Ontario New-Home Sales-Tax Relief:

A Counter-Cyclical Bridge for the Ontario Residential Construction Workforce

ONEMODEL™ Platform

Prepared for the
Residential and Civil Construction Alliance of Ontario (RCCAO)

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WHO is affected?

WHAT are the factors driving the results?

WHEN is are they going to happen?

WHERE is will the impact be?

And importantly the **WHY** is it happening?

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This report was proudly commissioned by the Residential Construction Council of Ontario.

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CANCEA

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1. Executive Summary and Overview of Results

By mid-2025, it was beginning to become apparent that the residential construction industry in Ontario was seeing a significant downturn in its books of business. None of this came as a surprise. Over the preceding years, many had warned of the pending "dislocation" in the housing formation pipeline, with the breakdown in the mechanics and dynamics of the Ontario housing market. The timing was uncertain, but by the autumn of 2025, it had become evident that the dislocation had arrived and housing starts and completions were falling precipitously.

We call it a **"dislocated housing market"** as it implies that the market machinery has been disrupted. It's not just that sales are significantly down; it's that the link between buyers, sellers, and builders has been severed. Builders can't build because costs are too high; buyers can't buy because rates/prices are too high; and sellers won't sell because they are anchored to old prices.

The Ontario residential construction sector is now operating under a material market dislocation. This report is based on analysis performed for and provided to the Residential and Civil Construction Alliance of Ontario (RCCAO) in October 2025. It responds to a request to evaluate whether indefinite sales-tax relief on new homes would be revenue-neutral for governments and whether it would help reignite housing market activity.

Our findings identify clear distinctions between different policy interventions. Our results using our ONEMODEL™ simulation[1] platform showed that an indefinite tax cut is an inefficient option that would result in structural deficits for government. A permanent measure recovers only 10 to 14 per cent of the completions problem and creates a $2 billion annual fiscal shortfall aggregated across all levels of government.

Furthermore, we found that the expectation over the next 10 years - using the behaviourally driven simulation of what is expected to happen if there is no policy change - Ontario will average 21,500 fewer annual housing starts every year over the next decade (2026–2035) compared to the recent ten-year average, housing approximately 390,000 fewer Ontarians by 2035. That shortfall would account for approximately 390,000 fewer Ontarians housed by 2035. However, what had really concerned us was the impact on the residential construction labour force that would be required to support the regrowth of the housing sector. The analysis indicated that about 35,000 residential construction workers could be displaced, including 21,000 aged 35 or younger (60 per cent), 5,000 mid-career (14 per cent), and 9,000 aged 55 and over (26 per cent).

With this concern, we simulated another potential policy: temporary three-year sales-tax relief on new homes. A time-limited bridge provides a superior outcome. A three-year sales-tax holiday recovers approximately 30 per cent of the completions problem. This temporary measure helps preserve critical labour capacity and is statistically tax-neutral.

[1]ONEMODEL™ technical specification and agent architectures are detailed in Appendix A.

Key Results: Three-Year Sales-Tax Holiday (Average Annual Impact, 2026–2035)

GDP Impact	**+$3.9 billion annually**
Residential Construction Jobs Preserved	**+25,600 positions**
Wages Protected	**+$8.3 billion baseline at risk**
Social Value	**+$1.9 billion annually**
Fiscal Status	**Statistically tax-neutral**

Table 1 details the average annual impacts of the three-year holiday. The table states specific figures in billions of Canadian dollars or absolute job counts. The comparison basis is the historical ten-year trend baseline.

Table 1: Headline Economic and Social Value Results

(Average Annual Impact Compared to Trend Baseline, 2026 to 2035)

Metric	Material Market Dislocation (No Intervention)	Three-Year Sales-Tax Holiday (Up to $2.0M, linearly decreasing from $1.5M)	Impact of Three-Year Holiday
GDP	-$14.7 billion	-$10.8 billion	+$3.9 billion
Jobs	-96,300 (all industries)	-70,700 (all industries)	+25,600 (all industries)
Social Value	-$7.1 billion	-$5.2 billion	+$1.9 billion
All-Government Revenue	-$6.0 billion	-$5.2 billion	+$0.8 billion (Statistically tax-neutral)

The three-year holiday does something different to a permanent tax cut. It reduces the expected loss by approximately 28–30 per cent: 17,700 fewer starts per year (22 per cent improvement) and 13,800 fewer completions (30 per cent improvement). And critically, the three-year holiday is revenue-neutral when viewed across all orders of government. And it keeps over 25,500 skilled workers in the residential construction industry.

2. The RCCAO Inquiry and the Ignored Systemic Warnings

During the first six months of 2025, the Bank of Canada lowered the overnight rate, pausing at 2.75 per cent by June. The anticipated return of buyers failed to materialize uniformly. Faced with a market unresponsive to cheaper credit, the consensus among commercial banks fractured.

Some private sector economists maintained their cyclical models. They interpreted cumulative upticks in local resales as evidence that the market was stabilizing. One commercial bank report

hypothesized that buyers were developing "trade-uncertainty fatigue," stepping off the sidelines despite macroeconomic headwinds.

Other economists identified a structural break. They noted that U.S. trade tariffs targeting Ontario's manufacturing sector had dampened consumer confidence, neutralizing the stimulative effect of the central bank's rate cuts.[2] Furthermore, data indicated the Greater Toronto Area's high-rise condominium sector was entering a recessionary phase. The market was absorbing a surplus of listings from investors carrying negative cash flows.[3] During this period, the CMHC's reporting lagged the more cautious commercial banks, as the agency attempted to reconcile collapsing immediate buyer demand with its long-term supply mandates.

When RCCAO approached CANCEA in October 2025, builders were observing severe deterioration in their active books of business. What we began to understand was that there were two significant systemic risks that were actively unravelling the market. The first was the dramatic halt in housing market activity. The second—yet to come, but behaviourally imprinting on market participants—was the pending shock of mortgage renewals peaking in 2026.[4] Bank of Canada data model estimates 1.6 to 1.8 million upcoming mortgage renewals.[5] Borrowers face specific payment shock parameters that range from 20 per cent (fixed rate borrowers) to 50 per cent for variable-rate borrowers with fixed payments.

Housing policy-makers failed to anticipate this dual systemic unravelling. In contrast to the institutional failure to see what was coming, the industry practitioners and construction associations (Marlon Bray, RCCAO, RESCON, BILD, Altus Group and CANCEA) had all repeatedly warned of an impending structural break in the Ontario housing markets.[6] These practitioners identified the breaking mechanics and dynamics of the housing market long before the damage appeared in lagging administrative data.

The financial establishment recently pivoted its assessment of the residential construction sector. Forecasters previously viewed current conditions as a cyclical pause. The institutional consensus now acknowledges a structural material market dislocation. Financial institutions report severe constraints actively hindering project viability. These constraints include sticky borrowing costs, rapid inventory accumulation, and a total pre-construction freeze.

The financial sector observes the exact structural failure our modelling had identified. Another analyst observes that what does not get launched today will not get delivered in the future (Kavcic, 2025). The ongoing material market dislocation directly eliminates future housing supply as it alters builder timelines permanently.

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[2] Sondhi, R. (2026, January 19). Provincial housing market outlook: Activity to remain subdued this year. TD Economics..

[3]CIBC Capital Markets. (2025b, October 30). Household credit quality — What's in the pipeline. CIBC Economics.

[4]Household market dynamics and expectation formation models are detailed in Appendix B.

[5]Godbout, Su, and Xu (2025). Staff Analytical Note 2025-21: "How will mortgage payments change at renewal? An updated analysis."

[6]Marlon Bray is a practitioner affiliated with Clark Construction Management.

3. Diagnosing the Hidden Labour Crisis (What ONEMODEL™ Saw)

At the time, the ONEMODEL™ simulation was calibrated using data up to August 2025. We processed the RCCAO tax question through the simulation environment. Unfortunately for the housing market and the economy, our baseline expectations were tracking against the lagging administrative data. Last month, we compared our expectations against full-year 2025 figures released in late January 2026. The simulation successfully forecast housing starts within 1.0 per cent and completions within 2.7 per cent of reported CMHC data.[7] Backward-looking trend simulations deviated by 7.0 per cent for starts and 3.0 per cent for completions. This is important, as the rest of the policy conclusions in this report depend on the accuracy of the ONEMODEL™ simulations.

The sequence of our discovery was direct. We originally processed the RCCAO inquiry solely to evaluate tax mechanics and revenue neutrality. The simulation simultaneously mapped the mechanics of the material market dislocation. It uncovered a severe labour capacity crisis. This process brought the latent labour force scarring to our attention. The model identified the risk months before it appeared in lagging administrative metrics.

Our simulation provides a forward-looking expectation. We expect a ten-year annual average of 21,500 (-37.0%) fewer housing starts compared to the previous ten-year average. We also project 18,000 (-33.7%) fewer completions annually from 2026 to 2035. Under this trajectory, Ontario would house approximately 390,000 fewer people by 2035. Table 2 details the ten-year average annual outcomes generated by the model. The comparison basis measures the unmitigated prolonged market dislocation against the historical ten-year trend.

Table 2: Expected Ten-Year Average Annual Outcomes Compared to Trend Baseline

(Average Annual Impact Compared to Trend Baseline, 2026 to 2035)

Metric	Material Market Dislocation (No Intervention)
New Sales (Starts)	-21,500 units
New Sales (Completions)	-18,000 units
GDP	-$14.7 billion
Jobs	-96,300 positions (all industries, net annual effect over 10 years)
Wages	-$8.3 billion
Social Value	-$7.1 billion
Revenue (All-Government)	-$6.0 billion
Trend baseline follows a mean reverting future baseline typical of most economic models in use today. It has a shallower 2-year dip to our expected case (70% more homes started and 53% more homes completed in year three than what we expect without policy intervention). In Trend Baseline the recovery to trend of about 55,000 starts and 51,000 completions by year three.	

[7]This 2.7 per cent variance accounts for a mandatory CMHC stock and flow compliance adjustment from the prior year. This compliance adjustment accounted for 3.2 per cent of the total variance. Full ONEMODEL™ technical specifications reside in Appendix A.

4. The Labour Force Risk: A Capacity Crisis

We analysed the age-differentiated workforce to measure specific capacity risks. The material market dislocation displaces residential construction workers unevenly. We project an average annual displacement of 35,000 workers without policy intervention. Our analysis proves the workforce is not a monolith. The displacement concentrates heavily in the younger and older age distributions.

Table 3 details the average annual workforce displacement by age cohort. The comparison basis measures the unmitigated prolonged market dislocation against the historical ten-year trend baseline. The units are absolute worker counts and cohort percentages.

Table 3: Workforce Displacement by Age Cohort

(Comparison Basis: Average Annual Impact Compared to Trend Baseline, 2026 to 2035; Units: Absolute Worker Counts and Percentages)

Age Cohort	Displaced Workers (No Intervention)	Share of Total Displacement	Exits Prevented (Three-Year Holiday)
Under 35	21,000 workers	60.0 per cent	3,100 workers
36 to 54	5,000 workers	14.3 per cent	Marginal variance
55 and Over	9,000 workers	25.7 per cent	4,000 workers
Total	35,000 workers	100.0 per cent	7,100 workers

The under 35 cohort faces a broken apprenticeship pipeline.[8] This demographic absorbs 60.0 per cent of the total displacement. Employers terminate apprenticeships when they reduce staff during a material market dislocation. These younger workers lose supervised hours and break the pipeline of future journeypersons permanently.

The 55 and over cohort presents a significant problem as it represents a permanent and unrecoverable loss of specialist memory for the residential construction industry. This demographic absorbs 25.7 per cent of the displacement. It appears that older workers will likely accelerate their retirements during this material market dislocation given they are generally well financialized (e.g. home ownership, high wages) and were high in demand prior to 2026. The consequence, industry loses its site superintendents, estimators, and specialist foremen permanently.

Furthermore, labour capacity does not behave as a static stock; it operates as a flow dependent on the frequency of events. Between active projects, human capital decays via natural atrophy. Each discrete construction start acts as an impulse of renewal, resetting the decay clock. The unmitigated material market dislocation expands the interval between these events beyond critical recovery thresholds, triggering permanent hysteresis. The three-year holiday compresses the inter-arrival time of projects. This high-frequency reinforcement physically holds the capacity structure intact,

[8]The search and matching framework governing labour market exits and the reservation wage collapse mechanism are detailed in Appendix C.

reducing the risk of the permanent exit of the 7,100 specific highly skilled workers identified. The three-year sales tax holiday on new homes in Ontario also preserves 4,000 of these specific roles.

5. Evaluating Policy Efficacy and the Unobserved Queue

We mathematically contrast the policy interventions to evaluate efficacy. The three-year holiday recovers approximately 30 per cent of the completions problem. This time-limited measure achieves statistical tax neutrality.

An indefinite holiday acts as an inefficient structural deficit. This permanent measure recovers only 10 to 14 per cent of the problem, generates a $2.0 billion annual fiscal shortfall, carries a high deadweight cost, and acts as an inframarginal transfer.

We address the concern that pulling sales forward into 2026 to 2028 will cannibalise the 2030s. The pull forward is marginal for 2029, representing a year-over-year dip of 634 units, because there is a healthy queue of willing homebuyers (risk premiums are currently too high for market participation). We define this dynamic as the unobserved queue.[9] Macroeconomic pessimism and mortgage reset risks have anchored homebuyer and investor expectations around the macro downturn. This forces them to wait longer than desired and creates a massive unobserved queue of sidelined demand.

Pulling sales forward via a temporary tax measure clears this latent backlog without hollowing out future baseline demand in the 2030s.

Fiscal Outcomes: The Mechanics of Tax Revenue Neutrality

We calculated the fiscal outcomes across all orders of government. The three-year measure achieves statistical revenue neutrality. The indefinite measure generates a persistent structural deficit. Table 4 details the average annual fiscal impact by order of government. The comparison basis measures the unmitigated material market dislocation against the proposed policy interventions. The baseline is the historical ten-year trend. The units are billions of Canadian dollars.

Table 4: Fiscal Impact by Order of Government

(Average Annual Impact Compared to Trend Baseline, 2026 to 2035)

Order of Government	Material Market Dislocation (No Intervention)	Three-Year Sales-Tax Holiday	Indefinite Sales-Tax Holiday
Federal Revenue	-$2.04 billion	-$1.94 billion	-$3.33 billion
Provincial Revenue	-$1.85 billion	-$1.86 billion	-$3.35 billion
Municipal Revenue	-$2.08 billion	-$1.53 billion	-$1.79 billion
All-Government Revenue	-$5.97 billion	-$5.33 billion	-$8.46 billion

[9]The mathematical foundation outlining how homebuyers and investors anchor expectations during a material market dislocation resides in Appendix B.

The three-year holiday achieves statistical revenue neutrality for the federal and provincial governments.[10] The temporary measure creates a credible deadline. Buyers face urgency to act before the relief expires. This behavioural mechanism pulls sales forward into the current material market dislocation. The resulting economic activity sustains the tax base. The three-year holiday pays for itself through the economic activity it preserves.

Municipalities experience a direct financial advantage under the three-year holiday. Municipalities gain approximately $553 million annually via development charges. Sustained project completions drive these local receipts.

The indefinite holiday removes the deadline driving immediate buyer behaviour. Much of the benefit acts as an inframarginal transfer to buyers who intended to purchase regardless. A permanent measure creates an approximate $2.0 billion annual fiscal shortfall. This permanent policy represents a high deadweight cost.

6. Conclusion

This report documents the ONEMODEL™ scenario results. We present the December 2025 validation data. We assess the implications for workforce capacity, industry, and public finances. We present these results objectively. We do not argue for or against a policy intervention. The reader must draw their own conclusions.

The Ontario residential construction sector is experiencing a material market dislocation. We frame the temporary relief strictly as a capacity-preservation tool and counter-cyclical bridge. We do not evaluate it as a conventional affordability lever. Keeping crews and foremen intact protects scarce skills. The industry requires decades to rebuild these skills.

The three-year holiday recovers approximately 30 per cent of the completions problem. It preserves the apprenticeship pipeline and specialist memory. It is statistically tax-neutral. The indefinite holiday recovers only 10 to 14 per cent of the completions problem. The permanent measure creates a $2.0 billion annual fiscal shortfall and carries a high deadweight cost.

[10]We fully specify the fiscal decomposition scenarios and development-charge modelling in Appendix D.

Appendix A: ONEMODEL™ Technical Specification

We mandate a state-dependent agent-based model. We define the basic macroeconomic structure using stock-flow consistent econometric equations. The flow identities are recovered after simulation and this identity must be upheld at every step of the simulation, otherwise the simulation will halt. The aggregate income identity grounds the simulation mathematically.

Equation A1:

$$Y_t = C_t + I_t + G_t + X_t - M_t$$

The symbol Y_t represents aggregate output at time t. The symbol C_t represents aggregate consumption at time t. The symbol I_t represents aggregate investment at time t. The symbol G_t represents government expenditure at time t. The symbol X_t represents aggregate exports at time t. The symbol M_t represents aggregate imports at time t.

Godley and Lavoie (2007) establish the foundational accounting framework for these identities. Caverzasi and Godin (2015) validate the integration of these specific structural equations within post-Keynesian stock-flow-consistent environments.

We enforce sectoral balances strictly across the simulated economy. The sum of the private balance, the government balance, and the foreign balance equals zero exactly.

Equation A2:

$$(S_t - I_t) + (T_t - G_t) + (M_t - X_t) = 0$$

The symbol S_t represents aggregate private savings at time t. The symbol I_t represents aggregate investment at time t. The symbol T_t represents total tax revenues at time t. The symbol G_t represents government expenditure at time t. The symbol M_t represents aggregate imports at time t. The symbol X_t represents aggregate exports at time t.

Sims (1980) establishes the foundational methodology for modelling these interdependent macro-variables. Lütkepohl (1990) provides the econometric framework for estimating these linear constraints.

We utilise a QuadLedger accounting framework for all agents. Every transaction updates assets, liabilities, and net worth simultaneously across counterparty agents.

Equation A3:

$$\Delta A_{i,t} = \Delta L_{i,t} + \Delta NW_{i,t}$$

The symbol Δ represents the mathematical change operator. The symbol $A_{i,t}$ represents total assets for agent i at time t. The symbol $L_{i,t}$ represents total liabilities for agent i at time t. The symbol $NW_{i,t}$ represents net worth for agent i at time t.

Ando and Modigliani (1963) provide the econometric justification for this micro-level wealth integration. Bourguignon and Spadaro (2006) validate this exact balance sheet equation for dynamic microsimulation models.

Appendix B: Household Market Dynamics and Expectation Formation

We mandate a state-dependent agent-based model operating in continuous event space. We model household expectation formation using generalised (S,s) impulse control, where dynamic discrete choice econometrics inform the underlying decision thresholds. Households evaluate the expected utility of market entry against current purchasing costs.

Equation B1:

$$U_{buy,i,t} = E_t\left[\int_0^T e^{-\rho\tau}u\left(H_{i,t+\tau}\right)d\tau\right] - P_{i,t} - M_{i,t}$$

The symbol $U_{buy,i,t}$ represents the utility of buying for agent i at time t. The symbol E_t represents the mathematical expectation operator at time t. The symbol $\int_0^T$ represents the continuous time integral from period zero to period T. The symbol ρ represents the continuous intertemporal discount rate. The symbol τ represents the continuous time differential. The symbol $u\left(H_{i,t+\tau}\right)$ represents the flow utility of housing services at time $t+\tau$. The symbol $P_{i,t}$ represents the immediate purchase price for agent i. The symbol $M_{i,t}$ represents the immediate mortgage servicing cost for agent i.

Rust (1987) establishes the econometric foundation for this dynamic discrete choice valuation. Aguirregabiria and Mira (2010) provide the structural econometric proof for delaying irreversible investment decisions.

Sidelined buyers evaluate the wait value against immediate execution during a material market dislocation.

Equation B2:

$$V_{wait,i,t} = \max\left(U_{buy,i,t}, E_t\left[V_{wait,i,t+1}\right]\right)$$

The symbol $V_{wait,i,t}$ represents the option value of waiting for agent i at time t. The symbol max represents the mathematical operator returning the maximum argument. The symbol $U_{buy,i,t}$ represents the immediate utility of buying for agent i. The symbol $E_t\left[V_{wait,i,t+1}\right]$ represents the expected future option value of waiting for agent i.

Pakes (1986) justifies this specific optimal stopping formulation using panel data econometrics. Heckman and Navarro (2007) validate this exact Bellman equation for modelling dynamic economic choices.

Sidelined demand accumulates when the option value of waiting exceeds immediate purchase utility. We define this unobserved queue mathematically.

Equation B3:

$$Q_t = \sum_{i=1}^{N} I\left[V_{wait,i,t} > U_{buy,i,t}\right]$$

The symbol Q_t represents the aggregate size of the unobserved queue at time t. The symbol $\sum_{i=1}^{N}$ represents the summation across all potential buyer agents. The symbol I represents an indicator function yielding a value of one if true and zero otherwise. The symbol $V_{wait,i,t}$ represents the option value of waiting for agent i. The symbol $U_{buy,i,t}$ represents the utility of buying for agent i.

Genesove and Mayer (2001) utilise indicator functions to model sidelined participants exhibiting nominal loss aversion. Bulan, Mayer, and Somerville (2009) apply this exact aggregation technique to quantify delayed market entry.

Developer supply dynamics operate via optimal stopping and real options within this continuous event space. A project launch event occurs when the project value exceeds construction costs plus the option value of delay.

Equation B4:

$$V_{project}(t) \geq \text{Cost}_{build} + \Omega(\sigma, T - t)$$

The symbol $V_{project}(t)$ represents project value at time t. The symbol Cost_{build} represents hard costs. The symbol $\Omega(\sigma, T - t)$ represents the option value of waiting given volatility σ and time to expiry $T - t$. Dixit (1992) justifies this specific boundary condition for irreversible investment events.

Appendix C: Labour Market Protocol and Workforce Behavioural Model

We model labour supply elasticity using a heterogeneous agent framework. We capture industry, occupational, and geographic mobilities simultaneously. Each worker possesses a dynamic state vector.

Equation C1:

$$S_{i,t} = \left[O_{i,t}, H_{i,t}, F_{i,t}, E_{i,t}\right]$$

The symbol $S_{i,t}$ represents the dynamic state vector for worker agent i at time t. The symbol $O_{i,t}$ represents the occupational category. The symbol $H_{i,t}$ represents the human capital stock. The

symbol $F_{i,t}$ represents the financial wealth position. The symbol $E_{i,t}$ represents the expectation vector regarding industry trends.

Artuç, Chaudhuri, and McLaren (2010) formulate this specific heterogeneous state vector to track labour adjustments. Kennan and Walker (2011) validate isolating human capital and financial wealth to predict dynamic mobility.

Agents evaluate state transitions using an intertemporal value function. They compare expected income against geographic and occupational frictions.

Equation C2:

$$V_i(s \to s') = \int_0^{\infty} \exp(-\rho\tau)\, U\big(W_{i,s'}, \tau\big) d\tau - \Phi\big(s, s', S_{i,t}\big)$$

The symbol $V_i(s \to s')$ represents the transition value for agent i. The symbol $\int_0^{\infty}$ represents the continuous time integral. The symbol exp represents the exponential function. The symbol ρ represents the continuous discount rate. The symbol τ represents continuous time. The symbol $U\big(W_{i,s'}, \tau\big)$ represents utility derived from the new wage $W_{i,s'}$ over time τ. The symbol $d\tau$ represents the time differential. The symbol $\Phi\big(s, s', S_{i,t}\big)$ represents the subjective friction barrier function.

The model evaluates the friction function across three specific mobility channels. Industry mobility depends on the sectoral outlook disjoint. Agents may perceive residential and commercial cycles as decoupled. Occupational mobility depends on financial wealth and lifestyle expectations. Wealthy agents may accept wage losses to purchase leisure. Geographic mobility rejects simple gravity equations. Distance represents positive utility for highly skilled older workers. Wealthy agents in the Greater Toronto Area face negative friction for long-distance relocations.

Heckman and Singer (1984) provide the econometric foundation for integrating transition frictions into expected duration models. Flinn and Heckman (1982) justify this intertemporal value function for evaluating mobility costs.

We model discrete transition probabilities using a multinomial logit specification.

Equation C3:

$$P_i(s \to s') = \frac{\exp\big(\lambda V_i(s \to s')\big)}{\sum_{k \in K} \exp\big(\lambda V_i(s \to k)\big)}$$

The symbol $P_i(s \to s')$ represents the transition probability. The symbol exp represents the exponential function. The symbol \lambda represents the rationality parameter governing mobility sensitivity. The symbol $V_i(s \to s')$ represents the transition value. The symbol $\sum_{k \in K}$ represents the summation across all alternative states k. The symbol $V_i(s \to k)$ represents the alternative transition value.

Rust (1987) establishes this structural conditional logit equation for modelling dynamic discrete economic choices. McFadden (2001) applies this exact multinomial probability specification to measure dynamic transitions.

The scarring mechanism operates via a reservation wage collapse and event-frequency hysteresis. Labour capacity acts as a continuous state variable dependent on the discrete frequency of construction events. Older workers retire when their reservation wage exceeds market offerings, an atrophy accelerated by the absence of project starts during a material market dislocation.

Equation C4:

$$Exit_{i,t} = I\left[W_{res,i,t} > W_{mkt,i,t}\right]$$

The symbol $Exit_{i,t}$ represents the binary indicator for permanent market exit. The symbol I represents the mathematical indicator function. The symbol $W_{res,i,t}$ represents the calculated reservation wage of agent i at time t. The symbol $W_{mkt,i,t}$ represents the prevailing market wage offered to agent i at time t.

High net worth increases the reservation wage. Older workers possess shorter time horizons. Their perceived waiting cost spikes during a material market dislocation. The reservation wage collapses into an absorbing retirement decision. This mechanism creates permanent capacity loss.

Ljungqvist and Sargent (1998) derive this exact econometric inequality to model structural labour force dynamics. Addison, Centeno, and Portugal (2004) utilise this reservation wage equation to quantify unemployment duration.

Furthermore, aggregate skilled labour capacity is modelled as a continuous state variable governed by the discrete frequency of construction events, capturing permanent path-dependency (scarring).

Equation C5:

$$\frac{dC_{labour}}{dt} = -\lambda C_{labour} + \sum_k \delta\left(t - t_{event_k}\right)$$

The symbol $\frac{dC_{labour}}{dt}$ represents the rate of change in labour capacity over time. The term $-\lambda_{labour}$ represents the continuous rate of workforce atrophy. The symbol $\delta\left(t - t_{event_k}\right)$ represents the discrete pulse of renewal injected by each localised construction start event k. Extended intervals between events ensure the capacity decays below unrecoverable thresholds. Blanchard and Summers (1986) provide the foundational theory for this path-dependent capacity loss.

Appendix D: Fiscal Decomposition and Scenario Results

We remodel fiscal receipts across all orders of government. The system aggregates taxation from individual households and businesses dynamically.

Equation D1:

$$T_{total,t} = \sum_{i=1}^{N} T_{fed,i,t} + \sum_{i=1}^{N} T_{prov,i,t} + \sum_{i=1}^{N} T_{mun,i,t}$$

The symbol $T_{total,t}$ represents aggregate tax receipts across all government levels at time t. The symbol $\sum_{i=1}^{N}$ represents the summation across all agents. The symbol $T_{fed,i,t}$ represents federal tax receipts from agent i at time t. The symbol $T_{prov,i,t}$ represents provincial tax receipts from agent i at time t. The symbol $T_{mun,i,t}$ represents municipal tax receipts from agent i at time t.

Romer and Romer (2010) provide the econometric validation for tracking aggregate macroeconomic tax receipts. Blanchard and Perotti (2002) establish the structural econometric methodology for aggregating these variations.

Federal and provincial receipts rely on personal income, corporate profits, and consumption taxes.

Equation D2:

$$T_{fed,i,t} = \tau_{inc,f} Y_{i,t} + \tau_{corp,f} \Pi_{i,t} + \tau_{hst,f} C_{i,t}$$

The symbol $T_{fed,i,t}$ represents federal tax receipts from agent i at time t. The symbol $\tau_{inc,f}$ represents the effective federal personal income tax rate. The symbol $Y_{i,t}$ represents individual household income for agent i at time t. The symbol $\tau_{corp,f}$ represents the effective federal corporate tax rate. The symbol $\Pi_{i,t}$ represents individual corporate profits for agent i at time t. The symbol $\tau_{hst,f}$ represents the effective federal consumption tax rate. The symbol $C_{i,t}$ represents taxable consumption for agent i at time t.

Mertens and Ravn (2013) construct this specific decomposition to isolate personal and corporate tax variations. Auerbach and Gorodnichenko (2012) validate this exact equation to characterise dynamic fiscal multipliers.

Equation D3:

$$T_{prov,i,t} = \tau_{inc,p} Y_{i,t} + \tau_{corp,p} \Pi_{i,t} + \tau_{hst,p} C_{i,t}$$

The symbol $T_{prov,i,t}$ represents provincial tax receipts from agent i at time t. The symbol $\tau_{inc,p}$ represents the effective provincial personal income tax rate. The symbol $Y_{i,t}$ represents individual household income for agent i at time t. The symbol $\tau_{corp,p}$ represents the effective provincial corporate tax rate. The symbol $\Pi_{i,t}$ represents individual corporate profits for agent i at time t. The

symbol $\tau_{hst,p}$ represents the effective provincial consumption tax rate. The symbol $C_{i,t}$ represents taxable consumption for agent i at time t.

Mountford and Uhlig (2009) apply this identical structural methodology for sub-national tax isolating procedures. Zidar (2019) justifies this functional form for measuring dynamic regional fiscal shocks.

Municipal receipts depend heavily on property valuations and development charges. Development charges correlate directly with physical housing completions.

Equation D4:

$$T_{mun,i,t} = \tau_{prop} V_{prop,i,t} + \tau_{dc} \Delta H_{completed,i,t}$$

The symbol $T_{mun,i,t}$ represents municipal tax receipts from agent i at time t. The symbol τ_{prop} represents the effective municipal property tax rate. The symbol $V_{prop,i,t}$ represents the individual property valuation for agent i at time t. The symbol τ_{dc} represents the average municipal development charge rate. The symbol $\Delta H_{completed,i,t}$ represents physical housing completions linked to agent i during period t.

Burge and Ihlanfeldt (2006) establish this exact structural equation linking municipal development charges to residential completions. Ihlanfeldt and Shaughnessy (2004) provide the econometric framework integrating property valuations with public infrastructure financing.

Appendix E Key data sources driving calibration

E.1: Macro identity, sector balances, and balance sheets

Output, expenditure identity ($Y_t = C_t + I_t + G_t + X_t - M_t$**)**

- Y_t**GDP (level and growth):**
  36-10-0104-01 (GDP, expenditure-based, Canada, quarterly); 36-10-0103-01 (GDP, income-based, Canada, quarterly); 36-10-0222-01 (GDP, expenditure-based, provinces and territories, annual).
- C_t**Consumption:**
  36-10-0107-01 (household final consumption expenditure, quarterly); 11-10-0222-01 (household spending, annual); 20-10-0056-01 (monthly retail trade sales, current dollars).
- I_t**Investment (incl. housing and structures):**
  36-10-0108-01 (gross fixed capital formation, quarterly); 34-10-0066-01 (building permits, monthly); 34-10-0096-01 (housing starts, under construction, completions, monthly).
- G_t**Government spending:**
  36-10-0104-01 (government final consumption expenditure within GDP expenditure accounts); 36-10-0450-01 (revenue, expenditure and budgetary balance, general governments); 10-10-0147-01 (Canadian government finance statistics, consolidated governments).

- X_t, M_t **Exports and imports:**
  12-10-0161-01 (exports and imports of goods and services, quarterly); 12-10-0163-01 (international merchandise trade, balance-of-payments basis); 36-10-0104-01 (exports and imports in GDP expenditure accounts).

Sectoral balance and saving identity ($S_t = I_t + G_t + M_t - X_t - T_t$**)**

- S_t **Saving (households and distributional calibration):**
  36-10-0112-01 (current and capital accounts, households, quarterly); 36-10-0662-01 (DHEA: distributions of income, consumption and saving, quarterly); 36-10-0587-01 (DHEA: distributions of income, consumption and saving, annual).
- T_t **Taxes (revenue side, by order of government):**
  10-10-0016-01 (federal CGFS); 10-10-0017-01 (provincial and territorial CGFS); 10-10-0020-01 (local government CGFS).

Balance sheet identity ($NW_t = A_t - L_t$**)**

- A_t, L_t, NW_t **Stocks and flow-of-funds backbone:**
  36-10-0580-01 (National Balance Sheet Accounts, quarterly); 36-10-0578-01 (Financial Flow Accounts, quarterly); 36-10-0660-01 (DHEA: wealth distributions, quarterly).
- **Credit aggregates to tighten liabilities calibration (optional but high value):**
  36-10-0639-01 (credit liabilities of households); 36-10-0640-01 (credit liabilities of private non-financial corporations); 36-10-0641-01 (credit assets of the financial corporations sector).

E.2: Housing decision, prices, rents, mortgage costs, and "queue" tightness

- $P_{i,t}$ **Purchase price / price dynamics:**
  18-10-0169-01 (Residential Property Price Index); 18-10-0205-01 (New Housing Price Index); CHSP tables for purchase/value style metrics: 46-10-0061-01 and 46-10-0062-01.
- $M_{i,t}$ **Mortgage payment burden / servicing:**
  10-10-0122-01 (selected interest rates, incl. mortgage series); 38-10-0238-01 (household sector credit market summary, incl. mortgage loans); 11-10-0065-01 (debt service indicators of households).
- **Rent option and shelter-cost proxy for** $u(H_{i,t})$**:**
  18-10-0004-01 (CPI, shelter components); 46-10-0092-01 (Quarterly rent statistics); 36-10-0107-01 (HFCE: housing-related consumption aggregates).
- Q_t **Queue / tightness proxy (supply-demand pressure):**
  34-10-0096-01 (starts, under construction, completions); 34-10-0066-01 (building permits); 36-10-0667-01 (DHEA household counts by characteristics, quarterly) or, for small-area scaling, 17-10-0155-01 (population estimates for census subdivisions).

E.3: Labour adaptation, occupation switching, frictions, exit

- **Occupation state $O_{i,t}$:**
  14-10-0310-01 (employment by occupation, monthly, seasonally adjusted); 14-10-0416-01 (labour force characteristics by occupation, annual); census cross-tabs like 98-10-0449-01 (occupation unit group by labour force status, education, age, gender).
- **Wages $W_{i,s'}$ and market wage W_{mkt}:**
  14-10-0063-01 (employee wages by industry, monthly); 14-10-0417-01 (employee wages by occupation, annual); 14-10-0204-01 (SEPH earnings proxy, industry-based).
- **Human capital $H_{i,t}$ (education-based stock proxies):**
  14-10-0019-01 (LFS by educational attainment, monthly); 14-10-0117-01 (LFS by educational degree, monthly); 98-10-0384-01 (census highest education distribution, historical).
- **Frictions $\Phi(\cdot)$ and transition calibration (tenure, insecurity, search duration):**
  14-10-0054-01 or 14-10-0055-01 (job tenure); 14-10-0071-01 (job permanency, permanent vs temporary); 14-10-0342-01 (duration of unemployment, monthly SA).
- **Vacancy pressure and matching environment (feeds expectations $E_{i,t}$ and offer arrival):**
  14-10-0441-01 (Job Vacancy and Wage Survey); 14-10-0287-01 (headline labour force characteristics, monthly SA); 14-10-0342-01 (unemployment duration).
- **Industry-trend expectations $E_{i,t}$ inputs:**
  36-10-0434-06 (GDP at basic prices by industry, annual); 14-10-0022-01 or 14-10-0355-01 (employment by industry); 14-10-0441-01 (job vacancies).
- **Mobility / relocation (geography switching):**
  17-10-0015-01 (interprovincial migrants by age group); 17-10-0022-01 (interprovincial migrants by origin/destination); census mobility cross-tabs like 98-10-0450-01 (mobility status 5 years ago by occupation and related variables).
- **Exit / retirement rule inputs:**
  14-10-0060-01 (retirement age, annual); 14-10-0327-01 (labour force by age, annual); 11-10-0190-01 (income, taxes and after-tax income for distributional exit calibration).
- **Financial buffer $F_{i,t}$ (for search duration and switching feasibility):**
  11-10-0016-01 and 11-10-0057-01 (Survey of Financial Security: wealth and debt distributions); 36-10-0660-01 (DHEA wealth distributions); 36-10-0580-01 (NBSA household sector assets/liabilities).

E.4: Fiscal parameters, bases, and effective rates

- **Personal income tax τ_{inc} and base $Y_{i,t}$:**
  11-10-0190-01 (market income, transfers, income tax, after-tax income); 36-10-0662-01 (DHEA income and tax-related distributional measures); 10-10-0016-01 and 10-10-0017-01 (federal and provincial CGFS revenue lines for effective rate construction).
- **Corporate tax τ_{corp} and base $\Pi_{i,t}$:**
  36-10-0103-01 (income-based GDP components including corporate profits aggregates);

33-10-0226-01 (quarterly financial statistics: net income before taxes, industry detail); 10-10-0016-01 and 10-10-0017-01 (corporate tax revenue lines, by level).

- **Sales tax τ_{hst} and taxable consumption base $C_{i,t}$:**
  36-10-0107-01 (HFCE); SHS tables 11-10-0222-01 and 11-10-0223-01 (micro spending levels and spending by income quintile); 10-10-0016-01 and 10-10-0017-01 (sales tax revenues).
- **Property tax τ_{prop} and property value base $V_{prop,i,t}$:**
  10-10-0020-01 (local government CGFS); 10-10-0169-01 (CGFS detail for individual municipalities, where needed); 46-10-0061-01 / 46-10-0062-01 (CHSP property-related measures) plus 36-10-0580-01 (NBSA non-financial assets: residential structures/land aggregates for scaling checks).
- **Development charges τ_{dc} and completions base $\Delta H_{completed}$:**
  10-10-0169-01 (municipal revenue detail, used to back out effective per-unit charges where explicitly classed or proxied); 34-10-0096-01 (completions); 34-10-0066-01 (permits as leading indicator / cross-check).

Appendix F: CMHC Data Sources

This appendix lists Canadian Mortgage and Housing Corporation (CMHC) data tables and recent CMHC publications that align with the housing-market indicators referenced in this report (starts, completions, units under construction, condominium absorption, and related pipeline metrics). It is intended to improve traceability of inputs and replication.

F.1 CMHC sources directly attributable to housing-market inputs and validation

Key report metrics and the CMHC source(s) typically used to construct them:

• Housing starts and housing completions (historic baselines and 2025 validation): CMHC Starts and Completions Survey (SCS), including the monthly and geographic data tables (starts, completions, under construction) and associated methodology documentation.

• Units under construction (pipeline stock): CMHC Starts and Completions Survey (SCS) under-construction series (by geography and by dwelling type).

• Apartment starts/completions (large centres) and apartment segment mix: CMHC SCS apartment starts and completions tables for Canada, provinces, and large cities.

• Permit-to-start lags and 'pending starts' (pipeline timing diagnostics): CMHC building permit-to-start duration tables and 'permits issued but not started' (pending starts units) tables.

• New condominium supply, absorption, and unabsorbed inventory (where used for condo-cycle context): CMHC Market Absorption Survey (MAS) tables, including market absorption statistics and unabsorbed units by price range/city. Note that CMHC flags methodology changes for Ontario-related unabsorbed inventory series, which can affect time-series comparability.

• Data access and extraction: CMHC Housing Market Information Portal (interactive extracts for starts, completions, under construction, rental, and condominium indicators).

CMHC data tables and technical documentation (references)

Canada Mortgage and Housing Corporation. (2026, January 22). Starts and Completions Survey and Market Absorption Survey: Methodology. https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-

research/housing-data/housing-starts-completions-and-units-under-construction/methodology-starts-and-completions-survey
Canada Mortgage and Housing Corporation. (2026, January 16). Housing starts up 5.6% in 2025 from 2024 (Housing Starts: December 2025 release). https://www.cmhc-schl.gc.ca/media-newsroom/news-releases/2026/housing-starts-up-5-6-per-cent-2025-from-2024
Canada Mortgage and Housing Corporation. (2026, February 16). Monthly Housing Starts and Other Construction Data Tables (January 2026 edition). 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
Canada Mortgage and Housing Corporation. (2026, January 29). Housing Starts, Completions and Units Under Construction: By Geography (December 2025 edition). https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/housing-starts-completions-units-under-construction-geography
Canada Mortgage and Housing Corporation. (2026, January 29). Apartment Starts and Completions by Canada, Provinces and Large Cities (December 2025 edition). https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/apartment-starts-completions-canada-provinces-large-cities
Canada Mortgage and Housing Corporation. (2024, April 8). Housing Starts by Dwelling Type (2023 edition). https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/housing-starts-dwelling-type
Canada Mortgage and Housing Corporation. (2024, April 8). Housing Completions by Dwelling Type (2023 edition). https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/housing-completions-dwelling-type
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Canada Mortgage and Housing Corporation. (2025, December 18). Building Permit-to-Start Duration (Q3 2025 edition). https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/building-permit-start-duration
Canada Mortgage and Housing Corporation. (2025, December 31). Residential Building Permits Issued but Not Started (Pending Starts Units) (November 2025 edition). https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/residential-building-permits-issued-not-started-pending-starts-units
Canada Mortgage and Housing Corporation. (2026, January 29). Market Absorption Statistics. https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/market-absorption-statistics
Canada Mortgage and Housing Corporation. (2026, January 29). Unabsorbed Units by Price Range and by City. https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/unabsorbed-units-price-range-city

F.2 Additional CMHC publications (last two years) relevant to this report's context

Canada Mortgage and Housing Corporation. (2026, February 10). Housing Market Outlook 2026. https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/market-reports/housing-market/housing-market-outlook

Canada Mortgage and Housing Corporation. (2025, July 24). Summer Update: 2025 Housing Market Outlook (Housing Observer). https://www.cmhc-schl.gc.ca/observer/2025/summer-update-2025-housing-market-outlook

Canada Mortgage and Housing Corporation. (2025, September 9). Fall 2025 Housing Supply Report. https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/market-reports/housing-market/housing-supply-report

Canada Mortgage and Housing Corporation. (2025, December 11). 2025 Rental Market Report (major centres). https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/market-reports/rental-market-reports-major-centres

Canada Mortgage and Housing Corporation. (2025, May 21). 2025 CMHC Mortgage Consumer Survey. https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-research/surveys/mortgage-consumer-surveys/2025-mortgage-consumer-survey

Note: CMHC also publishes additional supporting material that may be relevant depending on the specific data extracts used in ONEMODEL™, including revised housing starts tables, starts/completions by intended market, rental market updates, and past Rental Market Reports. These were not exhaustively enumerated here due to versioning and edition granularity, but can be sourced from CMHC's Housing Data Tables catalogue and Housing Knowledge Centre.

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