

Reshaping Where We Live: Housing Shifts in Post-COVID Edmonton

Competition Submission by
Nida Arya, Alex Bauer, Efe Oroh

Abstract

This paper examines how the COVID-19 pandemic reshaped housing patterns in Edmonton. We review global, national, and municipal urbanization trends and assess relevant housing policy. Using municipal property assessment data from 2016 to 2023, we conduct a descriptive analysis of trends in property values, development types, and spatial distribution across neighborhoods. We then apply a three-part empirical approach: (1) measuring spatial shifts in residential demand relative to the city core, (2) analyzing changes in demand for high- and low-density housing, and (3) using a Bayesian Vector Autoregressive (BVAR) model to estimate a counterfactual scenario and isolate the pandemic's impact. Our preliminary findings suggest that the pandemic accelerated decentralization and shifted housing preferences toward low-density, peripheral areas. The BVAR results confirm these changes deviate significantly from pre-pandemic trends, indicating lasting structural shifts in Edmonton's housing market.

August 2025

Department of Economics
University of Alberta
Edmonton, Canada

Contents

1	Introduction	1
2	Urbanization Trends: Global, National, and Edmonton	2
2.1	Defining Urbanization	2
2.2	Urbanization in Canada	4
2.3	Edmonton in Focus	5
3	Planning and Policy Considerations	7
3.1	International Policy Innovations in Housing	7
3.2	National and Provincial Legislation in Alberta Affecting Housing	9
3.3	Municipal Policy	9
4	Data	10
5	Descriptive Analysis	11
5.1	Summary Statistics of Key Numerical Variables	11
5.2	Distributions of Assessed Values	13
5.3	Boxplot Analysis Over Time	14
5.4	Property Counts Over Time by Classification	15
5.5	Assessed Value Trends by Classification	16
5.6	Spatial Distribution of Values Across Neighborhoods	18
5.7	Discussion and Motivation for Main Analysis	18
6	Methodology	19
6.1	Residential Shifts from the Urban Core	19
6.2	Residential Shifts in High- and Low-Density Housing	19
6.3	Counterfactual Estimation Using a BVAR Model	20
7	Results	22
7.1	Colinear Movements of Housing After 2021	23
7.2	Housing Construction by Category	24
7.3	Counterfactual Analysis With BVAR Forecast	25
8	Discussion	26

1 Introduction

The COVID-19 pandemic sparked several enduring questions in urban economics. While some researchers argue that many cities have reverted to pre-pandemic norms, others suggest that the pandemic triggered lasting structural changes in housing markets.

The widespread adoption of remote and hybrid work enabled many households to move further from city centres. Ramani et al. (2024) describe this phenomenon as the “donut effect,” where central business districts lost residents while suburban and exurban areas experienced rising demand. Delventhal et al. (2022), using a general equilibrium model for Los Angeles, similarly found a permanent shift toward working-from-home jobs in the city’s core, with residents relocating to the outskirts. Although average assessed values fell citywide, the pattern was not uniform: central areas saw declines, while suburban and exurban neighborhoods experienced gains.

While prior studies offer valuable insights into how the COVID-19 pandemic reshaped housing patterns, they overwhelmingly focus on large, global cities. In contrast, the experience of mid-sized, car-oriented cities remains largely overlooked, despite the fact that these cities house a substantial share of the population in countries like Canada. The urban form, infrastructure, and policy context of such cities differ meaningfully from their larger counterparts. Lower densities, weaker transit networks, and greater reliance on private vehicles may alter how remote work, housing preferences, and migration dynamics play out. These differences raise important questions about whether decentralization trends observed in global cities are truly universal, or whether they reflect the specific conditions of dense, transit-rich urban environments.

Edmonton, Alberta, presents a particularly important and understudied case. It encapsulates the defining challenges of contemporary urban growth in mid-sized cities, low density, car dependence, limited transit infrastructure, and rapid suburban expansion. During the pandemic, Edmonton experienced a surge in both interprovincial and international migration (Government of Alberta, 2024), making it one of Canada’s fastest-growing urban centres. At the same time, it became an early adopter of progressive zoning reforms aimed at increasing housing density and diversifying supply (Illingworth & Renner, 2024). These features position Edmonton as a critical test case for assessing whether the spatial and structural shifts seen elsewhere are replicable in more dispersed, car-reliant urban settings. Studying Edmonton therefore offers not only local policy relevance but also broader insight into the evolving geography of housing demand in the post-pandemic era.

In this paper, we review global urbanization trends, Canadian urbanization, and Edmonton’s demographic, spatial, and policy landscape. Using municipal property data from 2016 to 2023, we find that property values dipped during the early pandemic years but rebounded sharply by 2022, showing a clear V-shaped recovery. This rebound was strongest in suburban neighborhoods, while downtown values remained high but stable. Mean assessed values rose unevenly across the city, and variation in mid-market homes widened, indicating growing internal stratification. Spatial mapping reveals a pronounced “donut effect” emerging post-2020, with notable value growth in outer neighborhoods, particularly in the northeast, southeast, and northwest. These patterns suggest a decentralization of housing demand and uneven recovery across space.

Building on our descriptive analysis, we apply a three-part empirical strategy: (1) mea-

asuring spatial shifts in demand by distance from the city core, (2) analyzing development trends in high- and low-density housing, and (3) estimating a counterfactual using a Bayesian VAR model to isolate the pandemic’s effect. Our results confirm that suburban and low-density housing saw the most significant gains after 2020, diverging meaningfully from pre-pandemic trends. These findings suggest that COVID-19 catalyzed lasting spatial and structural changes in Edmonton’s housing market.

The remainder of this paper is structured as follows. Section 2 reviews global, national, and municipal urbanization trends. Section 3 discusses relevant planning and policy considerations. Section 4 describes the dataset and Section 5 showcases our descriptive analysis. Section 6 presents our empirical methodology in detail. In Section 7, we present our results, followed by a discussion and conclusion in Section 8.

2 Urbanization Trends: Global, National, and Edmonton

In this section, we explore urbanization trends at multiple geographic levels. Section 2.1 defines urbanization and its global implications. Section 2.2 discusses Canada’s urbanization history and challenges. Finally, Section 2.3 focuses on Edmonton’s unique spatial growth, economic structure, and population shifts.

2.1 Defining Urbanization

Urbanization refers to the increasing share of a population living in urban areas. It typically coincides with shifts in employment patterns, such as agriculture to industry and services, and is reflective of broader social changes such as rising education levels, lower fertility rates, and better health (Sakketa, 2022). Urban areas tend to be characterized by higher population density and infrastructural development.

Globally, the urban population has increased significantly, particularly in recent decades, as illustrated in Figure 1. According to Ritchie et al. (2024), only 33.65% of the world’s population lived in cities in 1960. By 2023, this figure had risen to 57.25%. Their projections suggest that by 2050, more than two-thirds of the global population will reside in urban areas. This ongoing shift carries major implications for infrastructure, housing, transportation, and the environment.

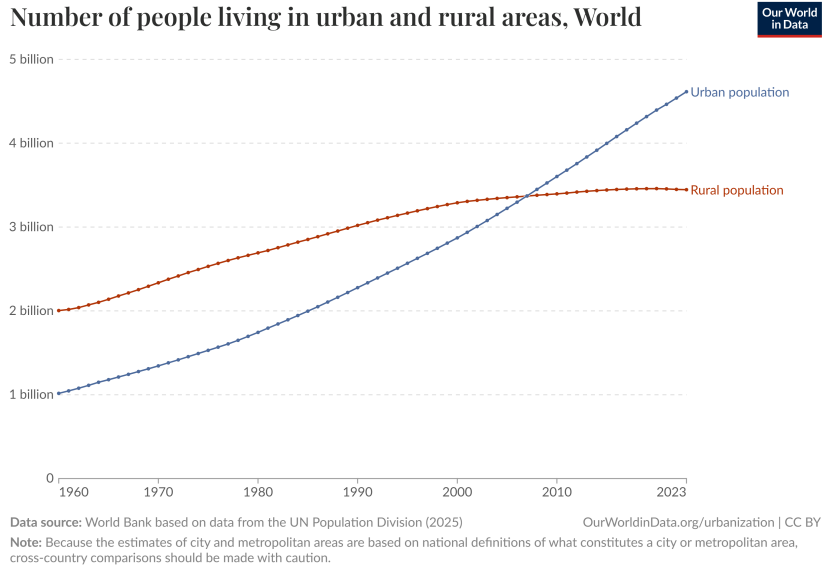


Figure 1: Global urban population surpassed rural population around 2007, reflecting a steady trend toward urbanization from 1960 to 2023. Source: Ritchie et al. (2024).

This global trend is reflected across countries of all income levels, though the pace and extent of urbanization vary considerably, as shown in Figure 2. High-income countries, including Canada, were already largely urbanized by 1960 and now maintain urban populations around 80%. In contrast, upper- and middle-income countries have experienced more rapid urban growth in recent decades as their economies have industrialized. While low-income countries remain predominantly rural, they too are undergoing a steady shift toward urban living.

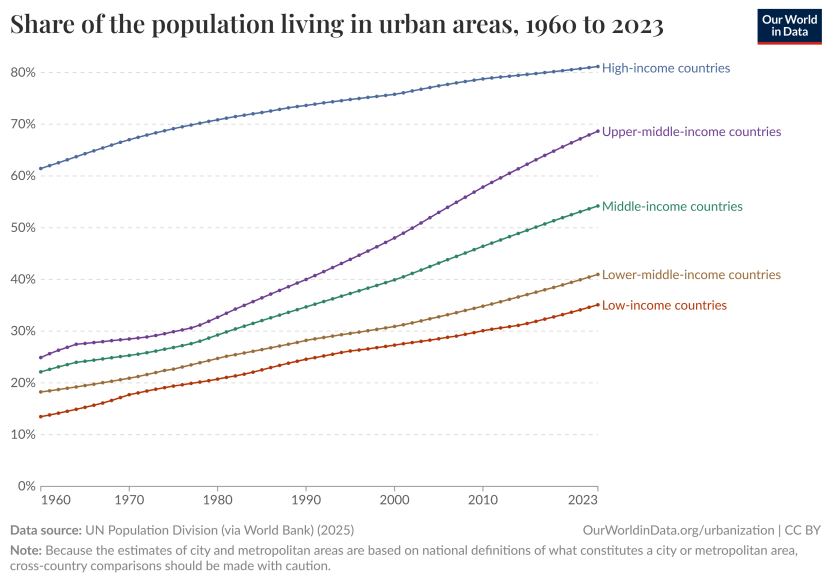


Figure 2: Urbanization rates have increased across all income groups since 1960, with high-income countries remaining the most urbanized and lower-income countries catching up. Source: Ritchie et al. (2024).

2.2 Urbanization in Canada

Canada is one of the most urbanized countries in the world, with over 80% of its population residing in urban areas (Ritchie et al., 2024). As shown in Figure 3, much of this population is concentrated in a handful of large metropolitan regions, such as Toronto, Montreal, and Edmonton, each home to over one million residents.

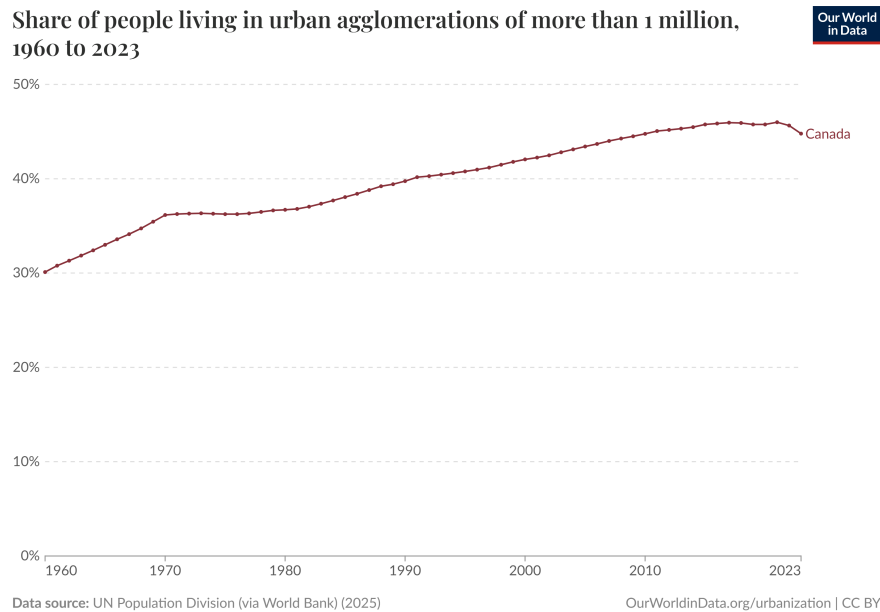
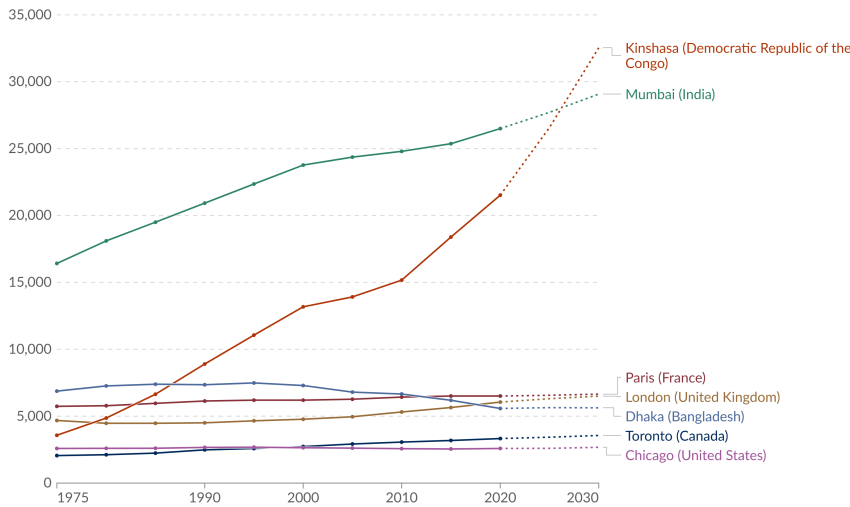


Figure 3: In Canada, a significant portion of the urban population is concentrated in a few major cities. Source: Ritchie et al. (2024).

Despite this high level of urbanization, Canadian cities are geographically dispersed. Unlike older, denser cities in Europe or Asia, Canadian urban areas tend to follow a low-density, car-oriented development pattern. Figure 4 illustrates how even Toronto, Canada's largest city, ranks among the least dense major cities globally, resembling other New World cities such as Chicago. The comparatively low density of Canadian urban centers reflects Canada's vast land area and relatively young urban history, which has allowed cities to expand outward rather than upward.

Population density of the world's largest cities

The number of people per km² of land area for cities ranked among the top 100 most populous in 2020.



Data source: European Commission, Joint Research Centre (JRC) (2024)

OurWorldinData.org/urbanization | CC BY

Figure 4: Population density of major global cities. Canadian cities, including Toronto, tend to have lower population densities compared to counterparts in Europe, Africa, and Asia. Source: Ritchie et al. (2024).

In recent years, rising housing costs in major cities like Toronto and Vancouver have prompted many Canadians to relocate to mid-sized urban centers, such as Edmonton (Stephen, 2024). The widespread adoption of remote work has further supported this trend, enabling people to live farther from traditional job hubs without compromising employment opportunities.

However, urban growth has also brought new challenges. Canadian cities now grapple with housing shortages, rising crime, and growing socioeconomic inequality. How these urban centers navigate the next phase of development will be critical in shaping the future of urban life in Canada.

2.3 Edmonton in Focus

Edmonton, the capital of Alberta, is Canada's 5th largest city, with a population of 1.2 million in 2024 (Government of Alberta, 2025). While it lacks the scale and density of cities like Toronto or Montreal, Edmonton is a major economic hub in the Prairies. The city's economy is deeply tied to the oil and gas sector, but it also features a strong public sector including employers such as the Government of Alberta, Alberta Health Services, and the University of Alberta.

Edmonton covers 765.61 square kilometers with a density of 1320.4 people per square kilometer, making it one of the most geographically expansive cities in Canada (Canada, 2023). In fact, Edmonton occupies more land than Toronto, which spans just over 630 square kilometers (City of Toronto, 2023), though it remains far less dense.

The city's neighborhoods are diverse in character but often suburban in form. One of the most striking trends in Edmonton's recent urban growth has been the explosive expansion of the city's south end. According to Edmonton Journal Staff (2025), the former federal

riding of Edmonton-Wetaskiwin nearly doubled in population between 2011 and 2021, adding 99 thousand residents, more than any other region in the city. Surrounding ridings such as Edmonton-Riverbend and Edmonton-Mill Woods each added close to 20 thousand residents in the same period, highlighting southward growth. Interestingly, three out of five of the new federal ridings in the country since the previous election are in Alberta, with one in Edmonton. New developments are also occurring in previous industrial areas, such as Blatchford.

Overall, the city has demonstrated strong past population growth, as shown in Figure 5, and is projected to continue to grow. In 2024, Edmonton’s population reached 1.2 million, making it the second-largest city in the province (Government of Alberta, 2024). The city experienced significant growth, with a 5.73% increase over the past year and a total rise of 16.0% over the last five years. This growth has been driven by both international and interprovincial migration. As shown in Figure 6, net migration into Alberta surged following 2021, reaching historic highs in 2023. International arrivals contributed the most to this spike, but interprovincial migration also rose sharply, possibly reflecting Alberta’s (and Edmonton’s) relative affordability and job market conditions compared to other provinces.

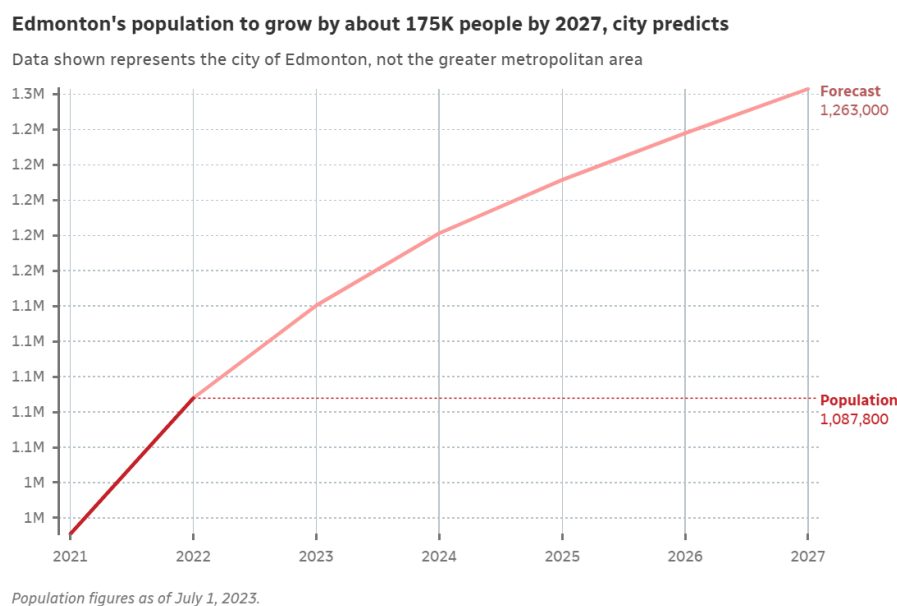


Figure 5: Forecasted population growth in Edmonton, 2021–2027. The city’s population is expected to grow about 175k people by 2027, reflecting strong migration and housing demand. Source: Edmonton Journal Staff (2025).

Moreover, transit infrastructure remains a work in progress. Edmonton’s LRT system includes three main lines (Capital, Metro, and Valley). The city’s LRT network currently includes the Capital, Metro, and Valley lines, though construction delays have slowed the full rollout of the Valley Line. Transit infrastructure continues to evolve in Edmonton. Notably, Edmonton is one of only five Canadian cities offering a high-frequency transit grid, with service every 15 minutes or less across most of the core throughout the day (Bartko, 2024). Transit ridership has rebounded strongly post-pandemic. Monthly usage now regularly exceeds six million trips, and total ridership since the start of 2024 has

surpassed pre-pandemic levels by 12%, making it one of the strongest recoveries in the country.

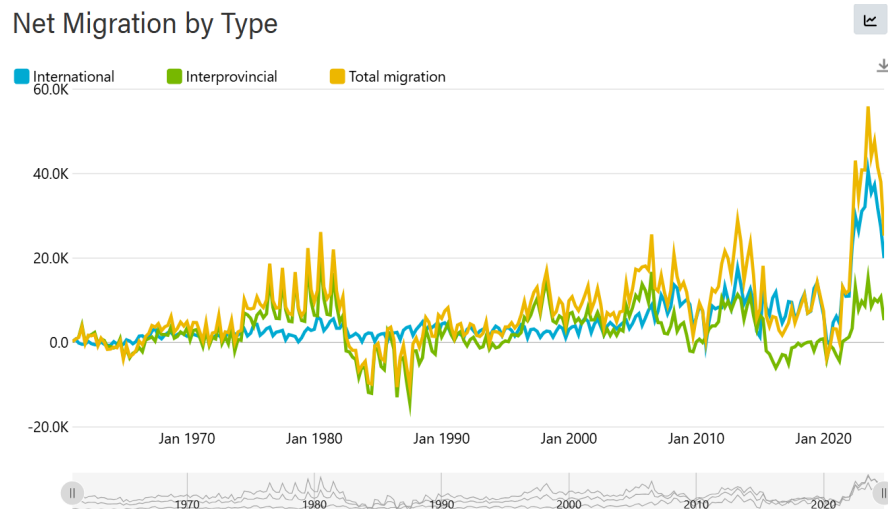


Figure 6: Net international and interprovincial migration have fluctuated over time, with notable spikes during economic booms. Source: Government of Alberta (2024).

3 Planning and Policy Considerations

This section reviews key housing policies enacted in response to COVID-19. Section 3.1 surveys international innovations aimed at housing affordability and stability. Section 3.2 examines existing and proposed policies at the national and provincial level. Section 3.3 examines Edmonton-specific policy.

3.1 International Policy Innovations in Housing

During the COVID-19 pandemic, a wave of temporary policies and initiatives were launched worldwide to address the challenges in the housing market that emerged at the time. An Australian Housing and Urban Research Institute brief (2021) summarized the international dialogue on COVID-19 housing related responses, finding countries implemented widespread eviction moratoria, income support measures, and flexible rental regulations, which helped stabilize household budgets during the crisis. The brief notes that these temporary policies did not necessarily address underlying structural issues with the housing market, warning that households could be overburdened by deferred payments or may find themselves unable to afford their current housing.

Panel A: share of population in the bottom quintile of the income distribution spending more than 40% of disposable income on mortgage and rent, by tenure, in percent, 2020 or latest year available

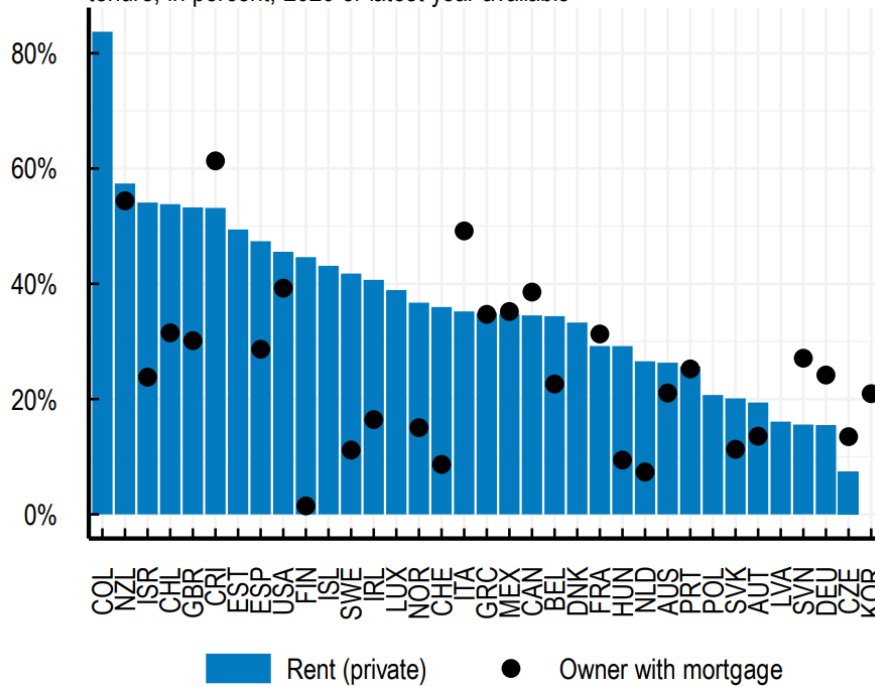


Figure 7: Source: OECD (2023).

The OECD’s *Brick by Brick (Volume 2), 2023* report found that, among developed nations, upwards of 40% of renters and home owners were spending 40% or more on housing (OECD, 2023). The OECD attributes this fact to interest rate increases that central banks implemented to combat inflation. As illustrated in Figure 7, housing construction costs have outpaced inflation in many countries. Finally, public investment in all OECD nations in housing as a function of GDP has remained significantly below 2009 levels.

In response, the World Economic Forum (Raisner and Bracken, 2022) recommended that governments implement zoning changes, introduce financial incentives for housing developers and buyers, use property tax revenue from retail establishments to fund affordable housing, and loosen downpayment requirements for mortgages. These policies aim to make it easier for families to access housing while simultaneously stimulating supply. In particular, rezoning is intended to increase the amount of high density housing in a given neighborhood, and financial incentives are seen as a way to both stimulate private investment and reduce costs for families.

Nevertheless, as shown in Figure 8, new housing starts as tracked by the CMHC (Canada Mortgage and Housing Corporation, 2025) have stagnated over the past four quarters, with Ontario seeing a notable decline in new housing starts in the last two quarters. This trajectory is somewhat unexpected, as lower interest rates should have incentivized property developers to increase their investments, given elevated property pricing levels.

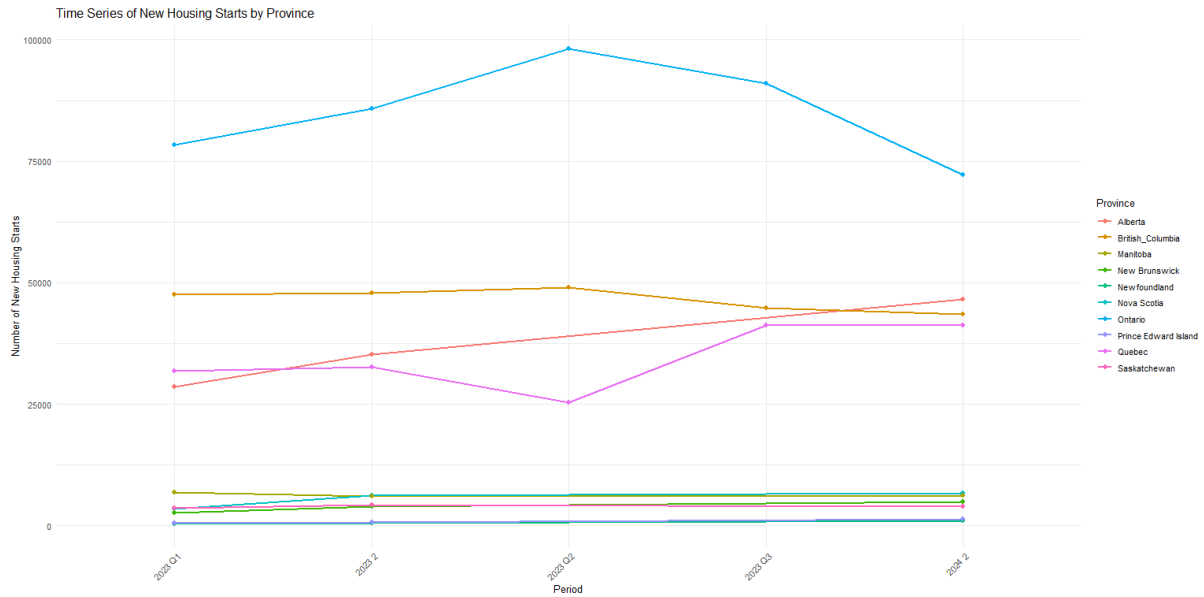


Figure 8: Source: Canada Mortgage and Housing Corporation (2025).

3.2 National and Provincial Legislation in Alberta Affecting Housing

In response to public pressures seeking action on housing affordability, legislation in Canada, Alberta and Edmonton has aimed at increasing housing affordability for first time house buyers. Rezoning, providing financial incentives and improving loaning facilities have been the primary mode of redress with Canadian Prime Minister Mark Carney having announced a few months ago that he plans to create a new entity called Build Canada Homes, which is aimed at facilitating the development of housing in Canada, removing GST for first time home buyers and doubling the rate of construction of new homes (Liberal Party of Canada, 2025). The Leader of the Official Opposition, Pierre Poilievre, during the election campaign, committed to penalizing large urban centers should they not increase new housing starts by 15% year over year through the withholding of funding (Conservative Party of Canada, 2025).

3.3 Municipal Policy

In both Canada and the United States, municipal governments are the primary authorities responsible for zoning, permitting, and transit decisions, with Edmonton being no exception. In response to growing concerns about affordability and car dependence, Edmonton’s municipal government has introduced several policy reforms in recent years.

The most significant is the new Zoning Bylaw, which came into effect in 2024 after many years of discussion and consultation (Illingworth & Renner, 2024). The bylaw allows eight or more dwellings of any type to be built on a standard residential lot. It builds on earlier reforms: in 2014, the city began easing restrictions on infill development; in 2018, duplexes and semi-detached homes were permitted across all residential zones, effectively ending single-detached-only zoning; and in 2019, the “missing middle” reforms allowed

multi-unit housing in core neighborhoods. Compared to many other Canadian cities, Edmonton moved relatively early on zoning reform.

The city also introduced the District Planning Project, which organizes Edmonton into 15 districts (City of Edmonton, 2024). This framework is intended to support the creation of 15-minute communities, where residents can access daily needs like schools, groceries, and parks within a short walk, bike ride, or transit trip. The goal is to reduce reliance on automobiles and promote more sustainable, climate-conscious development.

The expansion of the Valley Line LRT is another major component of Edmonton’s growth strategy. The project aims to make traditionally suburban areas more walkable and better connected to the rest of the city. It also seeks to encourage higher-density housing and commercial development around transit hubs, making transit a more viable option for a broader range of residents (City of Edmonton, 2019).

Possibly due to the new zoning policies and LRT expansion, Edmonton saw a notable increase in development activity in 2024. While it is difficult to attribute causality directly, the timing suggests these reforms may have played a contributing role. The city issued 50 percent more residential development and building permits compared to 2023, with the total value of construction permits reaching \$4.2 billion—a 31% increase from the previous year (CBC News, 2025). Nearly 16,000 net new homes were approved, including more than 6,000 units categorized as row houses, backyard homes, or secondary suites.

Still, there has been some pushback. News coverage and community engagement reports show that some residents are concerned about rapid change and neighbourhood character. These reactions reflect broader tensions around densification and what is often referred to as NIMBYism (“not in my backyard”) (CBC News, 2023). These concerns remain a challenge for implementation, even in cities actively pursuing reform.

4 Data

We use two main datasets for our analysis, both focused on the Edmonton property market. The public property assessment data is sourced from the City of Edmonton Open Data Portal (2025b) and covers parcel-level assessment records from 2012 onward. This dataset includes assessed property values, geographic coordinates (latitude and longitude), neighborhood names, assessment years, zoning codes, and classification types such as Assessment Class and Land Use Code. It provides an overview of the property market landscape in Edmonton, enabling spatial analysis of how property values evolved across neighborhoods before, during, and after the COVID-19 pandemic. This dataset is used to examine general trends in urban valuation patterns, track recovery trajectories, and visualize city-wide changes through geospatial mapping.

The confidential property assessment dataset, provided by the Open Data Centre for Alberta Urban Real Estate, offers a more granular view of Edmonton’s residential property market from 2014 to 2023. Unlike the public data, this dataset includes additional fields that offer detailed land use classifications beyond basic assessment class labels. This level of detail allows for a more refined analysis of how specific property types such as single-family homes, condos, or duplexes were affected differently by the pandemic. The confidential dataset allows us to segment the residential market and understand intra-city disparities in valuation changes. It is especially valuable for uncovering the drivers behind

the “donut effect” and identifying which property types were most resilient or vulnerable during and after COVID-19.

In addition, we incorporate building permit data from the City of Edmonton Urban Planning & Economy Department (2025a), which lists all permits issued for construction or maintenance on structures within the city since January 1, 2009. This dataset includes project descriptions, building types, permit issuance dates, and locations. We use it to track new housing starts and residential conversions over time by building type, offering insight into how supply dynamics have evolved across Edmonton during and after the pandemic.

To contextualize property market shifts within broader macroeconomic and public health dynamics, we supplement our core datasets with external sources. These include COVID-19 case and death counts from the Government of Canada, the Bank of Canada COVID-19 Stringency Index, economic indicators such as inflation and interest rates from the Bank of Canada, and neighborhood-level demographic data from Statistics Canada. We also draw on rental and construction trend data from the Canada Mortgage and Housing Corporation (CMHC) to better understand housing demand pressures and development activity.

5 Descriptive Analysis

This section presents descriptive statistics and exploratory analysis of the two core datasets used in this report: the public property assessment data from the City of Edmonton and the confidential residential dataset provided by Open Data Centre for Alberta Urban Real Estate. To ensure clarity and organization, the analysis follows a consistent structure across both datasets.

Section 5.1 presents summary statistics of key numerical variables. Section 5.2 explores the distribution of assessed values. Section 5.3 provides a boxplot analysis of property values over time. Section 5.4 tracks property counts over time by classification. Section 5.5 analyzes assessed value trends by classification. Section 5.6 maps the spatial distribution of values across neighborhoods. Section 5.7 concludes with a discussion of how these findings motivate the main analysis in Section 6 and beyond.

5.1 Summary Statistics of Key Numerical Variables

Variable	Mean	Median	SD	N
Assessed Value (\$)	464571.19	319500.00	3712192.14	5,070,252
Lot Size (m ²)	1598.72	398.47	21568.35	4,882,878
Distance from Downtown (km)	8.50	9.03	4.05	5,039,015

Table 1: Summary Statistics (2012–2024) – Public Property Assessment Data.

Summary statistics from the public property dataset provide a foundational understanding of Edmonton’s urban property landscape. Assessed Value refers to the predicted market price of a property, estimated using a regression model trained on actual transaction prices, where property characteristics such as size, age, and location are used as

predictors. This means that assessed values represent what a property would likely sell for if listed in a given year, though they rarely match the actual sale price for any individual property. These values are right-skewed, with a median of \$319,500 and a significantly higher mean of \$464,571, driven by a small number of extremely high-value properties. Lot Size, measured in square meters, captures the total land area of each parcel. It also exhibits right-skewness, with a median of 398 square meters and a mean of 1,599 square meters, reflecting the presence of large institutional or irregular parcels in the data. Distance from Downtown refers to the straight-line distance between a property and the geographic center of downtown Edmonton, as calculated in Section 6.1. The resulting distribution is fairly balanced, with a median of 9.03 km and a mean of 8.5 km, indicating that most properties are situated within a 10 km radius of the city’s core. Together, these summary statistics, based on over five million observations, highlight the scale and diversity of Edmonton’s property market and underscore the importance of addressing missing values and outliers when conducting further analysis.

Variable	Mean	Median	SD	N
Total Assessed Value (\$)	998556.3	336000	10940053	3922577

Table 2: Summary Statistics (2014–2022) – Confidential Property Assessment Data

The confidential dataset provides a more detailed view of Edmonton’s residential market, with over 3.9 million observations and finer land use distinctions than the public dataset. The median assessed value is \$336,000, while the mean is significantly higher at \$998,556, reflecting the influence of high-value properties. With a standard deviation exceeding \$1 million, this dataset captures the broad dispersion in residential property values. Its main purpose is to complement the public dataset by disaggregating the residential assessment class into more specific categories, allowing for deeper analysis of value trends across property types.

Building Type	Mean	median	sd	n
Apartment	0.05882353	0	0.2376354	51
Backyard House	0.36274510	0	1.3679711	2346
Duplex	0.09150327	0	0.3773849	306
Row House	1.08931133	0	3.1959542	2788
Row House Condo	0.74226006	0	2.7738366	1292
Semi-Detached Condo	0.19377163	0	1.0787544	289
Semi-Detached House	3.31250000	0	8.6482140	2720
Single Detached House	7.35059994	0	30.8739978	3417

Table 3: Summary Statistics (2009-2025) - Housing Starts Data

The housing starts data presents summary statistics for new residential building permits by type, offering insight into construction and development trends across Edmonton from 2009 to 2025. Single detached houses dominate with an average of 7.35 permits issued per year per reporting unit, far exceeding other types such as row houses, semi-detached houses, and duplexes. Notably, apartments and backyard houses remain rare, with median counts of zero and low standard deviations, indicating infrequent construction. This table helps contextualize the pace and type of residential development, showing that while

Edmonton’s housing market is stable, new construction is disproportionately concentrated in low-density forms like detached homes. These statistics frame our longitudinal analysis of permit issuance and help assess how housing supply evolved in response to market conditions, policy shifts, and population changes.

5.2 Distributions of Assessed Values

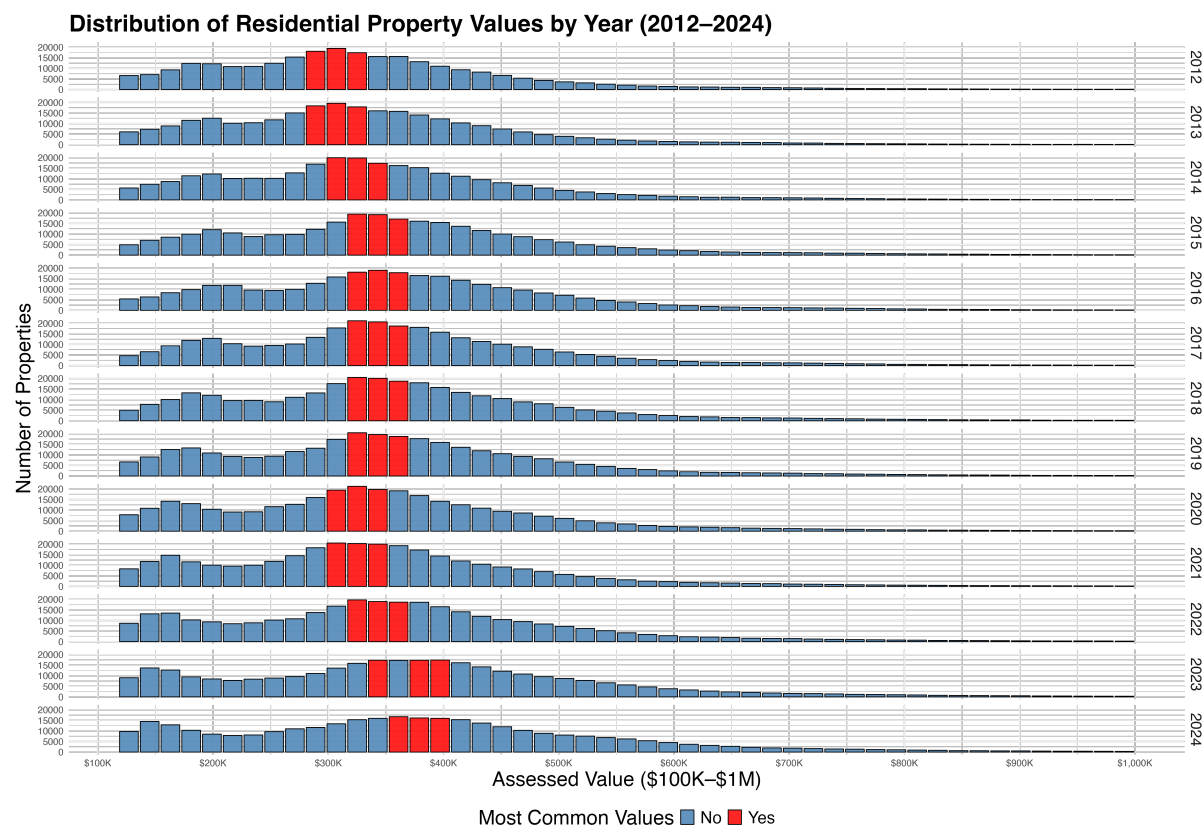


Figure 9: Distribution of Residential Property Values by Year.

Figure 9 illustrates the remarkable stability of Edmonton’s residential property values from 2012 to 2024 while spotlighting subtle structural changes through the red-highlighted bins, which mark the three most common assessed value ranges in each year. These peaks consistently cluster between \$300K and \$400K, reinforcing the strength of a stable market core where typical homes are valued. From 2012 to 2019, these peak values remain steady, but a temporary shift occurs during the COVID-19 pandemic: between 2019 and 2020, the most common assessed values move leftward, indicating a dip in market confidence or pricing. However, by 2022, the peaks quickly return to their pre-pandemic range, though most bins appear more compressed, suggesting a tighter clustering of property values overall. This compression is not evenly distributed across the assessment value spectrum. Instead, it corresponds with a gradual increase in properties assessed below \$200K, especially near the \$100K to \$150K range, which have grown more numerous over time. Simultaneously, the number of properties between \$200K and \$300K has thinned, as the secondary peak in this range is slowly pushed downward. While the top end of the market remains relatively stable, this quiet reconfiguration of the lower and

lower-middle segments points to a redistribution within the housing stock, where more properties are shifting into the lowest valuation bins. This consistency and visibility in residential property trends, combined with the dominance of residential properties in the dataset, their standardized characteristics, and their stronger connection to household behavior rather than business cycles, supports our decision to focus solely on residential data in our analysis.

5.3 Boxplot Analysis Over Time

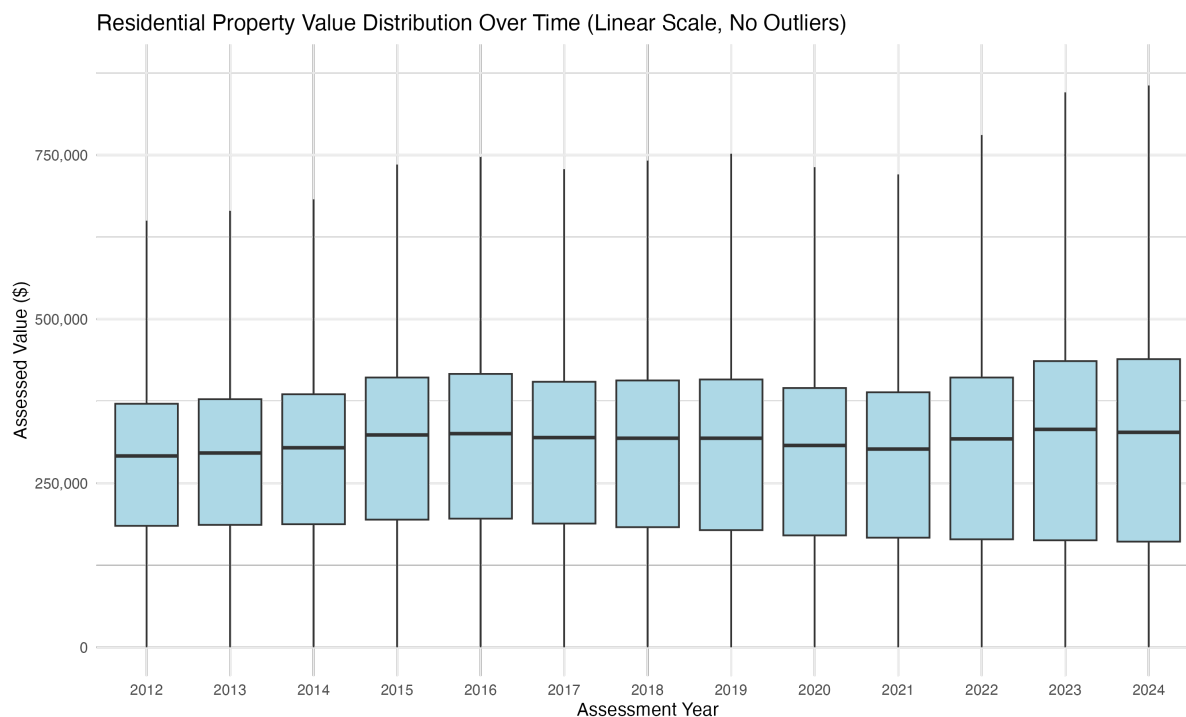


Figure 10: Residential Property Value Distribution Over Years.

This broader view of value distributions is sharpened in Figure 10, which zooms in on how the middle range of residential property values has shifted over time. The growing interquartile range (IQR) in the boxplot, visible as the widening blue box from 2020 onward, shows that the spread of the central 50 percent of residential property values in Edmonton has increased over time, particularly after the onset of COVID-19, reflecting rising inequality within the middle of the market. From 2012 to 2020, the IQR remained relatively stable, indicating consistent clustering of typical mid-market home values. However, post-2020, the blue box begins to widen noticeably, signaling greater dispersion in property values among the “normal” or non-outlier range. This widening gap between lower and upper-middle property values may reflect diverging neighborhood dynamics, where some areas appreciated faster than others due to location advantages, new development, or pandemic-driven migration patterns. In effect, there is now more variation in what constitutes a typical home. This change points to a growing internal stratification of the housing market, that is, even within the broad category of “mid-market” or “typical” homes, there is now a clearer separation between higher-end and

lower-end properties. Rather than a single middle-class tier, the data suggests the emergence of multiple tiers within the middle: some households are increasingly priced into premium mid-range homes, while others are confined to the lower end of the market. This motivates our analysis by emphasizing the need to examine whether post-COVID recovery has been uniform throughout the city or whether certain neighborhoods and property types are being left behind.

The boxplot also shows how residential property values in Edmonton evolved from 2012 to 2024, using a linear y-axis to provide a more intuitive sense of dollar values. The median line remains closer to the third quartile across most years, which reflects a consistent left-skewed distribution, meaning a large concentration of properties lies above the median, with fewer lower-value properties pulling the average downward. Importantly, despite the pandemic, the position of the median did not drop sharply, which suggests that core property values held firm even during COVID-19. Combined with persistent upper whiskers and high-value outliers, these patterns point to a housing market where most properties are clustered in the mid-to-high range, while the spread is increasingly driven by variability at the lower end and steady growth at the top. This reinforces the relevance of our report by highlighting the need to understand which assessment classes contribute the most to this transformation.

5.4 Property Counts Over Time by Classification

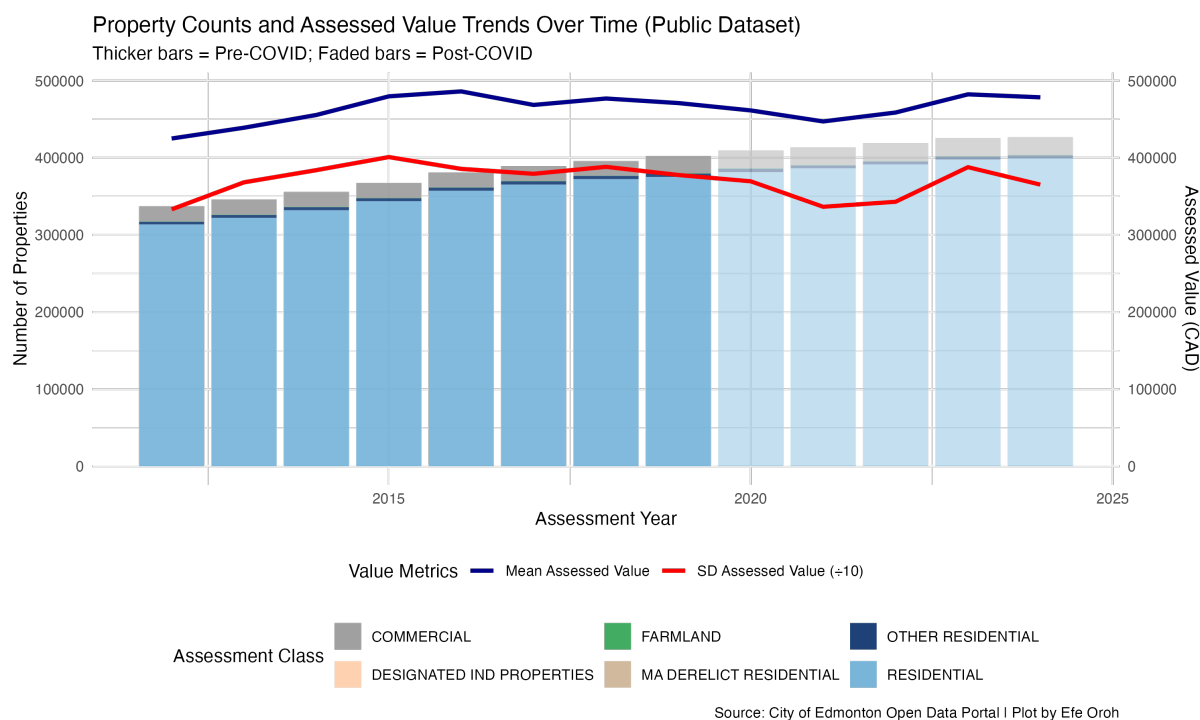


Figure 11: Property Counts and Assessed Value Trends Over Time (Public Dataset).

Figure 10 shows us how the middle range of residential property values has shifted over time; Figure 11, by contrast, lets us see how this compares to other assessment classes. Property counts steadily increase from 2012 to 2024, with no visible disruption during the

COVID-19 period, indicating continued development and assessment activity throughout the pandemic. Mean assessed values climb from 2012 and reach a peak around 2016, then gradually decline through the pandemic years. However, post-COVID, both the mean and standard deviation rebound, rising steadily from 2021 and by 2023–2024, both indicators return to near-peak levels last seen in 2015–2016. This result suggests that while the pandemic temporarily dampened property values, the market not only recovered but re-approached its pre-pandemic highs. The rising post-COVID mean reflects renewed market confidence, while the increasing standard deviation indicates growing disparity in property values across the city. Notably, the chart is overwhelmingly dominated by residential assessments, with other classes making up only a small share of observations. This reinforces our decision to focus exclusively on residential data for the analysis: their prevalence ensures a strong sample size, the data is more standardized and comparable over time, and residential property values are more directly tied to household-level decision, such as where to live, work, or relocate, unlike commercial or industrial properties, which are influenced by broader business cycles and policy changes.

5.5 Assessed Value Trends by Classification

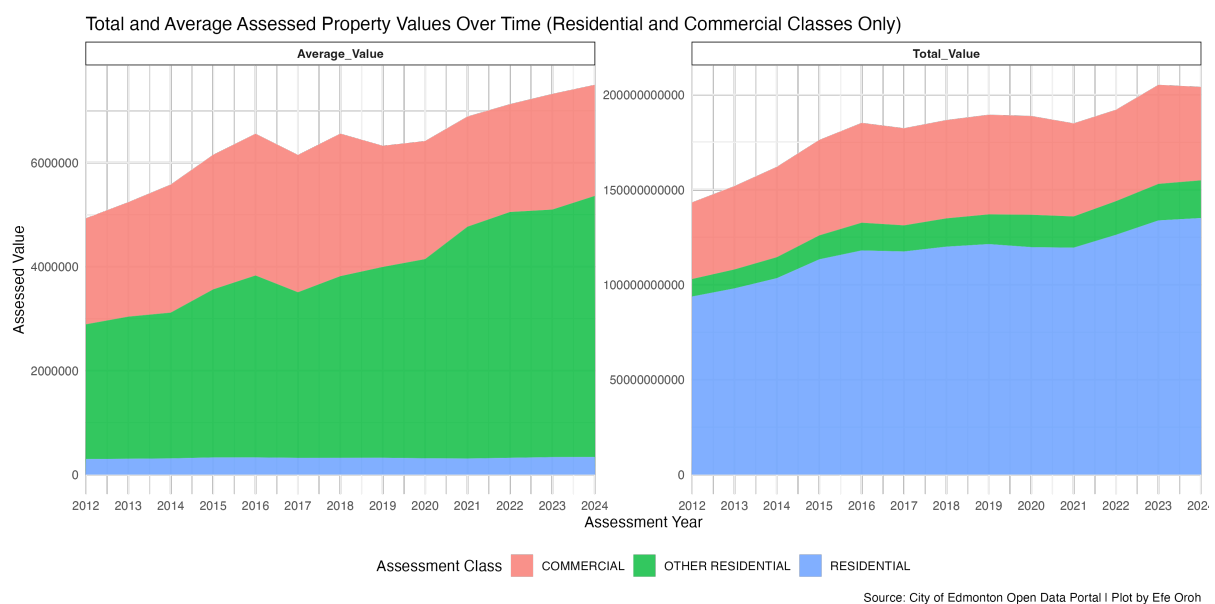


Figure 12: Total and Average Assessed Property Values Over Time (Residential and Commercial Classes Only).

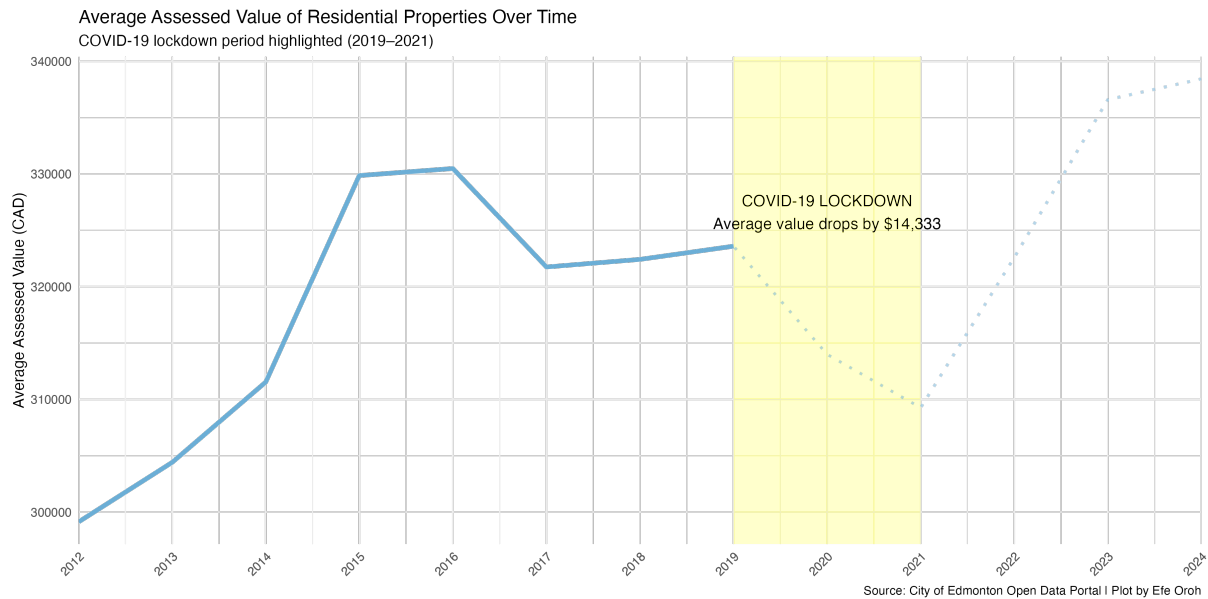


Figure 13: Average Assessed Value of Residential Properties Over Time.

Figures 12 and 13 build directly on Figure 11 by zooming in on the trend in mean assessed values over time, allowing us to isolate the effects of COVID-19 more clearly. The assessed value of residential and commercial properties in Edmonton has grown over time, though in uneven ways, with COVID-19 temporarily disrupting trends in both total and average values before a sharp rebound. In Figure 11, we see that total assessed values rose steadily for all classes from 2012 to 2016, dipped slightly around 2017 to 2019, and flattened during 2020, likely due to COVID-19. After 2021, total values picked up again, especially for the residential class, suggesting a strong post-COVID recovery.

The average assessed value plot, however, shows a more mixed story: commercial and other residential classes saw more consistent growth, while residential values dipped noticeably during COVID-19, only to rebound strongly in 2022 and continue rising through 2024. Edmonton’s assessment system classifies “Residential” properties as those with three or fewer dwelling units such as, single-family homes, condos, and townhouses, while “Other Residential” includes properties with four or more units on a single title, like apartment buildings and multi-unit row houses.

Figure 13 isolates residential properties and confirms this rebound in average value after COVID-19. We see a steady climb from 2012 to 2016, a steep decline during COVID-19 lockdowns from 2019 to 2021, then a sharp rise in 2022 that continues through 2024. This V-shaped recovery in residential property values suggests that while the pandemic disrupted assessment values in the short term, demand and confidence in the housing market returned quickly, pushing values back up. Together, these plots help motivate our analysis of COVID-19’s impact by highlighting clear before and after shifts, setting up the next section where we explore the underlying drivers behind these growth patterns.

5.6 Spatial Distribution of Values Across Neighborhoods

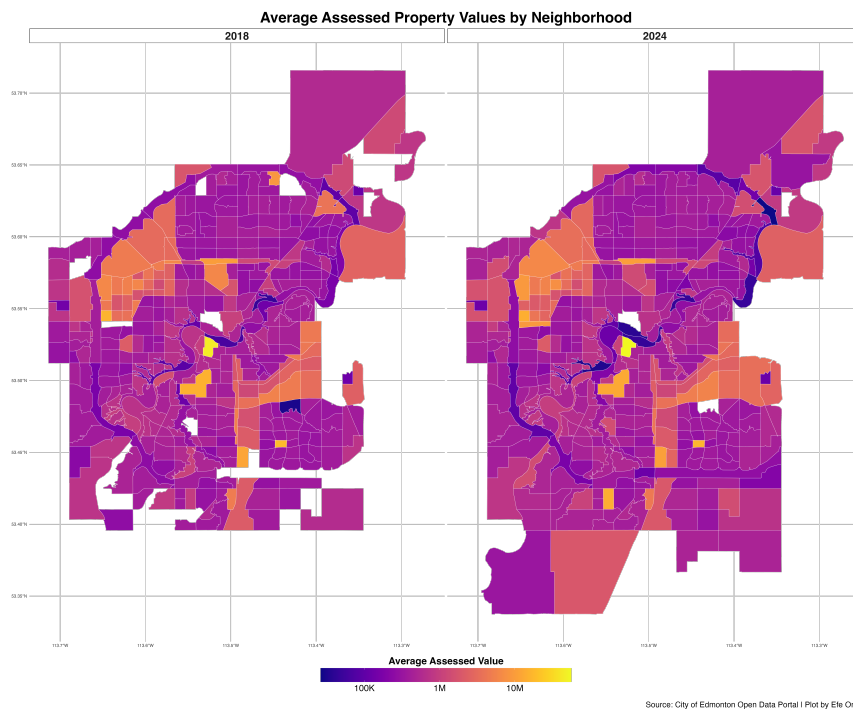


Figure 14: Average Assessed Property Values by Neighborhood.

Figure 14 illustrates which neighborhoods were most affected by the COVID-19 pandemic. The spatial distribution of average assessed property values across Edmonton reveals a clear and persistent geographic pattern, where the city’s core maintains the highest values while surrounding neighborhoods experience gradual growth. The bright yellow region in the center of both maps, likely representing Edmonton’s downtown, consistently holds the highest property values. This pattern suggests a stable concentration of economic and real estate activity in that area. Surrounding the core, we observe a “donut effect” taking shape between 2018 and 2024: property values on the outer edges of the city, particularly in the northeast, southeast, and northwest, have significantly increased. This finding indicates that the city’s value growth is expanding outward from the center. Over time, especially in the years following COVID-19, this pattern became more pronounced. Outer neighborhoods saw sharper upticks in value while the core remained saturated. This visual progression, supported by both the [animated map](#) and the static comparison above, illustrates how the recovery has played out unevenly across space.

5.7 Discussion and Motivation for Main Analysis

These spatial shifts motivate the next section of our analysis, where we test whether a neighborhood’s distance from the downtown core predicts how much its average property value changed after COVID-19. This analysis helps us move from descriptive analysis to counterfactual analysis by identifying which areas gained the most, which fell behind, and what that tells us about the nature of Edmonton’s post-pandemic recovery. Together, the data presented in Section 3 set the foundation for understanding not only how the market shifted during this period, but also why those shifts occurred where they did.

6 Methodology

In this section, we describe our methodology. To assess spatial and structural changes in Edmonton’s housing market post-COVID, we use a three-part empirical approach. In Section 6.1, we categorize properties by distance from the city center to capture suburbanization trends. In Section 6.2, we classify housing into high- and low-density types to examine structural shifts. Finally, in Section 6.3, we outline a counterfactual strategy to isolate pandemic-related changes in assessment values and volumes.

6.1 Residential Shifts from the Urban Core

To evaluate whether the pandemic led to increased decentralization within Edmonton, we performed a spatial analysis of residential property data. We first calculated the geographic center of downtown using the centroid of the downtown boundary polygon. This point is adjacent to the World Trade Centre Edmonton, near the intersection of Jasper Avenue NW and 99 Street NW. Using the Haversine formula, which measures the distance between two points on a sphere using their latitude and longitude, we calculated the straight-line distance of each property from the city’s central location based on its recorded coordinates.

We then assigned each property to one of four distance categories:

- Within 5 km.
- 5–10 km.
- 10–15 km.
- 15+ km.

The analysis was restricted to properties classified as residential (Assessment Class 1 == “RESIDENTIAL”). For each year, we computed the average assessed property value and total number of properties within each distance band, allowing us to detect how demand and construction activity varied across zones over time. To further capture dynamic changes, we calculated year-over-year differences in both metrics.

6.2 Residential Shifts in High- and Low-Density Housing

To assess how the structural composition of Edmonton’s housing market evolved, we analyzed detailed land-use records from confidential municipal datasets spanning 2017 to 2023. Each property’s `Luc 1 Description` field was used to categorize its housing type through pattern matching with descriptive keywords and predefined classifications.

We then grouped the resulting categories into two broad types:

- **High Density:** Lowrise apartment building, Highrise apartment building, Combination lowrise and highrise apartment building, Highrise condominium, Row house condominium, Row house, Multiresidential building (other), Fraternity house with four or more suites, Boarding house with four or more suites, University/college residence, Co-op non-profit highrise apartment building, Co-op non-profit fourplex, Commercial condominium converted from residential row house.

- **Low Density:** Single-family detached house, Acreage for residential use (building and land), Carriage home condominium, Residential condominium parking stall, Manufactured home (building and land), Manufactured home (building only), Rooming house with four or more suites, Triplex, Duplex, Duplex with lower-level self-contained suites, Fourplex, Detached residence with three self-contained suites, Detached residence with four or more self-contained suites, Semi-detached residence in duplex, Semi-detached residence in multiplex (four or more), Co-op non-profit row house, Co-op mobile home park, Residential bare land condominium (land and building), Two or three detached residences on one lot or parcel, Undeveloped residential land.

This classification enabled us to track the quantity of new developments and average assessed values for high- and low-density properties by year. Similarly to Section 6.1, we calculated year-over-year differences in both metrics.

6.3 Counterfactual Estimation Using a BVAR Model

A rigorous difference-in-differences (DiD) analysis requires a control group or baseline that remains unaffected by the treatment, in our case, the COVID-19 pandemic. Given the pandemic’s truly global reach, no natural counterfactual for assessed housing values exists. To emulate a DiD framework, we therefore construct a credible “no-COVID” counterfactual via a Bayesian Vector Autoregressive (BVAR) forecast (Cimadomo et al., 2022). This approach projects the path housing assessments would have followed absent the pandemic shock, enabling direct comparison between realized and counterfactual assessment value trajectories.

Alternative forecasting methods, standard ARIMA, VARX, and simple OLS regressions prove inadequate for our needs:

- **ARIMA(p, d, q)/ARIMAX.** A univariate ARIMA(p, d, q) model,

$$\Delta^d y_t = c + \sum_{i=1}^p \phi_i \Delta^d y_{t-i} + \sum_{j=1}^q \theta_j \varepsilon_{t-j} + \varepsilon_t, \quad \varepsilon_t \sim N(0, \sigma^2),$$

omits exogenous factors. It can be extended to an ARIMAX model by adding exogenous predictors $\sum_{k=1}^m \beta_k x_{k,t}^{\text{exo}}$. However, doing so introduces combinatorial lag-order selection: one must choose not only which variables to include, but also how many lags of each to use, resulting in a large number of possible model specifications. Moreover, ARIMAX models treat (ϕ, θ, β) as fixed, so forecast intervals account only for $(\varepsilon_t) = \sigma^2$ and do not consider parameter uncertainty.

- **VARX(p) with exogenous regressors.** A VARX(p) system,

$$y_t = c + \sum_{\ell=1}^p A_\ell y_{t-\ell} + B^{\text{exo}} x_t^{\text{exo}} + u_t, \quad u_t \sim N(0, \Sigma),$$

models the joint dynamics of multiple time series (y_t) while incorporating external drivers (x_t^{exo}). However, when estimated via Ordinary Least Squares (OLS), it treats coefficient estimates as fixed and often neglects parameter uncertainty. As a result, forecast variances typically exclude the term $X_{T+h} \text{Var}(\hat{\beta}) X_{T+h}^\top$, understating

total variance and therefore uncertainty associated with the forecast.

- **OLS regression.** A static model

$$y_t = \beta_0 + \sum_{k=1}^K \beta_k z_{k,t} + \eta_t, \quad \eta_t \sim N(0, \sigma^2),$$

assumes a linear relationship between predictors and outcomes. This can lead to omitted-variable bias if the true data-generating process is nonlinear. Additionally, including lagged terms increases the dimensionality very quickly, making the model harder to estimate and interpret. They also ignore uncertainty in the estimated coefficients, so forecast error variances are often underestimated, collapsing to just σ^2 .

In contrast to static or frequentist time-series models, a Bayesian VAR allows for dynamic and non-linear interrelationships among multiple series while incorporating prior information to manage parameter uncertainty, an especially valuable feature when facing unprecedented shocks like the COVID-19 pandemic.

In our framework:

- *Endogenous variables* $y_t \in \mathbb{R}^n$ include assessed housing values and population growth, allowing pre-pandemic momentum in population to influence assessment value dynamically.
- *Exogenous regressors* $x_t^{\text{exo}} \in \mathbb{R}^m$ capture macroeconomic factors such as interest rates and inflation, which evolved independently during the pandemic.

We specify a VAR(p) with intercept:

$$y_t = c + \sum_{\ell=1}^p A_\ell y_{t-\ell} + B^{\text{exo}} x_t^{\text{exo}} + u_t, \quad u_t \sim N(0, \Sigma),$$

where $y_t \in \mathbb{R}^n$ is a vector of endogenous variables and $x_t^{\text{exo}} \in \mathbb{R}^m$ is a vector of exogenous regressors. We assume normally distributed errors with covariance matrix Σ .

To estimate the model, we stack the observations over $t = p + 1, \dots, T$:

$$Y = X C + U, \quad U \sim N(0, I_{T-p} \otimes \Sigma),$$

where

$$Y = \begin{pmatrix} y'_{p+1} \\ \vdots \\ y'_T \end{pmatrix}, \quad X = \begin{pmatrix} 1 & y'_p & \cdots & y'_1 & x_{p+1}^{\text{exo}'} \\ \vdots & & \ddots & & \vdots \\ 1 & y'_{T-1} & \cdots & y'_{T-p} & x_T^{\text{exo}'} \end{pmatrix}, \quad C = (c \ A_1 \ \cdots \ A_p \ B^{\text{exo}})'$$

Vectorizing the coefficient matrix as $\beta = \text{vec}(C)$ transforms the system into a standard multivariate linear regression with a Gaussian (Normal) likelihood:

$$\text{vec}(Y) = (I \otimes X) \beta + \varepsilon.$$

We impose a Minnesota prior (Giannone et al., 2012) on the coefficients, a structured set

of assumptions about their likely values before observing the data:

$$\beta \sim N(\beta_0, V_0), \quad \beta_0 = [0, \dots, 0, 1, 0, \dots, 0, 0, \dots, 0]',$$

$$V_0 = \text{diag}(v_{j,i,\ell}), \quad v_{j,i,\ell} = \begin{cases} V_{\text{const}}, & \text{intercept (diffuse)}, \\ \lambda^2/\ell^2, & i = j, \\ \lambda^2\tau_i^2/\ell^2, & i \neq j, \end{cases}$$

with overall tightness $\lambda > 0$, cross-series weights $\tau_i > 0$, and $V_{\text{const}} \gg 1$. Here, λ controls overall shrinkage, pulling coefficient estimates toward zero to prevent overfitting in high-dimensional VARs. The parameter $\tau_i > 0$ governs shrinkage on cross-variable effects, reflecting the belief that a variable's own lags are more informative than those of others. A large V_{const} places a diffuse prior on the intercept, allowing it to be freely estimated without strong prior constraints.

Note that we have conjugacy, meaning both the prior and likelihood are Gaussian. By conjugacy, we obtain a posterior distribution, our updated belief about the coefficients after observing the data, which is also Gaussian:

$$V_1 = (V_0^{-1} + X'X \otimes \Sigma^{-1})^{-1}, \quad \beta_1 = V_1(V_0^{-1}\beta_0 + (X' \otimes \Sigma^{-1}) \text{vec}(Y)),$$

and reshaping β_1 produces posterior estimates C_1 .

To simulate the no-COVID counterfactual, we condition on data through t_0 (pandemic onset) and recursively iterate, setting $u_t = 0$ for $t > t_0$:

$$y_t = c_1 + \sum_{\ell=1}^p A_{\ell,1} y_{t-\ell} + B_1^{\text{exo}} x_t^{\text{exo}}.$$

We select the lag order p from 1 to 24 by minimizing the out-of-sample root mean square error on the most recent 20% of data, thereby avoiding time-series leakage. The resulting forecast path underpins our counterfactual analysis, isolating the COVID-19 shock's effect on housing values.

7 Results

This section presents the empirical findings from our analysis. Section 7.1 evaluates assessment value movements across distance bands, showing spatial variation after 2021. Section 7.2 examines construction trends by housing type. Section 7.3 applies a differences-in-differences framework using BVAR modeling to assess deviations from pre-pandemic trajectories.

7.1 Colinear Movements of Housing After 2021

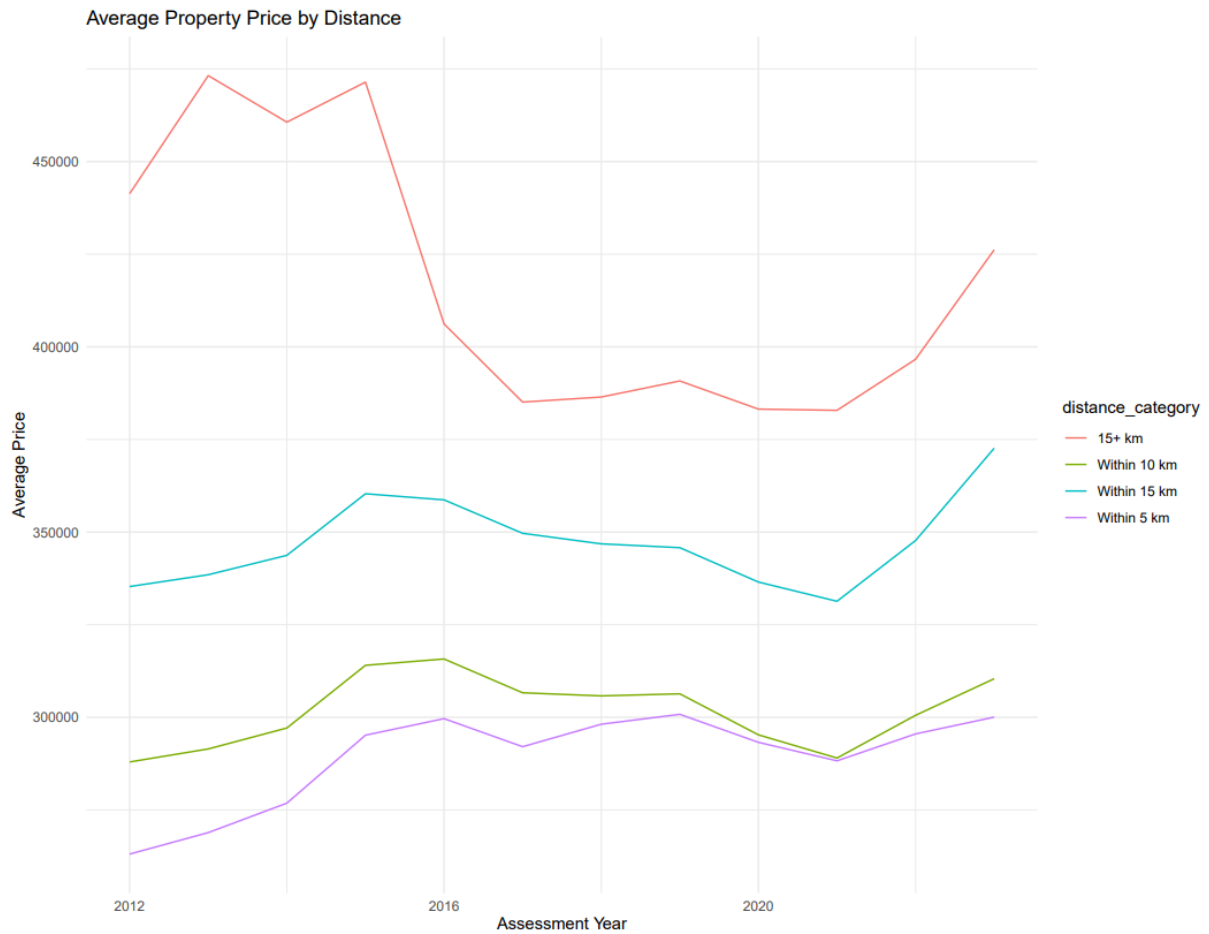


Figure 15: Absolute Pricing of Housing Stratified by Distance to Edmonton’s Center.

The assessed values of properties less than 15 kilometers from city’s center move in parallel over the measured time horizon. In these three groups, property values increased at a higher rate after 2021, which may be attributed to the pandemic. Properties at distance greater than 10km from the city’s center seem to have increased in value at a higher rate than properties closer to the center. This pattern is consistent with findings reported in Ramani et al. (2024), although data sparsity for properties located more than 15 km from the center may cause increasing heteroskedasticity with distance.

7.2 Housing Construction by Category

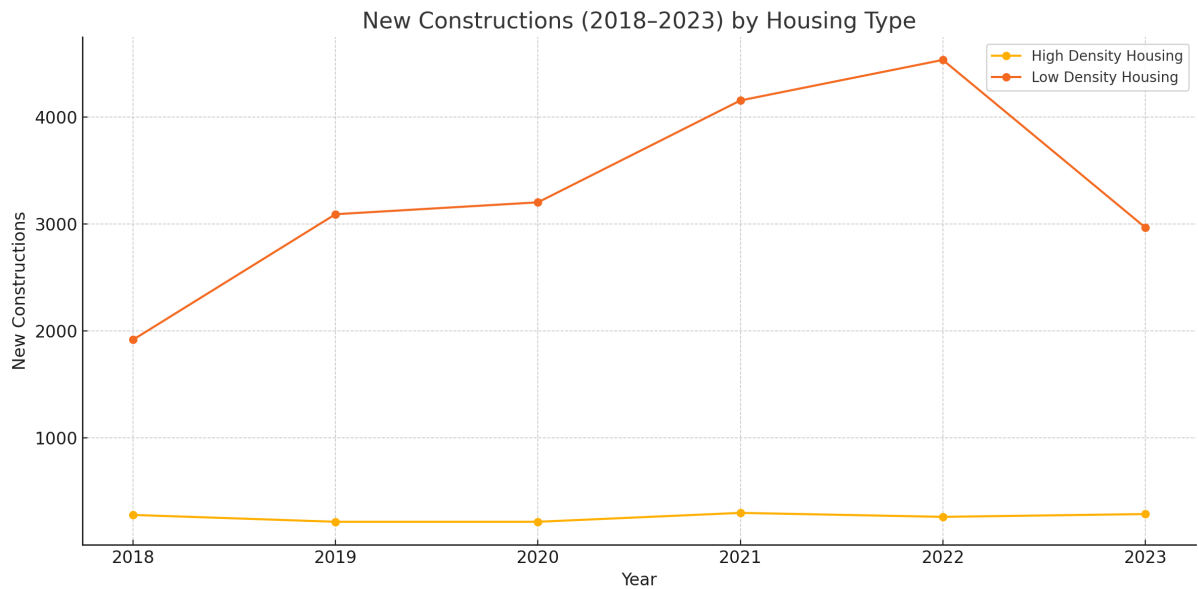


Figure 16: New Permits by Housing Type.

Between 2018 and 2023, new housing builds for high-density residential buildings remained relatively constant, although these data do not capture the number of housing units per new build. New construction of detached houses peaked in 2022, which coincides with the increase in assessed housing values during the period. In 2023, the Bank of Canada increased interest rates to combat inflation and uncertainty from recession fears led to a decrease in low-density housing starts. High-density housing starts remained fairly constant, although this fact may be attributable to the more lengthy and intensive permitting and planning process.

7.3 Counterfactual Analysis With BVAR Forecast

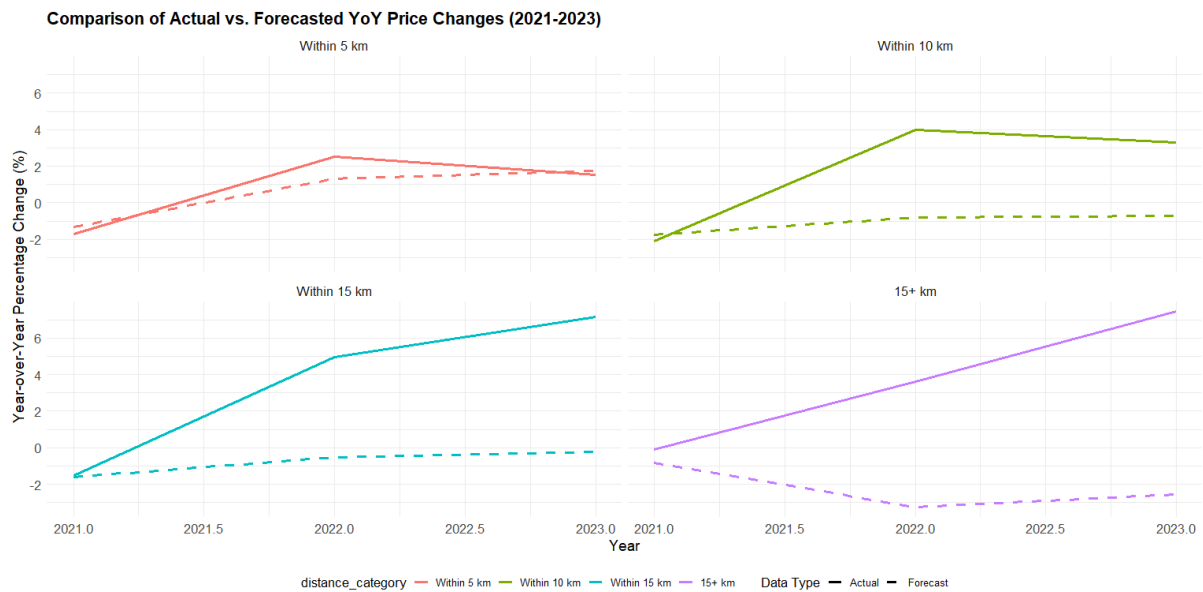


Figure 17: Forecast vs. Actual Housing Prices by Distance from City Center.

To estimate the counterfactual scenario in the absence of COVID-19, we use a Bayesian Vector Autoregressive (BVAR) forecasting model to conduct a differences-in-differences analysis. This methodology allows us to compare projected (i.e., no-shock) housing values with observed outcomes.

Across different geographic zones, our analysis reveals varying degrees of divergence between actual and forecasted assessed housing values, even after accounting for forecast uncertainty.

- Within 5 km of the city center:** Both actual and forecasted assessed housing values dipped in 2021, followed by a moderate recovery in 2022 and 2023. Actual assessed values slightly outperformed projections but remained within the forecast's confidence intervals, suggesting limited deviation from expected trends.
- Within 10 km:** The BVAR forecast predicted relatively stagnant assessed value movements. Contrary to forecasted assessed values, observed assessed values were notably higher, with statistical significance at the 10% level ($\alpha < 0.10$).
- Within 15 km:** The model again projected minimal assessment value growth. However, actual assessed values surpassed the forecast with greater confidence ($\alpha < 0.05$), indicating a stronger deviation likely driven by pandemic-induced shifts in housing preferences.
- Beyond 15 km:** Actual assessed values also exceeded forecasts significantly ($\alpha < 0.05$), suggesting broader suburban appreciation possibly linked to remote work and urban decentralization trends.

These results collectively suggest that the COVID-19 pandemic had a differential impact on housing values across distance bands, with the largest deviations occurring in mid-

and outer-ring suburbs.

8 Discussion

This study set out to examine how the COVID-19 pandemic has reshaped Edmonton’s housing market, with a particular focus on spatial shifts, changes in housing construction patterns, and deviations from expected assessment value trajectories.

First, our spatial analysis indicates that housing values in Edmonton did not move uniformly across the city. While properties within 5 km of the downtown core experienced a dip in 2021 followed by a moderate recovery, areas located 10 km and beyond exhibited assessment value trajectories that significantly outpaced the counterfactual forecasts generated by our BVAR model. These findings are consistent with the “donut effect” described by Ramani et al. (2024) and echo similar conclusions drawn by Delventhal et al. (2022) in other urban contexts. The results suggest that the shift toward remote work and changing housing preferences have accelerated the decentralization process, with suburban and exurban areas emerging as key beneficiaries.

Second, the observed patterns in housing construction add another layer of nuance to the discussion. Our data indicate that between 2018 and 2023, while new high-density residential builds remained relatively steady, there was a notable spike in detached (low-density) housing during the height of the pandemic. However, the subsequent rise in interest rates in 2023 appears to have dampened low-density construction, even as high-density projects continued at a constant pace, likely a reflection of longer planning horizons and permitting challenges. These trends highlight the complex interplay between market demand, economic policy, and the practical constraints of urban development.

The counterfactual analysis further reinforces the notion that the pandemic triggered a structural change in housing dynamics. The BVAR-based counterfactual forecasts suggest that, in the absence of COVID-19, housing values, especially in the mid and outer-ring areas would have followed a more muted growth trajectory. The statistically significant divergence between actual and projected values underscores the lasting impact of the pandemic shock on market behavior.

From a policy perspective, these findings have several important implications. The rapid appreciation in suburban and exurban areas may necessitate a rethinking of urban infrastructure investments. Enhanced transit networks, improved road connectivity, and expanded public services in these regions could help manage the pressures of rapid growth while preventing unchecked sprawl. Moreover, the observed shifts in housing construction call for policies that balance the demand for detached housing with the long-term benefits of higher-density development, especially in light of affordability and sustainability concerns. It is important to acknowledge certain limitations. Data sparsity in the outermost distance bands could introduce heteroskedasticity that affects the precision of our estimates.

Additionally, while the BVAR model provides a plausible counterfactual, the inherent uncertainty in macroeconomic forecasting suggests that our results should be interpreted with caution. Future research might incorporate additional variables such as employment trends, transit usage, or household composition changes and extend the analysis to other mid-sized cities to gain a broader perspective on post-pandemic urban restructuring.

In summary, our analysis provides strong evidence that Edmonton has experienced a pronounced “donut” effect, echoing the findings of Ramani et al. (2024). This spatial divergence in assessment value dynamics suggests that policy makers should consider rezoning measures to boost population density, as well as programs aimed at mitigating rapid value escalations in suburban neighborhoods. However, it is important to recognize that our study is confined to Edmonton, and these results may not necessarily extend to other urban centers. Moreover, due to the absence of a strong counterfactual, attributing causality solely to the impacts of COVID-19 remains challenging. Future research should explore these dynamics in broader contexts and employ more rigorous counterfactual strategies to better isolate pandemic effects.

References

- AHURI. (2021). Global solutions to a global crisis: International housing policy lessons from the pandemic. <https://www.ahuri.edu.au/analysis/brief/global-solutions-global-crisis-international-housing-policy-lessons-pandemic>
- Bartko, K. (2024). Edmonton transit ridership up 14% in 2024. <https://globalnews.ca/news/10801035/edmonton-transit-ridership-2024/>
- Canada, S. (2023). Census profile, 2021 Census of population [Accessed 2025-03-30].
- Canada Mortgage and Housing Corporation. (2025). Monthly housing starts and other construction data tables. <https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/monthly-housing-starts-construction-data-tables>
- CBC News. (2023). *What is NIMBYism?* [Accessed: 2025-04-16]. <https://www.cbc.ca/news/canada/nimbyism-explainer-1.6909852>
- CBC News. (2025). Record-setting boom in development driven by new zoning rules and new LRT [Accessed: 2025-04-06]. *CBC News*. <https://www.cbc.ca/news/canada/edmonton/record-setting-boom-in-development-driven-by-new-zoning-rules-and-new-lrt-1.7465369>
- Cimadomo, J., Giannone, D., Lenza, M., Monti, F., & Sokol, A. (2022). Nowcasting with large Bayesian vector autoregressions [Special Issue: The Econometrics of Macroeconomic and Financial Data]. *Journal of Econometrics*, 231(2), 500–519. <https://doi.org/https://doi.org/10.1016/j.jeconom.2021.04.012>
- City of Edmonton. (2019). Valley Line West LRT: Business Case Summary [Accessed: 2025-04-17]. https://www.edmonton.ca/sites/default/files/public-files/assets/VLW_Business_Case_Summary.pdf
- City of Edmonton. (2024). District Planning Information Booklet. <https://www.edmonton.ca/sites/default/files/public-files/assets/PDF/District-Planning-Information-Booklet.pdf>
- City of Edmonton. (2025a). General Building Permits [Accessed: 2025-04-21]. <https://data.edmonton.ca/Urban-Planning-Economy/General-Building-Permits/24uj-dj8v>
- City of Edmonton. (2025b). Property Assessment Data (Historical) [Accessed: 2025-03-31]. <https://data.edmonton.ca/City-Administration/Property-Assessment-Data-Historical-/qi6a-xuwt>
- City of Toronto. (2023). Toronto at a glance [Accessed: 2025-03-30]. <https://www.toronto.ca/city-government/data-research-maps/toronto-at-a-glance/>
- Conservative Party of Canada. (2025). Conservatives Will Build Homes For Canadians [Accessed 2025-04-20]. <https://www.conservative.ca/conservatives-will-build-homes-for-canadians/>
- Delventhal, M. J., Kwon, E., & Parkhomenko, A. (2022). JUE insight: How do cities change when we work from home? [JUE Insights: COVID-19 and Cities]. *Journal of Urban Economics*, 127, 103331. <https://doi.org/https://doi.org/10.1016/j.jue.2021.103331>
- Edmonton Journal Staff. (2025). Explosive growth Edmonton’s south end federal electoral riding. <https://edmontonjournal.com/news/local-news/explosive-growth-edmontons-south-end-federal-electoral-riding>

- Giannone, D., Lenza, M., Pill, H., & Reichlin, L. (2012). *The ECB and the Interbank Market* (Working Papers ECARES No. ECARES 2012-005). ULB – Université Libre de Bruxelles. <https://ideas.repec.org/p/eca/wpaper/2013-108100.html>
- Government of Alberta. (2024). Edmonton - population [Accessed: 2025-03-31]. <https://regionaldashboard.alberta.ca/region/edmonton/population/#/custom/age-pyramid/?for=2005>
- Government of Alberta. (2025). Edmonton - Population [Accessed: 2025-03-30]. <https://regionaldashboard.alberta.ca/region/edmonton/population/#/?from=2020&to=2024>
- Illingworth, T., & Renner, J. (2024). Is Zoning a Barrier to the City We Want? *Plan Canada*, 64(3), 20–23. <https://www.edmonton.ca/sites/default/files/public-files/assets/PDF/PlanCanada-Article-Edmonton-Zoning-Bylaw.pdf>
- Liberal Party of Canada. (2025). Mark Carney’s Liberals unveil Canada’s most ambitious housing plan since the Second World War [Accessed 2025-04-20]. <https://liberal.ca/wp-content/uploads/sites/292/2025/03/Mark-Carneys-Liberals-unveil-Canadas-most-ambitious-housing-plan-since-the-Second-World-War.pdf>
- OECD. (2023). *Brick by brick (Volume 2): Better housing policies in the post-COVID-19 era*. <https://doi.org/10.1787/e91cb19d-en>
- Raisner, R., & Bracken, K. (2022). Here are five policies to help solve the global housing crisis. *World Economic Forum*. <https://www.weforum.org/stories/2022/03/how-to-solve-the-global-housing-crisis/>
- Ramani, A., Alcedo, J., & Bloom, N. (2024). How working from home reshapes cities. *Proceedings of the National Academy of Sciences*, 121(45), e2408930121. <https://doi.org/10.1073/pnas.2408930121>
- Ritchie, H., Samborska, V., & Roser, M. (2024). Urbanization [Online Resource]. *Our World in Data*. <https://ourworldindata.org/urbanization>
- Sakketa, T. G. (2022). Urbanisation and rural development in developing countries: A review of pathways and impacts [Accessed: 2025-03-30], (5/2022). <https://doi.org/10.23661/dp5.2022>
- Stephen, A. (2024). Moving out of Vancouver? Everyone is heading to this Alberta city [Accessed: 2025-03-30]. *Daily Hive*. <https://dailyhive.com/vancouver/vancouver-edmonton-affordable-cities-report>