



Predicting Shelter-users Research

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TABLE OF CONTENTS

1	BACKGROUND.....	1
2	EXPLORING 2020 DECLINE IN SHELTER-USERS	3
3	PREDICTING SHELTER-USERS.....	7
	3.1 The Data.....	7
	3.2 Estimating the Models	10
4	ESTIMATION RESULTS – MODEL 1 TO 12	13
5	MAIN MODEL – MODEL 12 RESULTS	14
	5.1 Results.....	14
	5.2 Result Implications	15
	5.3 Performance	16
	5.4 Summary of Implications for Model Performance	18
6	FORECASTING SHELTER-USERS.....	18
	6.1 Scenario 1: Strong Economic Growth.....	19
	6.2 Scenario 2: Moderate Economic Growth.....	20
	6.3 Scenario 2: Moderate Economic Growth.....	21
7	CONCLUSION.....	22

1 BACKGROUND

Shelters are pivotal in supporting Canada's most vulnerable population groups. For the less fortunate, shelters are often their only source of safety from the elements, for essential services, and for basic necessities like food, clothing, and shelter. With the foregoing in mind, it is vital that the demand for shelters be accurately estimated in a timely manner to ensure that the appropriate resources are allocated to meet the needs of those most vulnerable.

An important point to note is that the number of shelter-users and the number of people homeless may not always have a direct and positive relationship. There are many reasons for this, some of which include:

Shelters' accessibility and capacity

When the capacity at shelters is exhausted, or when accessibility to shelters is not ideal, the number of shelter users may plateau even if the number of homeless increases. On the other hand, if capacity and accessibility is improved, people who would have previously not considered using shelters may use them, increasing the number of shelter users but not necessarily the number of homeless.

Definition of Homelessness

The total number of homeless includes, according to the definition by the Canadian Observatory of Homelessness, along with those in emergency shelters, all people living rough (on the streets, parks, wooded areas, abandoned building, etc.), those provisionally accommodated (those whose accommodation is temporary or lacks the security of tenure), and those at risk of homelessness (those whose current economic and/or social situation is precarious or does not meet public health and safety standards. The circumstantial change in the number of any of these other categories would increase the number of people homeless, even if the number of shelter-users decline.

Weather

During colder seasons, the number of shelter-users may increase while not necessarily increasing the total number of those homeless.

Stigma and/or Cultural Influences

Some homeless individuals may avoid the use of shelters all together due to social stigma, rules, and/or other safety concerns. For example, homeless-females may avoid shelters if there were no female-only shelters. These factors influence the number of shelter-users independently of the total considered homeless.

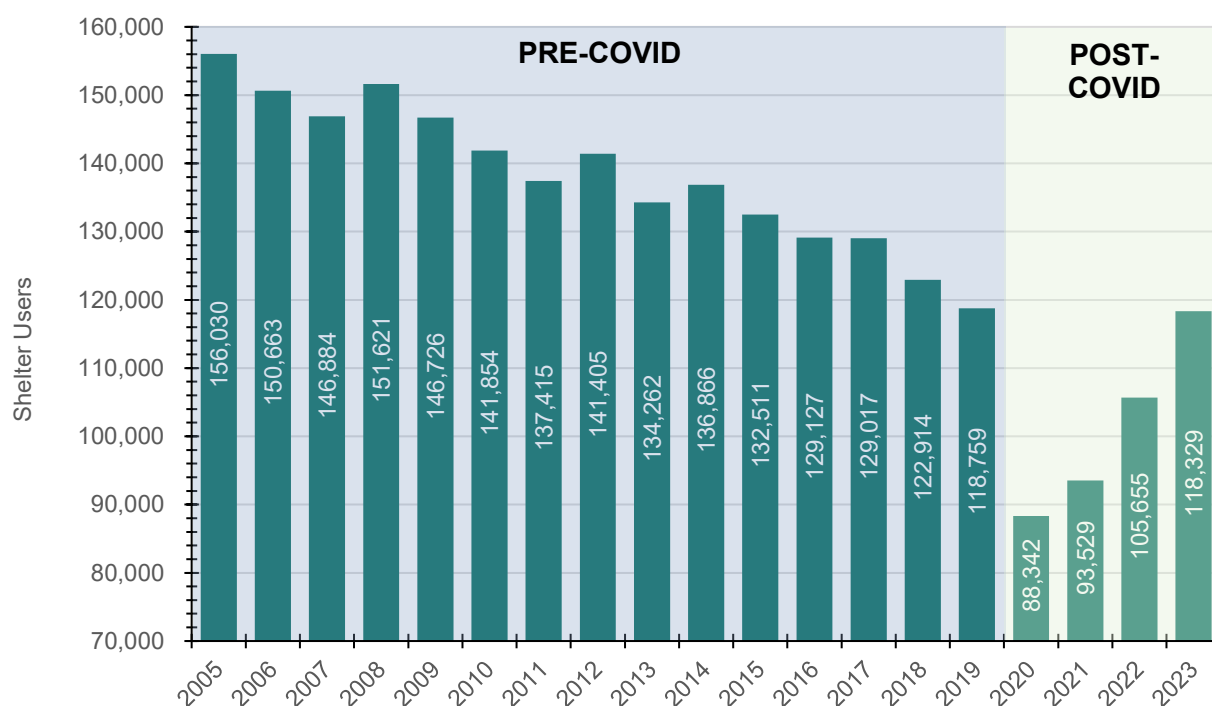
The National Shelter Study 2023,¹ published by Housing, Infrastructure and Communities Canada (HICC), and using data collected from the Homeless Individuals and Families Information System (HIFIS), is an ongoing analysis of trends in the use of homeless shelters in Canada. This study analyzes about 50% of all shelters in Canada, which is thought to represent about 70% of available shelter beds in the country. Shelter-users are only counted once if they are observed to be using multiple shelters to avoid double counting. Domestic violence shelters, immigrant and refugee shelters, and transitional housing are all excluded from the study.

¹ Government of Canada. (2024). [Homelessness Data Snapshot: The National Shelter Study 2023](#). Housing, Infrastructure and Communities Canada.

In 2023, the study found that there were 118,329 shelter-users across the covered communities in Canada. This figure is up 12.0% (+12,674) from 2022 when the figure was 105,655. The 2022 figure itself was an increase of 13.0% over 2021 (93,529), and the 2021 figure represented an increase of 5.9% over 2020 (88,342). Taking a four-year view from 2020 to 2023, the number of shelter-users have grown at a rate of 10.2% per year, and by a striking 33.9% overall; an increase of 29,987 people between 2020 and 2023.

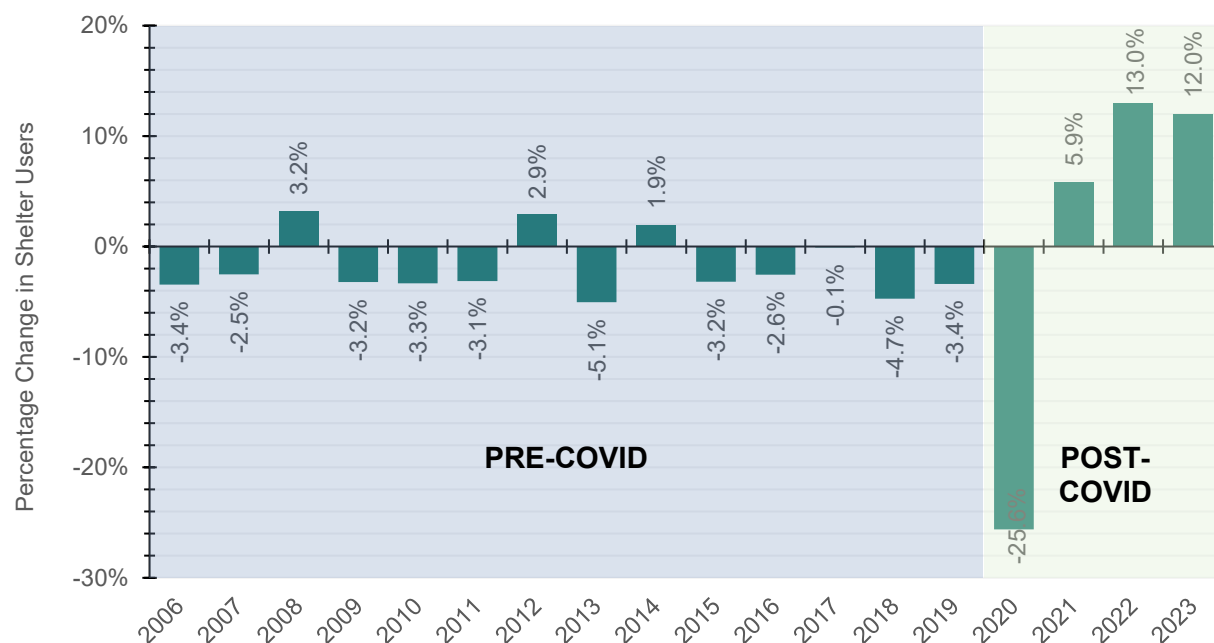
A longer-term analysis paints a more positive picture. The 2023 figure of shelter-users at 118,329 is 430 less than what it was in 2019 (118,759), a decline of 0.4%. Since 2005, the earliest year for which data is available, the number of shelter-users have declined by 24.2% (2005: 156,030), representing a 37,701 decrease in shelter-users by 2023. In fact, between 2005 and 2023, the number of shelter-users in Canada (across the areas covered by The National Shelter Study) have declined at a rate of 1.5% per year.

Figure 1: Shelter-users in Canada



Source: The National Shelter Study 2023 & TDP

Figure 2: Percentage change in shelter-users in Canada



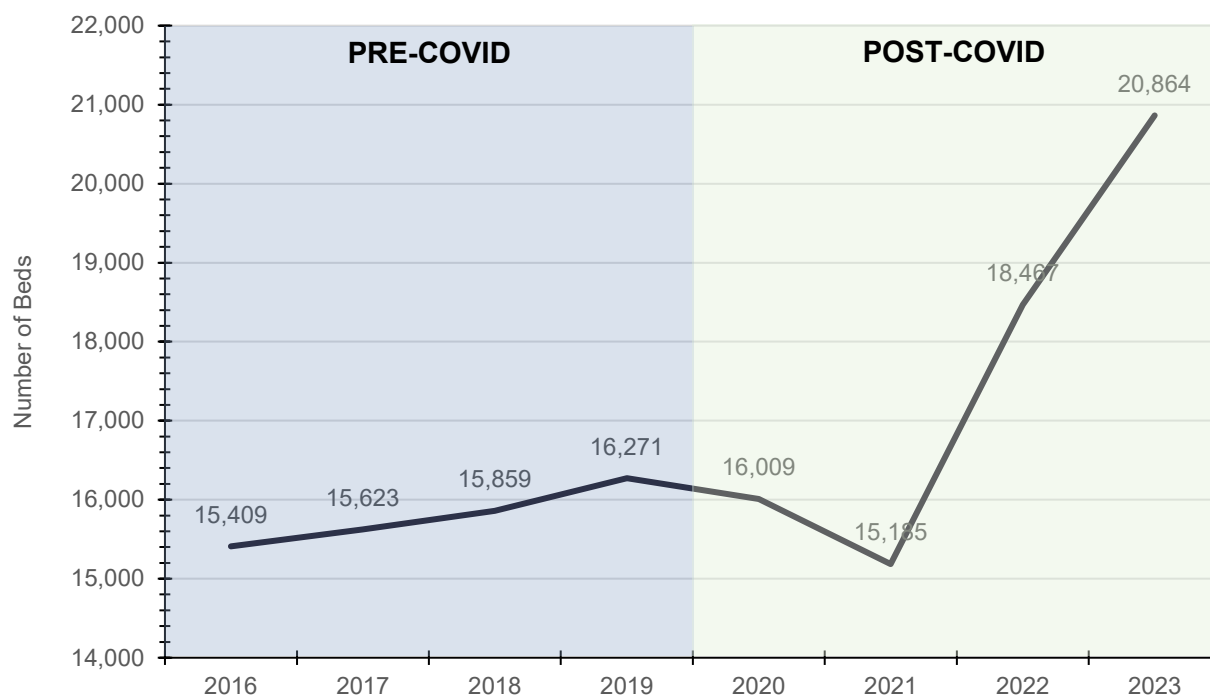
Source: The National Shelter Study 2023 & TDP

The longer-term view makes it clear that the trend in shelter-users across the country can be divided into two periods: pre-covid and post-covid. There was a clear and consistent downward trend in the number of shelter-users from 2005 to 2019, falling by an average of 1.9% per year. The number then drops by 25.6% (-30,417) between 2019 and 2020, when COVID-19 started. Since 2020, the number of shelter-users have been on an upward trend, growing at an average of 10.2% per year, almost equaling the 2019 figure by 2023.

2 EXPLORING 2020 DECLINE IN SHELTER-USERS

One thing that is clear from the long-term data is the notable decline in shelters users between 2019 and 2020. The decline in the number of shelter users could be attributed to many shelters reducing capacity to ensure social distancing guidelines during COVID-19 associated lockdowns in 2020.

Figure 3: Number of beds (i.e., capacity) in shelters across Canada



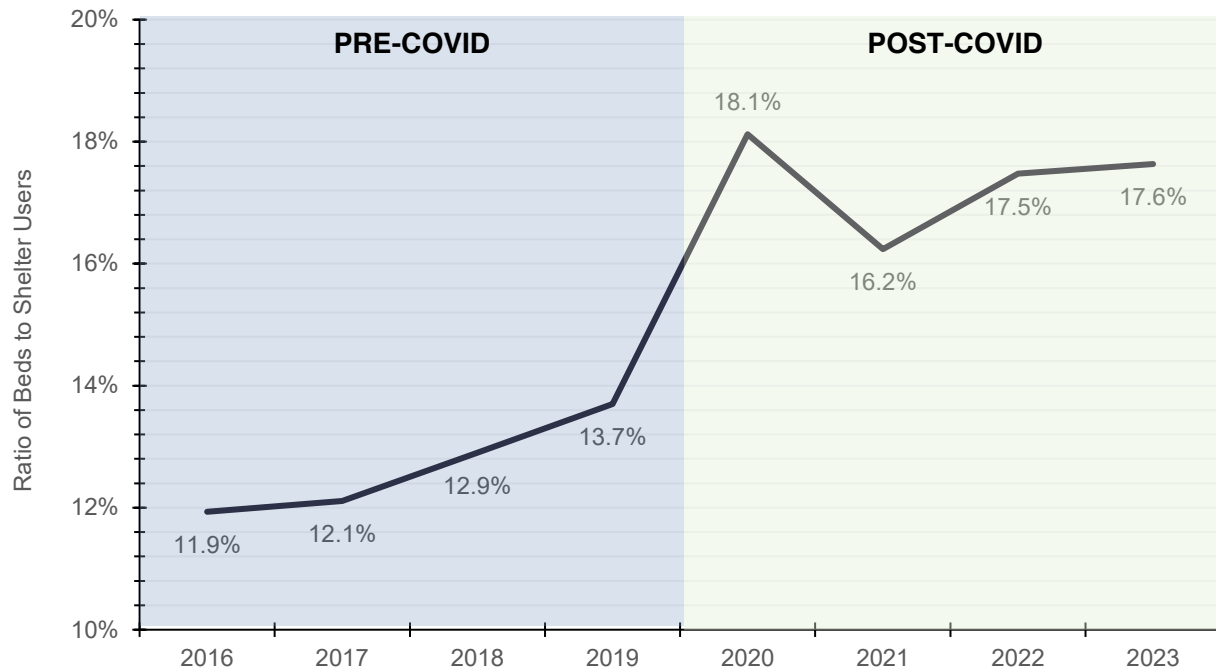
Source: Statistics Canada, Table 14-10-0353-01 & TDP

Looking at the capacity at shelters across Canada, we see a decline in the number of beds between 2019 (16,271) and 2020 (16,009) of 262. However, this does not come close to explaining the totality of the 30,417-person decline in shelter users between the two years.

The number of beds at shelters declined by an even greater number of 824 between 2020 and 2021 (15,185). Canadian shelters increased their capacity in 2022 to 18,467 (an increase of 3,282 over 2021), and then again in 2023 to 20,864 (an increase of 2,397 over 2022). By 2023, the number of beds at shelters were the highest in record. As discussed earlier, the number of shelter-users increased in 2022 (+13.0% over 2021) and 2023 (+12.0% over 2022) as well.

The data on shelter-users reflect individuals who experienced at least one night at a shelter in the given year. If the annual total of unique shelter-users required shelter services on the same night, there would be capacity for less than 20%. In 2020, when Canada recorded its lowest number of shelter-users, there were enough capacity for only 18.1% of the total. As of 2023, with growing number of shelter-users in the country, shelter capacity would drop to 17.6%.

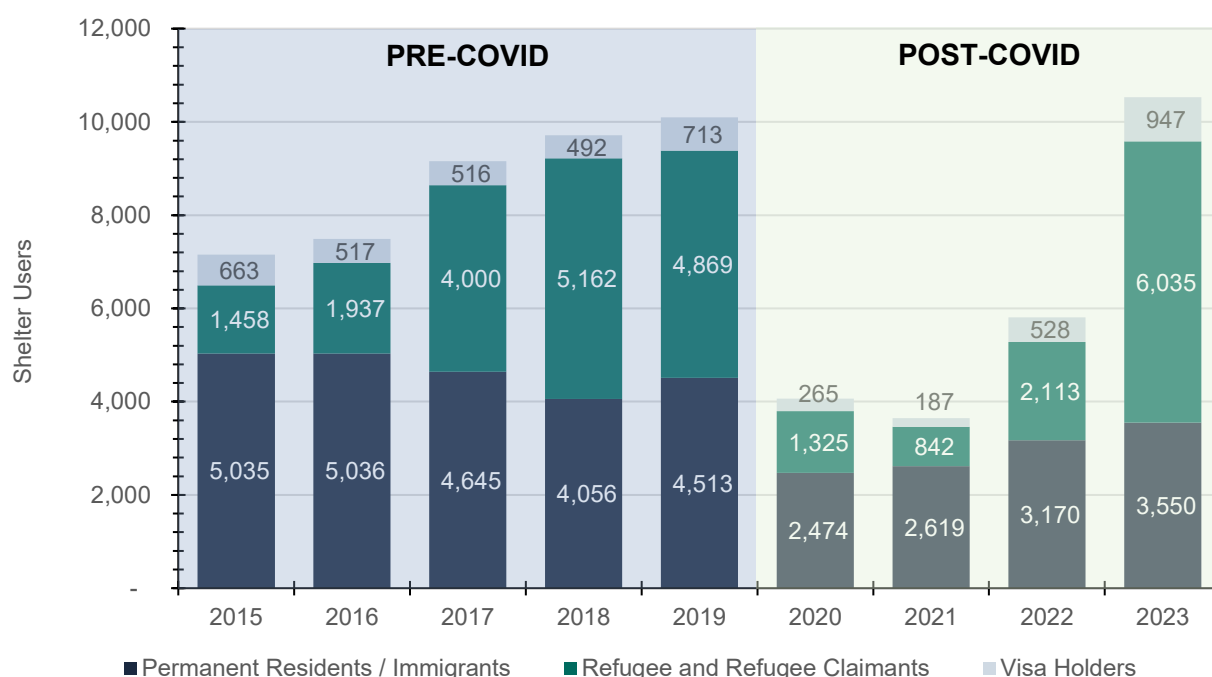
Figure 4: The share of beds (i.e., capacity) at emergency shelters as a share of annual shelter-users



Source: Statistics Canada, Table 14-10-0353-01, The National Shelter Study & TDP

Another decrease in the number of shelter-users in 2020 could be attributed to low global mobility due to the pandemic. The National Shelter Study 2023 reported on shelter-users by immigration status, which found that the number of shelter-users who were immigrants/permanent residents, refugee and refugee claimants, or visa holders declined by 6,031 between 2019 (10,095) and 2020 (4,064).

Figure 5: Shelter-users by immigration status



Source: Statistics Canada, Table 14-10-0353-01, The National Shelter Study & TDP

Among the three immigration categories, the largest decline in 2020 was observed for refugee and refugee claimants, which dropped from 4,869 in 2019 to 1,325. The number of shelter-users who were visa holders (student or work permits) also declined between 2019 (713) and 2020 (265) by 488 people.

Since 2020, Canada has played a major role in global geopolitics, accepting refugees and refugee claimants from Afghanistan after the Taliban take-over of that country in 2021; from Ukraine since Russia's invasion of the country in early 2022; from various Latin American and Caribbean countries in efforts to mitigate regional displacement; and many other countries such as Syria, Somalia, and Eritrea where there are cases on humanitarian need.

By 2023, 6,035 shelter-users were refugee or refugee claimants, an increase of 355.4% (+4,710) since the low of 2020. With Canada also recording historic numbers of visa holders in the country over the last few years, the number of shelter-users who were visa holder also increased to 947 in 2023, 257.2% (682) more than in 2020. The number of permanent resident shelter-users have also been growing since 2020, having reached 3,550 by 2023 compared to 2,474 in 2020, but remain below the 2019 figure of 4,513 and also lower than every recorded figure prior to 2019.

The combined effects of the decrease in shelter beds and the decrease in global mobility account for 6,293 (20.7%) of the 30,417-decline in shelter-users in 2020. The remaining 24,124 may be attributable to indeterminable factors such as fear of infection (where people would rather live rough than in close contact with others at shelters), increased government support (where government assistance enabled people to avoid/postpone homelessness, defer loans, etc.), and eviction moratoriums (which meant tenants were able to occupy units despite missing shelter payments).

3 PREDICTING SHELTER-USERS

3.1 The Data

It is important to be able to accurately estimate and predict shelter-users not only for optimal resource allocation in terms of shelter services, but also for policy development to be proactive in addressing homelessness. The use of emergency shelters is determined to come a step before homelessness in the [housing continuum](#), according to Canada Mortgage and Housing Corporation (CMHC, 2018).

We build and test various models to estimate the relationship between a vector of socio-economic indicators and the number of shelter-users in Canada. Based on the results of these models we determine how well these relationships could be used to accurately replicate historic numbers for shelter-users. We then use the best model to predict the number of shelter-users over the coming years.

In its simplest form, the model is laid out as:

$$Y_t = \beta_0 + \beta_x X_{xt} + \varepsilon_t;$$

Where, Y_t is the number of shelter-users in Canada in year t ; X is a vector of socio-economic indicators that affect Y_t ; β_{xt} is the magnitude of the effect of X on Y ; and β_{0t} is the constant.

For the ease in the interpretation of β_{xt} , we transform the equation into a *log-log* form, meaning that we apply logarithmic transformations to all variables on both side of the equation. Doing this allows us to express β_{xt} in terms of elasticity, or the percentages change in Y_t due to a one-percentage change in X_{xt} . We then have the equation:

$$\log(Y_t) = \beta_0 + \beta_x \log(X_{xt}) + \varepsilon_t;$$

As mentioned earlier, Y_t , the dependent variable is the annual number of shelter-users in Canada from 2005 to 2023, as collected by HICC from the HIFIS. These annual figures include the number of unique individuals who checked-in at emergency shelters across Canada, excluding domestic violence shelters, immigrant and refugee shelters, and transitional housing each year. We collected this data from the National Shelter Study 2023.

The data for the vector of socio-economic indicators, denoted by X_{xt} , were all collected in October of 2024. Since then, some of them have seen updates to previously released data points, and data points for later periods have added. We have not updated the data for these variables since they were initially collected.

The vector of independent socio-economic variables used to explain changes in the number of shelter-users include:

Government Spending (General Governments Expenditure)²

General governments expenditure includes the unadjusted aggregated expenses incurred by the federal, provincial, municipal, and other local governments collected from Statistics Canada. This considers annual spending by governments like old age security, social assistance, family and youth allowances, Canada child benefit, school spending, etc., among others.

The justification for the inclusion of this indicator is that spending that governments incur to directly influence shelters and their usage through the allocation of resources towards social programs, poverty reduction measures, and various housing initiatives. For instance, increased government spending in programs related to affordable housing, social welfare, mental health services, employment protection, and unemployment benefits, among others can help reduce the number of individuals needing to use emergency shelters in any given year.

Building Construction Price Index (BCPI)³

The building construction price index (BCPI) measure the change in the costs to construct a new residential building in Canada. The index is available for 11 census metropolitan areas (CMAs) and a composite of all the CMAs. We take the composite index a proxy for the index of the country. The price of constructing a building is considered to include the value of materials, labour, equipment, overhead, and profit represented by the construction contractor's bid price for a new building project. Costs for land, land assembly, building design, land development, and real estate fees are all excluded.

As construction costs rise, the development of new housing becomes more expensive and thus reduced. Low numbers of new inventory coming to the market, during times of high demand, increases the price for the ones in the market, proving detrimental to affordable housing stock. This exacerbates housing shortages, especially for low-income households, and increases the demand for emergency shelters.

Gross Domestic Product (GDP)⁴

Gross domestic product (GDP) at market prices of Canada is the total annual monetary value of all final goods and services produced within Canadian borders. GDP at market prices would be taken in essence as the measure of the economic well-being of the country.

In our models, GDP acts as an indicator of housing market dynamics. GDP growth correlate with housing demand and supply. Rapid growth in GDP, may correlate with higher home prices and rents, as was the case between 2020 and 2022. If wages do not increase accordingly, this has the potential to push low-income households into shelter usage.

² Statistics Canada. Table 36-10-0477-01 Revenue, expenditure and budgetary balance - General governments (x 1,000,000). DOI: <https://doi.org/10.25318/3610047701-eng>

³ Statistics Canada. Table 18-10-0276-01 Building construction price indexes, by type of building and division, inactive. DOI: <https://doi.org/10.25318/1810027601-eng>

⁴ Statistics Canada. Table 36-10-0222-01 Gross domestic product, expenditure-based, provincial and territorial, annual (x 1,000,000). DOI: <https://doi.org/10.25318/3610022201-eng>

Population⁵

The annual number of people living in Canada as estimated by Statistics Canada. The latest data point used in our models was annual population estimates as of July 1st, 2023.

A larger and growing population means a larger and growing housing need, which when unmet increases the reliance on shelters. Canada has seen rapid population growth over the last five years, while the supply of affordable housing has not grown proportionally. Population growth, without adequate adjustments to housing supply, will have a direct and positive relationship with housing demand.

Unemployment⁶

The number of people without employment, or as a share defined as the proportion of the labour force without employment, but actively seeking one is also added as an explanatory variable in our model. As such, when unemployment is high, a larger share of families may experience reduced incomes, increasing the likelihood of shelter-use. Unemployment also exacerbates challenges related to mental health and other social factors, which influence housing instability.

Average Rental Price⁷

We used the average rent data from Canada Mortgage and Housing Corporation (CMHC) as another one of our explanatory variables. As rental prices increase, low-income households may struggle to maintain stable housing, leading to an increase in the use of shelters. Rising rents can also outpace wage growth, disproportionately affecting vulnerable populations and pushing more people into housing insecurity.

Other Variables

Some other variables that were included in our models but proved not significant were:

- a) Consumer Price Index (CPI)⁸ was included with the reasoning that an increase in the overall price level would lead to higher levels of unaffordability. The variable proved insignificant likely due to its correlation with the BCPI. Components of CPI like costs of rented and owned accommodation were also tested but proved insignificant.
- b) Average Individual Income⁹ was included with the reasoning that a higher income level would lower the likelihood of shelter use. The variable proved insignificant likely due to its correlation to GDP.
- c) Low Income Measure After Tax (LIM-AT)¹⁰ represents the number of people earning an average income less than a threshold set for that year. This variable was included with the reasoning that the lower than number of people earning an annual income

⁵ Statistics Canada. Table 17-10-0005-01 Population estimates on July 1, by age and gender.

DOI: <https://doi.org/10.25318/1710000501-eng>

⁶ Statistics Canada. Table 14-10-0023-01 Labour force characteristics by industry, annual (x 1,000).

DOI: <https://doi.org/10.25318/1410002301-eng>

⁷ Canada Mortgage & Housing Corporation. [Housing Market Information Portal](#).

⁸ Statistics Canada. Table 18-10-0005-01 Consumer Price Index, annual average, not seasonally adjusted.

DOI: <https://doi.org/10.25318/1810000501-eng>

⁹ Statistics Canada. Table 11-10-0239-01 Income of individuals by age group, gender and income source, Canada, provinces and selected census metropolitan areas. DOI: <https://doi.org/10.25318/1110023901-eng>

¹⁰ Statistics Canada. Table 11-10-0135-01 Low income statistics by age, gender and economic family type.

DOI: <https://doi.org/10.25318/1110013501-eng>

less than the threshold for the given year, the lower than likelihood of high shelter use.

- d) Perceived Mental Health¹¹ was included in our models due to the evidence from The Homeless Hub,¹² a project of the Canadian Observatory on Homelessness, that in general, “30-40% of those experiencing homelessness have a mental illness (this figure climbs to 76% in one international study of wealthy countries that also included substance use disorders).” The reasoning is that the higher the prevalence of low perceived mental health, the higher the number of shelter-users. The variable, however, proved insignificant likely due to the lack of data. Data on mental health was only available from 2015 to 2022.
- e) Rental Units¹³ was included with the reasoning that there would be a negative relationship between the number of rental units in the market and the number of shelter-users. The variable proved to be insignificant likely due to the correlation between the change in the BCPI and the change in the rental unit inventory.
- f) Social Protection Spending and Spending on Housing and Community Amenities by the federal Government¹⁴ was included with the expectation to see a negative correlation between these spendings and the number of shelter-users. The variable proved to be insignificant due to lack of data (the data is only available since 2008) and due to correlation with general government expenditure.

3.2 Estimating the Models

Various models were tried and tested using the variables mentioned previously, of which the 12 most significant and accurate are shown in the table on the next page (Table 1). The coefficients of which of the variables to explain the changes in shelter-users, the level of significance for each of the coefficients, values for the R^2 and the adjusted R^2 , the F statistic, as well as the results for the Breusch-Pagan and White tests are all listed in the table.

This section will, however, focus only on the two best models that describe the changes in the number of shelter-users in Canada between the years 2005 and 2023. The two models were considered best, based on the combination of the level of significance of their coefficients and the various test results, which will be discussed in detail.

Model 1

The first model deemed best is Model 1, which takes the log-log form of:

$$\log(\text{shelter} - \text{users}_t) = \beta_{0t} + \beta_1 \log(\text{spending})_t + \beta_2 \log(\text{BCPI})_t + \beta_3 \log(\text{unemployment})_t + \beta_4 \log(\text{arp})_t + \varepsilon_t;$$

where *spending* is general government expenditure, *BCPI* is building construction price index, *unemployment* is the number of people actively looking for employment, and *arp* is average rental price.

¹¹ Statistics Canada. Table 13-10-0096-03 Perceived mental health, by age group. DOI: <https://doi.org/10.25318/1310009601-eng>

¹² Homeless Hub. (2025). [Mental Health](#).

¹³ Canada Mortgage & Housing Corporation. (2025). [Housing Market Information Portal](#).

¹⁴ Statistics Canada. Table 10-10-0024-01 Canadian classification of functions of government, by general government component (x 1,000,000). DOI: <https://doi.org/10.25318/1010002401-eng>

Diagnostic results of the Model are as follows:

- The R^2 , or the coefficient of determination, measures how well the independent variables in the model explain the variation in the dependent variable. With a value of 0.97, results suggest that 97% of the variance in shelter-users can be explained by the independent variables in the model.
- The adjusted R^2 , is an adjustment of the R^2 , to avoid overestimating the explanatory power of the independent variables. The adjusted value of 0.96, indicates that the model is robust, where 96% of the variance in shelter-users can be explained by the independent variables. However, the slight drop in the adjusted R^2 from the R^2 reflects some cost in terms of complexity.
- The F-statistic tests if the overall regression model is statistically significant. Model 1 has a F-statistic of 112.2, with a p-value of 0.00, indicating that the model is highly significant, and that the independent variables collectively explain the dependent variable well.
- The Breusch-Pagan (BP) test checks for heteroskedasticity, that is checking to see if the spread of the errors (differences between predicted and actual values) is uneven. It is ideal for the spread of the error to remain the same because it shows that your model is consistent and treats all data points fairly, no matter their values. If the error grows or shrinks based on the value (like larger errors for larger values), it suggests that the model is not doing equally well across all scenarios.
- The BP test result for Model 1 has a value of 5.30, and a p-value 0.26, suggesting no evidence of heteroskedasticity.
- The White test is a test similar to the BP test, where it tests for the presence of heteroskedasticity and other forms of model misspecification. The White test results for Model 1 has a value of 5.61, and a p-value of 0.06, suggesting very marginal evidence of heteroskedasticity. We, therefore, run the regression of the model again, with robust standard errors as a precaution. We see no change in coefficients, while their significance improves.

Model 12

The second model deemed best is Model 12, which takes the log-log form of:

$$\log(\text{shelter} - \text{users}_t) = \beta_{0t} + \beta_1 \log(\text{spending})_t + \beta_2 \log(\text{BCPI})_t + \beta_3 \log(\text{gdp})_t + \beta_4 \log(\text{population})_t + \varepsilon_t;$$

where *spending* is general government expenditure, *BCPI* is building construction price index, *gdp* is the gross domestic product of the country at market prices, and *population* is the number of people living in Canada as of July 1st of a given year.

Diagnostic results of the Model are as follows:

- With a value of 0.99, results suggest that 99% of the variance in shelter-users can be explained by the independent variables in the model.
- The adjusted R², of 0.98, indicates that the model is robust, where 98% of the variance in shelter-users can be explained by the independent variables.
- The F-statistic of 230.6, with a p-value of 0.00, indicating that the model is highly significant, and that the independent variables collectively explain the dependent variable well.
- The BP test result for Model 12 has a value of 4.91, and a p-value 0.30, suggesting no evidence of heteroskedasticity.
- The White test value of 5.11, and a p-value of 0.08, suggests very marginal evidence of heteroskedasticity. We run the regression of the model again, with robust standard errors as a precaution and see that the coefficients do not change while their significance improves.

4 ESTIMATION RESULTS – MODEL 1 TO 12

Table 1: Estimation results

Dependent Variable: log(shelter_users)												
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Intercept	18.69976***	-25.34888**	-16.86121	-20.3325	18.88411***	-1.39338	-9.13111	-472.4189	10.096888	14.16570 .	-55.08997***	-36.22474***
log(spending)	-1.18759***	-1.17725***	-1.12175***	-1.1896***	-0.45618***		-0.93898***	1.5253	-0.439579	-1.27905***	-1.12711***	-1.12486***
log(BCPI)	0.07038***	0.06974**					0.06398*	2.0237	-0.027107	0.07195*	0.07343***	0.06898***
log(unemployment)	0.22155**	0.17701*	0.18377*	0.1996*	-0.13006			1.3395	-0.062559	0.27562*		
log(arp)	1.06643***			0.3401				4.6069	-0.408969	1.03066*	-0.43969 .	
log(cpi)			0.53542					18.7013				
log(indiv_income)								7.9776	-0.1384	-0.07142		
log(gdp)						-0.59577		-22.3084	0.749968	0.46	-1.39936***	-1.31344***
log(LIM)						0.6084***		0.7711	0.093263			
log(pop_growth)								-0.3388	-0.009469	-0.0216		
log(m_health)												
log(rentals)								9.3671				
log(sp)								-4.7664				
log(cpi_rented)								-15.5082				
log(cpi_owned)								-18.9909				
log(population)		2.96192***	2.2963	2.558*		0.71816	1.91791***	36.767			6.04650***	4.71674***
log(housing_community)								NA	0.036914			
R2	0.97	0.98	0.97	0.97	0.91	0.95	0.97		0.99	0.97	0.99	0.99
Adj. R2	0.96	0.98	0.96	0.96	0.90	0.94	0.96	NA	0.97	0.96	0.98	0.98
F. Stat (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NA	0.00	0.00	0.00	0.00
Breusch-Pagan test (p-value)	0.26	0.07	0.45	0.48	0.17	0.29	0.04	NA	0.39	0.21	0.31	0.30
White test (p-value)	0.06	0.06	0.99	0.95	0.03	0.52	0.06	NA	0.39	0.04	0.05	0.08

Significance levels:
*** alpha=0
** alpha=0.001
* alpha=0.01
. alpha=0.05

5 MAIN MODEL – MODEL 12 RESULTS

While both model 1 and model 12 showed no major issues with heteroskedasticity and other model misspecification, model 12 performed better overall, explaining more variation in the data and showing a stronger relationship between predictors and the outcome. Thus, we adopt model 12 as the main model for the estimation and prediction of shelter-users in Canada.

5.1 Results

General Government Spending

- Every 1% increase in general government spending is associated with a 1.12%-decrease in the number of shelter-users.
- Government spending generally includes funding for social protections and programs, housing initiatives and funds, and other categories that directly or indirectly affect shelter use and homelessness. More spending on these resources, with the right plan can lower the number of people in need of housing.
- The results well-planned, well-targeted, and well-executed spending on homelessness, shelter-use, and related issues.

Building Construction Price Index (BCPI)

- Every 1% increase in the building construction price index (BCPI) is associated with a 0.07% increase in the number of shelter-users.
- An increase in the BCPI signals higher costs of construction materials and labour. The higher construction costs would lead to few housing projects and even fewer affordable housing being built.
- The effect is small at 0.07%, but it demonstrates a strong relationship between housing costs and the number of shelter-users in Canada.

Gross Domestic Product (GDP)

- Every 1% increase in the gross domestic product of Canada is associated with a decrease of 1.31% in the number of shelter-users across the country.
- This relationship between GDP and the number of shelter-users seems intuitive in the sense that a higher GDP should be associated with elevated standards of living.
- However, it is important to note that economic growth does not always benefit low-income groups of a country. This signals the importance to focus more on inclusive growth.
- Economic growth also leads to population concentrations in more urban areas, where higher living costs can exacerbate housing insecurity. Homelessness is more prevalent in urban areas because the risks of homelessness is higher in these areas. According to a

report on migration of shelter-users in Canada by Statistics Canada,¹⁵ most shelter-users do not migrate between cities, and there is no evidence in scientific literature supporting that “magnet theory,” which theorizes that those experiencing homelessness are drawn to larger and urban centres.

- Though this result suggests that GDP growth does reduce the number of shelter-users or those experiencing homelessness, targeted policies should be accompanied to aid those experiencing housing insecurity.

Population

- Every 1% increase in the population of Canada is associated with a 4.72%-increase in the number of shelter-users in the country.
- A growing population puts pressure in the housing market, especially in urban areas, which leads to higher demand and an increased usage of emergency shelters by those who cannot afford housing.
- The pressures of a growing population are not only felt in the housing market. A larger population puts pressure also on mental health services, social support systems, the labour market, etc. If these don't scale proportionally to the growth in population, people in the lower-income cohort may fall through the cracks.
- The large effect of 4.72% also points toward the lagging supply of housing relative to demand.

5.2 Result Implications

1. Government spending as a means to reduce risks of homelessness.

Results suggest a clear negative relationship between government spending and the number of shelter-users. It indicates that public investment in social programs and housing initiatives has the potential to significantly lower the risks of homelessness. These public investments could be direct funding for the construction of affordable housing, rent subsidies, favourable development environment for private developments, etc.

2. Rising costs to building construction and housing affordability.

The small but positive relationship between the BCPI and the number of shelter-users highlights the impact of construction costs on housing affordability. When the housing market is already constrained, even the slightest increase in costs can have a direct impact on the most vulnerable low-income households.

There are opportunities here to provide subsidies or tax incentives for developers to prioritize affordable housing projects, as well as to encourage innovation in construction techniques such as modular or prefabricated housing, to reduce overall costs.

3. Gross domestic product growth and inequality.

¹⁵ Government of Canada. (2022). [Homelessness data snapshot: Homelessness migration in Canada](#). Housing, Infrastructure and Communities Canada.

Results suggest that overall economic growth reduces the risk to homelessness. However, while GDP measures overall economic performance, it doesn't necessarily reflect on how the benefits of that growth are distributed.

Economic growth almost always leads to rising rents and housing prices, particularly in urban areas. Growth in these areas can exacerbate inequality if low-income populations don't benefit proportionally, leaving them vulnerable to housing insecurity.

Economic growth has to be paired with policies aimed at reducing inequality, with expanded social safety nets, progressive taxation, and higher minimum wages.

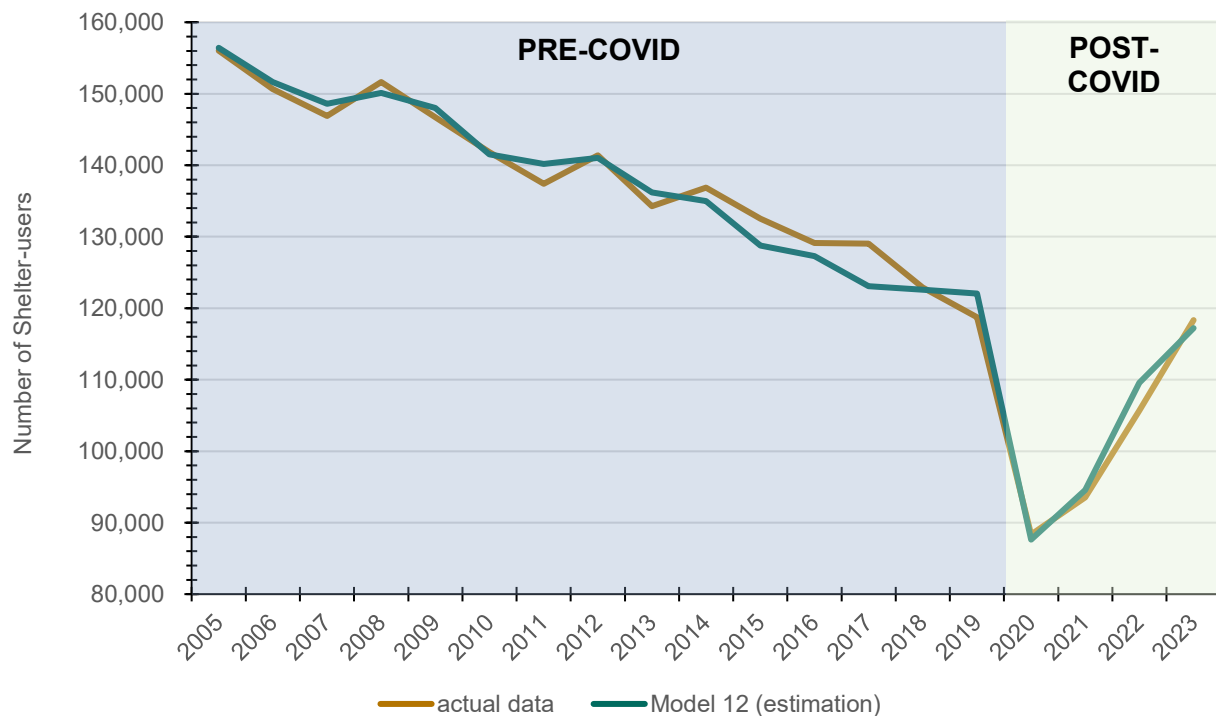
4. Population growth as a key driver of shelter-use.

Cities across Canada experiencing population boom over the last five years were all subject to housing crises, with increases in homelessness being a visible consequence of it. Without adequate planning and interventions, this trend could lead to worsening shelter-conditions, overcrowding, and increased demand for emergency shelters.

5.3 Performance

Model 12 consistently estimates numbers of shelter-users that are very close to the actual counts for every year between 2005 and 2023. This is an indication that model 12 effectively captures much on the underlying trends and key factors influencing shelter use.

Figure 6: Model 12 estimations and actual number of shelter-users, Canada, 2005 to 2023



Source: Turner Drake & Partners Ltd.

Table 2: Model 12 estimations and actual number of shelter-users, Canada, 2005 to 2023

Year	Actual Number	Model 12 (prediction)
2005	156,030	156,424
2006	150,663	151,640
2007	146,884	148,611
2008	151,621	150,138
2009	146,726	148,022
2010	141,854	141,538
2011	137,415	140,165
2012	141,405	141,020
2013	134,262	136,199
2014	136,866	135,005
2015	132,511	128,787
2016	129,127	127,308
2017	129,017	123,100
2018	122,914	122,585
2019	118,759	122,065
2020	88,342	87,629
2021	93,529	94,564
2022	105,655	109,564
2023	118,329	117,210

Source: Turner Drake & Partners Ltd.

The model's strength lies in its predictive abilities post-pandemic (from 2020 to 2023), likely as the independent variables in the model started to have a stronger impact on shelter-users since then. For example, in 2020, the actual number of shelter-users across Canada was 88,342, while model 12 estimated it would be 87,629.

More impressive is model 12's capability to predict direction of change. Over the study period, the model correctly predicted the direction of change for the number of shelter-users for each year, except 2014 (the model predicted a decline in shelter-users while the number had increased).

However, rather than eyeballing the performance of the model against actual values, it is important to run tests to diagnose the performance of the model. Such diagnostics can be performed through the calculations of the Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and Mean Absolute Percentage Error (MAPE).

Mean Absolute Error (MAE)

The MAE provides us with the average absolute difference between the actual number of shelter-users and the numbers that model 12 predicted. This metric shows how far the predicted values are from the actual values. The MAE for model 12 is 1,841.

Given that our values range between 80,000 to 160,000, a MAE of 1,841 is quite low, suggesting that the model is performing well in terms of predicting shelter-users.

Root Mean Square Error (RMSE)

The RMSE is the square root of the average squared differences between the actual and the predicted values. This metric shows us how spread out the mistakes made by the model are.

A RMSE of 2,345 for model 12 suggests that while the model is performing quite decently overall, there are some years, like 2014 and 2017, where the prediction error is much larger. This could be indicative of outliers or other factors that cause significant deviation in certain years, like an unusual demographic shift, policy change, economic shock, etc.).

Mean Absolute Percentage Error (MAPE)

The MAPE calculate the average absolute percentage difference between the actual and the predicted values. This metric expresses the error in terms of percentages. The MAPE for model 12 is 1.46%, which means that, on average, the model's predicted values are off by 1.46% compared to the actual number of shelter-users each year.

Although the value of the MAPE is a positive testament to the predictive abilities of model 12, particularly as a long-term dataset with many fluctuations, attention should be given to years where the deviation is greater than the average deviation.

5.4 Summary of Implications for Model Performance

- **MAE: 1,841**
Model 12 is mostly accurate in its predictions, with an average error of approximately 1,841 shelter-users. This gives a good sense of overall prediction accuracy but does not emphasize outliers.
- **RMSE: 2,343.35**
This shows that there are some years with larger errors, which is particularly useful for spotting outliers or years where the model's performance deviates significantly. The RMSE is higher than the MAE, indicating that larger errors are more common than frequent ones in model 12.
- **MAPE: 1.46%**
Model 12's predictions are, on average, within 1.46% of the actual number of shelter-users, which is a very good result in percentage terms. This suggests that the model performs consistently well when compared to the actual values, especially considering the long-time span of the data.

Together, these metrics paint a picture of a model that is generally accurate but may have some larger errors in certain years that are worth exploring further. The MAPE, in particular, is a strong indicator of the model's consistency in terms of relative error, but RMSE suggests some room for improvement in years with larger discrepancies.

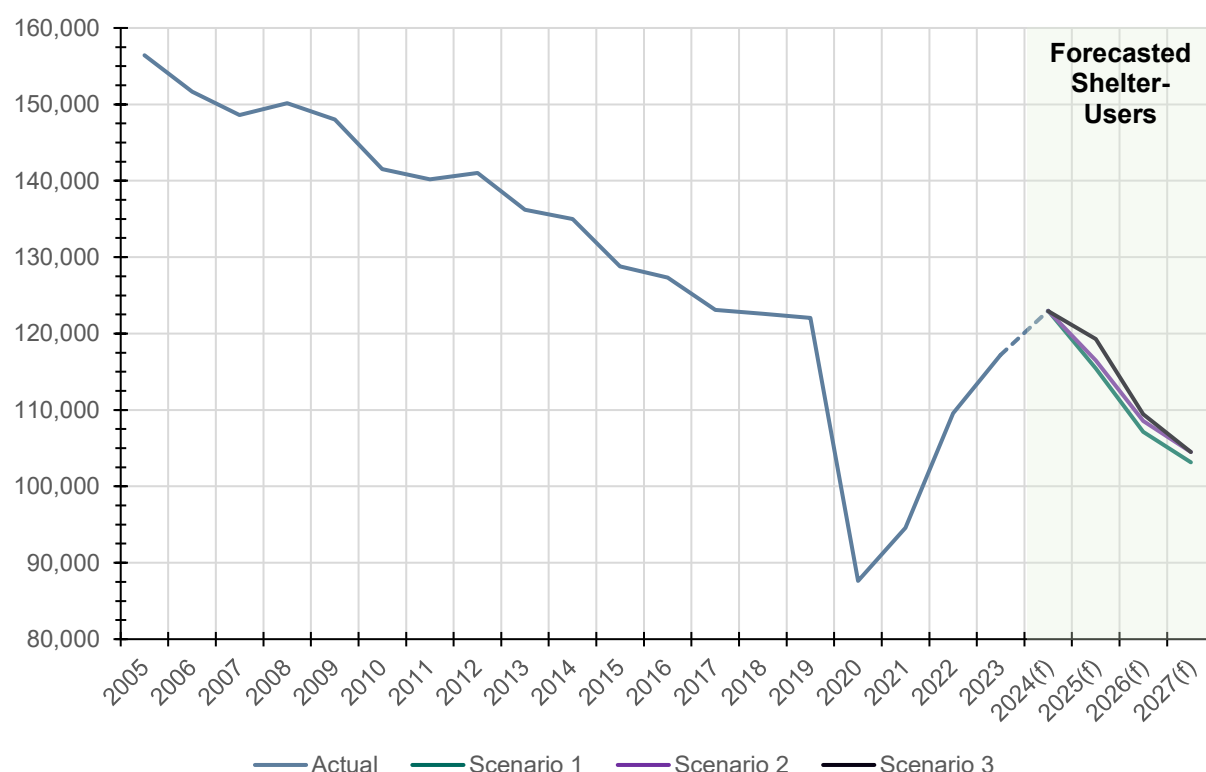
6 FORECASTING SHELTER-USERS

In 2024, there are forecasted to be 122,983 shelter-users across Canada, an increase of 4.9% or 5,773 people from the 2023 figure of 177,210. The 2024 are based on the preliminary

assumptions that GDP would grow by 1.3%; BCPI would grow by 2.1%; the population would grow by 3.0%; and government spending would grow by 7.0%.

Forecasts for the years 2025 to 2027 are conducted based on assumptions for the changes in GDP, BCPI, population, and government spending. While assumptions in the changes for GDP and BCPI change for each scenario, population changes in all scenarios are based the Immigration Levels Plan 2025 to 2027, and changes in spending in all scenarios come from federal budgetary projections. Thus, assumptions for population and government spending remain the same in all scenarios.

Figure 7: Actual and forecasted shelter-users by scenarios, 2005 to 2027



Source: Turner Drake & Partners Ltd.

6.1 Scenario 1: Strong Economic Growth

Scenario 1 assumes strong growth in GDP between 2025 and 2027; a constant growth in the BCPI; decline in the population as targeted by the Federal government and outlined in the Immigration Plan 2025 to 2027; and changes in government spending as projected in the Federal budget.

According to scenario 1, the following trends may be observed for shelter-users:

- **2023:** saw 117,210 shelter-users across Canada. According to scenario 1, the following trend will be observed for shelter-users between 2025 and 2027.
- **2024:** Shelter users are forecasted to rise at 122,983.
- **2025:** a gradual decline begins with 115,420 shelter-users.

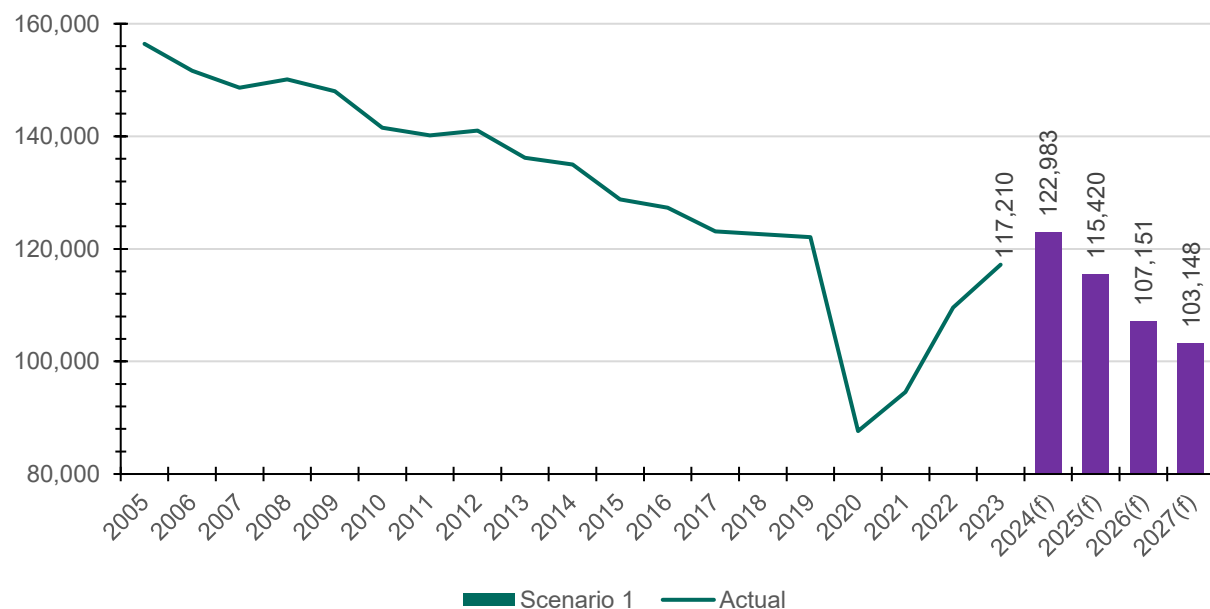
- **2026:** Decline maintain reaching 107,151 users.
- **2027:** Further decline to 103,148.

Table 3: Scenario 1 growth assumptions

GDP	BCPI	Population	Government Spending
1.3%	2.1%	3.0%	7.0%
1.7%	2.0%	-0.2%	3.0%
1.7%	2.0%	-0.2%	4.0%
1.7%	2.0%	0.8%	5.0%

Source: Turner Drake & Partners Ltd.

Figure 8: Scenario 1 forecasts, 2024 to 2027



Source: Turner Drake & Partners Ltd.

6.2 Scenario 2: Moderate Economic Growth

Scenario 2 assumes moderate growth in GDP between 2025 and 2027; a constant growth in the BCPI; decline in the population as targeted by the Federal government and outlined in the Immigration Plan 2025 to 2027; and changes in government spending as projected in the Federal budget.

According to scenario 2, the following trends may be observed for shelter-users:

- **2024:** 122,983 shelter users.
- **2025:** Decline begins at 116,488.
- **2026:** Reaches 108,573.
- **2027:** Further decrease to 104,497.

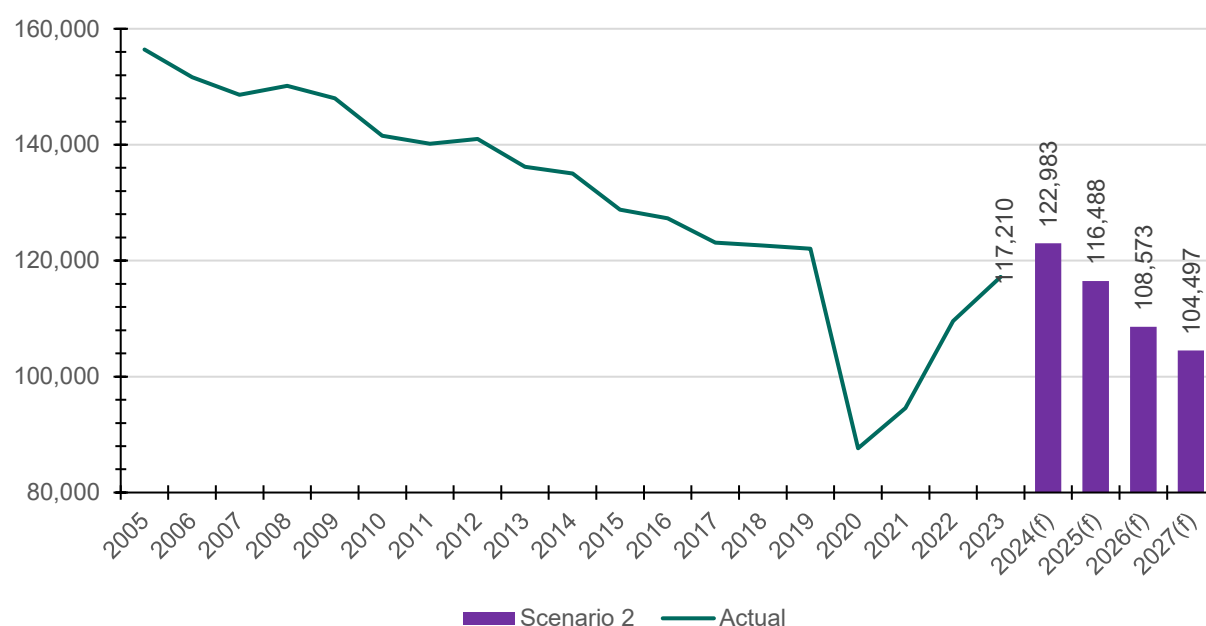
Scenario 2 suggests a similar pattern to Scenario 1, with a short-term rise followed by a gradual decline, though at slightly higher levels than Scenario 1.

Table 4: Scenario 2 growth assumptions

GDP	BCPI	Population	Government Spending
1.3%	2.1%	3.0%	7.0%
1.0%	2.2%	-0.2%	3.0%
0.7%	2.3%	-0.2%	4.0%
0.7%	2.0%	0.8%	5.0%

Source: Turner Drake & Partners Ltd.

Figure 9: Scenario 2 forecasts, 2024 to 2027



Source: Turner Drake & Partners Ltd.

6.3 Scenario 2: Moderate Economic Growth

Scenario 3 assumes slow growth in GDP between 2025 and 2027; a faster growth in the BCPI; decline in the population as targeted by the Federal government and outlined in the Immigration Plan 2025 to 2027; and changes in government spending as projected in the Federal budget.

According to scenario 2, the following trends may be observed for shelter-users:

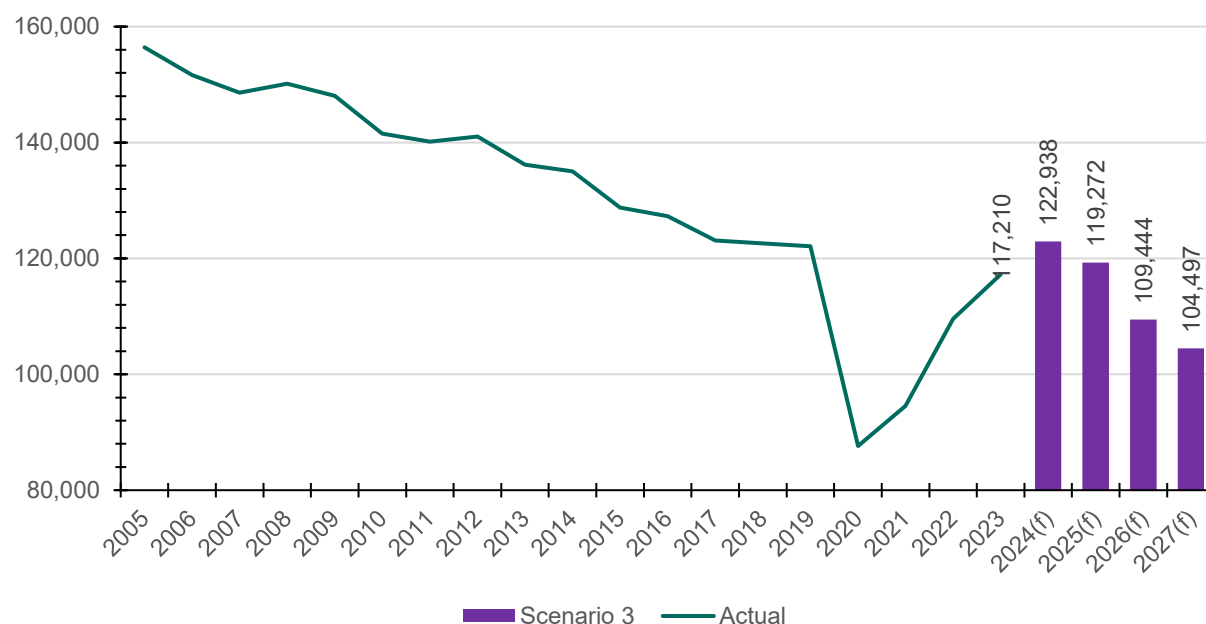
- **2024:** 122,983 shelter users.
- **2025:** Decline begins at 119,272.
- **2026:** Reaches 109,444.
- **2027:** Further decrease to 104,497.

Table 5: Scenario 3 growth assumptions

GDP	BCPI	Population	Government Spending
1.3%	2.1%	3.0%	7.0%
-0.8%	2.2%	-0.2%	3.0%
0.1%	2.5%	-0.2%	4.0%
0.7%	2.0%	0.8%	5.0%

Source: Turner Drake & Partners Ltd.

Figure 10: Scenario 3 forecasts, 2024 to 2027



Source: Turner Drake & Partners Ltd.

7 CONCLUSION

This analysis underscores the multifaceted nature of homelessness and shelter use in Canada, emphasizing the interplay of government spending, economic growth, construction costs, and population dynamics. Model 12 emerges as a robust predictive tool, effectively capturing these relationships and providing valuable insights into the factors influencing shelter-user trends.

The findings highlight key areas for intervention:

Targeted Government Spending:

Increased investment in social programs and housing initiatives has the potential to significantly reduce homelessness. Strategic allocation of resources, such as funding for affordable housing and support services, is essential to address shelter-user needs effectively.

Addressing Rising Construction Costs:

While the effect of building construction costs is smaller, it demonstrates the need for innovative and cost-effective housing solutions to improve affordability.

Inclusive Economic Growth:

While GDP growth correlates with reduced shelter use, it must be accompanied by policies to ensure equitable benefits, such as social safety nets and affordable housing measures.

Managing Population Growth:

Rapid population growth, particularly in urban areas, intensifies pressure on the housing market and social services. Proactive planning and scaling of resources are critical to mitigate these effects.

Model 12's predictive accuracy, validated by low MAE, RMSE, and MAPE values, instills confidence in its application for forecasting future shelter-user trends. However, continued refinement, particularly in addressing outlier years, issues related to lack of data particularly with social and health variables such as intimate partner violence and mental health, will further enhance its reliability.

As Canada navigates the complexities of housing and homelessness, integrating these findings into policymaking offers a pathway to more sustainable and inclusive solutions. This report serves as both a reflection of current realities and a roadmap for future action, urging stakeholders to prioritize evidence-based strategies to tackle this pressing issue.