Understanding the forces driving the shelter affordability issue

A linked-path assessment of housing market dynamics in Ontario and the GTHA

May 2017

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

An independent study conducted on behalf of:

RESCON®
RESIDENTIAL CONSTRUCTION
COUNCIL OF ONTARIO

RESIDENTIAL AND
CIVIL
CONSTRUCTION
ALLIANCE OF
ONTARIO

RCCAO **Constructing Ontario's Future**

OAA
Ontario Association of Architects

OCS
Ontario Construction Secretariat

About the Canadian Centre for Economic Analysis

About the Report

The Canadian Centre for Economic Analysis (CANCEA) is a socio-economic research and data firm. CANCEA periodically provides objective, independent and evidence-based analysis dedicated to a comprehensive, collaborative, and quantitative understanding of the short- and long-term risks and returns behind policy decisions and economic outcomes.

At the centre of CANCEA's analysis is its *Prosperity at Risk* simulation platform which is an agent-based, socio-economic computer platform. Using "big data" technology advancements, and data sets that are linked back to the objects that generated them , *Prosperity at Risk* simulates the interactions of more than 40 million virtual agents (individuals, corporations, governments, and non-profit organizations) to provide a deep and realistic understanding of the consequences of market and policy developments for our clients.

CANCEA does not accept any research funding or client engagements that require a pre-determined result or policy stance, or otherwise inhibits its independence.

In keeping with CANCEA's guidelines for funded research, the design and method of research, as well as the content of this study, were determined solely by CANCEA.

This information is not intended as specific investment, accounting, legal or tax advice.

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

TABLE OF CONTENTS

CANADIAN CENTRE FOR
ECONOMIC ANALYSIS

LIST OF FIGURES

LIST OF TABLES

CANADIAN CENTRE FOR
ECONOMIC ANALYSIS

EXECUTIVE SUMMARY

SHELTER AFFORDABILITY IN A "SYSTEMS THINKING" FRAMEWORK

The deteriorating affordability of shelter in select Canadian markets has become the focus of much analysis and regular national headlines (seemingly on a daily basis), which acknowledge its impact on millions of households across a wide spectrum of income and wealth. And no wonder: there are few issues more central to our day-to-day well-being than finding affordable shelter that is safe, comfortable, and close to our places of work, education, worship, and play. But what makes shelter "affordable", and what can we do to help make it so?

Canada's shelter affordability challenge is complex, rife with data limitations, and poses risks associated with both action and inaction by policymakers. Unfortunately most of the existing commentary is singularly focused, ignoring this complexity and the interrelatedness of factors and behaviours that are actually driving the issue. We might ask why, if the issue was so simple, it hadn't been solved already.

In other words, housing affordability requires more than "economics 101", and anyone who suggests "silver bullet" solutions might either have an agenda or may not have sufficiently considered the scope of the problem. Yet, while we live in the midst of major computing and analytical innovations, there is no evidence of a quantitative assessment that respects the interrelated factors that have been (or might be) the greatest contributors to the affordability challenge. While many commentators imagine the problem is affected by a number of issues, they've yet to quantitatively link those impacts, which hampers the prioritization of policy inteventions.

CANCEA adopts a "systems approach" to socio-economic analysis which has been made possible by innovations in agent-based modelling and the availability of many sources of data which allows for the consideration of:

- Hundreds of data sources linked to the objects that generate the data (e.g., households);

- Over 40 factors (as well as the behaviours they influence) *simultaneously*, allowing for a unique quantitative linking and prioritization; and

- Household level accounts and behaviours tracked through every simulation, showing differentiated impacts on "making ends meet".

In other words, this research applies a comprehensive dataset that has been linked in a way that does not publically exist, studies more factors and behaviours than ever before, and provides more realistic results than can be found anywhere else. As such, we hope that this research will be recognized as a seminal contribution to the importance of the topic at hand.

INVESTIGATING "AFFORDABILITY"

To be clear, experts and stakeholders have proposed dozens of potential factors as either the cause of, or solution to, the current housing affordability challenge. Though such arguments are not themselves logically flawed, the lack of comprehensive linkages potentially misses out on combined factors at play.

WHAT DOES "AFFORDABILITY" *NOT* MEAN?

Annual growth in Teranet's *House Price Index* (Toronto)

Year-over-year price growth

Average over the period

Average +/- 2 std. deviations

Source: Teranet; calculations by CANCEA

Price-to-income ratio: Toronto vs. the world (2016)
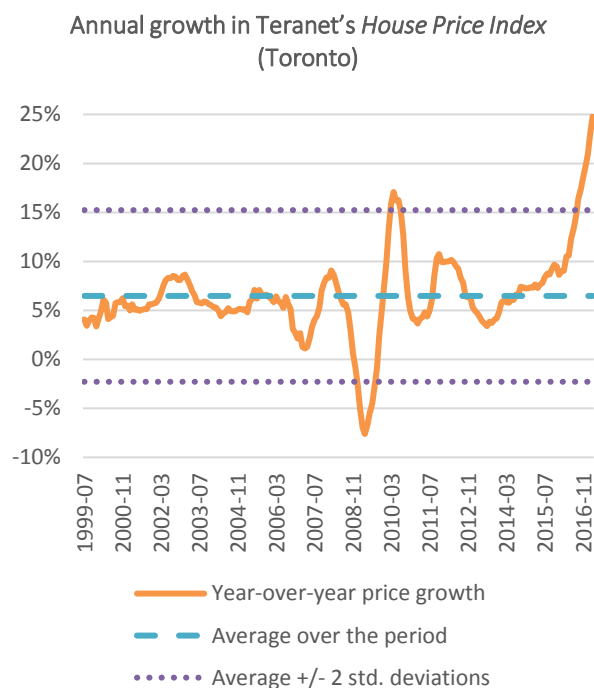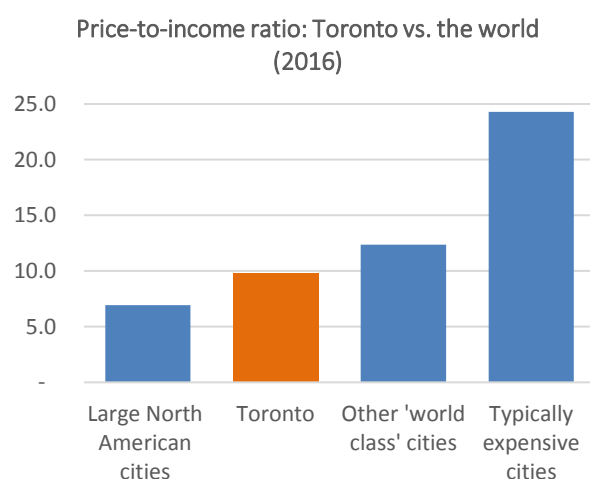
Source: Numbeo; calculations by CANCEA

The seemingly daily headlines around housing largely focus on housing prices, particularly in Vancouver and Toronto (though this is certainly spreading beyond such borders). This should not be overly surprising: over the 15 years prior to 2016, year-over-year price growth in Toronto has only been outside the "normal" range (average +/- two standard deviations) twice – during the "great recession" in 2009 and recovering from it in 2010. But, as of March 2017, price growth has surpassed *four* standard deviations from the average. If this process were random, such a result would be expected to occur roughly 1 out of 16,000 times.

But does a house's price really define whether it is "affordable"? Ignoring the rental market for a moment, what if (a big "if"), incomes were rising at the same rate? One way to use prices to start to measure "affordability" is to compare (say) Toronto's price-to-income ratio to similar cities around the world.

By this measure, Toronto could be seen as relatively *cheap*, with a price-to-income ratio roughly 1/3 of the highest in world, such as Hong Kong, Hanoi, and Mumbai. If comparing to typically expensive (and often poorer) cities[1] seems unfair, limiting the comparison to other large North American cities and other "world class" cities[2] makes Toronto appear similar to the likes of Berlin, Boston, and Melbourne.

---

[1] Top 20 typically high-ranked cities (as defined by P/I ratio) not included in the other groupings (e.g., Paris, London)
[2] Top 50 non-North American cities on the 2017 Mercer *Quality of Living Survey*

Another overly-simplistic argument has been that it is just an overall "supply" issue. But even a simple analysis suggests that this is unlikely to be the case. For example, over the last decade, housing starts per household have over doubled in the GTHA, and housing stock per capita has remained flat in the region for 25 years. The question is therefore not just about supply (which includes the supply of serviced "developable" land), but about how *productive and appropriate* that supply is.

A similar stumbling block in getting to a consensus definition of "affordable" seems to be that many commentators focus solely on home ownership. But higher ownership rates haven't improved affordability either. In fact, home ownership rates in Toronto have increased by 23% over the last 35 years (11% in Ontario overall), putting the region close to the highest among "world class" cities[3]. Having a high ownership rate does not make a "world class" city though; in fact it appears to be quite the opposite – the correlation between ownership rate and ranking of "liveability" is negative.

Homeownership rates in "world class" cities
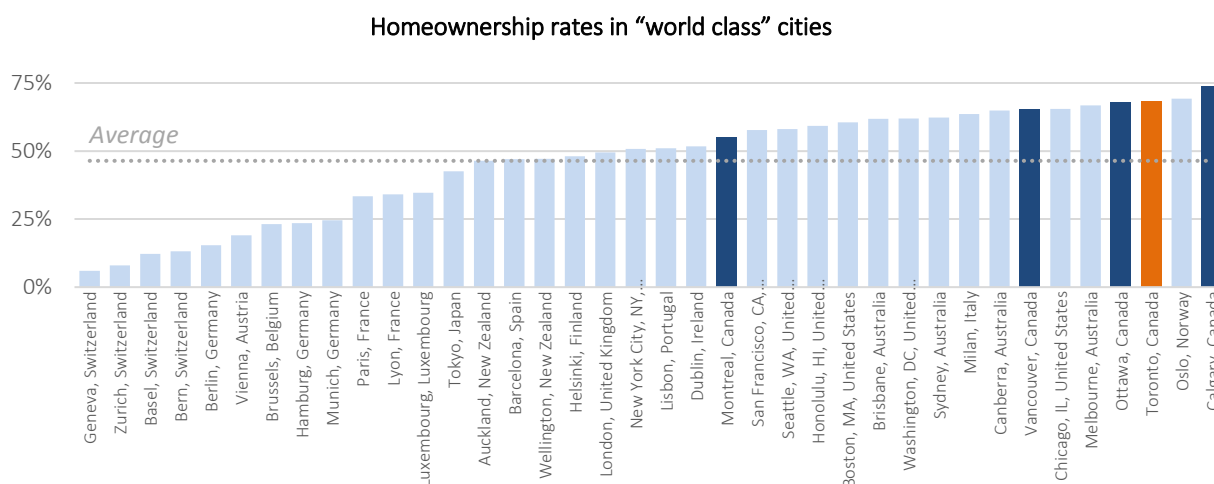
Source: Mercer, UN Data, US Census Bureau, CMHC; calculations by CANCEA

THE SCAR INDEX: A HOLISTIC APPRECIATION OF SHELTER AFFORDABILITY

CANCEA's *Shelter Consumption Affordability Ratio* (SCAR) index measures the share of after-tax income that households devote to their shelter-related needs (including transportation and utilities) after paying for other necessities, such as health care, food, and child care. The SCAR index, unlike other housing affordability indices widely used in Canada, does not simply measure the cost of owning a home (i.e., mortgage payments). Rather, the SCAR index measures the affordability of the *consumption of* (or access to) shelter, which is a separate concept from the affordability of *investing in* a housing asset. The SCAR index captures the breadth

$$SCAR = \frac{\text{Shelter consumption costs}}{\text{Discretionary net income after other necessities}}$$

---

[3] Selection of top cities on 2017 Mercer *Quality of Living Survey* (data dependent)
* As forecast by CMHC

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

and complexity of the shelter affordability issue, lending itself well to use in scenario and sensitivity analysis.

Given how the SCAR index is constructed, a relatively higher or growing SCAR index value is a sign that things are (or becoming) more *unaffordable*. Unfortunately, SCAR index levels for Canada, Ontario, and the GTHA are the highest seen in the data. In Ontario and the GTHA, affordability (as measured by the median SCAR index) has worsened by around 40% since the early 1980s, and around 15% since 2000.

Median SCAR Index over time

Ontario SCAR – 25th, 50th, and 75th percentile
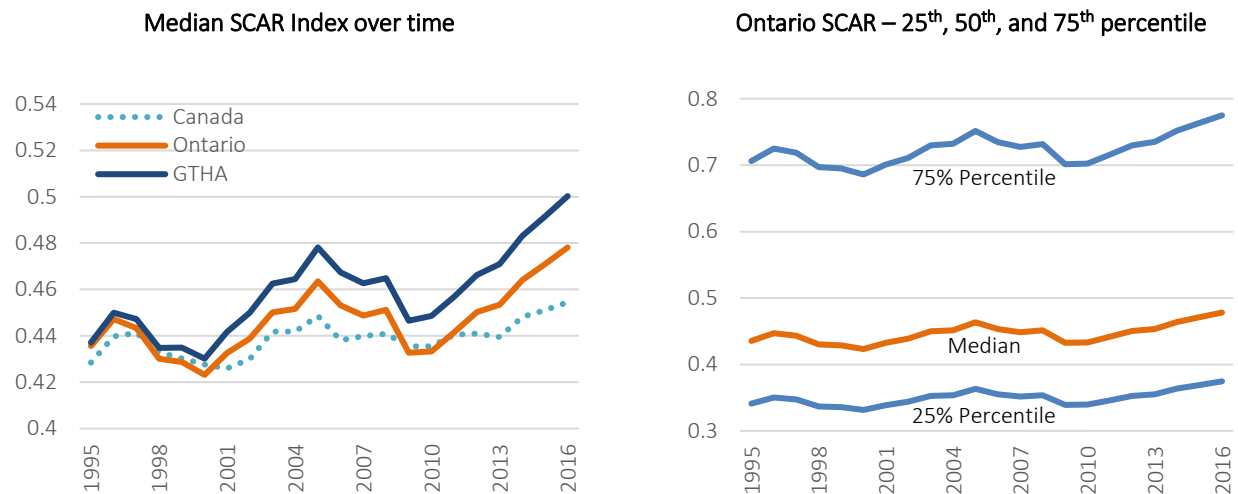
But averages are dangerous. Shelter affordability varies by household, so SCAR does too. The distribution of households by SCAR varies by the likes of household structure, age, sex, and number of children in the household. Further, as SCAR is modeled for every household in Ontario, it can also be mapped (say, by neighbourhood). This shows that the ability to make ends meet is distributed unevenly.

SCAR by Toronto neighbourhood
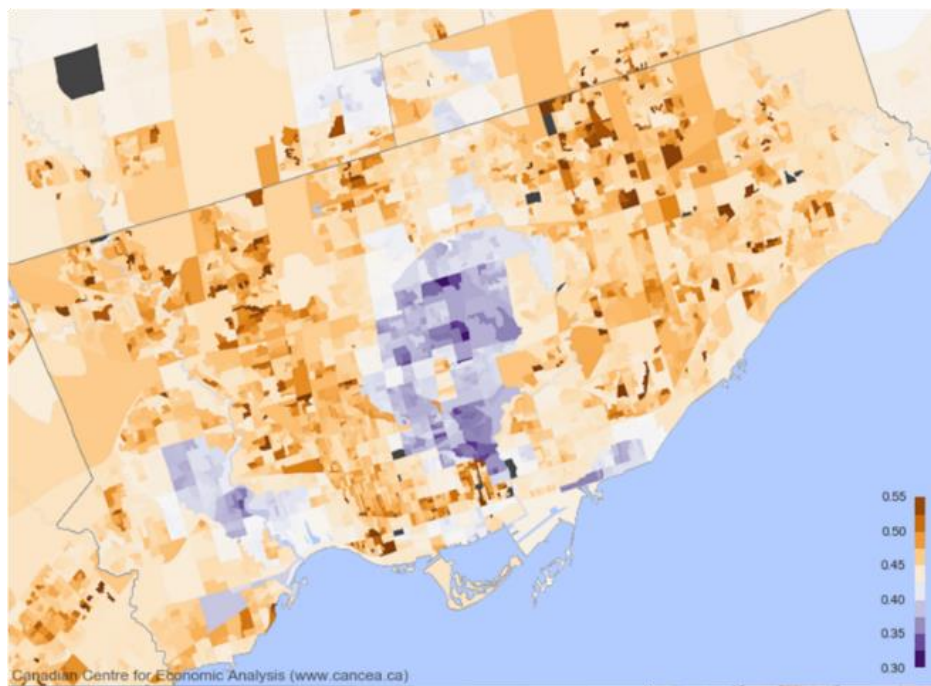
A NEW APPROACH

Given the incredible complexity of modeling the range of networked interactions and impacts – a different approach is required. As such, CANCEA utilized *Prosperity at Risk* (PaR), its "big data" computer simulation platform that models households, business, and governments as:

- **Individuals**, with individual budget constraints and production/consumption activities, thereby recognizing the independence of their motivations and decisions; and as

- **Part of a spatial and economic network**, thereby recognizing the dependence of their economic decisions upon other agents (via, for example, policy, investment decisions, and land use).

As such, PaR simulates the interactions of more than 40 million agents across Canada that are each encoded with behavioural rules[4] to guide their decisions, act based on those rules, and be influenced by the actions of others. This is enabled by an enormous "linked-path" database that links hundreds of disparate (and typically cross-sectional) data sources back to the very objects that created them (e.g., households)[5].

MULTI-FACTOR AND BEHAVIOURAL ANALYSIS

In order to assess the influence of the multitude of potential drivers of the affordability of shelter throughout Ontario and the GTHA, over 40 different factors have been chosen for analysis. Each factor is both individually analyzed for its effects on the SCAR index, as well as assessed in tandem with all others to identify any interaction effects. These include factors related to:

- Costs of residential development inputs and land supply
- Population and demographics
- Labour force, income, and wealth
- Shelter-related household expenses
- Other essential household expenses

- Transportation and proximity
- Debt, credit, and monetary/macroprudential policy
- Public infrastructure and other investment
- Government taxes and transfers

All of these factors also influence at least one of the behaviours (on both the demand and supply sides of the equation) that could be targeted by policy. These are the behaviours that may ultimately need to be changed if we are to have any hope in addressing (on a broad scale) the affordability issue going forward. By linking these factors to such behaviours, we are also able to help prioritize where policy should be focused, while leaving the (relatively) more marginal or "boutique" issues for later.

---

[4] For example, the fraction of income spent on consumption depending on the likes of location and family size.

[5] For example, PaR imbues in agents hundreds of data sources (e.g., Statistics Canada tables, many down to detailed geographic areas) on demographics, income statements and balance sheets, consumption patterns, labour force statistics, and commuting choices, among many others.

RESULTS AT A GLANCE

Our "stage 1" multi-factor analysis shows that there are only a few factors that have *significantly* affected the SCAR index (in aggregate) over the last decade, some which have increased it and some which have decreased it. In particular:

- *Factors that have increased the SCAR index*: demographic-induced demand pressures (e.g., population growth and decreasing average household size), and other debt (e.g., credit cards, car loans, and student debt); and

- *Factors that have decreased the SCAR index*: increasing average wages, growing gap between ownership and rental prices, growth in government transfers.

Also worth noting here, though, is that when it comes to setting policy, it is the future that should be the focus of concern. From that perspective, what got us here is useful context, but the SCAR *sensitivities* are more relevant going forward. And in terms of sensitivities (again, in aggregate), the key factors are:

- Average household size and population growth (collectively, demographics);

- Average wages and employment rate (collectively, economic prosperity);

- The shelter demand/supply mismatch (i.e., over- and under-housing); and

- The gap between ownership and rental prices.

WHERE COULD WE GO FROM HERE?

The sensitivities described above can now be linked back to the *behaviours* that they affect to provide a collective set of issues that should be addressed. Further, the realistic potential of policy options are not equal across these factors (e.g., population growth), but that does not mean we can ignore them. That is, these issues *must be considered in conjunction*.

Going further, part of the power of PaR is that behaviours can be synthetically influenced in such a way that they diverge from historical levels. This allows for detailed and authoritative "if this, then that" statements. Applying that here includes "turning the dials" on development behaviour (e.g., what gets built and how quickly) and household shelter decisions (e.g., rent vs. own, propensity to resize). These behaviours are obviously affected by specific policy, which this study does not investigate in detail. This study is simply concentrated on identifying the areas of necessary focus.

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

Understanding the forces driving the shelter affordability issue

Sensitivity of factors and the policy focuses they affect

Factors

Policy focus

LEGEND
Arc thickness represents SCAR sensitivity
Blue = makes SCAR go down (good) as factor increases
Orange = makes SCAR go up (bad) as factor increases

CANADIAN CENTRE FOR ECONOMIC ANALYSIS
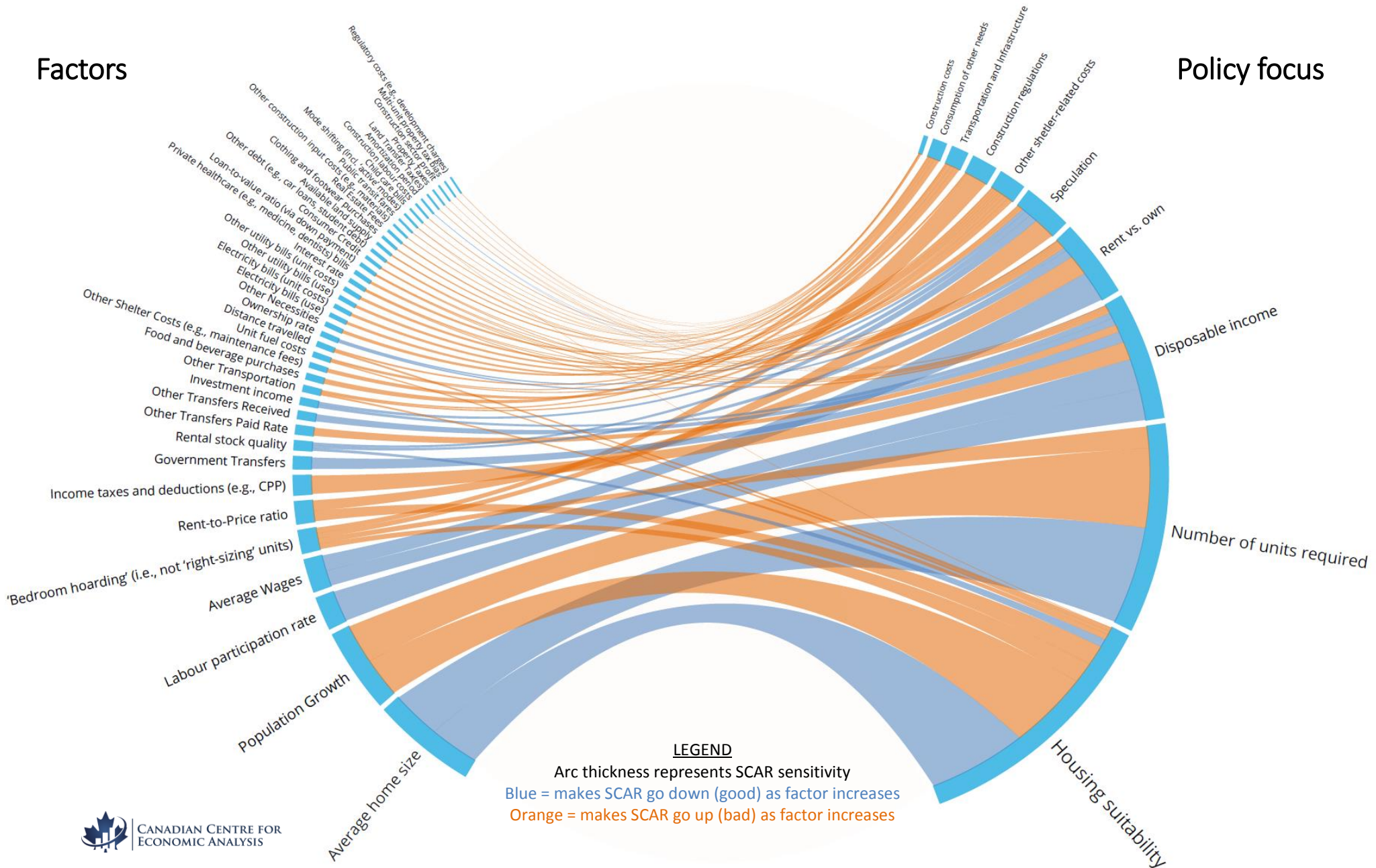
What we find is that economic development is obviously critical, and should be an ongoing focus of government in many respects (not just shelter affordability), but there are other behaviours that might be more easily affected by policy. Similarly, increasing average household size would help, though meaningful policy change here is likely unrealistic. Areas that should be a focus of policy discussions going forward:

- **Right-size matching** is split into two pieces. First is the propensity for households to right-size their housing (e.g., reduce over-housing). Such behaviour is affected by the likes of housing style preference (rather than utility), transaction costs (e.g., land-transfer taxes, real-estate, legal, and moving costs, and the uncertainty associated with matching changes in ownership) as well as having appropriate housing options (i.e., a place to downsize to) available to them. The second is about what developers build (i.e., matched to needs, status quo, or purposefully mismatched needs). Such behaviour is largely affected by regulation and risk-adjusted profit potential.

- **Speculation** has two components. First is vacancy, which requires additional (offsetting) units be built. The second is price expectations, which behaviourally causes overbidding (e.g., to yield a quick return, fear-of-missing out), driving up prices for all buyers, potentially crowding out.

- **Developer response time** to changing demands. The ability (and desire) of developers to put new housing on the ground when it is needed requires relatively stable demographic changes (for forecasting purposes), available serviced land and quick regulatory turnarounds (e.g., site approvals), and a lack of speculation on the developers' side.

- **Tenure matching** is also split into two pieces. Similar to right-size matching, tenure-matching is affected by both the propensity of households to rent (vs. owning), as well as developers' propensity to build purpose-built rental stock. Household behaviour here is driven by the likes of market expectations (e.g., of economic returns after fees/taxes, ownership bias), availability of rental stock, and macroprudential policy. Developer behaviour here is driven by risk-adjusted profit motives as well as the regulatory environment (e.g., zoning, property tax differentiation).

- **The confluence of such behaviours** is most important. As an example, rental stock availability is only useful if it is appropriately sized.

Quantitatively, there are combinations of behaviours that do significantly improve affordability (as well as the opposite). In addition to household size and economic prosperity, already discussed above, housing affordability could be improved significantly within the next 15 years by:

- Getting households to right-size and developers to build appropriately sized units could reduce the SCAR index below levels seen in the 2000s.

- Curtailing speculation would avoid equally large *increases* in the SCAR index.

- Getting more households to rent and developers to build more purpose-built rentals would almost get the SCAR index back to levels seen in the 1990s.

- Most importantly, facilitating all of these behaviours would provide the largest impact: the SCAR index would drop below levels seen in the 1990s and would be roughly equivalent to the impact of quickly increasing wages.

Impact of behavioural changes on housing affordability
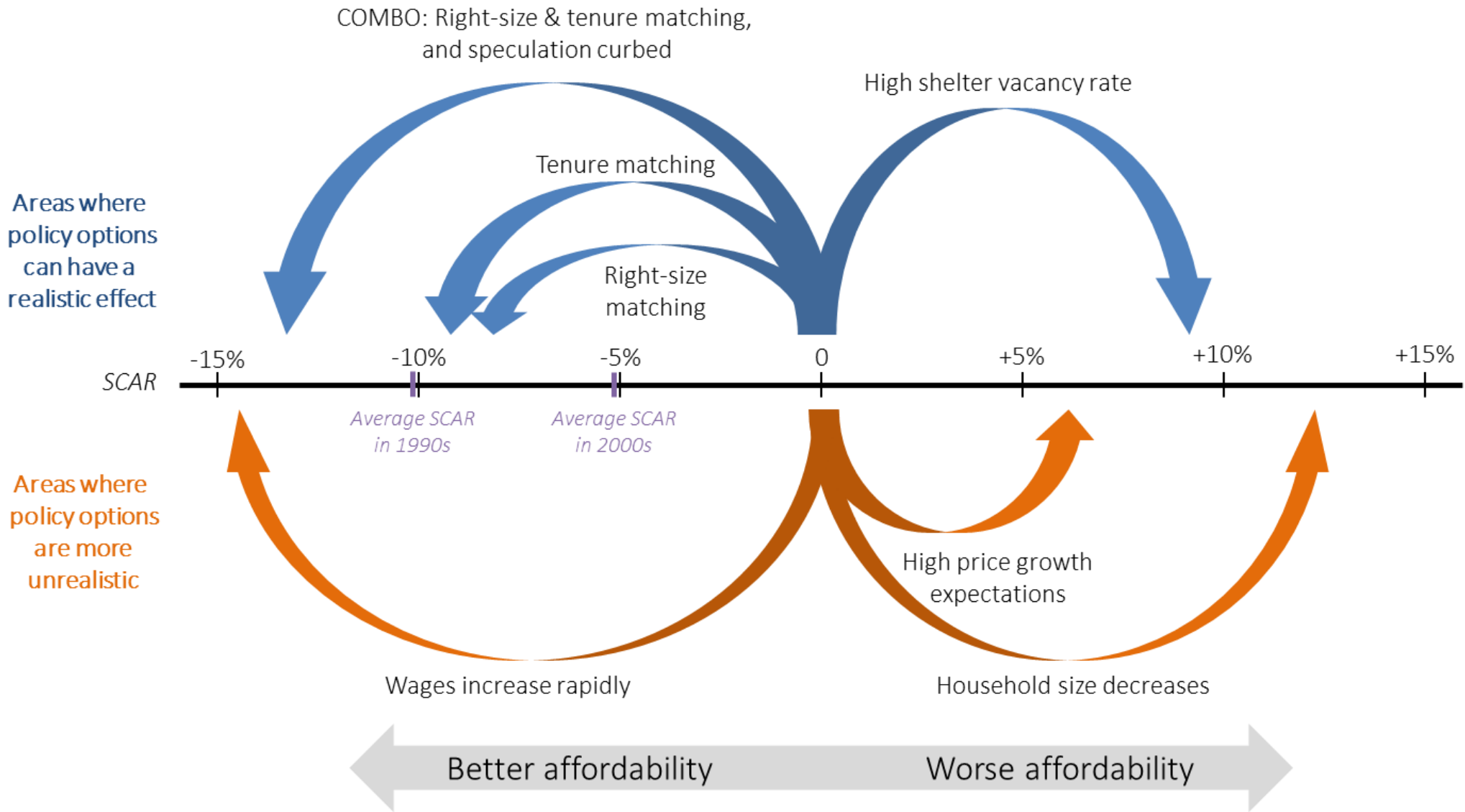
COMBO: Right-size & tenure matching, and speculation curbed

High shelter vacancy rate

Tenure matching

Right-size matching

Areas where policy options can have a realistic effect

SCAR

-15%   -10%   -5%   0   +5%   +10%   +15%

Average SCAR in 1990s

Average SCAR in 2000s

Areas where policy options are more unrealistic

Wages increase rapidly

High price growth expectations

Household size decreases

Better affordability   Worse affordability

Further, it appears that a market dominated by owner-occupiers – such as we have in Ontario – imposes severe limitations on the ability to right-size, as residents are required to pass through an ownership-to-ownership transaction that usually means:

- Relatively high transaction costs associated with change of ownership; and

- What economists often call a "double coincidence of want": the less likely coincidence that someone is selling a property you want at the same time you choose to move.

The obvious solution is more rental options, which would provide lower transaction costs while presenting less frictions for the movement of households.

APPROPRIATE HOUSING AND HOUSING "PRODUCTIVITY"

What all of these factors and behaviours seem to be pointing to is the idea of not just building *more* housing, but building *appropriate* housing, and then getting people to move into it.

In economics, the notion of "productivity" – that is, the ability to turn inputs into outputs – is used heavily. (It may even be the highest of economic goals in certain policy circles.) When it comes to housing appropriateness, 'output' can be thought of as the provision of a right-sized shelter unit. The 'inputs' here would be factors such as land size, housing size, and location, each with a "productivity coefficient". In this way, the larger the land and housing size (beyond a viable minimum), and the less accessible the unit is from the likes of work or amenities, the smaller the productivity to deliver the same right-sized housing unit. Low housing productivity worsens affordability in a number of ways.

Currently, about 45% of GTHA households live in detached homes and 35% live in apartment buildings. This leaves only 20% living in what is often called the "missing middle" – that is, the "gentle density" housing types such as semi-detached, row homes, townhomes, multiplexes, and courtyard apartments. (These proportions are nearly identical to the New York City metro area, just on a smaller scale.)

Such housing types provide more affordable ground-level (or close to it) shelter, without having to live in smaller, family unfriendly units, many stories off the ground. For example, at a construction cost of about $135 per square foot[6], even a reasonably-sized basic 1,480 square foot home (enough for a comfortable three bedrooms) costs approximately $200,000 to build, *excluding other costs (e.g., land)*. Building an equivalently costly condo unit in a 30-storey building would only yield 880 square feet, which would (arguably) not provide enough space for three bedrooms. But it could also allow for the construction of a 1,480 square foot unit in a 3-storey stacked townhouse or a 1,400 square foot unit in a 6-storey wood-frame condo. Such options get productive use out of land without limiting the number of bedrooms provided (i.e., without changing the "product" delivered).

So why isn't more productive "gentle density" built? While zoning policy is not the main thrust of this report, part of the reason is surely because it isn't allowed in most places. Even in the City of Toronto, where people imagine condo towers as far as the eye can see, a significant portion of the city only allows

---

[6] Cost data for this example comes from Altus Group: http://www.altusgroup.com/services/cost-guide/

detached homes (often referred to as the "yellow belt" after the colour used on planning maps to depict detached housing). It has been estimated that up to 40% of land in the city is zoned this way (Novakovic, 2017), or roughly 60% of the residentially-zoned lands (Kalinowski, 2017).

Opening up more of such land to more productive uses through slightly increased density would not only allow for the provision of additional housing (without significantly encroaching on the "character" of neighbourhoods) at a reasonable cost, it would also increase affordability through the provision of *existing* infrastructure. This is especially true in seemingly obvious places, such as the TTC's Line 2 subway, along much of which (e.g., along Danforth Avenue) is surprisingly low density.

Given the affordability challenges discussed throughout this report, increasing the productivity of land that is already serviced would be a more cost effective way of producing appropriate housing stock without having to open up new land supply farther afield from employment centres, which is generally unproductive.

CONCLUSIONS

In Ontario, a relatively high-income province, shelter prices have been rising much faster than incomes, while incomes (and wealth) have grown more unequally distributed. Meanwhile, the shelter market has been responding to demand from wealthier households: offering large, ground-related homes in car-dependent neighbourhoods on the low-density urban fringe (called "location inefficient neighbourhoods"), and hyper-compact condos in the urban cores. This has led to crowding out.

Various stakeholders have come forward with proposed solutions to the housing affordability problem; however no comprehensive quantitative analysis of a broad range of potential factors has taken place. Therefore, CANCEA tested – simultaneously – over 40 factors and the behaviours they impact to quantitatively determine the major drivers of decreasing affordability. This robust and comprehensive study has taught us that the region's affordability pressures are generally due to a few key linked issues:

- **A lack of appropriate housing choice**: in terms of size, location/transit access, and tenure;

- **A lack of housing productivity**: in terms of lots of over-housing and density being too low; and

- **Many families being "forced" into worse options**: e.g., people buying when they should rent or moving farther away (e.g., from their work).

Addressing these significant drivers of the affordability issue require things going differently. Building the nearly 600,000 new housing units – on the order of $100 billion to $150 billion worth of construction – expected to be needed across Ontario a decade from now can go a number of ways. For example, for Ontario's homeownership rates to get back *close* to those seen in the 1970s, 80s, and 90s – i.e., Toronto's rates being similar to those seen in major U.S. cities – then *all expected new units* built over the next decade would need to be purpose-built rental. Most of these would need to be multi-bedroom units, unless smaller households (e.g., senior couples) started disproportionately renting relative to current rates.

Although non-intervention may appear to be a safe option if intervention can be expected to carry adverse consequences on other areas of the economy, abstaining from the current situation also carries risks. For example, while shelter prices nearly doubled in the 1980s, GDP from residential construction tripled. But in the 1990s, as shelter prices remained relatively flat, so did GDP from residential construction, and the share of GDP coming from residential structures declined by a quarter. Further, as household debt continues to grow and differentiated households continue to compete for differentiated shelter, it is likely that crowding out will impact a wider segment of the population as more households leverage themselves heavily to enter the real estate ownership market (given the lack of rental stock), adding to demand and reducing economic stability. Because shelter is a fundamental need, the ongoing discussion about reducing affordability pressures and continuing to invest in growth so that future populations can be accommodated has to centre on sustainability.

If the status quo is undesirable, evidence-based analysis is the only way to increase the likelihood that a policy outcome will be more desirable. The enormous contribution of shelter to our national economy – let alone the everyday lives of Ontario households – demands that any measure taken to track and correct affordability pressures is done with precision and without sacrificing our overall sustainability and economic well-being.

SOME INTERESTING FACTS

- **1 in 8 Ontarians are under-housed** (i.e., do not have enough bedrooms). It would take 2.5 years just to supply 'missing' bedrooms. But **over half of Ontarians (and 3/4 of those aged 65+) are *over-housed*** (i.e., have too many bedrooms). There are over **5m spare bedrooms in Ontario**, equivalent to 25 years' worth of construction. (In fact, there are over 400,000 homes in Ontario that have three or more empty bedrooms – that is, nearly 1.3 million empty bedrooms in family-sized homes.)

- **In the GTHA**, approximately 45% of housing units are single-detached homes and 35% are in apartment buildings (equal to New York City metro area); **only 20% are "missing middle" housing**

- **30% of GTHA commuters commute 45+ min. each way**. Outside the GTHA is very car dependent – 85% commute by car (5% by transit). In the GTHA, "only" 70% commute by car (20% by transit)

- Since 1990, **rental stock per capita has fallen by 1/3 in the GTHA** (1/8 outside)

- Over the last 20 years, **over 10 times more condo units have been built than purpose-built rental in the GTHA** (roughly equal numbers built outside). 1/3 of Toronto's condos are now rented out

- **Over half of "family-sized" renter households (4+ people) in Ontario are under-housed** (far more than owners). 20% of such households (25% in GTHA) are under-housed by *multiple* bedrooms

- The rent-to-price ratio in Toronto is lower than every major North American city (except Vancouver and Ottawa), and is much closer to other 'world class' cities, suggesting that **renting in Toronto could be a good alternative to buying**

- An "estimated **95% of all investment properties purchased in 2016 are losing money every month**"[7] on the assumption that prices will continue to rise – a sign of speculation, not investment

- "Roughly 17% of homes were resold within 2 years as of March 2016, up from about 9% a year earlier"[8] – a sign of house-flipping

- **An estimated 1.5% of the stock in Ontario (or about 85,000 dwellings) is vacant**[9], down from 3% in 2011. This is equivalent to about 1.5 years' worth of construction. (It is estimated that vacant stock in the GTHA represents a much lower proportion and number)

- Affordability is largely driven by average household size (which is shrinking) and average wages (which are growing, but unevenly). For example, **a very small change in average household size** (say 2.6 to 2.5) **would necessitate a very large increase in housing stock** (= 3.5 years' worth of construction)

- Economic prosperity is a huge driver of affordability. **Real median family market income has been effectively flat for decades**, despite significant real increases in shelter prices

---

[7] (Parsalis, 2017)

[8] (Caranci, Petramala, & Judge, 2017)

[9] Note that this is different to the often mischaracterized Canadian census data showing total private dwellings not occupied by "usual residents", which excludes non-residents (e.g., foreign students).

1.0   INTRODUCTION

Canada's deteriorating housing affordability is front of mind for many and has become the focus of much analysis and regular national headlines (seemingly on a daily basis), highlighting it as a growing concern for Canadian households across a wide spectrum of income and wealth. And no wonder. There are few issues more central to our day-to-day lives than having an affordable place to call home. Finding affordable shelter that is safe, comfortable, and close to our places of work, education, worship, and play is critical to our well-being. But what makes shelter "affordable", and what can we do to help make it so?

Canada's shelter affordability challenge is complex, rife with data limitations, and poses risks associated with both action and inaction by policymakers. Acknowledgement of the problem by diverse stakeholders – and initial policy responses by government – indicate a strong desire to affect the affordability of Canadian shelter markets. Unfortunately most of the existing commentary is singularly focused, ignoring this complexity and the interrelatedness of factors and behaviours that are actually driving the issue. We might ask why, if the issue was so simple, it hadn't been solved already.

This prompted CANCEA to expand upon the first phase of its affordability research, *Understanding Shelter Affordability Issues: Towards a better policy framework in Ontario*.[10] The phase one report took a systems-based approach to understanding potential supply and demand factors underlying the affordability problem in Ontario. It identified the relationships between industry, government, and households as they make decisions to secure shelter and other needs. Such "systems thinking" allowed for a broader understanding of how virtually every aspect of the Canadian economic system was (at least partially) implicated in creating the current (and growing) shelter affordability crisis. The report also took into consideration what roles shelter plays for households that make it unique relative to other goods. These ideas underlie CANCEA's *Shelter Consumption Affordability Ratio* (SCAR Index), which has become well known as a "pocket book" accounting measure of the ability of a household to make ends meet as they try to operationalizing their shelter.

This phase two report is the culmination of another year and a half's worth of work trying to quantitatively unpack the root causes of our affordability crisis. It turns out that, not surprisingly, there are numerous interrelated things at play.

1.1 A different way of thinking

We view socio-economic questions such as shelter affordability through a "systems" lens – that is, how do households, businesses, and governments (collectively called "agents") interact to generate the aggregated outcomes that they do? Housing affordability is no simple matter. CANCEA has undertaken over two years of dedicated research to address what the driving factors of housing affordability are in Ontario (and the GTHA specifically), culminating in this report.

---

[10] Available at http://www.cancea.ca/?q=node/96

Pressures arising from unaffordable shelter affect both families who rent and those who own their homes, across a broad spectrum of income and wealth levels. Although shelter affordability and the market for shelter have become central to the discussion of the overall health of the Canadian economy, it is often the case that different stakeholders will favour a particular approach to the problem.

In other words, housing affordability requires more than "economics 101", and anyone who suggests "silver bullet" solutions might either have an agenda or may not have sufficiently considered the scope of the problem. Yet, while we live in the midst of major computing and analytical innovations, there is no evidence of a quantitative assessment that respects the interrelated factors that have been (or might be) the greatest contributors to the affordability challenge. While many commentators imagine the problem is affected by a number of issues, they've yet to quantitatively link those impacts, which hampers the prioritization of policy inteventions.

CANCEA adopts a "systems approach" to socio-economic analysis which has been made possible by innovations in agent-based modelling and the availability of many sources of data which allows for the consideration of:

- Hundreds of data sources linked to the objects that generate the data (e.g., households);

- Over 40 factors (as well as the behaviours they influence) *simultaneously*, allowing for a unique quantitative linking and prioritization; and

- Household level accounts and behaviours tracked through every simulation, showing differentiated impacts on "making ends meet".

In other words, this research applies a comprehensive dataset that has been linked in a way that does not publically exist, studies more factors and behaviours than ever before, and provides more realistic results than can be found anywhere else. As such, we hope that this research will be recognized as a seminal contribution to the importance of the topic at hand.

1.2 Perspectives on shelter affordability in Canada

An increasing number of commentators have been issuing warnings about the rise of house prices and, more recently rents, amid a backdrop of stagnant incomes and growing levels of household debt. For instance, a Royal Bank of Canada's (RBC) report on national housing affordability identified that the costs of homeownership have continued to rise relative to incomes, particularly in Vancouver and Toronto (RBC Economics, 2016). RBC estimates that almost half of the average Canadian household's income is dedicated to costs related to owning a home, while in Toronto that figure rises to over 60% and over 87% in Vancouver (RBC Economics, 2016). Similar conclusions have been drawn by the National Bank of Canada (National Bank Financial Markets, 2016), Toronto Dominion Bank – which adds that prices are "ripe for a correction" without intervention to curb speculation (TD Economics, 2016) – the Bank of Nova Scotia (Scotiabank, 2016), Desjardins Insurance (Desjardins, 2016), and the Bank of Montreal (BMO Capital Markets, 2016), with some analysis of potential drivers. These banks are not alone in their conclusions.

The Bank of Canada has also expressed concern surrounding mounting consumer and mortgage debt, but has suggested that the issue is really one of *individual* financial prudence. More recently, the Bank of Canada suggested that the house prices in Toronto and Vancouver have grown unsustainable, with significant rises in household risk associated with the soaring debt (Blatchford A. , 2016).

The problem is that policy interventions cannot be made without a thorough understanding of the way in which households interact with *shelter* as a need and *houses* as an investment good, which agents should be targeted by policy interventions and how, and potential spillover effects into other markets resulting from intervention and non-intervention.

1.2.1 BIAS TOWARDS A SIMPLE SOLUTION

Several stakeholders have stepped beyond merely warning of an affordability problem; they also try to identify its causes. This is a crucial step towards resolving the source of the problem rather than merely imposing reactionary and blunt policies. However, some stakeholders involved in identifying the sources of the affordability problem continue to focus on what they *largely qualitatively* estimate to be the dominant factor, suggesting that affordability pressures could be resolved with simple, potentially unilateral policy interventions.

By breaking the problem down to increasingly separate components, the interaction between them gets ignored. This may then overstate the effect of a particular factor relative to others and, because it is found that a particular factor has an effect, bias makes a single-issue solution appear more likely to work. As multiple stakeholders with different beliefs about the fundamental source for the problem each take such an approach, each becomes increasingly specialized and disconnected, in some cases approaching the belief that one factor is responsible for the entirety of the effect. This creates a climate of narrowly-focused solutions – a problem that this paper specifically attempts to fix.

Table 1 presents a summary of what experts and stakeholders have proposed over the last few years as either the cause of, or solution to, the housing affordability challenge. (For more detailed summaries of the various viewpoints, please see Appendix C.) What can be seen here is that, not only is there no general consensus on the issue (as might be expected across such varied groupings), there is not even consensus *within* groups. There is obviously a need to rationalize this complexity.

Table 1 What selected experts and stakeholders think is driving Canada's housing affordability crisis

(As of 18 Apr. 2017)	Foreign investment	Domestic investment	Monetary & macro-prudential policy	Insufficient overall supply	Lack of ground-level stock	Lack of missing middle stock	Lack of affordable rental stock	Lack of gov. investment in housing	Taxes & development fees	Land use, supply, & development approval	Planning, density & infrastructure	Income stagnation vs. house prices	Increasing demand (e.g., pop. growth)	Increased credit & riskier lending practices	Generational Wealth
Government															
Federal Government	●		●				●	●							
CMHC	●	●										●	●	●	
Ontario Min. of Finance	●	●											●	●	
Universities															
Ryerson CUR					●					●	●				
Ryerson CBI	●	●				●				●	●		●		
Simon Fraser, Various	●				●		●			●					
Think Tanks															
Fraser Institute				●						●	●				
C.D. Howe			●	●						●			●	●	
Can. Cen. for Policy Alt.'s							●	●				●			
Wellesley Institute				●			●	●			●				
Pembina Institute			●						●		●		●		
OECD														●	
Construction															
CHBA					●				●	●					
OHBA					●				●	●			●		
BILD				●		●				●					
Real Estate															
TREB				●							●				
OREA						●			●						
Banks															
TD Bank	●													●	
RBC	●	●	●	●								●	●	●	
BMO	●	●	●		●					●			●		
CIBC			●						●	●	●				
Scotiabank										●				●	
National Bank			●		●	●									
Other															
Urbanation		●					●						●		
Fortress Real Develop.	●	●		●						●			●	●	●

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

Since the release of the phase one report, public attention on shelter affordability in Canada, particularly in the GTHA, has grown significantly. Although it is becoming clear that diverse institutions have acknowledged the mounting problem, significant gaps in research persist. In particular:

- **The confusion of housing as an investment with addressing the need for shelter** continues to be central to most discussions about affordability, in part due to the interests of some stakeholders who track and report on these issues. This neglects the basic need for access to shelter rather than the viability of housing as an investment vehicle. A policy mix that does not appreciate the different market segments involved in social housing, rental housing, and homeownership may not address the unique problems faced by each.

- **The reliance upon aggregate measures** may distort the true experience of households across Canada, and ignores the particular needs of those at different levels of income or wealth, have different preferences and expenditure profiles, vary in household size, and more. Aggregate measures are useful for tracking broad trends, but they are unable to inform targeted policies that could resolve pockets of extreme pressure. Without an understanding of where systemic risks lie, who bears them, and what the broad economic impacts may be, aggregate measures leave policy makers with limited options for how to address the challenge.

- **The lack of appreciation of the context of affordability** in which households can be expected to allocate their incomes according to a hierarchy of basic necessities (such as food, clothing, transportation, and shelter) before dedicating income to non-discretionary expenses. Although the exact nature of the needs may be, in part, socially defined, the affordability of shelter must be taken into consideration in tandem with the affordability of these other needs. Households are expected to make trade-offs between discretionary and non-discretionary expenses, but under severe constraints, they may make trade-offs among non-discretionary expenses as well.

- **The role of speculation** and its effects on households participating in shelter markets in order to secure their fundamental need for shelter. Because all households participate in the same market, demand is expected to cater to the marginal investor, who typically has greater discretionary income, than the households who are only trying to meet their shelter needs. Although speculation has been discussed by some stakeholders as contributing to affordability constraints, little has been done to quantify the size and nature of the impact of speculation in the Canadian housing market.

- **Disjointed quantitative analysis:** To date, no study has attempted to provide comprehensive and robust quantitative evidence of the full range of potential and connected issues impacting affordability. This does not serve the Canadian population as well as a measured grasp on the expected outcomes of policy interventions.

2.0 WHAT DOES "AFFORDABILITY" MEAN?

As described in the phase one report – and as shown in Table 1 above – one of the main issues in getting consensus around the nature of the problem, let alone potential solutions, is the fact that there is no consensus view on what "affordability" means, or even which way it is trending. Let's start with some of things that it is not.

2.1 What does "affordability" *not* mean?

2.1.1 LOW HOUSING PRICES?

The seemingly daily headlines around housing largely focus on housing prices, particularly in Vancouver and Toronto (though this is certainly spreading beyond such borders). This should not be overly surprising: over the 15 years prior to 2016, year-over-year price growth in Toronto has only been outside the "normal" range (average +/- two standard deviations) twice – during the "great recession" in 2009 and recovering from it in 2010. But, as of March 2017, price growth has surpassed *four* standard deviations from the average. If this process were random, such a result would be expected to occur roughly 1 of 16,000 times.

Figure 1   Year-over-year growth in Teranet's *House Price Index* (Toronto)
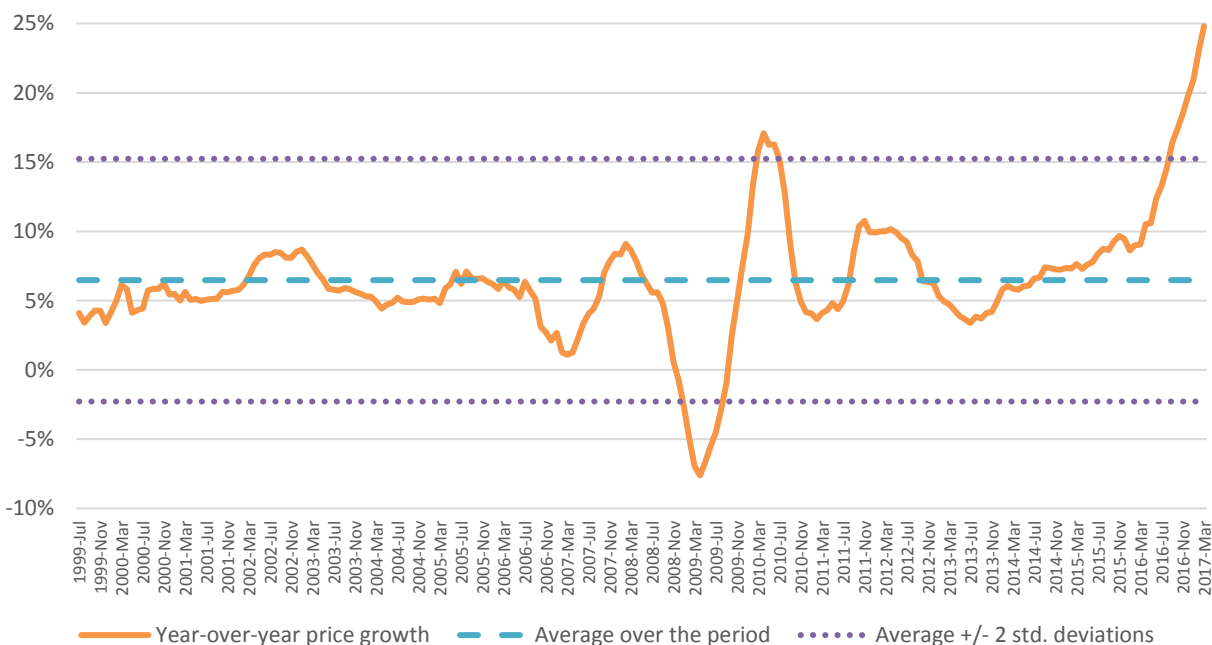
Source: Teranet; calculations by CANCEA

But does a house's price really define whether or not it is "affordable"? Ignoring the rental market for a moment, what if (a big "if"), incomes were rising at the same rate? One way to use prices to start to measure "affordability" is to compare price-to-income ratios.

While numerous countries face significant affordability pressures as well, Canada's home ownership costs (especially relative to incomes) are among the highest and most rapidly increasing in the world, suggesting that the tides of the global economy are not necessarily responsible for Canada's particular situation. For example, a little over one third of all OECD countries saw rising price-to-income ratios in 2011 and 2012. That proportion has risen consistently, whereby over three quarters of OECD countries saw price-to-income ratios increase in 2015 and 2016. But Canada is among only one fifth of OECD countries that have seen an increase *every* year for six years in a row. By this (high-level and average) metric, affordability has worsened in Canada by 20% over the last six years, four times the average among OECD countries.

Figure 2   Growth in price-to-income ratios across the OECD (2010-Q4 = 100)
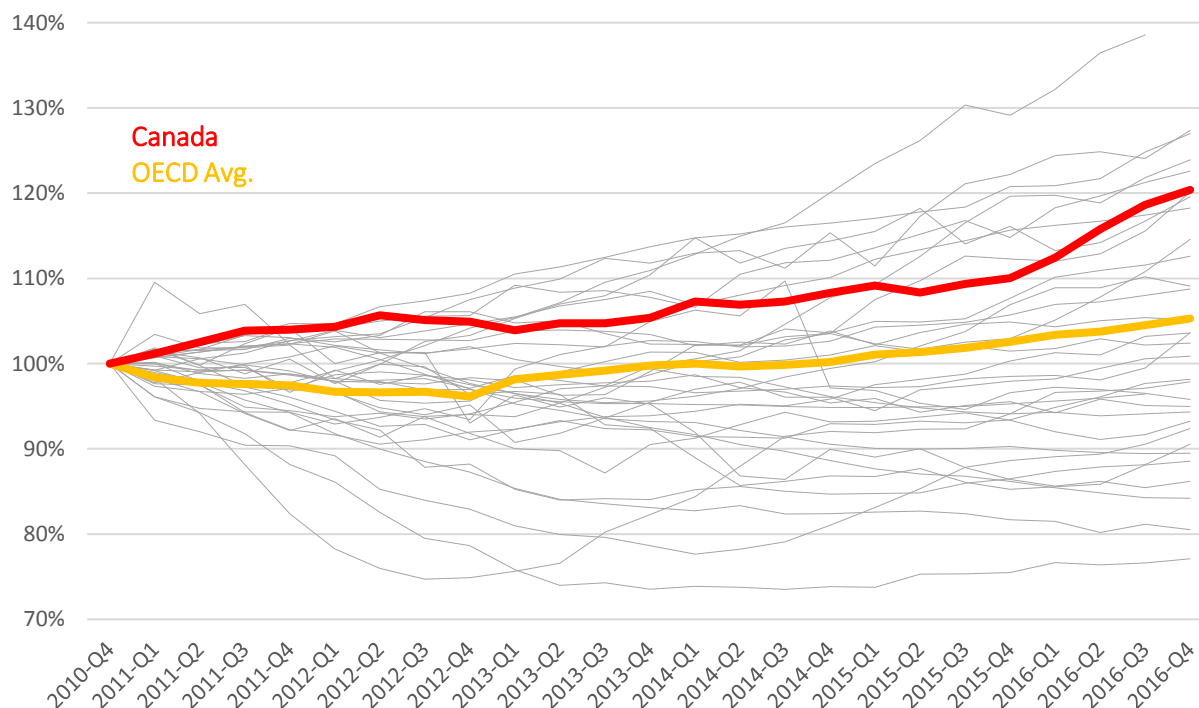
Source: OECD Data: Housing indicators; calculations by CANCEA

In fact, not only does Canada overall have one of the highest price-to-income ratios in the OECD, but in 2016, it had the second highest growth in the ratio as well (behind Norway, which had lower income growth). The IMF has also highlighted Canada's precarious affordability position (IMF, 2016), as has Moody's ratings agency (MacFarland, 2017). Although these are insightful analyses, they still rely on aggregate measures and may not reflect the daily challenges faced by different households when attempting to secure shelter of different types and in different regions of the country. Therefore, responding to an overall trend of growing housing affordability pressures using equally broad policies may generate risks and unintended consequences. At the household level, many Canadians do not look like the national average.

This also does not help tell a story about specific markets, such as Toronto. And cities can be particularly different beasts than a country-wide average. So let's now turn to some major cities across the world.

Figure 3   Price-to-income ratio: Toronto vs. the world
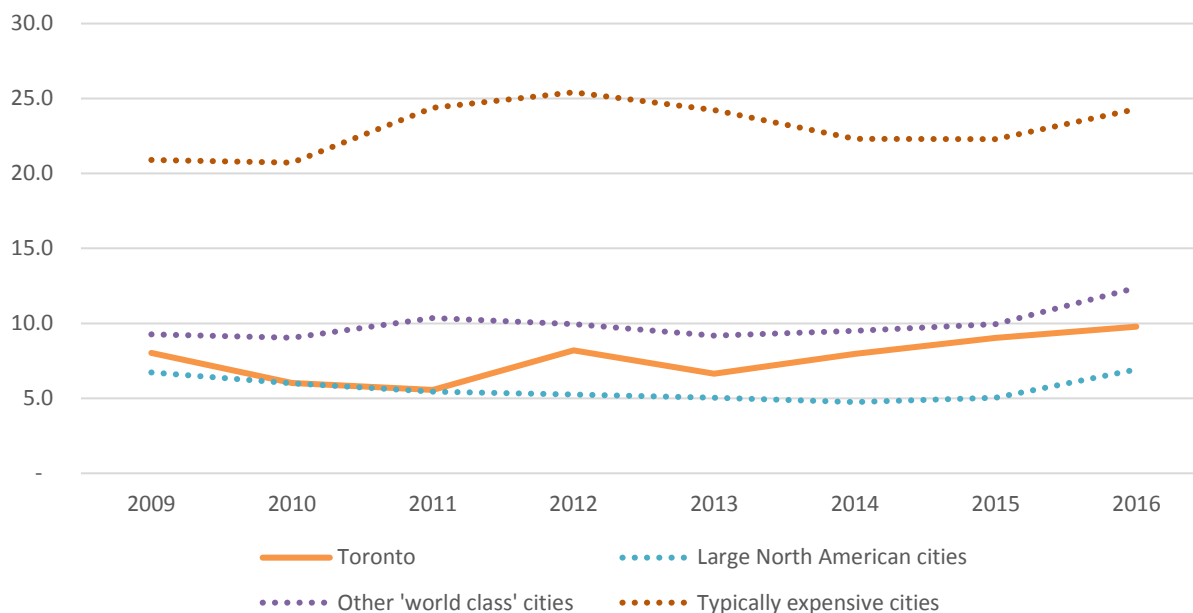
Source: Numbeo; calculations by CANCEA

By this measure, Toronto could be seen as relatively *cheap*, with a price-to-income ratio roughly 1/3 of the highest in world, such as Hong Kong, Hanoi, and Mumbai. If comparing to typically expensive (and often poorer) cities[11] seems unfair, limiting the comparison to other large North American cities and other "world class" cities[12] makes Toronto appear similar to the likes of Berlin, Boston, and Melbourne.

2.1.2   BUILDING "MORE, MORE, MORE"?

Another overly-simplistic argument of the housing issue has been that it is an overall "supply" issue. But even a simple analysis suggests that this is unlikely to be the case. For example, over the last decade, housing starts per household have over doubled in the GTHA, and housing stock per capita has remained flat in the region for 25 years.

The question then becomes not just about supply (which includes the supply of serviced "developable" land), but about how *productive and appropriate* that supply is. If building more requires significantly new (particularly) linear infrastructure be built, than the costs simply get passed onto tax payers in other ways. This notion of housing "productivity" will be returned to later.

---

[11] Top 20 typically high-ranked cities (as defined by P/I ratio) not included in the other groupings (e.g., Paris, London)
[12] Top 50 non-North American cities on the 2017 Mercer *Quality of Living Survey*

CANADIAN CENTRE FOR
ECONOMIC ANALYSIS

Figure 4   Housing starts per 1,000 households
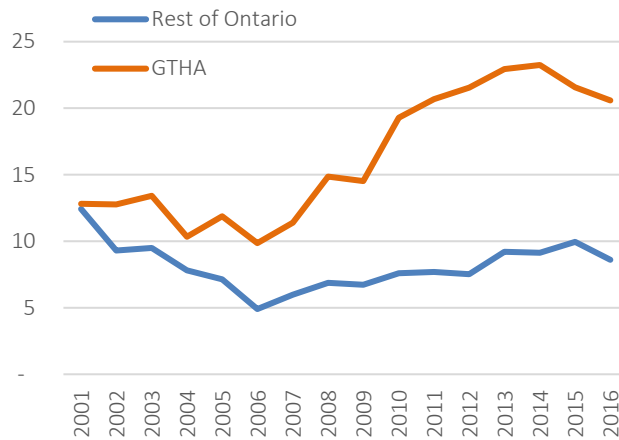
Figure 5   Housing stock (units) per person
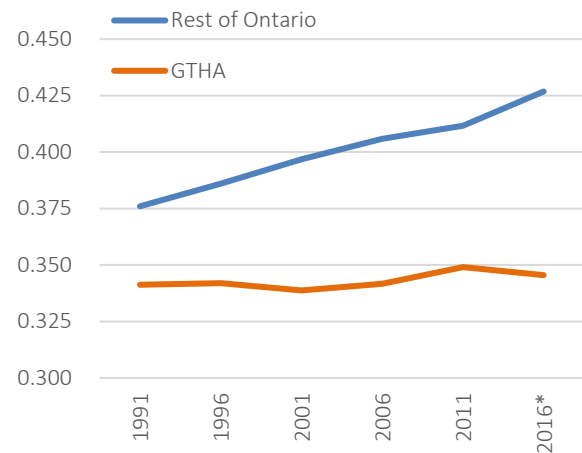
2.1.3   MAKING HOME *OWNERSHIP* MORE AFFORDABLE?

One of the major stumbling blocks in getting to a consensus definition of "affordable" seems to be that many commentators focus solely on home ownership. But higher ownership rates haven't improved affordability either. In fact, home ownership rates in Toronto have increased by 23% over the last 35 years (11% in Ontario overall), putting the region close to the highest among "world class" cities[13].

Figure 6   Homeownership rates in Ontario and Toronto

---
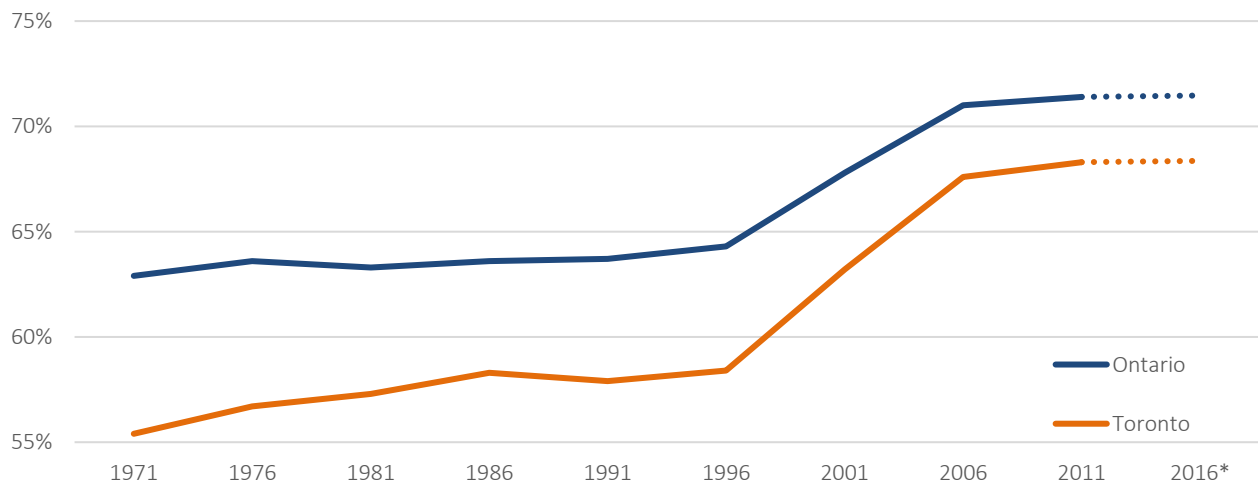
[13] Selection of top cities on 2017 Mercer *Quality of Living Survey* (data dependent)
* As forecast by CMHC

Figure 7   Homeownership rates in "world class" cities
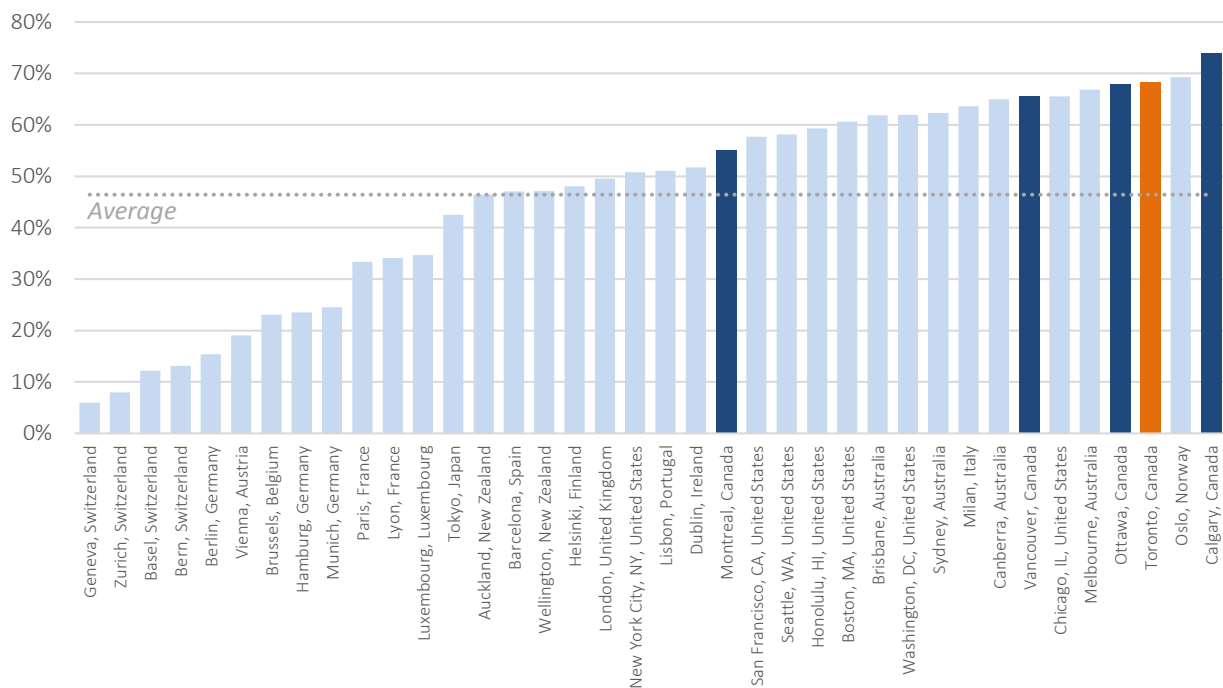
Source: Mercer, UN Data, US Census Bureau, CMHC; calculations by CANCEA

However, as Figure 7 shows, having a high ownership rate does not make a "world class" city; in fact it appears to be quite the opposite – the correlation between ownership rate and ranking of "liveability" is negative.

2.2   The SCAR index: a holistic appreciation of shelter affordability

In order to appreciate the complex and non-discretionary nature of shelter, the multiple roles it plays for a household, resolve the focus on aggregate measures, and tease out the realistic circumstances faced by differentiated households, the phase one report introduced a new measure of affordability.

The *Shelter Consumption Affordability Ratio* (SCAR) index measures the share of after-tax income that households devote to their shelter-related needs (including transportation and utilities) after paying for other necessities, such as health care, food, and child care. The SCAR index, unlike other housing affordability indices widely used in Canada, does not simply measure the cost of owning a home (i.e., mortgage payments). Rather, the SCAR index measures the affordability of the *consumption of* (or access to) shelter, which is a separate concept from the affordability of *investing in* a housing asset. The SCAR index captures the breadth and complexity of the shelter affordability issue, lending itself well to use in scenario and sensitivity analysis.

$$SCAR = \frac{\text{Shelter consumption costs}}{\text{Discretionary net income after other necessities}}$$

Shelter-related consumption costs: Unlike other affordability indices, the SCAR index differentiates shelter consumption from ownership by considering rental costs for tenants and "imputed" rent among homeowners who act as their own landlords[14]. Other shelter-related consumption costs in the SCAR index include utility expenses, maintenance and repair costs, and property taxes. In addition, as households must travel from their residence to reach necessary amenities and places of work, transportation expenses are also included. In aggregate, these are the costs required to "operationalize" shelter.

Discretionary net income after other necessities: This represents income available to pay for the consumption costs of shelter. It is calculated as after-tax income less financial obligations (such as debt repayment) less other necessary expenses: food, clothing, private healthcare costs, and essential non-shelter employment costs (e.g., childcare).

(For additional details regarding the construction of SCAR, please see Appendix D.)

Given how the SCAR index is constructed, a relatively higher or growing SCAR index value is a sign that things are (or becoming) more *unaffordable*.[15] Unfortunately, as shown in Figure 8, the median SCAR index levels for Canada, Ontario, and the GTHA are the highest seen in the data. Further, the median GTHA household is having a 10% tougher time "making ends meet" than the median Canadian household, a gap that is also the highest measured in the data.

| Figure 8 | Median SCAR Index over time (Canada, Ontario, and GTHA) | Figure 9 | Ontario SCAR – 25th, 50th, and 75th percenttile |
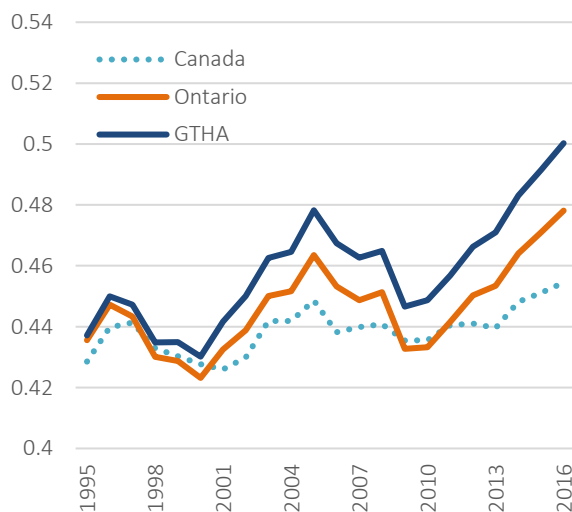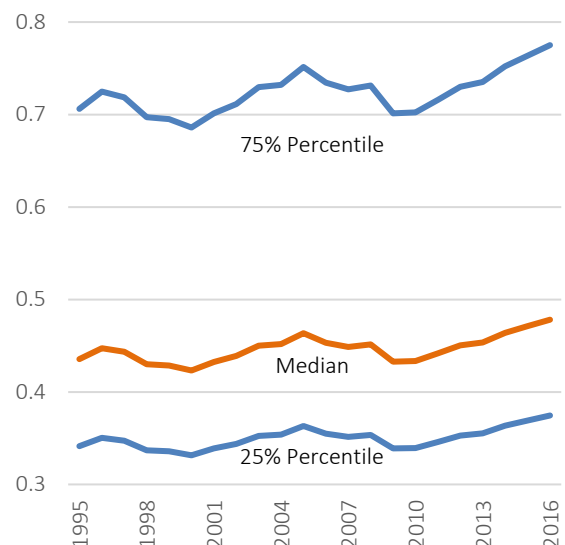
But averages are dangerous. As shelter affordability varies by household, SCAR does too. And, as Figure 9 shows, one quarter of Ontario households are under extreme affordability pressures, with a SCAR index in excess of 0.775. Going deeper, Figure 10 demonstrates that the distribution of households by SCAR and

---

[14] This concept is already in use as a component of GDP measurement by Statistics Canada.
[15] There is no easily defined "reasonable" SCAR index level, which may depend on a household's situation. However, a SCAR index of 1 would mean no room for anything like education, savings, or vacations.

income varies by the likes of household structure, age, sex, and number of children in the household. The darker the area on the chart, the more households are represented. (Note that these orange ovals highlight general trends, and are therefore also averages.)

Figure 10   SCAR for Ontario varies by household characteristic
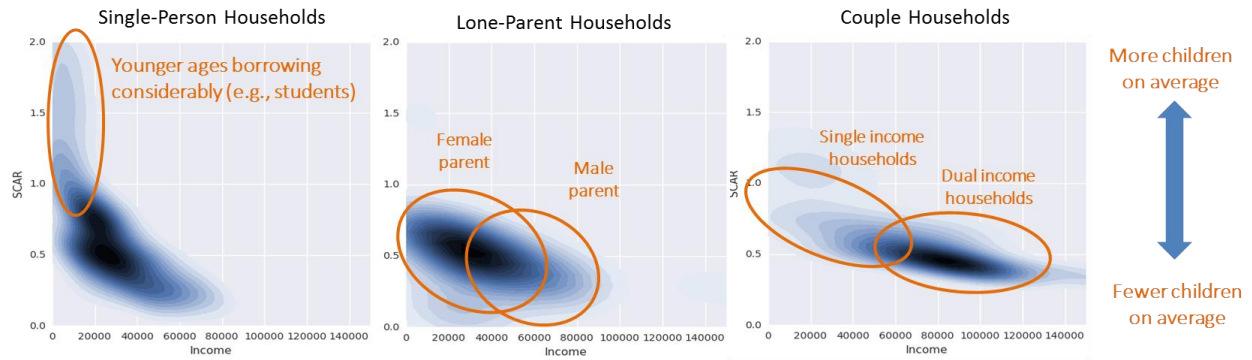
As SCAR is modeled for every household in Ontario, it can also be mapped (say, by neighbourhood, as shown in Figure 11). This shows that the ability to make ends meet is distributed unevenly across the GTHA.

Figure 11   SCAR by location
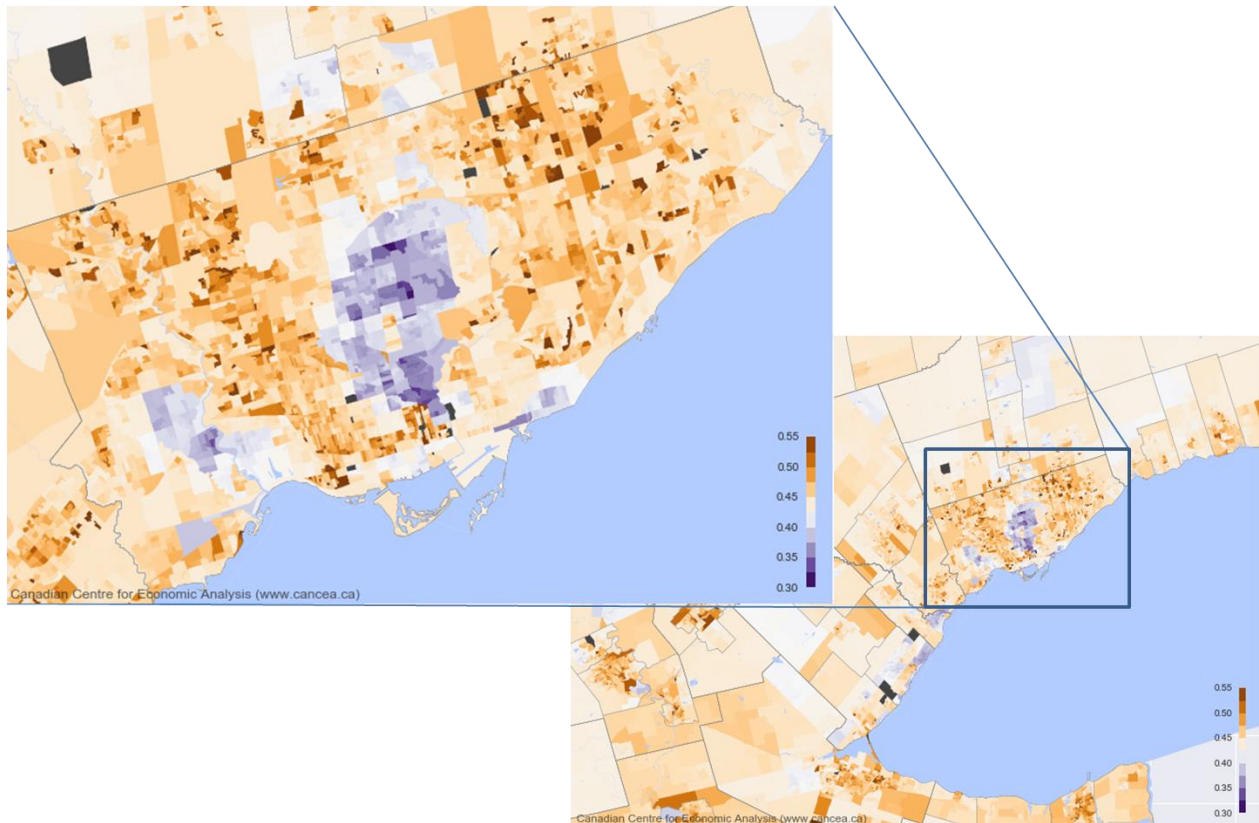
2.3 Objective

Through the identification of the breadth and interconnectedness of factors impacting housing affordability in the phase one report, CANCEA generated a framework incorporating holistic systems thinking, which serves as a starting point for this second phase. This focuses on quantifying the effects of the many dozens of factors identified and how they could impact the province and GTHA over time[16]. This will also offer a ranked and linked perspective of the most important factors driving the shelter affordability issue, providing an evidence-based starting point for the pursuit of a targeted suite of solutions. As such, this report attempts to reconcile the main factors driving shelter affordability, creating a base for additional future research and collaborative efforts towards its resolution.

We hope this supports the decision-making of government and private industry by illustrating the tools they have at their disposal to mitigate risks associated with unaffordable shelter in Ontario and the GTHA.

---

[16] Other jurisdictions (e.g., Vancouver), although similarly suffering from affordability concerns, will not be the focus of this report. However, similar analysis could be done for other markets.

3.0 METHODOLOGY

Given the incredible complexity of modeling the range of networked interactions and impacts required for this project – a different approach is required. Thankfully, with improvements in computing power and data, a new method of socio-economic inquiry is on the rise.

Agent-based modeling provides a framework for investigating dynamic, networked systems, such as an economy (with specific land-uses), by means of individual agents (e.g., households, businesses, governments), their mutual interaction with each other and their environment. *Prosperity at Risk* (PaR) is CANCEA's "big data" computer simulation platform that incorporates social, health, economic, financial, and infrastructure factors in a networked system. This platform models agents as:

- **Individuals**, with individual budget constraints (e.g., income, expenses, assets, and liabilities) and production/consumption activities (dependent upon economic input/output tables), thereby recognizing the independence of their motivations and decisions; and as

- **Part of a spatial and economic network**, thereby recognizing the dependence of their economic decisions upon other agents (via, for example, policy, investment decisions, and land use).

As such, PaR simulates the interactions of more than 40 million agents across Canada that are each encoded with behavioural rules to guide their decisions, act based on those rules, and be influenced by the actions of others. This is enabled by an enormous "linked-path" database that links hundreds of disparate (and typically cross-sectional) data sources back to the very objects that created them (e.g., households)[17]. This allows for varied constraints and behaviours over time. The goal of such analysis is to identify the risks and rewards (intended or not) to various stakeholders.

Because PaR features the entirety of the Canadian economy and adopts a micro-simulation approach, all scenarios can be evaluated with precision regarding their impacts on various types of agents or sectors of the economy. This also allows for unforeseen spillover effects (or 'externalities') to be accounted for, tracked, and assigned to the correct cause, as agents dynamically adapt to their environments. Small changes in behaviour, spending, infrastructure, and others lead to local adaptations by agents, which then spread to others, such that all the relevant aspects of the economy reflect all the 'ripples in the pond'.

In this way, the whole breadth of effects can be tracked as it unfolds geographically and temporally, and an intervention or scenario can be assessed holistically, such that all impacts are taken into consideration. The model is sensitive to the particular type of investment, intervention, or behavioural change with as few *a priori* assumptions as possible.

---

[17] For example, PaR imbues in agents hundreds of data sources (e.g., Statistics Canada tables, many down to detailed geographic areas) on demographics, income statements and balance sheets, consumption patterns, labour force statistics, and commuting choices, among many others.

3.1 Stage 1: Multi-factor analysis

In order to assess the influence of the multitude of potential drivers of the affordability of shelter throughout Ontario and the GTHA, over 40 different factors have been chosen for individual and combinatorial analysis. Each factor is both individually analyzed for its effects on the SCAR index, as well as assessed in tandem with all others to identify any interaction effects. Because the SCAR index tracks such diverse aspects of the economy and is designed to reflect the realistic choices that households must make for ends to meet, it is able to capture changes in the nature of shelter affordability that may stem from unforeseen changes.

Broadly, the 40+ factors can be roughly grouped into the following categories. Each factor has been identified as a *potential* driver of shelter affordability levels in Ontario and the GTHA, and so is being considered in this study. (In lay terms, everything is being thrown at the wall to see what sticks.) A full list can be found in Table 2.

- **Costs of residential construction and land supply**: challenges that the residential construction and design sector have expressed as being obstacles to the ability of the market to deliver a sufficient supply of affordable housing – such as shortages of labourers and delays in zoning and other procedures – and scenarios based on the influence of input prices and fees. The debate on the influence of land supply on the housing market persists (though little discussion of the *productivity* of the land being used), with certain stakeholders asserting that limited supply of serviced land on which residential development can take place has been curbing the ability of the supply of shelter to match demand. This shortage of supply could ultimately keep prices elevated, eroding affordability.

- **Demographic-driven demand**: birth rates and immigration, household size, the rate of household formation, and other related factors do not just influence the amount of shelter demanded, but also the type of shelter and its location.

- **Labour force, income, and wealth:** the ability of a household to access shelter is directly impacted by how much money the household has (especially given the inequality that exists). Given that most households derive the vast majority of their income from employment, labour market conditions (and participation) could play a significant role in affordability.

- **Shelter-related household expenses**: non-discretionary costs, including utilities, maintenance fees, and property taxes, are directly related to households' shelter decisions, and therefore need to be accounted for.

- **Other essential household expenses**: other non-discretionary goods and services that households purchase, including food and beverages, clothing and footwear, and out-of-pocket medical costs cannot be ignored in the discussion of shelter affordability, as some households often trade-off such expenditures with shelter-related costs.

- **Transportation and proximity**: as households must travel to and from their homes in order to meet their other needs, (e.g., in order to go to their place of employment), and because access to

amenities impacts the cost of shelter, changes in the costs of transportation such as fuel or public transit fares, or in household preferences for commute modes and distances, influence the shelter chosen and the ability of households to afford that type of shelter.

- **Debt, credit, and monetary/macroprudential policy**: the cost and ability to borrow and how it relates to sustaining the sale and resale of shelter. Similarly, macroprudential policy can supplement interest rate policy by placing important limits on the size of loans available relative to home values and the amortization period of mortgages, thereby influencing the ability of households to (over-)leverage themselves. The use of consumer credit is also included.

- **Public infrastructure and other investment:** services such as transit, roads, water and wastewater infrastructure, form the surface of our built communities but cost more per person when spread out over greater distances.

- **Government taxes and transfers**: including income tax and land transfer tax, act to redistribute income and facilitate broader access to the shelter market across population segments.

Stage 1 of the analysis looks at the impact of each of these factors on the SCAR index historically, as well as the sensitivity of the SCAR index to changes in the factor. This provides two things. First, it helps with understanding what has driven the SCAR index to the levels seen today. Second, by breaking out the sensitivities of the SCAR index to the various factors, we can help identify the issues that should be addressed going forward.

3.2 Stage 2: Behavioural analysis

All of these factors also influence at least one of the behaviours (on both the demand and supply sides of the equation) that could be targeted by policy. These are the behaviours that may ultimately need to be changed if we are to have any hope in addressing (on a broad scale) the affordability issue going forward. By linking these factors to such behaviours, we are also able to help prioritize where policy efforts should be focused, while leaving the (relatively) more marginal or "boutique" issues for later. Importantly:

- As shown in Table 2, some factors may influence multiple behaviours, making them appear to be more influential *a priori*. However, results may show that the SCAR index is not overly sensitive to those factors, meaning that in aggregate, changing such behaviours may have little impact overall.

- On the flip side, some of the factors and behaviours may have little influence on the SCAR index overall, but may have impacts on affordability for specific demographic groups. For example, while child care costs may not impact the ability of households to make ends meet in aggregate, it may certainly do so for families with young children.

- Similarly, while some factors may not play a large role in the affordability story themselves, they may have marginal impacts that are not picked up in the data given how things have changed. For example, construction costs may not have been a factor writ large as house price growth (largely set by the resale market) has outstripped input costs, but if the market were to crash, construction costs may quickly become important (i.e., building homes may not be profitable).

Table 2   Factors and linked behaviours that influence affordability

Factors	Number of units required	Construction costs	Construction regulations	Housing suitability	Transportation and Infrastructure	Consumption of other needs	Disposable income	Speculation	Rent vs. own	Other shelter-related costs
'Bedroom hoarding'	■		■	■				■		
Average household size	■			■						
Population Growth	■			■						
Available land supply		■	■		■					
Construction labour costs		■	■							
Regulatory costs (e.g., development charges)		■	■							
Construction sector profit		■								
Other construction costs (e.g., materials)		■								
Unit fuel costs				■	■					■
Other Transportation				■	■					■
Mode shifting (incl. 'active' modes)				■	■					■
Distance travelled				■	■					
Rental stock quality				■				■	■	
Rent-to-Price ratio				■					■	
Public transit fares					■					■
Child care bills						■				
Clothing and footwear purchases						■				
Food and beverage purchases						■				
Private healthcare bills						■				
Other Necessities						■				
Interest rate							■	■	■	
Loan-to-value ratio (via down payment)							■	■	■	
Investment income							■	■		
Amortization period							■		■	
Consumer Credit							■		■	
Average Wages							■		■	
Other debt (e.g., car loans, student debt)							■		■	
Property Taxes							■		■	
Multi-unit property tax bias							■		■	
Labour participation rate							■			
Government Transfers							■			
Other Transfers Paid Rate							■			
Other Transfers Received							■			
Income taxes and deductions (e.g., CPP)							■			
Land Transfer Tax(es)								■	■	
Ownership rate								■	■	
Real Estate Fees								■	■	
Electricity bills (unit costs)										■
Electricity bills (use)										■
Other Shelter Costs (e.g., maintenance fees)										■
Other utility bills (unit costs)										■
Other utility bills (use)										■

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

4.0 RESULTS

4.1 How did we get here?

As described above, when investigating the over 40 factors at play in the housing affordability puzzle, we need to split their impacts into two pieces. The first is how much the given factors has itself changed over the period of investigation (the last decade, here). The second piece is how sensitive the SCAR index is to changes in that factor. Multiplying these two pieces yields the overall impact of that factor on the SCAR index. For example, the SCAR index will not be affected in aggregate by a factor that it:

- Is sensitive to but that hasn't changed; or

- Is insensitive to, regardless of how much it changes.

Similarly, the SCAR index could have *increased* due to a changing factor that it:

- Is positively sensitive to and has increased; or

- Is negatively sensitive to and has decreased.

This stage 1 analysis shows that there are only a few factors that have significantly affected the SCAR index (in aggregate) over the last decade, as highlighted in Figure 12. In particular, these are factors that have both increased the SCAR index (a bad thing) and decreased it (a good thing):

- *Factors that have increased the SCAR index*: demographic-induced demand pressures (e.g., population growth and decreasing average household size), and other debt (e.g., credit cards, car loans, and student debt); and

- *Factors that have decreased the SCAR index*: increasing average wages, growing gap between ownership and rental prices, growth in government transfers.

Further, there are some factors that have not driven the SCAR index in aggregate, but have driven it for certain groups. For example, construction costs have not played a significant role overall, but have affected the ability of the market to provide low-cost housing options.

Also worth noting here, though, is that when it comes to setting policy, it is the future that should be the focus of concern. From that perspective, what got us here is useful context, but the SCAR sensitivities are more relevant going forward. And in terms of sensitivities (again, in aggregate), the key factors are:

- Average household size and population growth (collectively, demographics);

- Average wages and employment rate (collectively, economic prosperity);

- The shelter demand/supply mismatch (i.e., over- and under-housing); and

- The gap between ownership and rental prices.

Figure 12   Factors that have driven changes in aggregate SCAR over the last decade (right = bad; left = good)

As stated above, these are the sensitivities to Ontario's SCAR index values overall. But different households face different constraints and pressures. For example, if we run the same analysis only on households with below median incomes, we find very different pressures. For example, as shown in Figure 13, such households have been more affected by certain factors that have both increased the SCAR index (a bad thing) and decreased it (a good thing):

- *Factors that have increased the SCAR index*: growth in food and beverage expenditures, significant growth in other debt (e.g., credit cards, car loans, and student debt), and growth in private healthcare costs; and

- *Factors that have decreased the SCAR index*: growth in government transfers and other transfers, and decreasing interest rates.

Similarly, the SCAR index for these households is highly sensitive to average wages, labour participation, and rental stock quality.

Figure 13   Factors that have driven changes in aggregate SCAR over the last decade for below-median income households (right = bad; left = good)

4.2   Where could we go from here?

The sensitivities described above can now be linked back to the *behaviours* that they affect (according to the concordance outlined in Table 2), to provide a collective set of issues that should be addressed. As shown in Figure 14, the five things that need to be the focus of policy-makers are:

- Housing suitability;
- Demographic changes;
- Economic development (including inequality);
- The rental market; and
- Speculation (and over-leverage).

Further, the realistic potential of policy options are not equal across these factors (e.g., demographic changes), but that does not mean we can ignore them. That is, these issues *must be considered in conjunction*.

Understanding the forces driving the shelter affordability issue

Figure 14   Sensitivity of factors and the policy focuses they affect

Factors

Policy focus

LEGEND
Arc thickness represents SCAR sensitivity
Blue = makes SCAR go down (good) as factor increases
Orange = makes SCAR go up (bad) as factor increases

CANADIAN CENTRE FOR
ECONOMIC ANALYSIS
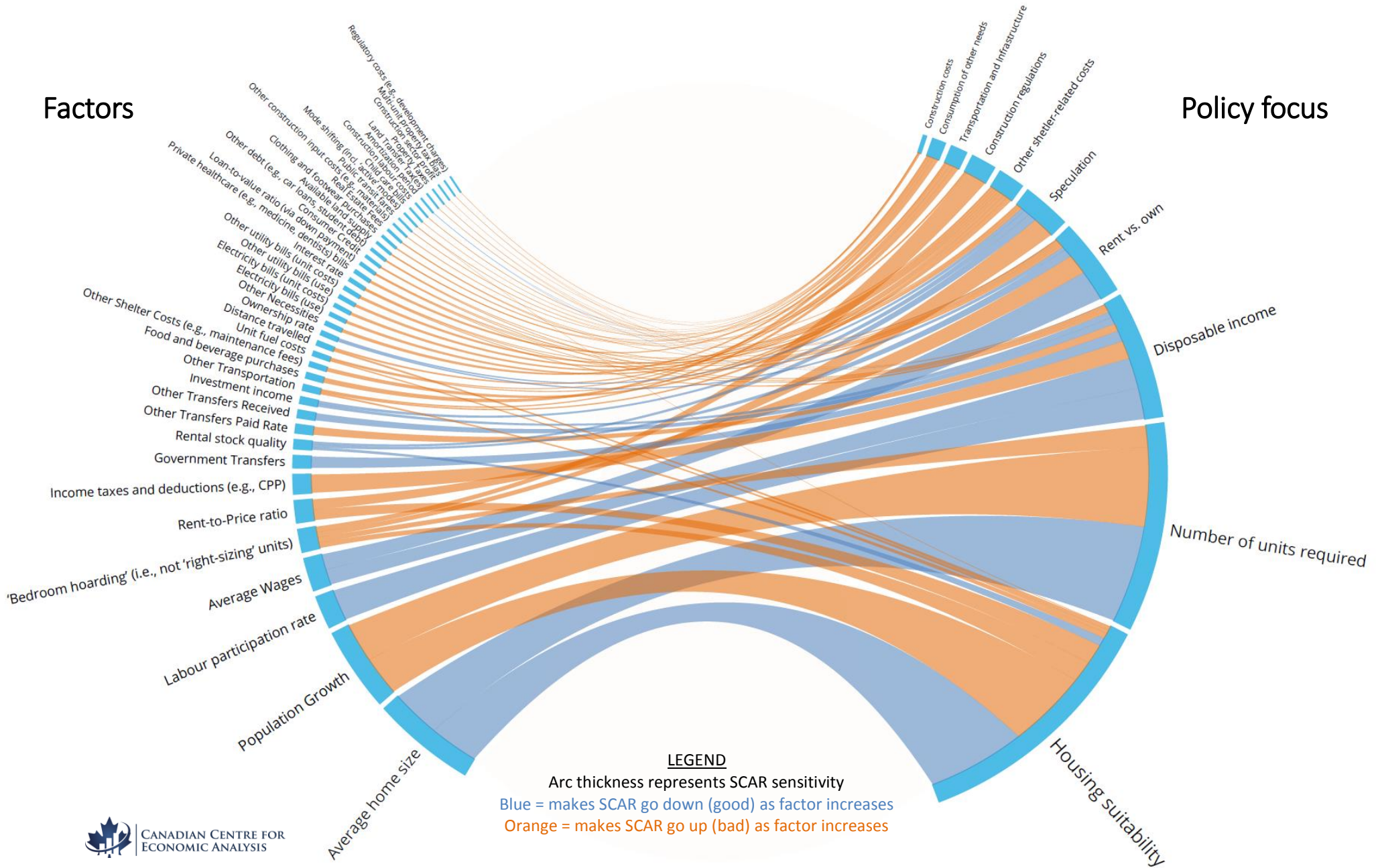
This helps focus the discussion to only a few areas of linked concern. It also helps "push the pedal" on the modeling side, such that more robust analysis can be conducted in stage 2, which we turn to now.

Part of the power of PaR is that behaviours can be synthetically influenced in such a way that they diverge from historical levels. This allows for detailed and authoritative "if this, then that" statements. It is then up to policy makers (led by community values) to determine how much pressure is put into the system to facilitate the required behaviours. Applying that here includes "turning the dials" on development behaviour (e.g., what gets built and how quickly) and household shelter decisions (e.g., rent vs. own, propensity to resize). These behaviours are obviously affected by specific policy (e.g., regulations affecting building times, incentives to rent); this study is concentrated on identifying the areas of necessary focus.

As Figure 15 and Table 3 show, the ability of households to see quickly increasing wages would significantly improve housing affordability both in the short- and long-term. This should not be a surprise, but does not involve simple policy responses. Economic development is obviously critical, and should be an ongoing focus of government in many respects (not just shelter affordability), but there are other behaviours that might be more easily affected by policy. Similarly, increasing average household size would lead to improvements in affordability, though meaningful policy change here is unrealistic. The areas that should be the focus of policy discussions going forward are:

- **Right-size matching** is split into two pieces. First is the propensity for households to right-size their housing (e.g., reduce over-housing). Such behaviour is affected by the likes of housing style preference (rather than utility), transaction costs (e.g., land-transfer taxes, real-estate, legal, and moving costs, and the uncertainty associated with matching changes in ownership) as well as having appropriate housing options (i.e., a place to downsize to) available to them. The second is about what developers build (i.e., matched to needs, status quo, or purposefully mismatched needs). Such behaviour is largely affected by regulation and risk-adjusted profit potential.

- **Speculation** has two components. First is vacancy, which requires additional (offsetting) units be built. The second is price expectations, which behaviourally causes overbidding (e.g., to yield a quick return, fear-of-missing out), driving up prices for all buyers, potentially crowding out.

- **Developer response time** to changing demands. The ability (and desire) of developers to put new housing on the ground when it is needed requires relatively stable demographic changes (for forecasting purposes), available serviced land and quick regulatory turnarounds (e.g., site approvals), and a lack of speculation on the developers' side.

- **Tenure matching** is also split into two pieces. Similar to right-size matching, tenure-matching is affected by both the propensity of households to rent (vs. owning), as well as developers' propensity to build purpose-built rental stock. Household behaviour here is driven by the likes of market expectations (e.g., of economic returns after fees/taxes, ownership bias), availability of rental stock, and macroprudential policy. Developer behaviour here is driven by risk-adjust profit motives as well as the regulatory environment (e.g., zoning, property tax differentiation).

- **The confluence of such behaviours** is most important. As an example, rental stock availability is only useful if it is appropriately sized.

Table 3   Percent change in aggregate SCAR by scenario and year (positive = bad; negative = good)

Scenario	% change in SCAR by:	
	2022	**2032**
A) Household Size: Decrease	1.4	12.2
A) Household Size: Increase	(0.7)	(6.4)
B) Wages: Improve Quickly	(4.8)	(14.3)
B) Wages: Improve Slowly	(2.4)	(7.1)
C) Right-size Matching: Quick to Resize, Matched Builds	(1.8)	(7.9)
C) Right-size Matching: Quick to Resize, Mismatched Builds	0.5	5.7
C) Right-size Matching: Quick to Resize, Status Quo Builds	0.3	0.7
C) Right-size Matching: Slow to Resize, Matched Builds	(0.1)	(4.0)
C) Right-size Matching: Slow to Resize, Mismatched Builds	0.1	4.0
C) Right-size Matching: Slow to Resize, Status Quo Builds	(0.2)	(1.3)
C) Right-size Matching: Status Quo Resizing, Matched Builds	(0.7)	(4.6)
C) Right-size Matching: Status Quo Resizing, Mismatched Builds	0.2	4.9
D) Prices and Stock Vacancy: Decrease Price Bias	(1.4)	(4.9)
D) Prices and Stock Vacancy: High Vacancy	3.0	9.1
D) Prices and Stock Vacancy: Increase Price Bias	1.5	6.1
D) Prices and Stock Vacancy: Moderate Vacancy	0.6	1.8
E) Developer Response Time: Fast	(0.6)	(2.3)
E) Developer Response Time: Moderate	(0.3)	(1.5)
F) Tenure matching: = Ownership Pref., Decr. Rental Build %	0.3	1.6
F) Tenure matching: = Ownership Pref., Incr. Rental Build %	(0.2)	(1.5)
F) Tenure matching: Decr. Ownership Pref., = Rental Build %	0.2	1.5
F) Tenure matching: Decr. Ownership Pref., Decr. Rental Build %	0.3	1.8
F) Tenure matching: Decr. Ownership Pref., Incr. Rental Build %	(0.6)	(9.1)
F) Tenure matching: Incr. Ownership Pref., = Rental Build %	0.4	2.4
F) Tenure matching: Incr. Ownership Pref., Decr. Rental Build %	(0.1)	(0.5)
F) Tenure matching: Incr. Ownership Pref., Incr. Rental Build %	0.4	4.6
G) Combined: Quick to resize, Decr. Ownership Pref., Incr. Rental Build %; = speculation	(1.9)	(13.1)

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

Figure 15   Impact of behavioural changes on housing affordability by 2032
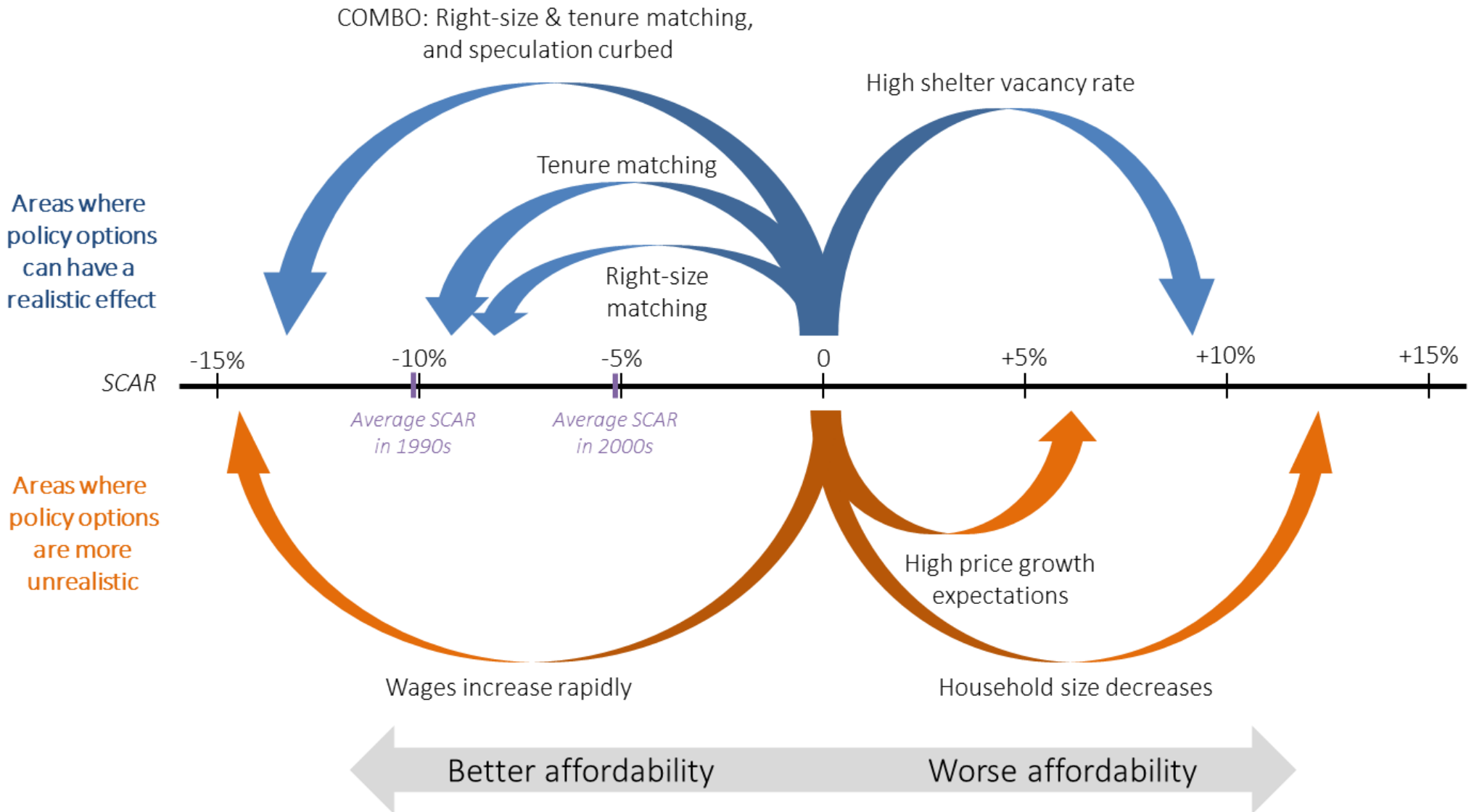
As shown in Figure 15, there are combinations of behaviours that do improve affordability (as well as the opposite). In addition to household size and economic prosperity, already discussed above:

- **Getting households to right-size and developers to build appropriately sized units** could reduce the SCAR index below levels seen in the 2000s within the next 15 years.

- **Curtailing speculation** would avoid equally large *increases* in the SCAR index.

- **Getting more households to rent and developers to build more purpose-built rentals** would almost get the SCAR index back to levels seen in the 1990s in the next 15 years.

- Most importantly, **facilitating all of these behaviours** would provide the largest (realistic) impact: the SCAR index would drop below levels seen in the 1990s and would be roughly equivalent to the impact of quickly increasing wages.

Further, it appears that a market dominated by owner-occupiers – such as we have in Ontario – imposes severe limitations on the ability to right-size, as residents are required to pass through an ownership-to-ownership transaction that usually means:

- Relatively high transaction costs associated with change of ownership; and

- What economists often call a "double coincidence of want": the less likely coincidence that someone is selling a property you want at the same time you choose to move.

The obvious solution is more rental options, which would provide lower transaction costs while presenting less frictions for the movement of households.

4.2.1   RIGHT-SIZING

Numerous experts argue that we have a generic housing supply problem, but this is overly simplistic – the main issue is that we as a society are not matching families with *appropriate* housing in a broad sense of the term. Such experts simply advocate building more, but there could be a more cost effective alternative in which everyone wins: reducing the significant "over-housing" that exists in Ontario. That is, there are many families living in units that are bigger than their needs, meaning that growing families have limited appropriate options.

The Canada Mortgage and Housing Corporation (CMHC) uses a National Occupancy Standard (NOS) to determine housing "suitability"[18]. In simple terms, this formulaically calculates how many bedrooms a household requires (depending on household structure, and age and sex of children), and then checks if the household has at least that many bedrooms. In cases where it does not, the household is deemed to be "under-housed". In Ontario, around 8% of households (representing 13% of the population) are under-housed. These numbers are typically higher in urban areas. For example, 11% of households (representing 18% of the population) in the GTHA are under-housed. In total, such households are "short" by nearly half

---

[18] See http://www.statcan.gc.ca/eng/concepts/definitions/dwelling06 for more detail.

a million bedrooms; at current construction rates, it would take over two years to construct the housing to accommodate these families. These are certainly troubling statistics.

Unfortunately, the CMHC's definition stops at "suitable"; that is, they do not discuss "*over*-housing". But, as it turns out, nearly two-thirds of Ontario households are over-housed to the tune of over 5 million empty bedrooms. At current construction rates, this represents 25 years of housing supply. In other words, the number of spare bedrooms in the homes of the over-housed represent 10.5 times the number of bedrooms the under-housed are short. In fact, there are over 400,000 homes in Ontario that have three or more empty bedrooms – that is, nearly 1.3 million empty bedrooms in family-sized homes.

Comparing the following tables shows that the GTHA has less of an over-housing issue than the rest of the province, and that less than a third of Ontarians are actually "suitably" housed.

Table 4   Housing suitability in Ontario

	% People	% Households	Mismatched bedrooms (in aggregate)
Under-housed	13	8	0.5m
Suitably housed	30	29	0 (by definition)
Over-housed	57	63	Over 5m
Years' of supply represented by spare bedrooms	25		

Table 5   Housing suitability in the GTHA

	% People	% Households	Mismatched bedrooms (in aggregate)
Under-housed	18	11	0.4m
Suitably housed	32	33	0 (by definition)
Over-housed	51	56	Over 2m
Years' of supply represented by spare bedrooms	17 (40 outside GTHA)		

Breaking this down shows that this housing suitability issues comes from a mismatch between the shelter sizes needed and available – in other words, it is a housing "geometry" problem.

Table 6   The housing "geometry" mismatch in Ontario: bedrooms needed vs. available

Bedrooms needed:	Bedrooms in unit:					Total
	0-1	2	3	4	5+	
1	6%	7%	11%	4%	1%	28%
2	1%	6%	12%	6%	1%	26%
3	1%	3%	13%	10%	3%	29%
4	0%	1%	3%	5%	2%	11%
5+	0%	0%	1%	2%	1%	5%
Total	8%	17%	40%	27%	8%	

Legend: *Light blue – people over-housed;* *Orange - people matched;* *Dark blue – people under-housed*

Table 7   The "housing geometry" mismatch in the GTHA: bedrooms needed vs. available

Bedrooms needed:	Bedrooms in unit:					Total
	0-1	2	3	4	5+	
1	6%	6%	7%	3%	1%	23%
2	2%	6%	10%	6%	1%	26%
3	1%	4%	12%	11%	3%	31%
4	0%	1%	4%	5%	2%	13%
5+	0%	0%	2%	3%	2%	7%
Total	10%	17%	36%	29%	9%	

Legend: *Light blue – people over-housed;* *Orange - people matched;* *Dark blue – people under-housed*

Perhaps not surprisingly, the proportion of people who are under-housed increases with household size: 80% of people in 2-person households are over-housed whereas 67% of people in 7+ person households are *under*-housed. In gross count terms, a majority of under-housed people live in 5+ person households whereas a majority of over-housed people live in 1-3 person households.

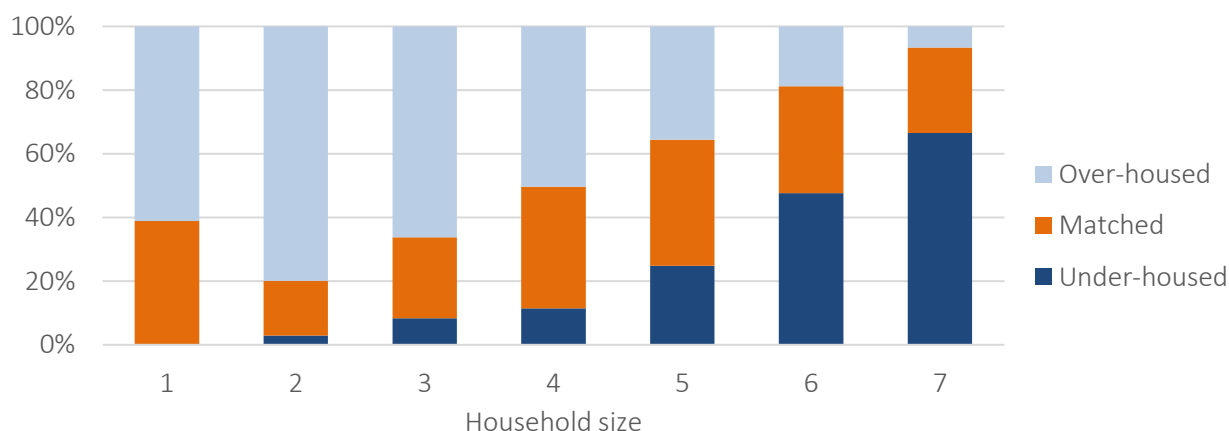Figure 16   Housing suitability (people) by household size

Figure 17   Housing suitability in Toronto by neighbourhood and shelter type

Table 8   What characteristics define the over-housed?

Characteristic	Split	% Over-housed inside GTHA	% Over-housed outside GTHA
Income:	Households with <1/2 median household income	45	60
	Households with >2x median household income	65	75
Tenure:	Households who rent	25	40
	Households who own	70	80
Age:	People <30	40	50
	People 65+	70	85
Overall:		55	70

Table 8 shows that splits in numerous characteristics seem to define the over-housed population, though tenure more so and income less so. Either way, over-housing does apply to some household types far more than others. For example, differentiating households by numerous characteristics shows the proportions of under- and over-housing can swing significantly by household situation.

Figure 18   Housing suitability for young (<30), low-income (<1/2 median HH income) renter households in Toronto (CMA)
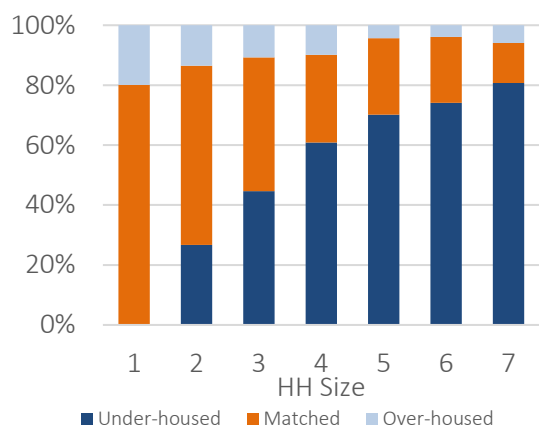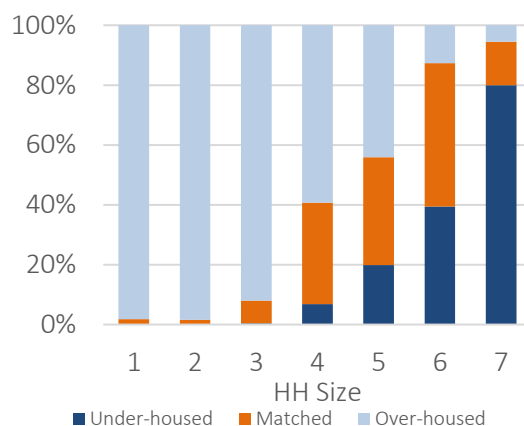
Figure 19   Housing suitability for older (65+), higher-income (>2x median HH income) owner households outside the GTHA


4.2.2   EXPANDING RENTAL

Homeownership is on everybody's mind across Canada, and detached homes represent an especially hot commodity, with limited supply in places like Toronto. Some – including Ontario's Minister of Finance – have called home ownership the "Canadian Dream". Recent surveys by the Ontario Real Estate Association (OREA) found that 80% of Ontario residents say that home ownership is important to them, with the top reasons for wanting to buy a home being the long-term investment value. This is perhaps why home ownership rates have continued to increase steadily over the last three decades. However, a decreasing proportion of Ontarians believe that, over the long-term, owning "makes more sense" than renting – down from 89% in 2014 to 81% in 2016.

This changing expectation may be due to the increasingly high cost-to-income ratios seen in Canada's top markets. But does perception match reality? While rents are certainly rising in Ontario (and Toronto specifically) – as shown in Figure 20 – and even relative to income – as shown in Figure 21 – the rent-to-income ratio in Toronto is roughly equivalent to other large North American and other "world class" cities.

Figure 20   Median rent in the primary rental market in Ontario and Toronto (CMA)
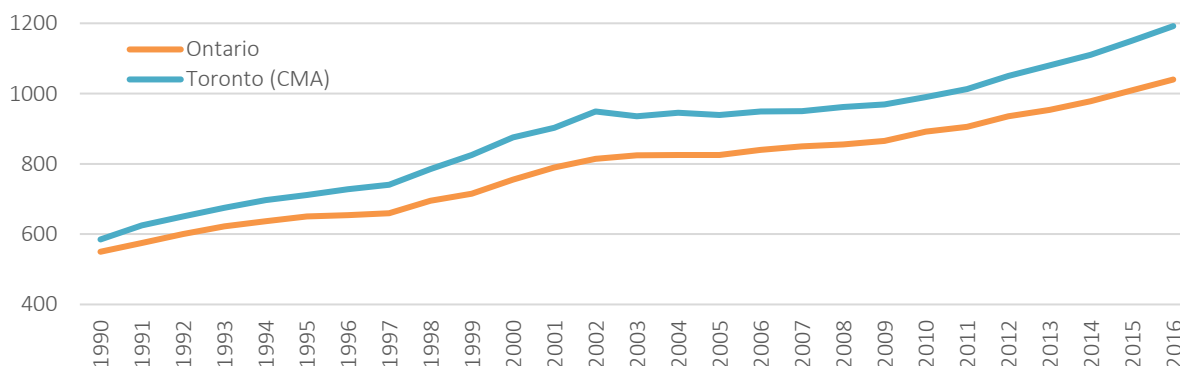
Source: CMHC

Figure 21   Rent-to-income (city centre): Toronto vs. the world
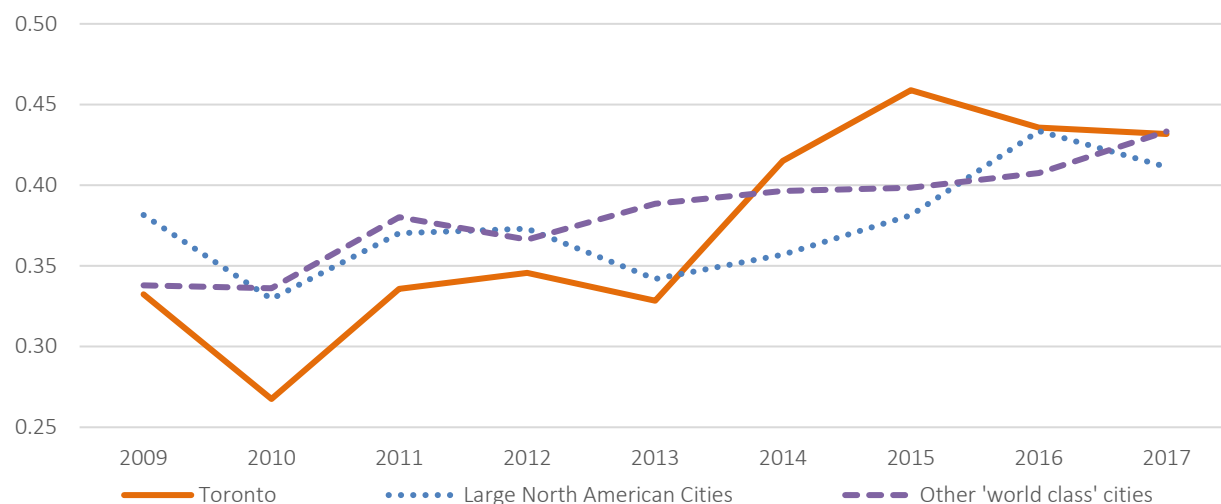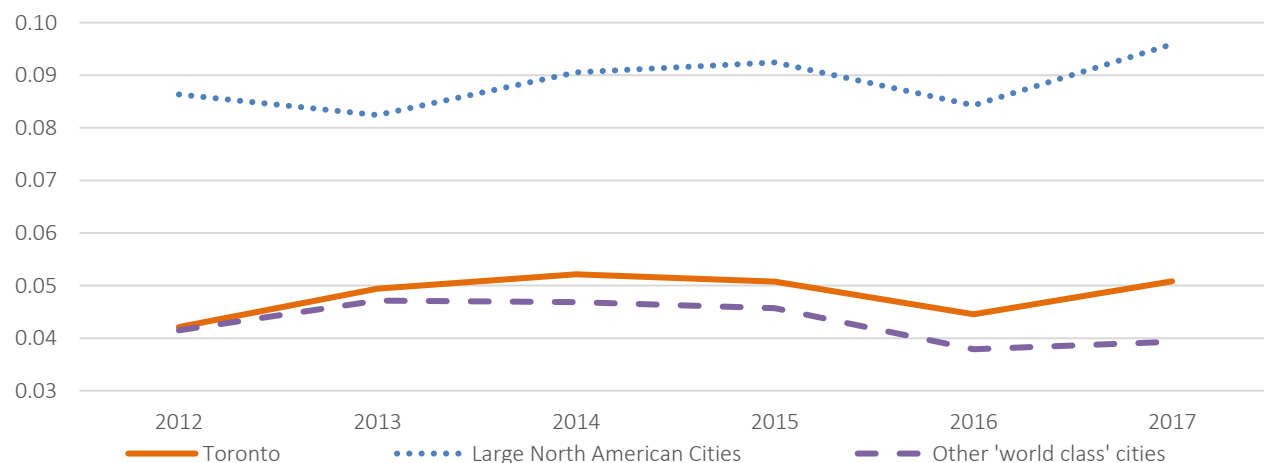

Source: Numbeo; calculations by CANCEA

Further, while rents are increasing, the *rent-to-price* ratio (in other words, the renting vs. owning ratio) – shown in Figure 22 – in Toronto is both fairly flat over time and lower than every major North American city (except Vancouver and Ottawa), and is much closer to other "world class" cities, suggesting that renting in Toronto can be a good alternative to buying.

Figure 22   Rent-to-price (city centre): Toronto vs. the world

Source: Numbeo; calculations by CANCEA

This begs the questions as to why so many people own (versus rent) in Toronto, or Ontario more generally. One major reason appears to be a lack of purpose-built rental stock: between 1990 and 2016, the stock of purpose-built rental units in the GTHA only increased by 3% (5% outside) while the population of the GTHA grew by 53% (21% outside). The result is that rental stock per capita has fallen by 1/3 in the GTHA (1/8 outside).

Figure 23   Purpose-built rental stock per capita
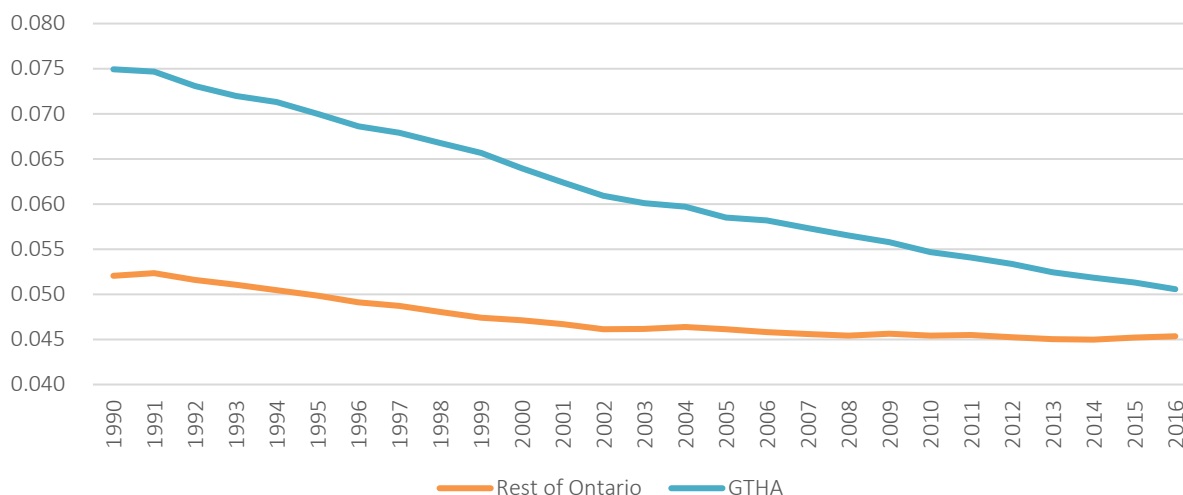
Source: CMHC; CANCEA

Over that same period, the proportion of households in the region that are renting has decreased by only 1/4. The difference is squared by the fact that far more households are now renting *condos*, which have come to dominate the GTHA market instead of purpose-built rental: over the last 20 years, over 10 times more condo units than purpose-built rental units have been built (while roughly equal numbers have been built outside the GTHA).

Figure 24   Percent of Toronto (CMA) completions by intention
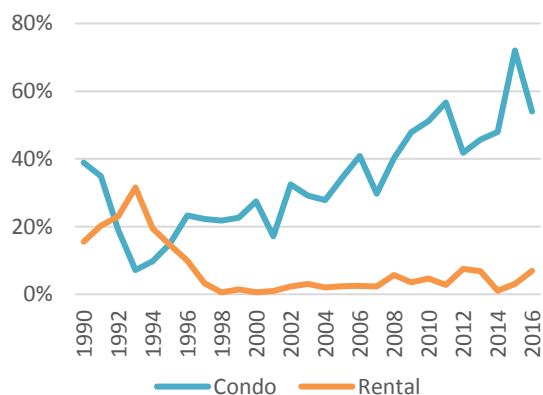
Figure 25   Cumulative Toronto (CMA) completions since 1997 by intended market
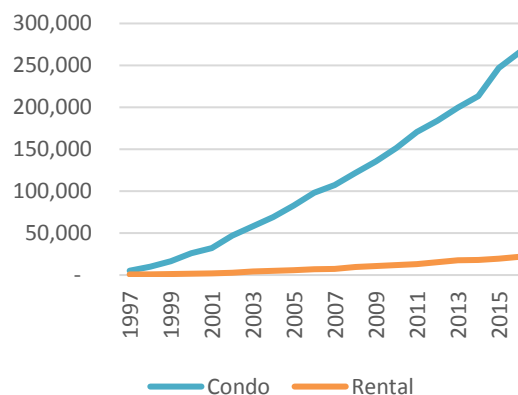
Source: CMHC; calculations by CANCEA

As such, over the last decade, the decline in primary rental units per capita in Toronto has been made up for by the secondary market (i.e., condo owners renting out their units). This has occurred as Toronto's secondary market has grown from 11% of rentals to 27%. The result is that 1/3 of Toronto's condos are now rented out (versus 1/5 a decade ago).

Figure 26   Toronto (CMA) rental units per capita by rental market
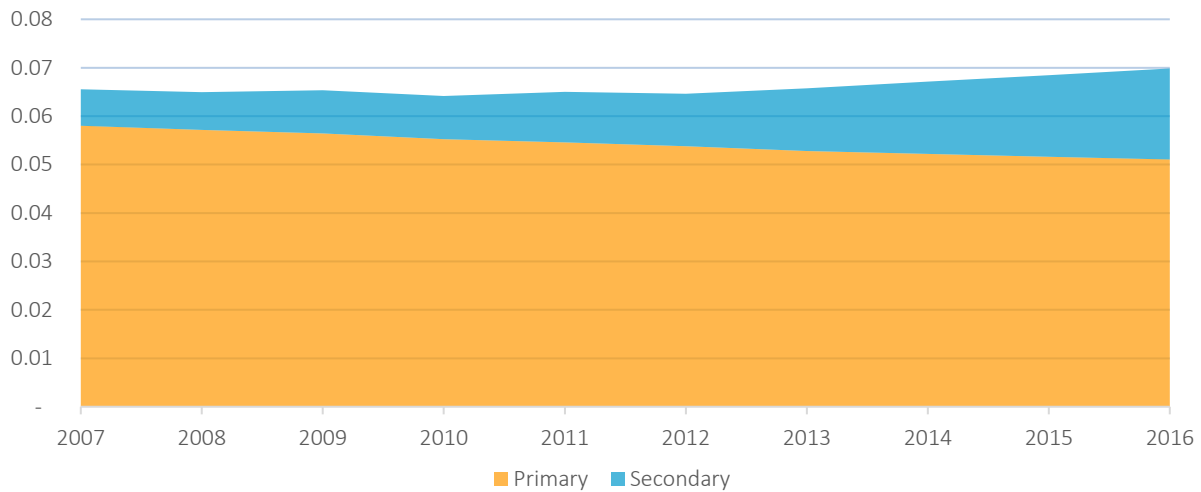
Source: CMHC; CANCEA

One issue here is that rents in Toronto condo units (the "secondary market") are on average around 50% higher than units in the primary rental market (with the same number of bedrooms), including 63% more for 3-bedroom units. This is often because such units are in newer (and nicer) buildings, which likely have better amenities and locations. Unfortunately, this also suggests that renting out condos to lower-income families will likely not solve their affordability issues.

Table 9   Average rents in Toronto (CMA) in 2016 by market

	Bachelor	1 Bedroom	2 Bedroom	3 Bedroom +	All
Primary market	957	1,132	1,326	1,525	1,240
Secondary market	1,428	1,653	2,029	2,487	1,901
Markup	49%	46%	53%	63%	53%

Source: CMHC

As such, the provision of right-sized units (highlighting the linkages between the various issues being identified in our results) in the rental market is critical going forward. Three times as many renters as owners are under-housed in Ontario, including half of "family-sized" renter households (4+ people). In fact, 1/5 of "family-sized" renter households (and 1/4 in GTHA) are under-housed by *multiple* bedrooms. Further, there is a significant difference between owned and rented shelter available for same size households – as such, most large renter households do not have the same options as owners. As indicated in Figure 27, only 30% of rented units have 3+ bedrooms, versus over 85% for owned units. Subtracting one from the other shows an "excess rental rate", highlighting the significant lack of options for larger families, who often get "forced" into buying when they might otherwise rent.

Figure 27   Excess rental rate in the GTHA: a disproportionate number of small rental units
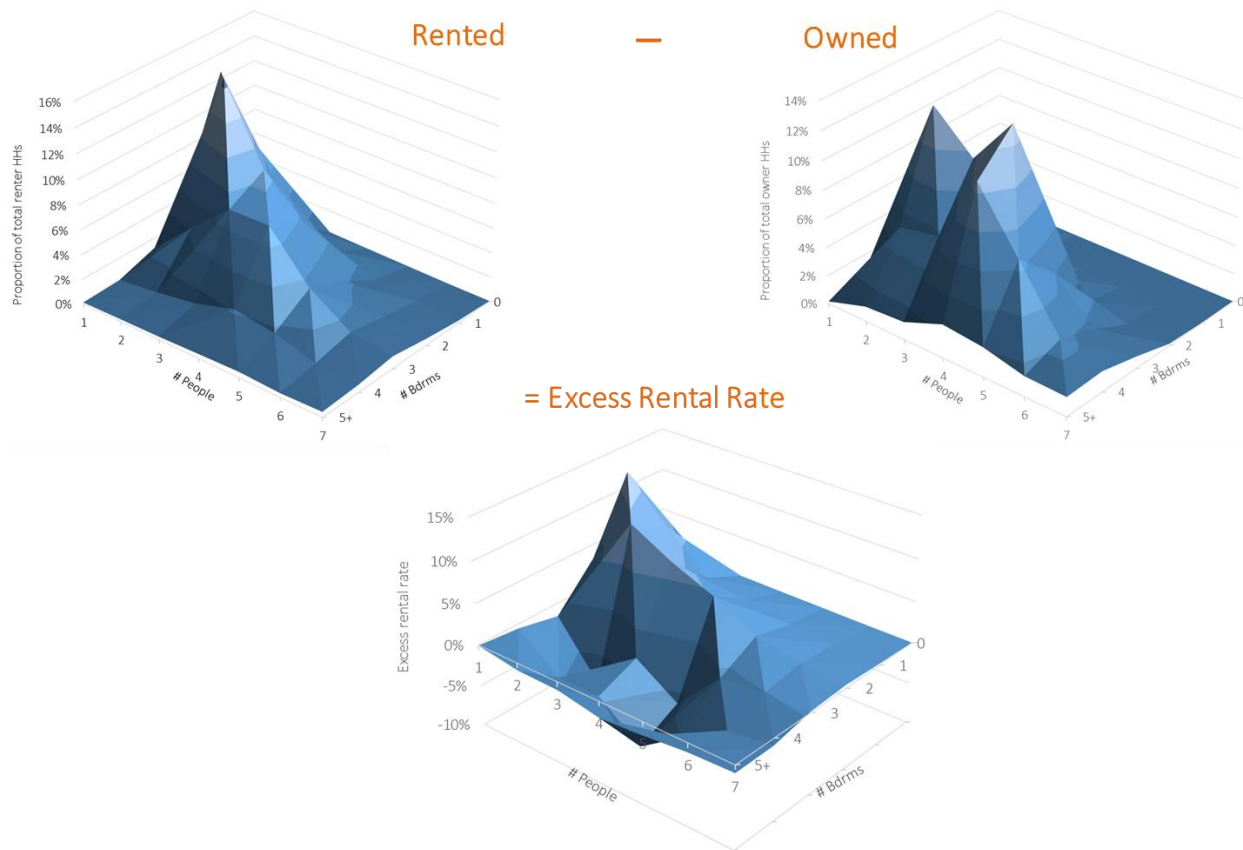
Is addressing this even feasible? Looking back at the definition of the SCAR index, each combination of SCAR and income implies a maximum rent payable. For example, Figure 28 shows that a typical household with an income of $20,000 and a (roughly median) SCAR of 0.5 spends up to $500 on rent, but so does a typical household with a (very high) SCAR of 1 and an income of around $9,000.

Figure 28   Maximum rent contours for given SCAR and household income
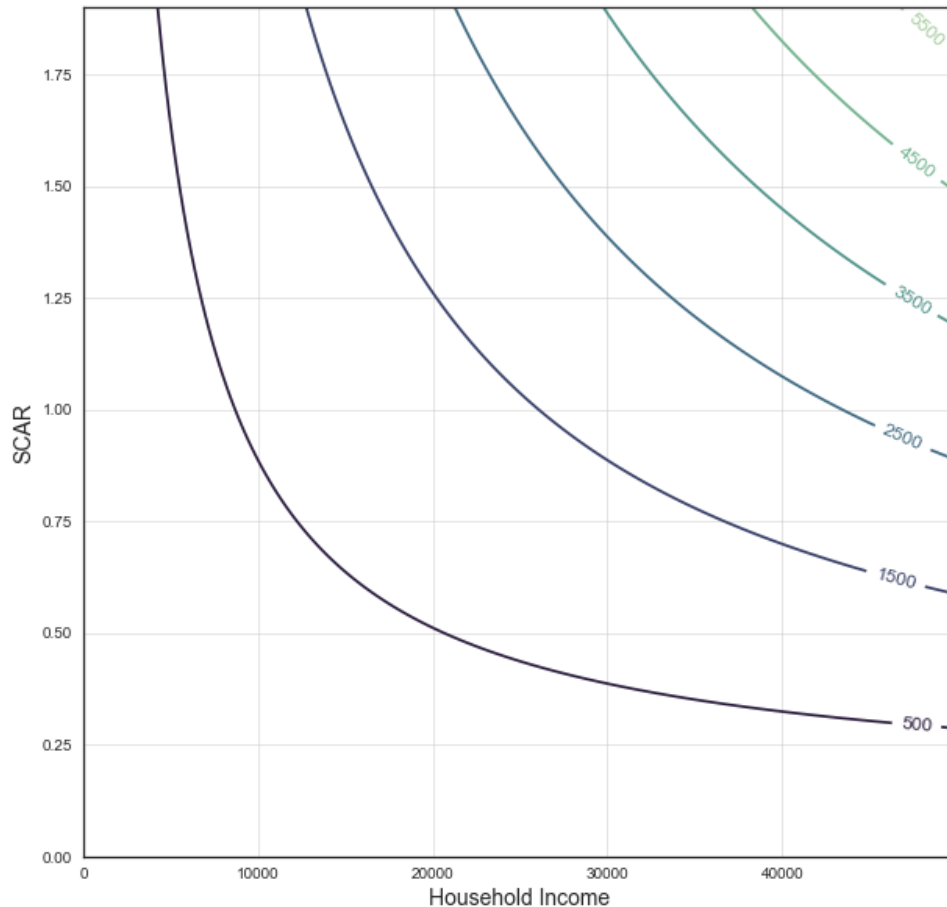
Given that the median rent of a 2-bedroom unit in Toronto (CMA) exceeds $1,400, and rental yields being what they are in the region, this means that addressing affordability for a household in this situation would require heavy subsidization (on either the demand or supply side). Further, the costs of construction alone would make many appropriate units (e.g., by size and location) unaffordable. For example, at $227.50 per square foot for a GTA apartment building (e.g., 30 storeys), the construction costs of a 1,100 square foot unit would cost approximately $250,000. This alone would generate a rent of $917 at current average yields, *before even including any other costs (e.g., land, development fees).*

4.2.3 COMBINING RIGHT-SIZE AND TENURE MATCHING

Addressing these two significant drivers of the affordability issue require things going differently. Building the nearly 600,000 new housing units – on the order of $100 billion to $150 billion worth of construction – expected to be needed across Ontario a decade from now can go a number of ways. As some extremes:

- If things continue as they have (e.g., ownership rates, rates of under/over-housing, population splits), by 2026, Ontario would likely need to build around 450,000 units to simply eliminate the under-housing issue. This could happen in one of two ways:

  1. Build according to the size required by the under-housed. In this case, slightly over half of these would be rental units, over 80% would have at least three bedrooms, and over two-thirds would be in the GTHA.

  2. Build according to the size required by downsizing over-housed families – thus freeing up room for the under-housed. For example, instead of a family requiring three bedrooms (but currently living in a one-bedroom unit) moving into a brand-new three bedroom unit, it could move into a three-bedroom unit currently occupied by a family only requiring one bedroom. This latter family could then move into a brand new one- (or even two-) bedroom unit, which would be cheaper to construct than a new three-bedroom unit. In this case, virtually all 450,000 units *could be* one-bedroom (or two-bedroom at most). This would be a "win-win" scenario for both families.

- For Ontario's homeownership rates to get back *close* to those seen in the 1970s, 80s, and 90s – i.e., Toronto's rates being similar to those seen in major U.S. cities – then *all expected new units* built over the next decade would need to be purpose-built rental. Again, most of these would need to be multi-bedroom units, unless smaller households (e.g., senior couples) started disproportionately renting relative to current rates.

4.2.4 CURBING SPECULATION

As described in section 2.1.1, housing prices are growing at an unusually high rate. In fact, as is shown in Figure 29, housing prices in Toronto are currently 18% above what they would have been had they followed their 20-year growth rate trend prior to 2016.

These price changes have started to shift expectations about owning. Recent real estate surveys[19] have shown that, while the importance of home ownership has not changed across the province, the idea of home ownership as an investment has shifted, such that it is increasingly seen as the top reason to buy. To be clear, though, investment – by anyone foreign or domestic – is not a problem, because funding the development of housing stock is certainly required. But, if price expectations start driving purchasing behaviour past the point of investment (especially where leverage is involved), or if stock is purchased but left vacant, then the story becomes one of speculation and crowding out.

---

[19] Undertaken by the Ontario Real Estate Association: see https://www.orea.com/Buyers-and-Sellers/Ontario-Home-Ownership-Index for more information

Figure 29   Growth in Teranet House Price Index (HPI) - Toronto (Jul 1998 = 100)
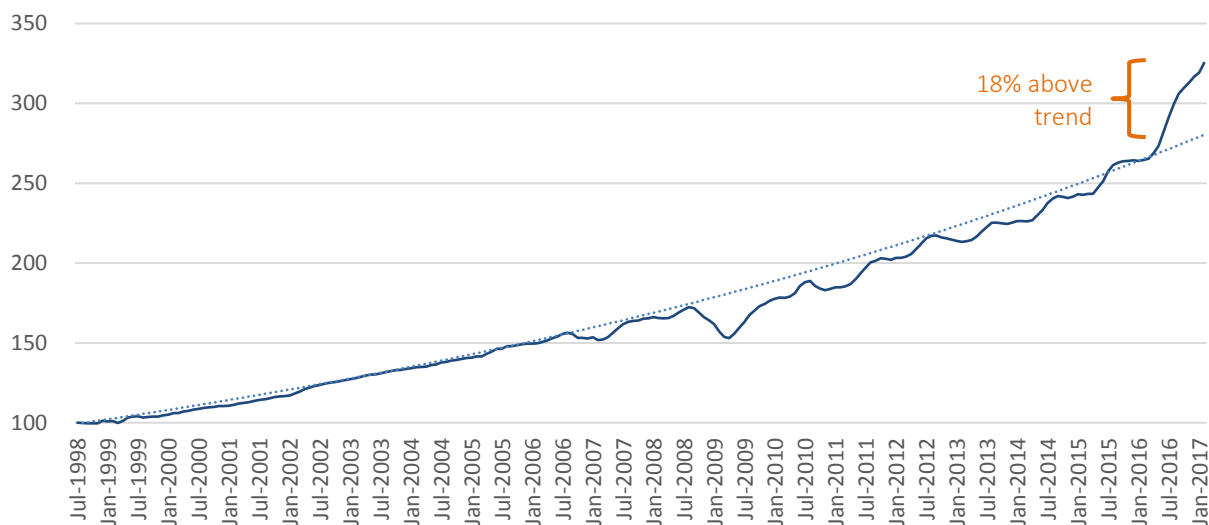
Source: Teranet; calculations by CANCEA

While clearly measuring speculation is difficult, there is some evidence that it may be occurring:

- According to a recent study by Realosophy Realty (Parsalis, 2017), *at least* 10% of GTHA residential sales in 2016 were to "buy-to-rent" investors, though the number is likely 25%-30%. However, an "estimated 95% of all investment properties purchased in 2016 are losing money every month" on the assumption that prices will continue to rise – a sign of speculation, not investment. (The average monthly loss per property exceeded $1,100).

- According to TD Economics (Caranci, Petramala, & Judge, 2017), "roughly 17% of homes were resold within 2 years as of March 2016, up from about 9% a year earlier" – a sign of house-flipping.

- CANCEA estimates that 1.5% of the stock in Ontario is vacant (or about 85,000 dwellings)[20], down from 3% in 2011. This is equivalent to about 1.5 years' worth of construction. (It is estimated that vacant stock in GTHA represents a much lower proportion.)

4.3 Appropriate housing and housing "productivity"

What all of these factors and behaviours seem to be pointing to is the idea of not just building *more* housing, but building *appropriate* housing, and then getting people to move into it.

In economics, the notion of "productivity" – that is, the ability to turn inputs into outputs – is used heavily. (It may even be the highest of economic goals in certain policy circles.) When it comes to housing appropriateness, 'output' can be thought of as the provision of a right-sized shelter unit. The 'inputs' here would be factors such as land size, housing size, and location, each with a "productivity coefficient". In this

---

[20] Note that this is different to the often mischaracterized Canadian census data showing total private dwellings not occupied by "usual residents", which excludes non-residents (e.g., foreign students).

way, the larger the land and housing size (beyond a viable minimum), and the less accessible the unit is from the likes of work or amenities, the smaller the productivity to deliver the same right-sized housing unit. Low housing productivity worsens affordability in a number of ways.

For example, low "productivity" 4,000 square foot houses on 5,000 square foot lots on the urban fringe cost significantly more per household to provides services such as roads, transit (though unlikely in such places), water and wastewater, schools, and hospitals – leading to higher taxes. They also have higher heating and cooling bills than an equally insulated but smaller home, and may lead to increased transportation costs, as such people may now need to commute farther. On the flip side, a 600 square foot condo on a (vertically shared) 700 square foot lot in the downtown core – and thus sharing infrastructure costs among many more people – has relatively higher "productivity", *assuming that it can provide the same shelter needs.* This may be a big assumption, as discussed shortly.

Further, there are currently over 3 million over-housed households in Ontario, many of whom live in lower-density areas. In our economic analogy, and regardless of the "productivity" of the shelter units, the resulting spare bedrooms are effectively "dumped" (i.e., thrown away), meaning lost economic opportunity, or increased costs to society overall in sheltering the under-housed.[21]

4.3.1   PRODUCTIVITY AND THE "MISSING MIDDLE"

Currently, about 45% of GTHA households live in detached homes and 35% live in apartment buildings. This leaves only 20% living in what is often called the "missing middle" – that is, the "gentle density" housing types such as semi-detached, row homes, townhomes, multiplexes, and courtyard apartments. (These proportions are nearly identical to the New York City metro area, just on a smaller scale.) And, as shown in Figure 30, this trend is not expected to change over the next 25 years.

Figure 30   Estimated evolution of housing stock (2010-2040)
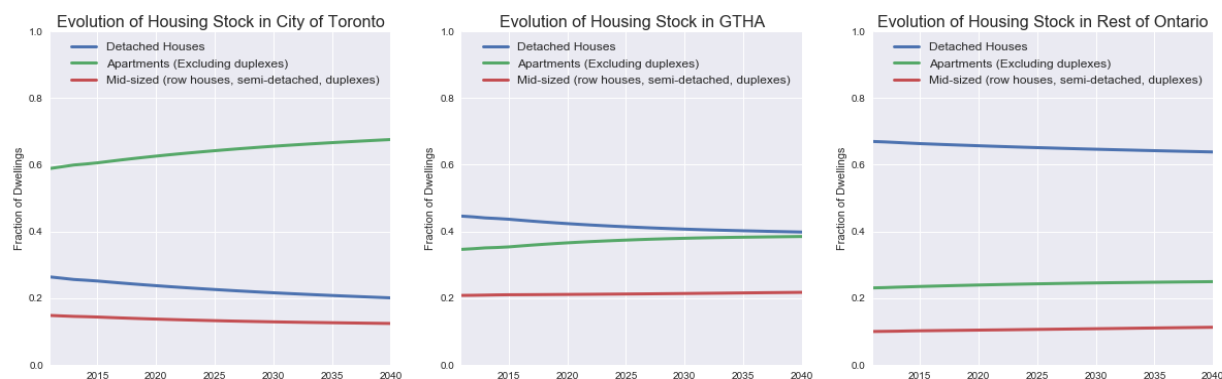

Such housing types provide more affordable ground-level (or close to it) shelter, without having to live in smaller, family unfriendly units, many stories off the ground. For example, at a construction cost of about

---

[21] This also implies that potentially much of the rent paid in Ontario (direct or imputed), which is included in GDP, is actually over-consumed.

$135 per square foot[22], even a reasonably-sized basic 1,480 square foot home (enough for a comfortable three bedrooms) costs approximately $200,000 to build, *excluding other costs (e.g., land)*. Building an equivalently costly condo unit in a 30-storey building would only yield 880 square feet, which would (arguably) not provide enough space for three bedrooms. But it could also allow for the construction of a 1,480 square foot unit in a 3-storey stacked townhouse or a 1,400 square foot unit in a 6-storey wood-frame condo. Such options get productive use out of land without limiting the number of bedrooms provided (i.e., without changing the "product" delivered).

So why isn't more productive "gentle density" built? While zoning policy is not the main thrust of this report, part of the reason is surely because it isn't allowed in most places. Even in the City of Toronto, where people imagine condo towers as far as the eye can see, a significant portion of the city (often referred to as the "yellow belt" after the colour used on planning maps to depict detached housing) only allows detached homes. It has been estimated that up to 40% of the city is zoned this way (Novakovic, 2017), or roughly 60% of the residentially-zoned lands (Kalinowski, 2017).

Figure 31   Permitted residential zones in Toronto
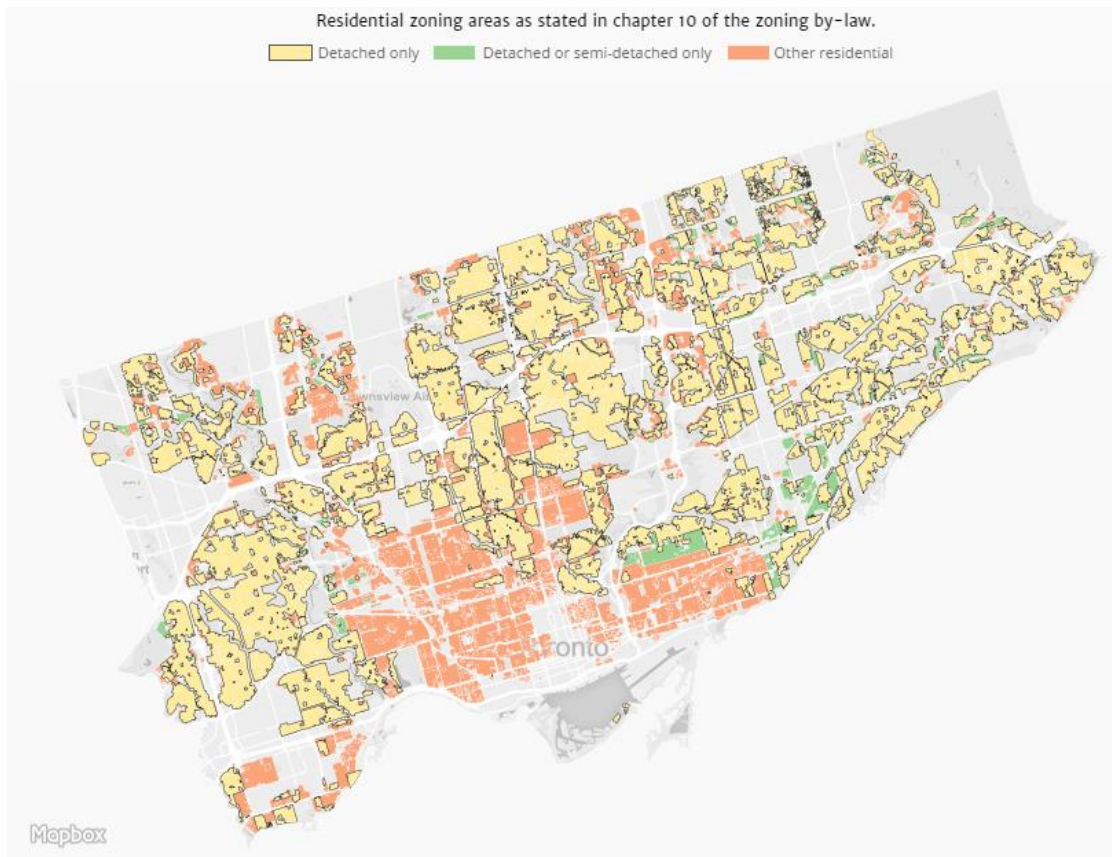

Source: Toronto Star (Micallef, 2016)*, based on City of Toronto data and inspired by Galbraith & Associates*

---

[22] Cost data for this example comes from Altus Group: http://www.altusgroup.com/services/cost-guide/

Opening up more of such land to more productive uses through (even *slightly*) increased density would not only allow for the provision of additional housing (without significantly encroaching on the "character" of neighbourhoods) at a reasonable cost, it would also increase affordability through the provision of existing infrastructure. This is especially true in seemingly obvious places, such as the TTC's Line 2 subway, along much of which (e.g., along Danforth Avenue) is surprisingly low density. Given the affordability challenges discussed throughout this report, increasing the productivity of land that is already serviced would be a more cost effective way of producing appropriate housing stock without having to open up new land supply farther afield from employment centres, which is generally unproductive.

Further, what gets built can have significant impacts on the make-up of the region. To explain this, let's start with the fact that demographic changes have been uneven across the region since 2001.

Figure 32   Percent change in population (2001-2016) by neighbourhood
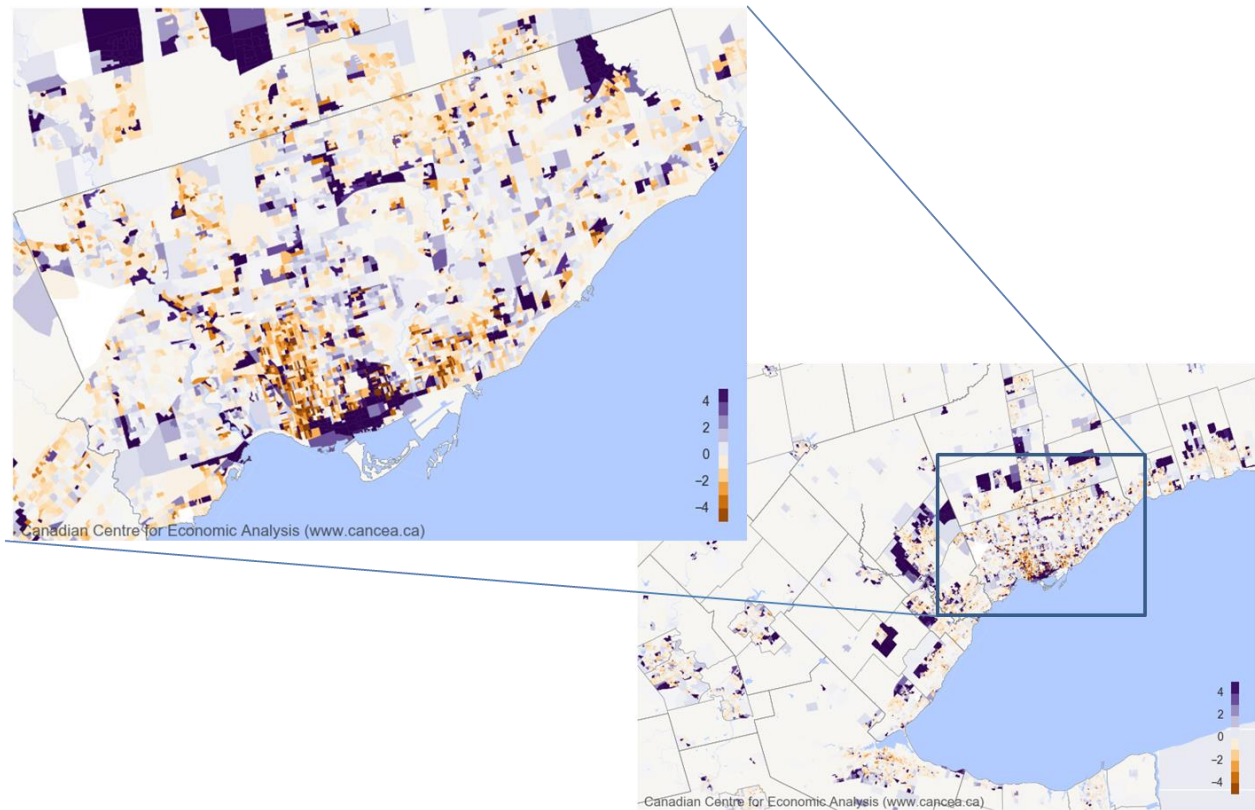
Tying this back to zoning highlights an interesting trend in Toronto. By "graying out" all zones other than mixed use residential, residential apartment, and unclassified (e.g., much of the waterfront), we can see – other than along some of the east-west avenues – enormous population growth, largely where there are a lot of new towers. This is in stark contrast with the population decline seen in most zones limited to ground level housing (residential-only, excluding residential apartment). Refering back to the housing suitability map (Figure 17), these are the zones that also tend to see more over-housing. While this report does not quantitatively link these two issues (i.e., zoning and over-housing), there is certainly some correlation.

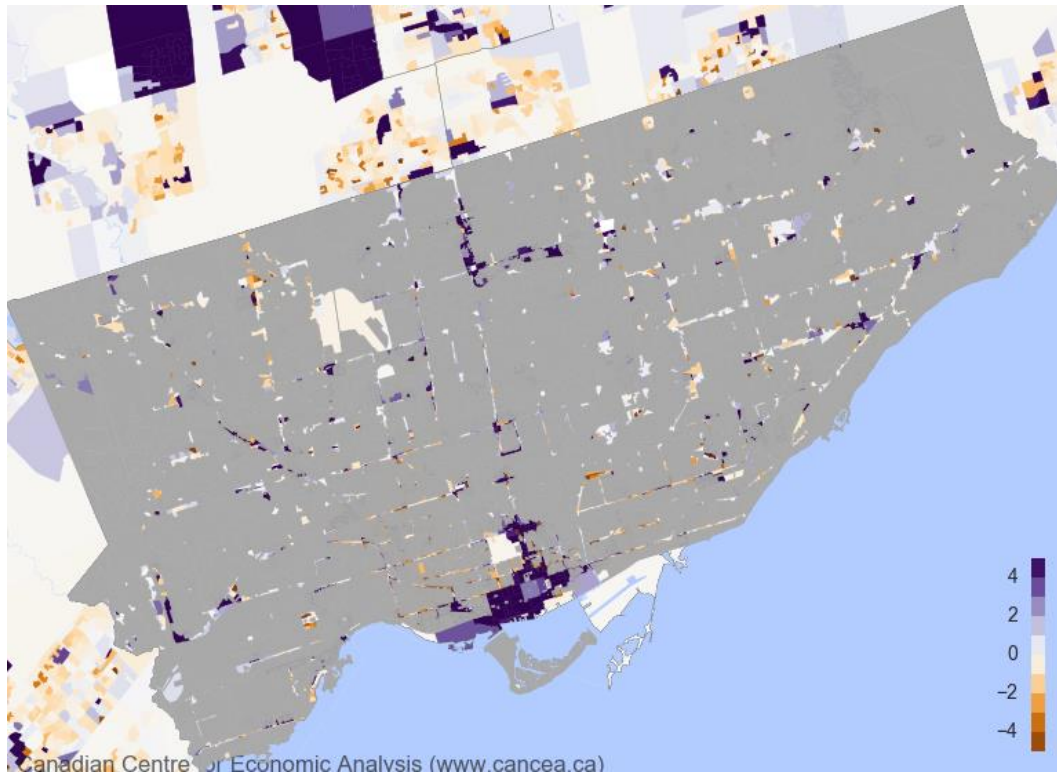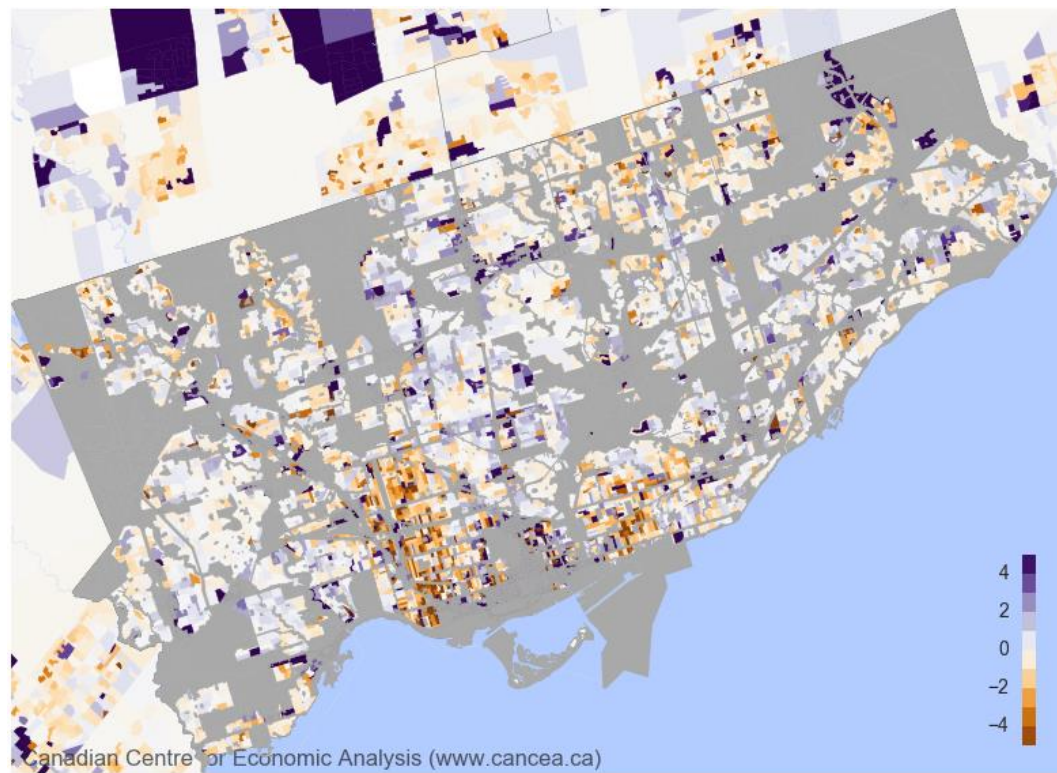Figure 33   Percent change in population (2001-2016) in zones with apartments

Figure 34   Percent change in population (2001-2016) in residential-only zones (excl. residential apartment)

4.4 Limitations

This study is limited by the level of detail in the data available. Although efforts are made to ensure completeness and accuracy, in many cases, the data required simply did not exist. In such circumstances, data reconciliation algorithms in PaR are used to triangulate and backfill missing data in a way that is internally consistent with all available sources.

For example, at the time of writing, no longitudinal data exist on the supply of serviced and unserviced land in Ontario. Similarly, foreign investment levels and the behaviours of foreign investors are not fully understood. CMHC and OREA surveys offer glimpses into the Toronto market and what proportion of homes are purchased by foreign investors, as well as select information about the dwellings themselves. These data were used to extrapolate the behaviour of foreign investors in the Toronto market at large. Lastly, the most recent data included in this report may not fully reflect emergent policy interventions, such as the foreign buyer tax in Vancouver, new macroprudential measures (e.g., the "stress test") or CMHC's efforts to reduce exposure within the Canadian housing market (e.g., increasing mortgage insurance premiums).

4.5 Future Research

This report is focused on the Ontario and GTHA economy and housing markets. However, other regions in Canada have also faced significant shelter affordability pressures that have not manifested with the same symptoms as the Ontario situation. Although these findings cannot necessarily be extrapolated to other markets, future research may fill any remaining gaps by performing similar analysis. This may include the relationship between intervention in one region, and the spillover reaction that occurs in a different region's market, such as the impact of affordability in the GTHA on that of surrounding areas.

Further, while this study focused on the causes of the affordability crisis and the high-level impacts on the SCAR index from affecting certain behaviours, it did not dig deep into specific detailed policies. With this framework firmly in place, such analysis could be done to:

- Evaluate the impact of particular policy responses from government;

- Determine the impact of transit-oriented development on housing affordability (i.e., along existing or proposed subway/LRT/GO train lines);

- Assess specific land-use policies; or

- Forecast the impact of advancing technology on housing affordability (e.g., automated vehicles, new construction techniques).

5.0 CONCLUSIONS

In Ontario, a relatively high-income province, shelter prices have been rising much faster than incomes, while incomes (and wealth) have grown more unequally distributed. Meanwhile, the shelter market has been responding to demand from wealthier households: offering large, ground-related homes in car-dependent neighbourhoods on the low-density urban fringe (called "location inefficient neighbourhoods"), and hyper-compact condos in the urban cores. This has led to crowding out.

Various stakeholders have come forward with proposed solutions to the housing affordability problem; however no comprehensive quantitative analysis of a broad range of potential factors has taken place. Therefore, CANCEA tested – simultaneously – over 40 factors and the behaviours they impact to quantitatively determine the major drivers of decreasing affordability. This robust and comprehensive study has taught us that the region's affordability pressures are generally due to a few key linked issues:

- **A lack of appropriate housing choice**: in terms of size, location/transit access, and tenure;

- **A lack of housing productivity**: in terms of lots of over-housing and density being too low; and

- **Many families being "forced" into worse options**: e.g., people buying when they should rent or moving farther away (e.g., from their work).

Although non-intervention may appear to be a safe option if intervention can be expected to carry adverse consequences on other areas of the economy, abstaining from the current situation may also carry risks. For example, residential construction accounts for over 7% of GDP and employment in Ontario, and there is a strong correlation between price corrections and GDP, particularly from residential construction. For example, while shelter prices nearly doubled in the 1980s, GDP from residential construction tripled. But in the 1990s, as shelter prices remained relatively flat, so did GDP from residential construction, and the share of GDP coming from residential structures declined by a quarter. Further, as household debt continues to grow and differentiated households continue to compete for differentiated shelter, it is likely that crowding out will impact a wider segment of the population as more households leverage themselves heavily to enter the real estate ownership market (given the lack of rental stock), adding to demand and reducing economic stability. Because shelter is a fundamental need, the ongoing discussion about reducing affordability pressures and continuing to invest in growth so that future populations can be accommodated has to center on sustainability.

If the status quo is undesirable, evidence-based analysis is the only way to increase the likelihood that a policy outcome will be more desirable. The enormous contribution of shelter to our national economy – let alone the everyday lives of Ontario households – demands that any measure taken to track and correct affordability pressures is done with precision and without sacrificing our overall sustainability and economic well-being.

A. BIBLIOGRAPHY

Arseneau, M., & Dahms, K. (2017). *Housing Affordability Monitor: Affordability worsens for a sixth consecutive quarter.* National Bank of Canada.

Artuso, A. (2017, Jan 28). *Greenbelt forcing up home prices in GTA: Critics*. Retrieved from The Toronto Sun: http://www.torontosun.com/2017/01/28/greenbelt-forcing-up-home-prices-in-gta-critics

Baskin, D. (n.d.). *Is the Canadian Housing Market Due for a Correction.* Retrieved from Baskin Wealth Management: http://www.baskinwealth.com/is-the-canadian-housing-market-due-for-a-correction/

BILD. (2015). *Housing affordability is an important issue for everyone.* Retrieved from BILD Blogs: http://bildblogs.ca/housing-affordability-an-important-issue-for-everyone/

BILD. (2016). *Sales of new high-rise homes boom while low-rise inventory continues to shrink.* Retrieved from http://bildblogs.ca/sales-of-new-high-rise-homes-boom-while-low-rise-inventory-continues-to-shrink/

Blatchford, A. (2016, Oct 12). *Ottawa's new mortgage rules a prudent measure*. Retrieved from Global News: http://globalnews.ca/news/2999429/ottawas-new-mortgage-rules-a-prudent-measure-says-cibc-head/

Blatchford, A. (2016, June). *Soaring house prices in Vancouver and Toronto unsustainable: Bank of Canada.* Retrieved from Canadian Business: http://www.canadianbusiness.com/business-news/bank-of-canada-issues-stern-warning-on-toronto-and-vancouver-housing-markets/

BMO Capital Markets. (2016, June). *BMO Capital Markets.* Retrieved from Bank of Montreal: http://economics.bmocapitalmarkets.com/economics/focus/20160617/feature.pdf

Bousfields Inc. and Altus Group. (2013). *A Review of the Site Plan Approval Process in Ontario.*

Building Industry and Land Development Association. (2015). *Housing affordability is an important issue for everyone*. Retrieved from BILD Blogs: http://bildblogs.ca/housing-affordability-an-important-issue-for-everyone/

Burchfield, M., & Kramer, A. (2015). *Growing Pains.* The Neptis Foundation, Toronto.

Burda, C. (2017, Apr 18). *Can we build our way out of a housing bubble?* Retrieved from Ryerson CBI Blog: http://www.ryerson.ca/citybuilding/blog/housing_bubble/

Burda, C., & Collins-Williams, M. (2016, September 14). *Affordable homes for a priced-out generation*. Retrieved from Toronto Star: https://www.thestar.com/opinion/commentary/2016/09/14/affordable-homes-for-a-priced-out-generation.html

Canada Mortgage and Housing Corporation. (2015). *Housing starts will moderate in 2016.*

Canada, F. (2017). *Budget 2017: Building a Strong Middle Class.* Queen's Printer.

Canadian Centre for Policy Alternatives. (2013). *Doing it Better: Alternative Federal Budget 2013: Housing.* Canadian Centre for Policy Alternatives. Retrieved from http://www.policyalternatives.ca/afb2013chapters/Housing.pdf

Canadian Centre for Policy Alternatives. (2016). *2016 Alternative Federal Budget.* Retrieved from https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2016/03/AFB2016_Main_Document.pdf

Canadian Rental Housing Index. (n.d.). Retrieved from Canadian Rental Housing Index: http://rentalhousingindex.ca/

Caranci, B., Petramala, D., & Judge, K. (2017). *Toronto Housing: The Heat is On, Buyers Caught up in the Action.* TD Economics.

Carmichael, K. (2017, Mar 10). *How Canada's big banks pumped up the housing bubble*. Retrieved from Maclean's: http://www.macleans.ca/economy/economicanalysis/how-canadas-big-banks-pumped-up-the-housing-bubble/

CBC News. (2016, Apr 20). *House affordability improving in some parts of Canada*. Retrieved from CBC News: http://www.cbc.ca/news/business/house-affordability-national-1.3544721

CBC News. (2016, April 14). *Toronto condo rents jump, driven by higher prices.* Retrieved from CBC News Business: http://www.cbc.ca/news/business/condo-rent-1.3535678

CCPA. (2013). *Doing it Better: Alternative Federal Budget 2013: Housing.* Canadian Centre for Policy Alternatives. Retrieved from http://www.policyalternatives.ca/afb2013chapters/Housing.pdf

CCPA. (2016). *2016 Alternative Federal Budget.* Retrieved from https://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2016/03/AFB2016_Main_Document.pdf

Cerqua, L. (2016, Aug 19). TREB: Transit planning ties to housing affordability. *The Toronto Sun*.

CHBA. (2016). *Housing Markets and Affordability: Strategic Considerations.* Canadian Home Builders' Association.

Clayton, F. (2016, August 8). *A Statistical Mystery: Diminishing Expansion of the GTA's Built-Up Area at a Time of Surging Construction of Single-Detached Houses.* Retrieved from Ryerson Centre for Urban Research and Land Development: http://ryerson.ca/cur/Blog/blogentry5.html

CMHC. (2016). *Most Canadian Housing Markets Overvalued, Price growth to slow through 2018.* Canada Mortgage and Housing Corporation.

Cox, W., & He, A. (2016). *Canada's Middle-Income Housing Affordability Crisis.* Frontier Centre for Public Policy.

Crawley, M. (2016, Nov 1). *What's really driving Toronto's red-hot real estate market*. Retrieved from CBC News: http://www.cbc.ca/news/canada/toronto/foreign-buyers-tax-toronto-real-estate-investors-1.3824467

CUR. (2015). *Why There is a Shortage of New Ground-Related Housing in the GTA.* Centre for Urban Research and Land Development. Retrieved from http://www.ryerson.ca/content/dam/cur/images/CUR_PC%234_Shortage_New_Ground-Related_Housing_June1%2C%202015.pdf

CUR. (2016). *Will GTA Homebuyers really give up ground-related homes for apartments?* Centre for Urban Research and Land Development. Retrieved from

http://www.ryerson.ca/content/dam/cur/pdfs/Projects/CUR%20Report_Will%20GTA%20homebuyers%20give%20up%20ground-related%20houses%20%20for%20apartments.pdf

Dachis, B. (2016, August 11). *Property Transfer Taxes hurt Current Homeowners, not Foreign Buyers.* Retrieved from C.D. Howe: https://www.cdhowe.org/intelligence-memos/ben-dachis-property-transfer-taxes-hurt-current-homeowners-not-foreign-buyers

Demographia. (2016). *12th Annual Demographia International Housing Affordability Survey: 2016 Rating Middle-Income Housing Affordability.* Retrieved from http://www.demographia.com/dhi.pdf

Desjardins. (2016, May). *Desjardins Affordability Index.* Retrieved from Desjardins Economic Studies: https://www.desjardins.com/ressources/pdf/iad0516e.pdf?resVer=1462905084000

Evans, P. (2016, Oct 3). *Ottawa tightens mortgage requirements and targets foreign money*. Retrieved from CBC News: http://www.cbc.ca/news/business/ottawa-housing-tax-real-estate-1.3788725

Finnigan, B. (2017, Feb 6). *What is causing Canadian home prices to rise?* Retrieved from Real Estate News Exchange: https://renx.ca/what-is-causing-canadian-home-prices-to-rise-bob-finnigan-president-chba/

Geller, M. (2015, July). City of Vancouver's red tape adds excess costs to housing. *Vancouver Courier*. Retrieved from http://www.vancourier.com/opinion/city-of-vancouver-s-red-tape-adds-excess-costs-to-housing-1.2008069

Giovannetti, J. (2017, Apr 18). *Ontario considers housing tax for non-resident speculators*. Retrieved from The Globe and Mail: http://www.theglobeandmail.com/news/national/ontario-considers-housing-tax-for-non-resident-speculators/article34731629/

Gold, K. (2016, September 10). Data suggest Vancouver housing supply isn't the issue, affordability is. *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/real-estate/vancouver/vancouver-housing-supply-isnt-the-issue-affordability-is-data-shows/article31794288/

Gordon, J. (2017). *In High Demand: Addressing the demand factors behind Toronto's housing affordability.* Ryerson City Building Institute. Retrieved from http://www.theglobeandmail.com/real-estate/toronto/demand-fuels-toronto-house-prices-not-lack-of-supply-study-finds/article34279980/

Green, K., Filipowicz, J., Lafleur, S., & Herzog, I. (2016). *The Impact of Land-Use Regulation on Housing Supply in Canada.* Fraser Institute.

Green, K., Herzog, I., & Filipowicz, J. (2016a, July 7). *How to solve soaring house prices without raising taxes.* Retrieved from Financial Post Business: http://business.financialpost.com/fp-comment/how-to-solve-soaring-house-prices-without-raising-taxes

IMF. (2016, May). *Canada: Staff Concluding Statement of the 2016 Article IV Mission.* Retrieved from International Monetary Fund: http://www.imf.org/external/np/ms/2016/050916a.htm

Jones, A. (2017, Mar 10). *Biggest factor in red-hot Toronto housing market is demand: minister*. Retrieved from CTV News: http://www.ctvnews.ca/business/biggest-factor-in-red-hot-toronto-housing-market-is-demand-minister-1.3319585

Kalinowski, T. (2016, Jun 03). Toronto house prices up 15.7% in May. *The Toronto Star*.

Kronick, J. (2016, June 11). *Canada's housing problem is supply, and the solution is local, not federal.* Retrieved from Globe and Mail Business Commentary: http://www.theglobeandmail.com/report-on-business/rob-commentary/canadas-housing-problem-is-supply-and-the-solution-is-local-not-federal/article30396780/?cmpid=rss1&click=sf_globe

MacFarland, J. (2017, Apr. 11). *Canada at risk of housing correction, Moody's warns*. Retrieved from The Globe and Mail: http://www.theglobeandmail.com/report-on-business/economy/canada-faces-risk-from-potential-housing-correction-moodys/article34666541/?utm_source=twitter.com&utm_medium=Referrer:+Social+Network+/+Media&utm_campaign=Shared+Web+Article+Links

Mann, C. (2017, Mar 7). *Will risks derail the modest recovery?* Retrieved from OECD Interim Economic Outlook: https://www.oecd.org/eco/outlook/Will-risks-derail-the-modest-recovery-OECD-Interim-Economic-Outlook-March-2017-presentation.pdf

Marr, G. (2016). CMHC warns housing prices overvalued in 9 Canadian markets, with Vancouver at high risk. *Financial Post*.

Marr, G. (2017, Feb 17). Chasing the Canadian dream: The real force driving the housing boom in our big cities. *Financial Post*.

Marr, G. (2017, Feb 17). *Chasing the Canadian dream: The real force driving the housing boom in our big cities*. Retrieved from Financial Post: http://business.financialpost.com/personal-finance/mortgages-real-estate/chasing-the-canadian-dream-the-real-force-behind-the-housing-boom-in-our-big-cities

Masson, P. (2013). *The Dangers of an Extended Period of Low Interest Rates: Why the Bank of Canada Should Start Raising Them Now.* Retrieved from https://www.cdhowe.org/pdf/Commentary_381.pdf

McMahon, T., & Bradshaw, J. (2017, Feb 24). *Toronto's housing market may need a Vancouver-style cooling: RBC*. Retrieved from The Globe and Mail: http://www.theglobeandmail.com/real-estate/the-market/torontos-housing-market-may-need-a-vancouver-style-cooldown-rbc/article34133220/

Metrolinx. (2015). *Transit Fares in the GTHA Today -- An Overview.* Toronto.

Micallef. (2016, Nov 7). *Toronto's grudge against apartments*. Retrieved from The Toronto Star: https://www.thestar.com/news/gta/2016/11/07/torontos-grudge-against-apartments-micallef.html

Minister of Finance. (2016, March). Growth for the Middle Class. In *Growing the Middle Class (Federal Budget 2016).* Ottawa: Department of Finance Canada.

Ministry of Municipal Affairs and Housing. (2015). *Performance Indicators for the Growth Plan for the Greater Golden Horseshoe, 2006.* Toronto: Queen's Printer for Ontario.

Myers, B. (2017, Feb 24). *Is Canada (Still) Experiencing One of the Biggest Housing Bubbles in the World?* Retrieved from Fortress Real Developments: https://fortressrealdevelopments.com/news/canada-still-experiencing-one-biggest-housing-bubbles-world/

National Bank Financial Markets. (2016, July). *Housing Affordability Monitor.* Retrieved from National Bank of Canada: https://www.nbc.ca/content/dam/bnc/en/rates-and-analysis/economic-analysis/housing-affordability.pdf

Novakovic, S. (2017, Mar 17). *Toronto's Housing Crisis: A Problem of Supply or Demand?* Retrieved from UrbanToronto: http://urbantoronto.ca/news/2017/03/torontos-housing-crisis-problem-supply-or-demand

OECD. (2017, Apr 18). *Focus on house prices*. Retrieved from OECD: http://www.oecd.org/eco/outlook/focusonhouseprices.htm

OHBA. (2016). *Co-ordinated Review: Proposed Growth Plan for the Greater Golden Horseshoe.* Ontario Home Builders' Association.

OHBA. (2017). *2017 Pre-Budget Consultation Submission.* Ontario Home Builders' Association.

OREA. (2017, Apr 18). *Ontario Home Ownership Index*. Retrieved from Ontario Real Estate Association: https://www.orea.com/Buyers-and-Sellers/Ontario-Home-Ownership-Index

OREA and OHBA. (2017, Mar 6). *Housing sector calls on Queen's Park to address home affordability*. Retrieved from OREA: https://www.orea.com/About/News-and-Press-Releases/Press-Releases/March-6-2017#.WL1oyLmJowE.twitter

Parsalis, J. (2017). *Freeholds on Fire How Investor Demand for Houses is Driving Up Prices in the Greater Toronto Area.* Realosophy Realty.

Paszkiewicz, L. (2003). The Cost and Demographics of Vehicle Acquisition. *Consumer Expenditure Survey Anthology*, 61-66.

Pembina Institute - RBC. (2013). *Priced Out: Understanding the factors affecting home prices in the GTA.* Retrieved from https://www.pembina.org/reports/priced-out.pdf

Pigg, S. (2015, Jul 8). *Canada's mortgage insurance system needs overhaul*. Retrieved from The Toronto Star: https://www.thestar.com/business/real_estate/2015/07/08/canadas-mortgage-insurance-system-needs-overhaul.html

Porter, D., & Kavcic, R. (2016, June 17). *The Housing Market Blame Game.* Retrieved from BMO Capital Markets: http://economics.bmocapitalmarkets.com/economics/focus/20160617/feature.pdf

Posadzki, A. (2017, Feb 8). *Canadian families moving to escape urban housing prices*. Retrieved from Maclean's: http://www.macleans.ca/news/canadian-families-moving-to-escape-soaring-housing-prices/

Posadzki, A. (2017, Feb 28). *Toronto, Vancouver Housing Markets Headed For Correction*. Retrieved from Huffington Post: http://www.huffingtonpost.ca/2017/02/28/toronto-vancouver-housing_0_n_15068912.html

RBC Economics. (2016, June). *Housing Trends and Affordablity.* Retrieved from RBC Economics Research: http://www.rbc.com/newsroom/_assets-custom/pdf/20160622-ha.pdf

Scotiabank. (2016, July). *Global Economics: Housing News Flash.* Retrieved from Scotiabank: http://www.gbm.scotiabank.com/English/bns_econ/housingflash.pdf

Selten, R. (1999). What is Bounded Rationality. Bonn.

Sherman, J. (2017, Mar 1). *One more big Canadian bank raises red flags on Toronto real estate*. Retrieved from BuzzBuzzNews: http://news.buzzbuzzhome.com/2017/03/one-more-big-canadian-bank-flags-toronto-real-estate.html

Siddall, E. (2016). Housing in Canada and the Imaginary City: Addressing Vulnerabilities, Data Gaps and Affordability. *Greater Vancouver Board of Trade.* Canada Mortgage and Housing Corporation.

Smetanin, P., Moca, I., Yusuf, F., & Kobak, P. (2016). *Understanding Shelter Affordablity Issues.* Toronto: Canadian Centre for Economic Analysis (independent study for RESCON).

Staff and agencies in Vancouver. (2016, June 17). *Canada's housing 'affordability crisis' fueled by overseas money, Trudeau says.* Retrieved from The Guardian: https://www.theguardian.com/world/2016/jun/17/canada-housing-prices-vancouver-asia-justin-trudeau

Statistics Canada. (2015, Apr 27). *Housing suitability of private household*. Retrieved from Statistics Canada.

Stueck, W. (2016, June 27th). National housing strategy could be set by the end of year, federal minister says. *Globe and Mail*. Retrieved from http://www.theglobeandmail.com/news/british-columbia/federal-government-invests-150-million-for-affordable-housing-in-bc/article30621242/

Suttor, G. (2016). *3 Steps Closer to Equitable Housing in Ontario.* Retrieved from http://www.wellesleyinstitute.com/housing/3-steps-closer-to-equitable-housing-in-ontario/

Tal, B., & Judge, K. (2016). *The GTA Housing Market: Is There Logic Behind the Madness?* CIBC Economics.

TD Economics. (2016, June). *Quarterly Economic Forecast.* Retrieved from TD Economics: https://www.td.com/document/PDF/economics/qef/qefjun2016_canada.pdf

TD Economics. (2016a). *Provincial Economic Forecast: Provincial Economies Increasingly Divergent in 2016.*

Toronto Real Estate Board. (2016). *Condo Market Report: Second Quarter 2016.* Toronto Real Estate Board.

Urbanation. (2016). *These GTA condo markets are heating up as single-family home affordability crumbles.*

Wellesley Institute. (2015). *Submission to the Province of Ontario: Long Term Affordable Housing Strategy Update.* Retrieved from http://www.wellesleyinstitute.com/wp-content/uploads/2015/07/Long-Term-Affordable-Housing-Strategy.pdf

World Bank Group. (2016). *Ease of Doing Business in Canada*. Retrieved from World Bank Group: http://www.doingbusiness.org/data/exploreeconomies/canada/#dealing-with-construction-permits

Wright, C., & Hogue, R. (2016). *Housing Trends and Affordability: Housing affordability takes a hit in Canada's hot spots, erodes mildly in other markets in Q1/16.* RBC Economics.

B. DEFINTIONS

Agent: An autonomous individual, firm or organization that responds to cues from other agents and their environment using a set of evidence-based behavioural rules in response to those cues.

Agent-based modeling: A framework for modeling a dynamic system, such as an economy, by means of individual agents, their mutual interaction with each other, and their mutual interaction with their environment(s)

Core Housing Need: According to CMHC, a shelter unit is rendered "acceptable" if it fulfills the following conditions:

- Adequacy: Unit does not require major repairs

- Suitability: In terms of size relative to household requirements

- Affordability: The shelter unit costs less than 30% of before-tax household income.

Households are said to be in core housing need if their shelter units do not fulfill at least one of the aforementioned conditions and if they are unable to pay the median rent for alternative local housing meeting all three conditions without spending 30% or more of their before-tax income

"Crowding Out": Unlike the economic concept of "crowding out", which refers to the squeezing out of private investment through increased government borrowing and expenditure, "crowding out" in the context of this framework will refer to the squeezing of "needs" households out of the shelter market by "wants" households and investors, who are in a better position to satisfy their discretionary shelter preferences. Three ingredients—heterogeneity of households, heterogeneity of investors, and shelter differentiation—facilitate this process as competition for shelter stock intensifies. In effect, this would render "needs" households less capable of finding suitable and affordable shelter to satisfy their fundamental consumption need for shelter. As with any other commodity, shelter prices will respond to significant demand-side pressures; therefore, demand from socioeconomically-privileged households seeking to satisfy their preferences (rather than need for shelter) could dramatically affect prices for available shelter, as well as future supply levels of different shelter types.

Investors: A subset of "wants" households who purchase property for the purpose of capital gains, and in some cases, both capital gains and rental income. Among these are domestic investors, which are those who have a permanent residency or citizenship of Canada with a domestic address, or foreign investors, referring to those whose primary residence is outside of Canada.

"Needs" households: These are households whose motivation to participate in the shelter market is purely to satisfy their non-discretionary need to consume shelter. It is very important to distinguish "needs" from low-income households: the "needs" category could, for example, include middle-class households looking for affordable and suitable shelter to satisfy their needs. At the same time, some low-income households may not only be looking to satisfy their shelter needs in the market.

Over-housing: A household has too many bedrooms, relative to needs as defined by the National Occupancy Standard.

Prosperity at Risk: An event-driven, agent-based, microsimulation platform that tracks over 50 million agents for all of Canada. It simulates the economy's processes, including consumption, production, labour force dynamics, as well as evolving financial statements of agents. It conserves the flows of people, money and goods.

SCAR (Index): Shelter Consumption Affordability Ratio, measures the proportion of after-tax income that households allocate to shelter-related needs after paying for other necessities.

Shelter as a consumption good: Shelter is a non-discretionary good demanded by all people. It is not ownership of shelter that is non-discretionary; rather it is access and consumption. Regardless of whether a household owns their own home, economic theory identifies rent (actual or imputed) as the price of consuming shelter. Homeowners are then essentially acting as their own landlords.

Shelter consumption needs and wants: The consumption of shelter is, at first glance, non-discretionary; however, consuming or purchasing shelter units in excess of shelter needs still offers desirable benefits to households. The desire to own additional shelter beyond non-discretionary consumption is therefore a discretionary behaviour (i.e. a choice). The market for shelter reflects the interplay between motivations designed to secure non-discretionary consumption of shelter and motivations leading to additional, discretionary consumption of shelter by different households.

Shelter as a composite good: The characteristics of shelter vary by form and function: size, structure, surrounding land density, proximity to necessary amenities, and other factors. The combination of these characteristics renders shelter a composite good, which allows for many types of shelter to be demanded based on household formation and preference combinations.

Shelter as a store of value, an investment asset: Shelter also serves as an investment good by virtue of its inherent value. Like any other asset, shelter provides its investor with potential returns and exposure to risks. Although the decision to invest in any asset, including shelter, is usually discretionary, the fact that some base level of shelter is a human need may result in a non-discretionary tenure choice. In other words, some households may be pushed by market and regulatory forces to own their homes and bear otherwise unacceptable expenses and levels of risk, despite merely looking for access to shelter consumption.

Shelter-related needs/expenditures: Shelter-related needs refer to all auxiliary goods and services that households must purchase or access in order to use or maintain their shelter.

Shelter stock imbalance: A structural mismatch between total shelter stock and the number of occupied shelter units on aggregate. An example of shelter stock imbalance would be when households in general cannot access their shelter "needs" due to limited aggregate supply.

System effects: Impacts that transcend direct, indirect and induced effects, which are not traditionally measured by economics. These impacts arise from the relationship between every economic agent and the environment in which they operate, as they influence one another's states and behaviours.

Systemic risk: In the context of this report, "systemic risk" refers to risks that are inherent to an entire market segment as well as the wider macroeconomic framework.

Under-housing: A household has too few bedrooms, relative to needs as defined by the National Occupancy Standard.

"Wants" households: This category refers to households whose motivation to participate in the shelter market is not only to satisfy a consumption need for shelter, but rather to satisfy a discretionary preference either for additional shelter units or for shelter with preferred characteristics, in excess of need. While some "wants" households will be affluent, this may not always be the case: even middle and low-income households could be considered "wants" households if they participate in the shelter market in order to secure shelter to fulfill preferences rather than needs. As investment is a discretionary activity in this framework, investors, domestic or foreign, are also motivated to fulfill "wants".

C. STAKEHOLDER VIEWS ON FACTORS UNDERLYING SHELTER AFFORDABILITY

Organization and example sources	High-level summary of arguments
Government	
Canadian Federal government **(Canada, 2017)**; *(Prime Minister Justin Trudeau) (Staff and agencies in Vancouver, 2016)*	In the 2017 federal budget, the government committed to "a variety of initiatives designed to build, renew and repair Canada's stock of affordable housing", as part of a new "National Housing Strategy". The government also introduced measures to "ensure that prospective homebuyers are only taking on mortgages that they can continue to afford even if interest rates rise or their income falls" in October 2016. Further, although the budget committed to gathering data that currently does not exist, Prime Minister Trudeau has said that foreign investment is a factor in Canada's shelter affordability crisis.
Canada Mortgage and Housing Corporation *(Siddall, 2016); (CMHC, 2016); (Marr, 2016); (Marr, 2017)*	Although different Canadian cities face different challenges, Toronto and Vancouver in particular suffer from housing overvaluation and price acceleration. The CHMC further finds strong evidence of home prices rising ahead of disposable income and population growth. According to the CEO of the CMHC, "A number of factors, including foreign investment, but also domestic residential investing, population and economic growth, accommodative monetary policy, our tax regime, supply constraints and some other phenomena have all contributed to high house prices."
Ontario Minister of Finance Charles Sousa *(Jones, 2017); (Giovannetti, 2017)*	The Minister is considering a tax on foreign home buyers for Toronto but believes that it's not the biggest factor that could potentially cool down the housing market. The demand for housing has increased with more people moving in to Ontario and with a lower interest rate. Demand is outstripping supply and is creating an imbalance. Further, domestic speculation also plays a key role.
Universities	
Ryerson Centre for Urban Research and Land Development *(Clayton, 2016); (CUR, 2016); (CUR, 2015)*	The lack of available serviced land for residential development, urban containment policies, and high, government-imposed fees such as development charges may have constricted the supply of ground-related homes, which residents of the GTHA prefer over multi-residential units. Inclusionary zoning as a policy intervention may not be the ideal solution; instead Ontario should leverage Section 37 (i.e., "density bonuses") of the *Planning Act* to encourage private sector building of affordable housing. However, effective planning cannot take place with a full inventory of the short-term land supply and integrated planning.
Ryerson City Building Institute **(Burda & Collins-Williams, Affordable homes for a priced-out generation, 2016)**; *(Burda, 2017); (Posadzki, 2017); (Gordon, 2017)*	The *Growth Plan for the Greater Golden Horseshoe* already mandates that most of the anticipated growth is directed to built-up areas, where homes also tend to be least affordable. Improving density in these areas with a mix of dwelling types. Improving mobility and facilitating the functionality of this density is also key to improving affordability, and can be achieved with transit networks that are equipped to service the anticipated population. "Currently, developers are not building enough "missing middle" housing-townhouses, mid-rise buildings and stacked flats – that can accommodate families better than condominiums. The city and the province need to figure out how to make it more cost-effective for developers to build those types of buildings."

	House prices are driven up by demand. Even though there is clearly a shortage of listings relative to the demand, this problem is primarily driven by the imbalance caused by speculative demand in Toronto and low interest rates.
Simon Fraser University, *(Geller, 2015); (Gold, 2016)*	Global cities, including Vancouver, Boston, San Francisco, London and New York all have hindrances to supply such as complex and lengthy approval processes, suggesting that taxes on vacant units or foreign buyers will significantly cool down markets. It could also be the type of supply that is ill-suited to the market: while there are a large number of luxury homes responding to demand by high-income groups, many of which are foreigners. Because of this demand, the price of land has risen, reducing the opportunity for homes geared towards low or average-income residents to be built.
Think Tanks	
Fraser Institute *(Green, Filipowicz, Lafleur, & Herzog, 2016); (Green, Herzog, & Filipowicz, 2016a)*	Land use and urban containment policies have led to a less responsive supply of homes relative to demand. Long development approval processes and costly fees are also associated with reduced growth in the housing stock. These regulatory constraints have led to higher house prices.
C.D. Howe *(Kronick, 2016); (Dachis, 2016); (Masson, 2013); (Pigg, 2015)*	Land restrictions and collecting fees for the use of infrastructure up-front increases the price of new homes. In addition, persistently low interest rates, with relatively low unemployment and high income growth in certain Canadian regions may also have been fueling a housing bubble. Therefore raising interest rates and calming the growth in debt (much of which is mortgage debt) is another policy avenue worth considering. Since the home prices have risen significantly, only a few homebuyers are able to come up with a 20% down payment, required under federal regulation to borrow without mortgage insurance.
Canadian Centre for Policy Alternatives *(CCPA, 2016); (CCPA, 2013)*	As markets for rental and homeownership illustrate tight conditions as evidenced by persistently low vacancy rates, household incomes have not risen sufficiently (nor equally) to bid effectively in these markets. Policy intervention and direct government investment would resolve the housing affordability problem.
Wellesley Institute *(Suttor, 2016); (Wellesley Institute, 2015)*	Because rent is a non-discretionary expense, in a climate of low supply of affordable housing, the Ontario government should provide assistance in order to ensure that other needs do not go unmet as a result of expensive shelter costs. Proposed solutions and policy interventions include rental assistance, inclusionary zoning practices, and recurring research on housing market trends and evidence-based policy design, and programs that increase supply.
Pembina Institute *(Pembina Institute - RBC, 2013)*	Significantly lower mortgage rates and increased accessibility to mortgages have driven increasing housing prices. Even though the costs of building a home has increased in the GTA, it accounts only for a small fraction of the increase in prices. Further, land availability is not an issue for the GTA, but the neighbourhoods that are favoured by the homebuyers are near the urban centre and are thus experiencing high levels of demand. Moreover, the population of the GTA is projected to increase creating more demand for housing.
Organization for Economic Co-operation and Development (OECD) *(OECD, 2017); (Mann, 2017)*	Extended periods of exceptionally lower interest rates and rising debt levels have resulted in rapid rise of house prices in Canada, which can be a precursor of an economic downturn.

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

Construction	
Canadian Home Builders' Association *(CHBA, 2016); (Finnigan, 2017)*	There exists an undersupply of family-friendly and ground-oriented homes while demand for housing is on the rise. Further, the effective level of taxation on a home has dramatically increased, and since the GST is applied on the selling price of a new home (including development charges), there is double taxation. Further, there has been inadequate investment to develop the transit system of major Canadian cities. As it becomes increasingly difficult to commute from the outer regions, the prices of houses closer to the centre rise. Finally, affordability is not based exclusively on income but also on access to financial resources, such as the wealth transferred from older generations to the millennials.
Ontario Home Builders' Association *(OHBA, 2016); (OHBA, 2017)*	OHBA is concerned that many urban and suburban centres are impacted by a lack of supply in the housing market. The out-dated zoning by-laws are making the planning process much more difficult and making it more expensive to build "high density transit oriented communities and the 'missing middle' of housing supply". Further, under-investment has resulted in long-term infrastructure deficits, and some areas that have potential for development have no access to existing water and waste water services. Finally, a well-implemented Growth Plan and increased investment in infrastructure will help to increase supply.
Building Industry and Land Development Association *(BILD, 2015); (BILD, 2016)*	Land use and zoning regulations, government fiscal policy and fees, and lack of serviced land all contribute to the decreased supply of low-rise homes, as evidenced by declining inventory of such homes and relatively high number of condos available for sale.
Real Estate	
Toronto Real Estate Board *(Toronto Real Estate Board, 2016); (Cerqua, 2016); (Kalinowski, 2016)*	Sellers' market conditions have caused continual growth in the real estate market, or sellers' leverage, which often refers to a combination of low interest rates and many buyers. By improving transit infrastructure, consumers could be enticed to consider areas that they typically would not offsetting some shelter-related costs. People who would like to sell their house choose to renovate as they worry that they might not be able to find another house.
Ontario Real Estate Association (OREA) *(Artuso, 2017); (Marr, 2017); (OREA and OHBA, 2017)*	A lack of housing supply is the main factor driving house prices, not foreign buyers. By introducing the Greenbelt in 2005, the government created artificial barriers: the density targets and intensification are applied across most of the Greater Golden Horseshoe area, adopting a "one-size- fits-all" approach without taking into consideration the characteristics of the diverse communities and infrastructure. More flexibility should be afforded to municipalities in providing growing families and empty nesters with a wide array of home selections (i.e., need to focus on building townhouses, stacked homes, and semi-detached housing as these are the starter homes that bring people into the market). Further, unnecessary delays in housing construction reduces the housing supply and trigger price increases. Also in addition, the outdated zoning laws could be modernized to build the "missing middle" of housing supply with connections to transit and in closer proximity to job sites.

Banks	
TD Bank *(TD Economics, 2016); (TD Economics, 2016a); (Caranci, Petramala, & Judge, 2017)*	A combination of strong demand and a lack of supply have created the "perfect eco-climate" for speculators. "The continued escalation in home prices may have generated a greater tendency towards flipping homes for a profit." Further, low interest rates, foreign investment, and population growth continue to sustain acceleration in pockets of the Canadian housing market. A price correction should be expected, resulting from high costs of borrowing and poor levels of affordability limiting demand.
Royal Bank of Canada *(Wright & Hogue, 2016); (Marr, 2017); (McMahon & Bradshaw, 2017); (Carmichael, 2017); (Pembina Institute - RBC, 2013)*	Home prices are rising at accelerating rate relative to incomes in Vancouver and Toronto, causing overheating in the housing markets, likely diverging from market fundamentals. Continued price growth is expected to be sustained by strong demand. House prices are soaring due to the strong demand from both immigration and job growth and the Toronto market has attracted real estate speculators. The rich international buyers, ultra-low interest rates, limited supply and speculators all contribute to rising prices. Favourable mortgage insurance rules have also resulted in higher home prices.
Bank of Montreal *(Porter & Kavcic, 2016); (Evans, 2016)*	Changes in demographics, urbanization, foreign investment, speculation, low levels of construction of detached homes, low interest rates, and land restrictions are all potential sources of unaffordable housing. However, without quantification, it is assumed that "foreign investment, speculation, and land restrictions, in that order", are responsible. The new stress test will help in combating the higher house prices as it will be harder for buyers to qualify for loans, especially in high-priced regions.
CIBC *(Tal & Judge, 2016); (Blatchford A. , 2016)*	Government policies such as the Greenbelt and Growth Plan have reduced the serviced land available for constructing ground-oriented houses by setting density targets. Additionally, the approval process has become time-consuming and the developers are holding on to the land as it appreciates in value. These factors have increased the time it takes for the land to be brought to the market. Finally, the increasing development costs have also compounded the affordability issue. On the demand side, the federal government's new mortgage lending rules "are "prudent" and will help shore up the housing system."
Scotiabank *(Sherman, 2017); (Posadzki, 2017)*	Immigration, population growth and time consuming government processes associated with developing a property have made the housing crisis a complicated issue. Recent government changes to mortgage rules are positive. "Previously, stress tests were not necessary for fixed-rate mortgages longer than five years."
National Bank *(Arseneau & Dahms, 2017); (CBC News, 2016)*	Rising house prices are mostly due to lower supply of non-condo dwelling types. Home affordability has further become a concern with higher minimum down payments required. "The measures taken to cool these markets are beginning to be felt in Vancouver, but the potential for cooling is limited by the very strong population growth of the country's two main immigration portals."

CANADIAN CENTRE FOR ECONOMIC ANALYSIS

Other	
Urbanation *(CBC News, 2016); (Urbanation, 2016)*	The rental market is experiencing improving fundamentals such as employment and population growth, and combined with high levels of competition and low vacancy rates, is reducing affordability. In addition, a lack of purpose-built rental and the dominance of the secondary rental market are decreasing rental affordability. Demand for condos has been pushed up as a result of affordability pressures in the single-detached market, leading to spillovers in price.
Fortress Real Developments *(Myers, 2017); (Crawley, 2016)*	House prices are being driven up by a combination of foreign buyers, investors, low interest rates, lack of new supply, longer commutes causing bidding wars for prime properties, bigger inheritances and gifts, renovation spending, burdensome land-use policies, people living longer, decent job growth, steady immigration, young buyers' fear of missing out.

D. SCAR CONSTRUCTION

$$SCAR = \frac{Shelter\ related\ needs}{(Disposable\ income - other\ needs)}$$

The following lists provide household consumption commodity groups utilized (partially or wholly) for the construction of SCAR. In cases where the group is not entirely used, assumptions are applied based on best available research. Further, margins (i.e., transportation, wholesale, and retail) are proportionally reduced (i.e., assumes all margins for the group are uniformly distributed per dollar consumed).

paid rental fees for housing	food
imputed rental fees for housing	non-alcoholic beverages
materials for the maintenance and repair of the dwelling	garments
services for the maintenance and repair of the dwelling	cleaning of clothing
electricity	clothing and clothing accessories
gas	footwear
other fuels	furniture and furnishings
water supply and sanitation services	carpets and other floor coverings
new passenger cars	household textiles
new trucks, vans and sport utility vehicles	major household appliances
used motor vehicles	small electric household appliances
other vehicles	other non-durable household goods
spare parts and accessories for vehicles	repair of personal and household goods
fuels and lubricants	pharmaceutical and other medical products
maintenance and repair of vehicles	out-patient services
parking	hospital services
railway transport	telecommunication equipment
urban transit	telecommunication services
interurban bus	health insurance
other transport services	personal grooming services
insurance related to transport	other appliances and products for personal care
property insurance	child care services outside the home
	child care services in the home

Canadian Centre for Economic Analysis