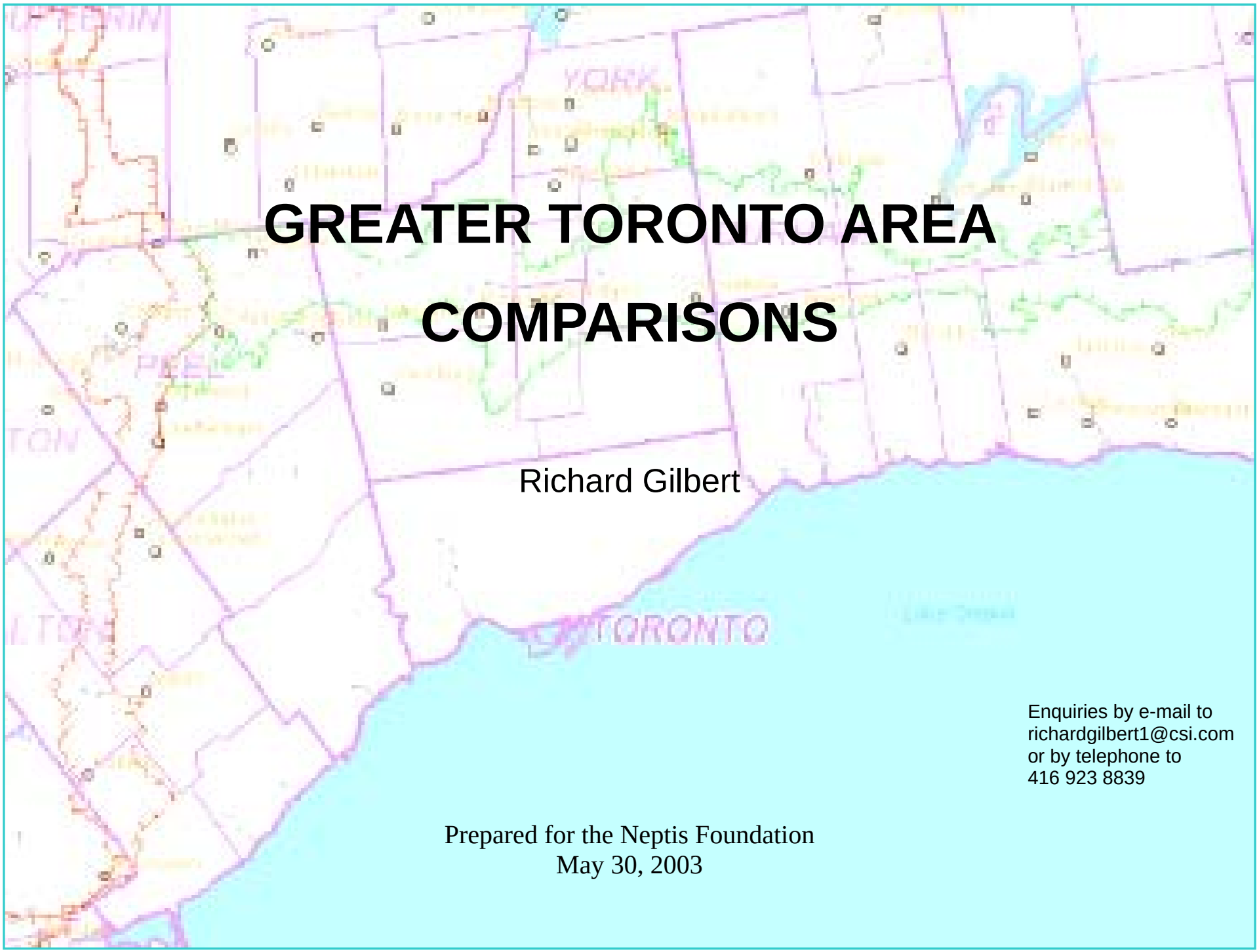

GREATER TORONTO AREA COMPARISONS

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Prepared for the Neptis Foundation
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Table of Contents

Introduction

This brief report provides comparisons of the Greater Toronto Area (GTA) with 51 other affluent urban regions in Canada (4), the U.S. (10), Western Europe (28), Asia (5), and Australia (4). Comparisons involve 23 variables all for 1995.

The 23 variables for 52 affluent urban regions are a selection from the more than 200 variables for 100 urban regions (60 affluent; 40 other) found in *The Millennium Cities Database for Sustainable Transport*. The *Database* was developed by Jeff Kenworthy and Felix Laube of Murdoch University, Perth, Australia, for the Brussels-based Union internationale des transports publics and is available on a CD-ROM from UITP (www.uitp.com). Data for the *Database* were gathered by questionnaire from researchers and officials in the respective regions and thoroughly checked by the compilers.

The data used here are presented on the last page of this report (Page 16) and briefly described in text that accompanies the 23 charts on Pages 3-14. Each chart consists of bars whose heights show the values of the respective variable for each of the 52 urban regions. The bar for the GTA (the regions of Durham, Halton, Peel, and York plus what was then Metropolitan Toronto) is always shown in white; those for the four other Canadian urban regions are in red, with other colours indicating the other groups of regions. Note that in the text with the charts ‘car’ covers all 4-wheeled personal motorized vehicles, including minivans, sport-utility vehicles, and regular automobiles.

A key issue is the determination of the boundaries of the urban regions in the *Database*. According to UITP (see the source detailed above), the regions were specified “with utmost care” taking into account what was regarded as the functional urban region, actual administrative arrangements, and data availability. The Toronto region was defined as the GTA as described above. Sub-regional areas—including the developed portion of the region and the Central Business District (CBD)—were as defined by the local respondents.

Where possible, GTA data in the *Database* have been checked against another source, as noted in the text. The other source is usually the 1996 *Transportation Tomorrow Survey* (TTS) conducted by the Joint Program in Transportation at the University of Toronto (www.jpint.utoronto.ca).

The present report has been produced for the Neptis Foundation to help illuminate its ongoing work on the future of the Toronto-related region (see www.neptis.org).

Variable 1: Residential density

Shown are the residential densities of the urbanized portions of the 52 urban regions, i.e., excluding farmland, forests, and large green spaces. This may be the most important variable of all; it underlies energy use, transport activity, local environmental impact, the 'feel' of the region, and perhaps several features of efficiency in business and convenience in other aspects of daily life.

Canadian urban regions lie in the middle of this spectrum, and the GTA is in the middle of the Canadian regions. The GTA's urban density is higher than all represented Australian and U.S. urban regions, but lower than all European and Asian regions, except Oslo.

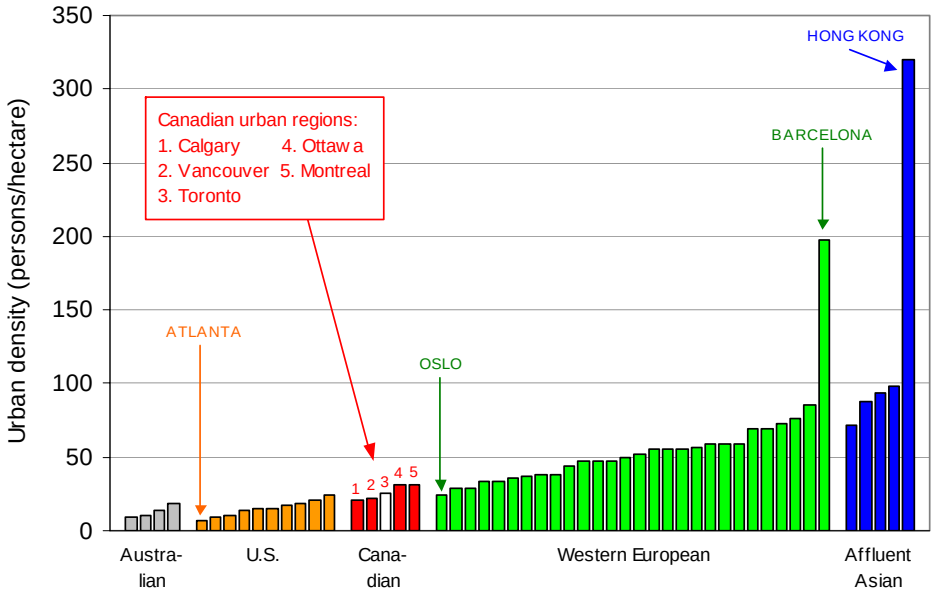
The indicated value for the GTA, 25.5 residents per hectare in 1995, can be compared with the value of 35.3 residents per hectare in 2000 derived from IBI Group's report for the Neptis Foundation, *Toronto-Related Region Futures Study Interim Report: Implications of Business-as-Usual Development*. The difference likely arises because (i) the extent of the urbanized area is overestimated in the *Database* (i.e., 1,813 km^2 rather than the best current estimate of 1,651 km^2), and (ii) the GTA's population grew by about 500,000 between 1995 and 2000.

Variable 2: Job density

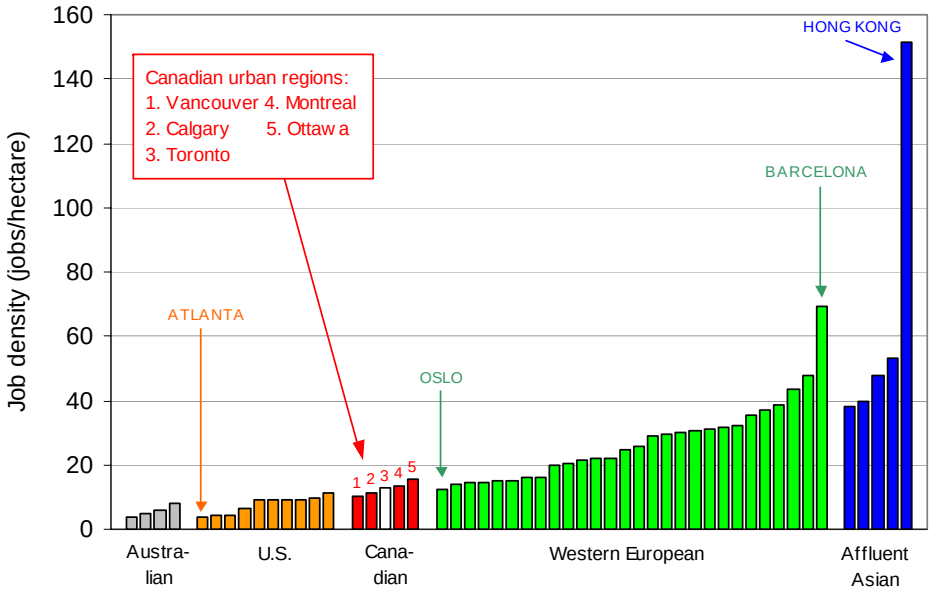
Job or employment density—the number of people who work in the region divided by the urbanized area—shows an almost identical pattern to residential density (Variable 1). This is to be expected as the variation in employment levels (jobs per resident) across regions is small compared with the variation in residential densities.

Again, the indicated value for the GTA is considerably lower than that in the IBI Group's report for the Neptis Foundation (12.8 vs. 17.8). The explanation given for the similar difference in Variable 1 can probably also serve for this variable.

Variable 1



Variable 2

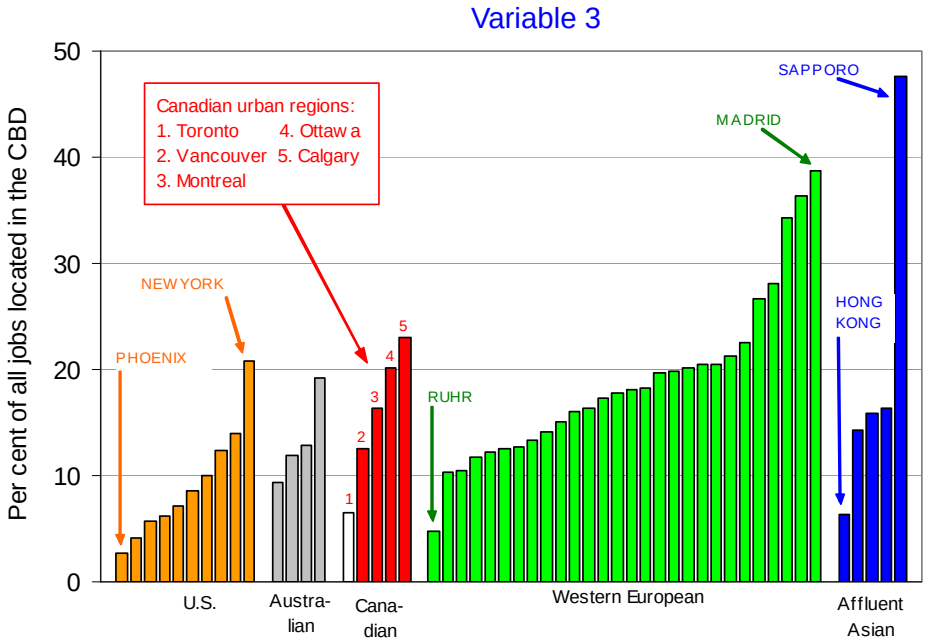


Variable 3: Proportion of jobs in the central business district

The variable here is the number of jobs located in the region's central business district (CBD), also known as its core or downtown, as a proportion of the total number of jobs in the region. The GTA has an unusually low value (6.5 per cent); only Hong Kong, the Ruhr, and some U.S. cities are lower. Hong Kong has several centres of business activity beyond the area known as Central, and the Ruhr is a polycentric agglomeration of several cities.

The GTA's unusually low value raises questions as to how its CBD was defined and whether this was done consistently across urban regions. A 6.5-per-cent share corresponds to approximately 150,000 jobs, roughly what exists in the downtown's financial district. An alternative definition of Toronto's downtown embraces the area bounded by the lake, Bathurst Street, the CPR tracks, and the Don Valley, where there are about 400,000 jobs or about 17 per cent of the GTA's total. This value would put the GTA in the middle of both Canadian urban regions and all represented urban regions, but with relatively more employment in the downtown than U.S. regions other than New York.

Thus, the GTA's unusually low value in the *Database*, as shown in the chart, may have been an artifact of the way in which the CBD was defined.

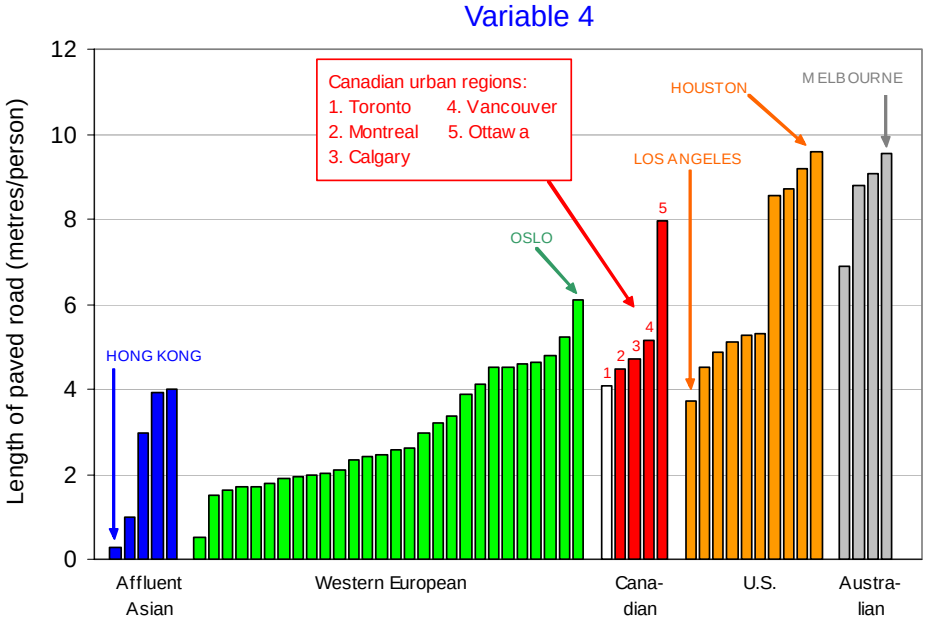


Variable 4: Length of road per person

The variable here is the "centreline length" of all roads in the urban region. It does not take into account the width of the road, i.e., the number of lanes. This may account for the surprisingly low placing of Los Angeles. There, expressways (freeways) comprise a higher-than-average proportion of all roads.

The GTA has less road length per capita than all Australian, other Canadian, and U.S. cities except Los Angeles, and less than several European cities. It also has a *lower* proportion of expressways in the road mix than on average do other North American urban regions. Thus, unless expressways and regular roads tend to have fewer lanes in the GTA than elsewhere, road capacity in the GTA could be relatively low, which could be a cause of congestion. (See the 'further comment' on congestion below the text for Variable 13.)

In Canada, to allow for road width, 'length of two-lane-kilometre equivalents' is often used as the descriptor of road capacity. However, there are no such data on road capacity in the GTA.



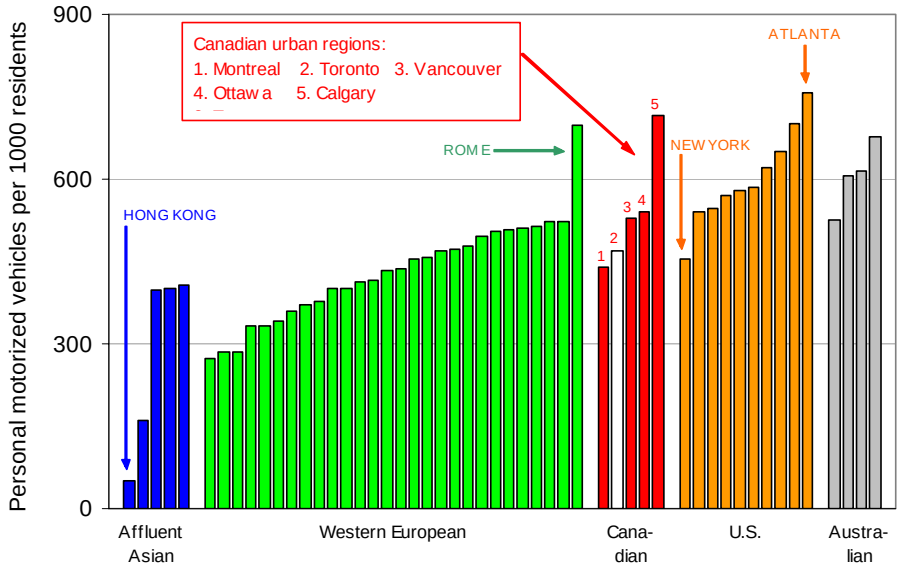
Variable 5: Ownership of personal motorized vehicles

This variable is the rate of ownership of four-wheeled light-duty motorized road vehicles (automobiles, SUVs, vans, pick-up trucks, etc.). At the rate of 470 per 1000 persons, GTA residents have fewer such vehicles—known in what follows as 'cars'—than all Australian, all U.S. except New York, and several European urban regions.

The *TTS* indicates a similar ownership rate of 479 per 1000 persons for the GTA in 1996. According to Natural Resources Canada, the rate for all of Canada in 1995 was 480 per 1000. Thus, the GTA's relatively low value in the *Database* has some credibility. For comparison, the corresponding overall rate for the United States in 1995 was 695 per 1000 residents.

Further comment: Because vehicle use is closely linked to vehicle ownership, this variable ranks among the most important descriptors of urban regions. It has a moderately strong, inverse correlation with residential density.

Variable 5



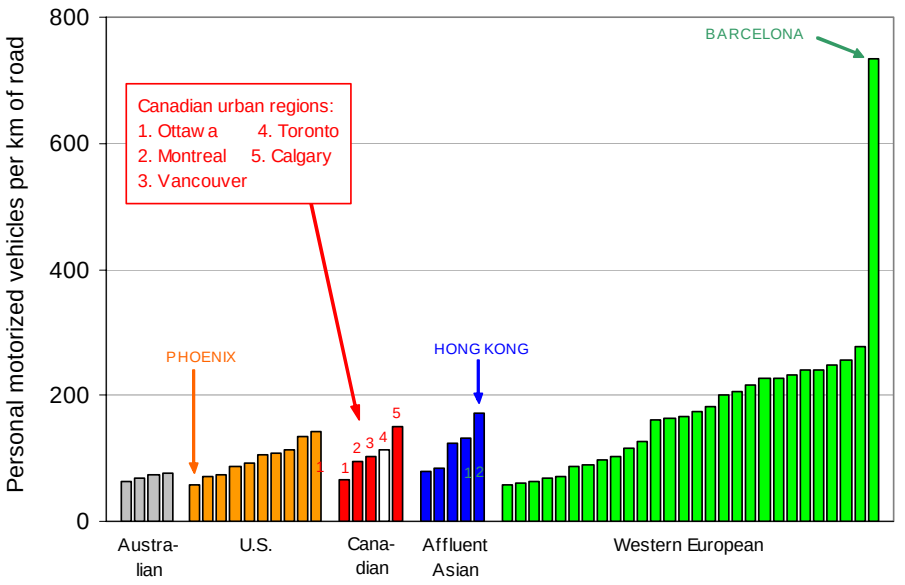
Variable 6: Cars per kilometre of road

This is a combination of Variables 4 and 5 (Variable 6 = 1000 * Variable 5 / Variable 4). It could possibly serve as an indicator of congestion (i.e., more vehicles per kilometre of road corresponds to more congestion). However, the qualification concerning Variable 4 applies: no account was taken of road width.

The GTA had a higher value for Variable 6 than all Australian and most U.S. regions, but it was not the highest in Canada, and most European regions have more vehicles per kilometre of road.

Further comment: Congestion is discussed in the comment below the text for Variable 13.

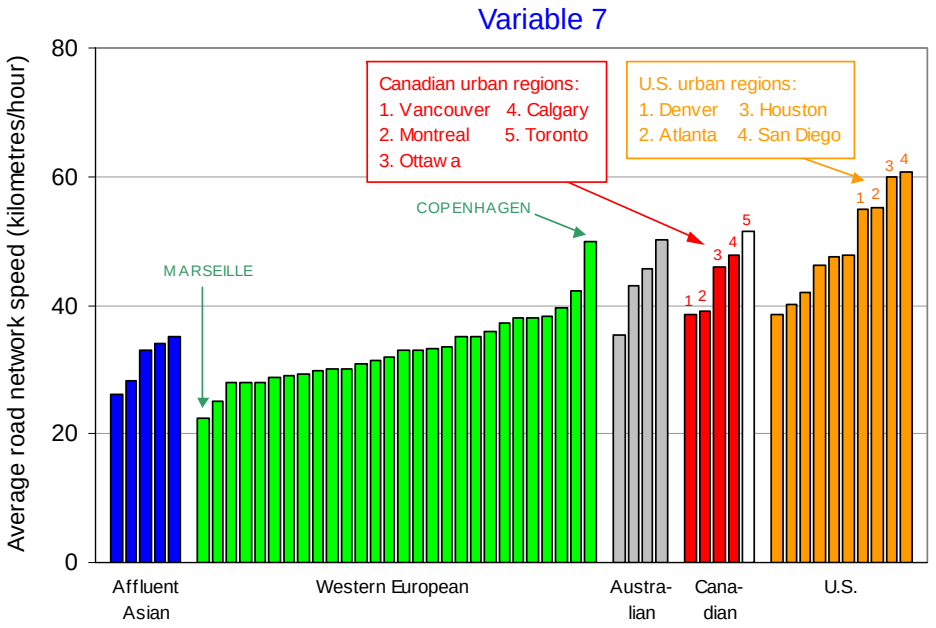
Variable 6



Variable 7: Average road network speed

This is a more important indicator of congestion than vehicles per road length (Variable 6). Higher speeds indicate less congestion. In this respect, the GTA was reported to be less congested than all the other represented urban regions except for four regions in the U.S.

Further comments: Note that Variable 7 represents the average speed across the whole day, not during rush periods only, which is when congestion is more apparent. Congestion is discussed in the comment below the text for Variable 13.



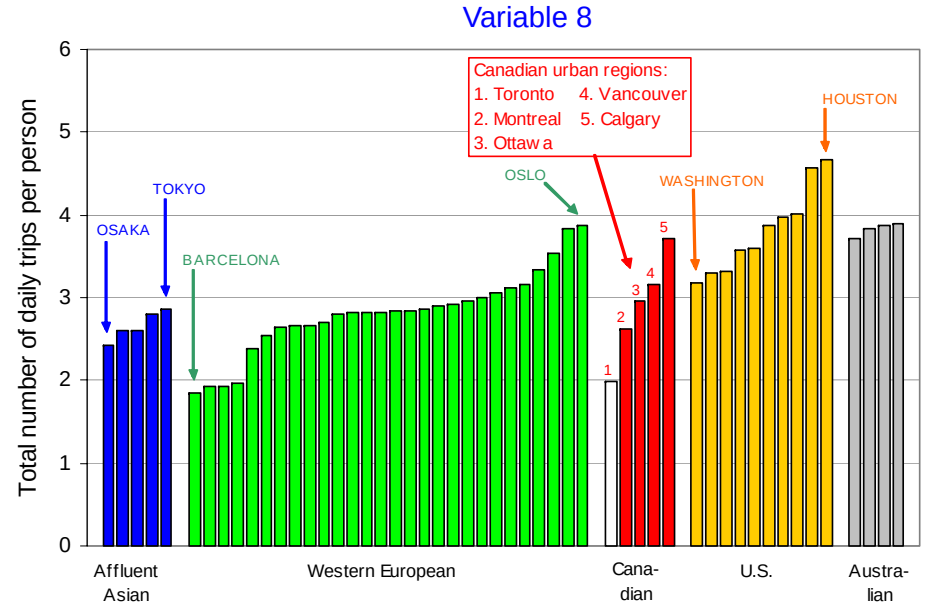
Variable 8: Number of trips per day

Number of trips made per person per day may be an indicator of access. More trips could mean that people are reaching more destinations and having potentially richer lives as a consequence.

According to the *Database*, GTA residents make almost the fewest trips of residents of any of the urban regions. Only residents of the GTA and of four European regions make fewer than two trips per day on average. Residents of some U.S. cities make more than twice as many trips per day.

TTS indicates that GTA residents aged 11 and over made 2.41 trips per weekday in 1996. This may be consistent with the *Database* value, which also represented persons under 11 years, who may make less trips than average, and also trips on weekends, when fewer trips may be made.

Variables 9-12 are the constituents of Variable 8, showing respectively trips by foot, bicycle, transit, and car. The values for the GTA for these four variables, expressed as percentages of the total trip rate, were 6, 1, 14, and 79 per cent. These values correspond precisely with the *TTS* values for 1996 (if school bus and cab trips are excluded from the *TTS* estimates).



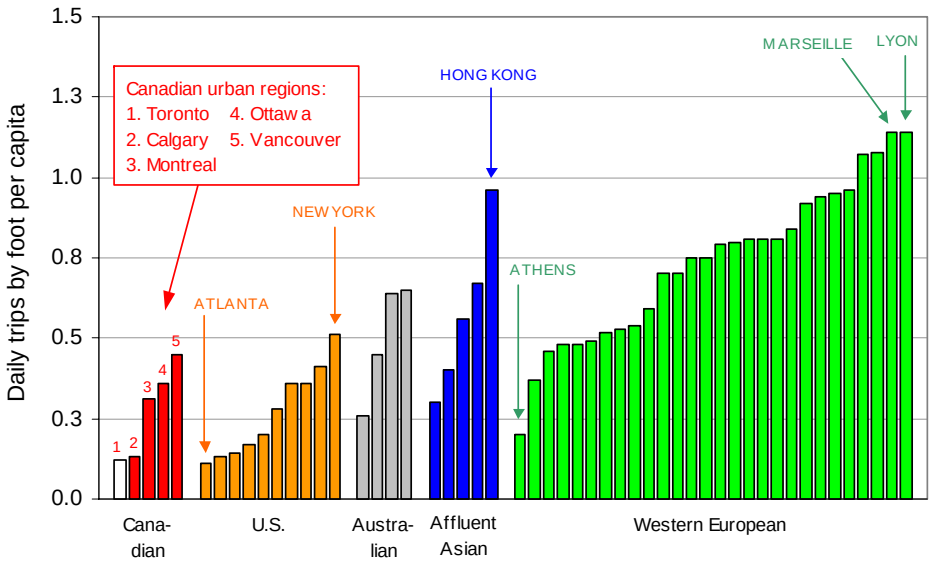
Variable 9: Daily trips by foot per capita

Residents of the GTA made almost the lowest number of walking trips per person. Residents of the other urban regions made on average almost five times as many trips per day as GTA residents. There may be discrepancies here as to what was classified as a walking trip.

The *Database* value of 0.12 walking trips a day by GTA residents is identical to the *TTS* value and may have been based on this value. There seems to be no other estimate of the amount of walking in the GTA. It should be noted again that *TTS* data do not represent children under 11 and weekend travel. However, proper allowance for these factors would likely not bring the GTA average to near the average for the 52 regions (0.56 trips per day).

The GTA's low walking rate partially explains the low overall trip rate (Variable 8).

Variable 9



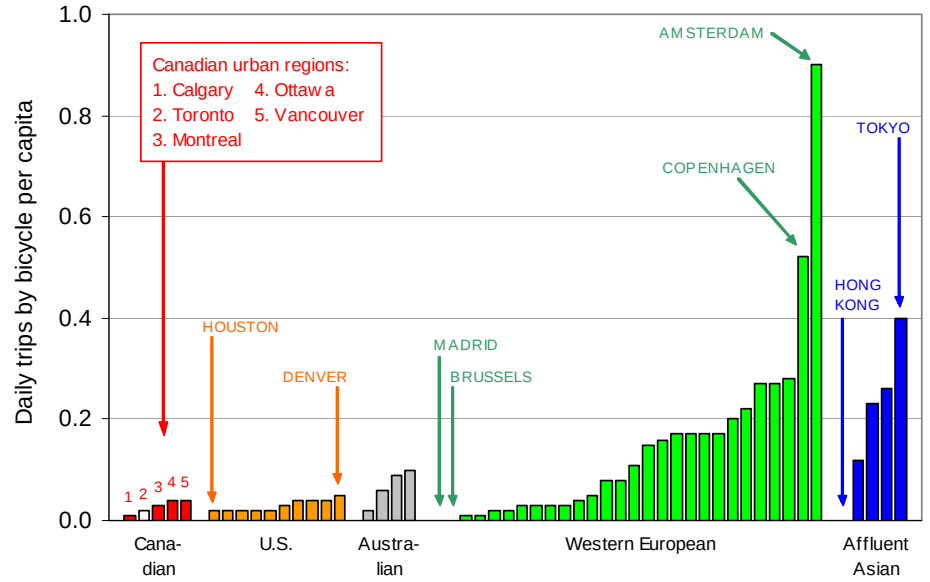
Variable 10: Daily trips by bicycle

Of all the variables, this one shows the widest relative range, with some urban regions—Madrid, Brussels, Hong Kong—reporting almost no trips by bicycle and others—notably Amsterdam, Copenhagen, and Tokyo—reporting quite large numbers of such trips. The GTA is near the low end of the range. It reported the second lowest rate in Canada, the fifth lowest in North America, and the 14th lowest overall.

The *Database* value of 0.02 cycling trips a day by GTA residents is identical to the *TTS* value. It suffers the limitations noted in respect of Variable 9.

The low rate of cycling trips contributes to the overall low trip rate (Variable 8).

Variable 10



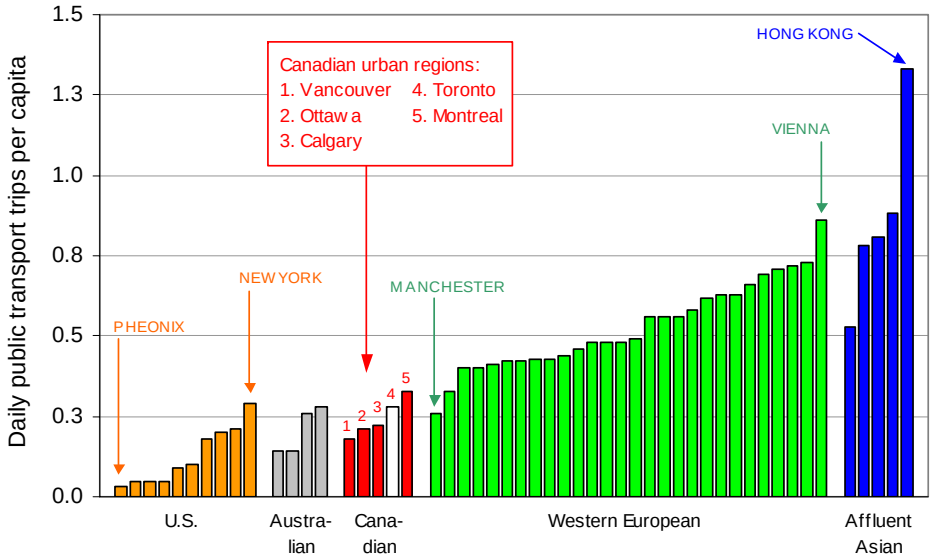
Variable 11: Daily public transport trips per capita

This is another variable with a wide range. The GTA has a relatively low rate of public transport use, but it is higher than all but three of the North American and Australian regions (Montreal, New York, and Sydney) and one of the Asian and European regions (Manchester).

Note that the rates are based on urban regions. The rates in the main municipalities of regions are often differently ordered. For example, the City of Toronto has a higher rate than the City of Montreal. Note too that there is a definitional problem with transit trips that invalidates some comparisons. For Variable 11, 'trip' is the operative word; but a transit trip may require two or more boardings, and some jurisdictions count each boarding as a trip.

The *Database* value of 0.28 transit trips a day by GTA residents is almost identical to the *TTS* value of 0.29 trips. It suffers the limitations noted in respect of Variable 9.

Variable 11



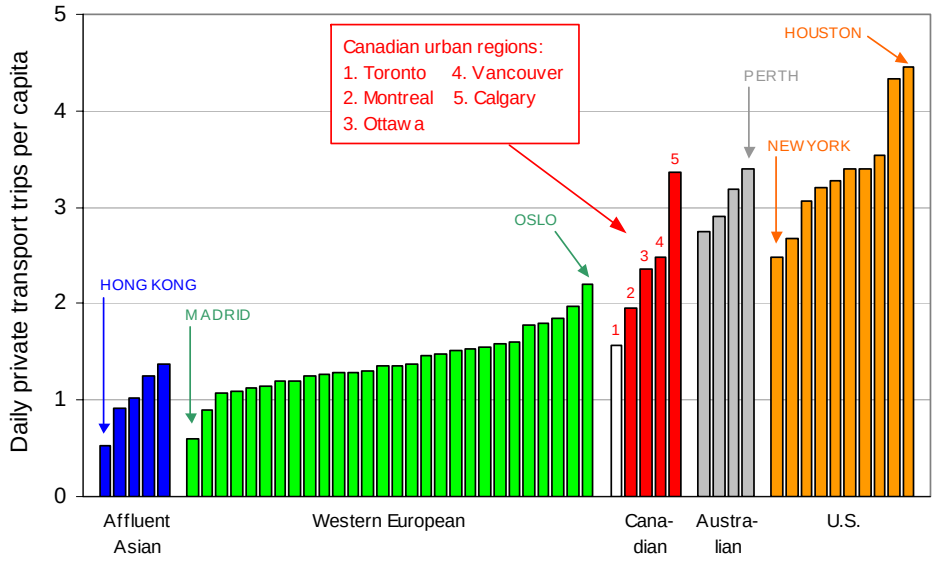
Variable 12: Daily trips by car per capita

Trips by car usually comprise the largest component of all daily trips, with only Hong Kong and Madrid reporting more trips by another mode (in each case, both by transit and by foot).

The GTA reported a lower rate of daily car trips than all other North American and Australian cities, and a lower rate even than some European cities (Helsinki, Copenhagen, Marseille, Hamburg, and Nantes). The GTA's low rate contributes to the low overall trip rate (Variable 8)

The *Database* value of 1.56 car trips per day by GTA residents is almost identical to the *TTS* value of 1.58 trips. It suffers the limitations noted in respect of Variable 9.

Variable 12



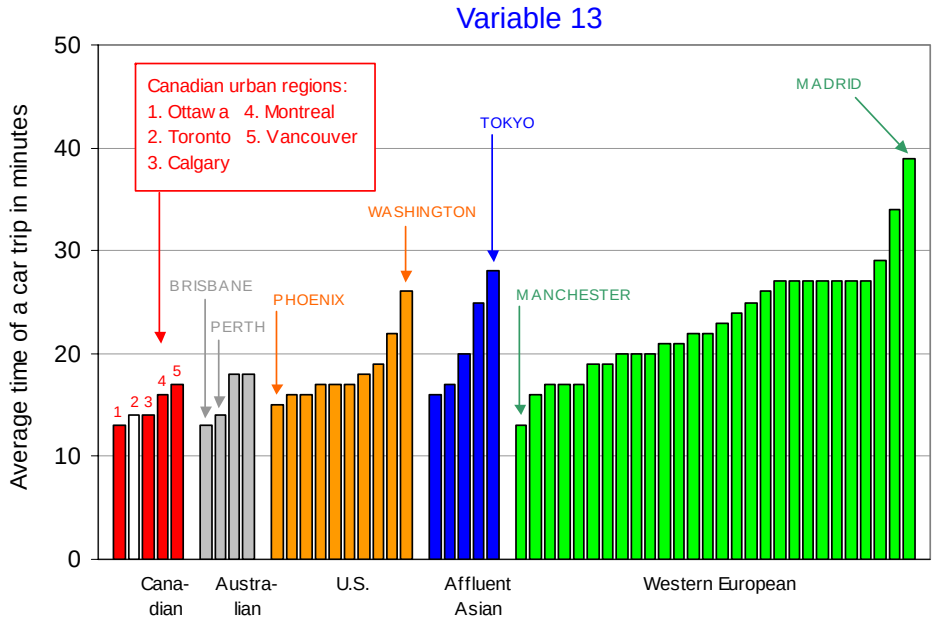
Variable 13: Average time of a car trip

This is another potential indicator of congestion, with high car trip times being associated with high congestion rates. Only Manchester, Ottawa, and Brisbane reported lower rates than the GTA.

Further comment: The GTA's ranking on this variable supports the indication from Variable 7 (average road network speed) that the GTA's roads are relatively uncongested when compared with other major affluent urban regions, including others in North America.

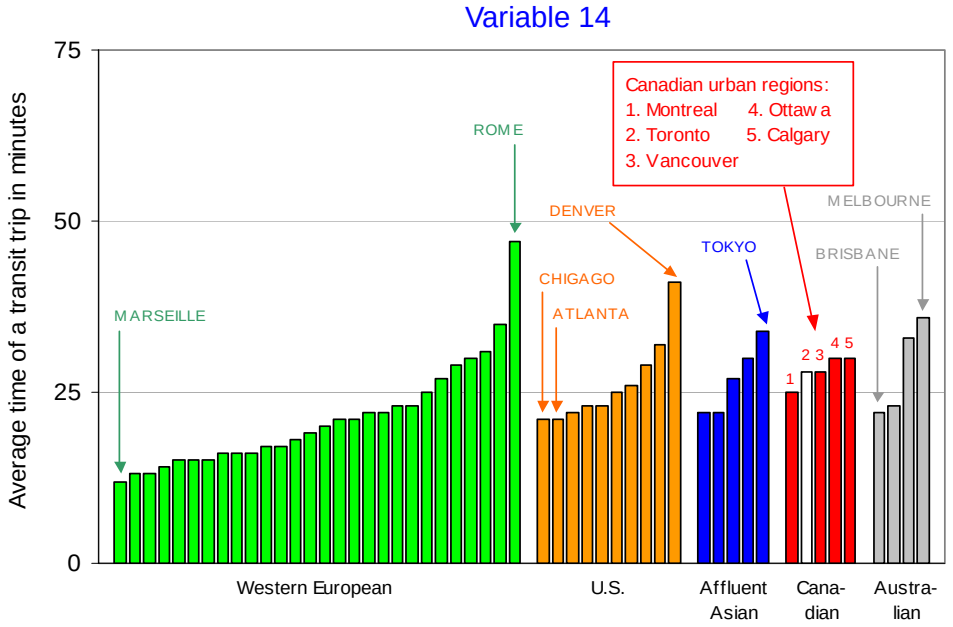
On the other hand, Variable 4 and 6 suggest that the GTA *could* be more congested, at least in comparison with several Australian and other North American regions. The GTA has a relatively low length of road per person (Variable 4) and a relatively high number of vehicles per kilometre of road (Variable 6).

It may be reasonable to attach more credibility to performance measures—e.g. travel speed and time—than to capacity measures such as road length and road use in that the former are usually of greater concern. Thus the reasonable conclusion from the *Database* is that the GTA is relatively uncongested.



Variable 14: Average time of a transit trip

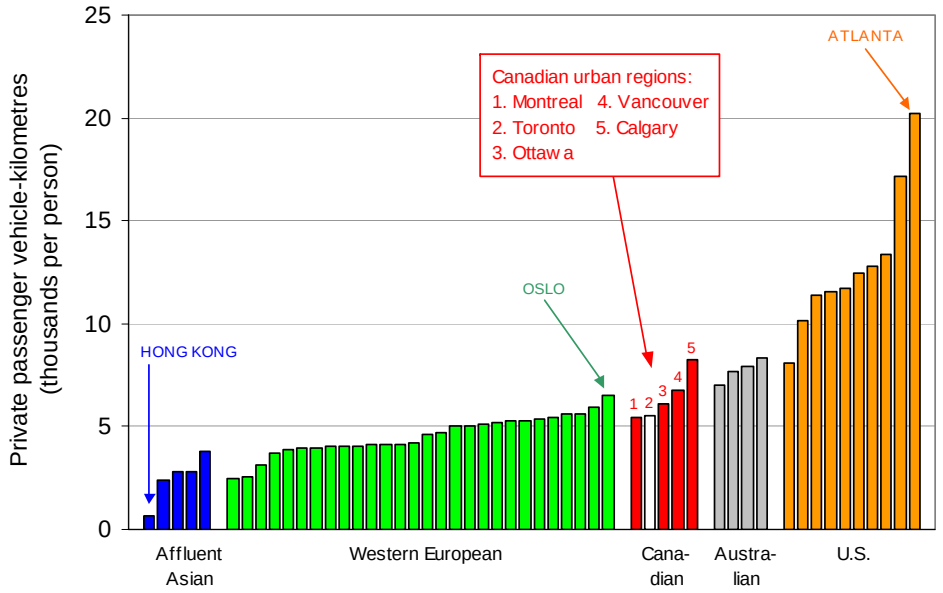
Here, the GTA is near the high end of the range of urban regions, perhaps reflecting in part what may be a relative lack of priority given to transit on GTA roads. Exclusive bus lanes are an example of such priority, although there are not good comparative data on how the GTA fares in this respect.



Variable 15: Total kilometres by car per capita

The GTA reported less travel by car than other North American and Australian regions, except the Montreal region, and less than was reported by four European regions (Oslo, Ruhr, Stuttgart, and Düsseldorf). This reflects the low number of trips made by car (Variable 12).

Variable 15



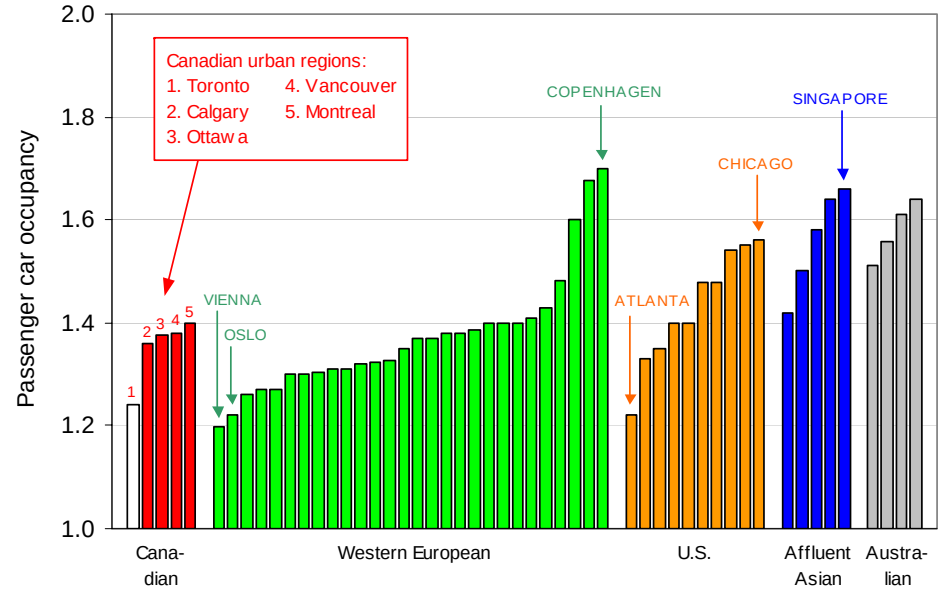
Variable 16: Car occupancy

The GTA has among the lowest car occupancies; only Vienna, Oslo, and Atlanta report lower rates. As well, Canadian urban regions as a group reported the lowest average occupancies.

TTS allows an estimate to be made of average car occupancy in the GTA. It is 1.25, i.e. almost identical to the value in the *Database*. The occupancy estimate from *TTS* is for weekday trips only. Occupancies are likely higher at weekends because weekend travel involves more family tripping and less commuting.

Thus, the *Database*—which concerns travel at weekends too—may underestimate GTA car occupancy. However, a correction for weekend travel (if data were available) could still leave the GTA among the urban regions with the lowest occupancies.

Variable 16



Variable 17: User cost of car travel per person-kilometre

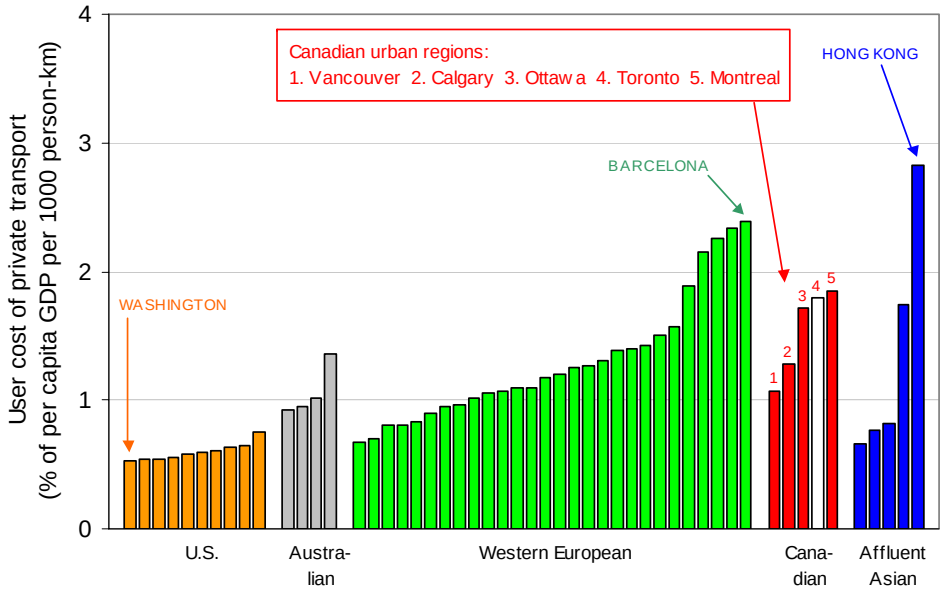
User costs are difficult to compare because of the different price structures across urban regions and the general challenge of comparing across currencies. In the *Database*, an attempt was made to normalize comparisons by relating them to Gross Domestic Product (GDP), which was reported for each region.

Variable 17 shows the percent of per-capita GDP that users pay—for ownership and operation—to achieve 1,000 person-kilometres of travel by car. (Ten person-kilometres is equivalent to one person moving through 10 kilometres, or to five people each moving through two kilometres.)

The GTA reported the second highest such cost among North American regions (behind the Montreal region), and the eighth highest cost overall. In part, this is a result of the low vehicle occupancy rate (see Variable 16), which means that the costs of vehicle ownership and use are spread across fewer person-trips.

However, even if the cost per vehicle-kilometre is used (rather than cost per person-kilometre), the GTA slips only one place; it has the 9th highest overall cost.

Variable 17

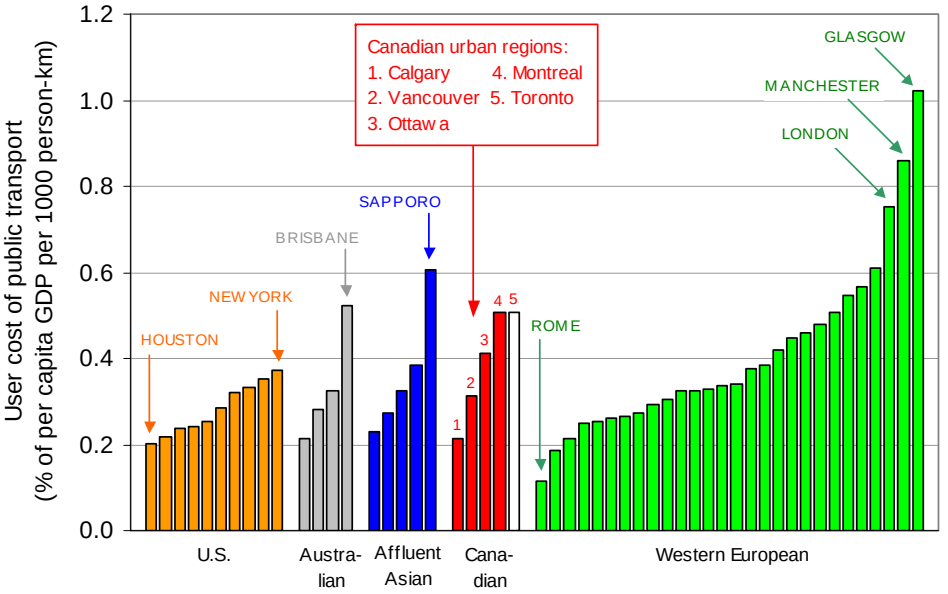


Variable 18: User cost of public transport per person-kilometre

Variable 18 shows user costs of transit reported on a similar basis to that for Variable 17. The GTA has the highest relative cost of transit in North America, just ahead of the Montreal region. Worldwide, only urban regions in the UK have substantially higher relative transit costs than the GTA.

Further comment: Variables 17 and 18 together suggest that transport costs more in the GTA than in most other affluent urban regions. This may help explain in part why people in the GTA travel less than people in most other regions (see Variable 8).

Variable 18

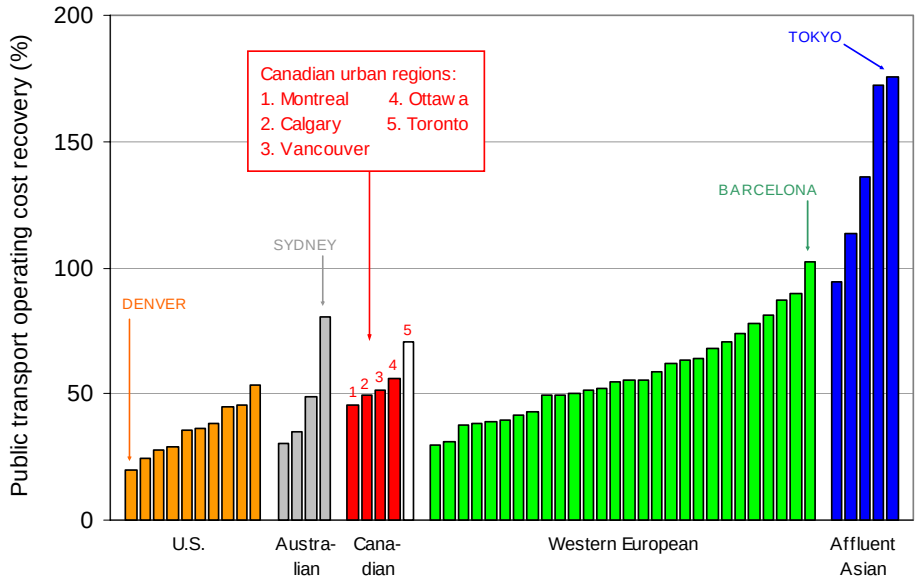


Variable 19: Public transport operating cost recovery

This variable concerns operating revenues as a percentage of operating costs (i.e., excluding the costs of capital additions, depreciation, and debt retirement). The GTA has by far the highest rate in North America, recovering over 70 per cent of costs, mostly from fares. This proportion has increased since 1995 with reductions in operating subsidies imposed by provincial and municipal governments.

Note that Barcelona and four of the affluent Asian cities more than cover their operating costs from operating revenues. Three of the Asian regions—Tokyo, Osaka, and Hong Kong—also cover their capital costs. There, public transport comprises private-sector operations that receive no direct subsidy and provide a return to shareholders.

Variable 19



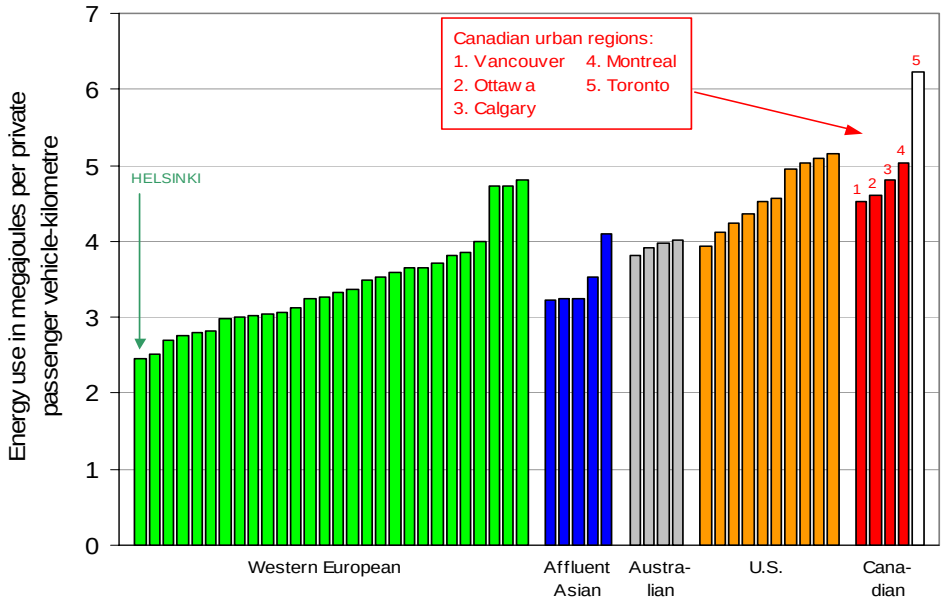
Variable 20: Energy use by cars per vehicle-kilometre

Energy use is a critical variable because it is strongly associated with resource depletion, greenhouse gas emissions, air pollution, and several economic factors. The GTA appears to have had by far the most inefficient private transport in this respect. This means that residents of the GTA used more litres of fuel for every 100 kilometres driven than those of any other urban region.

Why this should be the case is unclear. Possible factors are climate (both cold winters and hot summers increase fuel use), vehicle maintenance, and driving habits (rapid acceleration uses very much more fuel than a gradual start).

To the extent the data in the *Database* are valid, there seems evident scope for improvement in the overall energy efficiency of private transport in the GTA, by reducing fuel use per kilometre and by improving occupancy (see Variable 16).

Variable 20



Variable 21: Energy use per transit vehicle-kilometre

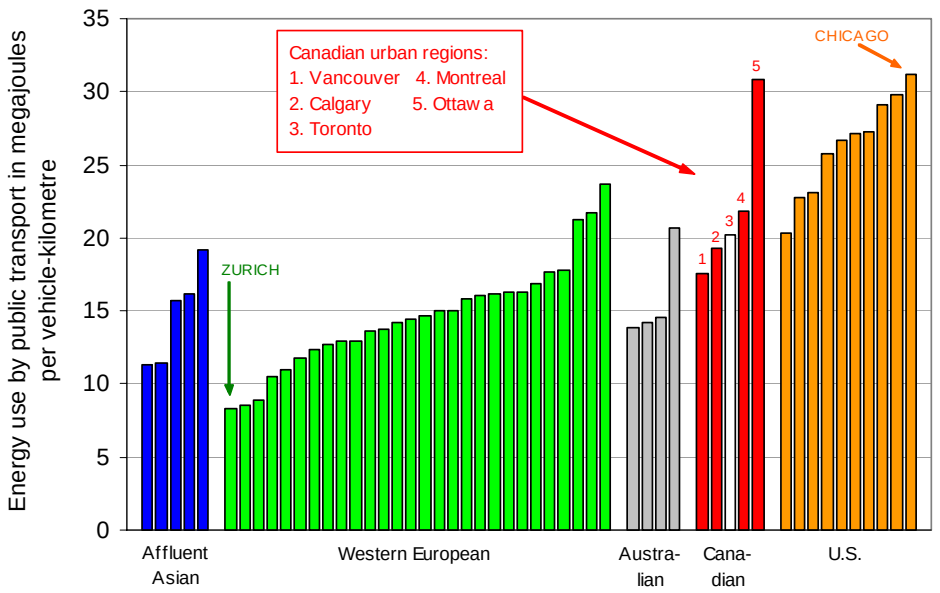
Transit in the GTA uses less energy per vehicle-kilometre than in all North American urban regions except Vancouver and Calgary. (For trains, each car counts as a vehicle.)

The high energy use by transit in the Ottawa region likely resulted from its dependence (in 1995) on buses rather than more energy-efficient tethered vehicles (regional and subway trains, streetcars, trolleybuses, etc.).

The lower energy use in most European, Asian, and Australian cities likely resulted from their greater use of tethered vehicles.

Note that this variable concerns *vehicle*-kilometres not *person*-kilometres. Thus, vehicle occupancy is not a factor. (Also, most of the fuel is used to move the vehicle rather than the people in it.).

Variable 21



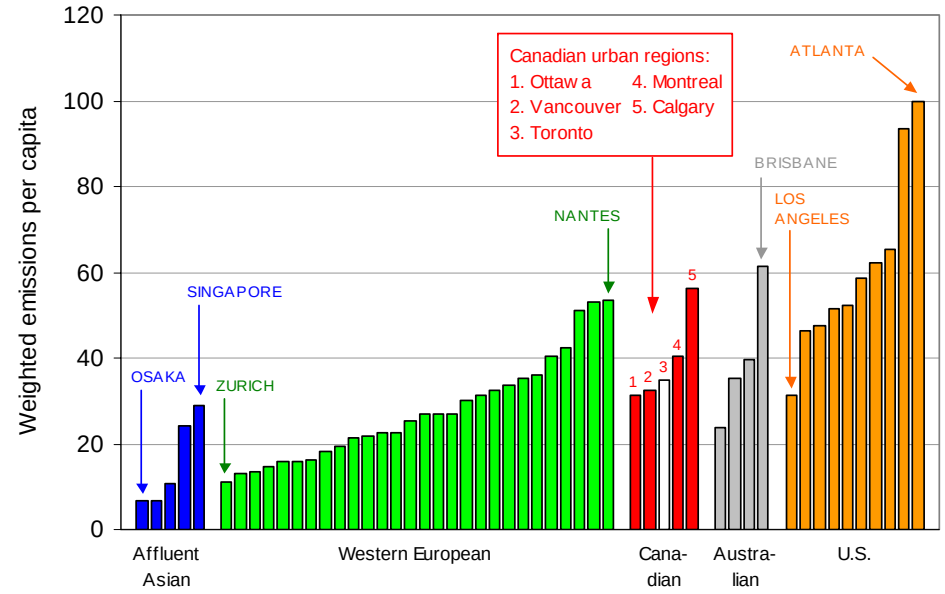
Variable 22: Total weighted emissions per capita

This variable combines emissions of four local pollutants from transport into a weighted index. The pollutants are nitrogen oxides and volatile organic compounds (the main ingredients for the production of smog), and carbon monoxide and sulphur dioxide. The weighted emissions are presented on a per-capita basis and adjusted so that 100 is the highest value (that for Atlanta).

The GTA's rating on this variable is low by North American standards, although high by European and Asian standards. The GTA's low rate of use of personal motorized vehicles (Variables 12 and 15) probably contributed to the relatively low rating.

The low rating of Los Angeles (31) may reflect California's unusually stringent vehicle emissions standards, although San Diego (52) and San Francisco (62) did not have such low ratings.

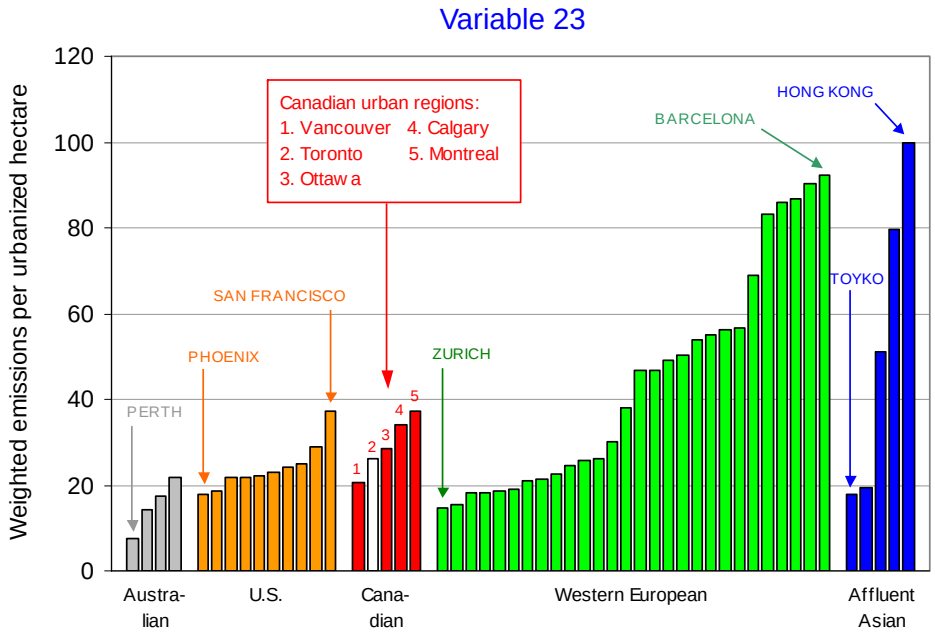
Variable 22



Variable 23: Total weighted emissions per hectare of urbanized land

Poor air quality consists of high concentrations of pollutants. Thus, emissions per hectare can be more important for air quality than emissions per person. This variable is a reshaping of Variable 22 to show relative emissions per hectare of developed land in the region. It thus favours sprawling regions (e.g., Phoenix) over tightly packed regions (e.g., Hong Kong) even though there are many more transport emissions in the former kind of region.

The GTA rates relatively low overall, although higher than most regions in North America.



Discussion

Specific comments on several variables are noted in the text above, on Pages 5, 6, 9, and 11. The following discussion pulls together these points, noting which among the 23 comparisons are the most reliable and valid, and striking and meaningful.

Reliability and validity. These are qualities of the data, which were compiled in the manner indicated on Page 2. Were the variables reported with sufficient care, and do they represent what they are purported to represent, for the GTA and for all the other regions?

The *Database* was compiled with evident care, but there were likely numerous problems of language and local terminology, as well as different practices in compensating for missing data points. Data issues have already been noted in relation to Variables 3, 4, 6, and 8-12.

Because urbanization and vehicle occupancy are often not well assessed, there could also be questions about the data comprising Variables 1, 2, and 16-18. Indeed, there may also be questions about the remaining variables—5, 7, 11-15, and 19-23.

An important point is that comparative data are rarely perfect. Even when there are known or potential data issues, comparisons across jurisdictions can often be informative about the regions being compared and, at a minimum, serve as a stimulus to better data collection.

Striking and meaningful comparisons. For several variables, the GTA appears from the *Database* to be extreme for North America. The variables are the following (with asterisks where the GTA is also extreme among all 52 surveyed affluent urban regions):

4. Unusually low length of road
5. Unusually low rate of car ownership
8. Unusually low number of trips per day per person (except by transit)*
13. Unusually low average time for a car trip*
15. Unusually low annual distance travelled by car per person
16. Unusually low car occupancy*
17. Unusually high cost of car travel*
18. Unusually high cost of transit use
19. Unusually low level of transit subsidy
20. Unusually high energy use by cars per unit distance*

The overall picture provided by these comparisons is that of the GTA as a region where, at least for North America, car ownership rate is low, car use rate is low, walking and cycling rates are low, there is relatively little congestion, and travel is expensive and inefficient.

In respect of the last three points—congestion, cost, and efficiency—the GTA is also at or near an extreme among *all* the affluent regions.

The GTA's roads are less congested in that travel times are low and travel speeds are high.

The GTA is an expensive place for people to travel by car and by transit.

Travel by car in the GTA is inefficient from two perspectives. One is that occupancy rates are unusually low. With higher occupancies, the same number of trips could be made in fewer cars, or, more people could travel with little added environmental impact, resource use, and congestion.

The other apparent inefficiency is in energy use, which is extraordinarily high for cars (Variable 20) although not for transit (Variable 21).

The positive aspect of these inefficiencies is that, if they are confirmed, they provide much scope for improving the performance of car travel in the GTA. By increasing occupancy and reducing unit energy use to the averages for all 52 regions, fuel use by cars in the GTA could be reduced by almost 50 per cent, with no reduction in the amount of travel. This opportunity could serve the GTA well in an era of energy constraint. If taken, if could also provide substantial reductions in transport-related pollution.

GREATER TORONTO AREA COMPARISONS

Data used in the charts on Page 3-14

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Amsterdam	57.0	29.0	17.7	2.60	0.33	125	33.2	3.83	1.07	0.90	0.66	1.20	23.0	17.0	3,963	1.38	1.31	0.29	31.0	3.13	15.0	18	30
Athens	69.4	30.1	17.3	4.52	0.36	71	25.0	1.93	0.20	0.03	0.43	1.27	27.0	20.0	4,083	1.27	2.15	0.33	49.7	3.02	16.1	42	86
Atlanta	6.4	3.6	6.3	8.70	0.76	86	55.1	4.57	0.11	0.03	0.10	4.33	17.0	21.0	20,213	1.22	0.55	0.24	36.4	5.04	20.4	100	19
Barcelona	197.1	69.3	20.5	0.53	0.43	733	30.2	1.84	0.46	0.01	0.48	0.89	20.0	29.0	2,476	1.35	2.40	0.42	102.1	2.82	10.5	16	92
Berlin	56.0	24.8	20.2	1.50	0.37	241	31.0	3.05	0.81	0.17	0.72	1.35	17.0	21.0	3,121	1.40	1.88	0.48	39.5	3.99	8.9	16	26
Brisbane	9.6	4.0	11.9	8.80	0.61	68	50.1	3.87	0.45	0.09	0.14	3.19	13.0	22.0	7,895	1.61	1.36	0.52	48.6	3.81	13.9	61	17
Brussels	72.4	47.6	26.7	1.97	0.47	232	32.0	2.54	0.94	0.00	0.48	1.12	26.0	25.0	4,106	1.40	1.06	0.32	29.5	4.72	23.7	33	69
Calgary	20.8	11.0	23.0	4.73	0.71	149	47.7	3.72	0.13	0.01	0.22	3.36	14.0	30.0	8,242	1.36	1.29	0.21	49.6	4.81	19.3	56	34
Chicago	16.8	9.0	10.0	5.11	0.59	113	42.0	3.98	0.36	0.04	0.18	3.40	18.0	21.0	10,163	1.56	0.60	0.32	44.7	4.36	31.2	46	23
Copenhagen	28.5	15.0	14.1	4.57	0.28	61	50.0	2.96	0.37	0.52	0.46	1.61	17.0	23.0	4,714	1.70	0.67	0.34	78.0	3.00	12.7	22	18
Denver	15.1	9.0	8.6	8.57	0.65	74	54.9	3.57	0.20	0.05	0.05	3.27	16.0	41.0	11,529	1.55	0.60	0.22	20.0	5.16	27.1	65	29
Düsseldorf	49.2	35.2	34.3	2.10	0.52	241	31.4	3.00	0.75	0.27	0.63	1.35	29.0	13.0	5,589	1.32	0.89	0.27	55.5	2.51	16.3	14	21
Frankfurt	47.6	38.7	20.5	2.02	0.47	227	29.8	2.64	0.81	0.17	0.56	1.10	34.0	14.0	5,279	1.30	0.70	0.46	73.6	3.59	13.0	35	49
Glasgow	34.0	14.7	12.6	4.79	0.29	59	38.0	2.82	0.92	0.02	0.33	1.55	22.0	16.0	5,388	1.41	1.27	1.02	64.2	2.70	21.3	21	21
Hamburg	38.4	22.3	16.4	2.56	0.44	165	28.0	2.90	0.49	0.22	0.40	1.79	27.0	22.0	5,166	1.60	0.81	0.33	59.0	3.65	11.8	14	15
Helsinki	33.0	16.2	21.3	3.36	0.33	97	38.2	2.92	0.48	0.28	0.58	1.58	16.0	21.0	4,056	1.37	1.42	0.38	63.6	2.46	21.7	19	19
Hong Kong	320.4	151.3	6.4	0.28	0.05	172	28.3	2.81	0.96	0.00	1.33	0.52	17.0	22.0	631	1.58	2.83	0.39	136.2	4.09	16.1	11	100
Houston	8.8	4.3	7.2	9.60	0.70	72	59.9	4.66	0.14	0.02	0.05	4.45	16.0	23.0	17,131	1.48	0.54	0.20	24.2	4.96	29.8	94	24
London	59.1	31.5	28.0	1.92	0.34	174	28.7	2.82	0.96	0.04	0.44	1.38	24.0	35.0	4,197	1.33	1.07	0.75	89.5	3.07	8.6	27	47
Los Angeles	24.1	11.2	4.1	3.73	0.54	142	47.4	4.01	0.36	0.02	0.09	3.54	17.0	29.0	12,420	1.40	0.63	0.29	29.2	4.11	29.1	31	22
Lyon	47.4	20.5	15.1	2.43	0.52	201	28.1	3.54	1.14	0.03	0.40	1.97	21.0	13.0	4,994	1.43	0.95	0.45	41.3	3.24	14.5	34	47
Madrid	85.9	29.5	38.7	1.72	0.46	256	35.1	1.96	0.75	0.00	0.62	0.59	39.0	18.0	3,943	1.27	2.33	0.51	61.8	3.36	15.8	23	57
Manchester	51.6	19.9	10.5	3.22	0.38	116	39.7	1.92	0.48	0.03	0.26	1.15	13.0	17.0	2,599	1.38	2.25	0.86	70.8	4.72	11.0	25	38
Marseille	58.7	21.9	19.8	1.63	0.42	248	22.5	3.34	1.14	0.02	0.41	1.77	20.0	12.0	3,695	1.31	1.57	0.57	52.3	4.81	17.8	31	54
Melbourne	13.7	5.7	9.4	9.53	0.61	63	43.0	3.71	0.65	0.06	0.26	2.74	18.0	36.0	7,710	1.56	0.93	0.28	34.7	4.02	14.5	35	14
Milan	76.6	31.1	10.3	2.32	0.46	182	29.0	2.85	0.54	0.08	0.71	1.52	19.0	19.0	3,875	1.30	1.40	0.30	38.9	3.27	12.9	40	90
Montreal	31.7	13.3	16.3	4.48	0.44	96	39.0	2.63	0.31	0.03	0.33	1.96	16.0	25.0	5,433	1.40	1.85	0.51	45.3	5.04	21.8	40	37
Munich	55.7	32.3	36.3	1.72	0.50	278	33.5	2.67	0.59	0.27	0.73	1.08	27.0	27.0	4,655	1.30	0.80	0.19	54.9	3.33	15.0	51	83
Nantes	35.8	16.2	12.5	5.24	0.51	91	30.0	3.16	0.81	0.08	0.42	1.85	21.0	16.0	5,030	1.37	1.26	0.21	51.7	3.81	13.6	53	56
New York	18.0	9.5	20.7	4.88	0.45	92	38.5	3.31	0.51	0.02	0.29	2.49	22.0	23.0	8,126	1.54	0.59	0.37	53.6	5.10	23.1	47	25
Newcastle	38.4	14.8	16.0	3.87	0.27	70	38.1	2.67	0.84	0.05	0.49	1.29	20.0	23.0	4,039	1.40	1.50	0.61	68.3	3.86	14.7	16	18
Osaka	98.1	40.0	15.9	3.90	0.40	78	33.0	2.43	0.40	0.23	0.78	1.02	20.0	27.0	2,808	1.42	0.82	0.33	172.6	3.25	11.4	7	19
Oslo	24.0	12.3	18.3	6.10	0.41	64	35.0	3.88	0.95	0.17	0.56	2.20	17.0	15.0	6,520	1.22	1.17	0.38	81.2	2.98	12.4	27	19
Ottawa	31.3	15.7	20.1	7.95	0.54	67	46.0	2.97	0.36	0.04	0.21	2.36	13.0	30.0	6,070	1.38	1.71	0.41	56.0	4.61	30.8	31	29
Paris	47.6	21.3	18.1	1.93	0.48	226	35.8	2.84	1.08	0.03	0.48	1.25	19.0	22.0	4,144	1.31	1.09	0.27	38.2	3.49	14.2	36	50
Perth	10.9	4.6	19.2	9.07	0.68	73	45.6	3.90	0.26	0.10	0.14	3.40	14.0	23.0	8,337	1.64	0.96	0.21	30.1	3.92	20.6	24	8
Phoenix	10.4	4.3	2.7	9.18	0.55	58	47.7	3.60	0.13	0.04	0.03	3.40	15.0	25.0	11,394	1.33	0.75	0.25	27.4	4.52	26.7	59	18
Rome	55.8	25.8	19.6	4.13	0.70	162	29.3	2.70	0.53	0.01	0.63	1.53	27.0	47.0	5,272	1.39	1.39	0.11	37.3	3.65	16.3	53	87
Ruhr	36.5	14.6	4.8	2.98	0.51	163	33.0	2.80	0.70	0.20	0.42	1.48	27.0	15.0	5,917	1.32	1.10	0.25	55.5	2.79	17.7	23	24
San Diego	14.6	6.6	5.8	5.30	0.57	106	60.6	3.30	0.17	0.02	0.05	3.06	17.0	32.0	13,395	1.40	0.65	0.35	38.4	3.94	25.8	51	22
San Francisco	20.5	8.9	13.9	4.51	0.62	134	46.2	3.87	0.41	0.04	0.21	3.21	19.0	26.0	12,825	1.35	0.55	0.24	35.8	4.57	22.7	62	37
Sapporo	72.1	37.9	47.5	2.95	0.40	124	34.1	2.60	0.56	0.26	0.53	1.25	25.0	22.0	3,789	1.64	0.66	0.61	94.1	3.23	19.1	24	51
Singapore	93.5	53.3	16.4	0.98	0.16	132	35.2	2.61	0.30	0.12	0.81	1.38	16.0	30.0	2,367	1.66	1.74	0.23	113.8	3.25	15.7	29	80
Stockholm	29.0	14.1	13.3	4.50	0.40	87	42.2	2.39	0.52	0.15	0.43	1.29	27.0	31.0	5,099	1.68	1.21	0.25	42.9	3.54	13.8	30	26
Stuttgart	58.9	43.3	22.5	2.46	0.52	205	33.1	3.11	0.79	0.17	0.69	1.46	22.0	16.0	5,631	1.26	1.02	0.55	87.2	2.75	16.1	13	23
Sydney	18.9	8.0	12.8	6.89	0.53	75	35.5	3.84	0.64	0.02	0.28	2.90	18.0	33.0	6,988	1.51	1.02	0.33	80.5	3.97	14.2	40	22
Tokyo	87.7	47.5	14.3	4.01	0.41	84	26.1	2.86	0.67	0.40	0.88	0.91	28.0	34.0	2,779	1.50	0.77	0.27	175.8	3.54	11.4	7	18
Toronto	25.5	12.8	6.5	4.08	0.47	114	51.4	1.98	0.12	0.02	0.28	1.56	14.0	28.0	5,495	1.24	1.80	0.51	70.7	6.23	20.3	35	26
Vancouver	21.6	10.4	12.6	5.14	0.53	102	38.6	3.15	0.45	0.04	0.18	2.48	17.0	28.0	6,785	1.38	1.07	0.31	51.6	4.52	17.6	33	21
Vienna	69.4	37.1	11.8	1.77	0.40	215	28.0	2.86	0.70	0.11	0.86	1.19	25.0	15.0	4,140	1.20	0.96	0.34	49.3	3.71	16.9	27	55
Washington	14.3	9.2	12.4	5.25	0.58	109	40.2	3.18	0.28	0.02	0.20	2.68	26.0	22.0	11,707	1.48	0.52	0.33	45.8	4.24	27.3	52	22
Zurich	44.3	30.6	12.2	4.63	0.51	103	37.3	2.82	0.80	0.16	0.56	1.30	27.0	30.0	5,457	1.48	0.83	0.26	50.0	3.04	8.3	11	15