

Supply constraints have increased prices of apartment condominiums in Canadian cities

Prices of apartments in Toronto and Vancouver are much higher than the cost to provide additional units

INTRODUCTION

Since the end of the U.S. financial crisis, housing affordability concerns have risen in some of Canada's major cities. Prices have increased in cities like Toronto and Vancouver in the last decade. However, unaffordable housing itself is not a market failure. When the price of housing is similar to the cost of producing more of it, that is, the marginal cost, the market is operating properly and housing prices cannot decrease by adding more supply. For apartment units, the marginal cost of units is the cost of building up one floor. In a well-functioning market without market power, the price of a housing unit will be equivalent to its average cost of production. Over the long run, the average cost of production is equal to the marginal cost of production. A difference between price and cost will erode as new builders enter the market to provide new supply and compete on price. If prices are above the cost to provide additional units, the market has failed. Market failure has several possible causes. Among them are supply constraints, regulatory and non-regulatory, and a lack of competition. To differentiate between these major causes, the analysis must establish whether suppliers can respond to higher prices by building more units. If they cannot, then it is apparent they are constrained in some way.

FINDINGS

- Prices are compared to marginal costs on a per-square-foot basis. Two price measures were considered, the benchmark price of all units in the area covered by the Real Estate Board and that of units built within five years of their closing date. Both price measures rose over the last decade in the three cities evaluated: Toronto, Montréal and Vancouver (figure 1).
- The estimation of the marginal cost of apartment units follows Glaeser, Gyourko and Saks (2005).¹ RSMMeans provides average construction cost data for each city for several building types, from which we estimate marginal costs. If the ratio of price per square foot to marginal cost per square foot shows that

the price of apartment units is far above the cost to produce them (a reasonable threshold is prices that are 1.3 times higher than marginal costs²), then prices are much higher than costs and the market is constrained in some way.

- Regardless of the price measure used, the prices of apartment condominium units are much higher than the cost to produce them in the Vancouver area (figure 2).
 - Unlike in the other two cities, at no point was the ratio of price to marginal cost ever below one.
 - As with all markets, prices are more variable than marginal costs, suggesting strong demand likely opened the gap between prices and costs.
 - Condominium markets in Vancouver are not providing efficient outcomes.
- When considering the Toronto area, the price measure used greatly affects the results:
 - For both measures, the price-to-cost ratio began the period below one, showing a market that is unlikely to be constrained (figure 3).
 - When the benchmark price for Toronto is the price measure considered, the ratio of price to marginal cost remains near one throughout the sample.
 - When only new units, the structures that builders are building, form the price measure the results change. The ratio of prices to marginal costs greatly exceed 1.3 and suggests that new construction is constrained in Toronto. Using only the benchmark price masks the conditions that suppliers of new homes face.
- Unlike in the other two cities, prices were not above costs in the Montréal area (figure 4).
 - Like in Toronto, the ratio between price and marginal cost increases when the prices of new units are the basis of comparison. However, the ratio remains below the identified threshold.

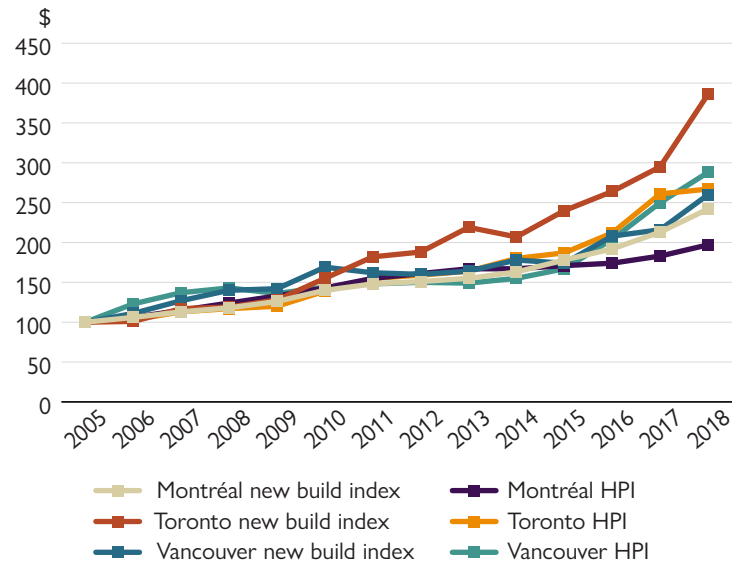
¹ Glaeser, Edward, Joseph Gyourko, and Raven Saks. 2005. "Why Is Manhattan So Expensive? Regulation and the Rise in Housing Prices." *The Journal of Law and Economics* 48 (2): 331-369.

² Housing suppliers in Canada follow a rule of thumb where, ideally, no more than a third of the cost of a building is spent on land.

- Individual municipalities within a larger metropolitan area may have different approaches to development and different geography, which may affect how constrained construction is. We repeat the above analysis at the census subdivision level.
 - Within the Vancouver area in 2018, the majority of units are in municipalities other than the city of Vancouver, specifically in Burnaby and Richmond. Municipalities near the centre of Vancouver have price-to-marginal cost ratios close to that for the overall Vancouver area. Burnaby's ratio is lower, but still elevated (figure 5).
 - The city of Montréal itself has a ratio of price to marginal cost above 1.3, while other municipalities off the main island, like Laval, do not. Increased sprawl and higher prices in the central city suggest that Montréal's height limit may be constraining (figure 5).
 - The vast majority of condominium units built within the last five years in the Toronto census metropolitan area (CMA) were in the city of Toronto. Thus, there was no analysis of the census subdivisions performed for Toronto.
- To determine if we have observed constraints on supply in Canada's major cities, we must determine if builders can react to changes in demand indicated by increasing prices. If a supply constraint prevents builders from responding to higher prices with more units, we would expect little relationship between past prices and current apartment starts.
 - There is no statistically significant relationship between apartment starts and past prices in the Toronto or Vancouver areas. Such a relationship exists in Montréal, the area analyzed that shows no evidence of constrained supply (figure 6).
 - This suggests that supply constraints have muted supply responses in Vancouver and Toronto.
- Price frictions in Toronto and Vancouver are low compared to those observed in cities in the U.S., Australia³ and New Zealand.⁴

House prices in major Canadian cities have grown consistently over the last decade.

Figure 1: Sale prices, HPI benchmark price and average price of new units. Index, 2005 = 100



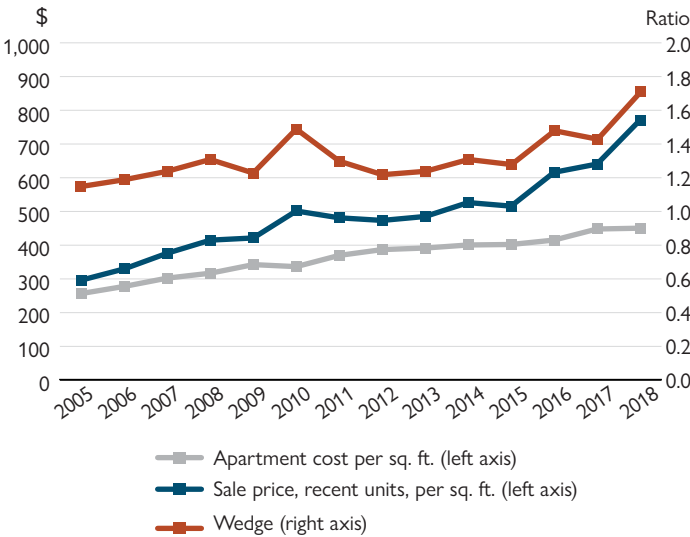
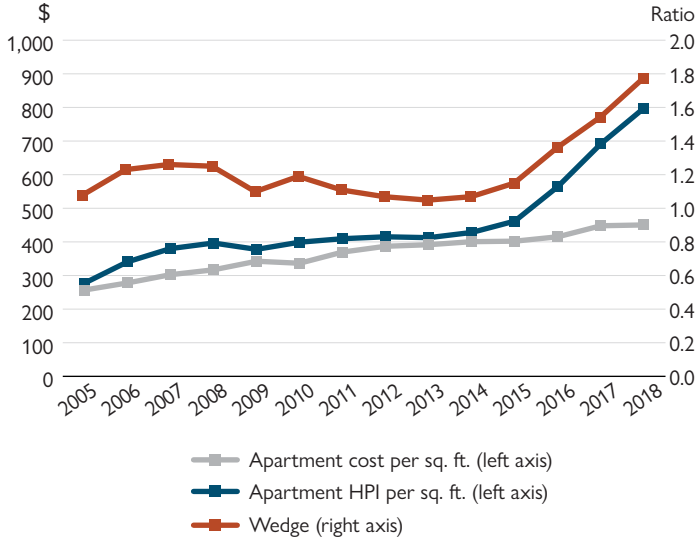
Sources: Canadian Real Estate Association, BC Assessment, Landcor, Teranet, Centris

³ Kendal, Ross, and Peter Tulip. 2018. *The Effect of Zoning on Housing Prices*. Research Discussion Paper, Economic Research Department, Reserve Bank of Australia, Canberra: Reserve Bank of Australia.

⁴ Lees, K. 2017. *Quantifying the impact of land use regulation: Evidence from New Zealand*. Report for Superu, Ministerial Social Sector Research Fund, Wellington: Sense Partners.

Prices are above marginal costs in Vancouver.

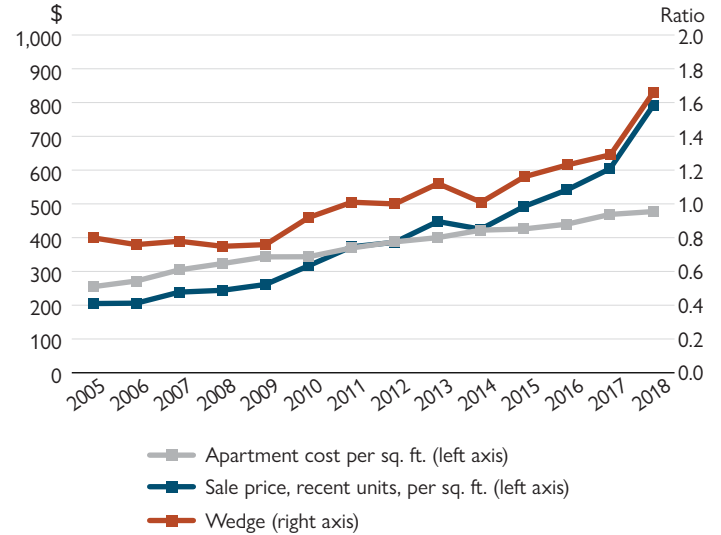
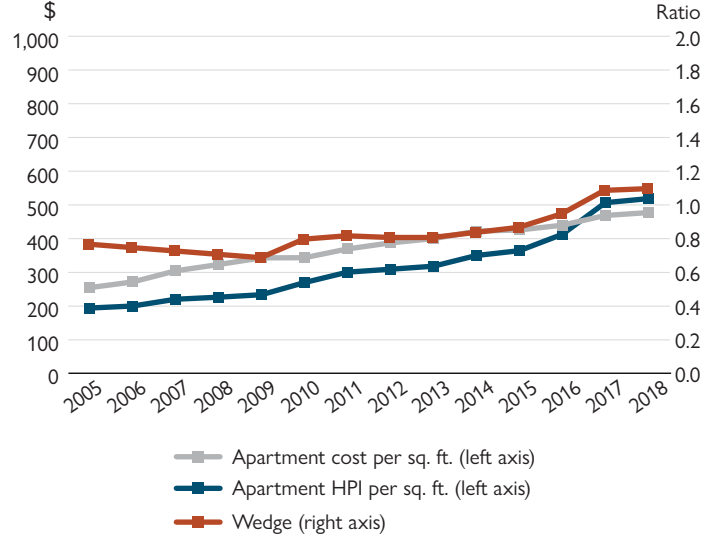
Figure 2: Comparison of sale prices, construction costs and the wedge between them: Vancouver (HPI: top, new units: bottom)



Sources: BC Assessment, Landcor, RSMMeans, CMHC calculations

Prices are above marginal costs for new units in Toronto.

Figure 3: Comparison of sale prices, construction costs and the wedge between them: Toronto (HPI: top, new units: bottom)

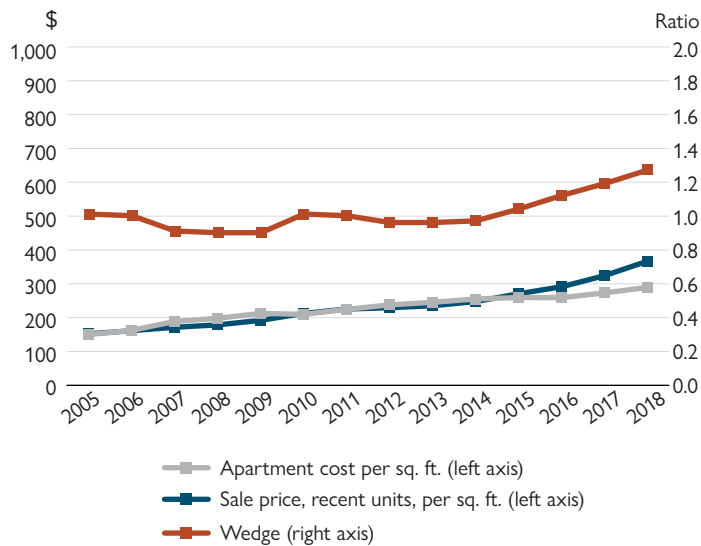
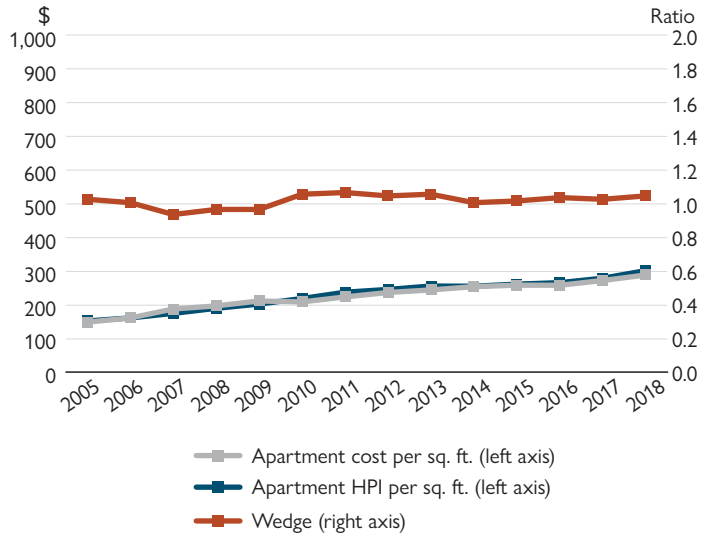


Sources: Teranet, RSMMeans, CMHC data and calculations

Prices are near marginal costs for apartment condominium units in Montréal.

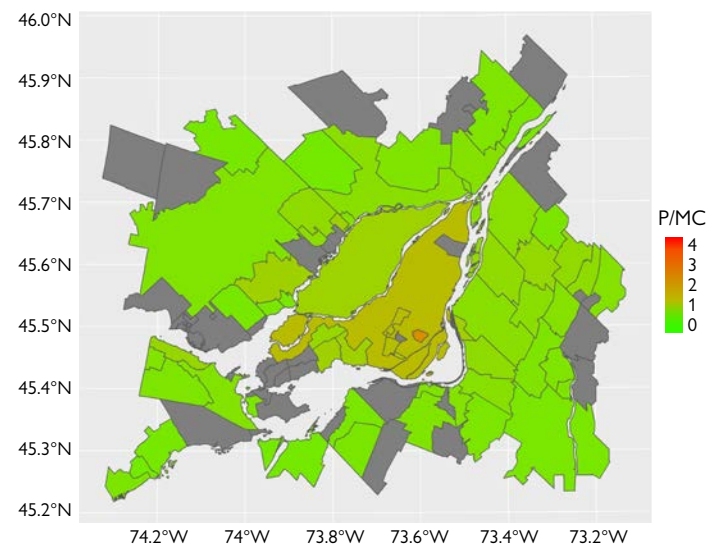
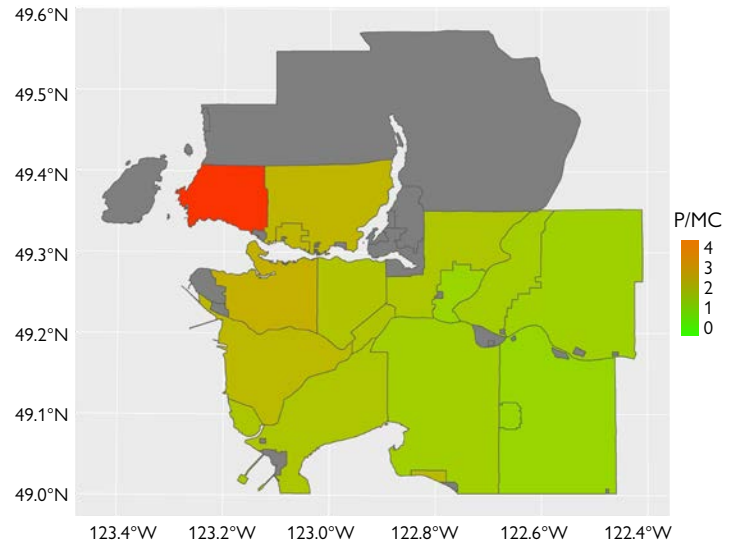
The differences between price and marginal cost are higher in municipalities near the city centre.

Figure 4: Comparison of sale prices, construction costs and the wedge between them: Montréal (HPI: top, new units: bottom)



Sources: Centris, RSMMeans, CMHC data and calculations

Figure 5: Maps of price to marginal cost in municipalities within the Vancouver and Montréal CMAs, 2018 (Vancouver: top, Montréal: bottom)



Sources: BC Assessment, Landcor, Statistics Canada, Centris, CMHC calculations

There is no strong relationship between past prices and current construction.

Figure 6: One-year lagged price coefficient from regression on apartment starts

	Montréal	Toronto	Vancouver
Coefficient	48625	-3919	-8497
t-statistic	2.95*	-0.14	-0.52
R squared	0.46	0.01	0.03
Observations	12	12	12

* Significant at the 5% significance level.

Sources: BC Assessment, Landcor, Teranet, Centris, CMHC data and calculations

FURTHER READING

Full report – *Supply constraints have increased prices of apartment condominiums in Canadian cities* (https://eppdscrmssa01.blob.core.windows.net/cmhcprodcontainer/sf/project/archive/research_5/rr_supply_constraints_increased_prices_mar_12.pdf)

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ALTERNATIVE TEXT AND DATA FOR FIGURES

Figure 1: Sale prices, HPI benchmark price and average price of new units. Index, 2005 = 100

Year	New Build			HPI		
	Montréal new build index	Toronto new build index	Vancouver new build index	Montréal HPI	Toronto HPI	Vancouver HPI
2005	100	100	100	100	100	100
2006	106	101	111	106	103	123
2007	113	117	127	115	113	137
2008	118	119	140	124	117	143
2009	126	128	142	133	120	136
2010	140	155	169	143	139	144
2011	148	182	162	155	155	148
2012	151	188	160	161	159	150
2013	155	219	164	167	164	149
2014	163	207	178	167	180	155
2015	178	240	174	171	187	167
2016	192	264	208	174	212	204
2017	213	295	216	183	261	250
2018	242	386	260	197	267	288

Sources: Canadian Real Estate Association, BC Assessment, Landcor, Teranet, Centris

Figure 2: Comparison of sale prices, construction costs and the wedge between them: Vancouver (HPI: top, new units: bottom)

Year	HPI: Top			New Units: Bottom		
	Apartment cost per sq. ft. (left axis)	Apartment HPI per sq. ft. (left axis)	Wedge (right axis)	Apartment cost per sq. ft. (left axis)	Sale price, recent units, per sq. ft. (left axis)	Wedge (right axis)
2005	\$256.75	\$276.99	1.08	\$256.75	\$296.48	1.15
2006	\$277.84	\$340.50	1.23	\$277.84	\$329.85	1.19
2007	\$302.42	\$380.08	1.26	\$302.42	\$376.32	1.24
2008	\$316.93	\$396.63	1.25	\$316.93	\$414.99	1.31
2009	\$342.43	\$377.82	1.10	\$342.43	\$421.41	1.23
2010	\$336.44	\$399.09	1.19	\$336.44	\$501.39	1.49
2011	\$369.77	\$409.49	1.11	\$369.77	\$481.17	1.30
2012	\$386.97	\$415.17	1.07	\$386.97	\$473.43	1.22
2013	\$391.60	\$412.56	1.05	\$391.60	\$485.12	1.24
2014	\$400.63	\$428.10	1.07	\$400.63	\$526.38	1.31
2015	\$402.14	\$461.92	1.15	\$402.14	\$515.80	1.28
2016	\$415.21	\$564.60	1.36	\$415.21	\$616.10	1.48
2017	\$448.03	\$691.91	1.54	\$448.03	\$640.63	1.43
2018	\$450.41	\$798.06	1.77	\$450.41	\$770.97	1.71

Sources: BC Assessment, Landcor, RSMeans, CMHC calculations

Figure 3: Comparison of sale prices, construction costs and the wedge between them:
Toronto (HPI: top, new units: bottom)

Year	HPI: Top			New Units: Bottom		
	Apartment cost per sq. ft. (left axis)	Apartment HPI per sq. ft. (left axis)	Wedge (right axis)	Apartment cost per sq. ft. (left axis)	Sale price, recent units, per sq. ft. (left axis)	Wedge (right axis)
2005	\$254.87	\$194.34	0.76	\$254.87	\$204.93	0.80
2006	\$271.67	\$200.31	0.74	\$271.67	\$206.01	0.76
2007	\$304.69	\$220.40	0.72	\$304.69	\$238.79	0.78
2008	\$323.32	\$226.52	0.70	\$323.32	\$244.10	0.75
2009	\$343.10	\$233.84	0.68	\$343.10	\$261.34	0.76
2010	\$343.48	\$269.93	0.79	\$343.48	\$316.78	0.92
2011	\$369.49	\$300.77	0.81	\$369.49	\$372.96	1.01
2012	\$387.55	\$309.39	0.80	\$387.55	\$386.28	1.00
2013	\$400.11	\$318.36	0.80	\$400.11	\$447.87	1.12
2014	\$422.24	\$350.11	0.83	\$422.24	\$425.11	1.01
2015	\$425.76	\$364.31	0.86	\$425.76	\$492.06	1.16
2016	\$439.92	\$412.90	0.94	\$439.92	\$541.31	1.23
2017	\$468.79	\$506.74	1.08	\$468.79	\$604.05	1.29
2018	\$477.23	\$518.63	1.09	\$477.23	\$790.57	1.66

Sources: Teranet, RSMMeans, CMHC data and calculations

Figure 4: Comparison of sale prices, construction costs and the wedge between them:
Montréal (HPI: top, new units: bottom)

Year	HPI: Top			New Units: Bottom		
	Apartment cost per sq. ft. (left axis)	Apartment HPI per sq. ft. (left axis)	Wedge (right axis)	Apartment cost per sq. ft. (left axis)	Sale price, recent units, per sq. ft. (left axis)	Wedge (right axis)
2005	\$149.97	\$153.43	1.02	\$149.97	\$151.97	1.01
2006	\$162.26	\$162.36	1.00	\$162.26	\$161.48	1.00
2007	\$188.80	\$175.92	0.93	\$188.80	\$171.54	0.91
2008	\$198.04	\$190.88	0.96	\$198.04	\$178.64	0.90
2009	\$212.56	\$203.49	0.96	\$212.56	\$191.96	0.90
2010	\$209.70	\$219.90	1.05	\$209.70	\$212.53	1.01
2011	\$224.66	\$238.54	1.06	\$224.66	\$225.40	1.00
2012	\$237.73	\$246.78	1.04	\$237.73	\$229.35	0.96
2013	\$245.31	\$256.81	1.05	\$245.31	\$235.34	0.96
2014	\$255.10	\$256.25	1.00	\$255.10	\$247.56	0.97
2015	\$259.33	\$262.45	1.01	\$259.33	\$270.68	1.04
2016	\$259.15	\$266.87	1.03	\$259.15	\$291.40	1.12
2017	\$273.28	\$280.05	1.02	\$273.28	\$324.35	1.19
2018	\$289.52	\$302.54	1.04	\$289.52	\$367.32	1.27

Sources: Centris, RSMMeans, CMHC data and calculations

Figure 5: Maps of price to marginal cost in municipalities within the Vancouver and Montréal CMAs, 2018

Region	Municipality	Wedge Effect
Vancouver	Vancouver	1.89
	Richmond	1.71
	Burnaby	1.45
	Surrey	1.20
	North Vancouver	1.77
Montréal	Montréal	1.63
	Laval	1.11
	Longueuil	0.80

Sources: BC Assessment, Landcor, Statistics Canada, Centris, CMHC calculations