

# THE REGIONAL GEOGRAPHY OF SHORT-TERM RENTALS

**David Wachsmuth and Danielle Girard**

School of Urban Planning  
McGill University

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# Urban Politics and Governance research group



*upgo.lab.mcgill.ca*



airbnb



**DEAR AIRBNB TOURIST,**

Your vacation/short term rental has led to the eviction of Chinese immigrant families.

We have survived the 1882 Chinese Exclusion Act, 2 World Wars, the 1906 Great Quake and Fires, and the 1989 Earthquake.

But now, our lives, our schools, our grandparents' homes, and social fabric are being destroyed.

**AIRBNB IS DESTROYING OUR HOME**  
Have A Nice Visit In Chinatown.  
**San Francisco**

L'expulsion des familles chinoises de Chinatown à San Francisco est le résultat du décret d'exclusion chinoise, survécu au Chinese Exclusion Act, 2 World Wars, the 1906 Great Quake and Fires, and the 1989 Earthquake.

D Liebe AirBnB-Touristen

Lo sgombero di poveri e disoccupati cinesi è il risultato di Airbnb, che ha fatto esplodere il risultato di Airbnb, del Chinese Exclusion Act cinese del 1882, del 1906 e del 1989. Ora le nostre case sono state distrutte.

thestar.com

News · GTA

## Eemptied Kensington apartments appear on Airbnb

Former tenants allege they were forced out by illegal rent hikes and intimidation.

Toronto

**1) HOUSING IMPACTS** What impact have STRs had on housing availability, affordability, and quality of life in cities around the world?

**2) SOCIAL DYNAMICS** How is the platform economy changing social and economic relationships between inhabitants, housing, and urban space?

**3) POLICY OPTIONS** What policy options are available to governments seeking to regulate STRs in the public interest?

**What do STRs look like  
from a regional  
perspective?**

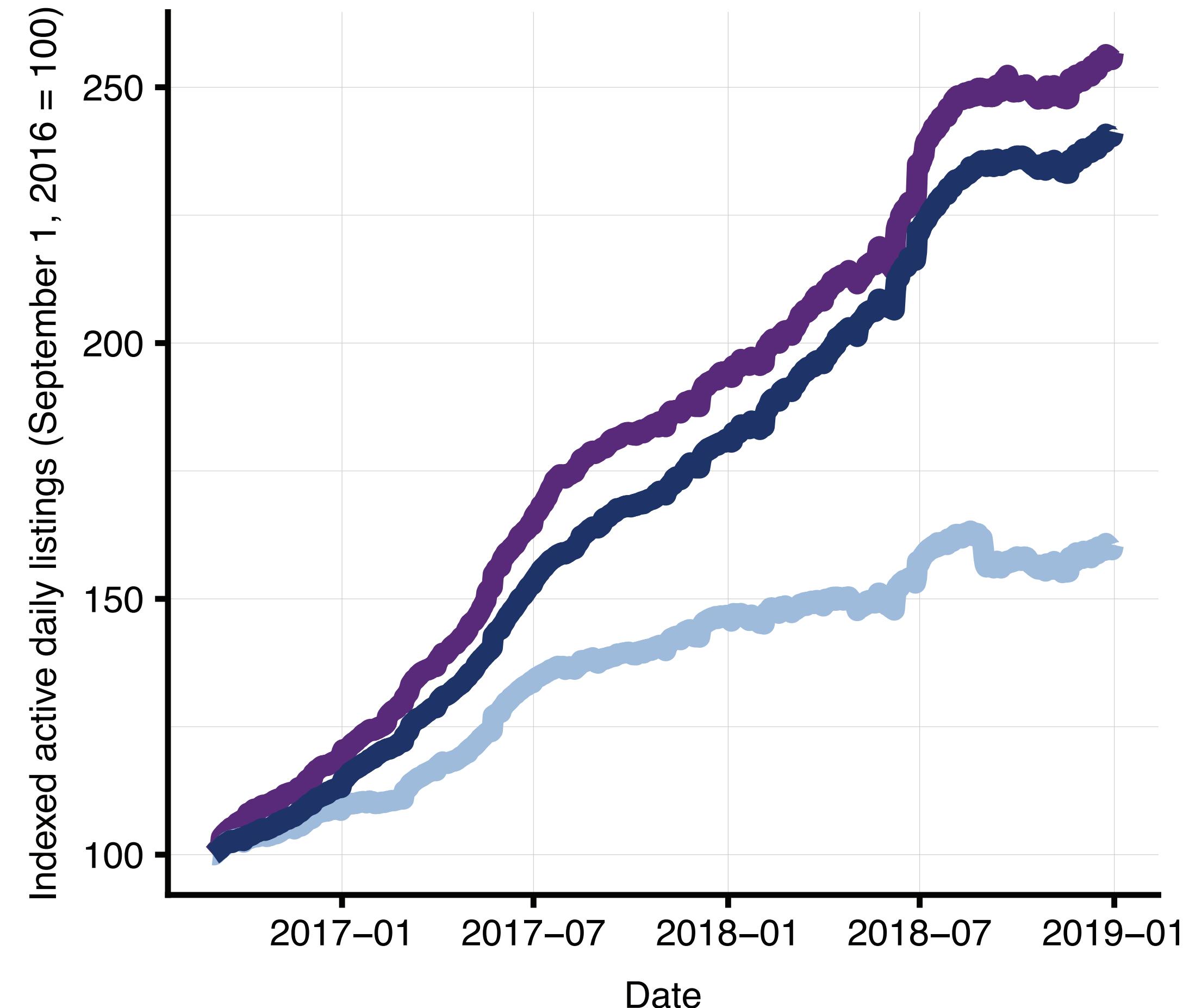
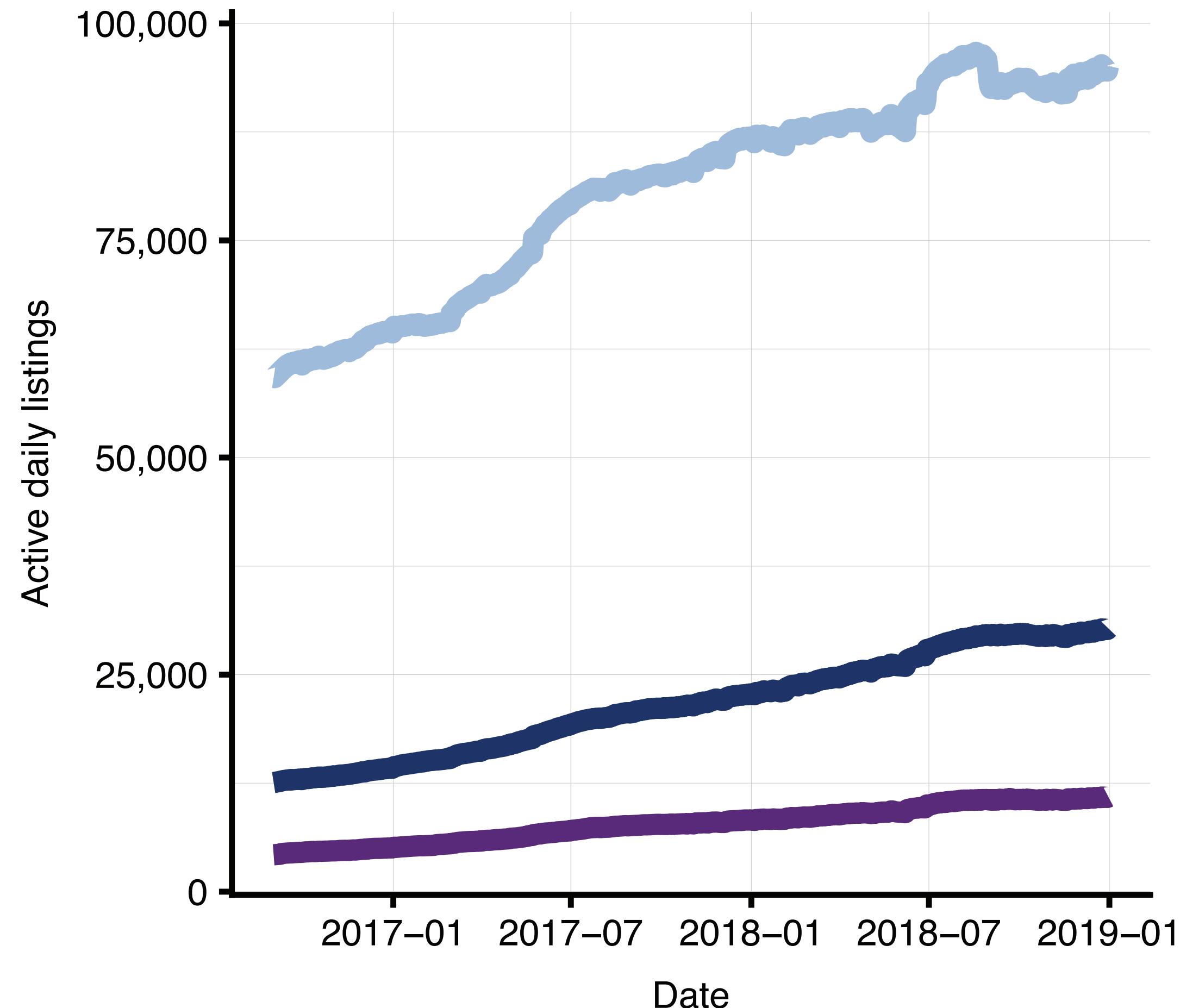
# The regional knowledge gap in short-term rentals

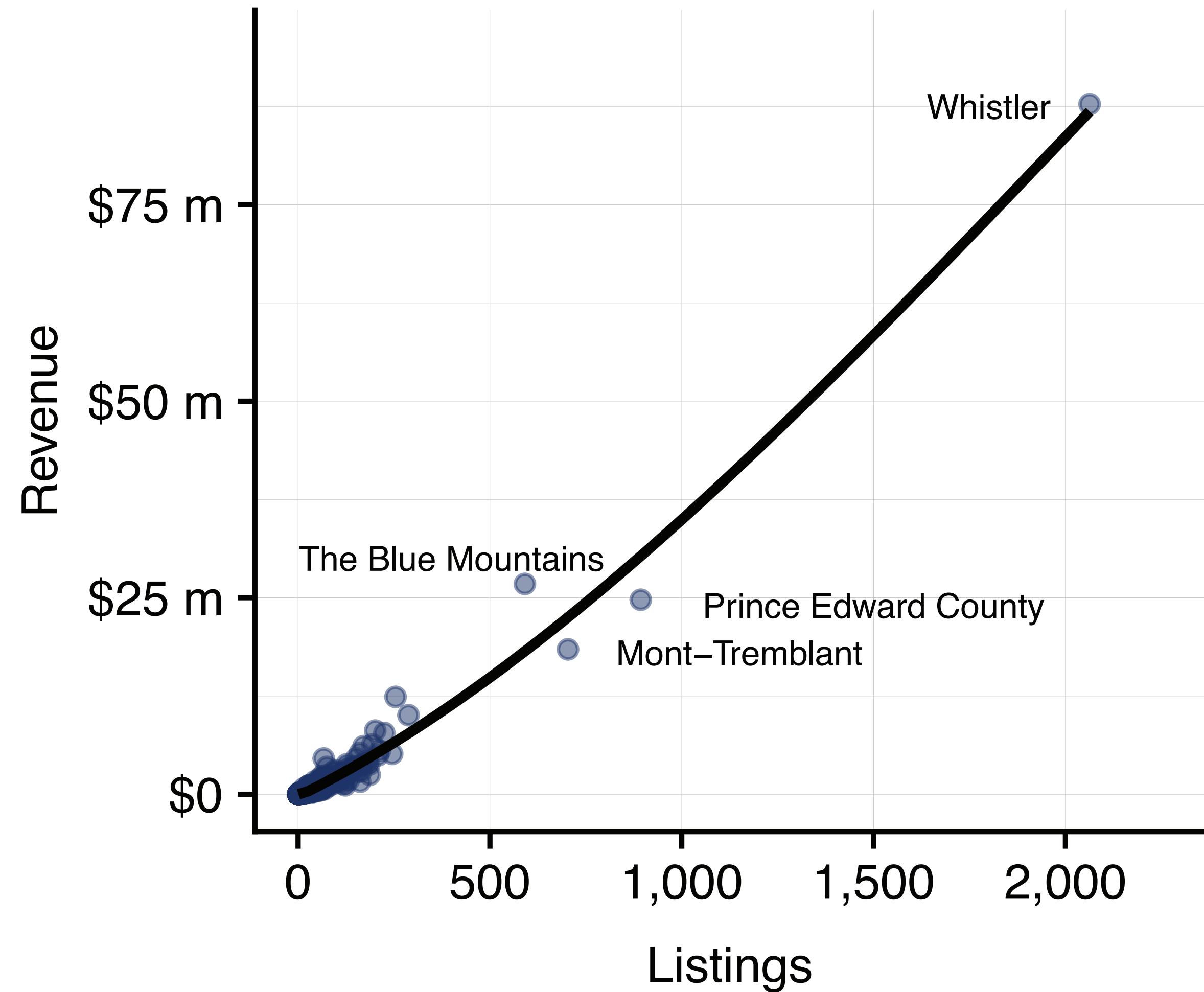
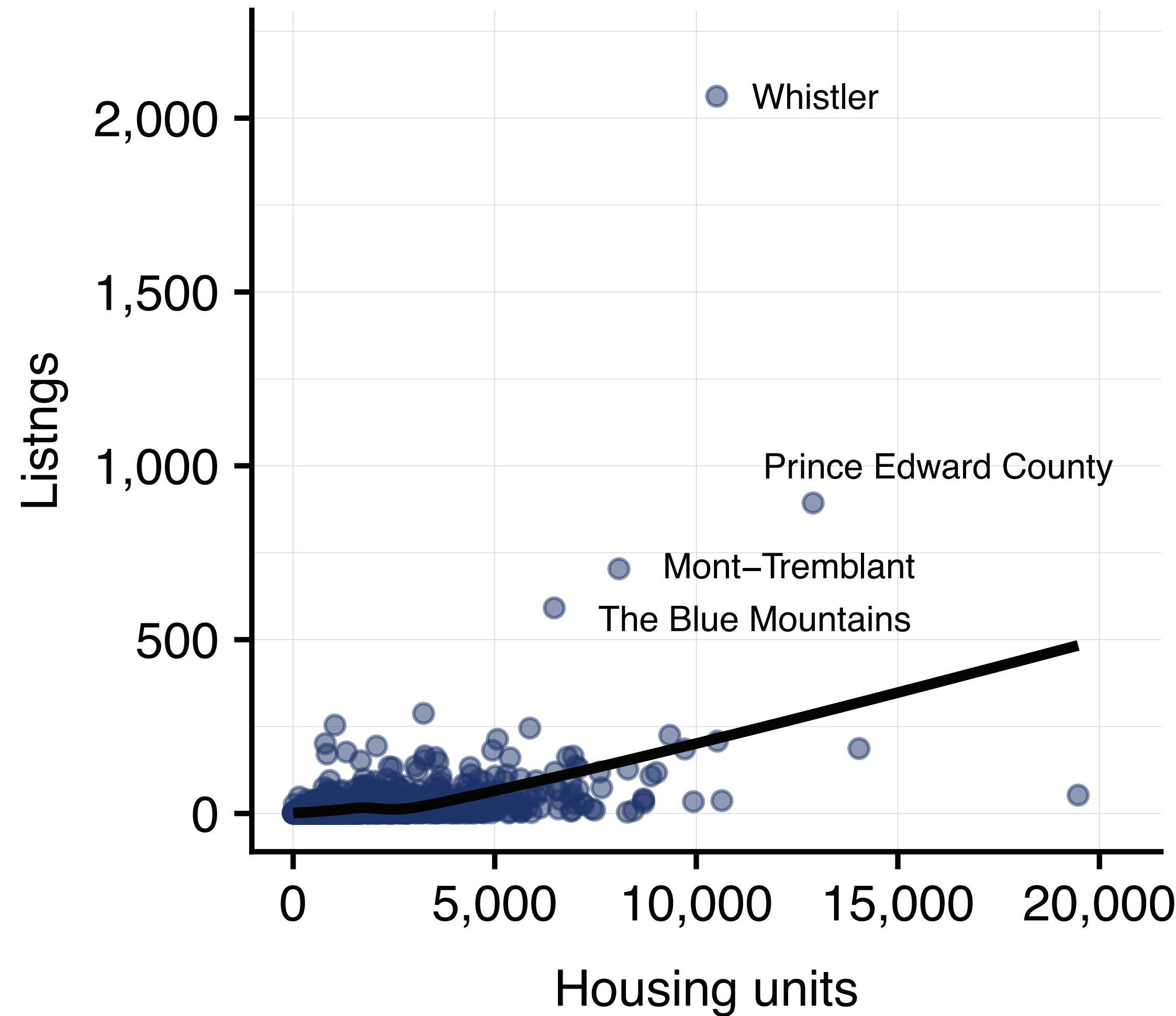
# The regional knowledge gap in short-term rentals

Increasingly extensive research into incidence and  
impacts of STRs in cities

Also some analysis of smaller communities,  
particularly resort towns

But no research we are aware of which analyzes  
STRs from a regional studies perspective





# What do STRs look like from a regional perspective?

Exploratory spatial analysis

Cross-Canada municipal comparison



# Methodology

**We have data about...**

**Every Airbnb/HomeAway property in the world, every single day  
since 2015**

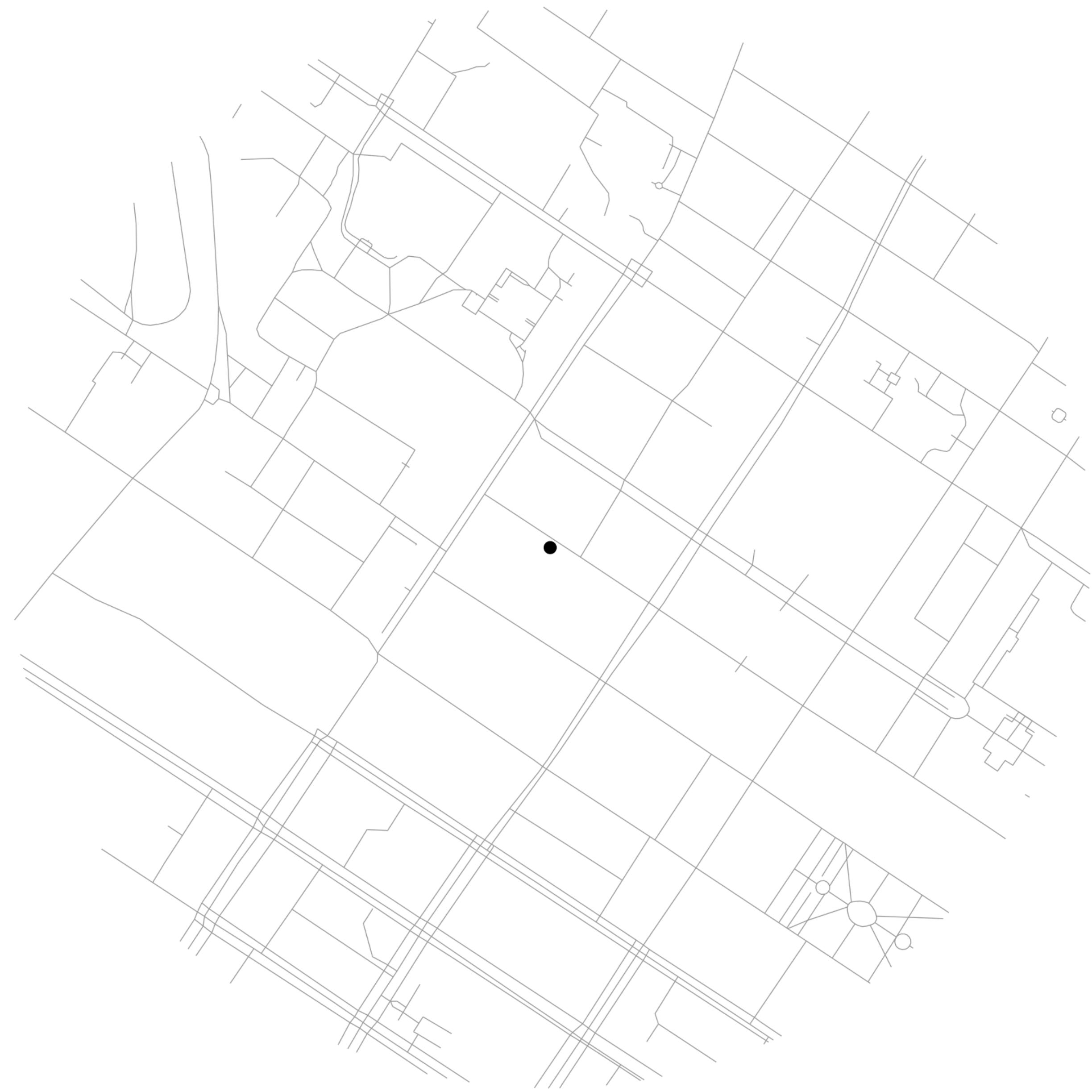
*15 billion data points (and 15 million more each day) derived from  
a combination of web scraping and ML, and 300 GB of review text*

# **Methodology**

**Three goals**

- 1. Improve spatial resolution**
- 2. Leverage detailed activity and performance data**
- 3. Raise the bar for the field**



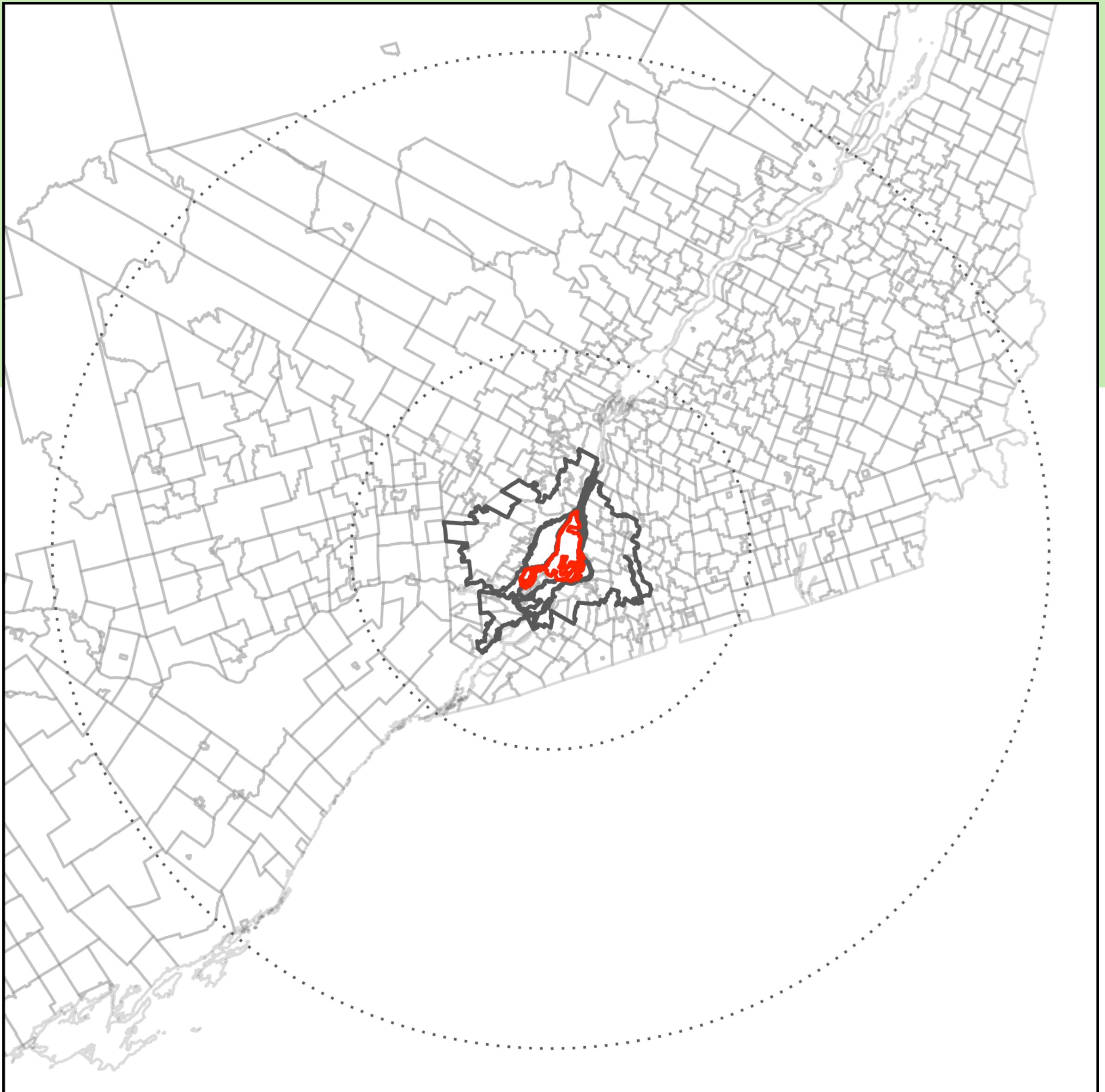


## Reservations on 2019-04-01



# Today

**Analysis of all municipalities  
in Canada: core, suburban,  
inner-regional (< 100 km),  
outer-regional (< 250 km), or  
non-regional**



# Today

Analysis of all municipalities in Canada: core, suburban, inner-regional (< 100 km), outer-regional (< 250 km), or non-regional

DVs: active listings per capita; annual revenue per capita; and frequently rented entire-home listings per capita

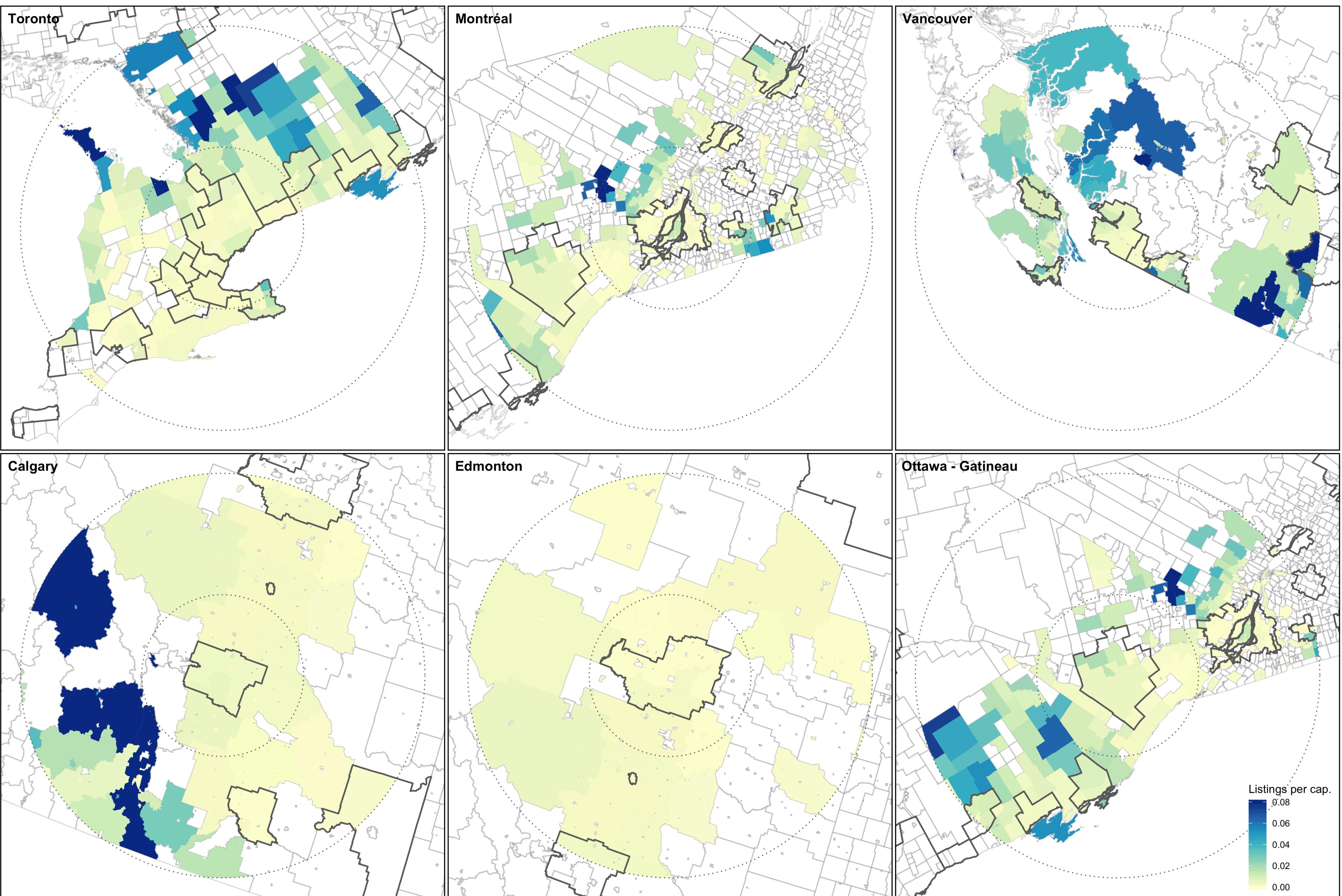
IVs: tourism employment (Canadian Business Patterns Survey); demographic data (2016 Census)

# Results

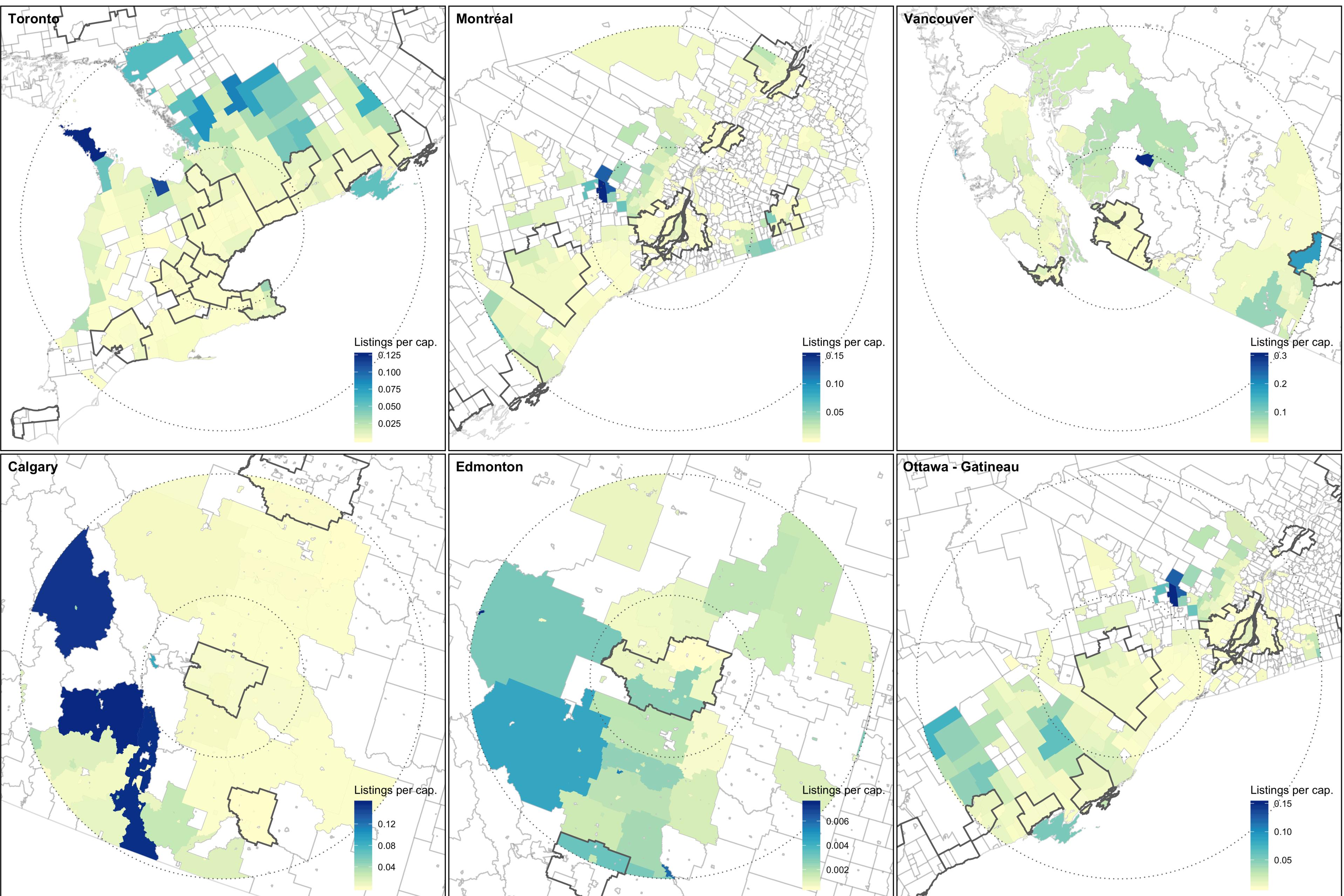




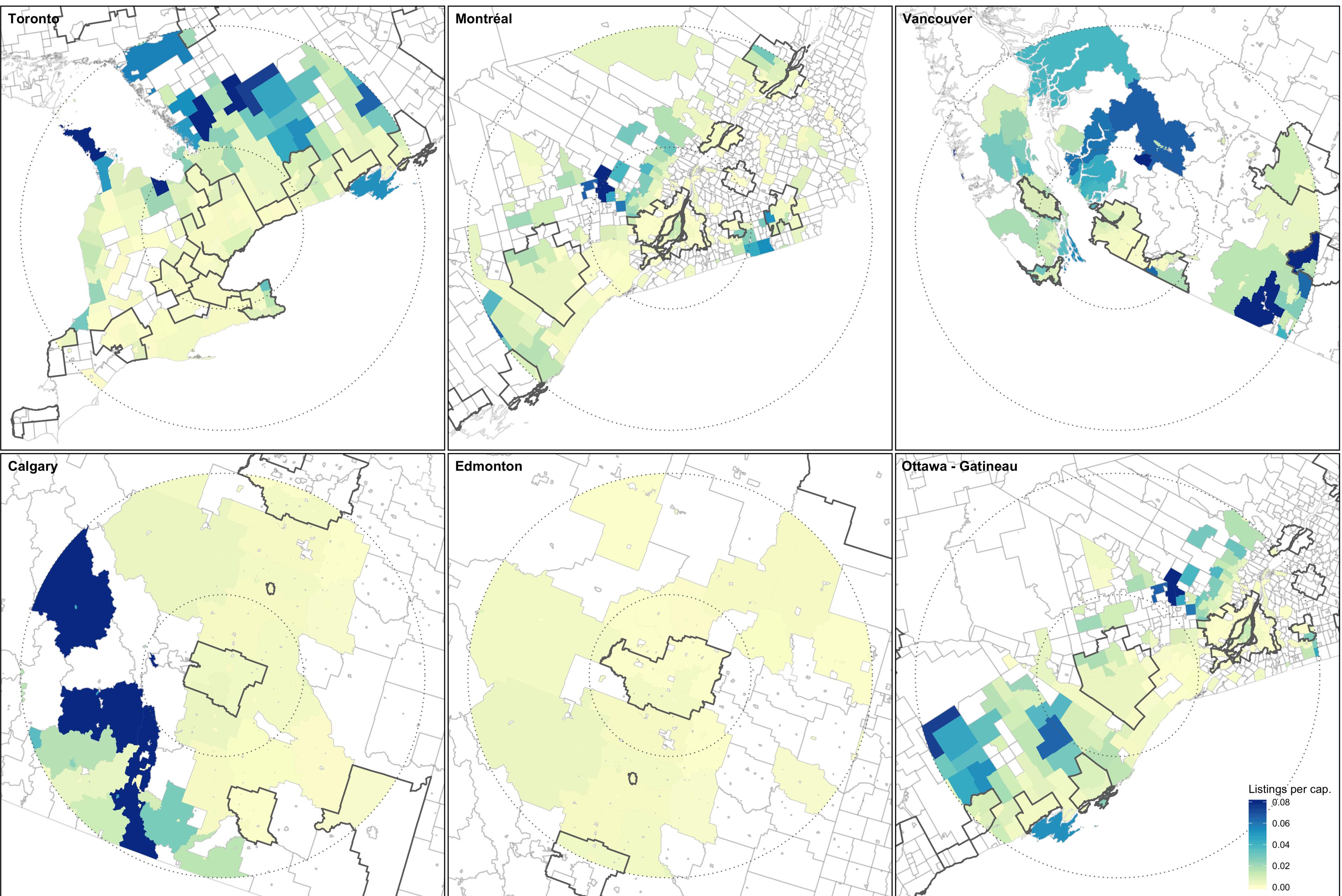
# Active listings per sq. km



# Active listings per capita



# Active listings per capita



# Active listings per capita

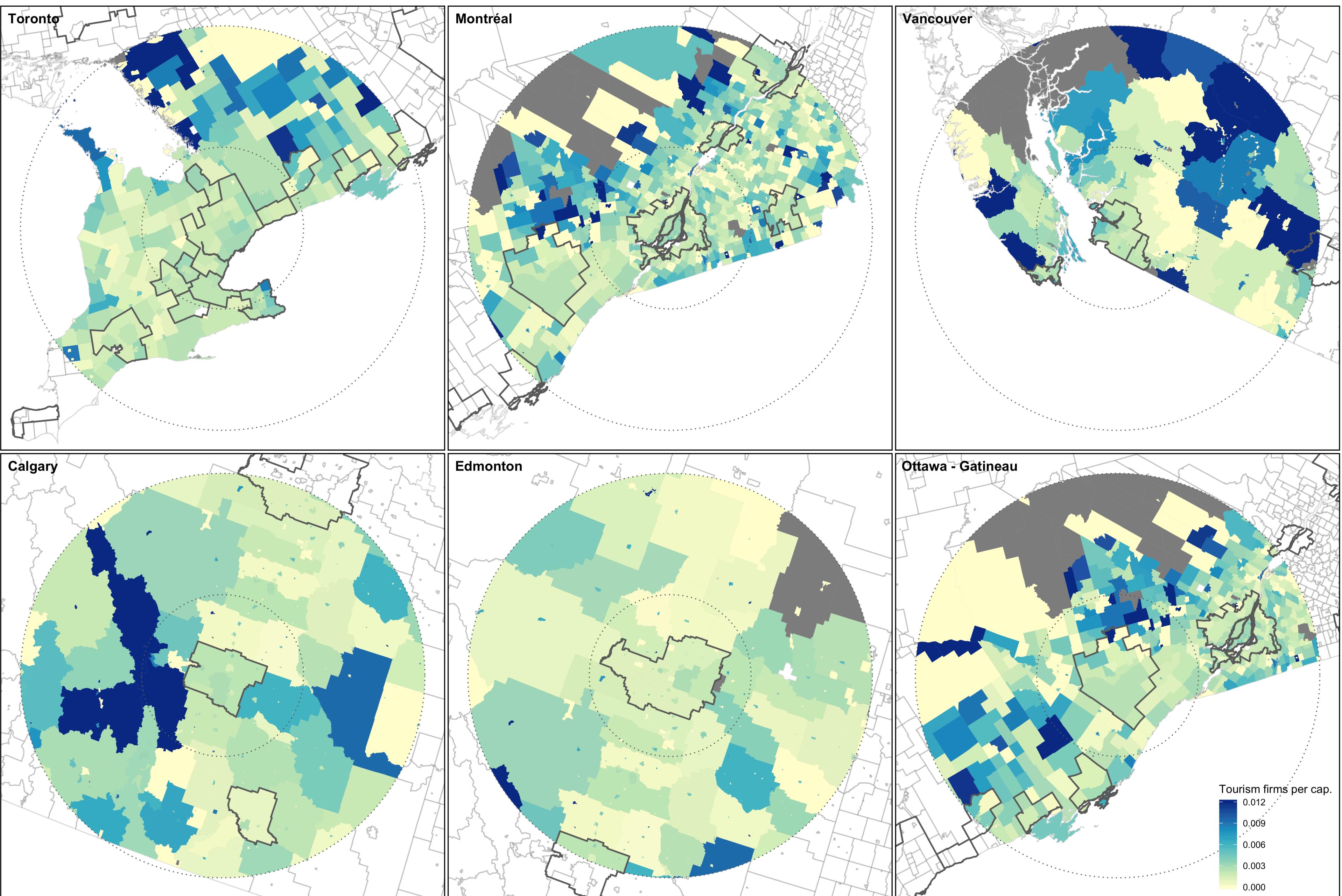


# Revenue per capita

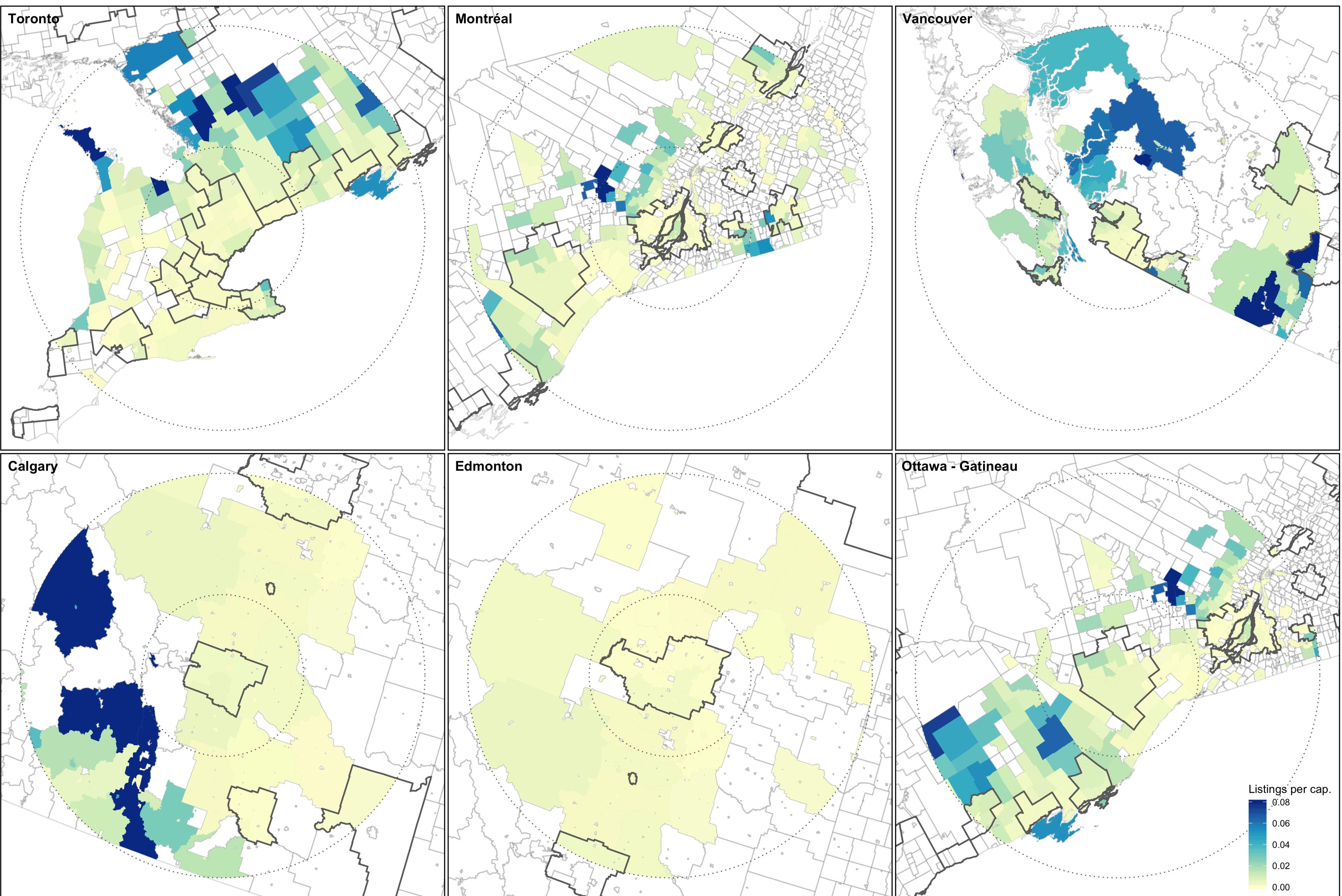
	Dependent variable: active_listings_per_cap	Dependent variable: FREH_per_cap	Dependent variable: revenue_per_cap
Tourism firms per capita	3.493*** (0.183)	1.163*** (0.068)	76,655.180*** (4,665.092)
Renter percentage	-0.055*** (0.008)	-0.012*** (0.003)	-788.427*** (201.886)
Core housing need percentage	0.090*** (0.018)	0.029*** (0.007)	1,867.390*** (460.864)
Median income	0.00000* (0.00000)	0.00000*** (0.00000)	0.010*** (0.003)
Density	-0.00000*** (0.00000)	-0.00000*** (0.00000)	-0.100*** (0.031)
Geography: inner region	-0.003 (0.003)	-0.001 (0.001)	-34.566 (88.680)
Geography: no region	-0.005 (0.004)	-0.003* (0.001)	-145.605 (102.040)
Geography: outer region	-0.001 (0.004)	-0.001 (0.001)	-34.672 (91.357)
Geography: suburb	-0.008** (0.004)	-0.003** (0.001)	-141.281 (90.999)
Core city renter percentage	0.007 (0.014)	0.005 (0.005)	-46.783 (358.462)
Core city housing need pct	-0.035 (0.028)	-0.012 (0.010)	-491.213 (704.953)
Core city median income	-0.00000 (0.00000)	-0.00000 (0.00000)	-0.009 (0.006)
Core city tourism per capita	0.371 (1.621)	1.389** (0.600)	43,819.600 (41,278.440)
Core city active listings	0.683*** (0.213)	0.079 (0.079)	8,983.475* (5,427.712)
CMA total population	-0.000 (0.000)	0.000 (0.000)	-0.00000 (0.00002)
Constant	0.006 (0.013)	-0.009* (0.005)	-290.353 (334.479)
Observations	1,054	1,054	1,054
R2	0.356	0.315	0.282
Adjusted R2	0.346	0.305	0.271
Residual Std. Error	0.019 (df = 1038)	0.007 (df = 1038)	482.924 (df = 1038)
F Statistic	38.212*** (df = 15; 1038)	31.808*** (df = 15; 1038)	27.142*** (df = 15; 1038)
Note:	*p<0.1; **p<0.05; ***p<0.01	*p<0.1; **p<0.05; ***p<0.01	*p<0.1; **p<0.05; ***p<0.01

## TOURISM

**Areas with more tourist amenities have more listings per capita.**



# Tourism firms per capita



# Active listings per capita

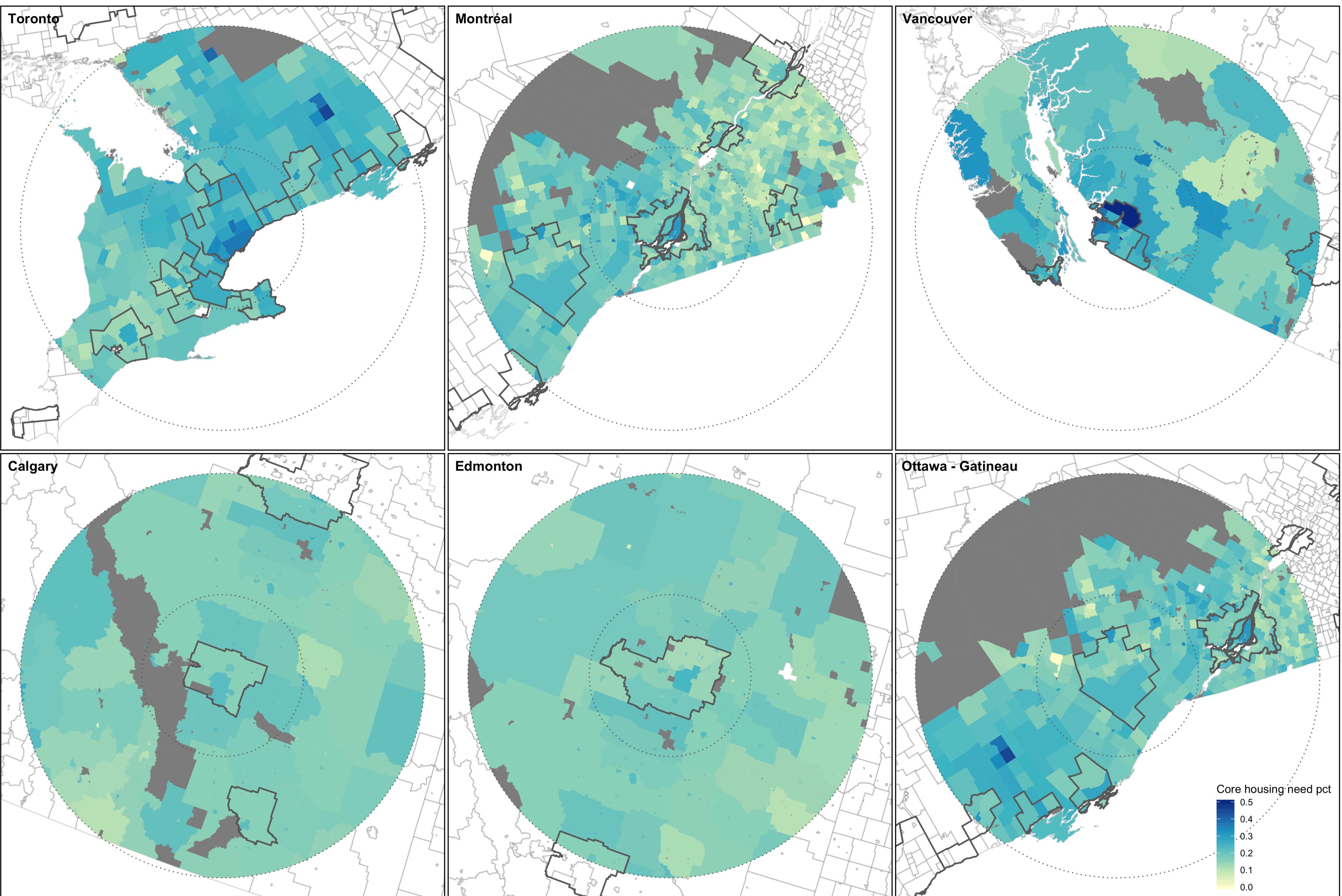
## **HOUSING AND WEALTH**

**Higher home-ownership rates are associated with more listings.**

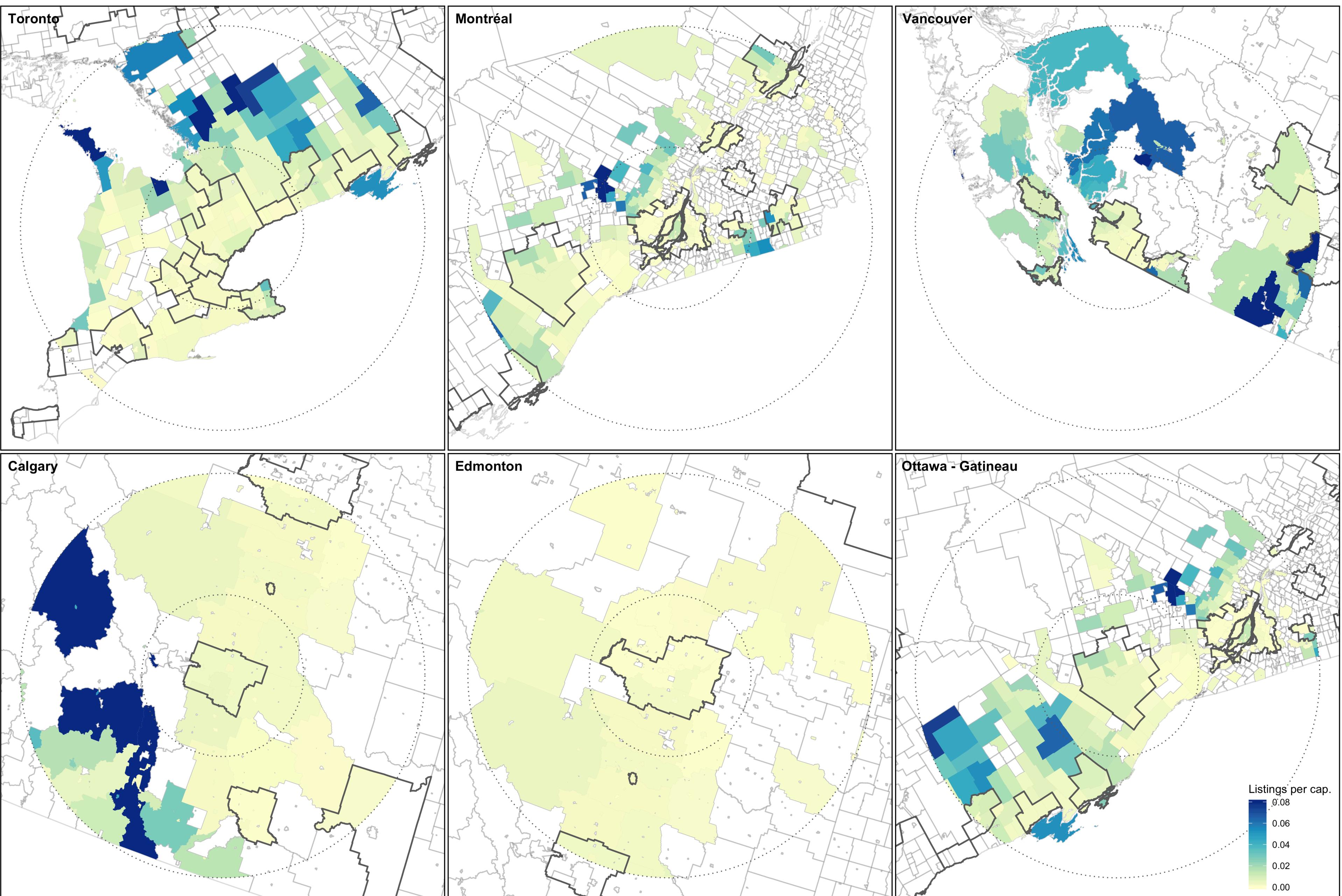
**High housing costs are associated with more listings.**

**High incomes are associated with more listings.**

**Low housing densities are associated with more listings.**



# Housing need percentage



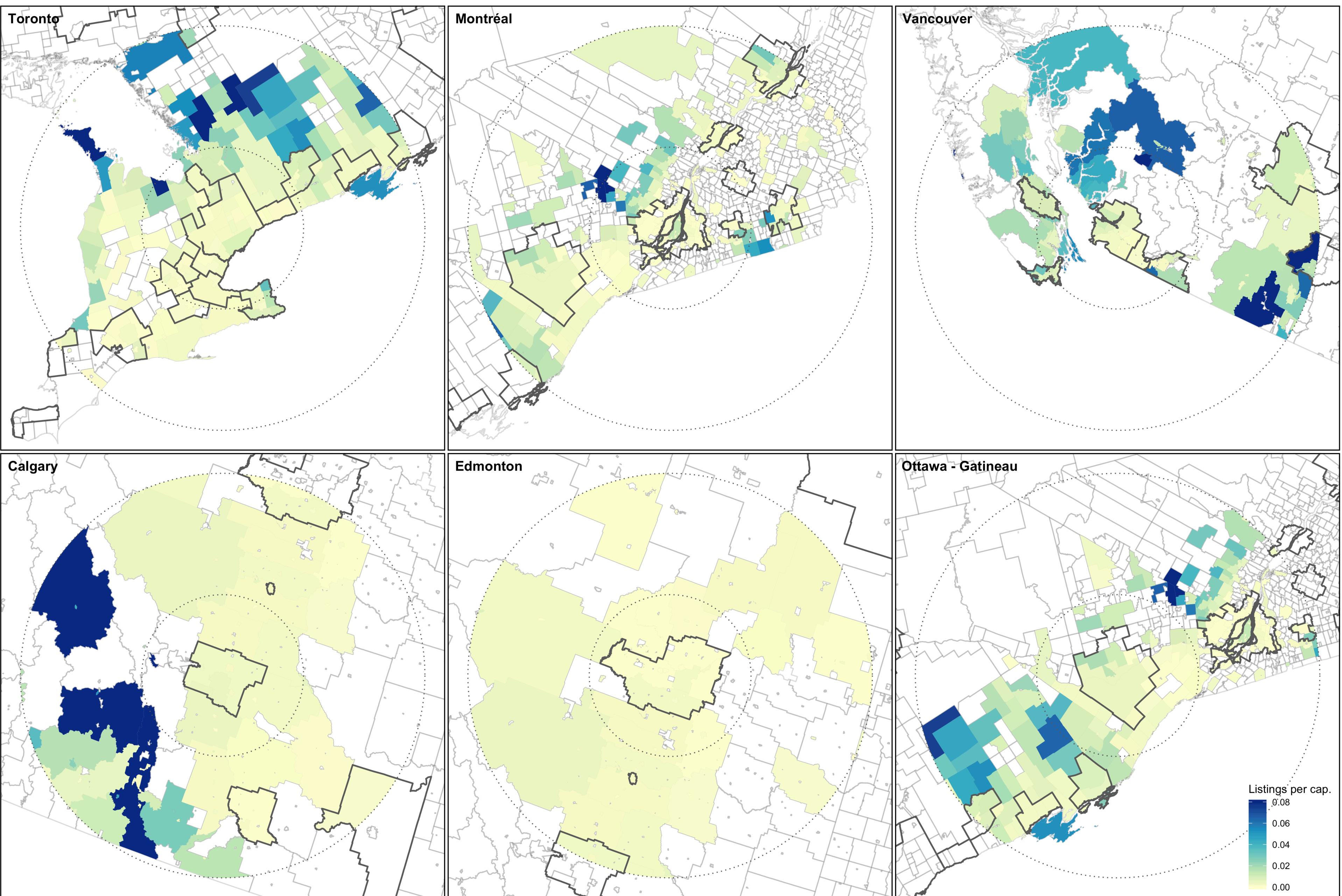
# Active listings per capita

## GEOGRAPHICAL PATTERNS

**Core cities have the highest rates of STR activity.**

**Core city STR activity predicts STR elsewhere in the region—particularly in inner-regional municipalities.**

**The spatial pattern is roughly U-shaped, with suburbs predicted to have fewer listings than core or inner-regional municipalities.**



# Active listings per capita

# **INTRA-REGIONAL PATTERNS**

## CORE MUNICIPALITIES

**Tourism, rather than housing, drives STR activities in core municipalities.**

**(Housing and social dynamics might be more accurately captured at smaller geographic scales within cities, however.)**

Dependent variable:	
-----	
	active_listings_per_cap
Tourism firms per capita	3.449*** (0.828)
Renter percentage	0.011 (0.008)
Core housing need percentage	0.013 (0.014)
Median income	0.00000 (0.00000)
Density	-0.00000 (0.00000)
CMA total population	0.000* (0.000)
Constant	-0.017** (0.007)
-----	
Observations	39
R2	0.749
Adjusted R2	0.702
Residual Std. Error	0.002 (df = 32)
F Statistic	15.908*** (df = 6; 32)
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Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

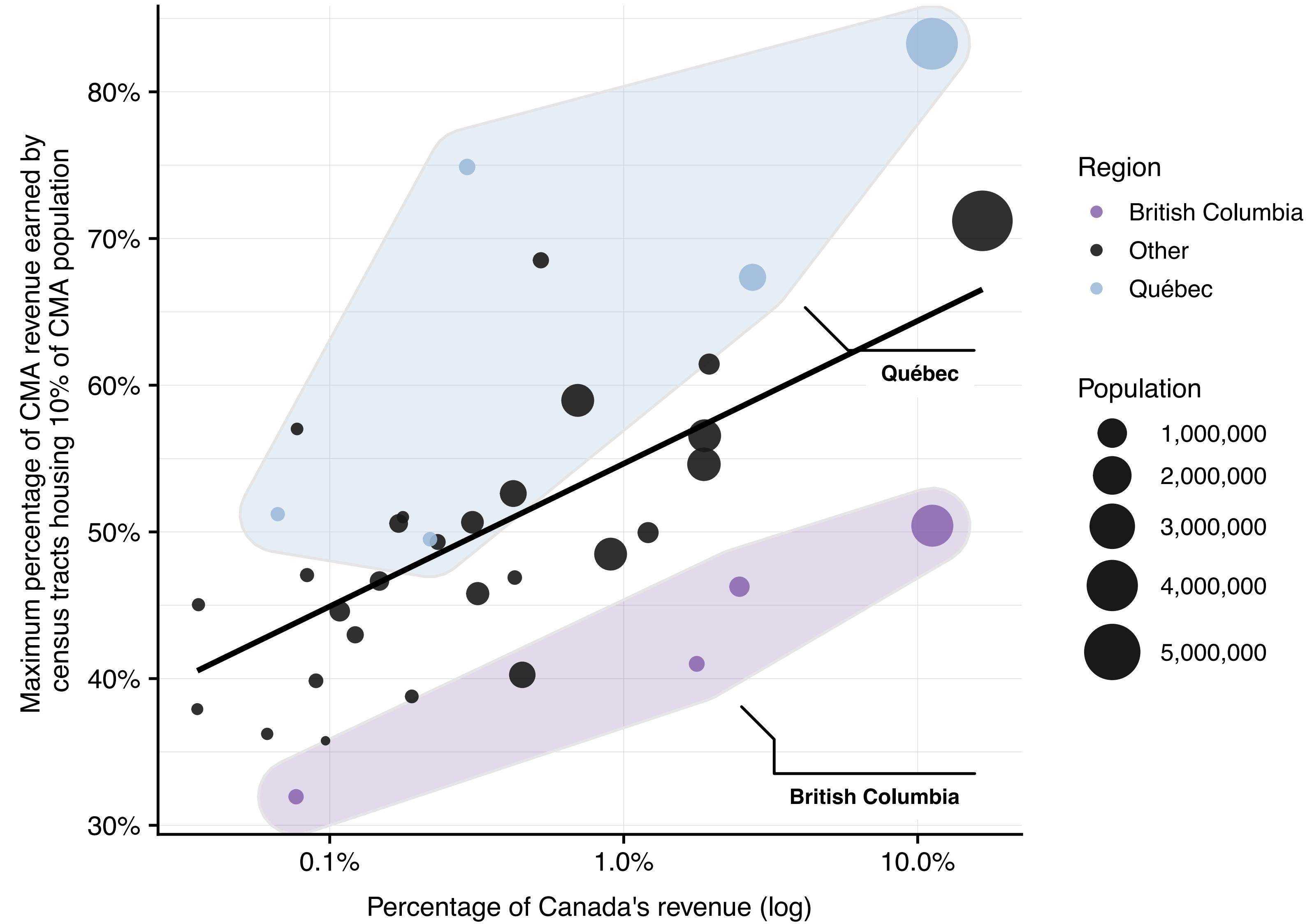
# SUBURBAN MUNICIPALITIES

**Low-income suburbs may serve as an affordable lodging alternative for tourists interested in visiting cities.**

**But we see less STR activity in suburbs surrounding cities with high housing costs.**

**Central cities disperse STR activity to the suburbs, but larger cities have stronger spatial concentration, and thus disperse less.**

Dependent variable: active_listings_per_cap	
Tourism firms per capita	3.293*** (0.110)
Renter percentage	-0.022*** (0.005)
Core housing need percentage	0.014 (0.011)
Median income	-0.00000** (0.00000)
Density	-0.00000 (0.00000)
Core city renter percentage	-0.007 (0.010)
Core city housing need pct	-0.035** (0.018)
Core city median income	-0.000 (0.00000)
Core city tourism per capita	0.516 (0.943)
Core city active listings	0.536*** (0.178)
CMA total population	-0.000* (0.000)
Constant	0.016* (0.009)
Observations	246
R2	0.844
Adjusted R2	0.836
Residual Std. Error	0.005 (df = 234)
F Statistic	114.738*** (df = 11; 234)
Note:	*p<0.1; **p<0.05; ***p<0.01



Combs et al. (forthcoming)

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# INNER-REGIONAL MUNICIPALITIES

**Inner region areas with locally unaffordable housing have more STR activity.**

**Inner region areas with higher population densities have less STR activity.**

**STR activity in the inner region appears to be strongly related to population and housing dynamics in the nearest core municipality. (This could reflect intra-metropolitan tourism: cottages/cabins.)**

Dependent variable: active_listings_per_cap	
Tourism firms per capita	5.014*** (0.405)
Renter percentage	-0.039** (0.016)
Core housing need percentage	0.103*** (0.035)
Median income	0.00000 (0.00000)
Density	-0.00002*** (0.00000)
Core city renter percentage	-0.047* (0.027)
Core city housing need pct	-0.065 (0.050)
Core city median income	-0.00000** (0.00000)
Core city tourism per capita	1.661 (3.105)
Core city active listings	1.380*** (0.430)
CMA total population	-0.000 (0.000)
Constant	0.036 (0.024)
Observations	425
R2	0.380
Adjusted R2	0.364
Residual Std. Error	0.022 (df = 413)
F Statistic	23.014*** (df = 11; 413)

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

## OUTER-REGIONAL MUNICIPALITIES

The local tourism industry remains very significant for predicting STR activity.

Local housing and income dynamics are similar to those observed in the inner regions, but there is a much weaker relationship with the nearest core municipality.

Dependent variable:	
active_listings_per_cap	
Tourism firms per capita	3.131*** (0.371)
Renter percentage	-0.078*** (0.021)
Core housing need percentage	0.156*** (0.041)
Median income	0.00000** (0.00000)
Density	-0.00002** (0.00001)
Core city renter percentage	0.048 (0.043)
Core city housing need pct	-0.014 (0.068)
Core city median income	-0.00000 (0.00000)
Core city tourism per capita	-1.225 (4.821)
Core city active listings	0.233 (0.556)
CMA total population	0.000 (0.000)
Constant	-0.020 (0.033)
<hr/>	
Observations	254
R2	0.362
Adjusted R2	0.333
Residual Std. Error	0.022 (df = 242)
F Statistic	12.458*** (df = 11; 242)
<hr/>	
Note:	*p<0.1; **p<0.05; ***p<0.01

# Conclusions

*Tourism first*

**Tourist amenities are the best predictor for STR activity.  
Other patterns vary across regional contexts, either in  
terms of direction or strength of effect.**

*Regional differentiation*

**STRs are more common in low-cost suburbs and high-  
cost outlying areas.**

*An inverted U*

**Inner regions appear more closely connected to core  
cities than suburbs do, but this relationship becomes  
weaker after 100 km.**

## *Next steps*

- 1. The STR sector combines local housing and tourism dynamics with global ones, making it a good topic for regional studies.**
- 2. Enough time has passed (and enough data has accumulated) that it is now possible to explore regional STR geographies.**
- 3. Many unexplored questions remain around regulation, incidence of (positive and negative) impacts, and growth trajectories.**

# Thank you!



@dwachsmuth

[upgo.lab.mcgill.ca](http://upgo.lab.mcgill.ca)