

Research Insight



Understanding Filtering: A Long-Term Strategy to New Supply and Housing Affordability

The housing supply gap in Canada is a major challenge to addressing the affordability crisis. But how does building new housing benefit a wide range of Canadians in terms of affordability?

- Resolving the supply gap can positively impact affordability for many Canadians, not just those moving into new units.
- Building new homes increases the overall housing stock and leads to a process known as “filtering.”
- Filtering is the gradual transition of housing units from higher-income households to lower-income households as newer units are built.

The Filtering Process Works in Canada

New CMHC research¹ and international studies support filtering as providing more affordable housing.

- CMHC research explores the type of housing supply needed to improve affordability and welfare the most. It finds that building mid-cost or a balanced mix of new housing cost types are the most effective for improving affordability and welfare.
- Building a balanced mix of new housing units promotes affordability and reduces other negative trade-offs (such as the out-migration of low-income families).
- These new housing types support the filtering process. This process allows for more low-income households to access more adequate homes through vacancies created in the housing market.

¹ Two research projects were conducted with Amy Hongfei Sun of Queen’s University, and Tom Davidoff and Tsur Somerville from the University of British Columbia on behalf of CMHC.

- CMHC research also finds that, relative to a new building, rents tend to fall 5% in the first 4 years after construction (after adjusting for inflation). This declines to just short of 20% near the 20-year mark.
 - As buildings mature, they tend to become more affordable for lower-income families.

The continuous construction of new housing is crucial:

- Today’s new developments will free up existing housing.
- Over time, the new housing of today will become tomorrow’s more affordable options.

This will ensure a sustained balance of housing supply into Canada’s future.

How Does Filtering Provide More Affordable Housing?

Vacancy Chains

Vacancy chains unfold when households with higher income move into newly built units (see Figure 1). Doing so releases their former units for occupancy by households with lower income. When lower-income households move into the newly vacated units, they in turn create vacancies in their former homes.

Our research explores how building new housing at different costs affects the filtering process in Toronto. Through vacancy chains, this new housing impacts households’ welfare, housing affordability, and local amenities.

The study finds that building mid-cost or a balanced mix of low-, mid- and high- cost housing is the best strategy. This is because it makes homes more affordable and benefits most household types. Moreover, building these unit types reduces the likelihood of low-income families leaving their city.

Overall, building low-cost housing leads to lower filtering

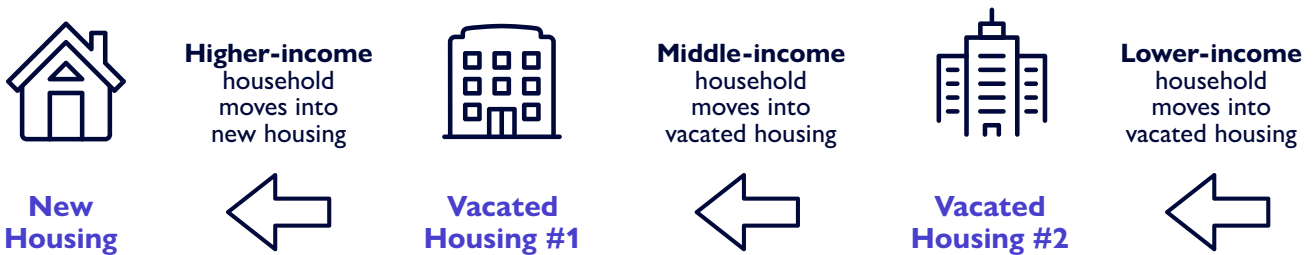
Building only low-cost housing isn’t optimal. Doing so primarily benefits low-income households, but decreases the welfare of high-income households as local wages can decline and lower property-tax revenue leads to less amenities. That results in many families with post-secondary education leaving the area, which leads to a further decline in amenities. In this case, only few low-income households move to better homes.

Building only high-cost housing is also not the most optimal solution. This type of supply improves amenities but doesn’t improve affordability or the welfare of low-income households very much.

The research also investigates how much new housing is needed to make homes more affordable and stop low-income families from leaving if housing prices rise suddenly. It finds that, while various supply strategies have differing impacts on the number and quality of homes, none of them can fully make them affordable again while also maintaining housing quality. This demonstrates the tricky balance that housing policies must navigate.

Beyond CMHC’s analysis, 2 recent studies on vacancy chains examine this topic in the U.S. and Finland, and find evidence that supports filtering.

Figure 1: New Housing Spurs Vacancy Chains



Research done in the U.S. (Mast, 2023)² shows that, for every 100 new units in above-median-income neighbourhoods, 70 vacancies would be generated in below-median-income neighbourhoods. Estimates show that it would take 2 to 5 years for these filtering effects to fully take place. However, they begin to occur with the first 2 vacancies.

With Finnish data, Bratu et al. (2021)³ find that 60% of vacancy chains from a newly built unit reached households in the bottom half of the income distribution.

Depreciation

Over time, the new housing of yesterday has become today's more affordable housing. The housing we build now will evolve over time and become the more affordable housing that future generations will rely on.

CMHC's research in Figure 2 displays how much inflation-adjusted rents are estimated to change compared to a new building. Rents tend to fall quickly after construction. This balances out to just short of 20% near the 20-year mark, and shows how relative affordability can improve over time.

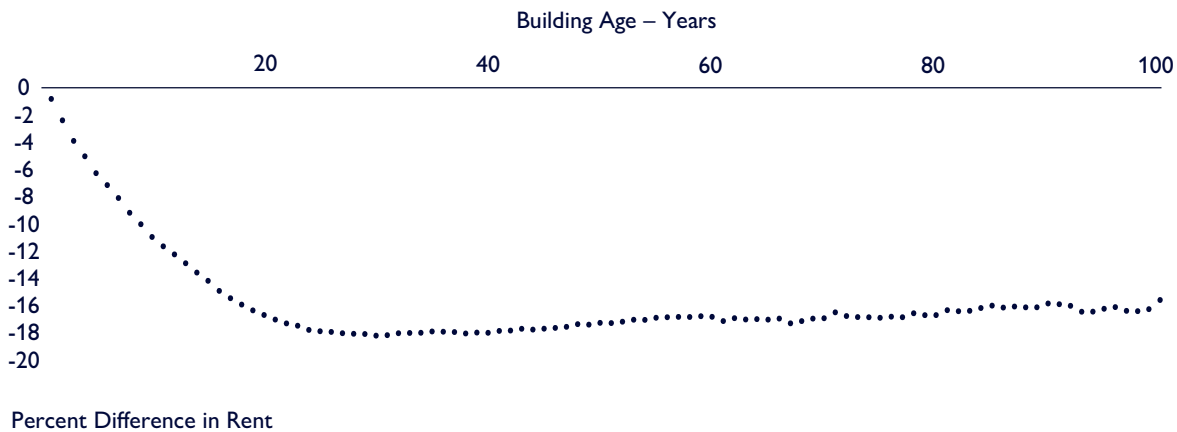
Existing studies, as well as the above findings, point to depreciation as leading to more affordable sources of housing.

A U.S. study (Rosenthal, 2014)⁴ found that every year a building ages, its real value decreases by 0.3%, and rents decrease by 0.7%. It also found that a unit's new tenants tend to be less affluent and have incomes 3% lower than those of the previous tenants, while, for owner-occupied homes, there's a 0.5% income decrease at turnover. This indicates that, over time, newer units eventually become the more affordable housing of tomorrow.

Another study by Liu et al. (2022)⁵ shows a similar trend, with homeowners who occupy their homes having a 0.5% lower income for every year their building ages.

In Canada, data from the 2021 Census reveals that average household income was 30% higher in newly built homes relative to those built in the period from 1961 to 1970.

Figure 2: National Estimates Show Strong Declining Rents Relative to a Building's Age



Notes: Estimated inflation-adjusted rents relative to a new building are shown as dots based on the age of the building. Source: CMHC Rental Market Survey 1989-2021. Other controls include building fixed effects, and market trends specific to the neighbourhood.

² <https://www.sciencedirect.com/science/article/abs/pii/S0094119021000656>

³ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3929243

⁴ <https://www.aeaweb.org/articles?id=10.1257/aer.104.2.687>

⁵ <https://www.sciencedirect.com/science/article/abs/pii/S0166046221001186>

Spillover Effects

The construction of new housing units can also have an important impact on the affordability of nearby housing. In a market where supply outpaces demand, or where there's strong competition among landlords, the increased supply may result in rent freezes or even reductions as landlords adjust to attract tenants and maintain occupancy. However, international literature in this area is rather inconclusive and CMHC is currently conducting research to examine the Canadian context.

A U.S.-based study observed a 5%-7% decline in rents of existing buildings surrounding a newly completed development (Asquith et al. 2021)⁶. However, Singh (2020)⁷ found an uptick in nearby rents when the construction occurred in areas with lots of vacant land.

Others have shown that spillover effects can vary between high- and low-rent areas. One such study discovered that rents decreased in high-rent buildings but increased in low-rent buildings, ultimately offsetting each other (Damiano and Frenier, 2020)⁸.

How Did We Come to These Findings?

The findings in this Research Insight are supported by 2 separate CMHC analyses.

The first analysis adopts the model used by Nathanson (2020)⁹, but with 2016 Census data for Toronto. It looks at how different types of new buildings affect people's welfare, house prices, and neighborhood facilities. It also explores how new construction impacts people moving within the city and if it helps lower-income families find better homes. To understand the effects of new housing, it considers 4 scenarios: (i) building only low-cost housing, (ii) building only mid-cost housing, (iii) building only high-cost housing, and (iv) building a balanced mix of all 3 types.

The analysis on the depreciation of rents was conducted using CMHC's Rental Market Survey. A model profiling inflation-adjusted rents at the national level was estimated. The model accounts for building age, building fixed effects, and market trends specific to the neighbourhood.

⁶ https://www.researchgate.net/publication/351431291_Local_Effects_of_Large_New_Apartment_Buildings_in_Low-Income_Areas

⁷ <https://ideas.repec.org/p/jmp/jm2020/psi856.html>

⁸ <https://www.cura.umn.edu/research/build-baby-build-housing-submarkets-and-effects-new-construction-existing-rents>

⁹ <https://bfi.uchicago.edu/wp-content/uploads/TrickleDownHousingEconomics.pdf>

Full Report

Evaluating the Impacts of Increasing Housing Supply in Canada: A Sorting Model with Heterogeneous Households

https://assets.cmhc-schl.gc.ca/sf/project/archive/research_6/filtering-report-for-hkc.pdf

Understanding Filtering: A Long-Term Strategy to New Supply and Housing Affordability

https://assets.cmhc-schl.gc.ca/sf/project/archive/research_6/understanding-filtering-research-report.pdf



For Further Reading

Asquith, Brian J, Evan Mast, and Davin Reed (2021). "Local Effects of Large New Apartment Buildings in Low-Income Areas". In: *The Review of Economics and Statistics*, pp. 1–46. URL: https://doi.org/10.1162/rest_a_01055.

Bratu, Cristina, Oskari Harjunen, and Tuukka Saarimaa (2021). *City-Wide Effects of New Housing Supply: Evidence from Moving Chains*. Working Paper. VATT Institute for Economic Research.

Damiano, Anthony and Chris Frenier (2020). *Build Baby Build?: Housing Submarkets and the Effects of New Construction on Existing Rents*. Working Paper. University of Minnesota, Center for Urban Affairs.

Liu, Liyi, Doug McManus, and Elias Yannopoulos (2022). "Geographic and Temporal Variation in Housing Filtering Rates". In: *Regional Science and Urban Economics* 93. URL: <https://doi.org/10.1016/j.regsciurbeco.2021.103758>.

Mast, Evan (2023). "The Effect of New Market-Rate Housing Construction on the Low-Income Housing Market". In: *Journal of Urban Economics*. URL: <https://doi.org/10.1016/j.jue.2021.103383>.

Nathanson, Charles G. *Trickle-down housing economics*. Northwestern University, 2020. Available at: <https://bfi.uchicago.edu/wp-content/uploads/TrickleDownHousingEconomics.pdf>

Singh, Divya (Jan. 2020). *Do Property Tax Incentives for New Construction Spur Gentrification? Evidence from New York City*. Job Market Paper. URL: <https://ideas.repec.org/p/jmp/jm2020/psi856.html>.

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Appendix A – Glossary

filtering is the gradual transition of housing units from higher-income households to lower-income households as newer units are constructed.

welfare of households refers to households' satisfaction and happiness arising from consuming goods and services. Welfare rises when wages and amenities increase and falls when house prices increase.

amenities are features of housing that determine its value, other than physical structure and the land components of housing.

housing cost and quality is a multidimensional concept that refers to the physical condition of a house, its size and amenities, and the social environment in which the house is situated.

- **low-cost housing** represents the 20th percentile of the housing value distribution.
- **mid-cost housing** represents the 50th percentile of the housing value distribution.
- **high-cost housing** represents the 80th percentile of the housing value distribution.
- **combined-cost or balanced mix of housing** consists of equal shares of low-cost, mid-cost, and high-cost housing.

Alternative text and data for figures

Depreciation

Figure 2: National Estimates Show Strong Declining Rents Relative to a Building's Age

Building Age	Rent Depreciation (%)
1	-0.916
2	-2.489
3	-4.001
4	-5.132
5	-6.371
6	-7.248
7	-8.196
8	-9.280
9	-10.121
10	-11.058
11	-11.745
12	-12.338
13	-12.989
14	-13.673
15	-14.279
16	-15.018
17	-15.558
18	-16.025
19	-16.450
20	-16.789
21	-17.126
22	-17.407
23	-17.577
24	-17.885
25	-17.983
26	-18.033
27	-18.128
28	-18.171
29	-18.187
30	-18.306
31	-18.271
32	-18.128
33	-18.110
34	-18.096
35	-18.000

Building Age	Rent Depreciation (%)
36	-18.018
37	-18.042
38	-18.147
39	-18.081
40	-18.098
41	-17.959
42	-17.934
43	-17.803
44	-17.863
45	-17.795
46	-17.739
47	-17.659
48	-17.463
49	-17.499
50	-17.367
51	-17.383
52	-17.283
53	-17.139
54	-17.149
55	-16.993
56	-16.954
57	-16.930
58	-16.936
59	-16.879
60	-16.923
61	-17.236
62	-17.023
63	-17.120
64	-17.093
65	-17.130
66	-17.053
67	-17.402
68	-17.238
69	-17.055
70	-17.028
71	-16.594
72	-16.866
73	-16.942
74	-16.955
75	-16.995
76	-16.914
77	-16.953

Building Age	Rent Depreciation (%)
78	-16.662
79	-16.801
80	-16.797
81	-16.436
82	-16.512
83	-16.484
84	-16.277
85	-16.102
86	-16.244
87	-16.168
88	-16.228
89	-16.224
90	-15.943
91	-15.997
92	-16.116
93	-16.550
94	-16.543
95	-16.333
96	-16.210
97	-16.485
98	-16.508
99	-16.361
100	-15.688

Source: CMHC Rental Market Survey 1989-2021. Other controls include building fixed effects, and market trends specific to the neighbourhood.