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# Model for Projecting the Number of Households in Core Housing Need

OFFICE OF THE PARLIAMENTARY BUDGET OFFICER
BUREAU DU DIRECTEUR PARLEMENTAIRE DU BUDGET

The Parliamentary Budget Officer (PBO) supports Parliament by providing economic and financial analysis for the purposes of raising the quality of parliamentary debate and promoting greater budget transparency and accountability.

This report outlines a model developed to project the number of households in core housing need.

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We thank the experts who provided feedback on earlier versions of this report and the underlying model prior to publication. The Parliamentary Budget Officer (PBO) retains ultimate responsibility for this report and the underlying model, including any errors or omissions therein.

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**Yves Giroux**
**Parliamentary Budget Officer**

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# Summary

This report outlines a model developed to project the number of households in core housing need to the end of Canada's National Housing Strategy in 2027. This model is intended to help Parliamentarians understand the extent to which core housing need is affected by existing programs and the sufficiency of those existing programs to achieve the strategy's overall target.

The results of the projection are set out and explained in a separate report, Federal Spending on Housing Affordability in 2024.

This model highlights some dynamics which are important for understanding the impact of federal policy on core housing need:

- Core housing need is primarily a function of changes in shelter costs relative to incomes. Homeowners with mortgages have seen increased shelter costs both due to rising interest rates and rising average mortgage debt. Renters have seen increases in shelter costs driven by increases in market rents.
- Increased immigration contributes to higher rents but also, over the longer term, towards increased supply which moderates those higher rents. Recent increases in rents are primarily attributed to the delay between increased demand from immigration and the adjustment of the housing supply.
- The primary contribution of targeted housing programs is to avoid a large loss of rent-geared-to-income housing for low-income households which would have otherwise occurred. The Canada Housing Benefit (CHB) also provides income support to a growing number of households, although most beneficiaries will remain in housing need. New Affordable Housing programs support the creation of some new below-market housing, but their impact is less when looking at the number of affordable units attributable to the federal share of project costs.
- New tax expenditures and incentives for less restrictive zoning may contribute to housing supply; however, that impact is highly uncertain and will largely fall beyond our projection period.

# Assessing Core Housing Need

## Definition

"Core Housing Need" is a Canada-specific term defined by the Canada Mortgage and Housing Corporation (CMHC) and applied across many Statistics Canada publications. The number of households in "Core Housing Need" is one measure of the broader concept of "Housing Need", which refers to households struggling to find housing that meets their needs and budget.

A household is in "Core Housing Need" if:

- Either:
    - Their home is in need of major repairs (inadequacy);
    - Their home does not have enough bedrooms for the household size and structure (unsuitability); or,
    - Their shelter costs (rent or mortgage plus utilities, property taxes, etc.) exceed 30% of the household's before-tax income (unaffordability); and,
- The local median cost of adequate suitable housing is more than 30% of the household's before-tax income.[1]

As an exception, non-family households with at least one maintainer aged 15 to 29 attending school are considered not to be in "Core Housing Need" regardless of their housing circumstances. Also, some households are not assessed for core housing need, such as households on reserves.

Implicitly, "Core Housing Need" does not count suppressed households since all individuals living in the same dwelling unit are counted as one household. In our recent report Household Formation and the Housing Stock we estimated that the number of households in 2021 in Canada would have been 631,000 (4.1 per cent) higher if Ontario and British Columbia had the same headship rates as the rest of Canada.

# Application

Because core housing need is assessed at the household level, we adopt a microsimulation approach to project the number of households in core housing need. Starting with the 2021 Census Hierarchical Public Use Microdata File, we adjust households' income, shelter cost, and the local median cost of adequate suitable housing to simulate each household's characteristics in each future year. Given those characteristics, we reassess whether the household is in core housing need based on the definition above. This microsimulation reflects the evolution of the cross-section of Canadian households over time, rather than the changing circumstances of specific households.

For the purposes of the reassessment of core housing need in each future year, all other characteristics are held constant, including household structure, dwelling suitability, dwelling state of repair, and whether a household is a student household or assessed for housing need.

There are some differences between how we measure "Core Housing Need" and the approach taken by Statistics Canada. Notably, we compare incomes and shelter costs for the same year, and we calculate the median cost of suitable and adequate housing from actual census shelter costs rather than using projected rents. See Appendix A for details.

# Validation

Our reassessment of core housing need produces comparable results to prior estimates of the number of households in core housing need. For 2021, our estimate of the number of households in housing need is 1,538,286, which is 5% more than the 2021 Census and 5% less than the 2021 Canadian Income Survey.

# Adjusting for Economic Trends

In order to determine current and projected core housing need, it is necessary to account for the impact of significant changes in incomes and rents since the 2020 income data and 2021 shelter costs used in the last census.

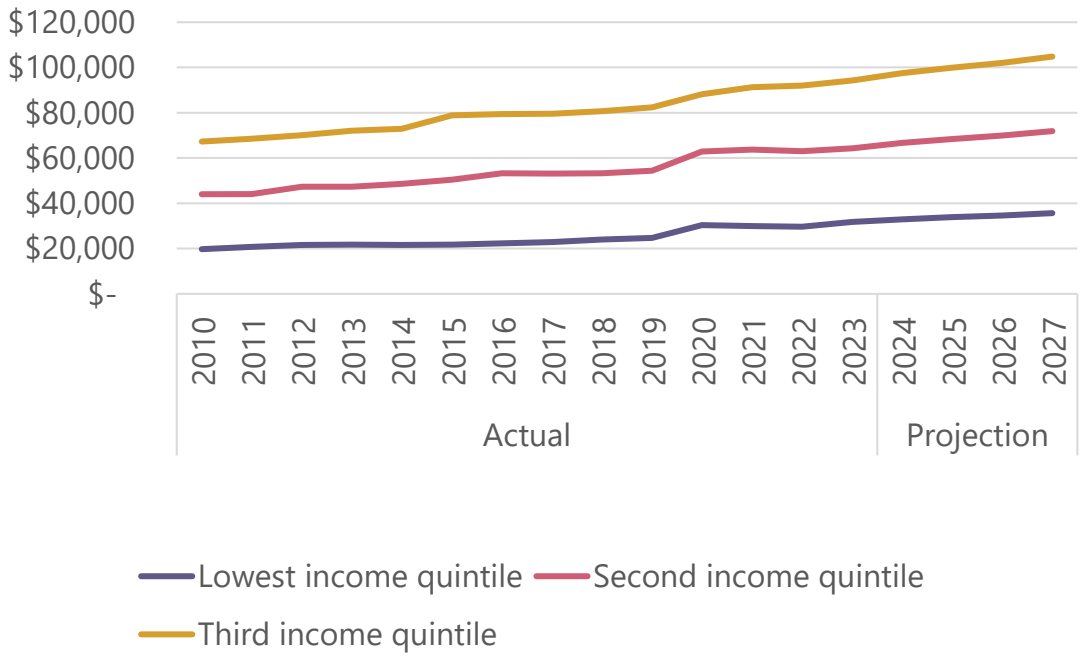
At a high-level, household incomes, actual shelter costs, and median market rents are all adjusted by indexing the base values for each household. The index used to adjust actual shelter costs depends on whether a household owns their home and whether they have a mortgage. For household incomes and actual shelter costs for renters, the index used also differs by household income quintile.

# Incomes

Core housing need is assessed based on households' total income, which includes transfers from government but does not deduct taxes paid to the government. We nowcast and project each households' income by indexing that income to a quintile-specific projection of total income based on the household economic accounts.[2] For example, for the bottom income quintile, average compensation of employees per household increases significantly, rebounding from a pandemic low, but this was offset by a decline in average transfers received, reflecting the expiry of time-limited pandemic income supports. For 2024 to 2027, each income component is linked to the Parliamentary Budget Officer (PBO) economic model.[3]

## Figure 1

### Actual and Projected Average Before-Tax Income per Household, by Household Income Quintile and Year




Source

Office of the Parliamentary Budget Officer.

# Shelter Costs

Our model for shelter costs focuses on mortgage payments for homeowners with mortgages and rents for renters.[4] All other aspects of shelter costs (like condo fees, property taxes, and utilities) are assumed to continue to grow at historical rates.[5]

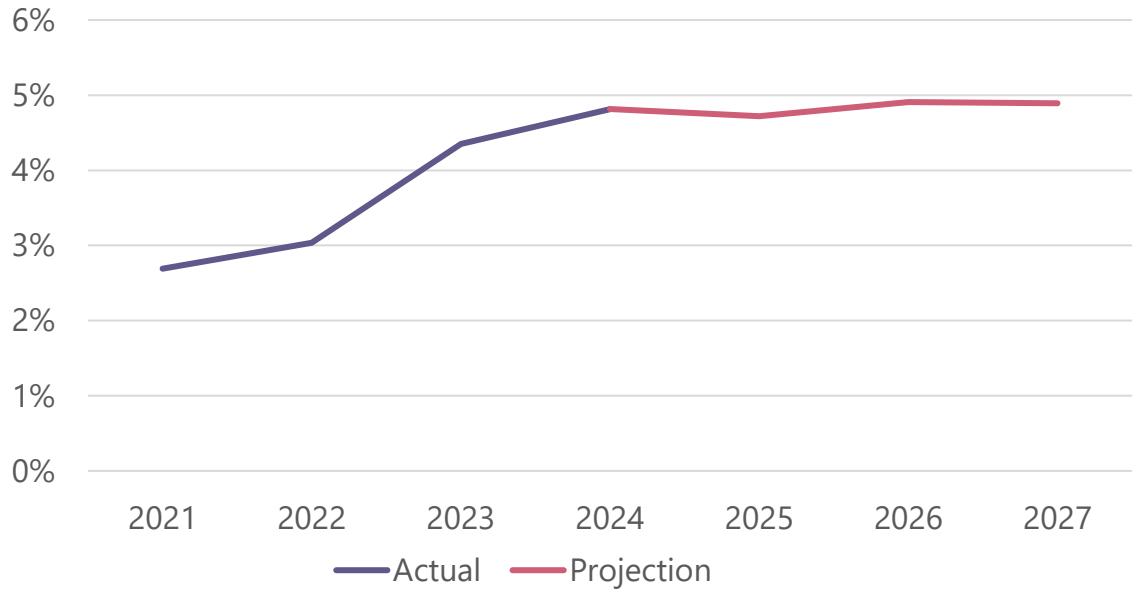
## Owners with Mortgages

Shelter costs for homeowners with mortgages are primarily a function of mortgage interest rates and mortgage debt.

Although mortgage rates increased in 2022, homeowners with mortgages have only gradually faced increases in mortgage rates because payments are usually fixed for the term of a mortgage, which is usually up to five years.[6] We project that the average interest-rate on in-service mortgages will remain around current levels. For details, see Appendix B.

**Figure 2**

Projected Average Interest Rate for Mortgages




Source

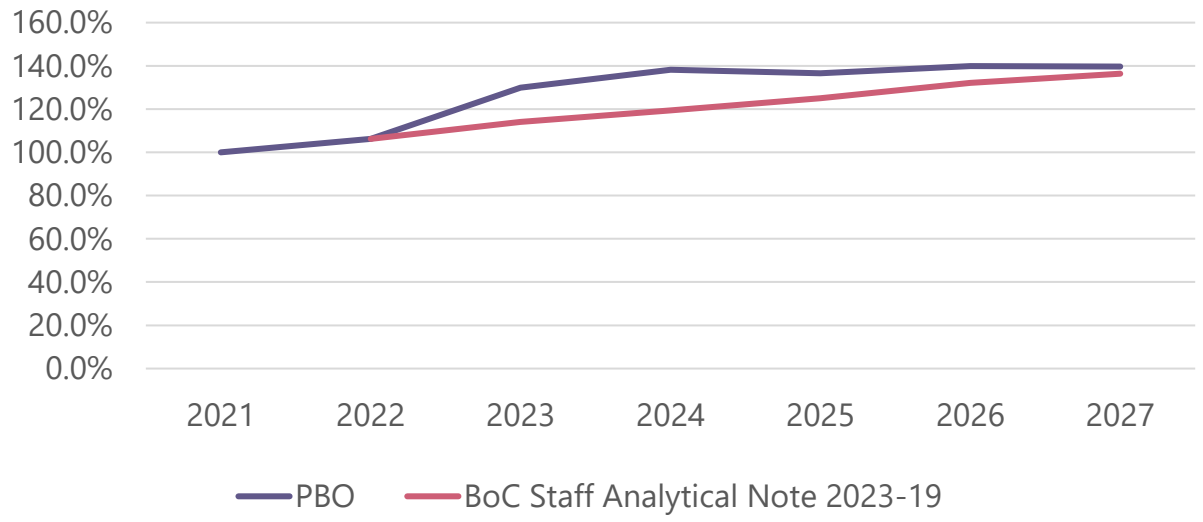
Office of the Parliamentary Budget Officer.

Mortgage payments also include principal repayments and sometimes other costs like property taxes and insurance. We assume that all these other costs will remain constant as a share of mortgage values.

Including these non-interest costs, our projection suggests a similar 2022 to 2027 change in mortgage payments to Bank of Canada Staff Analytical Note 2023-19, which constructed a more detailed microsimulation of mortgage turnover.

## Figure 3

### Change in Mortgage Payments as Share of Mortgage Value from 2021

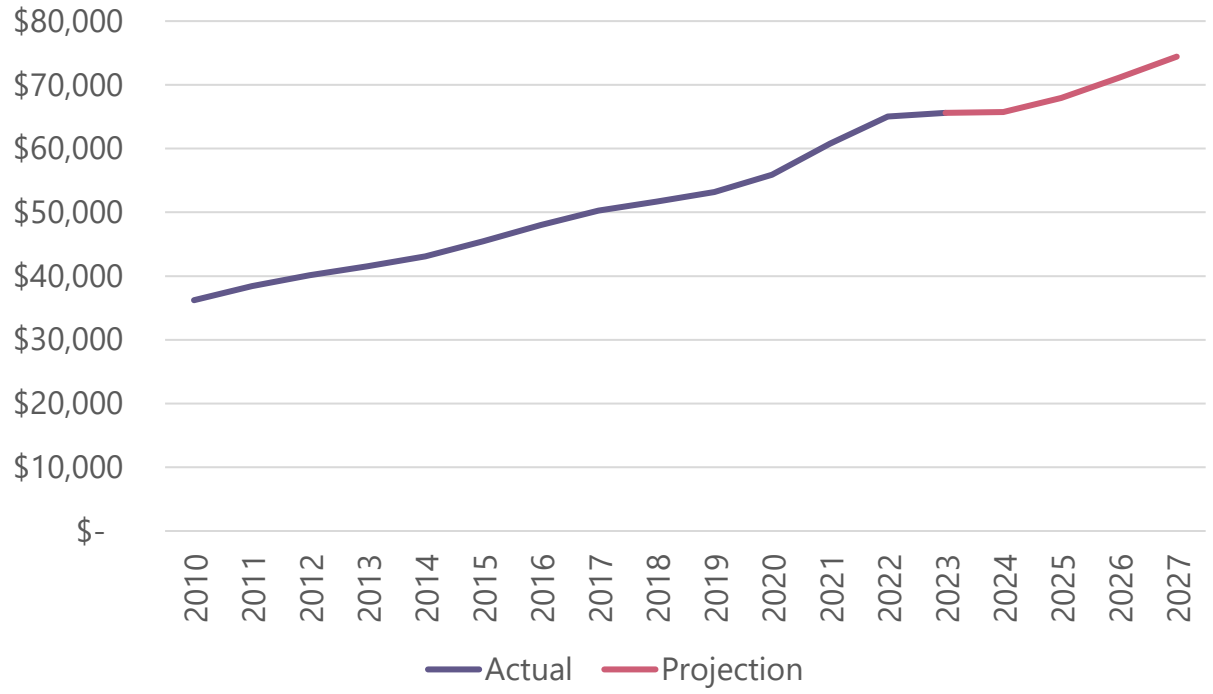



Source

Office of the Parliamentary Budget Officer; Maria teNyenhuis, Adam Su "The impact of higher interest rates on mortgage payments" Bank of Canada Staff Analytical Note 2023-19.

Our model also accounts for the impact of rising mortgage debt per adult driven by higher home prices. We project continuing increases in mortgage debt per adult consistent with the PBO's overall projection of household debt.[7]

**Figure 4**
Actual and Projected Mortgage Debt per Adult




Source
Office of the Parliamentary Budget Officer.

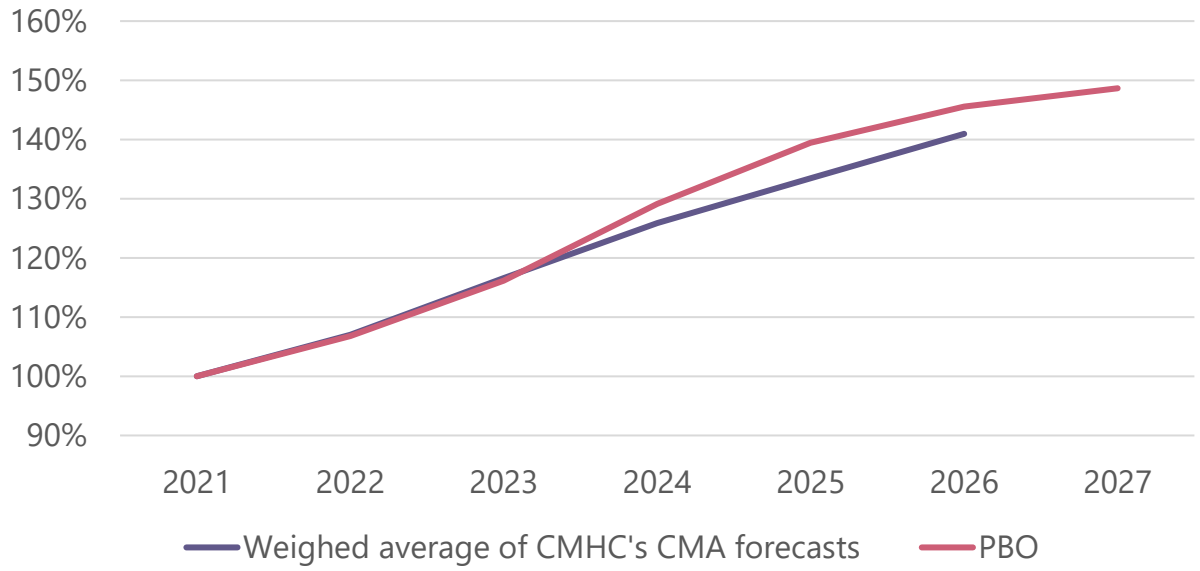
The index for mortgage payments for homeowners with mortgages is the product of the index for changes in mortgage debt per adult and the index for changes in mortgage payments as a share of mortgage values.

## Renters

Our model starts with each household's actual shelter costs in 2021, as well as the local median shelter cost for renters in units which are adequate and suitable for the household. Both actual rent and median rent are then indexed to a purpose-built rent projection for each income quintile. For details, see Appendix C.

By 2027, we project that median shelter costs for renters will be 48% higher than in 2021. Our projected growth in rents is slightly higher than the projected cumulative growth in 2-bedroom apartment rents projected by CMHC across their forecast period, driven largely by observed increases in the Rented Accommodations component of CPI in 2024 that were not available at the time of CMHC's forecast.[8]

**Figure 5**
Cumulative change in rents relative to 2021 by Model




Source
Office of the Parliamentary Budget Officer.

# Population

Canada's population grows over the term of our simulation. A growing population means a growing number of households across the income spectrum, some of whom will be in housing need. Thus, it is necessary to account for the impact of population growth on the number of households in housing need independent of its impact on rents. To do so, household weights are indexed to the projected population for each scenario. This implicitly assumes even growth across the population and across all characteristics.

In the base dataset, some households have low shelter costs due to targeted housing programs. A by-product of indexing record weights is that it increases the number of households represented by those records and implicitly increases the number of households benefiting from targeted housing programs. This is addressed through the policy impact modelling, which adjusts the number of beneficiaries of targeted programs to reflect the projected number of beneficiaries under each scenario.

# Validation

We validated the adjustments for economic trends by applying the same projection methodology to the 2011 Census public use microdata file (PUMF) and comparing the projection results for 2021 to the 2021 Census PUMF. Over the 10-year forecast, our model estimated that 12.74% of households would be in core housing need, compared to the 2021 Census estimate of 12.67% (when including unassessed households for comparability).[9] For details, see Appendix D.

# Immigration Impact Modelling

Immigration policy is not part of Canada's National Housing Strategy and serves a variety of objectives unrelated to, but having an impact on, housing. Nevertheless, we include immigration policy in our model both because it is important for the accuracy of our projection, and because recent reductions in immigration levels have been explicitly linked with the objective of restoring housing affordability.

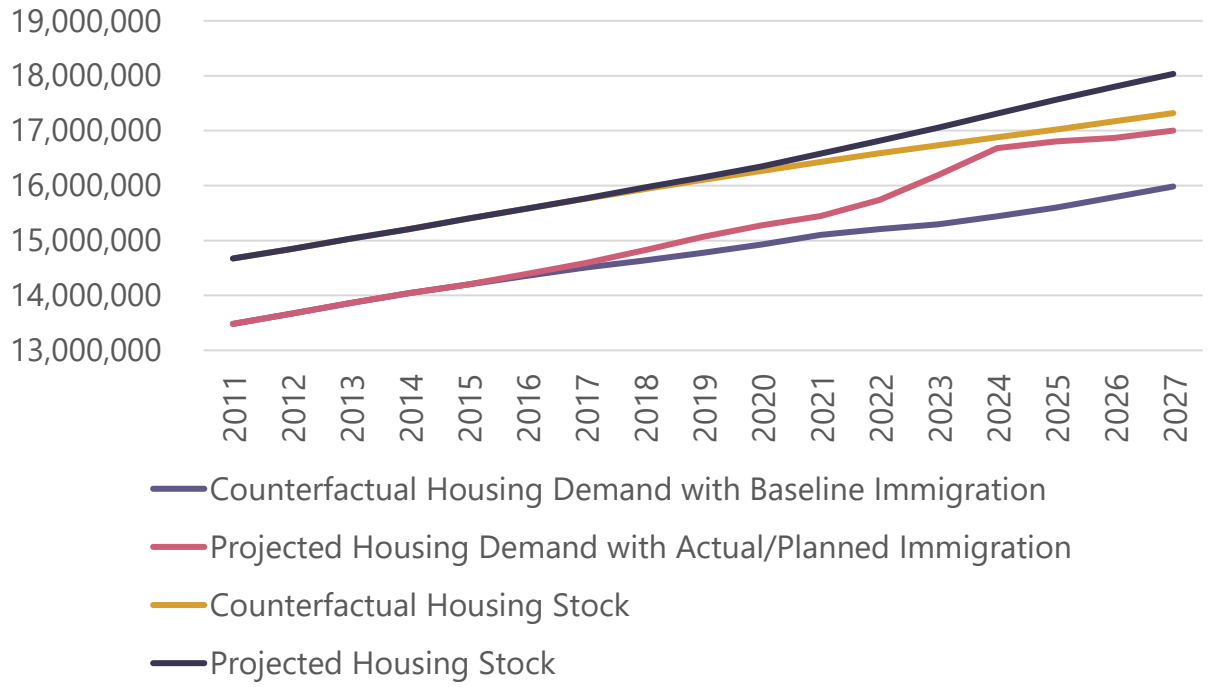
In order to distinguish the impact of increased immigration, we compare two scenarios, one with baseline immigration, and one with actual/planned immigration.

Despite recently announced reductions in immigration, Canada's population remains higher across our projection period than it would have been if immigration had continued at historical rates. In our model, this increased population contributes to higher rents but also contributes to increased supply moderating those higher rents.

Measured relative to a counterfactual assumption of historical immigration, changes to immigration policy have added demand for 1.2 million households as of 2024, but planned reductions in immigration will reduce the added demand to 1.0 million households by 2027, if fully realized. On the other hand, measured relative to the starts we would have expected with constant immigration, we estimate that this increase in demand will have stimulated the construction of 714,000 additional homes by 2027. For details regarding our demand and housing stock projections, see Appendix F.

## Figure 6

### Housing Stock and Homes Demanded at 2021 Headship Rates, by Scenario and Year




Source

Office of the Parliamentary Budget Officer.

Our model suggests that with stable long-run growth in demand, we would see stable long-run growth in the housing stock. The stock would not grow quite as much as demand – increasing at about 87% of the rate of increase in demand. Even in the long run, the housing stock is not perfectly elastic, so housing becomes more expensive as cities grow. However, with this long-run relationship between growth in demand and the stock, the stock to population ratio declines only slightly over many decades – across 1981 to 2016, housing demand grew 79%, while the housing stock grew 73%, giving a 3.5% decrease in the stock to population ratio over 25 years.

However, since 2017, Canada has seen immigration increasing demand above the long-run growth rate. The impact of an increase in immigration above the long-run growth rate is quite different because it takes many years for housing starts and ultimately the housing stock to adjust to increased demand. Across 2016 to 2024, housing demand grew by 16% while the housing stock grew by 11%, giving a 4.1% decrease in the stock to population ratio over 8 years. However, our model implies that in the long-run the

housing stock would still increase by 87% of the unexpected increase in demand, significantly mitigating its impacts on the stock to population ratio and therefore rents.

Our model suggests that recent increases in rents are primarily attributable to the delay between above-trend increases in demand from immigration and the adjustment of housing starts and the housing stock. The impact of that immigration would be much smaller if it were consistent with long-run trends in immigration, and the impact of that immigration will be much smaller as housing starts and ultimately the housing stock respond to higher prices.

We estimate that rents are currently 26% higher than they would have been without increased immigration but, with a lower planned growth and ongoing supply responses, this gap will decrease to 24% by 2027. Our projections of actual and counterfactual rents are based on our rent model as set out in Appendix C.

# Policy Impact Modelling

The housing-related federal policies implemented over the course of Canada's National Housing Strategy can be broadly grouped into:

1. targeted housing programs supported under CMHC's Assistance for Housing Need core responsibility and,
2. market measures supported under CMHC's other core responsibilities and by tax expenditures.

Targeted measures provide deeper affordability support to a limited number of low-income households, whereas market measures aim to increase the housing stock relative to demand and thereby reduce rents for all unsubsidized renter households.

In order to distinguish the impact of federal policies, we compare two projections. Both scenarios reflect actual/planned immigration, but the main projection includes the benefits of programs implemented under Canada's National Housing Strategy whereas the counterfactual projection reflects what would have happened in the absence of Canada's National Housing Strategy. More specifically, this counterfactual assumes:

- CMHC would have met its obligations towards existing social housing,
- All other funding would have expired,
- Provinces and territories would not have spent their share of the cost of the Canada Housing Benefit on housing or social assistance in the absence of federal funding for that program,
- In all other regards, subnational funding for housing programs would not have been any higher or lower in the absence of federal support, and
- In both projections, Canada achieves its targeted changes with respect to immigration as set out in the 2024 Annual Report to Parliament on Immigration.

This model does not account for the impact of sub-national initiatives, other than those agreed to as conditions of federal funding. It also does not account for federal funding under the indigenous housing strategies.[10]

## Targeted Housing Programs

The projected impacts of targeted housing programs by 2027 are:

1. The Canada Housing Benefit is expected to increase the incomes of about 430,075 households by an average of $2,500.
2. Support for community housing will support 148,817 additional rent-geared-to-income units for low-income households that otherwise would have been lost or not created.
3. Support for new affordable housing will add about 27,481 units that would not otherwise have been created, reducing shelter costs for residents.

For details, see Appendix E.

# Market Measures

Some federal policies are intended to reduce market rents by increasing supply. They can broadly be grouped into:

1. Subsidies for new construction, including below-market rate loans, and
2. Incentives for less restrictive zoning.

If these market measures will have an impact, it is not yet apparent. However, given these changes were implemented in 2023 and 2024, it may also be too soon to tell. It is also possible that there may be some impact offset by economic conditions. For our main projection outlined above, we assume that there is no future shift in the relationship between the housing stock and housing demand due to these programs. Our specific forecast of housing starts reflects a linear projection of in-year starts for 2024, then CMHC's high-growth forecast as set out in CMHC's 2024 Housing Market Outlook.

However, to demonstrate the sensitivity of our projection, we also provide an alternative scenario which assumes that starting in 2026 subsidies for new construction will increase housing completions by 25,000 units per year, while zoning reforms implemented under the Housing Accelerator fund increase housing completions by an additional 50,000 units per year. For details, see Appendix G. This would imply substantially more homes being built than at any point in Canada's history and far exceed CMHC's high growth scenario for housing starts. If realized, this increase in construction would increase the 2027 housing stock by 1.0% and decrease rents by 2.5%.

In short, while new tax expenditures and incentives for less restrictive zoning may contribute to housing supply, that impact is highly uncertain and will largely fall beyond our projection period.

# Appendices

## Appendix A: Implementation Differences in Assessment of Core Housing Need

### Income Misalignment

When Statistics Canada calculates the number of households in core housing need, it compares shelter costs for the census/survey year to incomes for the prior year. This misalignment is driven by the availability of administrative data used to calculate incomes and is not part of the definition of core housing need.

In implementing our assessment of core housing need, we compare incomes and shelter costs for the same year. This reduces the number of households in core housing need.

### Calculation of Local Cost of Adequate Suitable Shelter

Households are not considered to be in housing need if they can afford the local median cost of housing which is adequate (not in need of major repairs) and suitable for their household (has enough bedrooms for their households' size and structure).

To determine whether that household can afford suitable adequate housing, their household income is compared against the median shelter cost for households in units with enough bedrooms for each household's size and structure that are in their geography, which are not subsidized and are not in need of major repairs.[11]

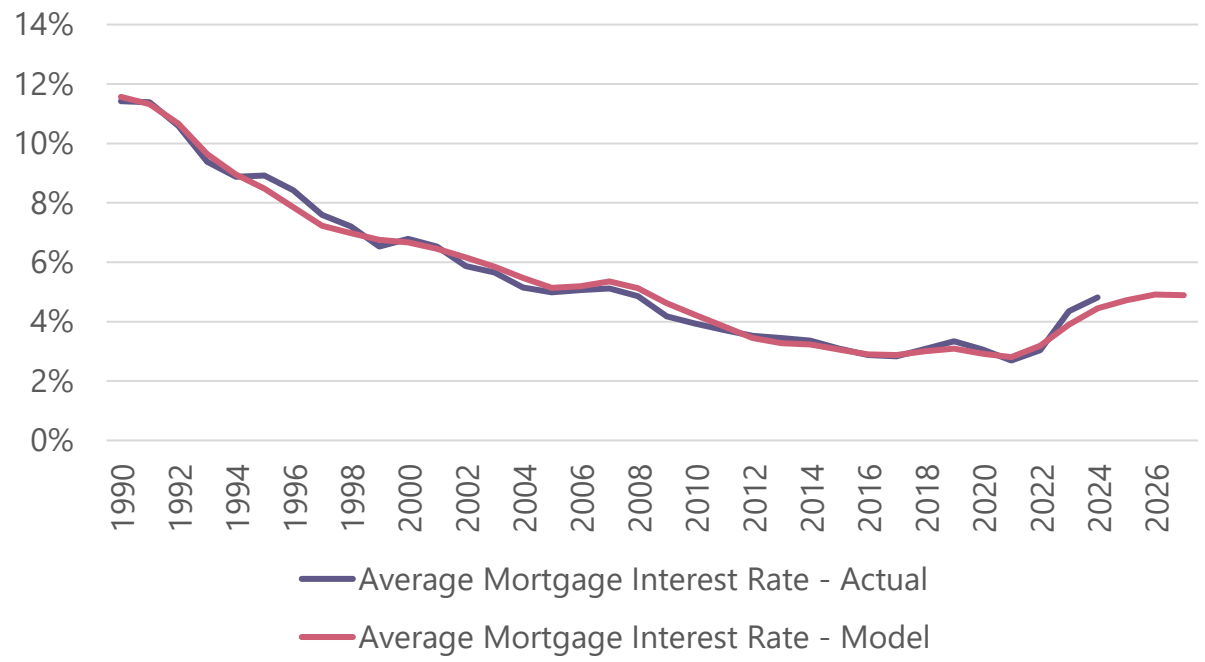
CMHC determines which households can afford market median rent for suitable units based on projected rents at the census sub-division level. This excludes shelter costs other than rents and may include units in need of major repairs. It also introduces some sampling and projection error. These methodological details are not driven by the definition of core housing need, which refers to shelter costs for adequate and suitable housing.

# Appendix B: Mortgage Interest Rate Projection

Up to 2024, mortgage interest rates are estimated based on residential mortgage payments as a share of residential mortgage debt.[12] For 2025 to 2027, we constructed a projection based on government bond rates.

Specifically, we used the 2019 Survey of Financial Security to determine the average duration of mortgages. Based on these durations, we constructed series reflecting the Treasury Bill rates and Government of Canada 10-Year Bond rates which would have been in place when in-service mortgages were signed. These serve as a proxy for expectations about inflation and interest rates at the time in-service mortgages were signed. Using these rates, a model was constructed of actual effective interest rates on in-service mortgages as a weighed average of these two series and a constant.

## Figure 7
### Mortgage Interest Rate Model




Source
Office of the Parliamentary Budget Officer.

# Appendix C: Rent Model

We developed a model of rents to support both our projection of rents and our estimates of the impact of federal policies on rents.

## Theory

Based on prior research, we identified several factors likely to impact rents:

1. Factors affecting households' ability to pay, like wages and unemployment.
2. Factors affecting the opportunity cost of homeownership, like mortgage rates, house prices, and house price appreciation.
3. Factors affecting tightness of housing markets, including immigration and population relative to the housing stock.[13]

The literature also highlights the importance of including auto-regressive terms in a forecast specification.[14]

## Application

We model log nominal rents (*R*) through an autoregressive distributed lag model, using:

- Log nominal disposable income per adult (*HDI/AP*), as a proxy for households' ability to pay;
- The log of the number of dwellings (*H*) relative to housing demand (*D*), as a proxy for the tightness of housing markets;
- The log of the product of the effective interest rates plus other costs (*M*) and average home prices (*PH*) as a proxy for the cost of homeownership excluding appreciation; and
- The change in the log of house prices, as a proxy for house price appreciation.

We allow a constant and up to one lag for both rents and each regressor, excluding lags that did not add significant explanatory value, ultimately giving the form:

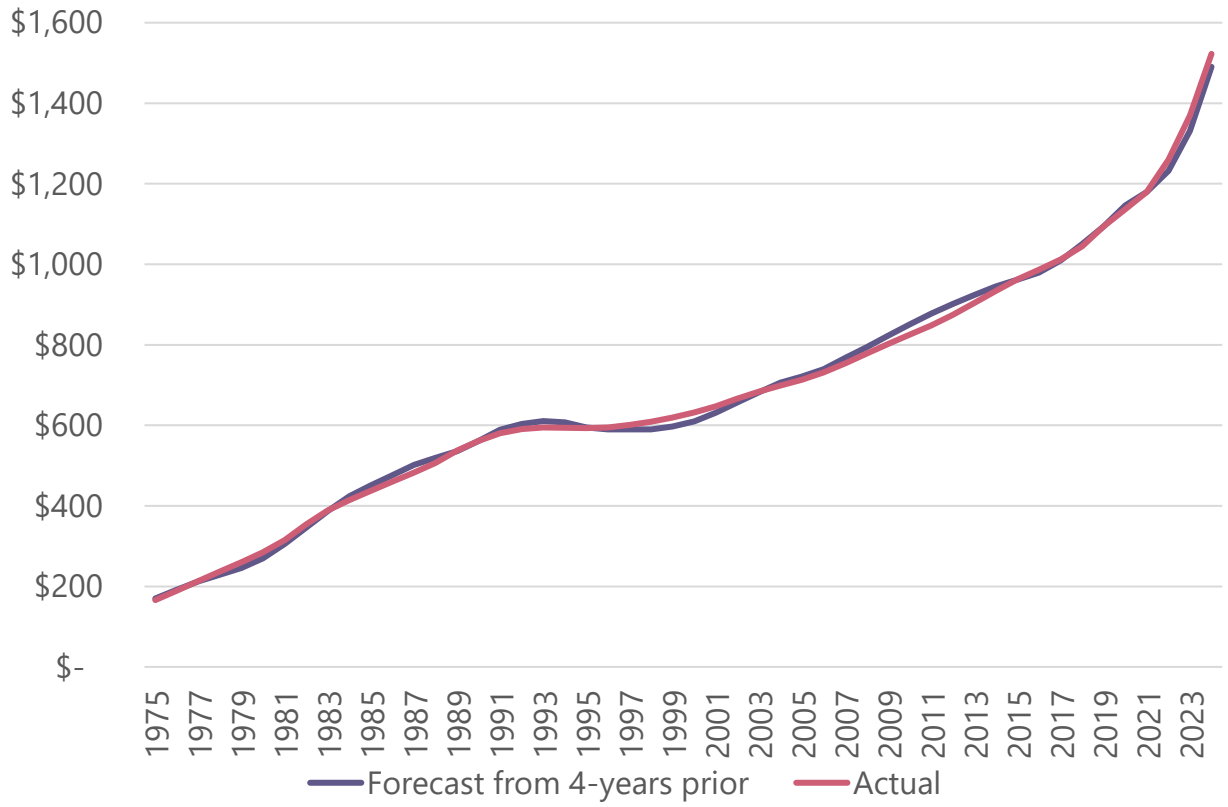
$$\log(R_t) = \partial_1 \cdot \log(R_t) + \partial_2 \cdot \log(R_{t-1}) + \beta_1 \cdot \log\left(\frac{HDI_t}{AP_t}\right) + \beta_2 \cdot \log\left(\frac{H_t}{D_t}\right) + \beta_3 \cdot \log\left(\frac{H_{t-1}}{D_{t-1}}\right) + \beta_4 \cdot \log(M_t \cdot PH_t) + \beta_5 \cdot \mathrm{dlog}(PH_t) + \beta_6 \cdot \mathrm{dlog}(PH_{t-1}) + C$$

The co-integrating relationship for these variables is significant, as are the co-efficients for all variables other than house price appreciation.[15] Consistent with theory, long-run rents are positively related to households' ability to pay and the cost of homeownership, whereas long-run rents are negatively related to the number of dwellings relative to demand.

At the relevant forecast horizon of 4 years and given actual data regarding the identified cost-drivers, this model misses actual rents by an average of 2.0% for 1975 to 2024, with an upward bias of 0.13%.

## Figure 8

### Average Monthly Rent v Forecast from 4 Years Prior




Source
Office of the Parliamentary Budget Officer.

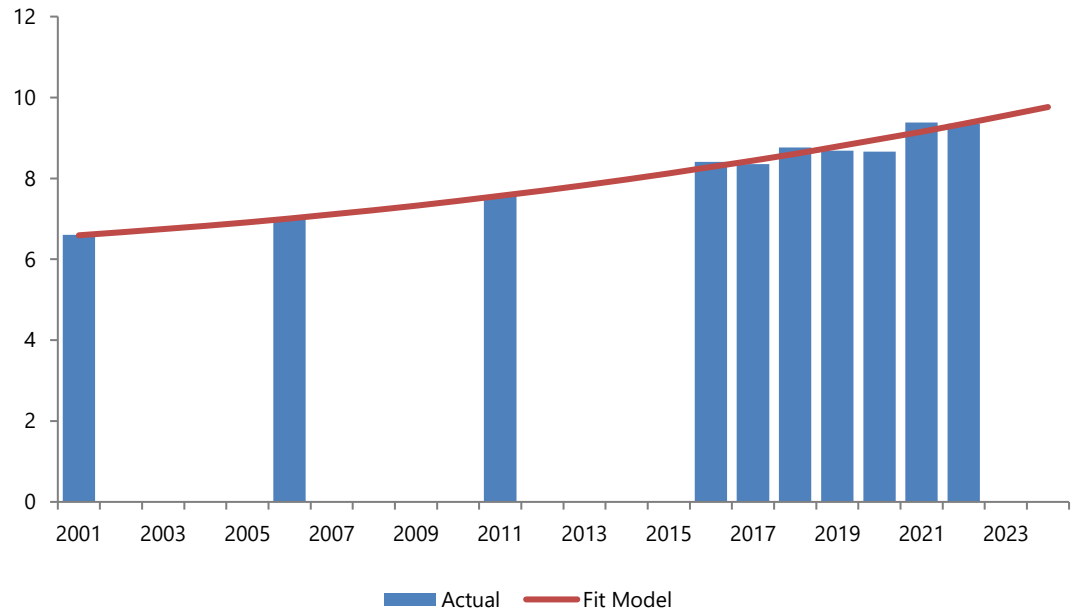
# Data

## Rent

For the purposes of this model, "rent" is an estimate of average rent for all renters. While we considered using the rented accommodations component of the consumer price index directly, we found that it consistently understates the growth of actual shelter costs since it only reflects changes in housing of a specific quality over time, excluding changing unit characteristics. For example, average rents increased 21% from the 2016 to 2021 census, whereas the rented accommodations component of the consumer price indexed only increased 8%. Prior research attributes this primarily to location demand, i.e. individuals moving to high-cost locations due to better wages and amenities.[16]

Instead, we constructed a model of the ratio between average rents (according to the Census and Canadian Income Survey) and the rented accommodation component of the consumer price index. From 2001 to 2021, this ratio increased from 6.6 to 9.4, contributing to the increase in shelter costs over that period. This relationship is then used to interpolate annual rents up to 2024.[17]

**Figure 9**
Ratio of Average Rent to Rent CPI by Year



Source
Office of the Parliamentary Budget Officer.
Based on tabulations by Statistics Canada and the Canadian Income Survey.

The rents for households in lower income quintiles are less responsive to changes in average rents than those of higher income households. To account for this, log rents for each quintile are defined as a function of a constant and the overall log average rent, fit to reflect changes in rent by quintile across 2011 to 2021. For example, for a 1% increase in average rents, rents for the bottom income quintile will increase by 0.91%, whereas rents for the top income quintile increase by 1.27%.

## Housing Demand

Housing demand is measured as the sum of the products of the 2021 age-specific headship rate for each 10-year age range and the projected population in each age group. We measure housing demand with a fixed-headship rate to produce a better proxy for total demand including suppressed demand. The actual number of households is constrained by the number of dwellings.

To construct our population projection, we assume that Canada will achieve its targets with respect to immigration as set out in the 2024 Annual Report to Parliament on Immigration. For all other components of population change, we use Statistics Canada's medium growth population projection. For further details, see Appendix F.

## Housing Stock

Up until 2023, the housing stock is based on census dwelling counts, with interpolation based on units created and lost through construction, conventions, and demolitions. The method used to project the housing stock varies by scenario as set out in Appendix F.

## Interest Rates

The interest rate projections used in our rent projection are derived from the PBO's October 2024 Economic and Fiscal Outlook. For details regarding the estimation of mortgage interest rates based on these projections, see Appendix B.

# Appendix D: Validation of Economic Adjustments

We validated our economic adjustments by projecting the number of households who would be in housing need starting with 2011 data and projecting for 2021. This validation uses actual household debt, population, government bond rates and incomes (per the economic accounts). As a result, it does not reflect uncertainty related to these underlying inputs. This analysis also uses models fit to actual data across the projection period.

By the end of the 10-year validation period, the projection model overestimates shelter costs by 3.1%. This reflects the offsetting effects of slightly underestimating shelter costs for renters by 0.5% while overestimating shelter costs for homeowners with mortgages by 6.4%, plus unmodelled changes in the homeownership rate and share of homeowners with mortgages. Our model underestimates household incomes by 0.6% overall, but overestimates incomes for the bottom income quintile by 0.2%.

Over the same period, the number of households in unsuitable housing decreased from 5.9% to 5.4%, while the number of households in housing in need of major repairs decreased from 7.4% to 6.1%. Despite these overall decreases in inadequacy and unsuitability, the share of households in core housing need due only to unsuitability or inadequacy actually increased slightly, from 0.95% of the population to 1.02% of all households. Because our methodology assumes a stable share of households in unsuitable and inadequate housing, it would not capture these changes.

A direct comparison of estimated core housing need is not possible because the 2011 Census PUMF does not identify households who are not assessed for core housing need. However, the forecasted core housing need rate including unassessed households is 12.73% based on the projection from 2011, compared with the Census value for 2021 of 12.67%, representing an overestimation of core housing need (prior to the exclusion of unassessed households) by 0.1 percentage points (0.5%).

## Table 1
Validation Results

| Indicator | Projection | Actual | Error (Projection/Actual) |
|---|---|---|---|
| **2021 Shelter costs** | 1,440 | 1,397 | 3.1% |
| **For owners with mortgages** | 2,179 | 2,048 | 6.4% |
| **For owners without mortgages** | 691 | 647 | 6.8% |
| **For unsubsidized renters** | 1,272 | 1,278 | -0.5% |
| **For subsidized renters** | 549 | 713 | -23.0% |
| **2020 Before-Tax HH Income** | 106,376 | 106,972 | -0.6% |
| **Bottom Income Quintile HH Income** | 30,379 | 30,331 | 0.2% |
| **Unsuitable Housing** | 5.9% | 5.4% | 9.0% |
| **Inadequate Housing** | 7.4% | 6.1% | 20.6% |
| **In core housing need only due to unsuitability or inadequacy** | 0.95% | 1.02% | -6.9% |
| **Unaffordable Housing** | 25% | 22% | 13.4% |
| **Can afford median market rent** | 81% | 81% | 0.4% |
| **Core housing need rate when including unassessed** | 12.74% | 12.67% | 0.5% |

Source

Office of the Parliamentary Budget Officer.

Note

Actuals tabulated by PBO from Statistics Canada's 2021 Census Hierarchical Public Use Microdata File.

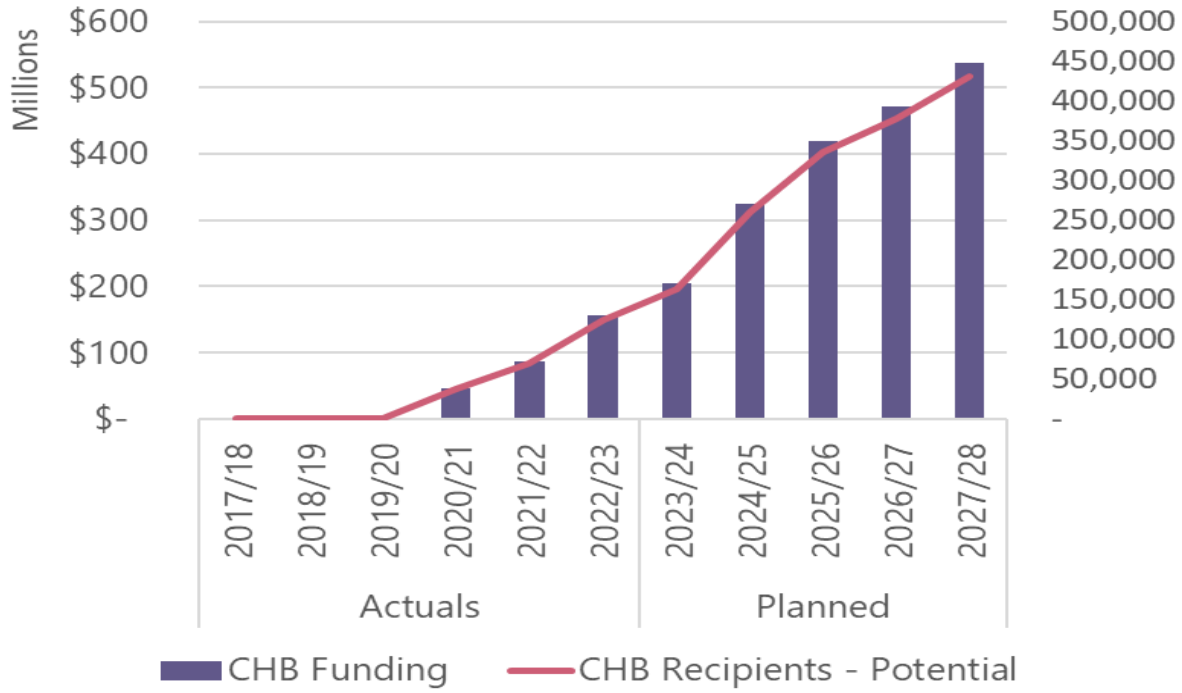
# Appendix E: Targeted Programs

## Canada Housing Benefit

The number of households receiving the Canada Housing Benefit is expected to exceed the 2027 target of 300,000 households. Allocated funding, with equal cost matching by the provinces and territories, grows over the term of Canada's National Housing Strategy and will be sufficient to pay the targeted average benefit of $2,500 to about 430,000 households by 2027-28.

**Figure 10**

Households receiving the Canada Housing Benefit




Source

Office of the Parliamentary Budget Officer, based on funding data provided by CMHC.

To model the impact of this program, a $2,500 increase in annual income was allocated to the projected number of incremental beneficiaries.[18]

## Table 2
Canada Housing Benefit Recipients, adjustment, by scenario and year

| Scenario | Income Base Year (2020) | End of projection (2027) |
|---|---|---|
| **Potential CHB Recipients** | 37,598 | 430,342 |
| **Implicit CHB recipients under actual/planned immigration** | 37,598 | 41,092 |
| **Adjustment to households receiving CHB under National Housing Strategy scenario** | - | 389,250 |
| **Adjustment to households receiving CHB under actual/planned immigration but no NHS scenario** | (37,598) | (41,092) |
| **Implicit CHB recipients under baseline immigration** | 37,598 | 39,675 |
| **Adjustment to households receiving CHB under baseline immigration scenario** | (37,598) | (39,675) |

Source
Office of the Parliamentary Budget Officer.

All incremental support was allocated to households in the bottom income quintile, with the probability of each household receiving support based on the characteristics of households who moved into subsidized housing over the last five years. The counterfactual loss of support was allocated in the same manner. Our model assumes that no individuals in community housing received the Canada Housing Benefit.

One factor which reduces the estimated impact of the Canada Housing Benefit is that it increases incomes rather than reducing shelter costs.[19]

# Social Housing

Many community housing providers had operating agreements which expired or will expire over the course of Canada's National Housing Strategy. This includes both federally administered units and provincially/territorially administered units. The National Housing Strategy allocates significant funding to preserve part of this

community housing through the Federal Community Housing Initiative and Federal, Provincial & Territorial Partnership Framework.

In order to account for the benefits of this funding, we construct a projection of the number of community housing units that will exist with this renewed funding, and the counterfactual number of community housing units that would have existed without that funding.

Within this projection, we distinguish the subset of community units which are rent-geared-to-income (RGI) units provided to low-income households. Not all residents in community housing are low-income households paying below-market rents, especially within federal community housing. For example, of the 42,730 units preserved under the Federal Community Housing Initiative as of the end of 2023, 9,432 were low-income households receiving rent assistance.[20] The need for operating subsidies and the benefits of operating subsidies are more closely linked with the number of low-income households receiving RGI support supported than the total community housing stock.

The 499,594 households in subsidized housing with the lowest rents were deemed to be living in RGI community housing allocated to low-income households, while the remainder were deemed to be living in other community housing. This cut off was determined based on CMHC's 2022 Social and Affordable Housing Survey indicating Canada had a total of 499,594 units of community housing with income-based rents.

The characteristics of these households limit the number who can be removed from core housing need through preserving rent-geared to income housing. First, 33% of these households are in core housing need despite being in rent-geared-to-income housing, so preserving that housing does not remove a household from core housing need. Additional households would not be put into housing need by any increase in their shelter costs because they can afford market median rent (28% of the pool of RGI households in 2021), they are not assessed for housing need (3%), or they are student households (1%). Of the remaining 35%, most, but not all, would be in core housing need if they had to pay the median shelter cost for low-income movers in the bottom income quintile. With shelter costs rising relative to incomes across our projection, the share of this RGI pool who can afford market median rent falls, and the share who cannot afford the median shelter cost for low-income movers in the bottom income quintile increases. By 2027, 38% of households in the RGI pool whose support is preserved due to the NHS are removed from core housing need due to that preserved support.

## Federal Community Housing

We assume that without renewed federal funding Canada would have lost all rent-geared-to-income support for low-income households in federal community housing, excluding those receiving ongoing support under legacy federal programs.

To simulate the impact of such a loss, we randomly select households in rent-geared-to-income pool to reflect the number of low-income units which would have otherwise been lost or not created. For those households, we increase their rents to the indexed market median rent for bottom-income quintile movers in adequate unsubsidized housing in their geography.

This does not necessarily represent what would happen to any particular household but rather the change in the cross-sectional profile of households. For example, the increase in rent for a household could occur by a community housing provider selling off a low-income unit that becomes vacant or renting it at market rate when they otherwise would have rented it to a low-income household at a discounted rate.

Under the counterfactual scenario, we project that there would be 5,000 fewer federal low-income units in the 2021 base year, and 13,700 fewer low-income units by 2027. The difference for the 2021 base year reflects the number of units supported under the Federal Community Housing Initiative in that year, while the difference for 2027 reflects the target of that initiative.

### Table 3

### Low-Income Federal Community Housing Units, changes from 2021 actual, by scenario and year

| Scenario | Base (2021) | End (2027) |
|---|---|---|
| **Actual/National Housing Strategy** | 0 | 0 |
| **Counterfactual** | -5,000 | -13,700 |

Source

Office of the Parliamentary Budget Officer.

## Provincially and Territorially Administered Community Housing

CMHC only covers part of the cost of operating provincial and territorially administered community housing. A loss of federal support would negatively impact the number of units that provinces can sustain with existing funding but is unlikely to result in a loss of subsidized housing proportionate to the decline in units receiving federal support. Federal funding does not cover the full cost of operating the community housing transferred to provinces and territories; in the case of BC Housing, federal contributions accounted for $188 million (7%) of $2,752 million in planned spending for 2023-24.[21]

As a more balanced approach, we assume that provinces adjust the number of low-income units they support based on their total available resources. In line with this approach, we assume losses of low-income housing proportionate to the reduction in low-income units that could be funded based on average operating subsidies per rent-geared to income unit occupied by a low-income household in Ontario.[22] This is not to say that the specific community housing projects formerly supported under the Social Housing Agreements would be lost – but rather that housing authorities would have less funding which would, in turn, reduce the number of low-income households that can be offered rent-geared-to-income support.

Under the National Housing Strategy scenario, there is a slight increase in the number of low-income units that can be maintained relative to 2021. Without renewed funding under the National Housing Strategy, we project that there would be 53,721 fewer low-income units in the 2021 base year, and 112,450 fewer low-income units by 2027.

### Table 4

### Low-Income Provincial/Territorial Community Housing Units, changes from 2021 actual, by scenario and year

| Scenario | Base (2021) | End (2027) |
|---|---|---|
| **Actual/National Housing Strategy** | - | 6,857 |
| **Counterfactual** | (53,721) | (112,450) |

Source

Office of the Parliamentary Budget Officer.

## New Community Housing

Some National Housing Strategy programs are intended to create new low-income housing, notably the Rapid Housing Initiative and the Federal, Provincial & Territorial Partnership Framework.

For the Rapid Housing Initiative, we assume all units funded are new rent-geared-to-income low-income housing units and attributable to federal funding. This is consistent with program parameters, which exclusively fund rent-geared-to-income housing, as well as the absence of cost matching requirements and resulting large federal share of funding for each project. By 2027, we assume that the Rapid Housing Initiative will add about 16,000 new rent-geared-to-income low-income housing units.

Under the Federal, Provincial & Territorial Partnership Framework federal funding contributes a share of a pool of funding used to support both existing community housing and the creation of new community housing. While the program aims to contribute to the creation of 50,000 units, those units will not necessarily be low-income units or incremental. Consistent with the assumption regarding the impact of changes in funding for provinces and territories above, we assume that the number of incremental rent-geared-to-income low-income units created under the Federal, Provincial & Territorial Partnership Framework due to federal funding will be equal to the increase in the number of low-income units which can be supported with that funding as estimated above, i.e. 6,857 more units.

In combination, under the National Housing Strategy scenario we project there will be 22,613 more low-income community housing units by 2027. Without renewed funding under the National Housing Strategy, there would be 58,721 fewer low-income community housing units in 2021, and 126,150 fewer low-income community housing units by 2027. Expressed relative to the changes implied by the indexation of population weights, this means that under the National Housing Strategy scenario only 20,803 weighed households face a simulated increase to the indexed median market rent for bottom income quintile movers, compared with 169,567 when simulating actual/planned immigration without the National Housing Strategy, and 149,097 when simulating baseline immigration without the National Housing Strategy.

## Table 5

### Low-Income Community Housing Units, by scenario and year

| Scenario | Base (2021) | End (2027) |
|---|---|---|
| **Implicit change in households in RGI low-income housing with actual/planned pop growth** | 0 | 43,417 |
| **NHS scenario: projected change in households in RGI low-income housing** | 0 | 22,613 |
| **Of which: New Federal Housing** | 0 | 0 |
| **Of which: New P/T Housing** | 0 | 6,857 |
| **Of which: RHI Housing** | 0 | 15,756 |
| **NHS scenario: Households in RGI low-income housing** | 499,594 | 522,207 |
| **Implicit households in RGI low-income housing with actual/planned pop growth** | 499,594 | 543,011 |
| **NHS scenario adjustment: Number of households with rent increases to median market rent for low-income movers** | 0 | 20,803 |
| **No NHS Scenarios: projected change in household in low-income community housing** | -58,721 | -126,150 |
| **Of which: Lost Federal Housing** | -5,000 | -13,700 |
| **Of which: Lost P/T Housing** | -53,721 | -112,450 |
| **No NHS Scenarios: Households in low-income housing** | 440,873 | 373,444 |
| **Actual/planned immigration but no NHS: Number of households with rent increases to median market rent for low-income movers** | 58,721 | 169,567 |
| **Implicit households in low-income housing with baseline immigration** | 499,594 | 522,541 |
| **Baseline immigration and no NHS: Number of households with rent increases to median market rent for low-income movers** | 58,721 | 149,097 |

Source

Office of the Parliamentary Budget Officer.

# New Affordable Housing

The Federal Lands Initiative, Innovation Fund, and Affordable Housing Fund, and Co-operative Housing Development Program all provide financial support for the creation of new below-market housing. These programs are largely on track to meet or exceed their targets for the number of units they fund.

There are several challenges in accounting for the potential impact of these activities.

First, not all units created are subject to affordability commitments. Excluding their potential contribution to the overall housing stock, it is only the units with affordability commitments that directly contribute to affordability. The largest of these programs, the Affordable Housing Fund, targets the creation of 60,000 new housing units.[23] About 2/3 of units funded under this program have been subject to affordability commitments.

Second, affordability commitments vary substantially, both across and within programs. Within the Affordable Housing Fund for example, some affordable units are shelter beds with a committed rent of 0% of median market rent, while other affordable units are offered at almost 80% of median market rent.

Third, federal contributions are often a small share of project costs, suggesting that federal funding is allowing other funding to be stretched further to fund more units, rather than being causally responsible for the creation of all the units in question. For financial commitments under the Affordable Housing Fund, federal contributions have represented an average of 16% of total project costs. We assume that federal funding makes a proportionate contribution to the number of units created. That is to say, without federal funding being available, project proponents and other levels of government would have concentrated their resources for housing on fewer or smaller projects that fit their available budgets instead of leaving gaps to be covered by federal funding and, as a result, fewer units would have been produced. It is possible that the availability of federal funding could leverage or displace funding from other partners, but we assume funding from these partners is fixed.

Finally, the indexation of population weights implicitly increases the affordable housing stock, so whatever changes are implemented should be expressed relative to this implicit expansion. There is limited information regarding the extent to which provinces and non-profits expand affordable housing independent of federal support.

Our approach assumes that the units created by new affordable housing programs are fully incremental. That is to say, we assume that irrespective of federal spending,

provinces, municipalities, non-profits and other groups would have expanded the stock of non-market housing just proportional to population. This assumption is made for consistency with the significant investments made by these groups within the projects receiving federal support, as well as the growth in subsidized housing observed across the 2011 to 2021 Censuses.

We assume that federal support results in the creation of additional affordable housing, with a causal contribution proportionate to the share of funding which is federal. For example, we assume that if a project created 100 affordable units, and the federal government contributed 16% of costs, then federal funding resulted in the creation of 16 affordable units. Based on Affordable Housing Fund projects, this suggests about 1,846 new affordable units created for each billion dollars in budgetary spending (i.e. excluding loans issued).

The distribution of those units across affordability levels is assumed to be the same as for Affordable Housing Fund projects to date. So, for example, of those 1,846 new affordable beds/units created for each billion dollars spent, we assume 209 will be free shelter beds and 332 will be offered at 80% of median market rent. This distribution of the number of units created per dollar spent is applied to the total planned spending of $14.9 billion for these programs over the course of the NHS. This suggests that these programs will result in the creation of about 27,509 units of affordable housing. We also assume all these units funded are created after 2021 and before 2027.

This is not necessarily inconsistent with the achievements of the targets of all these programs – for example, while the Affordable Housing Fund aims to contribute towards projects with 60,000 units, it doesn't set a target with respect to the share of those units which will be affordable and doesn't aim to causally contribute to the creation of 60,000 more units than would have otherwise been created.

## Table 6
### New Affordable Housing Program Impacts

| % of Median Market Rent | Projected Incremental Units Created |
|---|---|
| **0** | 3,138 |
| **10** | 667 |
| **20** | 835 |
| **30** | 2,116 |
| **40** | 2,701 |
| **50** | 4,113 |
| **60** | 2,303 |
| **70** | 6,665 |
| **80** | 4,970 |
| **Total** | 27,509 |

Source

Office of the Parliamentary Budget Officer.

For increases in affordable housing relative to 2021 under the National Housing Strategy, additional housing units were allocated to households in the bottom income quintile, with the probability of each household receiving support based on the characteristics of households who moved into subsidized housing over the last five years, excluding those households who receive the Canada Housing Benefit. It was assumed that those households would pay the specified percentage of median market rent (if less than their current shelter costs).

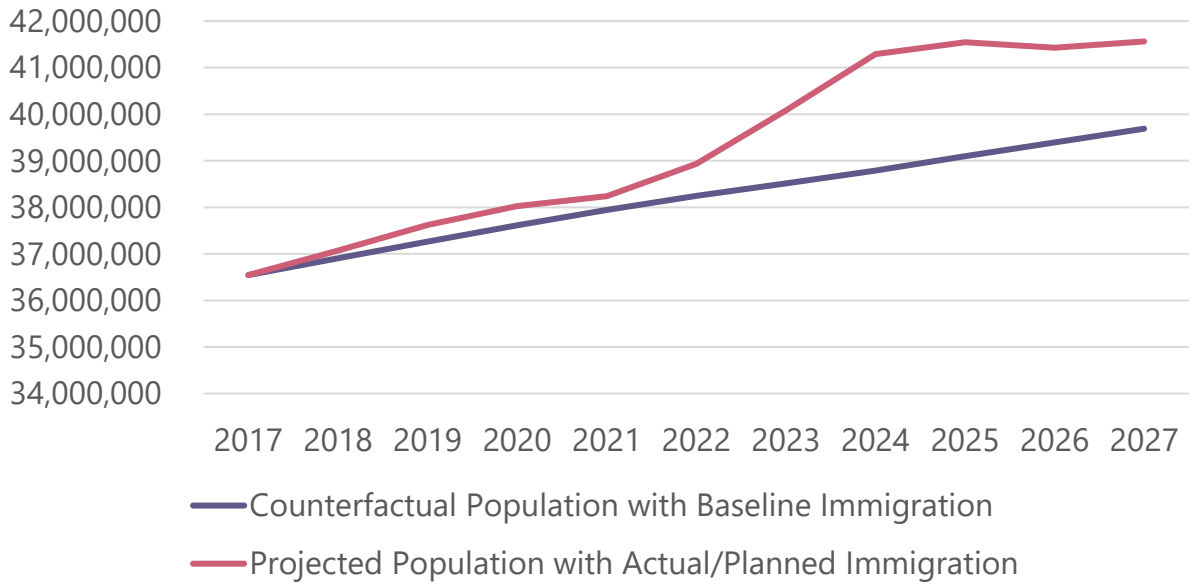
# Appendix F: Demand, Supply, House Prices and their Impact on Rents

## Housing Demand

Budget 2024 announced a planned 600,000-person reduction in non-permanent residents over 3 years, with the stated goal being to "lower housing demand [to] restore housing affordability."[24] Additional planned reductions in permanent resident immigration were announced in the 2024 Annual Report to Parliament on Immigration.[25] However, this announcement occurs in the context of an overall increase in Canada's population growth since the start of Canada's National Housing Strategy.[26]

Our main projection assumes that Canada will achieve its targeted changes with respect to immigration as set out in the 2024 Annual Report to Parliament on Immigration. For all other components of population change, we use Statistics Canada's 2024 medium growth population projection. This projection is also used to simulate what would have occurred without National Housing Strategy programs. However, to show the impact of increased immigration, we also provide a counterfactual projection exploring what would have happened if Canada had held immigration steady at historical rates from 2016.[27] Even with the planned reduction in immigration and non-permanent residents, Canada's projected population remains higher than the baseline-immigration counterfactual projection across our projection period.

## Figure 11
Population Projection by Scenario

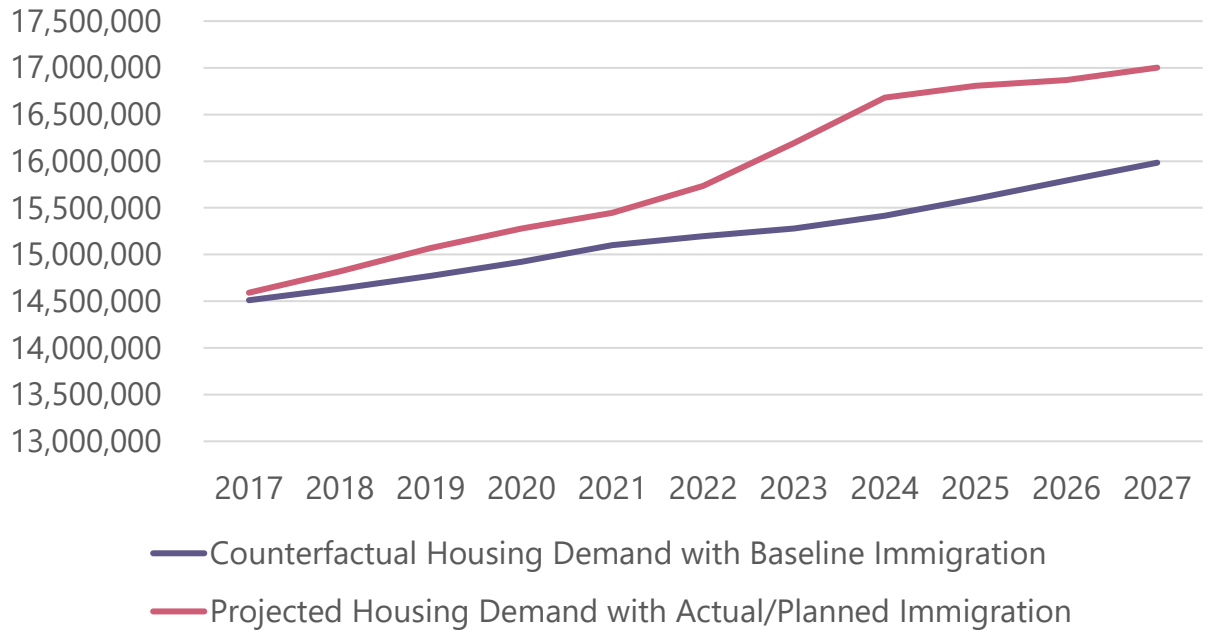



Source:
Office of the Parliamentary Budget Officer.

As noted in our rent model, we measure housing demand in terms of the number of homes that would be demanded at 2021 age-specific headship rates. As a result, it is necessary to make an assumption about the future population distribution. We use the population distribution from Statistics Canada medium growth population scenario, but with the population aged 15 to 34 years-of-age scaled to replicate the population changes in each scenario.[28]

**Figure 12**

Homes Demanded at 2021 Headship Rates by Scenario




Source

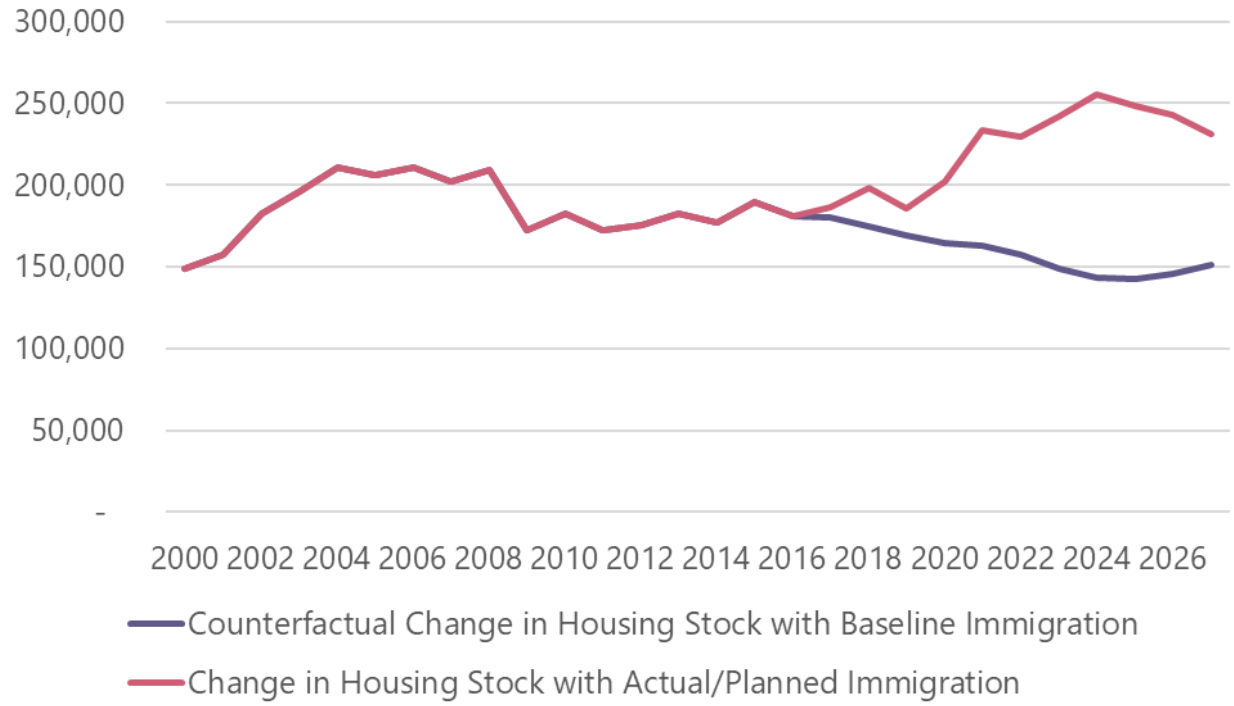
Office of the Parliamentary Budget Officer.

## The Housing Stock

For our main projection, we rely on housing starts, including CMHC's high-growth projection of housing starts across 2025 to 2026, to project the change in the housing stock out to 2027. The high growth projection was used because 2024 starts are on track to exceeded CMHC high-growth projection. We modelled the change in the housing stock as a function of housing starts in the prior three years:

$$d(Stock_t) = \beta_1 \cdot Starts_{t-1} + \beta_2 \cdot Starts_{t-2} + \beta_3 \cdot Starts_{t-3}$$

## Figure 13
Change in Housing Stock by Scenario




Source
Office of the Parliamentary Budget Officer.

To model the evolution of the housing stock under the counterfactual of baseline immigration, it is necessary to consider the extent to which immigration may have contributed to growth in the housing stock since 2017. Prior modelling has identified the primary long-run driver of changes in the housing stock to be household formation, i.e. changes in the number of homes demanded as a result of the size and age distribution of the population.[29]

To estimate the growth in housing stock that would have occurred without increased immigration, we fit a simplified autoregressive model across data for 1971 to 2024 with the form:

$$\log(Stock_t) = C + \alpha_1 \cdot \log(Stock_{t-1}) + \alpha_2 \cdot \log(Stock_{t-2}) + \beta_1 \cdot \log(Homes\ Demaned_{t-1})$$

The co-integrating long-run relationship for these variables is significant.

While most market measures are more recent, the Apartment Construction Loan has been in place since 2017 and may have contributed to increased housing starts under

the National Housing Strategy; however, as of June 2024, 23,029 units were under construction and 12,683 units funded under that program had been built, and only a subset of those units funded would be incremental.[30]

## House Prices

We constructed a projection of real house prices that specifically accounts for the housing stock relative to demand. This model is only used indirectly as in input for projecting rents for 2025 to 2027, and for the counterfactual projection of rents from 2017 to 2027.

We model real benchmark house prices (*PH/CPI*) through an autoregressive distributed lag model, using:

- Average real disposable income per adult (*HDI/AP/CPI*), as a proxy for households' ability to pay;
- The number of dwellings (*H*) relative to housing demand (*D*), as a proxy for the tightness of housing markets; and
- The 10-year government bond rate (I) both as a long-term factor affecting the cost of homeownership and as a short-term factor affecting the timing of first-home purchases and construction.

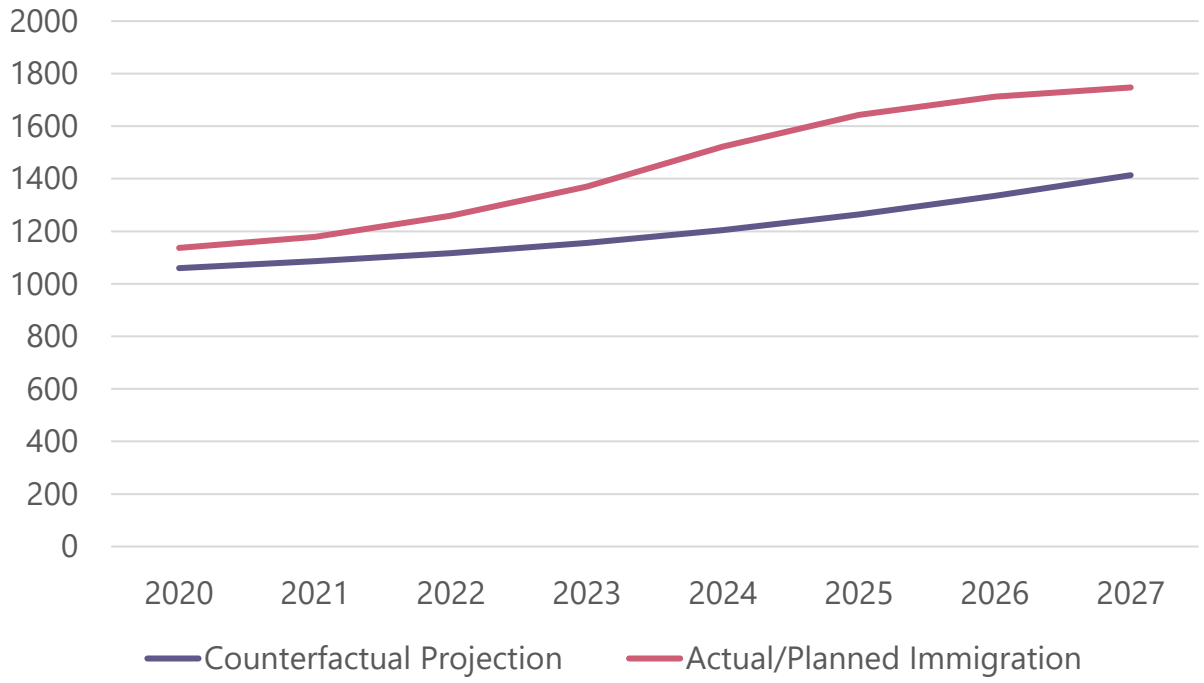
We allow a constant and up to one lag for both rents and each regressor, excluding lags that did not add significant explanatory value, ultimately giving the form:

$$\log(PH_t/CPI_t) = C + \alpha_1 \cdot \log(PH_{t-1}/CPI_{t-1}) + \beta_1 \cdot \log(HDI_t/(AP_t \cdot CPI_t)) + \beta_2 \cdot \log(H_t/D_t) + \beta_3 \cdot \log(H_{t-1}/D_{t-1}) + \beta_4 \cdot \log(@movav(I_t,4)) + \beta_5 \cdot \log(@movav(I_{t-1},4)) + \beta_5 \cdot \log(I_t)$$

## Impacts on Rents

As outlined above, immigration has increased demographic demand for housing, increasing rents, and therefore the housing stock. This increase in the housing stock moderates, but does not fully offset, the impact of increasing rents. Both rents and the housing stock adjust gradually over time. The net effect is that rents are higher than they would be without increased immigration – for 2027, we estimate that rents will be 24% higher than they would be in the absence of increased immigration.

## Figure 14
Projected Average Rents by Immigration Scenario




Source
Office of the Parliamentary Budget Officer.

As outlined in Appendix C, our model of the impact of market measures is based on an econometric model of rents fit to national data across 1971 to 2024. The actual and counterfactual rents are determined by the interaction of that rent model and the stock model outlined above. That elasticity is somewhat complex, reflecting the interaction of several factors.

- The model implies that a sustained 1% increase in the housing stock relative to demand would decrease rents by 1.8% in the following year and 3.5% in the long-run equilibrium form. We assume that this growing impact reflects the progressive exposure of renter households who are partially sheltered from rent increases for the duration of their tenancy.
- The housing stock relative to demand affects growth in the housing stock as outlined in Appendix F, meaning that an increase in the housing stock relative to demand will crowd out future supply while an increase in demand relative to the housing stock will promote future supply, mitigating the long-run impact of any shocks.

To validate this elasticity, we looked to prior work modelling housing market outcomes as a function of supply and demand. A significant limitation of this prior analysis is that it has generally focused on short-term responses of house prices or market rents in markets not subject to rent control. Some analysis also compares dwellings to actual households, even though the number of households is constrained by the number of dwellings through prices.

However, this elasticity falls within the wide range estimated by prior analysis.

### Table 7
Estimated Elasticities of Housing Demand

| Source | Approach | Estimate | External validity challenges |
|---|---|---|---|
| Jens von Bergmann | Econometric | -3.96<br>-1.75 used | For house prices in Vancouver |
| Alan Bentley et al | Econometric | -1.49 to<br>-1.71 | For flow rents New Zealand<br>(not subject to rent control) |
| Meen and Whitehead | Econometric | -1.55 to<br>-1.81 | For house prices in United Kingdom |
| **CMHC (unpublished)** | Econometric | -1.25 to<br>-2.55 | Reduced form elasticity for House Prices |
| Saiz (2003) | Natural Experiment | -1 | For refugee arrivals in Miami<br>(low purchasing power) |

Source
Office of the Parliamentary Budget Officer.

# Appendix G: Subsidies for New Construction and Zoning Incentives

While subsidies for new construction and incentives for less restrictive zoning may contribute to housing supply, that impact is highly uncertain and will largely fall beyond our projection period. Without any increase in starts to date, any potential impact would not even start to be seen in the housing stock until at least 2026. To test the sensitivity of our model to the impact these programs might have, we simulate a 75,000 units per year increase in completions starting in 2026, based on the analysis set out below.

## Subsidies for New Construction

Canada is subsidizing new construction by:

1. Providing low-cost loans under the Apartment Construction Loan Program, Affordable Housing Fund and proposed Canada Secondary Suite Loan Program. This reduces interest costs related to the financing of selected projects.
2. Increasing the GST Rental Rebate from 36 per cent to 100 per cent and removing the existing GST Rental Rebate phase-out thresholds for new rental housing projects that complete construction by December 31, 2035.[31] This reduces sales tax costs for new rental housing projects, especially for higher value units.
3. Increasing the accelerated capital cost allowance to 10 per cent for eligible new purpose-built rental projects that are available for residents to move in before January 1, 2036.[32] This defers tax obligations for developers, which generate some returns between the time of deferral and disposition of the building.

We assumed that these measures reduce the cost to supply a new home by a combined 3.5%, mostly attributable to the GST cut for purpose-built rentals (2.9%), the accelerated capital cost allowance (0.3%) and interest rate savings under the apartment construction loan program (0.3%).[33] With an assumed price elasticity of supply of 3.3, these measures would be expected to increase construction by about 12%, adding about 25,000 additional starts per year. Since the GST Rental Rebate and accelerated capital cost allowance are relatively new, they could increase future starts, although no increase is yet apparent.[34]

## Excluded Subsidy/Financing Measures

Some additional measures were considered but ultimately excluded since it was unclear how they would support the viability of new construction:

1. We considered the impact of the increase in the limit for Canada Mortgage Bonds specifically for multi-unit rental projects insured by CMHC. Canada Mortgage Bonds are CMHC-guaranteed bonds sold to investors and used to purchase Canadian insured eligible residential mortgage loans. While this might smooth the process for lenders of reselling insured-mortgages to investors, those lenders already have access to global capital markets and any impact on lending would be entirely speculative.
2. We also considered the new Public Lands Initiative. Canada already had programs to make federal lands available for housing through the Federal Lands Initiative, a targeted program which receives a top-up. One change proposed in Budget 2024 is to lease instead of selling those lands. However, the Budget does not include any significant budgetary expenditures to support leasing land at below market value and it is not clear that costs to rental developers or residents would be any lower leasing public lands at market rates than paying the financing costs to acquire land at market rates.
3. We also considered the potential impact of infrastructure funding under the Canada Housing Infrastructure Fund, which is expected to contribute to infrastructure costs usually borne by new development. This funding will help compensate for associated conditions, including a freeze on development charges for larger municipalities required under the Canada Housing Infrastructure Fund. However, municipal development charges are set in advance and will not be offset by federal contributions in the medium-term.

# Incentives for Less Restrictive Zoning

Canada is providing grants to provinces and municipalities who commit to incremental housing supply targets under the Housing Accelerator Fund. Canada also plans to attach zoning conditions to existing public transit funding and a new Canada Housing Infrastructure Fund.

The target of the Housing Accelerator Fund is to accelerate the supply of housing across Canada, resulting in at least 100,000 more housing units than would have occurred without the program by 2027, continuing towards an eventual goal of 750,000 incremental units over 10 years. The conditions attached to public transit funding and new Canada Housing Infrastructure Fund do not have independent targets and we assume their impact will contribute towards the achievement of HAF targets rather than resulting in independent incremental supply.

The potential impact of Housing Accelerator Fund programs could be assessed based on the specific measures to which municipalities have committed or based on the targets accepted by municipalities.

It is difficult to assess the potential impact of the Housing Accelerator Fund based on the specific measures to which municipalities have committed. As far as we can determine, the best model for the impact of municipal commitments is that set out by Jens von Bergmann et al, who estimate that Small Scale Multi-Unit Housing and Transit Oriented Areas implemented in British Columbia would create 216,000 to 293,000 incremental net new dwellings over the course of ten years, reducing house prices by 6% to 12% relative to what they otherwise would have been.[35] Unfortunately, this approach is very context-specific and many commitments made under the Housing Accelerator Fund are not sufficiently specific or clearly incremental to allow this approach to be applied.[36]

Regardless, the sufficiency of the specific measures to which municipalities have committed is not determinative since the municipalities could implement additional measures to reach their targets or implement collateral changes to other rules, like floor area ratios, development charges or inclusive zoning requirements, which would make development unviable even if their proposed measures would otherwise be sufficient to reach their targets.

Instead, we focus on the overall targets committed to by municipalities for which there is accountability, i.e. 100,000 incremental units by 2027. Initially, municipalities are only being held accountable for implementing the measures set out in their HAF

agreements.[37] However, in later years, the HAF requires attestations from local governments' Chief Financial Officers that their plan is viable, is on track to achieve its results (Year 3) and has achieved its results (Year 4).[38]

# Notes

[1] Statistics Canada, Core Housing Need.

[2] There are some definitional differences between total income on a tax basis and the associated components of income in the economic accounts. See Statistics Canada, Estimating household distributions on a System of Macroeconomic Accounts basis: Concordance for household disposable income. Of particular note is imputed rent for homeowners, which is included in net mixed income in the economic accounts income concept, but not included in the tax definition of total income used to assess core housing need. Due to these accounting differences, we model changes in total income as a function of a constant and the sum of compensation of employees and transfers by income quintile received, fitting to average household incomes by quintile across the 2006 to 2021 censuses. This approach provided a better fit than indexing to the full economics accounts total income concept, especially for the bottom income quintile.

[3] For each component of income, PBO economic model only provides the projected change in average income. To address this, we construct a model of the relationship between overall changes in an income component and change in that income component for each quintile, using data from 2000 to 2019. For example, across 2000 to 2019, the increase in compensation of employees per household in the lowest household income quintile was an average of 79% in the overall increase compensation of employees per household.

[4] Rents are 89% of shelter costs for renters and mortgage payments are 59% of shelter costs for homeowners with mortgages. PBO analysis of Statistics Canada 2021 Survey of Household Spending.

[5] Specifically, at the annual growth rate for those expenditures per household between 2010 and 2021 in the Survey of Household Spending.

[6] This simplifying assumption of fixed principal repayment would not hold in some cases, such as for variable interest rate mortgages during the term of the mortgage where the trigger rate is reached, or where individuals choose a longer amortization period in order to offset higher interest costs.

[7] As noted earlier, this model is intended to reflect changes in the cross-section of households over time rather than the experience of specific households over time. New households become households with mortgages when they finance the purchase of their first home, while some existing homeowners with mortgages pay off their mortgages or move out of homeownership.

The PBO economic model includes a projection of household debt, of which mortgage debt is the largest component and accounts for most growth. We model mortgage debt across data for 1990 to 2024 fitting the equation "LOG(Mortgage Debt) = 0.630248665581*LOG(HDEBT) + 2.85264200937 + 0.0262210283002*@TREND" (Adj. $R^2$=99.6%).

[8] We aren't aware of any existing multi-year projections of national shelter costs. This projection is the population-weighted average of CMHC's projected growth in rents for 2-bedroom apartments by CMA.

[9] It is not possible to identify households who were not assessed for core housing need prior to the 2021 Census PUMF. As a result, this figure reflects the share of all households in unsuitable, inadequate or unaffordable housing, who cannot afford market median rent and are not a student household.

[10] First Nations household living on-reserve are not assessed for housing need, making core housing need a particularly poor outcome indicator for the indigenous housing strategies. Nevertheless, it is worth noting that some off-reserve First Nations households, Metis households and Inuit households may be removed from housing need as a result of programs funded under the indigenous housing strategies.

[11] Units with 0 bedrooms are rare outside of census metropolitan areas. As a result, median market rents (where missing) were imputed based on the national average median market rent outside census metropolitan areas.

Consistent with CMHC's core need income threshold methodology, a few adjustments were made for inversions where, due to other characteristics like location and quality, the median rent is higher for smaller units. Specifically, the applicable median rent for an unattached individual was set to the rent for 1-bedroom apartment rather than the rent for a bachelor unit if the median market rent for 1-bedroom units was lower.

[12] See Statistics Canada, Household Sector Credit Market Summary.

[13] Alan Bentley, Enzo Cassino and Nam Ngo, What Drives Rents in New Zealand? National and Regional Analysis; KPMG, Study of the Impacts of Rent Control Policies.

[14] Christopher Farhi and James Young, Forecasting Residential Rents: The Case of Auckland, New Zealand.

[15] DLOG(PH) is potentially significant at the $p<0.1$ level, all other regressors were significant at the $p<0.001$ level.

[16] Greg Howard and Jack Liebersohn, Why is the rent so darn high? The role of growing demand to live in housing-supply-inelastic cities, Journal of Urban Economics, Volume 124, 2021.

[17] Due to an apparent structural break, a different trend was fit to the pre-2001 relationship between the rented accommodations component of the consumer price index and average rents reported in the census.

[18] In the base year for the census income data, 2020, some households would have already been receiving the Canada Housing Benefit. In addition, through the indexation of record weights for population growth, the same initial record represent an increasing number of households over time, meaning that there are proportionately more households implicitly receiving the Canada Housing Benefit. The number of households receiving the Canada Housing Benefit is deducted from the number of potential beneficiaries to estimate the number of incremental beneficiaries.

[19] Even though increases in after-tax income and decreases in shelter costs both have the same impact on the funds available for households for other purposes after paying for shelter, a much larger increase in income than decrease in shelter costs is needed to remove a household from the definition of core housing need. For example, a household with a monthly income of $2,000 a month and monthly rent of $1,000 a month would still be considered in core housing need if they received a $500 per month housing benefit ($1,000 in rent represents 40% of a $2,500 per month income), but not if their rent was reduced by $500 ($500 in rent represents 25% of a $2,000 per month income).

[20] CMHC, Progress Report on National Housing Strategy 2023Q4.

[21] BC Housing, 2024/25 – 2026/27 Service Plan.

[22] The Ontario cost data was used because we were able to obtain high-quality data indicating specifically the number of low-income households support and associated expenditures. With a claimed 95,000 low-income units supported in 2021-22, Ontario also accounts for about 40% of all low-income units supported. The cost was validated against the average cost per low-income unit under the Federal Community Housing Initiative.

[23] CMHC, Progress Report on the National Housing Strategy (Dec 2023).

[24] Department of Finance, 2024 Budget.

[25] Immigration, Refugees and Citizenship Canada, 2024 Annual Report to Parliament on Immigration.

[26] See for example Immigration, Refugees and Citizenship Canada, Supplementary Information for the 2023-2025 Immigration Levels.

[27] Specifically, net immigration and the annual change in non-permanent residents were fixed at the 2007-08 to 2016-17 average absolute growth. Our counterfactual projection matches Statistics Canada's latest M1 population growth scenario for all other aspects of population growth (i.e. births, deaths, and net emigration).

[28] In addition, in the counterfactual the years of 2016 to 2027 needed to be dropped then interpolated prior to rescaling to take out the increase in young non-permanent residents.

[29] Congressional Budget Office, The Outlook for Housing Starts.

[30] CMHC, Progress Report on the National Housing Strategy (June 2024).

[31] Department of Finance, Government introduces legislation to build more rental homes and stabilize grocery prices.

[32] Department of Finance, Budget 2024.

[33] The estimated cost savings from the GST cut for purpose-built rental units is based on the PBO projected tax expenditure for 2027 ($1,565 million) divided by total annual investment in residential construction ($53.6 billion). The cost savings for the accelerated capital cost allowances are based on a 10% return on deferred tax obligations and divestment after 10 years (0.4% tax savings) discounted for 62% of starts being apartments based on 2023Q4 starts. The interest rates savings under the Apartment Construction Loan Program assume a 1% reduction in interest rates over 10 years on a mortgage for 85% of project costs, available to projects with 7,100 units each year, representing 3.2% of total starts.

[34] This price elasticity of new construction is a raw average of elasticities estimated in Aled ab Iorwerth, Tim Gensey, Patrick Perrier, Estimating Canada's Housing Supply Shortages to 2030: Technical Companion Paper. Units created prior to 2025 are already included in the base housing stock for the main projection.

[35] Jens von Bergmann, Tom Davidof, Albert Huang, Nathanael Lauster and Tsur Somerville, SSMUH and TOA Scenarios in British Columbia.

[36] As an example of a proposal lacking specificity, a municipality committed to establishing incentives for secondary suites, but did not specify the amount of the incentive or program conditions. As an example of unclear incrementality, the same municipality committed to allowing rowhomes as of right where previously they would have required a routinely approved permit.

[37] The Star, Oakville told to pay back federal housing money after it rejects density.

[38] CMHC, Housing Accelerator Fund Pre-Application Reference Material.

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