

Bigger, Faster... More Affordable? Evaluating the Impact of Supply Side Policies on the BC Housing Market

Summary of Findings

- New home construction links to the resale market by increasing the overall housing stock and enhancing choice in the market.
- Improving affordability means slowing the future rate of growth in home prices and that means a faster supply response to demand.
- Our simulations show that policies designed to streamline the development cycle, such as building more units and building faster, are effective at mitigating demand shocks.
- Improving the current development process may be challenging, but new technologies, better processes and more collaboration between levels of government could make the streamlined policies in our simulations a reality.

Introduction

Since the beginning of the COVID-19 pandemic, average home prices in British Columbia have shot up more than 45 per cent. Active listings, or the number of homes for sale on the Multiple Listing Service® (MLS®) at a given point in time, have fallen across the province to record lows. The sales-to-active listings ratio, the most readily available measure of market tightness, has surged well beyond levels needed for the number of buyers and sellers to be roughly in balance. In short, BC's housing market became extremely hot since the onset of the COVID-19 pandemic.

In a previous Market Intelligence¹, the BC Real Estate Association (BCREA) identified demand shocks and interest rates as the most important drivers of home prices over the past four decades. Provincial and municipal policymakers have no control over global interest rates while demand for housing is a function of a strong labour market, income growth and healthy population growth. These are positives and should be encouraged, not limited, by public policy.

¹ BCREA Market Intelligence, "Supply and Demand: A Quantitative History of BC Home Prices," March 2021 <https://www.bcrea.bc.ca/economics/supply-and-demand-a-quantitative-history-of-bc-home-prices/>

There have been periods when expectations of rising prices played a fundamental role in rapid price growth and policymakers have already deployed tools in hopes of dampening speculation. For example, much of the province is now subject to a Foreign Buyers Tax and a Speculation and Vacancy Tax.

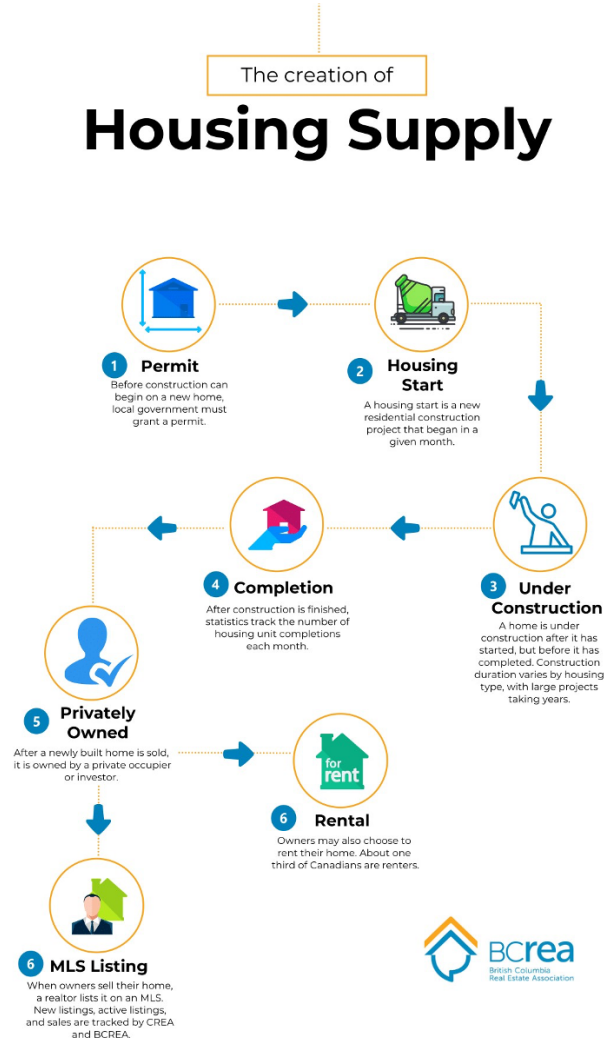
With demand-side mechanisms already enacted to moderate prices, supply is left as the major factor over which provincial and municipal governments have considerable influence. Amid this unprecedented surge in housing market activity, housing supply is therefore of renewed interest as policymakers grapple with methods of addressing waning affordability. While some will argue that we are already building enough housing, the evidence is clear and points to the opposite. New home completions, while rising, are low in per-capita terms. The inventory of homes for sale reached all-time lows in 2021 and most importantly, home prices and the cost to rent, probably the most obvious indicators of scarcity, are loudly indicating that supply is insufficient. Simply put, demand is significantly outpacing supply. Given this context, it is important to understand how thoughtful supply-side policies can help bring housing markets back into balance.

In this Market Intelligence, we look at the linkages between the new home construction market and the re-sale market and quantify how policies to build more and build faster could impact home prices and the housing market's ability to absorb new demand.

Potential Mechanisms Linking New Completions and MLS® Listings

The resale market is relatively straightforward to understand. It is well-established that the sales-to-active listings ratio is strongly correlated with price growth; when the ratio rises, prices are soon to follow. There are strong intuitive reasons to believe that, in the long-run, prices are driven by the fundamentals of demographics or population, as well as the total size and composition of the housing stock. The housing stock grows when new completions outpace demolitions, which provides the intuitive foundation for why new completions moderate home prices, all else equal. The process of new home construction and how it relates to the resale market is shown in Figure 1.

Figure 1: Linking New Construction and the Resale Market



Theoretically, new home completions are likely to increase the number of active listings and moderate the sales-to-active listings ratio, ultimately reducing price pressure. However, the link between new completions and new listings on the MLS[®] System is less clear than one might intuitively think. This paper seeks to establish this relationship concretely and empirically.

New home completions could impact the number of listings on the MLS[®] System both directly and indirectly. It is useful to explicitly characterize the mechanisms by which new completions affect the resale market for homes, particularly new listings and prices.

(a) **Direct Mechanisms**

When a new home is completed in British Columbia, the total housing stock in the province expands by one unit. Some proportion of interested buyers will be existing homeowners within the province who wish to move into this new unit. If an existing household purchases the newly completed unit, they may sell their current owner-occupied home and move into the new unit.

The above example above should moderate pressure on the resale market. In this example, the new completion directly results in another home being listed on the MLS® System as this household moves into the new unit. The new completion has directly improved the sales-to-actives listings ratio by causing a unit to be listed.

(b) **Indirect Mechanisms**

Indirect mechanisms include all the ways that a new home completion affects the resale market by indirectly reducing pressure. This is often understood by imagining the counterfactual world where a new completion had not occurred. For example, if an investor buys a newly completed home, this has no direct effect on the resale market (sales, listings, prices). However, if the new home had not been completed, the investor may have instead made a purchase through the MLS® System, incrementally increasing the sales-to-active listings ratio and putting upward pressure on prices. In this example, the new completion “moderates” prices *relative to the counterfactual* by preventing another scenario which would have raised prices from occurring. Simply put, the completion of a unit enhances the universe of potential housing choice.

This counterfactual logic applies to a variety of scenarios related to new home sales and completions. For example, if a new immigrant moves to BC and buys a newly completed home, this will not have a direct impact on the resale market. However, the existence of the new home indirectly relieves pressure on the resale market. Another example is if children move out of their family home and buy a newly completed unit. Once again, the new completion affects the resale market entirely by preventing the counterfactual scenario where the buyer instead purchases from the existing housing stock, raising the sales-to-active listings ratio and ultimately prices.

Home prices are largely a product of the resale market, but they are also inextricably linked to the new home market, the rental market and even resale markets in other jurisdictions. If a flood of new completions were to enter the market and drive down the price of new homes, this will impact prices in the resale market since new homes and existing homes are essentially substitutes.

Likewise, home prices must reflect the cost of rent. A common critique of new home development is that they are largely bought up by investors, who then rent out the units. Once again, while investor-purchased new completions may not have an immediate or direct impact on the resale market, there are downstream effects on the resale market. If rent costs were to

become “too cheap” relative to home prices, the marginal buyer will choose to rent instead of buying, moderating prices. Additionally, if the cost of rent falls, the marginal investor (who treats homes like an asset with cash flows) will choose to invest elsewhere, moderating prices in the new completion market and ultimately the resale market.

A recent report from the General Manager of Planning, Urban Design & Sustainability at the City of Vancouver supports these theoretical arguments with empirical evidence.² The report uses census data to reveal that “in 2016, 21,655 Vancouver households lived in housing built in the previous five years.” Comparing this figure to the number of households in the City of Vancouver, we find that nearly 8% of households in the city live in housing built in the previous five years. The same figure is roughly 9% for the lower mainland region (Vancouver CMA). This figure reveals that new housing is indeed a major source of housing for existing residents. Once again, one can imagine the counterfactual scenario where this housing was never built to get an idea of how new housing affects the resale market. In such a scenario, this 9% of lower mainland households living in newly built housing would instead need to crowd into the existing housing stock. It seems clear that resale market prices would be higher in this counterfactual, as demand would be considerably higher for resale market housing without the “shock absorber” of new housing.

To conclude this section, the linkages between the new home market and the resale market are numerous and integral. Each newly completed home will have effects on the resale market via both direct and indirect effects, the substitutability of new and used homes, the balance of the cost of rent and home prices, and other mechanisms that keep markets balanced. Indirect rather than direct mechanisms are more common; the positive effects of new completions on affordability largely result by preventing sales in the resale market that would have otherwise occurred. By increasing the stock of total homes, or the supply of housing, markets will tend to equilibrate towards lower prices, if all else is equal. This section has outlined some of the theoretical and intuitive reasons why this is the case. The following sections will outline the empirical basis for the relationship between the resale and new home markets.

² General Manager of Planning, Urban Design & Sustainability, “2021 Housing Progress Report, Housing Needs Report, and Update on Housing Targets Refresh”, City of Vancouver, April 6, 2022, <https://council.vancouver.ca/20220427/documents/cfsc3.pdf>

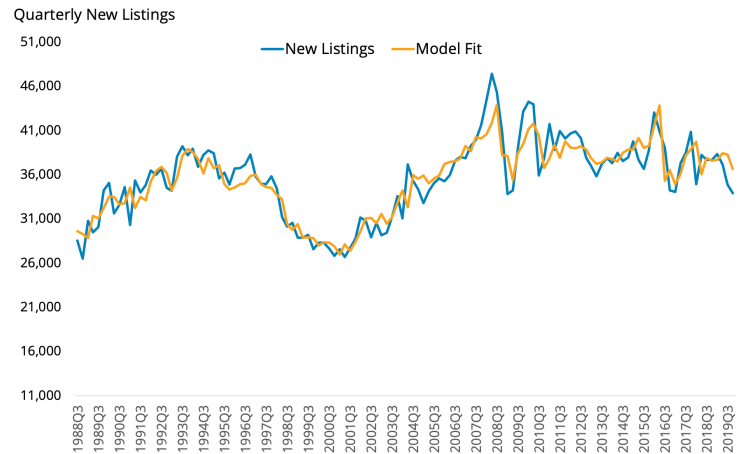
Empirical Link Between New and Resale Supply

The previous section explained the intuitive and theoretical links between new construction supply and the resale market. A key purpose of our resale market policy model is to measure this link empirically. The correlation between new listings and completions is strong, though both variables are also influenced by other important factors, most notably prices. We have good intuition behind causality; it is not hard to imagine a scenario where a family lists their current home once a new home completes construction. It is a reasonable assumption to treat

completions as having at least some causal impact on the level of new listings. New listings will rise when new homes complete, freeing up the existing housing stock, but there is also a feedback mechanism to new supply through the price expectations of developers.

In our policy model, we assume that completions have both an immediate, contemporaneous impact on new listings as well as a lagged impact. Overall, our regressions show that a 10 per cent increase in completions translates to a 2.5 per cent increase in new listings over an 18-month period³.

Figure 2: New Listings Model



Source: BCREA Economics

The Link Between Prices and Supply

We have outlined the link between new home construction and the resale market, but ultimately, we need to understand how prices feed back into housing supply. To measure the response of supply to prices, economists use something called supply elasticity, which indicates the effect of a change in prices on new housing supply (as measured by starts, permits, stock, or otherwise). If a city has a housing supply elasticity of X , this means that a 1 per cent increase in prices would correspond to an X per cent increase in housing starts. In theory, supply tends to rise when prices rise as builders chase higher revenues. This elasticity will however vary by region as local regulations, industrial structure and other macroeconomic and demographic factors influence the ease and rapidity of the local supply response.

³ This represents the estimated total impact multiplier from a distributed lag model

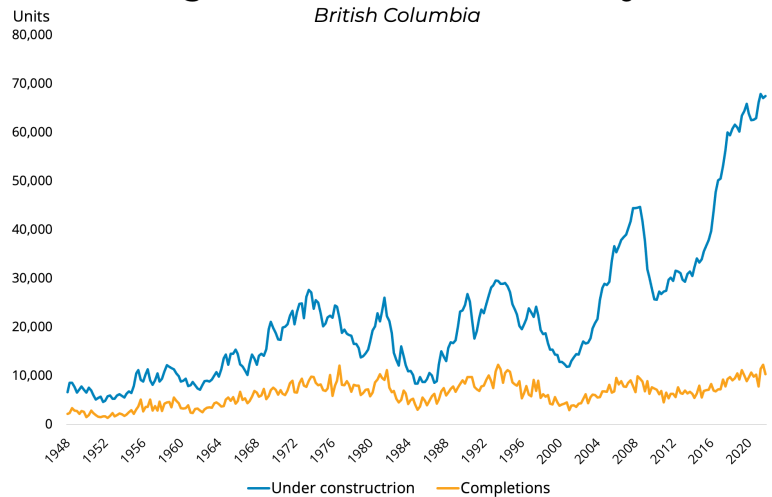
Based on our scan of the relevant literature and our own research (see Appendix 2), we have used a baseline supply elasticity of 0.2 in our policy analysis model.

Constraints on New Supply

Major cities in BC have clearly struggled with a low supply response to rising prices. For those that recognise housing supply as the best means of addressing affordability, zoning and regulation are typically seen as the binding constraints that ought to be relaxed. Indeed, most of the land in major cities like Vancouver is zoned for single-family dwellings, and therefore any net increase in housing supply is essentially impossible under current laws in these areas. However, there may be other constraints which limit the capacity of housing supply to expand.

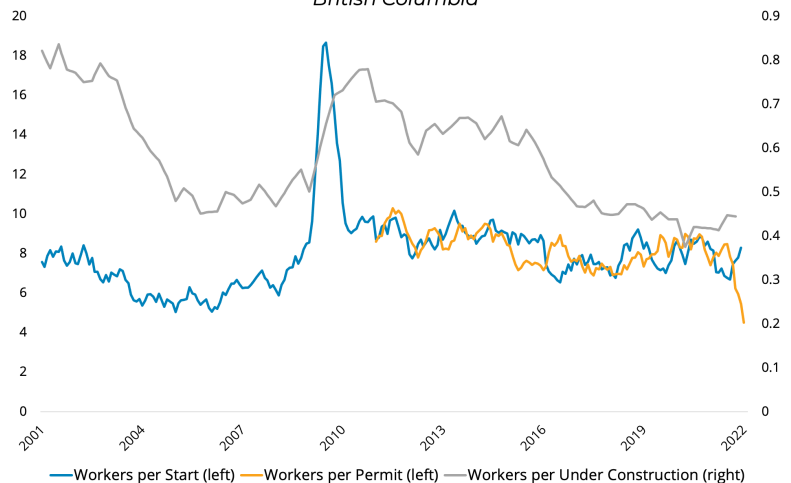
It may be that the economy does not have the construction capacity to build units fast enough to keep up with demand. Under this hypothesis, both regulatory constraints as well as limits on the capacity of the economy cap the number of new homes that can come online. There is some evidence for this hypothesis in the data. Figure 3 shows that the number of units currently under construction has surged to unprecedented levels. Notably, the number of units under construction is about 50 per cent higher than the previous peak just prior to the 2009 recession. By contrast, the number of units being started and completed are high but are roughly equivalent to prior records. This suggests that homes may be getting “stuck” in the construction pipeline, which could indicate construction capacity constraints.

Figure 3: Construction Activity
British Columbia



Source: CMHC; Statistics Canada; BCREA Economics

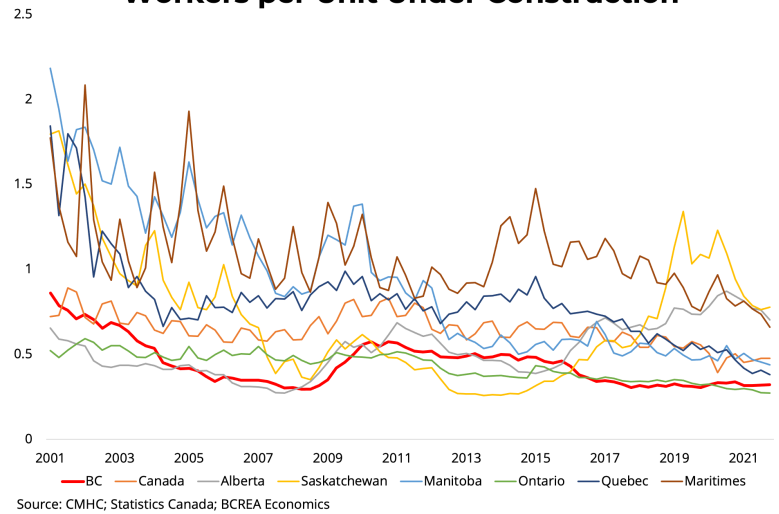
Figure 4: Construction Workers per Unit
British Columbia



Source: CMHC; Statistics Canada; BCREA Economics

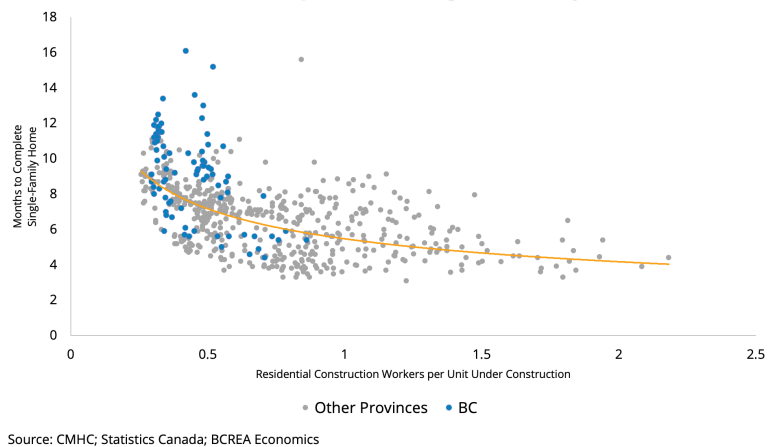
Examining the ratio of construction workers to measures of housing construction, we find that the ratio of residential construction workers to starts and permits appears to be in line with historical averages. By contrast, the number of workers per unit under construction has fallen to the lowest level recorded in recent years. Regulations related to permits and starts are certainly an obstacle to housing supply. However, the surging ratio of workers per unit under construction may suggest that there are also capacity constraints in the development industry, even after a project is out of the hands of city planners. Examining the ratios across all provinces, we observe a downward trend. Except for Saskatchewan and Alberta, all provinces have fewer workers per unit under construction now than during most other periods over the last two decades. Among the provinces, only Ontario has a fewer number of residential construction workers per unit under construction. If there were a construction capacity constraint, it would make sense that the problem would be national, as workers are able to relocate to areas with labour shortages and correspondingly higher wages. It would be surprising if BC was experiencing construction sector capacity constraints due to labour shortages, but Ontario was not.

Figure 5: Residential Construction Workers per Unit Under Construction



Figures 6 and 7 show the relationships between the number of residential construction workers per unit under construction with the months to complete a single-family home and apartment respectively. In the scatterplots, a single observation represents a particular quarter in a province over the last 10 years⁴. Thus, the scatterplots show the correlation between a construction sector labour market tightness (as measured by workers per unit under construction) and the time it takes to build units.

Figure 6: Construction Workers per Unit Under Construction vs Months to Complete a Single-Family Home



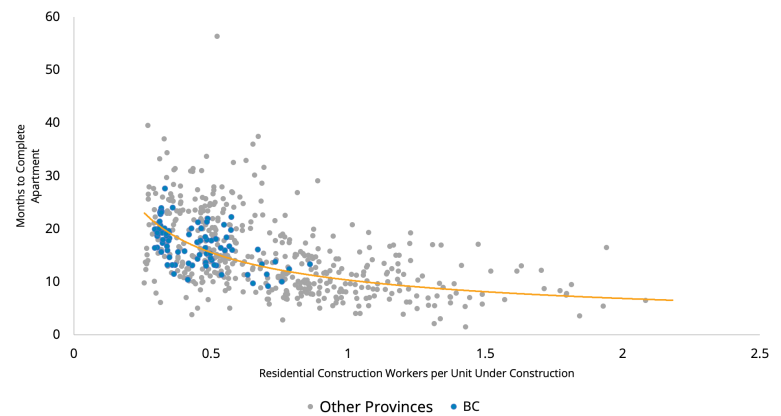
⁴ The four Maritime provinces are aggregated into a single region due to volatility and missing observations as a result of their small size.

Aligning with intuition, we observe a strong negative relationship between these variables over the last two decades across Canadian provinces; periods and places with fewer workers per unit under construction tend to have higher construction durations. By contrast, provinces with many workers per unit under construction complete units much more quickly.

This holds for both single-family homes and apartments, indicating that this relationship is not driven by compositional changes over time. We also observe that the relationship is non-linear, with construction durations rising particularly steeply after the number of workers per unit under construction is less than 0.5. This is notable, as in recent quarters the ratio has fallen below 0.4 in each of Canada's three largest provinces (Ontario, Quebec, and BC), with BC currently sitting at just 0.32 workers per unit under construction of all unit types.

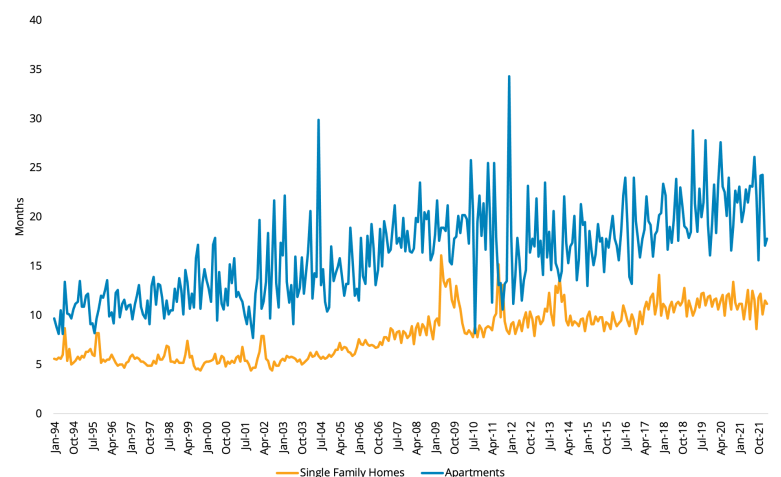
This analysis demonstrates that while regulation certainly constrains new housing supply, supply elasticities are also likely restrained by factors as simple as labour availability. In addition to rising construction durations, the presence of construction labour shortages is supported by survey evidence from the Independent Contractors and Businesses Association (ICBA) which recently found that 76 per cent of their members could not find enough workers for the projects that they already had.⁵ In addition, according to the BC Building Trades union, 25,000 workers representing 13 per cent of the BC construction labour force plans to retire by 2027. This evidence suggests that if housing prices are to be moderated through increased supply, additional workers will likely be needed to prevent the number of workers per unit under construction from falling further and construction durations from rising further.

Figure 7: Construction Workers per Unit Under Construction vs Months to Complete an Apartment



Source: CMHC; Statistics Canada; BCREA Economics

Figure 8: Construction Durations British Columbia



Source: CMHC; Statistics Canada; BCREA Economics

⁵ Smith, Charlie, "Canadian politicians' grand promises of new housing supply will require tens of thousands of new construction workers", The Georgia Straight, <https://www.straight.com/news/canadian-politicians-grand-promises-of-new-housing-supply-will-require-tens-of-thousands-of-new>

As shown in the primary model in this paper, both the number of starts and the speed of completion affect prices in the resale market. If starts rise but construction durations also rise due to a lack of skilled labour, the benefits of those starts will be attenuated.

Evaluating the Impact of Supply-Side Policy

British Columbia is known for having a very low supply response to rising prices. Developers would prefer to build more given prices in the market but have been constrained by land use policy and other factors. We have also seen that the amount of time it takes to build has been expanding over the past decade from an average of 12-13 months to an average of close to 20 months. That lengthening time is partly a function of the increasing share of apartments in the total number of units built, but as shown in Figure 8 durations are rising even after controlling for product type. Increasing regulation, rising construction standards and construction labour shortages may also be factors slowing construction times.

In this section, using a resale housing policy model currently under development at BCREA⁶, we evaluate some high-level improvements to the construction process to assess what impact, if any, these improvements may have on affordability in the resale market. This model allows us to quantify important questions such as:

- How does the new-construction market interact with the resale market?
- What if, through rezoning or other means, we could build more units each year?
- What is the impact of speeding up the construction process?
- What if improvements in the permitting process meant that developers could get to the construction stage of their plans faster?

We evaluate each of these policies based on how successful they are in mitigating the impact of an external demand shock on home prices compared to a baseline model calibration that reflects the current state of the market. That baseline assumes an average time to build of 19 months, a supply elasticity of 0.2 and a 20-month development period before the start of construction.

Of note, we are working at a provincial scale in the model which masks the significant variation in housing supply and demand at the regional level. As we further develop the model, we plan to include regional level analysis.

⁶ This model is based on a note by the US Federal Reserve adapted to include linkages between new-home construction and the re-sale market. The note can be accessed here: Anenberg, Elliot, and Daniel Ringo (2021). "Housing Market Tightness During COVID-19: Increased Demand or Reduced Supply?," FEDS Notes. Washington: Board of Governors of the Federal Reserve System, July 08, 2021, <https://doi.org/10.17016/2380-7172.2942>.

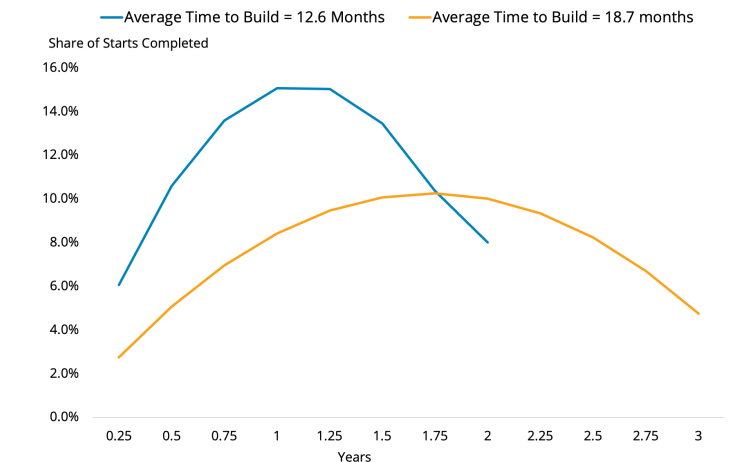
Scenario 1: Building Faster – Decreasing the Average Length of Construction

Modelling new home completions is a relatively straightforward, mechanical process. Most housing starts eventually become completed units and, according to the CMHC, the average time to build in BC is approximately 19 months⁷. In our model baseline scenario, we assume time-to-build is symmetric with half of units completed within 19 months and the other half taking longer than 19 months. We then run a simulation in which the average time to complete returns to its 2012 era value of 12-13 months.

Figure 9 shows the assumed completions curve for each scenario. For example, if in the current month 100 new units are started, then under our baseline calibration, 50 units would be completed within 19 months. In our alternative scenario of faster construction times, 74 units would be completed within 18 months.

As new units are added to the market faster, resale units are made available because some owners choose to list their current homes in favour of purchasing newly completed homes. While most new units are pre-sold, some units will also be available to purchase once completed, which adds to the overall inventory of homes for sale. The combined effect of higher listings and new units on the market expands the overall availability of housing and provides enhanced choice for prospective buyers. As new units are brought to market in a timelier fashion, the impact of a demand shock is tempered, though not completely mitigated.

Figure 9: New Construction Completions Curves



Source: CMHC; BCREA Economics

Scenario 2: Building More and Building Faster

While reducing construction time helps somewhat, it only shifts supply forward but does not necessarily result in more units being built and so can only provide temporary relief on affordability. In this scenario, we model the impact of not only building faster, but also increasing the magnitude of total new home supply. This can be thought of as the universe of potential construction opportunities expanding due to changes in zoning policy.

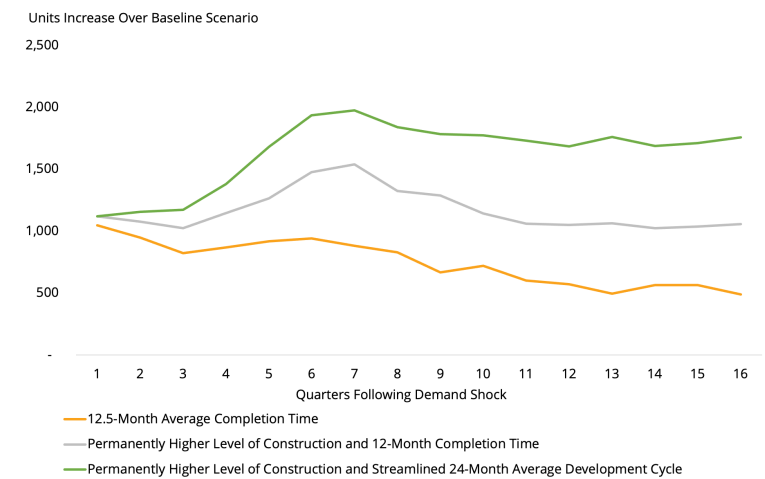
As a result, not only do units complete faster, but the market receives a consistently higher level of completions.

⁷ CMHC, Average Length of Construction (in months) by Dwelling Type by Provinces (In Census Metropolitan Areas and Census Agglomerations with at least 50,000 people)

Scenario 3: Streamlined Development Cycle

Much attention has been paid to delays and excessive red tape in the development process. In this scenario we simulate not only building more units each year, but also dramatically streamlining the development cycle from permitting to breaking ground and completing units from baseline scenario of 39 months down to 24 months. That time encompasses a 12-month pre-construction period and a 12-month average time to completion once construction starts.⁸ For comparison, the time from authorization of a building permit to completion for buildings of two units or more in the Western United States is about 15 months.⁹ As a result, new home completions ramp-up to a higher desired level much more quickly and sustain that level of supply over the duration of the demand-shock.

Figure 10: New Home Completions



Source: BCREA Economics

Summary of Results

Figure 11 shows the impact of a demand shock under each of our described scenarios. Without any improvements to the supply process, a demand shock causes sustained excess growth in home prices as total listings fall and new supply is slow to come to market.

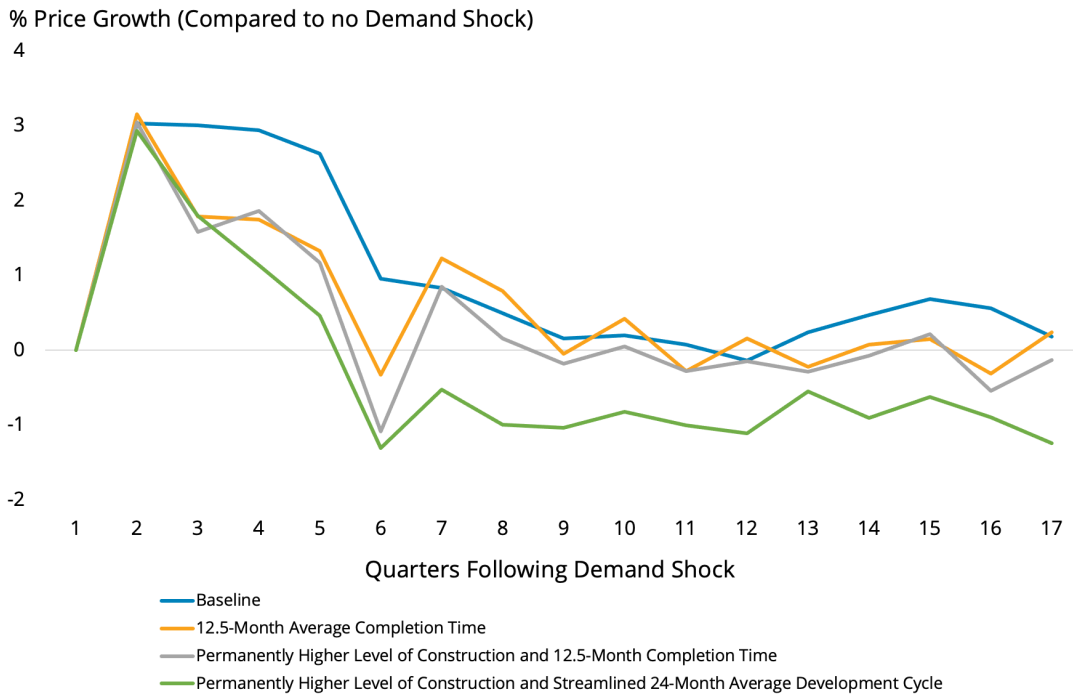
Each of our model scenarios has the desired effect of mitigating a demand shock, though to very different degrees. Speeding up the time it takes to complete units by about 6 months helps to offset the increase in demand before price growth returns to baseline.

However, in the scenarios where developers can build faster and build an increased number of units, not only is the impact of the demand shock mitigated much faster, but price growth falls below baseline due to a much more robust supply response. This happens even with the model incorporating lower price expectations feeding back into the supply side of the model. The time compression of the development cycle simulated under our third scenario is somewhat aggressive, especially for larger projects, but the goal of the simulation is to quantify how much of an improvement needs to be made in getting supply to the market and our results provide a useful boundary for the effectiveness of supply-side policy.

⁸ This is accomplished in the model by reducing the amount of time it takes for housing starts to reach their desired long-run level

⁹ US Census Bureau, <https://www.census.gov/construction/nrc/lengthoftime.html>

Figure 11: Response of Prices to Demand Shock



Source: BCREA Economics

Conclusion

Whether the types of improvements modeled in our research are achievable is outside the scope of this Market Intelligence, although the section on construction labour markets suggests building more may require expanding the labour supply in addition to regulatory and zoning changes. Given the ambitious plans to double home construction over the next decade laid out in the most recent Federal Budget¹⁰, our simulations are illustrative of what could be achieved on containing price growth if such major changes to supply were possible. New technologies, better processes and more collaboration between levels of government could very well make the types of streamlined policies in our simulations a reality in the future.

The alternative is the status quo in which the housing market continues to be beset by unpredictable shocks to demand, causing home prices to further drift out of reach for some households.

¹⁰ <https://budget.gc.ca/2022/report-rapport/chap1-en.html#wb-cont>

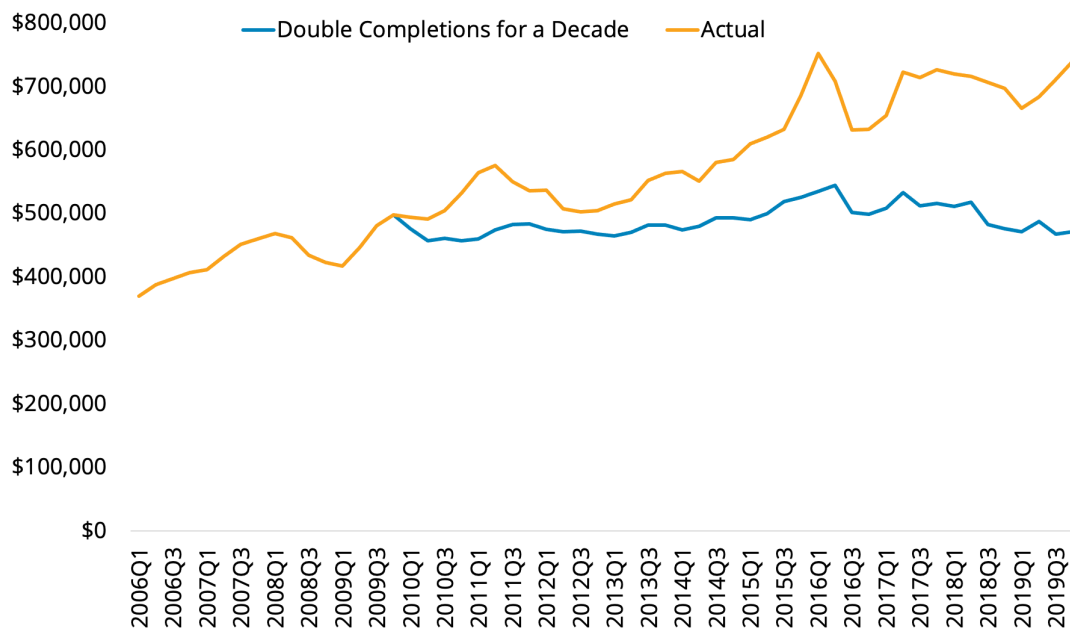
Appendix 1: Doubling New Home Construction

As aggressive as our Scenario 3 appears, it looks significantly less so in comparison to the goal of doubling new home construction as stated in the most recent Federal Budget. The Federal Government is investing significant resources into this goal but doubling the rate of completions is a daunting task. Nonetheless, we have run a scenario in our model to examine how affordability would have been impacted if completions from 2010 to 2019 were roughly double the actual rate over that period.

As expected, doubling the rate of new supply additions would have had a profound impact on affordability, even through periods of very strong demand. As shown in the figure below, under such a scenario our model estimates that prices would have been flat throughout the decade.

Appendix: Figure 1

MLS® Average Price (BC)



Source: BCREA Economics

Of course, this exercise assumes that builders and developers would continue building into a well-supplied market and that lower price expectations would not have short-circuited that steady stream of new homes. In addition, such a rate of new home completions assumes that any other constraints, such as labour supply, are not binding. While these assumptions are not totally realistic, this scenario is illustrative of what could be achieved with bold action on the supply side of the housing market. It also indicates what could be expected if the Federal Government were to fulfill its budgetary promise of doubling the rate of new home construction.

Appendix 2: Estimating Supply Elasticities

Elasticities can be estimated naively by running the following simple regression for a region:

$$\ln(\text{starts}) = c + \gamma * \ln(\text{price}) \quad (1)$$

Estimating (1), we find a naïve elasticity estimate of 0.23 for British Columbia and 0.27 for Vancouver. This would imply that a 1 per cent increase in prices corresponds to a relatively modest increase in housing supply of 0.23 per cent and 0.27 per cent respectively. These estimates are considered “naïve” due to their not controlling for relevant omitted variables, reverse causality and other endogeneity which biases the estimate of γ .

If we want to understand the **causal** relationship between prices and housing starts, or the causal elasticity, the researcher needs to use more advanced methodologies which aim to resolve this bias. Table 1 indicates the estimated elasticities from a survey of literature on the subject. The literature on elasticities varies by region, methodology, and measure of “supply,” which yields a range of results.

Table 1: Housing Supply Elasticities

Source	Methodology	Geography	Supply Measure	Elasticity
CMHC, 2018, “Examining Escalating House Prices in Large Canadian Metropolitan Centres” ¹¹	OLS	Vancouver	Housing Starts	0.22
CMHC, 2018, “Examining Escalating House Prices in Large Canadian Metropolitan Centres”	Instrumental Variables	Vancouver	Housing Starts	0.28
Bank of Canada, 2021, “Canadian housing supply elasticities” ¹²	Inverse of city-region price elasticity	Vancouver	“Supply”	0.63
Saiz, Albert. 2010. “The Geographic Determinants of Housing Supply.” <i>Quarterly Journal of Economics</i> , 125(3): 1253–1296.	Non-linear combination of geography and regulation constraints	Population-weighted US Metro Areas	Households	1.75
Giannone, E., Q. Li, N. Paixao and X. Pang. 2020. “Unpacking Moving.”	Inverse of city-region price elasticity	Vancouver	“Supply”	~0.15

¹¹ <https://assets.cmhc-schl.gc.ca/sf/project/cmhc/pdfs/content/en/69262.pdf?rev=15f4d0e4-a2e6-4aab-bb31-f4d88b5b17e4>

¹² <https://www.bankofcanada.ca/wp-content/uploads/2021/09/san2021-21.pdf>

While several papers estimated elasticities for Vancouver, none of the estimates in the literature are for the province of British Columbia. Following the Canada Mortgage and Housing Corporation (CMHC), BCREA uses four methodologies to estimate a “causal” elasticity for the province at large¹³. These approaches all yield estimates that range from 0.1 to 0.2. These are relatively low figures, meaning that a 10 per cent increase in prices would cause an increase in the number of starts in the province of between 1-2 per cent. As discussed in the paper, after weighing the literature and our own estimates, we chose to use a supply elasticity of 0.2.

Table 2: BCREA's Housing Supply Elasticities

BCREA Baseline	Cointegrating equation	BC	Starts	0.19***
BCREA	OLS with price equation	BC	Starts	0.13***
BCREA	SUR with price equation	BC	Starts	0.14***
BCREA	2SLS	BC	Starts	0.10***

¹³ These include a cointegrating equation methodology, OLS with controls, Seemingly Unrelated Regressions methodology and an instrumental variables approach