

15th Annual Demographia International Housing Affordability Survey: 2019

Rating Middle-Income Housing Affordability

Australia • Canada • China (Hong Kong)
Ireland • New Zealand • Singapore
United Kingdom • United States

Introduction: Avoiding Dubious Urban Policies, by

Alain Bertaud

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Data for 3rd Quarter 2018

15th Annual Demographia International Housing Affordability Survey

INTRODUCTION:

AVOIDING DUBIOUS URBAN POLICIES

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Author: [*Order without Design: How Markets Shape Cities*](#) (MIT Press, 2018)

Why an annual affordability survey matters to monitor the health of prosperous cities

Many prosperous cities consider ever increasing housing prices as an unavoidable side-effect of their economic success. The Annual Demographia International Housing Affordability Survey conducted by Wendell Cox and Hugh Pavletich demonstrates that some cities can be economically successful and avoid over-charging households for their housing consumption.

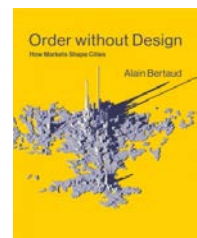


Photo Dennis Letbetter

The Demographia International Housing Affordability Survey rates housing affordability using the “Median Multiple”, average house price divided by average household income or Price-Income Ratio (PIR). In the 2019 Affordability Survey covering 90 cities of more than one million people, PIR values range from 2.6 in Pittsburgh, PA and Rochester, NY to 20.9 in Hong Kong! Why some cities manage to conciliate economic growth and housing affordability while others see their PIR number increases years after years?

An already high or increasing Price-Income Ratio (PIR) should immediately signal to urban managers that they should take urgent correcting action after conducting a detailed diagnosis that would explain the high PIR figure. The Affordability Survey should be similar to the periodic health check-up taken by an individual: an abnormally high blood pressure indicates that urgent correcting steps should be taken.

/ An abnormally high PIR number provided by the Affordability Survey is not a diagnosis that would allow finding what is wrong; it is only an indicator that something is wrong in the real estate supply system. While a high PIR always indicates a discrepancy between housing supply and demand, a low PIR might not necessarily be an indicator of housing economics health. A city with a low PIR might have just known better days. Cheap housing might only indicate low demand from a dwindling population with decreasing



income. PIR numbers should therefore always be related to demographic and economic growth. The Affordability Survey of 2019 shows that cities like Houston and Atlanta, for instance, have relatively low PIR of 3.7 and 3.5 respectively, while maintaining high economic growth and low unemployment.

Each city with a high PIR should, therefore, conduct a detailed study to identify the sources of this abnormality. Because the survey displays PIR numbers and households' median income for more than 300 metropolitan markets, cities managers could look for inspiration at urban development practices among cities with low PIRs and high economic growth rate.

The Affordability Survey has been running now for 14 years. It constitutes, therefore, an outstanding time series to analyze trends and relate them to reforms in different cities. The main message of the Annual Demographia International Housing Affordability Survey is that unaffordable housing is not an unavoidable fatality linked to economic success. Some cities achieve high demographic and economic growth without abnormal housing inflation.

Unaffordable housing misallocates resources

We know that unaffordable housing causes a lot of hardship for households that do not yet own their home, in particular, the youngest ones. But abnormally inflated housing prices have also a negative impact on the entire economy, including on the households who already own their home and who might rejoice that their real estate assets are increasing much faster than general inflation.

High housing prices misallocate resources toward real estate at the expense of the rest of the economy. This misallocation could eventually significantly slow down economic growth and causes a housing bubble to burst, freezing investments in the entire economy. Japan, has not yet completely recovered from its asset bubble created in the 1980s.

Hsieh and Moretti, two economists, found that the high price of housing in some otherwise very successful US cities has a ripple effect, distorting the spatial allocation of labor nationwide¹. They calculate that the cost of the misallocation of resources caused by unaffordable housing represented about 9.4 percent of US GDP in 2014. Housing affordability is therefore not a trivial issue.

Their paper demonstrates that the welfare of households already owning a house—who may feel that they benefit from climbing housing prices—is also significantly decreased in the long run. High housing prices, create an immediate hardship to low and median income households, but in the long term, every household—rich or poor—would eventually become poorer because the imbalance in resource allocation will decrease investments and the productivity of the entire country.

A high PIR requires a more in-depth diagnosis

High PIRs affect mostly economically successful cities. These cities create many new jobs, who in turn increase the number of households and their average income. More jobs and people with high incomes

¹ Chang-Tai Hsieh and Enrico Moretti, “Why Do Cities Matter? Local Growth and Aggregate Growth”. NBER working paper 21134, National Bureau of Economic Standards, Cambridge, MA, May 2015



creates more demand for urban floor space. The need for additional floor space is generated by new housing demand but also by the demand for more services like schools, restaurants, gyms, etc.

The provision of the additional floor space is possible only if a city can expand out and up rapidly enough to accommodate the new demand without creating real estate price inflation. Unfortunately, in free metropolitan areas, this expansion is blocked by inadequate land management policies and arbitrary land use regulations, and by an absence of mechanisms to finance infrastructure and transport to respond to demand for new greenfield land development.

Politicians and planners in unaffordable cities are well aware of the problems created by unaffordable housing. However, often they are not effective in allowing the supply of floor space and land to increase rapidly because many of them firmly believe in three myths:

Myth #1: planners know how to allocate land equitably through the design of increasingly complex zoning regulations while ignoring price signals.

Complex new zoning regulations are fixing administratively the consumption parameters that should be left to the market; they create a regulatory straightjacket that allows only the construction of luxury housing for which the minimum requirements are not binding. It is the difference between the supply of land and floor price compared to demand that generates land prices, not the color of a zoning map.

Myth #2: Regulators can mandate the creations of new affordable housing units by obliging private developers to provide a share (usually 20%) of the housing units they build at prices fixed by the government below market; regulators call these “affordable housing units.”

The practice is usually called inclusive zoning and has become a common practice in many cities from New York City to Mumbai! Under-inclusive zoning, a fraction of the demand for luxury housing coming from a minority of wealthy households is supposed to generate the entire supply of housing units affordable to the middle class! The quantity of “below market” affordable housing created by this regulatory mechanism is so short in meeting the demand that the new units have to be allocated through lotteries. In New York City, the odds faced by potential beneficiary households to win the lottery is usually below 1/100,000! ² Besides, of the obligation made to developers to produce units priced below market acts as a tax on the flow of new market produced units, and therefore progressively reduce their supply. Thus, the impact of inclusive zoning on the housing supply is to make housing more expensive for those who can afford it and gradually more scarce for those who rely on the program to access housing.

In spite of its obvious flaws, the inclusive zoning approach to the provision of affordable housing is increasingly popular with mayors and politicians because it appears to cost nothing to the taxpayer; in reality, with time fewer and fewer wealthy households are asked to pay for the housing units of the ever more numerous households requiring subsidies. Indeed, the “no free lunch” principle is at the “core of economics.” ³

Myth #3: The compact city fallacy. A city can accommodate increasing income and population through densification of the existing built-up area; expansion into greenfield would result in “sprawl.”

² Alain Bertaud, “Order without Design: How Markets Shape Cities”, MIT Press 2018, chapter 6 page 275-287

³ Campbell R. McConnell, Stanley L. Brue, *Economics: Principles, Problems, and Policies*, McGraw-Hill/Irwin, 2005.



Many regulations restrict densities and building heights arbitrarily. In some urban locations, removing these regulations would allow housing demand to increase densities. In the long run, this would be positive: creating new housing in areas where there is strong demand for it. However, the growth of housing supply generated by the densification of existing built-up areas is necessarily slow and limited. Existing low rise residential areas have to be acquired; their occupants relocated before developers can replace them with new taller buildings with more housing units.

Densification is desirable only when it is demand driven, i.e. if many households and firms prefer to locate in a specific part of the city. However, if regulations or a lack of infrastructure are preventing new greenfield developments, the densification of the existing built-up area is not any more demand driven. In this case, the densification is generated by the absence of a housing alternative, not by the preferences of households and firms for higher density urban location.

Any policy aimed at increasing the housing supply should, therefore, include two components: removing regulatory obstacles to densification and expanding urbanization into new greenfields. A misunderstanding of the structure of cities is usually the cause of the fear of sprawl. Cities do not have optimum densities. High accessibility areas that are centrally located have a higher density than distant suburban areas. Differences in densities reflect a spontaneous order created by markets. New greenfield developments will have much lower densities than more centrally located areas. These lower densities do not represent sprawl and do not indicate a wasteful use of land. Housing consumers are compensated for their longer commute by a higher consumption of land and floor area.

The way out of an affordability crisis

Politicians and planners have to stop believing in fairy tales consisting of thinking that smart zoning can allocate housing fairly between the wealthy, middle class and poor households. The only solution (except for the homeless) are solutions driven by market forces. A new school teacher finding a new job in a city is not helped when entering a lottery is the only way to access a house she/he could potentially afford. An alternative will be registering on a waiting list where she/he will stay for many years before obtaining a “below market” housing unit. The characteristic of markets is that there is constant flow in and out of the housing stock, allowing new entrants to find accommodation within at most a month of looking for the best choice offered by the housing market. The market solution also allows any household searching for a house to select the best trade-off between location, floor area and density that would best optimize its welfare.

The solution to unaffordable housing does not consist in inventing clever regulatory gimmicks or in designing massive subsidies to be paid by the taxpayer or by a few wealthy households. The answer will always consist of increasing the supply of land and floor space and removing any land and floor regulatory straight jacket. The tradeoff between housing standards, like housing sizes, densities, lot sizes, and location are always better left to the decision of the consumer, and not the whim of the regulator.

But increasing the supply of land requires having a financial mechanism to finance the infrastructure and transport systems that will make the new area of land developed accessible to the city labor market. A city cannot expand without disposing of a financial instrument to finance new infrastructure as the need arises for an urban extension. This instrument should be able to finance infrastructure including road, storm drainage, and sewers as well as urban transport network that would ensure that the new residents will be within a commuting travel time of less than one hour from the city labor market.



Even when politicians and planner have established a likely diagnosis and a strategy to solve the affordability problem, it is not easy to implement it. The distortions created by the regulatory repression of land and floor space supply generate a sort of pathological equilibrium. The reforms required to break this equilibrium will create potential winners and losers. The winners may not be aware yet of the impact of the changes while the losers are usually well aware of them and therefore resist them.

Universal resistance to change a damaging status quo may explain why some cities remain in a high PIR range for so long, even when the solutions are well known and accepted by all. For instance, in New Zealand, an otherwise exceptionally well-managed country, Auckland's PIR has increased from 5.9 in 2004, to 9.0 in 2018. The current government has explicitly declared that it will:

- 1) Remove the Auckland urban growth boundary
- 2) Free up density controls
- 3) Fund new infrastructure through innovative infrastructure bonds

These measures constitute the best approach to create a market for housing units responding to the demand of the majority of households. These measures, even when forcefully formulated, require time to be implemented as representative branches of government have to pass new laws and design implementation guidelines. After the government has successfully passed these reforms, the international community will watch with great interest the impact it will have on Auckland's PIR in the next few years. It is hoped that the example of Auckland will create a blueprint that could be used in other high PIR cities.

I have often compared very restrictive urban regulations with hard drugs and cities that practice them with drug addicts. Trying to remove their drug fix suddenly creates severe side effects because their organism is used to the drug and needs it, even as they are being destroyed by it. I guess that any reformer should approach urban regulatory reform in the same way as a doctor develops a treatment for a drug addict: a progressive withdrawal planned over the long term. The main lesson to be drawn is not to become addicted to dubious urban regulations in the first place. I wish planning professional associations, and academic institutions would contribute to dispelling the three myths described above that are causing so many urban dysfunctions.

Video Interview: [Paul Romer & Alain Bertaud Discuss "Order without Design"](#)

About Alain Bertaud ...

[Alain Bertaud](#) is a senior research scholar at the NYU Marron Institute of Urban Management. He just completed a book titled "*Order without Design: How Markets Shape Cities*" published by MIT Press in November 2018. In his book, he argues that the unfamiliarity with basic urban economic concepts of those in charge of managing cities has a negative impact on households' mobility and housing affordability. His field experience has confirmed that this ignorance is worldwide, from New York to Mumbai. The objective of the book is not to propose new urban forms but to apply already consensual basic economic principles to the practice of urban planning.

Bertaud previously held the position of principal urban planner at the World Bank. After retiring from the Bank in 1999, he worked as an independent consultant. Prior to joining the World Bank he worked as a resident urban planner in a number of cities around the world: Bangkok, San Salvador (El Salvador), Port au



Prince (Haiti), Sana'a (Yemen), New York, Paris, Tlemcen (Algeria), and Chandigarh (India). Bertaud's research, conducted in collaboration with his wife Marie-Agnès, aims to bridge the gap between operational urban planning and urban economics. Their work focuses primarily on the interaction between urban forms, real estate markets and regulations. Bertaud earned the Architecte DPLG diploma from the Ecole Nationale Supérieure des Beaux-Arts in Paris in 1967.



From the Authors



From Wendell Cox:

It is a privilege to present an *Introduction (Avoiding Dubious Urban Policies)* by one of the world's premier urbanists, Alain Bertaud, of New York University (NYU) and former principal urban planner at The

World Bank.

Bertaud has just published a new book ([*Order without Design: How Markets Shape Cities*](#)) which is particularly timely. There is an increasing recognition that deteriorating housing affordability is *the* principal factor in the international challenge to middle-income standards of living in multiple nations.

Bertaud suggests the way forward. He cites “the lack of interaction” between urban planning and urban economics” for the “serious dysfunction in the development of cities,” calling for incorporation of economics into urban planning. Indeed he suggests a merger of the two.

Berthoud elevates the issue of housing affordability, suggesting that: *The main objective of the planner should be to maintain mobility and housing affordability.* He characterizes the “modification of market outcome achieved by planners” as ranging from “only slight modification in a city like Houston, Texas, to complete obliteration in a city like Brasília, Brazil, and in some cities of the former Soviet Union.”

The solution begins with “paying attention.” Bertaud suggests that metropolitan areas monitor housing affordability and where price-to-income ratios (PIRs) are unaffordable, examine the causes and “look for inspiration at urban development practices among cities with low PIRs and high economic growth rate.”

For 15 years, the *Demographia International Housing Affordability Survey* has sought to portray the growing housing affordability crisis that has become an international standard of living crisis for middle-income households. Bertaud says that: *The main message of the Annual Demographia International Housing Affordability Survey is that unaffordable housing is not an unavoidable fatality linked to economic success.* We couldn't agree more.



From Hugh Pavletich:

Alain Bertaud, former chief urban planner with the World Bank and since then an academic at New York University, contributes this year's Survey Preface, following the recent publication of his important new book [*Order without Design: How Markets Shape Cities*](#).

Alain had earlier contributed the Preface to the [*2014 10th Edition*](#). He emphasised that primary focus of urban planners should be to maintain affordability and mobility.

This earlier Survey Preface had such an impact, New Zealand economists, led by people at the New Zealand Institute Of Economic Research, New Zealand Initiative and others, arranged for Alain with his wife and fellow researcher Marie – Agnes, to visit New Zealand mid - 2014 for an intensive [*3 City Speaking Tour*](#).

It was an enormous success!

As I explained in last year's Survey Message and within my archival website [*Performance Urban Planning*](#), this government know exactly what needs to be done.

They have promised to allow new affordable housing to be built.

The results of this year's Survey will come as a shock to New Zealand's Labour – led government.

The message is clear ... perform or perish.







Put simply ... if this government fails to perform with housing issues in 2019, it will deservedly be thrown out at the next general election late 2020.

The New Zealand public and media will not tolerate political and institutional failure ... something the [*previous government was taught at the 2017 election*](#).






Denying people access to affordable housing is of course a serious breach of basic human rights.



Highlights from Previous Introductions to the *Demographia International Housing Affordability Survey*

			Felipe Carrozi Paul Cheshire and Christian Hilbur London School of Economics (#14: 2018)
<p>Apart from the median multiple being simple and useful, it is also the only measure out there for purposes of international comparison.</p> <p>... the first paradox of housing 'affordability': housing is both an asset and a good providing a flow of housing services – a place to live. The interests of house owners do not align with those of would be house owners. Rising house prices relative to incomes pit the old against the young and the rich against the poor.</p> <p>... focusing on high and low-income groups within housing markets suggests, not surprisingly, that housing is most unaffordable for the lower income groups even though they buy cheaper houses</p>			
	Oliver Hartwich , Executive Director , The New Zealand (#13: 2017)	<p>We should not accept extreme price levels in our housing markets. High house prices are not a sign of city's success but a sign of failure to deliver the housing that its citizens need.</p> <p>Fortunately, the media are waking up to the realisation that housing and land supply matters. The most powerful infographic of 2016 was produced by The Wall Street Journal. It showed what happened to house prices in US cities that had expanded their residential areas between 1980 and 2010 – and those that had not. As was to be expected, greater land supply went hand in hand with lower price increases.</p>	
	Senator Bob Day , AO, Senate of Australia (#12: 2016)	<p>The distortion in the housing market... resulting from the supply-demand imbalance is enormous ... and affects every other area of a country's economy. New home owners pay a much higher percentage of their income on house payments than they should.</p> <p>However, the real culprit ... was the refusal of ... governments ... to provide an adequate and affordable supply of land for new housing stock to meet demand. ... the "scarcity" that drove up land prices is wholly contrived - it is a matter of political choice, not geographic reality. It is the product of restrictions imposed through planning regulation and zoning.</p>	
	Dr. Shlomo Angel , New York University (#11: 2015)	<p>We all understand what it means to prepare adequate lands for urban expansion, enough land to accommodate both residences and workplaces, so as to ensure that land—and particularly residential land—remains affordable for all. Unfortunately, municipalities of many rapidly growing cities often underestimate the amount of land needed to accommodate urban expansion. In the minority of cases where expansion is effectively contained by draconian laws, it typically results in land supply bottlenecks that render housing unaffordable to the great majority of residents.</p>	



	<p><u>Alain Bertaud,</u> <u>New York University</u> (#10: 2014)</p>	<p>It is time for planners to abandon abstract objectives and to focus their efforts on two measurable outcomes that have always mattered since the growth of large cities during the 19th century's industrial revolution: workers' spatial mobility and housing affordability.</p> <p>As a city develops, nothing is more important than maintaining mobility and housing affordability. Mobility takes two forms: first, the ability to travel in less than an hour from one part of a city to another; and second, the ability to trade dwellings easily with low transactions costs.</p>
	<p><u>Hon. Bill English,</u> <u>Deputy Prime Minister, New Zealand</u> <i>Later Prime Minister</i> (2016-2017) (#9: 2013)</p>	<p>Housing affordability is complex in the detail – governments intervene in many ways – but is conceptually simple. It costs too much +and takes too long to build a house in New Zealand. Land has been made artificially scarce by regulation that locks up land for development. This regulation has made land supply unresponsive to demand.</p>
	<p><u>Robert Bruegmann,</u> <u>PhD, University of Illinois, Chicago</u> (#8: 2012)</p>	<p>... I think it is fair to say that a growing number of people who have looked at the figures have tended to agree that a good many well-meaning policies involving housing may be pushing up prices to such an extent that the negative side-effects are more harmful than the problems the policies were intended to correct.</p>
	<p><u>Joel Kotkin,</u> <u>Chapman University</u> (#7: 2011)</p>	<p>Although usually thought of as “progressive” in the English speaking world, the addiction to “smart growth” can more readily be seen as socially “regressive”. In contrast to the traditional policies of left of center governments that promoted the expansion of ownership and access to the suburban “dream” for the middle class, today regressive “progressives” actually advocate the closing off of such options for potential homeowners.</p>
	<p><u>Dr. Tony Recsei,</u> <u>Save Our Suburbs, Sydney</u> (#6: 2010)</p>	<p>During the 18th century, especially after the industrial revolution, rural dwellers desperate to make a living streamed into the cities, converting many areas into overcrowded slums. However, as the new economic order began to generate wealth, standards of living improved, allowing an increase in personal living space.</p> <p>Unless we are vigilant, high-density zealots will do their best to reverse centuries of gains and drive us back towards a Dickensian gloom.</p>





	<p><u>Dr. Shlomo Angel, New York University</u></p> <p>(#5: 2009)</p>	<p>For cities to expand outward at their current pace — to accommodate their growing populations or the increased demand for space resulting from higher incomes — the supply of land must not be artificially constrained.</p> <p>The more stringent the restrictions, the less is the housing market able to respond to increased demand, and the more likely house prices are to increase. And when residential land is very difficult to come by, housing becomes unaffordable.</p>
	<p><u>Dr. Donald Brash, Fomer Governor, Reserve Bank of New Zealand</u></p> <p>(#4: 2008)</p>	<p>...the affordability of housing is overwhelmingly a function of just one thing, the extent to which governments place artificial restrictions on the supply of residential land.</p> <p>Australia is perhaps the least densely populated major country in the world, but state governments there have contrived to drive land prices in major urban areas to very high levels, with the result that in that country housing in major state capitals has become severely unaffordable...</p>
<p><u>2007: 3rd Edition</u></p>	<p><u>2006: 2nd Edition</u></p>	<p><u>2005: 1st Edition</u></p>



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(2019 Edition: Data from 3rd Quarter 2018)

By Wendell Cox (Demographia) & Hugh Pavletich (Performance Urban Planning)

The main message of the Annual Demographia International Housing Affordability Survey is that unaffordable housing is not an unavoidable fatality linked to economic success.
-Alain Bertaud, *Introduction: Avoiding Dubious Urban Policies*

EXECUTIVE SUMMARY

The 15th Annual Demographia International Housing Affordability Survey covers 309 metropolitan housing markets (metropolitan areas) in eight countries (Australia, Canada, China [Hong Kong Only], Ireland, New Zealand, Singapore, the United Kingdom and the United States) for the third quarter of 2018. A total of 91 major metropolitan markets (housing markets) --- with 1,000,000+ population --- are included, including three megacities, with more than 10,000,000 residents (New York, London and Los Angeles).

Middle-Income Housing Affordability

The *Demographia International Housing Affordability Survey* rates middle-income housing affordability using the “Median Multiple,” which is the median house price divided by the median household income. The Median Multiple is widely used for evaluating housing markets. It has been recommended by the World Bank and the United Nations and has been used by the Joint Center for Housing Studies at Harvard University. The Median Multiple and other price-to-income multiples (housing affordability multiples) are used to compare housing affordability between markets by the Organization for Economic Cooperation and Development, the International Monetary Fund, *The Economist*, and other organizations.

Table ES-1 <i>Demographia International Housing Affordability Survey</i> Housing Affordability Ratings	
Housing Affordability Rating	Median Multiple
Affordable	3.0 & Under
Moderately Unaffordable	3.1 to 4.0
Seriously Unaffordable	4.1 to 5.0
Severely Unaffordable	5.1 & Over
Median multiple: Median house price divided by median household income	

Historically, liberally regulated markets have exhibited median house prices that are three times or less that of median household incomes (a Median Multiple of 3.0 or less). *Demographia* uses the housing affordability ratings in Table ES-1.



Housing Affordability in 2018

Over the past year, there has been moderation of house prices in some of the most unaffordable markets. In some markets, prices have stabilized, while in others actual declines have occurred. However, none of the price declines have been sufficient to materially improve housing affordability. These developments could, in the long run, simply be further indication of the price volatility exhibited associated with stronger land use regulation.

There are 9 affordable major housing markets, all in the United States. There are 29 severely unaffordable major housing markets, including all in Australia (5), New Zealand (1) and China (1). Thirteen of the major markets in the United States are severely unaffordable (out of 55), seven in the United Kingdom (out of 21 major markets) and two out of Canada's six.

The most affordable major housing markets are in the United States, with a moderately unaffordable Median Multiple of 3.9, followed by Canada (4.3) and Singapore (4.6). Ireland and the United Kingdom both have Median Multiples of 4.8. The major markets of Australia (6.9), New Zealand (9.0) and China (20.9) are severely unaffordable (Table ES-2).

There are 9 affordable major housing markets, all in the United States. Pittsburgh and Rochester are the most affordable, with a Median Multiple of 2.6. Oklahoma City has a Median Multiple of 2.7, while Buffalo, Cincinnati, Cleveland and St. Louis each has a 2.8 Median Multiple. Indianapolis (2.9) and Detroit (3.0) are also affordable.

There are 26 severely unaffordable major housing markets in 2018. Again, Hong Kong is the least affordable, with a Median Multiple of 20.9 up from 19.4 last year. Vancouver has replaced Sydney as the second least affordable, with a Median Multiple of 12.6. With slightly declining house prices, Sydney's Median Multiple dropped to 11.7. Melbourne (9.7), San Jose (9.4), Los Angeles (9.2) and Auckland (9.0) were also among the least affordable. San Francisco (8.8), Honolulu (8.6), as well as London (Greater London Authority) and Toronto (both 8.3) were also among the 10 least affordable major markets. Schedule 1 includes Median Multiples for all major markets.

Nation	Affordable (3.0 & Under)	Moderately Unaffordable (3.1-4.0)	Seriously Unaffordable (4.1-5.0)	Severely Unaffordable (5.1 & Over)	Total	Median Market
Australia	0	0	0	5	5	6.9
Canada	0	3	1	2	6	4.3
China: (Hong Kong)	0	0	0	1	1	20.9
Ireland	0	0	1	0	1	4.8
New Zealand	0	0	0	1	1	9.0
Singapore	0	0	1	0	1	4.6
United Kingdom	0	1	13	7	21	4.8
United States	9	25	8	13	55	3.9
TOTAL	9	29	24	29	91	4.4



Table ES-3 summarizes housing affordability in all markets.

Table ES-3 Housing Affordability Ratings by Nation: All Markets						
Nation	Affordable (3.0 & Under)	Moderately Unaffordable (3.1-4.0)	Seriously Unaffordable (4.1-5.0)	Severely Unaffordable (5.1 & Over)	Total	Median Market
Australia	1	1	5	16	23	5.7
Canada	12	16	5	17	50	4.0
China (Hong Kong)	0	0	0	1	1	20.9
Ireland	2	2	1	0	5	3.7
New Zealand	0	0	2	6	8	6.5
Singapore	0	0	1	0	1	4.6
United Kingdom	0	4	18	11	33	4.8
United States	56	70	34	28	188	3.5
TOTAL	71	93	66	79	309	4.0

Well-Functioning Cities

There has been significant progress in the reduction of poverty around the world, first in the high-income world and now in other nations. Paradoxically, threats are emerging in some urban areas of the high-income world, as middle-income households face intensifying economic challenges.. Much of the cause can be traced to much higher house prices.

Former World Bank principal urban planner Alain Bertaud's new book (see *Introduction: Avoiding Dubious Urban Policies*) expresses concern that urban policy in cities is being driven by planning that ignores fundamental economics. This, he warns, can lead to a "costly utopia." According to Bertaud, "The objective of the book is not to propose new urban forms but to apply already consensual basic economic principles to the practice of urban planning."

In the environment of current urban policy, principally urban containment policy, middle-income housing has become too expensive for many middle-income households and poverty has increased. Significant national economic losses have been associated with more restrictive land use regulation.

Economists Paul C. Cheshire, Max Nathan and Henry G. Overman of the London School of Economics state the obvious priority: "... [the ultimate objective of urban policy is to improve outcomes for people](#)." Economists Edward Glaeser of Harvard University and Joseph Gyourko of the University of Pennsylvania, have that "well functioning" housing markets are crucial to housing affordability. Housing affordability requires well functioning land markets.

Bertaud adds: "The main objective of the planner should be to maintain mobility and housing affordability" This would produce substantial opportunities, permitting residents the widest access to employment and shopping and other pursuits--- in short, well functioning cities (labor markets).



15th Annual Demographia International Housing Affordability Survey

Rating Middle-Income Housing Affordability
(2019 Edition: Data from 3rd Quarter 2018)

By Wendell Cox (Demographia) & Hugh Pavletich (Performance Urban Planning)

The main message of the Annual Demographia International Housing Affordability Survey is that unaffordable housing is not an unavoidable fatality linked to economic success.
-Alain Bertaud, *Introduction: Avoiding Dubious Urban Policies*

1: MIDDLE-INCOME HOUSING AFFORDABILITY

The 15th Annual Demographia International Housing Affordability Survey measures middle-income housing affordability in 91 major metropolitan housing markets¹ in Australia, Canada, China (Hong Kong only), Ireland, New Zealand, Singapore, the United Kingdom and the United States.² Data is principally from the third quarter of 2018. These include three megacities³ New York, Los Angeles, and London.⁴ Fifteen markets have more than 5,000,000 population, eight are severely unaffordable, one seriously unaffordable and six moderately unaffordable (Figure 1).

In total, the 15th Annual Demographia International Housing Affordability Survey provides ratings for 309 housing markets located in the same eight nations, with data from the third quarter (September quarter) of 2018.⁵

The Survey is the world's largest known collection of housing affordability data at the housing market level. Most international economic analysis of housing markets focuses on national indicators. However, national measures can mask significant differences between housing affordability between metropolitan areas *within* countries. For example, during the housing bubble in the United States, some markets retained Median Multiples (price-to-income ratios) of 3.0 or less, while others rose to over 10.⁶

¹ Metropolitan areas with 1,000,000+ population.

² Japan is not included in this edition. For an affordability report by prefecture, see Kantei News, https://www.kantei.ne.jp/report/92bairitsu-chu.pdf?ranMID=37601&ranEAID=u*5WQ7Oo5Uo&ranSiteID=u.5WQ7Oo5Uo-XLCIvIJsOWGPxIjrmPVeAQ.

³ Metropolitan areas with more than 10 million population.

⁴ Metropolitan areas are labor markets and housing markets.

⁵ Sources and methods are described in the Annex: Sources, Methods and Uses.

⁶ There is the most variation between markets in Canada and the United States.



The *Demographia International Housing Affordability Survey* focuses on middle-income housing affordability. Middle-income housing affordability is different from low – income "affordable" housing," which requires subsidies.⁷ At the same time, shelter is a fundamental household need and subsidies are required when market prices or rents cannot be afforded. The *Survey* does not include indicators of subsidized or social housing. However, where middle-income housing is affordable, there will be less of a need for subsidized housing. As a result, the need for of social housing is inextricably determined to middle-income housing affordability.

Middle-income housing affordability is also different from luxury housing affordability, which is reported upon by a number of organizations (such as the [Knight Frank's Wealth Report](#)). In the vernacular of this populist era, middle-income housing affordability might be characterized as relating to the "99 percent" luxury end of the market, rather than the "one percent."

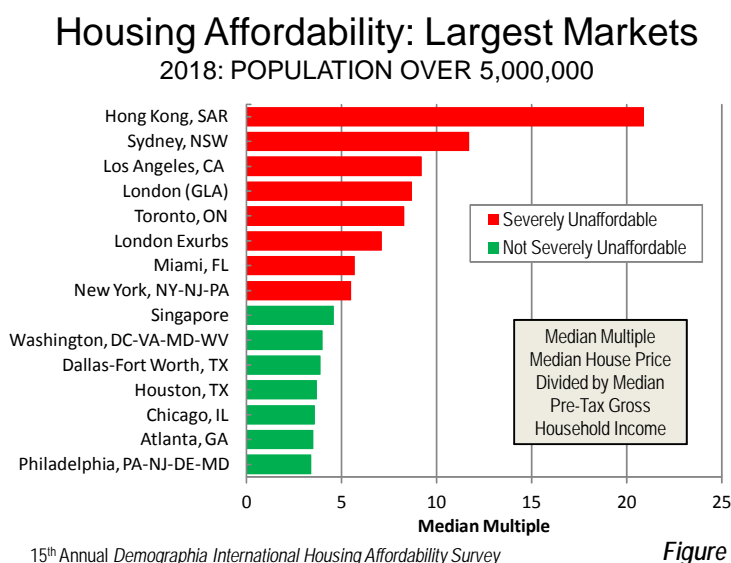


Figure 1

1.1: What is Middle-Income Housing Affordability?

Housing affordability is measured by comparison of house prices to household incomes.⁸ Mere comparisons of price levels between metropolitan areas are not a sufficient indicator of housing affordability. Evaluation of housing affordability requires comparison to incomes in the same housing market.

... the need for of social housing is inextricably determined to middle-income housing affordability

According to the United Nations,⁹ "If there is a single indicator that conveys the greatest amount of information on the overall performance of housing markets, it is the house price-to-income ratio." The *Demographia International Housing Affordability Survey* measures middle-income housing affordability in housing markets, or metropolitan area (labor

⁷ Including social housing.

⁸ See, for example, Jason Furman, *Barriers to Shared Growth: The Case of Land Use Regulation and Economic Rents*, Address to the Urban Institute, November 20, 2016. https://obamawhitehouse.archives.gov/sites/default/files/page/files/20151120_barriers_shared_growth_land_use_regulation_and_economic_rents.pdf

⁹ Shlomo Angel, Stephen K. Mayo and William L. Stephens, Jr., "The Housing Indicators Program: A Report on Progress and Plans for the Future," *Netherlands Journal of Housing and the Built Environment* 8, no. 1 (1993): 13-48. <http://sollyangel.com/wp-content/uploads/2013/10/38.-1993-The-Housing-Indicators-Program.pdf>.



markets), which is the economic (or functional) dimension of cities.¹⁰ Entire housing markets are used, rather than neighborhoods or parts of housing markets, because they represent the selection of housing that is locally available to households and from which businesses draw their employees.

Housing affordability is evaluated on two overall market levels, *between* housing markets (such as between Adelaide and Melbourne) and over time *within* the same housing market (such as Adelaide from 1980 to 2015).

1.2: The Median Multiple: Measuring Housing Affordability

The *Demographia International Housing Affordability Survey* uses the “Median Multiple” (median house price divided by median annual gross pre-tax household income¹¹) to assess housing affordability.

The Median Multiple is a house price to income ratio that is widely used for evaluating housing markets. It has been recommended by the World Bank¹² and the United Nations and is used by the Joint Center for Housing Studies, Harvard University.¹³ Similar house price to income ratios (housing affordability multiples) are used to compare housing affordability between markets by the

Organization for Economic Cooperation and Development, the International Monetary Fund, international credit rating services, media outlets (such as *The Economist*¹⁴) and others.

Table 1 <i>Demographia International Housing Affordability Survey</i> Housing Affordability Ratings	
Housing Affordability Rating	Median Multiple
Affordable	3.0 & Under
Moderately Unaffordable	3.1 to 4.0
Seriously Unaffordable	4.1 to 5.0
Severely Unaffordable	5.1 & Over
Median multiple: Median house price divided by median household income	

More elaborate indicators, which often mix housing affordability and mortgage affordability can mask the structural elements of house pricing and are often not well understood outside the financial sector. The mixed indicators provide only a "snapshot," because interest rates can vary over the term of a mortgage; however the price paid for the house does not.

Historically, the Median Multiple has been remarkably similar ... with median house prices from 2.0 to 3.0 times median household incomes.

¹⁰ The physical dimension of cities is the built-up urban area, which is surrounded by rural territory (see *Demographia World Urban Areas* (see: <http://demographia.com/db-worldua.pdf>). These definitions exclude the administrative unit or “municipality,” which is simply a political construct that may be smaller than the metropolitan area (generally in the West) or larger (such as in China). For further information see: [Paul Cheshire](#), [Max Nathan](#) and [Henry G. Overman](#) of the London School of Economics in their [recent book, *Urban Economics and Urban Policy: Challenging Conventional Policy Wisdom*](#)

¹¹ This is to be contrasted with median “family” income.

¹² *The Housing Indicators Program*, <http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1169578899171/rd-hs7.htm>. Also see Shlomo Angel, *Housing Policy Matters: A Global Analysis*. Oxford University Press, 2000.

¹³ *Indicators of Sustainable Development: House Price-to-income Ratio*: http://esl.jrc.it/envind/un_meths/UN_ME050.htm.

¹⁴ For example, *The Economist* publishes a housing affordability index for metropolitan areas in China (see Section 4).



The Median Multiple is a reliable, easily understood and essential structural indicator for measuring the health of residential markets and facilitates meaningful and transparent comparisons of housing affordability. The

Typically, severely unaffordable markets have urban containment land use policy.

Median Multiple provides a solid foundation for the consideration of structural policy options for restoring and maintaining housing affordability in local housing markets. The *Demographia International Housing Affordability Survey* housing affordability ratings are shown in Table 1 and discussed in more detail in Table 2.

Table 2
DEFINITION OF AN AFFORDABLE HOUSING MARKET

For metropolitan areas to rate as 'affordable' and ensure that housing bubbles are not triggered, housing prices should not exceed three times gross annual household earnings. To allow this to occur, new starter housing of an acceptable quality to the purchasers, with associated commercial and industrial development, must be allowed to be provided on the urban fringes at 2.5 times the gross annual median household income of that urban market (refer Demographia Survey Schedules for guidance). The critically important Development Ratios for this new fringe starter housing, should be 17 - 23% serviced lot / section cost - to balance the actual housing construction.

Ideally through a normal building cycle, the Median Multiple should move from a Floor Multiple of 2.3, through a Swing Multiple of 2.5 to a Ceiling Multiple of 2.7 - to ensure maximum stability and optimal medium and long term performance of the residential construction sector.

... so that today ... different forms of dwellings should be about or below these Median Multiples to rate as 'affordable' ...

1. Standard detached housing should not cost any more than 3.0 times annual household incomes of specific metros (refer [Annual Demographia Surveys](#) ; [recent Glaeser & Gyourko paper](#) ; [Recent Reserve Bank of Australia paper](#)); Harvard JCHR Median Multiple Tables (accessible top left column front page this website).
2. New fringe starter house and land packages should cost around 2.5 times ... at development ratios of 20% serviced lot and the balance construction (Definition of an affordable housing market www.PerformanceUrbanPlanning.org).
3. Apartment / townhouses should be around 2.0 times (about 70% of detached ... to illustrate refer [Houston Association of Realtors Monthly Report](#)).
4. Fringe manufactured house (prefab) and land packages should be around 1.5 times (refer [Leaky Homes And An Architect's Musing's | Scoop News](#) March 2010 published Interest Co NZ as 'Houston: We have a housing affordability problem'

*-Hugh Pavletich
[Performance Urban Planning](#)*

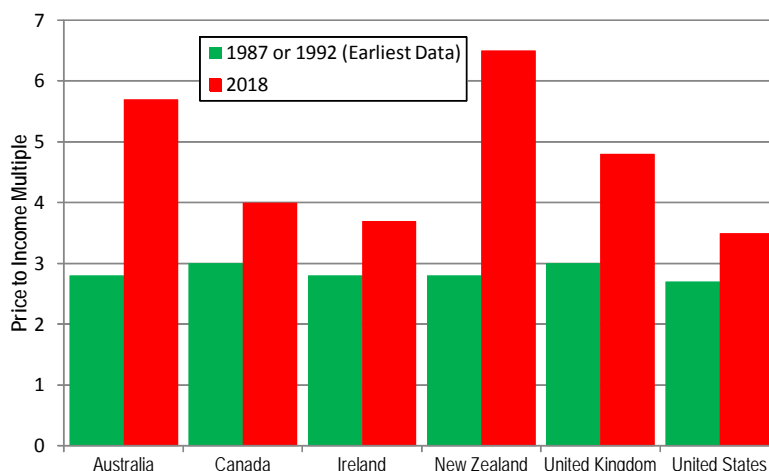
1.3: The Median Multiple: Historical & International Consistency

Available data shows that house costs have generally risen at a rate similar to that of household incomes until comparatively recently. This is consistent with cost trends among other basic necessities, such as personal transport, food and clothing.



historically, the Median Multiple has been remarkably similar among six surveyed nations, with median house prices from 2.0 to 3.0 times median household incomes (Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States). Housing affordability remained generally within this range until the late 1980s or late 1990s in each of these nations (Figure 2).¹⁷ In recent decades, house prices have escalated far above household incomes in many parts of the world. In some metropolitan markets house prices have doubled, tripled or even quadrupled relative to household incomes. Typically, the housing markets rated "severely unaffordable" typically have "urban containment" (Table 3).

International House Price to Income Ratios
1987/1992 TO 2018



Source: See Notes on Figures

Figure 2

Median Multiples of 3.0 or less continue to be observed in some markets of the United States, Canada and Ireland.¹⁸ Definitive historical data has not been identified for Hong Kong, or Singapore.

The *Demographia International Housing Affordability Survey* has been published for 15 years to emphasize the importance of well functioning housing markets. More severely unaffordable housing is strongly correlated with higher overall costs of living and thus lower standards of living between housing markets. Yet, higher standards of living and lower poverty rates are principal domestic policy priorities in virtually all nations. This requires attention to housing affordability (Section 4).

. In some metropolitan markets house prices have doubled, tripled or even quadrupled relative to household incomes.

¹⁷ Anthony Richards, *Some Observations on the Cost of Housing in Australia*, Address to 2008 Economic and Social Outlook Conference The Melbourne Institute, 27 March 2008 <http://www.rba.gov.au/speeches/2008/sp-so-270308.html>. This research included all nations covered in the *Demographia International Housing Affordability Survey* except for Ireland. The Richards research is also illustrated in the of the National Housing Council of Australia, http://www.fahcsia.gov.au/sa/housing/pubs/housing/national_housing_supply/Documents/default.htm (Figure 1.1).

¹⁸ A value below 2.0 is affordable, but may indicate depressed economic conditions.



Table 3
LIBERAL V. URBAN CONTAINMENT: LAND USE REGULATION CLASSIFICATIONS

The *Demographia International Housing Affordability Survey* uses the following land use regulation classifications:

Liberal Land Use Policy (Traditionally Regulated Markets) applies in markets not classified as having urban containment policy, which does not permit competitive land markets to operate on the urban fringe). In contrast, in liberal markets, residential development is allowed to occur based upon consumer preferences, subject to basic environmental regulation.¹⁹ Generally, liberal land use regulation is “demand-driven” Land is allowed to be developed, except in limited areas, such as parks and environmentally sensitive areas. By allowing development on the urban fringe, liberal land use regulation allows the “supply vent” to operate, which keeps house prices affordable. Less restrictive regulation can also be called *traditional* or *liberal* regulation. In addition to lower housing costs relative to incomes, the lower population densities typical of liberal markets are associated with [less intense traffic congestion and shorter average work trip journey times](#). Liberal land use regulation has also been called “traditional” regulation.

Urban Containment Policy does not permit²⁰ the competitive market for land to operate on the urban fringe. More restrictive land use regulation seeks to outlaw the liberal regulation that produced middle-income housing affordability. Typically, urban containment includes urban containment boundaries and related variations (such as urban growth boundaries, green belts, urban service districts, “growth areas” and other strategies that substantially reduce the amount of land available for house building).²¹ Urban containment policy may also be characterized by terms such as “densification policy,” “compact development,” or “urban consolidation.” Another strategy, “virtual” urban containment boundaries can be established independently by multiple jurisdictions in suburban or exurban areas.²² Urban containment may be imposed by any level of government and may involve regulations by multiple governments.

By severely limiting or even prohibiting development on the urban fringe, urban containment eliminates the “supply vent” of urban fringe development, by not allowing the supply of housing to keep up with demand, except at prices elevated well above historic norms.

Urban containment policies are often accompanied by costly development impact fee regimes that disproportionately charge the cost of the necessary infrastructure for growth on new house buyers. There is particular concern about the cost increasing impacts of these fees and levies, especially in Australia, Canada ([Canada Mortgage and Housing Corporation](#)), New Zealand ([New Zealand Productivity Commission](#)) and California.

Classification of Major Markets: The classification of major markets (metropolitan areas with more than 1,000,000 population) is described in Figure 4 and the figure notes in the Annex.

2: HOUSING AFFORDABILITY IN 2018: INTERNATIONAL SUMMARY

The *15th Annual Demographia International Housing Affordability Survey* provides housing affordability ratings for 91 major housing markets (1,000,000+ population) and an overall total of 309 markets. Markets in eight nations are rated.

Over the past year, there has been moderation of house prices in some of the most unaffordable markets. In some markets, prices have stabilized, while in others actual declines have occurred. However, none of the price declines have been sufficient to materially improve housing affordability. This trend may simply be a temporary phenomenon, evidence of the greater price volatility of more restrictively regulated housing markets.²³

²³ Dan Andrews, “Real House Prices in OECD Countries: The Role of Demand Shocks and Structural and Policy Factors,” OECD Economics Department Working Papers, No. 831, OECD Publishing, 2010. Available online at <http://dx.doi.org/10.1787/5km33bqzhhbzr-en> and Kate Barker, *Review of Housing Supply: Delivering Stability: Securing Our Future Housing Needs: Final Report – Recommendations*. Norwich, England: Her Majesty’s Stationery Office, 2004. http://www.andyweightmahttp://www.andyweightman.com/docs/barker_housing_final.pdf



2.1: Major Housing Markets

There was a reduction in the number of affordable major housing markets from 10 to 9 in 2018. At the same time, the number of severely unaffordable major housing markets rose from 28 to 29.

For the fifth year in a row, the United States has the most affordable housing among major housing markets, a moderately unaffordable Median Multiple of 3.9. Canada has a Median Multiple of 4.3, Singapore is 4.6, Ireland (Dublin) is 4.8, and the United Kingdom is 4.8, each of which is seriously unaffordable.

Three national markets are severely unaffordable, with Median Multiples of 5.1 or above. These include China (Hong Kong), with a Median Multiple of 20.9, New Zealand (Auckland), at 9.0 and Australia at 6.9). The trend in annual major housing market Median Multiples is shown in Figure 3. Ireland and Singapore are the only nations with no severely unaffordable major housing markets in this year's *Survey* (Table 4).

Nation	Affordable (3.0 & Under)	Moderately Unaffordable (3.1-4.0)	Seriously Unaffordable (4.1-5.0)	Severely Unaffordable (5.1 & Over)	Total	Median Market
Australia	0	0	0	5	5	6.9
Canada	0	3	1	2	6	4.3
China: Hong Kong	0	0	0	1	1	20.9
Ireland	0	0	1	0	1	4.8
New Zealand	0	0	0	1	1	9.0
Singapore	0	0	1	0	1	4.6
United Kingdom	0	1	13	7	21	4.8
United States	9	25	8	13	55	3.9
TOTAL	9	29	24	29	91	4.4

Most Affordable Major Housing Markets:

The 10 affordable major housing markets are all in the United States (Table 5). Pittsburgh and Rochester are the most affordable, with a Median Multiple of 2.6. Oklahoma City is third most affordable, with a Median Multiple of 2.7. Buffalo, Cincinnati, Cleveland and St. Louis have a Median Multiple of 2.8. Indianapolis (2.9) and Detroit (3.0) also are rated affordable. There is a three-way tie for 10th most affordable, with Columbus, Grand

Affordability Rank	Nation	Metropolitan Market	Median Multiple
1	U.S.	Pittsburgh, PA	2.6
1	U.S.	Rochester, NY	2.6
3	U.S.	Oklahoma City, OK	2.7
4	U.S.	Buffalo, NY	2.8
4	U.S.	Cleveland, OH	2.8
4	U.S.	St. Louis, MO-IL	2.8
8	U.S.	Indianapolis, IN	2.9
9	U.S.	Detroit, MI	3.0
10	U.S.	Columbus, OH	3.1
10	U.S.	Grand Rapids, MI	3.1
10	U.S.	Louisville, KY-IN	3.1



Rapids and Louisville having moderately unaffordable Median Multiples of 3.1. All of these markets have liberal land use regulation.

Least Affordable Major Housing Markets: The severely unaffordable major markets include all in Australia (5), New Zealand (1) and China (1). Two of Canada's six markets are severely unaffordable. Seven of the 21 major markets in the United Kingdom, and 13 of the 55 major markets in the United States are severely unaffordable.

The 29 severely unaffordable major housing markets are shown in Table 7. Hong Kong has a Median Multiple of 20.9, the least affordable Median Multiple yet recorded. For the ninth year in a row, Hong Kong has the worst housing affordability in the *Demographia International Housing Affordability Survey*.

Vancouver displaced Sydney as the second least affordable major housing market, with a Median Multiple of 12.6. Sydney now ranks third least affordable, with an 11.7 Median Multiple.

Housing Affordability: 2004-2018
MAJOR MARKETS (1,000,000+ POPULATION)

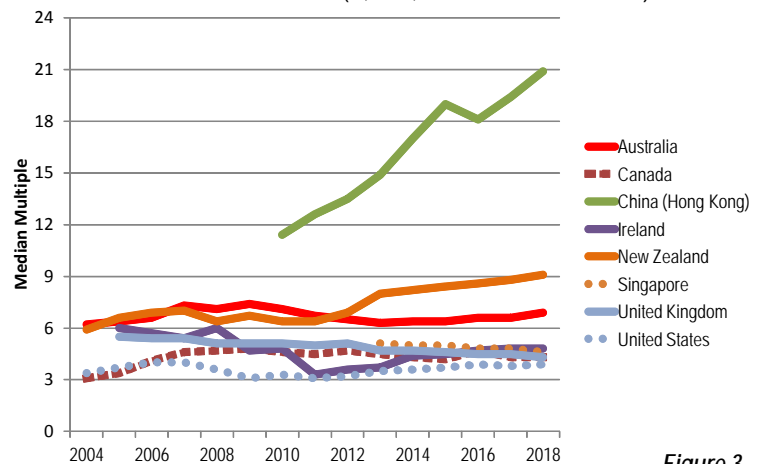


Figure 3

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
63	U.K.	Birmingham & West Midlands	5.2	78	Australia	Adelaide, SA	6.9
63	U.S.	Portland, OR-WA	5.2	79	U.K.	Bournemouth & Dorset	7.3
65	U.S.	Boston, MA-NH	5.3	80	U.S.	San Diego, CA	7.8
66	U.S.	Denver, CO	5.5	81	Canada	Toronto, ON	8.3
66	U.S.	New York, NY-NJ-PA	5.5	81	U.K.	London (Greater London Authority)	8.3
68	U.S.	Riverside-San Bernardino, CA	5.6	83	U.S.	Honolulu, HI	8.6
68	U.S.	Sacramento, CA	5.6	84	U.S.	San Francisco, CA	8.8
68	U.S.	Seattle, WA	5.6	85	N.Z.	Auckland	9.0
71	Australia	Perth, WA	5.7	86	U.S.	Los Angeles, CA	9.2
71	U.K.	Leicester & Leicestershire	5.7	87	U.S.	San Jose, CA	9.4
71	U.S.	Miami, FL	5.7	88	Australia	Melbourne, VIC	9.7
74	Australia	Brisbane, QLD	6.3	89	Australia	Sydney, NSW	11.7
75	U.K.	Plymouth & Devon	6.4	90	Canada	Vancouver, BC	12.6
76	U.K.	Bristol-Bath	6.7	91	China	Hong Kong	20.9
77	U.K.	London Exurbs (E & SE England)	6.8				

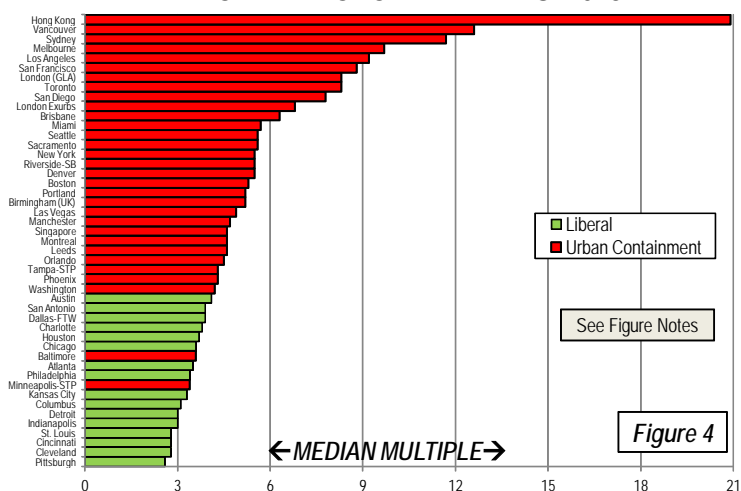


The least affordable 10 in major market housing affordability also includes Melbourne (9.7), San Jose (9.4), Los Angeles (9.2), Auckland (9.0),²⁵ San Francisco (8.8), Honolulu at 8.6, along with Toronto and London (Greater London Authority) which are tied at 10th least affordable, with a Median Multiple of 8.3. The severely unaffordable major housing markets are shown in Table 6. Virtually all of the severely unaffordable major markets have urban containment.

The housing affordability performance and general regulatory structure (urban containment or equivalent versus liberal land use policy) is illustrated for the largest markets in Figure 4.

Four of the six markets rated by the [UBS Global Real Estate Bubble Index 2018](#) as having the greatest bubble risk are included in the *15th Annual Demographia International Housing Affordability Survey*, each with severely unaffordable ratings. This includes Hong Kong (#1), Toronto (#3), Vancouver (#4), and London (#6).²⁶ Major market data is summarized in Schedule 1, with additional information in Schedule 3.

Housing Affordability & Land Regulation 2+ MILLION METROPOLITAN AREAS: 2018



2.2: All Housing Markets

Among all 309 markets, the United States has the most affordable housing with a national Median Multiple of 3.5. Ireland's Median Multiple is 3.7 and Canada is third with a 4.0 rating. Each of these is moderately unaffordable. Singapore (4.6) and the United Kingdom (4.8) are rated seriously unaffordable. The least affordable markets are China (Hong Kong), at 20.9, Australia (5.7) and New Zealand (6.5), each severely unaffordable (Figure 5).

Among all markets, 71 are affordable (Median Multiple of 3.0 or less). The affordable markets are in Australia (1), Canada (12), Ireland (2), and the United States (56). There are no markets in Australia, China (Hong Kong), New Zealand, Singapore or the United Kingdom.

Table 7
All Housing Markets: 10 Most Affordable

Rank	Nation	Metropolitan Market	Median Multiple
1	Canada	Cape Breton, NS	2.1
2	Canada	Fort McMurray, AB	2.2
2	U.S.	Rockford, IL	2.2
2	U.S.	Utica-Rome, NY	2.2
2	U.S.	Youngstown, OH-PA	2.2
6	Canada	Moncton, NB	2.3
6	U.S.	Davenport, IA-IL	2.3
6	U.S.	Peoria, IL	2.3
6	U.S.	Syracuse, NY	2.3
10	Canada	Fredericton, NB	2.4
10	U.S.	Erie, PA	2.4
10	U.S.	Lansing, MI	2.4

²⁵ Auckland's higher Median Multiple in 2018 is principally due to a restatement of median household incomes by Statistics New Zealand. See Section 3.5.

²⁶ Munich and Amsterdam are also rates in the most at-risk six by UBS.



Canada has four of the nine most affordable markets, including the first and second most affordable, Cape Breton, NS and Fort McMurray, AB. The United States has eight markets among the 12 ranked in the top 10 (Table 7).

There are 93 moderately unaffordable markets (Median Multiple of 3.1 to 4.0) and 66 seriously unaffordable markets (Median Multiple of 4.1 to 5.0). A total of 79 markets are severely unaffordable, with a Median Multiple of 5.1 or higher.

Among the 79 severely unaffordable markets, 28 are in the United States, 17 in Canada, 16 in Australia, 11, six in New Zealand and one in China.

Among the 10 least affordable housing markets, seven are major housing markets. The least affordable 10 also includes California's Santa Cruz, at 9.6 and Tauranga-Western Bay of Plenty in New Zealand, at 9.1. All of the other least affordable metropolitan areas were major markets (Table 8).

Table 9 summarizes housing affordability ratings by nation for all 309 markets. The markets are ranked by housing affordability in Schedule 2 and listed alphabetically in Schedule 3.

National Housing Affordability: 2018

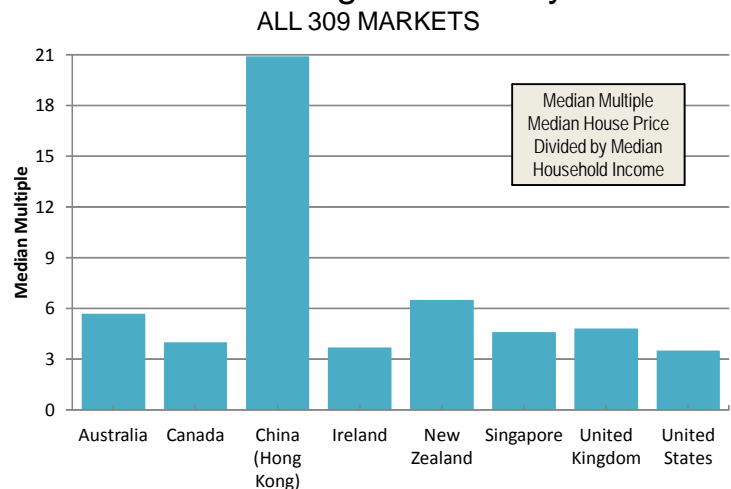


Figure 5

Rank	Nation	Metropolitan Market	Median Multiple
300	U.S.	San Francisco, CA	8.8
301	N.Z.	Auckland	9.0
302	N.Z.	Tauranga-Western Bay of Plenty	9.1
303	U.S.	Los Angeles, CA	9.2
304	U.S.	San Jose, CA	9.4
305	U.S.	Santa Cruz, CA	9.6
306	Australia	Melbourne, VIC	9.7
307	Australia	Sydney, NSW	11.7
308	Canada	Vancouver, BC	12.6
309	China	Hong Kong	20.9

Nation	Affordable (3.0 & Under)	Moderately Unaffordable (3.1-4.0)	Seriously Unaffordable (4.1-5.0)	Severely Unaffordable (5.1 & Over)	Total	Median Market
Australia	1	1	5	16	23	5.7
Canada	12	16	5	17	50	4.0
China (Hong Kong)	0	0	0	1	1	20.9
Ireland	2	2	1	0	5	3.7
New Zealand	0	0	2	6	8	6.5
Singapore	0	0	1	0	1	4.6
United Kingdom	0	4	18	11	33	4.8
United States	56	70	34	28	188	3.5
TOTAL	71	93	66	79	309	4.0



3: HOUSING AFFORDABILITY IN 2018: NATIONAL SUMMARIES

The housing affordability situation is summarized by nation below. The housing affordability data for each housing market is ranked in Schedule 1 for the major markets and Schedule 2 for all markets. Schedule 3 lists all markets, alphabetically, with additional data.

3.1: Australia

Again, as in each of the previous 14 *Demographia International Housing Affordability Surveys*, all of Australia's five major housing markets are severely unaffordable (Figure 6). The major housing market Median Multiple is a severely unaffordable 6.9 with only Hong Kong being less affordable.

However, nearly all of Australia's major markets have experienced [house price reductions](#) or relative price stagnation over the past year. [An OECD publication](#) expressed the following view of these developments (December 2018):

“Australia’s housing market is a source of vulnerability. Prices have more than doubled in real terms since the early 2000s and household debt has surged. The market has started to cool over the last year, with prices falling most notably in Melbourne and Sydney. So far, data point to a soft landing without substantial consequence for the overall economy. Nevertheless, risk of a hard landing remains.”

Even so, housing affordability remains severely unaffordable in all of the major markets, and by a substantial margin in Sydney and Melbourne. Despite [what has been called the largest Sydney price reduction in 35 years](#), house prices relative to incomes are more than double the rate of the early 1980s. In Sydney and Melbourne, median income households need at least three years’ more income to pay for the median priced house than in 2004, when the first *Survey* was published.

Major Markets: Sydney is again Australia’s least affordable market, with a Median Multiple of 11.7, and ranks third worst overall, trailing Hong Kong.

Sydney is again the third least affordable market, with a 11.7, while Melbourne is fourth least affordable at 9.7

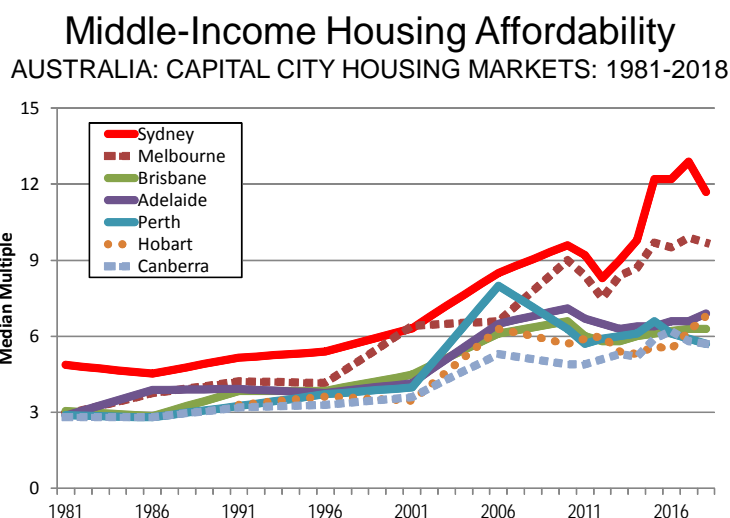


Figure 6



Melbourne has a Median Multiple of 9.7 and is the fourth least affordable major housing market internationally. Only Hong Kong, Vancouver, and Sydney are less affordable than Melbourne. Adelaide has a severely unaffordable 6.9 Median Multiple and is the 16th least affordable of the 91 major markets. Brisbane has a Median Multiple of 6.3 and is ranked 18th least affordable, while Perth, with a Median Multiple of 5.7 is the 24th least affordable major housing market in this year's *Survey*.

Other Housing Markets: Overall, Australia's housing markets have a severely unaffordable Median Multiple of 5.9. The most affordable markets are moderately affordable, Gladstone, Queensland at 3.2 and Rockhampton, Queensland at 3.9. There are no affordable or moderately affordable markets in Australia. Overall 16 markets in Australia are rated severely unaffordable. The least affordable are the Sunshine Coast, Queensland (8.7) and the Gold Coast, Queensland (8.4).

Historical Context: Australia's generally unfavorable housing affordability is in significant contrast to the broad affordability that existed before implementation of urban containment (called "urban consolidation" in Australia). As is indicated in Figure 2 the price-to-income ratio in Australia was below 3.0 in the late 1980s. All of Australia's major markets have urban containment policy and all have severely unaffordable housing.

3.2: Canada

House prices have been rising strongly ahead of income in Canada. A 2016 Frontier Centre for Public Policy research report reviewed the strongly rising house prices relative to incomes in 35 markets since 2000.²⁷ Both international and national organizations have expressed concern about the damage that Canada's rising prices (some suggest a "housing bubble") could do to the national economy.²⁸ According to the 2018 Third Quarter [Canada Mortgage and Housing Corporation](#) (CMHC) assessment: "Housing markets for Vancouver, Victoria, Toronto and Hamilton remain highly vulnerable because of the detection of price acceleration and overvaluation. Most notably, high evidence of overvaluation is still observed in Vancouver, Victoria and Toronto where house prices remain higher than levels supported by economic and demographic fundamentals."

Vancouver's Median Multiple is the third worst in Survey history. Only Hong Kong and Sydney have been more unaffordable

Vancouver has the second least affordable housing among the major markets, with a Median Multiple of 12.6, trailing only Hong Kong.

Major Housing Markets: Canada has two of the 10 least affordable major markets in the *Survey* (Figure 7).

²⁷ Wendell Cox and Ailin He (2016), *Canada's Middle-Income Housing Affordability Crisis*, Frontier Centre for Public Policy, <https://fcpp.org/wp-content/uploads/2016/06/Cox-He-Middle-Income-Housing-Crisis.pdf>.

²⁸ See, for example, Organisation for Economic Co-operation and Development, "OECD Economic Surveys Canada," June 2014. [http://www.oecd.org/eco/surveys/Overview%20CANADA 2014.pdf](http://www.oecd.org/eco/surveys/Overview%20CANADA%202014.pdf). International Monetary Fund, "2014 Article IV Consultation – Staff Report; Staff Statement; and Press Release," *IMF Country Report No. 15/22*, January 2015. <https://www.imf.org/external/pubs/ft/scr/2015/cr1522.pdf>. Bank of Canada, "Financial System Review – December 2015." <http://www.bankofcanada.ca/2015/12/fsr-december-2015/>.



Vancouver has the second least affordable housing among the major markets, with a Median Multiple of 12.6, trailing only Hong Kong. This is the third worst housing affordability for a major market in the 15 years of the *Demographia International Housing Affordability Survey*. The 2018 [UBS Global Real Estate Bubble Index](#) rates Vancouver as having the fourth worst housing "bubble risk" in the world.

By the time of the first *Demographia International Housing Affordability Survey*, Vancouver had already developed severely unaffordable housing, which has been associated with its urban containment policy, adopted more than four decades ago. Vancouver has experienced significant housing affordability deterioration among major markets, with its Median Multiple deteriorating from 5.3 to 12.6, equivalent to 7.3 years of pre-tax median household income.

While a British Columbia foreign buyers tax has been associated with a moderation of house prices in Vancouver, reductions have been concentrated in higher cost houses, with middle market housing affordability having continued some deterioration.

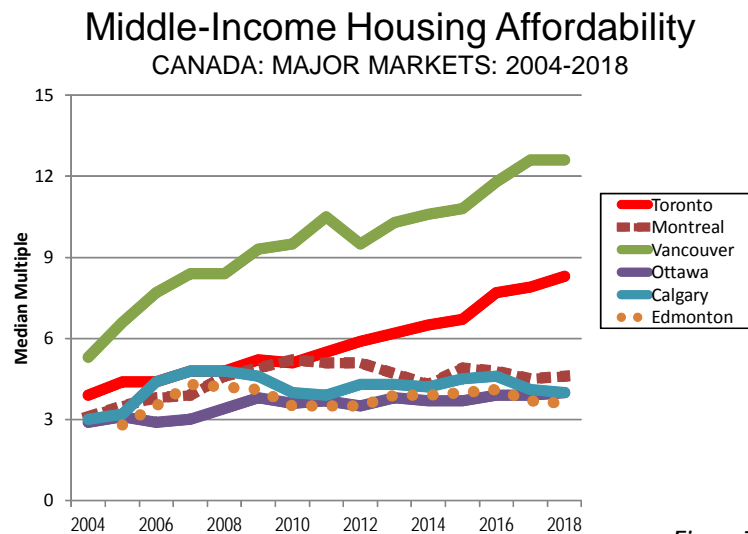


Figure 7

Toronto also has a severely unaffordable housing, with its Median Multiple deteriorating to 8.3, compared 3.9 in the first *Survey* (2004), a more than doubling of middle-income house prices relative to incomes. The 2018 [UBS Global Real Estate Bubble Index](#) rates Toronto as having the third worst housing "bubble risk" in the world.

Like in British Columbia, the province of Ontario has imposed a foreign buyers tax. Since that time, Toronto's house price hyper-inflation has stopped and prices are much more stable. However, much of the impact is evident in the highest market segments. Despite this demand-side strategy, housing affordability in Toronto has continued to deteriorate at the middle of the market.

Despite this demand-side strategy, housing affordability in Toronto has continued to deteriorate at the middle of the market..

In Toronto, the housing affordability loss has been associated with the middle-2000s adoption of urban containment policy ("Places to Grow"), including a Green Belt and other draconian restrictions. A *Survey* co-author predicted would lead to much worsened housing affordability.²⁹

²⁹ Wendell Cox (2004), *Myths about Urban Growth and the Toronto Greenbelt*, Fraser Institute.



Montréal has seriously unaffordable housing (4.6), having deteriorated from a moderately unaffordable 3.1 in 2004. Calgary has a moderately unaffordable Median Multiple of 4.0, which is down somewhat, due to the economic reversals in the petroleum industry of Alberta. Even so, the present Median Multiple is a significant deterioration from an affordable 3.0 in 2004.

Ottawa-Gatineau is also moderately unaffordable, at 4.0, having deteriorated from an affordable 2.9 in 2004. Canada's most affordable major market is Edmonton (3.6), which is rated as moderately unaffordable. This is a deterioration from the affordable 2.8 Median Multiple in 2005, when Edmonton's was first covered in the *Survey*.

Housing Choice Denied: A recent poll by [Sotheby's Real Estate International](#) found that a large percentage of households prefer detached housing, as has historically been the case in Canada. Yet budgetary pressures have been forcing many to purchase smaller houses that are less desired, principally attached housing (such as row houses and semi-detached) and condominiums. In Vancouver, Toronto, Montréal, and Calgary from 92 to 97 percent of young urban households were found to prefer "ground-oriented housing" (detached or attached housing). Each of these four metropolitan areas have urban containment.

Share of Median Pre-Tax Income Required
AVERAGE PRICED HOUSE: VANCOUVER & TORONTO AREAS

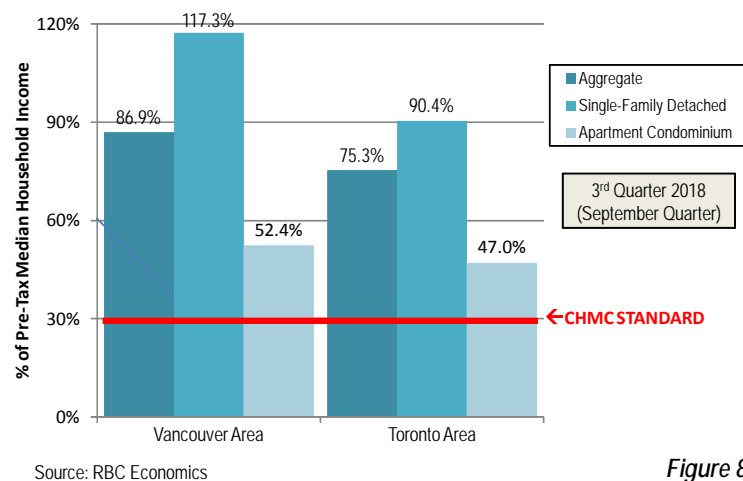


Figure 8

Ryerson University researchers have responded to the serious housing affordability concerns by proposing a substantial expansion of the lower density ground oriented housing (detached and attached) preferred by the market.³⁰ Current policy is skewed against the development of such housing.

The RBC Economics Affordability Measure: The [RBC Economics Housing Affordability Report](#) for the third quarter of 2018 illustrates the financial impossibilities faced by middle-income households in Canada's severely unaffordable markets. RBC found that the median income Vancouver household would need 117 percent of its pre-tax gross income for monthly payments on the average priced single detached house (a typical house in Canada), and the Toronto household 90 percent. In both Vancouver and Toronto, the cost of even the least expensive housing, apartment

³⁰ Frank Clayton (2017), "Countering Myths about Rising Ground-Related Housing Prices in the GTA: New Supply Really Matters," Centre for Urban Research and Land Development Ryerson University 2017



condominiums 52 percent and 47 percent respectively, well above the [Canada Mortgage and Housing Corporation 30 percent housing affordability guideline](#) (Figure 8).

Overall, the median income Canadian household must pay 54 percent of its income in ownership costs (all types of housing combined), and approximately 45 percent in Montréal and Calgary. Among smaller markets, Victoria ranks by far the worst, where the median income household requires 68 percent of its income to pay for the average priced house.

The two most affordable markets are in Canada, Cape Breton (NS), and Fort McMurray (AB).

Other Housing Markets: The overall Median Multiple for the 50 markets in Canada is a moderately unaffordable 4.0. As in California (Section 3.8), severely unaffordable housing is spreading from the major markets to nearby markets. Severely unaffordable housing has spread from Vancouver to the British Columbia markets of Victoria (8.5), the Fraser Valley (8.2), Nanaimo (8.0), Comox Valley (7.9), Kelowna (7.0), and Chilliwack (6.7).

Markets in the extended Toronto area (the “Greater Golden Horseshoe”) have become severely unaffordable, including Hamilton (6.6), Guelph (6.3), Kitchener-Waterloo (6.0), Peterborough (5.8), Cambridge (5.7), Oshawa (5.7), Barrie (5.5), St. Catharines-Niagara (5.5), and Brantford (5.2).

Outside of markets influenced by the urban containment policies of Ontario and British Columbia, Canada’s house prices are much more affordable. The two most affordable markets are in Canada, Cape Breton (NS), at a Median Multiple of 2.1 and Fort McMurray (AB), at 2.2. Moncton, NB, which was the most affordable market in last year’s *Survey* was sixth most affordable at 2.3. Fredericton, NB ranked 10th, with a Median Multiple of 2.4.

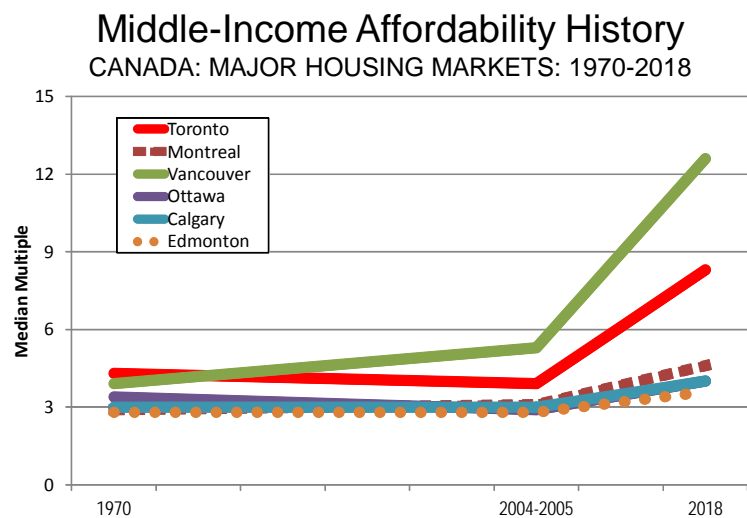


Figure 9

Historical Context: Until recently, most of Canada had been characterized by house prices that were affordable. From the early 1970s to the first *Demographia International Housing Affordability Surveys* (2004 and 2005 housing affordability was maintained or improved in the major markets (Figure 9). The exception was Vancouver, with its long-standing urban containment policy. Since the middle 2000s, rapidly escalating prices have been associated with wider adoption of urban containment policies.



3.3: China (Hong Kong)

Hong Kong is China's only market in the *Demographia International Housing Affordability Survey*. Hong Kong has the least affordable housing for the ninth straight year, with a Median Multiple of 20.9. This is the highest Median Multiple ever reported in the *Survey*, having risen from 19.4 last year.

Hong Kong's Median Multiple of 20.9 is the highest in the history of the Demographia Survey

However, since the period covered by this *Survey* that house prices have declined. [Some real estate experts](#) are projecting price drops of from 15 percent to 25 percent in 2019. While that would be a significant decline, Hong Kong's housing would continue to be severely unaffordable by a large margin.

There is an increasing concern about housing affordability. Hong Kong's government joins Singapore and New Zealand in intensifying attention on improving housing affordability by strengthening its management of the land and housing market. At the end of 2018 the [Task Force on Land Supply](#) proposed designation or reclamation of significant new areas for housing development, in the hope of improving both housing supply and housing affordability.

The [UBS Global Real Estate Bubble Index](#) rates Hong Kong as having the world's worst housing bubble risk.

Historical Context: Hong Kong's housing affordability was far better in the early 2000's. According to [The Chinese University of Hong Kong's' Quality of Life Index](#) the price-to-income ratio rose from 4.6 in 2002, based on a 39.9 square meter apartment (430 square feet). Academic research has indicated that Hong Kong's house prices have been driven higher by restrictive land-use regulation.³¹

3.4: Ireland

Overall, Ireland's Median Multiple is a moderately unaffordable 3.7, which is the second best housing affordability, following the United States.

Major Housing Market: Dublin is Ireland's only major metropolitan area market and has a seriously unaffordable Median Multiple, of 4.8. This is up nearly 50 percent from 3.3 in 2011.

Other Housing Markets: Galway (4.2) is seriously unaffordable and Cork (3.7) seriously unaffordable. Waterford (2.7) and Limerick (2.6) are rated affordable.

Historical Context: As is indicated in Figure 2, Ireland had a price-to-income multiple of less than 3.0 in the early 1990s and remained affordable to the late 1990s.

³¹ C. M. Hui & F. K. Wong (2003), "Dynamic Impact of Land Supply on Population Mobility with Evidence from Hong Kong," http://www.prrs.net/Papers/Hui_Dynamic_impact_of_land_supply_on_population_mobility.pdf.



3.5: New Zealand

New Zealand's housing affordability has a severely unaffordable Median Multiple of 6.5. Recent Median Multiple trends have been influenced by government restatement of median income data.³²

Major Housing Market: Auckland, New Zealand's only major housing market has a severely unaffordable 9.0 Median Multiple. Housing affordability has deteriorated from a Median Multiple of 5.9 in the first *Survey* (2004), thus adding the equivalent of three years in pre-tax median household income to the house prices. Over the past year, Auckland's house prices have been stable, with the Median Multiple increase resulting from the household income restatement described above. Auckland³³ is the seventh least affordable among the 91 major housing markets, and has been severely unaffordable in all 15 *Demographia International Housing Affordability Surveys*.

Auckland has been severely unaffordable in all 15 Demographia Surveys

Other Housing Markets: There is severely unaffordable housing in the two largest markets outside Auckland. Christchurch has a Median Multiple of 5.4, while Wellington is at 6.3.

Housing Affordability and Public Policy: Outside Singapore, New Zealand is the only nation in the *Survey* that emphasizing public policy priority to restore and maintain middle-income housing affordability.

In New Zealand, as in Australia, housing had been affordable until approximately a quarter century ago. However, urban containment policies were adopted across the country, and consistent with the international experience, housing became severely unaffordable in all three of New Zealand's largest housing markets, Auckland, Christchurch and Wellington (Figure 10).

Meanwhile, public opinion placed the issue of housing affordability to the top of the policy agenda in the last three national elections. That concern continues to be dominant according to the latest [IPSOS New Zealand Issues Monitor](https://www.ipsos.com/new-zealand/ipsos-new-zealand-issues-monitor) (October 2018), with 45 percent saying that "Housing/Price of Housing" is the issue of greatest concern. Poll respondents were asked to identify the three most important issues, and the cost of living rated third, which is to be expected given the enormous influence of housing costs on the financial health of households.

³² The national median household income was restated to show a 25 percent increase, instead of a 10 percent increase from the census year of 2013 to 2017. See: "Household income and housing-cost statistics: Year ended June 2017 corrected" (December 7, 2017). <https://www.stats.govt.nz/news/household-income-and-housing-cost-statistics-year-ended-june-2017-corrected>. A later downward revision of the 2017 income figure resulted in a slightly lower 2018 income than had been previously reported for 2017.

³³ The city of Auckland governs virtually the entire metropolitan area (housing market area or labor market area). Auckland and Honolulu are unique among metropolitan areas of 1,000,000 + population in being governed by a single local authority.



The new Labour Party led coalition government unveiled a focused housing affordability program, intending to increase the housing supply throughout Auckland, including both urban fringe and infill development.

The Labour Party's Urban Growth agenda calls for intensified residential development, both greenfield and infill. The Auckland urban containment boundary is to be abolished. Recently, the government and the city of Auckland agreed to establish a non-government [debt financing mechanism to facilitate development](#) of a 9,000 home greenfield development. The government intends to establish an [Urban Development Authority](#), which would provide means for communities and developers to finance infrastructure for new housing development.

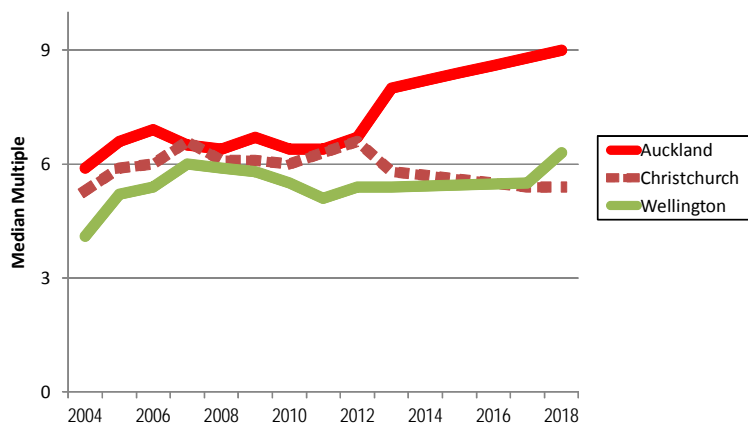
In his *Introduction: Avoiding Dubious Urban Policies* to this *Survey*, former World Bank principal urban planner Alain Bertaud says that “After the government has successfully passed these reforms, the international community will watch with great interest the impact it will have on Auckland’s PIR (Median multiple) in the next few years. It is hoped that the example of Auckland will create a blueprint that could be used in other high PIR cities.”

Labour Party’s Urban Growth agenda calls for intensified residential development, both greenfield and infill.

These developments build on other recent developments, especially a Productivity Commission of New Zealand report, which found that land use authorities have a responsibility to provide “capacity to house a growing population while delivering a choice of quality, affordable dwellings of the type demanded”³⁵

Consistent with that finding, the Productivity Commission proposed a measure that would automatically expand the supply of greenfield land when housing affordability targets are not met. The Commission said, “Where large discontinuities emerge between the price of land that can be developed for housing and land that cannot be developed, this is indicative of the inadequacy of development capacity being supplied within the city.” The Productivity Commission expansion of greenfield land for development where the difference between land prices on either side of an urban containment boundary become too great.³⁶

Middle-Income Housing Affordability NEW ZEALAND: 3 LARGEST MARKETS: 2004-2018



2013-2017 Scaled based on Statistics New Zealand income restatement.

Figure 10

³⁵ Productivity Commission of New Zealand, “Using Land for Housing.”

³⁶ The Productivity Commission did not propose a standard.



Historical Context: As indicated in Figure 2, New Zealand's price-to-income ratio was below 3.0 in the early 1990s.

3.6: Singapore

Singapore is particularly challenged by its borders, having among the most land constrained geography of any major metropolitan area in the world. Singapore is an island smaller than the land area of the municipalities (not metropolitan areas) of Kansas City, Missouri or Calgary, Alberta. Singapore has no mainland periphery within its national jurisdiction and, as a result, does not have the luxury of a competitive suburban market for housing land that would keep housing affordable.³⁷ While the topographies are different, Singapore has three-quarters less gross land than Hong Kong and three quarters as many residents.

With this challenge housing has been a principal national priority for Singapore since independence, in the middle 1960s. At that time, Singapore had a gross domestic product per capita [more than 85 percent below that of the United States](#). Singapore faced a serious housing crisis and there were larger squatter settlements. The government acted by establishing a pro-active housing policy led by the newly established Housing and Development Board (HDB). The purpose of the policy was summarized in the 1964 *HDB Annual Report*, to:

*...encourage a property-owning democracy in Singapore and to enable Singapore citizens in the lower middle income group to own their own homes*³⁸

Since that time, Singapore has made extraordinary economic progress, which the [World Bank reports](#) has a national GDP per capita trailing only Qatar and Luxembourg (2018).

The Singapore housing market is dominated by a publicly sponsored construction program, which sells houses to consumers (which though still called "public housing" are privately owned). The result is a vibrant competitive housing market. According to the Housing and Development Board (HDB), which administers the program, 81 percent of residents live in HDB housing.³⁹ Further, Singapore has an overall 88 percent rate of home ownership, the highest of any country in the *Survey*. Buyers are free to sell their own houses as in other nations with private ownership. Further, there are restrictions on foreign ownership, which may have shielded Singapore from the heightened cost escalation occurring from globalization of the real estate markets.

Singapore has avoided the rampant housign affordability deterioration typical of highly regulated markets.

³⁷ Faced with a similar situation, treaties between Switzerland, France and Germany effectively create international metropolitan areas (labor markets) by the use of [cross border commuting permits](#) in the Basel and Geneva areas.

³⁸ *Housing and Development Board 1964 Annual Report*. <http://www.globalurban.org/GUDMag07Vol3Iss1/Yuen.htm>.

³⁹ Housing Development Board, *Key Statistics for FY 2017/2018*, <http://www10.hdb.gov.sg/ebook/AR2018/key-statistics.html>.



HDB is offering new houses at considerable discounts from the resale values. For example, offerings for the most expensive 4-room houses that are most typical were at a moderately unaffordable Median Multiple of 3.8 in August of 2018. At a development in the middle of the market, the same house had a Median Multiple of 3.2.⁴⁰ Additional grants can reduce prices even beyond these discounts. The availability of this favorably priced new housing should lead to improved housing affordability.

Comparison to Other Highly Regulated Markets: Singapore has avoided the rampant housing affordability deterioration typical of highly regulated markets. This includes markets that have followed the British urban containment model, which can be largely traced to the Town and Country Planning Act of 1947. According to the [UBS Global Real Estate Bubble Index](#), “there has been no difference between house price and income growth in Singapore over the last 30 years.”

Singapore’s housing market has been suggested as a model for China’s Xiongan New Area (special economic zone) at the core of the Jingjinji, the city complex planned to economically integrate Beijing, Tianjin and northern Hebei. According to the *People’s Daily* publication *Global Times*, central government officials have indicated that Xiongan will “very likely follow” the Singapore model to ensure housing affordability. This could assist in managing the housing market to avoid the housing affordability problems that have plagued China’s largest cities in recent years.⁴¹

Historical Context: Historical price-to-income multiple data has not been identified for Singapore.

3.7: United Kingdom

The United Kingdom has a seriously unaffordable Median Multiple of 4.8 for both major markets and all markets. The nation has had a chronic housing shortage, which seems likely to continue. This decade, the United Kingdom is experiencing its strongest population growth since World War II.⁴² Yet, according to a projection by the [Centre for Policy Studies](#), house building will be the lowest since World War II.

Major Housing Markets: All of the United Kingdom’s 21 major housing markets are either severely unaffordable or seriously unaffordable, except for Glasgow, which at 4.0 is moderately unaffordable.

London (the Greater London Authority, inside the greenbelt) is the least affordable market, with a severely unaffordable Median Multiple of 8.3 and is rated the 10th least affordable major market in the *Survey*. In 2005, London had a Median Multiple of 6.9, indicating that house prices have increased by the equivalent of 1.4 years of pre-tax median income since that time. The [UBS Global Real Estate Bubble Index](#) rates London as having the world’s sixth worst housing bubble risk.

⁴⁰ Punggol <https://www.srx.com.sg/hdb/bto/punggol-point-woods-cove-2812>

Yishun <https://www.hdb.gov.sg/cs/infoweb/press-releases/28082018-bto-launch-aug>

⁴¹ “Xiongan very likely to follow example of Singapore in land management: advisor” (October 23, 2017). [Global Times](#).

⁴² Annual growth rate 2011 to 2017. Calculated from ONS data.



Six other major markets are severely unaffordable, including Bournemouth & Dorset, at 7.3, the London Exurbs (East and Southeast England, virtually all outside the London greenbelt) at 6.8, Bristol-Bath at 6.7, Plymouth & Devon at 6.4, Leicester & Leicestershire at 5.7, and Birmingham & the West Midlands at 5.2.

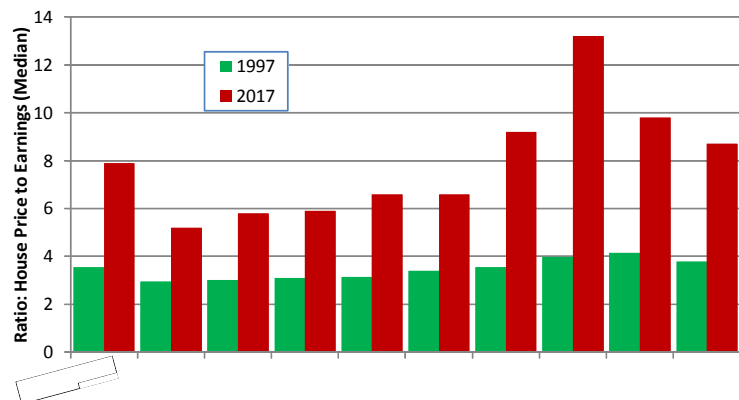
Other Housing Markets: Among the 33 housing markets in the United Kingdom, none are affordable. Only three smaller markets are moderately unaffordable, Aberdeen (4.0), Dundee at 3.9 and Falkirk at 3.9. Outside the major housing markets, there are four severely unaffordable housing markets, including Swindon & Wiltshire (6.2), Northampton & Northamptonshire (6.2), Warwickshire (6.1), and Telford & Shropshire (5.1).

Britain: "originator of the ideas and mechanisms of planning which have contributed so much to the problem: Green Belts and planning by unpredictable political processes"

Urban Containment and Housing Affordability in the UK: Various analyses have documented the association between UK's urban containment policies and its excessively high house prices. For example, the Blair government commissioned reports by Kate Barker (2004 and 2006), and then a member of the Monetary Policy Committee of the Bank of England, which attributed much of the nation's housing affordability loss to its urban containment policies.

Sir Peter Hall, et al, expressed concerns about the housing affordability losses associated with urban containment in the early 1970s.⁴³ A report by the International Monetary Fund⁴⁴ indicated the need to alleviate supply-side constraints, "notably pertaining to planning restrictions..."

Median House Price to Median Earnings
ENGLAND & REGIONS: 1997 TO 2017



Source: Data.gov.uk & Office for National Statistics

Figure 11

In their *Introduction (Measuring Affordability: Alternative Measures)* to the [14th Annual Demographia International Housing Affordability Survey](#), Felipe Carozzi, Paul Cheshire and Christian Hilber of the London School of Economics refer to Britain as the cradle of housing unaffordability, and its role as "originator of the ideas and mechanisms of planning which have

⁴³ Hall, Peter Geoffrey, Ray Thomas, Harry Gracey and Roy Drewett. *The Containment of Urban England: The Planning System: Objectives Operations, Impacts*. Vol. 2 Allen and Unwin [for] PEP, 1973.

⁴⁴ International Monetary Fund, Country Report: United Kingdom: Selected Issues, <http://www.imf.org/external/pubs/ft/scr/2015/cr14234.pdf>, 2015.



contributed so much to the problem: Green Belts and planning by unpredictable political processes!”

Historical Context: The Town and Country Planning Act (1947) enacted the first important urban containment restrictions and has been a model for such restrictions around the world. Urban containment policy was substantially strengthened during the 1990s and early 2000s. All markets have urban containment policy.

As Figure 2 indicates, the price-to-income ratio in the United Kingdom was below 3.0 in the early 1990s (where it remained until after 2000). In the last two decades, house prices have raced ahead of earnings (Figure 11). In London (GLA), house prices are now more than triple that of the price to earnings ratio in 1997. Even in the comparatively depressed North East, house prices rose at 1.75 times earnings, while in all of the regions, house prices were virtually double their two decades ago ratio to earnings.

3.8: United States

Overall, the United States has a moderately unaffordable Median Multiple of 3.5, the best housing affordability in this year’s *Survey*. This has been aided by recent increases that have finally propelled real household incomes⁴⁵ to above late 1990s levels, driven by improved economic growth and record lows in unemployment across all ethnic groups.

Major Housing Markets: The United States has a moderately unaffordable Median Multiple of 3.8 in its major markets. This is the most favorable major market housing affordability in this year’s *Survey*. There are 9 affordable major housing markets in the United States and 13 severely unaffordable markets.

The most affordable major housing markets are Pittsburgh (PA) and Rochester (NY), with a Median Multiple of 2.6, followed by Oklahoma City with a Median Multiple of 2.7. Buffalo (NY), Cleveland (OH), Cincinnati (OH-KY-IN) and St. Louis (MO-IL) all have a Median Multiple of 2.8. Indianapolis (IN) has a Median Multiple of 2.9, followed by Detroit (MI) at 3.0.⁴⁷ Tenth ranked Columbus (OH) has a moderately unaffordable Median Multiple of 3.1. Ohio has three of the most affordable major markets in the *Survey* (Cleveland, Cincinnati and Columbus).

The five major housing markets with the poorest U.S. housing affordability are in California and Hawaii. San Jose (CA), in the San Francisco Bay Area, is the least affordable, with a severely unaffordable Median Multiple of 9.4. This is improved from last year due to strong income growth.

⁴⁵ Federal Reserve Bank of St. Louis, “Real Median Household Income in the United States,” <https://fred.stlouisfed.org/series/MEHOINUSA672N>

⁴⁷ Detroit is often highlighted as a severely depressed area. This characterization principally applies to the city (municipality) of Detroit, which has lost more than 60 percent of its population since 1950. The balance of the metropolitan area, where more than 80 percent of households live has performed well economically. Indeed, overall, including the city of Detroit, [Detroit has the fourth highest standard of living index out of the more than 100 metropolitan areas with more than 500,000 residents](#) (measured in cost of living adjusted pay per job).



Los Angeles (CA) is the second least affordable, with a Median Multiple of 9.2. San Francisco (CA) is the third least affordable, with a Median Multiple of 8.8, while Honolulu (HI) is at 8.6 and San Diego (CA) is at 7.8.

There are eight additional severely unaffordable major housing markets in the United States, including Miami (FL) at 5.7, Seattle (WA), Riverside-San Bernardino (CA), and Sacramento (CA) at 5.6, Denver and New York (NY-NJ-PA) at 5.5, as well as Portland (OR-WA) at 5.2. The housing affordability performance of these metropolitan areas is detailed in Figure 12, and indicates the price volatility typical of such markets.

The Housing Crisis in California:

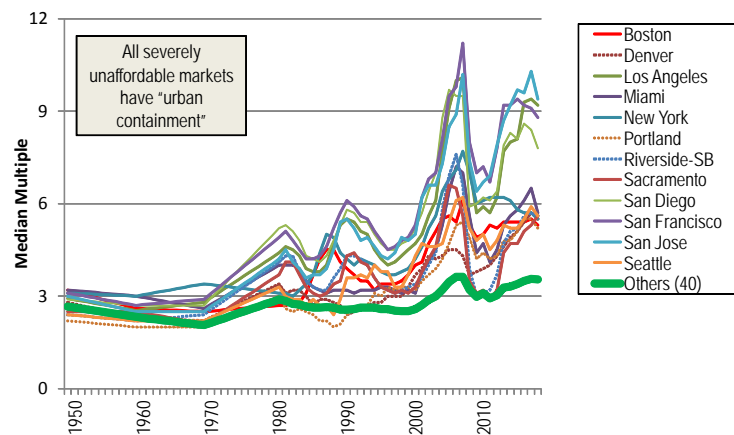
California is home to the most serious housing affordability crisis in the United States. Prospects for improvement appear to be bleak. Already, the new urban fringe housing, which drives housing affordability, is [prohibited or severely limited by state and local policy](#).

At the same time, California has the highest housing cost adjusted poverty rate of any US state. California also has the highest rate of homelessness in the United States.⁵¹ The problem of homelessness has become more severe. Informal [homeless encampments](#) now exist, for example in San Jose and San Francisco, which have the two highest median household incomes in the United States and above average income Los Angeles.

California has the highest housing cost adjusted poverty rate of any US state

The state continues to shed residents, losing a net 700,000 since 2010. The exodus is accelerating, with the state having lost 200,000 in the first four years of the decade and 500,000 in the last four years.⁵² There is also a significant outflow of business investment.⁵³

Severely Unaffordable US Markets History & OTHER MAJOR MARKETS: 1950-2018



See: Notes on Figures

Figure 12

⁵¹ For example, John M. Quigley and Stephen Raphael (2001), "The Economics of Homelessness: The Evidence from North America," *European Journal of Housing Policy* find a relationship between poorly functioning housing markets and greater homelessness.

⁵² Wendell Cox (2018), "California Out-Migration Intensifies, People Move South,"

<http://www.newgeography.com/content/006175-california-out-migration-intensifies-people-move-south>.

⁵³ See Joseph Vranich (2015), "California Companies Head for Greatness - Out of California," *newgeography.com*. Wendell Cox (2018), California Lithium Battery Manufacturer Heads to Appalachia, <http://www.newgeography.com/content/005840-california-lithium-battery-maker-heads-appalachia>.



As is occurring in Canada, markets nearby the severely unaffordable major markets in California are themselves becoming severely affordable, including Riverside-San Bernardino, Sacramento and in the San Joaquin Valley markets of Stockton, Modesto and Merced.

There is an increasing recognition that solving California's housing affordability requires an increase in housing supply. However, proposals thus far are limited to densification within the existing urban footprint, and would not restore the competitive land market on the urban fringe. As a result, most housing that is affordable for middle-income households could not be built. Without the safety value of urban expansion on competitively priced land, California's housing affordability is unlikely to materially improve.

California has the highest housing cost adjusted poverty rate of any US state

Some analysts claim that urban fringe development is impossible because of topographic barriers. The reality is that [all of California's major metropolitan areas](#) have sufficient adjacent land to accommodate a healthy expansion of suburban development. Meanwhile, [California has the highest urban density](#) in the nation, as detached housing peripheral development across the state has been on [much smaller lots \(sections\) than average](#) for the United States.

Other Housing Markets: The most affordable U.S. housing markets in this year's *Survey* are Rockford, Illinois, Utica-Rome, New York and Youngstown, Ohio (2.2). Two markets in Canada are more affordable. Santa Cruz, California, located in the San Francisco Bay Area, is the least affordable market in the United States, with a severely unaffordable Median Multiple of 9.6.

Historical Perspective: The United States had generally affordable housing through much of the period following World War II. The key was tract housing built on competitively priced land in the suburbs, the beginnings of which have been credited to entrepreneurs such as William Levitt, who built "Levittowns" and other similar developments in New York, New Jersey, Pennsylvania, Maryland and Puerto Rico. These communities were copied and improved upon, increasing the number of households able to live a middle-income quality of life. Similar communities emerged from Canada, Australia and New Zealand to other parts of the high income world. More recently, similar trends have been followed in emerging nations, such as Mexico, the Philippines, Chile, Indonesia, Thailand, Malaysia and countries in Central America. Median Multiples in the United States were virtually all below 3.0 until the 1970s and remained at that level in most housing markets until the housing bubble in the early 2000s.

Median Multiples in the United States were virtually all below 3.0 until the 1970s and remained at that level in most housing markets until the housing bubble in the early 2000s.



4: WELL FUNCTIONING CITIES

If planning helps people, they ought to be better off as a result, not worse off.
-Jane Jacobs⁵⁴

There has been significant progress in poverty reduction around the world. According to [Max Roser and Esteban Ortiz-Ospina](#) the world extreme poverty rate dropped from 60 percent in 1970 to less than 10 percent in 2015, as the population in poverty fell by 1.5 billion, while the population not in extreme poverty increased by 5.2 billion.⁵⁵ Obviously, this fortunate development has been accompanied by an unprecedented increase in middle-income households.

Cities: Integral to Prosperity: Cities have been integral to this progress. As the rate of urbanization has increased, poverty rates have declined. There is probably [no more vivid example than China](#) over the past four decades, which has seen its extreme poverty rate [reduced by 85 percent](#), while its rate of urbanization has tripled.

Similar desirable developments in other advancing nations have materially improved the lives of people well beyond the high-income nations where progress began decades ago.

Paradoxically, threats to middle-income standards of living are emerging in some high income world urban areas.

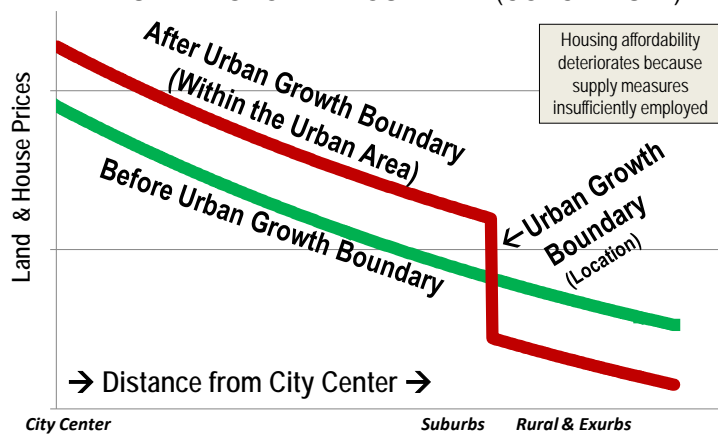
Urban containment, favored in the planning community, tends to force up land prices on the urban periphery, and as a consequence, throughout the urban area.

French economist Thomas Piketty has documented a rising concentration of wealth, to the detriment of middle-income households, which obviously leads to greater poverty. Matthew Rognlie (now of Northwestern University) found that virtually all of this excess wealth concentration has been related to housing.⁵⁶ This reflects the overall upward rate of house prices relative to incomes.

Failure to Account for Land

Markets: Former World Bank principal urban planner Alain Bertaud's new book (See: Introduction: Avoiding Dubious Urban Policies) expresses concern that urban planning generally ignores fundamental economics. Land prices per hectare (acre) are generally at their lowest at the urban periphery,

Regulatory Effect on Land & House Prices WITH URBAN GROWTH BOUNDARY (CONCEPTUAL)



See Figure Notes.

Figure 13

⁵⁴ Jane Jacobs: *The Last Interview*, Melville House (2016), p. 10.

⁵⁵ Max Roser and Esteban Ortiz-Ospina (2018) - "Global Extreme Poverty". <https://ourworldindata.org/extreme-poverty>.

⁵⁶ Matthew Rognlie, "A note on Piketty and diminishing returns to capital," <http://gabriel-zucman.eu/files/teaching/Rognlie14.pdf>



where the city meets the rural or agricultural land of the countryside. Urban containment policy, favored in the planning community, tends to force up land prices on the urban periphery, and as a consequence, throughout the urban area (Figure 13). In the process, housing affordability has deteriorated.

... failure to sufficiently account for urban economics leads to a “costly utopia.”

By severely restricting or even prohibiting expansion to accommodate larger population, urban containment has virtually destroyed the competitive market for land in many urban areas, driving house prices up relative to incomes. According to Bertaud, the failure to sufficiently account for urban economics leads to a “costly utopia.”⁵⁷ This is already evident in diminished standards of living and higher poverty rates in severely unaffordable housing markets. Moreover, a growing body of research associates [strong land use regulation with diminished economic growth](#).⁵⁸

Because housing is the largest household expenditure item, high housing prices can translate on a nearly one-to-one basis into higher overall costs of living and a lower standard of living.

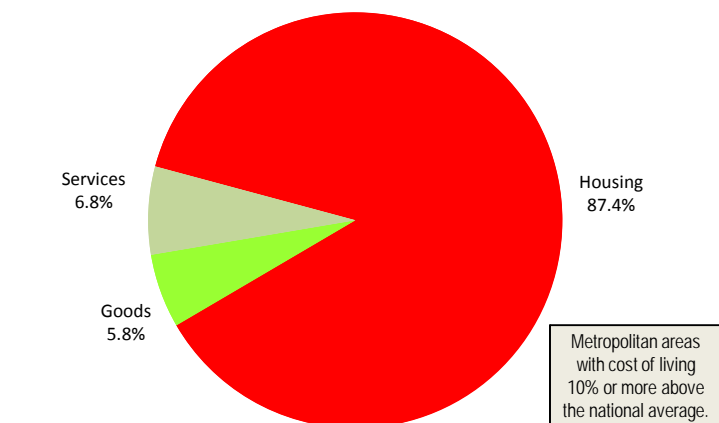
[Nearly all of the difference in cost of living between high cost metropolitan areas and those with average costs is in the cost of housing](#), which has been influenced upward of by urban containment policy (Figure 14).

Nearly all of the difference in cost of living between high cost metropolitan areas and those with average costs is in the cost of housing

Indeed, urban containment and housing affordability appear to be “irreconcilable,” as the title of a paper by London School of Economics Professor Paul Cheshire put it.⁶⁰ While some urban containment programs include mechanisms to expand land availability, virtually none have been flexible enough to preserve housing affordability and the standard of living.

There are proposals for significant densification of urban cores, as a strategy for improving housing affordability. Yet, these proposals

Housing Share of Excess Costs of Living
MOST EXPENSIVE UNITED STATES MARKETS: 2017



Estimated from Bureau of Economic Analysis & American Community Survey Data

Figure 14

⁵⁷ Page 4.

⁵⁸ See for example, Hsieh, Chang-Tai and Enrico Moretti (2015). “Why Do Cities Matter? Local Growth and Aggregate Growth.” The National Bureau of Economic Research. <http://www.nber.org/papers/w21154>.

⁶⁰ Paul Cheshire, “Urban Containment, Housing Affordability and Price Stability – Irreconcilable Goals.” SERC Policy Paper 4, Spatial Economics Research Centre, 2009



often fail to take account of land markets. Densification is not likely to materially improve housing affordability, unless the competitive market for land is restored throughout the metropolitan area, including the periphery. If greenfield development is severely limited, there is likely to be little or no improvement in housing affordability. The importance of restoring a competitive land market is described in the recent New Zealand Treasury Report: “[Competitive Urban Land Markets](#),” (paragraphs 31-39).

Toward Well Functioning Cities: Economists Paul C. Cheshire, Max Nathan and Henry G. Overman of the London School of Economics state the obvious priority: “... [the ultimate objective of urban policy is to improve outcomes for people](#).” Economists Edward Glaeser of Harvard University and Joseph Gyourko of the University of Pennsylvania,⁶⁴ have that “well functioning” housing markets are crucial to housing affordability. Housing affordability requires well functioning land markets.

In his book, Bertaud suggests that: “Poorly conceived urban strategies ... misdirect scarce urban investments toward locations where they are the least needed and , in doing so, greatly reduce the welfare of urban households . These failed strategies make housing less affordable and increase the time spent commuting .”

***The main objective of the planner
should be to maintain mobility
and housing affordability***

Bertaud adds: “The main objective of the planner should be to maintain mobility and housing affordability” This would produce substantial opportunities, permitting residents the widest access to employment and shopping and other pursuits--- in short, well functioning cities (labor markets).

⁶⁴ Glaeser, Edward L and Joseph Gyourko (2017), “The Economic Implications of Housing Supply, Samuel Zell and Robert Lurie Real Estate Center, University of Pennsylvania. <http://realestate.wharton.upenn.edu/research/papers.php?paper=802>



SCHEDULE 1
MAJOR HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2018: Third Quarter
15th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
1	U.S.	Pittsburgh, PA	2.6	46	U.S.	Salt Lake City, UT	4.4
1	U.S.	Rochester, NY	2.6	48	U.S.	Orlando, FL	4.5
3	U.S.	Oklahoma City, OK	2.7	49	Canada	Montreal, QC	4.6
4	U.S.	Buffalo, NY	2.8	49	Singapore	Singapore	4.6
4	U.S.	Cincinnati, OH-KY-IN	2.8	49	U.K.	Derby & Derbyshire	4.6
*4	U.S.	Cleveland, OH	2.8	49	U.K.	Leeds & West Yorkshire	4.6
4	U.S.	St. Louis, MO-IL	2.8	49	U.K.	Stoke on Trent & Staffordshire	4.6
8	U.S.	Indianapolis, IN	2.9	54	U.K.	Manchester & Greater Manchester	4.7
9	U.S.	Detroit, MI	3.0	54	U.K.	Newcastle & Tyneside	4.7
10	U.S.	Columbus, OH	3.1	56	Ireland	Dublin	4.8
10	U.S.	Grand Rapids, MI	3.1	56	U.K.	Nottingham & Nottinghamshire	4.8
10	U.S.	Louisville, KY-IN	3.1	58	U.K.	Hull & Humber	4.9
13	U.S.	Hartford, CT	3.3	58	U.K.	Middlesbrough & Durham	4.9
13	U.S.	Kansas City, MO-KS	3.3	58	U.S.	Fresno, CA	4.9
15	U.S.	Memphis, TN-MS-AR	3.4	58	U.S.	Las Vegas, NV	4.9
15	U.S.	Minneapolis-St. Paul, MN-WI	3.4	62	U.K.	Warrington & Cheshire	5.0
15	U.S.	Philadelphia, PA-NJ-DE-MD	3.4	63	U.K.	Birmingham & West Midlands	5.2
18	U.S.	Atlanta, GA	3.5	63	U.S.	Portland, OR-WA	5.2
18	U.S.	Birmingham, AL	3.5	65	U.S.	Boston, MA-NH	5.3
18	U.S.	Virginia Beach-Norfolk, VA-NC	3.5	66	U.S.	Denver, CO	5.5
21	Canada	Edmonton, AB	3.6	66	U.S.	New York, NY-NJ-PA	5.5
21	U.S.	Baltimore, MD	3.6	68	U.S.	Riverside-San Bernardino, CA	5.6
21	U.S.	Chicago, IL-IN-WI	3.6	68	U.S.	Sacramento, CA	5.6
24	U.S.	Houston, TX	3.7	68	U.S.	Seattle, WA	5.6
24	U.S.	Richmond, VA	3.7	71	Australia	Perth, WA	5.7
26	U.S.	Charlotte, NC-SC	3.8	71	U.K.	Leicester & Leicestershire	5.7
26	U.S.	Milwaukee, WI	3.8	71	U.S.	Miami, FL	5.7
26	U.S.	Raleigh, NC	3.8	74	Australia	Brisbane, QLD	6.3
29	U.S.	Dallas-Fort Worth, TX	3.9	75	U.K.	Plymouth & Devon	6.4
29	U.S.	Jacksonville, FL	3.9	76	U.K.	Bristol-Bath	6.7
29	U.S.	Nashville, TN	3.9	77	U.K.	London Exurbs (E & SE England)	6.8
29	U.S.	San Antonio, TX	3.9	78	Australia	Adelaide, SA	6.9
33	Canada	Calgary, AB	4.0	79	U.K.	Bournemouth & Dorset	7.3
33	Canada	Ottawa-Gatineau, ON-QC	4.0	80	U.S.	San Diego, CA	7.8
33	U.K.	Glasgow	4.0	81	Canada	Toronto, ON	8.3
33	U.S.	New Orleans, LA	4.0	81	U.K.	London (Greater London Authority)	8.3
33	U.S.	Tucson, AZ	4.0	83	U.S.	Honolulu, HI	8.6
33	U.S.	Washington, DC-VA-MD-WV	4.0	84	U.S.	San Francisco, CA	8.8
39	U.S.	Austin, TX	4.1	85	N.Z.	Auckland	9.0
39	U.S.	Tampa-St. Petersburg, FL	4.1	86	U.S.	Los Angeles, CA	9.2
41	U.K.	Blackpool & Lancashire	4.2	87	U.S.	San Jose, CA	9.4
41	U.K.	Sheffield & South Yorkshire	4.2	88	Australia	Melbourne, VIC	9.7
43	U.K.	Liverpool & Merseyside	4.3	89	Australia	Sydney, NSW	11.7
43	U.S.	Phoenix, AZ	4.3	90	Canada	Vancouver, BC	12.6
43	U.S.	Providence, RI-MA	4.3	91	China	Hong Kong	20.9
46	U.K.	Edinburgh	4.4				



SCHEDULE 2
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2018: Third Quarter
15th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
1	Canada	Cape Breton, NS	2.1	33	U.S.	Wichita, KS	2.8
2	Canada	Fort McMurray, AB	2.2	33	U.S.	York, PA	2.8
2	U.S.	Rockford, IL	2.2	49	Australia	Gladstone, QLD	2.9
2	U.S.	Utica-Rome, NY	2.2	49	Canada	Chatham, ON	2.9
2	U.S.	Youngstown, OH-PA	2.2	49	Canada	Trois-Rivieres, QC	2.9
6	Canada	Moncton, NB	2.3	49	U.S.	Augusta, GA-SC	2.9
6	U.S.	Davenport, IA-IL	2.3	49	U.S.	Clarksville, TN-KY	2.9
6	U.S.	Peoria, IL	2.3	49	U.S.	Fort Smith, AR-OK	2.9
6	U.S.	Syracuse, NY	2.3	49	U.S.	Huntington, WV-KY-OH	2.9
10	Canada	Fredericton, NB	2.4	49	U.S.	Indianapolis, IN	2.9
10	U.S.	Erie, PA	2.4	49	U.S.	Killeen, TX	2.9
10	U.S.	Lansing, MI	2.4	58	Canada	Lethbridge, AB	3.0
13	Canada	Saint John, NB	2.5	58	Canada	Red Deer, AB	3.0
13	U.S.	Cedar Rapids, IA	2.5	58	Canada	Regina, SK	3.0
13	U.S.	Harrisburg, PA	2.5	58	U.S.	Albany, NY	3.0
13	U.S.	Scranton, PA	2.5	58	U.S.	Amarillo, TX	3.0
13	U.S.	Toledo, OH	2.5	58	U.S.	Brownsville, TX	3.0
18	Ireland	Limerick	2.6	58	U.S.	Detroit, MI	3.0
18	U.S.	Akron, OH	2.6	58	U.S.	Fayetteville, NC	3.0
18	U.S.	Canton, OH	2.6	58	U.S.	Huntsville, AL	3.0
18	U.S.	Fort Wayne, IN	2.6	58	U.S.	Lexington-Fayette, KY	3.0
18	U.S.	Pittsburgh, PA	2.6	58	U.S.	Lincoln, NE	3.0
18	U.S.	Rochester, NY	2.6	58	U.S.	McAllen, TX	3.0
18	U.S.	South Bend, IN-MI	2.6	58	U.S.	Mobile, AL	3.0
25	Canada	Charlottetown, PEI	2.7	58	U.S.	Springfield, MO	3.0
25	Canada	Saguenay, QC	2.7	72	Canada	Thunder Bay, ON	3.1
25	Ireland	Waterford	2.7	72	U.S.	Allentown, PA-NJ	3.1
25	U.S.	Dayton, OH	2.7	72	U.S.	Beaumont-Port Arthur, TX	3.1
25	U.S.	Flint, MI	2.7	72	U.S.	Columbus, OH	3.1
25	U.S.	Oklahoma City, OK	2.7	72	U.S.	Grand Rapids, MI	3.1
25	U.S.	Omaha, NE-IA	2.7	72	U.S.	Gulfport, MS	3.1
25	U.S.	Reading, PA	2.7	72	U.S.	Hagerstown, MD-WV	3.1
33	U.S.	Atlantic City, NJ	2.8	72	U.S.	Jackson, MS	3.1
33	U.S.	Buffalo, NY	2.8	72	U.S.	Louisville, KY-IN	3.1
33	U.S.	Cincinnati, OH-KY-IN	2.8	72	U.S.	New London, CT	3.1
33	U.S.	Cleveland, OH	2.8	72	U.S.	Sioux Falls, SD	3.1
33	U.S.	Des Moines, IA	2.8	72	U.S.	Tulsa, OK	3.1
33	U.S.	Duluth, MN-WI	2.8	84	Canada	Drummondville, QC	3.2
33	U.S.	Evansville, IN-KY	2.8	84	U.S.	Columbia, SC	3.2
33	U.S.	Green Bay, WI	2.8	84	U.S.	Columbus, GA-AL	3.2
33	U.S.	Hickory, NC	2.8	84	U.S.	Fayetteville, AR-MO	3.2
33	U.S.	Kalamazoo, MI	2.8	84	U.S.	Greensboro, NC	3.2
33	U.S.	Little Rock, AR	2.8	84	U.S.	Kingsport, TN-VA	3.2
33	U.S.	Lubbock, TX	2.8	84	U.S.	Lancaster, PA	3.2
33	U.S.	Montgomery, AL	2.8	84	U.S.	Lynchburg, VA	3.2
33	U.S.	St. Louis,, MO-IL	2.8	84	U.S.	Roanoke, VA	3.2



SCHEDULE 2
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2018: Third Quarter
15th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
84	U.S.	Savannah, GA	3.2	135	U.S.	Milwaukee, WI	3.8
84	U.S.	Spartanburg, SC	3.2	135	U.S.	Raleigh, NC	3.8
84	U.S.	Trenton, NJ	3.2	135	U.S.	Springfield, MA	3.8
96	Canada	Quebec, QC	3.3	135	U.S.	Worcester, MA-CT	3.8
96	U.S.	Hartford, CT	3.3	143	Canada	Granby, QC	3.9
96	U.S.	Kansas City, MO-KS	3.3	143	U.K.	Dundee	3.9
96	U.S.	Waco, TX	3.3	143	U.K.	Falkirk	3.9
96	U.S.	Winston-Salem, NC	3.3	143	U.S.	Ann Arbor, MI	3.9
101	Canada	North Bay, ON	3.4	143	U.S.	Dallas-Fort Worth, TX	3.9
101	U.S.	Baton Rouge, LA	3.4	143	U.S.	Jacksonville, FL	3.9
101	U.S.	Chattanooga, TN-GA	3.4	143	U.S.	Nashville, TN	3.9
101	U.S.	Knoxville, TN	3.4	143	U.S.	Olympia, WA	3.9
101	U.S.	Lafayette, LA	3.4	143	U.S.	Portland, ME	3.9
101	U.S.	Laredo, TX	3.4	143	U.S.	Salisbury, MD-DE	3.9
101	U.S.	Manchester, NH	3.4	143	U.S.	San Antonio, TX	3.9
101	U.S.	Memphis, TN-MS-AR	3.4	154	Canada	Calgary, AB	4.0
101	U.S.	Minneapolis-St. Paul, MN-WI	3.4	154	Canada	Kingston, ON	4.0
101	U.S.	New Haven CT	3.4	154	Canada	Ottawa-Gatineau, ON-QC	4.0
101	U.S.	Ocala, FL	3.4	154	U.K.	Aberdeen	4.0
101	U.S.	Philadelphia, PA-NJ-DE-MD	3.4	154	U.K.	Glasgow	4.0
113	Canada	Halifax, NS	3.5	154	U.S.	Kennewick, WA	4.0
113	Canada	Sarnia, ON	3.5	154	U.S.	Melbourne, FL	4.0
113	Canada	Saskatoon, SK	3.5	154	U.S.	New Orleans, LA	4.0
113	Canada	Windsor, ON	3.5	154	U.S.	Tucson, AZ	4.0
113	U.S.	Atlanta, GA	3.5	154	U.S.	Washington, DC-VA-MD-WV	4.0
113	U.S.	Birmingham, AL	3.5	164	Canada	Whitehorse, YT	4.1
113	U.S.	El Paso, TX	3.5	164	U.K.	Swansea	4.1
113	U.S.	Virginia Beach-Norfolk, VA-NC	3.5	164	U.S.	Albuquerque, NM	4.1
121	Canada	Edmonton, AB	3.6	164	U.S.	Austin, TX	4.1
121	U.S.	Baltimore, MD	3.6	164	U.S.	Greenville, SC	4.1
121	U.S.	Chicago, IL-IN-WI	3.6	164	U.S.	Shreveport, LA	4.1
121	U.S.	Pensacola, FL	3.6	164	U.S.	Tampa-St. Petersburg, FL	4.1
125	Canada	Sherbrooke, QC	3.7	171	Australia	Darwin, NT	4.2
125	Canada	St. John's, NL	3.7	171	Australia	Townsville, QLD	4.2
125	Canada	Winnipeg, MB	3.7	171	Canada	Belleville, ON	4.2
125	Ireland	Cork	3.7	171	Ireland	Galway	4.2
125	U.S.	Corpus Christi, TX	3.7	171	U.K.	Blackpool & Lancashire	4.2
125	U.S.	Houston, TX	3.7	171	U.K.	Sheffield & South Yorkshire	4.2
125	U.S.	Madison, WI	3.7	171	U.S.	Myrtle Beach, SC-NC	4.2
125	U.S.	Ogden, UT	3.7	178	Australia	Mackay, QLD	4.3
125	U.S.	Richmond, VA	3.7	178	U.K.	Belfast	4.3
125	U.S.	Tallahassee, FL	3.7	178	U.K.	Liverpool & Merseyside	4.3
135	Australia	Rockhampton, QLD	3.8	178	U.S.	Bakersfield, CA	4.3
135	U.S.	Anchorage, AK	3.8	178	U.S.	Cape Coral, FL	4.3
135	U.S.	Charlotte, NC-SC	3.8	178	U.S.	Daytona Beach, FL	4.3
135	U.S.	Lakeland, FL	3.8	178	U.S.	Durham, NC	4.3



SCHEDULE 2
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2018: Third Quarter
15th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
178	U.S.	Phoenix, AZ	4.3	230	U.K.	Telford & Shropshire	5.1
178	U.S.	Providence, RI-MA	4.3	230	U.S.	Boise, ID	5.1
178	U.S.	Provo, UT	4.3	233	Canada	Brantford, ON	5.2
178	U.S.	Spokane, WA	4.3	233	U.K.	Birmingham & West Midlands	5.2
178	U.S.	Yakima, WA	4.3	233	U.S.	Fort Collins, CO	5.2
190	Australia	Alice Springs, NT	4.4	233	U.S.	Portland, OR-WA	5.2
190	U.K.	Edinburgh	4.4	237	Australia	Bendigo, VIC	5.3
190	U.S.	Fort Walton Beach, FL	4.4	237	U.S.	Boston, MA-NH	5.3
190	U.S.	Gainesville, FL	4.4	237	U.S.	Naples, FL	5.3
190	U.S.	Port St. Lucie, FL	4.4	240	Australia	Bundaberg, QLD	5.4
190	U.S.	Salt Lake City, UT	4.4	240	N.Z.	Christchurch	5.4
196	U.K.	Perth	4.5	240	U.S.	Vallejo, CA	5.4
196	U.S.	Bremerton, WA	4.5	243	Canada	Barrie, ON	5.5
196	U.S.	Charleston, SC	4.5	243	Canada	St. Catharines-Niagara, ON	5.5
196	U.S.	College Station, TX	4.5	243	U.S.	Denver, CO	5.5
196	U.S.	Colorado Springs, CO	4.5	243	U.S.	New York, NY-NJ-PA	5.5
196	U.S.	Orlando, FL	4.5	247	Australia	Ballarat, VIC	5.6
202	Canada	Montreal, QC	4.6	247	Australia	Cairns, QLD	5.6
202	Singapore	Singapore	4.6	247	U.S.	Eugene, OR	5.6
202	U.K.	Derby & Derbyshire	4.6	247	U.S.	Riverside-San Bernardino, CA	5.6
202	U.K.	Leeds & West Yorkshire	4.6	247	U.S.	Sacramento, CA	5.6
202	U.K.	Stoke on Trent & Staffordshire	4.6	247	U.S.	Seattle, WA	5.6
202	U.S.	Sarasota, FL	4.6	253	Australia	Canberra, ACT	5.7
202	U.S.	Visalia, CA	4.6	253	Australia	Perth, WA	5.7
209	Canada	London, ON	4.7	253	Canada	Cambridge, ON	5.7
209	U.K.	Manchester & Greater Manchester	4.7	253	Canada	Oshawa, ON	5.7
209	U.K.	Newcastle & Tyneside	4.7	253	U.K.	Leicester & Leicestershire	5.7
209	U.S.	Greeley, CO	4.7	253	U.S.	Miami, FL	5.7
213	Canada	Kamloops, BC	4.8	259	Canada	Peterborough, ON	5.8
213	Ireland	Dublin	4.8	259	U.S.	Reno, NV	5.8
213	U.K.	Cardiff	4.8	261	U.S.	Stockton, CA	5.9
213	U.K.	Nottingham & Nottinghamshire	4.8	262	Canada	Kitchener-Waterloo, ON	6.0
213	U.S.	Asheville, NC	4.8	262	U.S.	Merced, CA	6.0
218	Australia	Albury-Wodonga, NSW-VIC	4.9	264	N.Z.	Dunedin	6.1
218	U.K.	Hull & Humber	4.9	264	U.K.	Warwickshire	6.1
218	U.K.	Middlesbrough & Durham	4.9	266	U.K.	Northampton & Northamptonshire	6.2
218	U.S.	Bridgeport-Stamford, CT	4.9	266	U.K.	Swindon & Wiltshire	6.2
218	U.S.	Fresno, CA	4.9	268	Australia	Brisbane, QLD	6.3
218	U.S.	Las Vegas, NV	4.9	268	Canada	Guelph, ON	6.3
224	N.Z.	Palmerston North-Manawatu	5.0	268	N.Z.	Wellington	6.3
224	U.K.	Newport	5.0	271	U.K.	Plymouth & Devon	6.4
224	U.K.	Warrington & Cheshire	5.0	272	Australia	Fraser Coast, QLD	6.6
224	U.S.	Modesto, CA	5.0	272	Canada	Hamilton, ON	6.6
224	U.S.	Salem, OR	5.0	274	Canada	Chilliwack, BC	6.7
224	U.S.	Wilmington, NC	5.0	274	N.Z.	Napier-Hastings	6.7
230	Australia	Toowoomba, QLD	5.1	274	U.K.	Bristol-Bath	6.7



SCHEDULE 2
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2018: Third Quarter
15th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
274	U.S.	Boulder, CO	6.7	294	Canada	Toronto, ON	8.3
278	Australia	Hobart, TAS	6.8	294	U.K.	London (Greater London Authority)	8.3
278	N.Z.	Hamilton-Waikato	6.8	296	Australia	Gold Coast, QLD	8.4
278	U.K.	London Exurbs (E & SE England)	6.8	297	Canada	Victoria, BC	8.5
281	Australia	Adelaide, SA	6.9	298	U.S.	Honolulu, HI	8.6
282	Canada	Kelowna, BC	7.0	299	Australia	Sunshine Coast, QLD	8.7
283	U.S.	Oxnard, CA	7.1	300	U.S.	San Francisco, CA	8.8
284	U.K.	Bournemouth & Dorset	7.3	301	N.Z.	Auckland	9.0
285	U.S.	Salinas, CA	7.5	302	N.Z.	Taraunga-Western Bay of Plenty	9.1
285	U.S.	Santa Barbara, CA	7.5	303	U.S.	Los Angeles, CA	9.2
285	U.S.	Santa Rosa, CA	7.5	304	U.S.	San Jose, CA	9.4
288	Australia	Geelong, VIC	7.7	305	U.S.	Santa Cruz, CA	9.6
289	U.S.	San Diego, CA	7.8	306	Australia	Melbourne, VIC	9.7
290	Canada	Comox Valley, BC	7.9	307	Australia	Sydney, NSW	11.7
291	Canada	Nanaimo, BC	8.0	308	Canada	Vancouver, BC	12.6
292	U.S.	San Luis Obispo, CA	8.1	309	China	Hong Kong	20.9
293	Canada	Fraser Valley, BC	8.2				



SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2018: Third Quarter
15th Annual Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
281	78	18	Australia	Adelaide, SA	6.9	\$470,000	\$68,100
218		7	Australia	Albury-Wodonga, NSW-VIC	4.9	\$330,000	\$67,700
190		6	Australia	Alice Springs, NT	4.4	\$470,000	\$105,900
247		11	Australia	Ballarat, VIC	5.6	\$362,000	\$64,600
237		9	Australia	Bendigo, VIC	5.3	\$340,000	\$64,700
268	74	15	Australia	Brisbane, QLD	6.3	\$530,000	\$84,000
240		10	Australia	Bundaberg, QLD	5.4	\$290,000	\$53,400
247		11	Australia	Cairns, QLD	5.6	\$405,000	\$72,000
253		13	Australia	Canberra, ACT	5.7	\$635,000	\$112,200
171		3	Australia	Darwin, NT	4.2	\$500,000	\$119,000
272		16	Australia	Fraser Coast, QLD	6.6	\$320,000	\$48,700
288		19	Australia	Geelong, VIC	7.7	\$552,000	\$71,800
49		1	Australia	Gladstone, QLD	2.9	\$260,000	\$90,900
296		20	Australia	Gold Coast, QLD	8.4	\$630,000	\$75,300
278		17	Australia	Hobart, TAS	6.8	\$475,000	\$70,000
178		5	Australia	Mackay, QLD	4.3	\$335,000	\$77,900
306	88	22	Australia	Melbourne, VIC	9.7	\$835,000	\$86,000
253	71	13	Australia	Perth, WA	5.7	\$490,000	\$85,400
135		2	Australia	Rockhampton, QLD	3.8	\$265,000	\$70,500
299		21	Australia	Sunshine Coast, QLD	8.7	\$595,000	\$68,100
307	89	23	Australia	Sydney, NSW	11.7	\$1,100,000	\$94,400
230		8	Australia	Toowoomba, QLD	5.1	\$355,000	\$70,200
171		3	Australia	Townsville, QLD	4.2	\$325,000	\$77,600
				Median Market	5.6		
243		35	Canada	Barrie, ON	5.5	\$467,000	\$85,300
171		30	Canada	Belleville, ON	4.2	\$283,000	\$67,500
233		34	Canada	Brantford, ON	5.2	\$380,000	\$72,600
154	33	26	Canada	Calgary, AB	4.0	\$415,000	\$103,400
253		37	Canada	Cambridge, ON	5.7	\$463,000	\$81,500
1		1	Canada	Cape Breton, NS	2.1	\$122,000	\$56,900
25		6	Canada	Charlottetown, PEI	2.7	\$183,000	\$68,000
49		8	Canada	Chatham, ON	2.9	\$177,000	\$61,400
274		43	Canada	Chilliwack, BC	6.7	\$473,000	\$70,300
290		45	Canada	Comox Valley, BC	7.9	\$526,000	\$66,800
84		14	Canada	Drummondville, QC	3.2	\$182,000	\$56,300
121	21	21	Canada	Edmonton, AB	3.6	\$350,000	\$98,100
2		2	Canada	Fort McMurray, AB	2.2	\$444,000	\$201,000
293		47	Canada	Fraser Valley, BC	8.2	\$677,000	\$82,600
10		4	Canada	Fredericton, NB	2.4	\$167,000	\$70,700
143		25	Canada	Granby, QC	3.9	\$235,000	\$60,300
268		41	Canada	Guelph, ON	6.3	\$539,000	\$85,700
113		17	Canada	Halifax, NS	3.5	\$261,000	\$74,800
272		42	Canada	Hamilton, ON	6.6	\$530,000	\$79,700
213		33	Canada	Kamloops, BC	4.8	\$378,000	\$78,600
282		44	Canada	Kelowna, BC	7.0	\$535,000	\$76,200
154		26	Canada	Kingston, ON	4.0	\$304,000	\$75,200
262		40	Canada	Kitchener-Waterloo, ON	6.0	\$485,000	\$81,500
58		10	Canada	Lethbridge, AB	3.0	\$235,000	\$78,400
209		32	Canada	London, ON	4.7	\$323,000	\$68,300
6		3	Canada	Moncton, NB	2.3	\$153,000	\$66,500
202	49	31	Canada	Montreal, QC	4.6	\$306,000	\$66,400



SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2018: Third Quarter
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
291		46	Canada	Nanaimo, BC	8.0	\$540,000	\$67,300
101		16	Canada	North Bay, ON	3.4	\$235,000	\$68,600
253		37	Canada	Oshawa, ON	5.7	\$520,000	\$90,500
154	33	26	Canada	Ottawa-Gatineau, ON-QC	4.0	\$344,000	\$87,000
259		39	Canada	Peterborough, ON	5.8	\$400,000	\$69,300
96		15	Canada	Quebec, QC	3.3	\$235,000	\$70,200
58		10	Canada	Red Deer, AB	3.0	\$267,000	\$89,100
58		10	Canada	Regina, SK	3.0	\$275,000	\$90,600
25		6	Canada	Saguenay, QC	2.7	\$173,000	\$63,600
13		5	Canada	Saint John, NB	2.5	\$171,000	\$67,400
113		17	Canada	Sarnia, ON	3.5	\$258,000	\$74,700
113		17	Canada	Saskatoon, SK	3.5	\$316,000	\$89,100
125		22	Canada	Sherbrooke, QC	3.7	\$216,000	\$57,700
243		35	Canada	St. Catharines-Niagara, ON	5.5	\$369,000	\$67,700
125		22	Canada	St. John's, NL	3.7	\$310,000	\$83,100
72		13	Canada	Thunder Bay, ON	3.1	\$222,000	\$72,300
294	81	48	Canada	Toronto, ON	8.3	\$686,000	\$82,700
49		8	Canada	Trois-Rivieres, QC	2.9	\$163,000	\$55,700
308	90	50	Canada	Vancouver, BC	12.6	\$942,000	\$74,700
297		49	Canada	Victoria, BC	8.5	\$641,000	\$75,300
164		29	Canada	Whitehorse, YT	4.1	\$415,000	\$101,500
113		17	Canada	Windsor, ON	3.5	\$247,000	\$69,700
125		22	Canada	Winnipeg, MB	3.7	\$279,000	\$75,500
				Median Market	4.0		
309	91	1	China	Hong Kong	20.9	\$7,169,000	\$343,000
125		3	Ireland	Cork	3.7	€207,000	€55,600
213	56	5	Ireland	Dublin	4.8	€310,000	€64,200
171		4	Ireland	Galway	4.2	€210,500	€50,200
18		1	Ireland	Limerick	2.6	€150,000	€56,800
25		2	Ireland	Waterford	2.7	€140,000	€52,300
				Median Market	3.7		
301	85	7	N.Z.	Auckland	9.0	\$845,000	\$94,400
240		2	N.Z.	Christchurch	5.4	\$447,000	\$83,300
264		3	N.Z.	Dunedin	6.1	\$412,000	\$67,100
278		6	N.Z.	Hamilton-Waikato	6.8	\$551,000	\$81,400
274		5	N.Z.	Napier-Hastings	6.7	\$449,000	\$66,700
224		1	N.Z.	Palmerston North-Manawatu	5.0	\$310,000	\$61,700
302		8	N.Z.	Taraunga-Western Bay of Plenty	9.1	\$623,000	\$68,800
268		4	N.Z.	Wellington	6.3	\$577,000	\$91,700
				Median Market	6.5		
202	49	1	Singapore	Singapore	4.6	\$400,000	\$87,000
154		3	U.K.	Aberdeen	4.0	£182,700	£45,500
178		8	U.K.	Belfast	4.3	£142,400	£33,400
233	63	24	U.K.	Birmingham & West Midlands	5.2	£174,000	£33,400
171	41	6	U.K.	Blackpool & Lancashire	4.2	£142,000	£33,800
284	79	32	U.K.	Bournemouth & Dorset	7.3	£285,000	£39,000
274	76	30	U.K.	Bristol-Bath	6.7	£275,000	£40,900
213		17	U.K.	Cardiff	4.8	£170,000	£35,700



SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2018: Third Quarter
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
202	49	12	U.K.	Derby & Derbyshire	4.6	£172,900	£37,900
143		1	U.K.	Dundee	3.9	£136,600	£35,300
190	46	10	U.K.	Edinburgh	4.4	£183,400	£41,500
143		1	U.K.	Falkirk	3.9	£135,000	£34,400
154	33	3	U.K.	Glasgow	4.0	£143,600	£35,600
218	58	19	U.K.	Hull & Humber	4.9	£160,000	£32,400
202	49	12	U.K.	Leeds & West Yorkshire	4.6	£158,000	£34,000
253	71	25	U.K.	Leicester & Leicestershire	5.7	£208,000	£36,200
178	43	8	U.K.	Liverpool & Merseyside	4.3	£140,000	£32,700
294	81	33	U.K.	London (Greater London Authority)	8.3	£465,000	£55,800
278	77	31	U.K.	London Exurbs (E & SE England)	6.8	£306,100	£44,700
209	54	15	U.K.	Manchester & Greater Manchester	4.7	£160,000	£33,900
218	58	19	U.K.	Middlesbrough & Durham	4.9	£125,000	£25,300
209	54	15	U.K.	Newcastle & Tyneside	4.7	£143,900	£30,900
224		21	U.K.	Newport	5.0	£176,800	£35,700
266		27	U.K.	Northampton & Northamptonshire	6.2	£225,000	£36,200
213	56	17	U.K.	Nottingham & Nottinghamshire	4.8	£162,000	£33,500
196		11	U.K.	Perth	4.5	£184,000	£40,500
271	75	29	U.K.	Plymouth & Devon	6.4	£235,000	£36,700
171	41	6	U.K.	Sheffield & South Yorkshire	4.2	£139,000	£33,000
202	49	12	U.K.	Stoke on Trent & Staffordshire	4.6	£168,000	£36,500
164		5	U.K.	Swansea	4.1	£133,000	£32,300
266		27	U.K.	Swindon & Wiltshire	6.2	£254,000	£40,900
230		23	U.K.	Telford & Shropshire	5.1	£187,500	£36,500
224	62	21	U.K.	Warrington & Cheshire	5.0	£205,000	£41,100
264		26	U.K.	Warwickshire	6.1	£260,000	£42,800
				Median Market	4.8		
18		13	U.S.	Akron, OH	2.6	\$148,000	\$57,600
58		46	U.S.	Albany, NY	3.0	\$214,000	\$70,900
164		127	U.S.	Albuquerque, NM	4.1	\$214,000	\$52,200
72		57	U.S.	Allentown, PA-NJ	3.1	\$200,000	\$64,900
58		46	U.S.	Amarillo, TX	3.0	\$166,000	\$55,700
135		107	U.S.	Anchorage, AK	3.8	\$305,000	\$79,700
143		114	U.S.	Ann Arbor, MI	3.9	\$281,000	\$72,300
213		154	U.S.	Asheville, NC	4.8	\$246,000	\$51,300
113	18	94	U.S.	Atlanta, GA	3.5	\$235,000	\$66,500
33		24	U.S.	Atlantic City, NJ	2.8	\$184,000	\$65,200
49		40	U.S.	Augusta, GA-SC	2.9	\$148,000	\$51,400
164	39	127	U.S.	Austin, TX	4.1	\$311,000	\$76,200
178		133	U.S.	Bakersfield, CA	4.3	\$219,000	\$51,500
121	21	98	U.S.	Baltimore, MD	3.6	\$289,000	\$80,000
101		83	U.S.	Baton Rouge, LA	3.4	\$200,000	\$59,400
72		57	U.S.	Beaumont-Port Arthur, TX	3.1	\$160,000	\$51,300
113	18	94	U.S.	Birmingham, AL	3.5	\$192,000	\$54,700
230		161	U.S.	Boise, ID	5.1	\$290,000	\$57,400
237	65	164	U.S.	Boston, MA-NH	5.3	\$474,000	\$88,800
274		177	U.S.	Boulder, CO	6.7	\$561,000	\$83,700
196		146	U.S.	Bremerton, WA	4.5	\$338,000	\$75,900
218		155	U.S.	Bridgeport-Stamford, CT	4.9	\$445,000	\$90,300
58		46	U.S.	Brownsville, TX	3.0	\$118,000	\$38,700
33	4	24	U.S.	Buffalo, NY	2.8	\$158,000	\$57,300
18		13	U.S.	Canton, OH	2.6	\$135,000	\$52,000



SCHEDULE 3
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
178		133	U.S.	Cape Coral, FL	4.3	\$240,000	\$56,200
13		9	U.S.	Cedar Rapids, IA	2.5	\$164,000	\$66,200
196		146	U.S.	Charleston, SC	4.5	\$278,000	\$61,200
135	26	107	U.S.	Charlotte, NC-SC	3.8	\$243,000	\$63,200
101		83	U.S.	Chattanooga, TN-GA	3.4	\$178,000	\$51,700
121	21	98	U.S.	Chicago, IL-IN-WI	3.6	\$256,000	\$70,900
33	4	24	U.S.	Cincinnati, OH-KY-IN	2.8	\$175,000	\$63,200
49		40	U.S.	Clarksville, TN-KY	2.9	\$165,000	\$56,100
33	4	24	U.S.	Cleveland, OH	2.8	\$149,000	\$54,000
196		146	U.S.	College Station, TX	4.5	\$210,000	\$47,000
196		146	U.S.	Colorado Springs, CO	4.5	\$308,000	\$68,200
84		68	U.S.	Columbia, SC	3.2	\$171,000	\$54,200
84		68	U.S.	Columbus, GA-AL	3.2	\$141,000	\$44,100
72	10	57	U.S.	Columbus, OH	3.1	\$201,000	\$65,000
125		101	U.S.	Corpus Christi, TX	3.7	\$199,000	\$54,000
143	29	114	U.S.	Dallas-Fort Worth, TX	3.9	\$270,000	\$69,400
6		4	U.S.	Davenport, IA-IL	2.3	\$126,000	\$54,600
25		19	U.S.	Dayton, OH	2.7	\$145,000	\$54,600
178		133	U.S.	Daytona Beach, FL	4.3	\$209,000	\$48,800
243	66	167	U.S.	Denver, CO	5.5	\$431,000	\$78,600
33		24	U.S.	Des Moines, IA	2.8	\$201,000	\$71,000
58	9	46	U.S.	Detroit, MI	3.0	\$178,000	\$59,900
33		24	U.S.	Duluth, MN-WI	2.8	\$156,000	\$56,000
178		133	U.S.	Durham, NC	4.3	\$271,000	\$62,600
113		94	U.S.	El Paso, TX	3.5	\$157,000	\$45,400
10		7	U.S.	Erie, PA	2.4	\$126,000	\$52,100
247		169	U.S.	Eugene, OR	5.6	\$289,000	\$52,000
33		24	U.S.	Evansville, IN-KY	2.8	\$145,000	\$52,700
84		68	U.S.	Fayetteville, AR-MO	3.2	\$178,000	\$56,400
58		46	U.S.	Fayetteville, NC	3.0	\$137,000	\$46,000
25		19	U.S.	Flint, MI	2.7	\$128,000	\$47,900
233		162	U.S.	Fort Collins, CO	5.2	\$375,000	\$71,600
49		40	U.S.	Fort Smith, AR-OK	2.9	\$118,000	\$40,400
190		142	U.S.	Fort Walton Beach, FL	4.4	\$268,000	\$61,100
18		13	U.S.	Fort Wayne, IN	2.6	\$142,000	\$54,700
218	58	155	U.S.	Fresno, CA	4.9	\$263,000	\$53,700
190		142	U.S.	Gainesville, FL	4.4	\$202,000	\$46,200
72	10	57	U.S.	Grand Rapids, MI	3.1	\$192,000	\$62,600
209		153	U.S.	Greeley, CO	4.7	\$345,000	\$73,300
33		24	U.S.	Green Bay, WI	2.8	\$177,000	\$62,700
84		68	U.S.	Greensboro, NC	3.2	\$166,000	\$51,200
164		127	U.S.	Greenville, SC	4.1	\$211,000	\$51,400
72		57	U.S.	Gulfport, MS	3.1	\$151,000	\$48,400
72		57	U.S.	Hagerstown, MD-WV	3.1	\$191,000	\$62,300
13		9	U.S.	Harrisburg, PA	2.5	\$170,000	\$66,700
96	13	79	U.S.	Hartford, CT	3.3	\$234,000	\$71,800
33		24	U.S.	Hickory, NC	2.8	\$137,000	\$49,600
298	83	184	U.S.	Honolulu, HI	8.6	\$709,000	\$82,900
125	24	101	U.S.	Houston, TX	3.7	\$241,000	\$65,700
49		40	U.S.	Huntington, WV-KY-OH	2.9	\$122,000	\$41,800
58		46	U.S.	Huntsville, AL	3.0	\$191,000	\$63,100
49	8	40	U.S.	Indianapolis, IN	2.9	\$174,000	\$60,900
72		57	U.S.	Jackson, MS	3.1	\$165,000	\$53,500



SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2018: Third Quarter
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
143	29	114	U.S.	Jacksonville, FL	3.9	\$236,000	\$60,300
33		24	U.S.	Kalamazoo, MI	2.8	\$161,000	\$57,200
96	13	79	U.S.	Kansas City, MO-KS	3.3	\$213,000	\$65,300
154		122	U.S.	Kennewick, WA	4.0	\$259,000	\$64,700
49		40	U.S.	Killeen, TX	2.9	\$159,000	\$54,900
84		68	U.S.	Kingsport, TN-VA	3.2	\$141,000	\$44,200
101		83	U.S.	Knoxville, TN	3.4	\$186,000	\$54,000
101		83	U.S.	Lafayette, LA	3.4	\$166,000	\$49,200
135		107	U.S.	Lakeland, FL	3.8	\$192,000	\$50,200
84		68	U.S.	Lancaster, PA	3.2	\$205,000	\$64,900
10		7	U.S.	Lansing, MI	2.4	\$141,000	\$58,300
101		83	U.S.	Laredo, TX	3.4	\$152,000	\$44,600
218	58	155	U.S.	Las Vegas, NV	4.9	\$289,000	\$59,100
58		46	U.S.	Lexington-Fayette, KY	3.0	\$182,000	\$59,700
58		46	U.S.	Lincoln, NE	3.0	\$188,000	\$62,000
33		24	U.S.	Little Rock, AR	2.8	\$153,000	\$54,000
303	86	186	U.S.	Los Angeles, CA	9.2	\$671,000	\$72,700
72	10	57	U.S.	Louisville, KY-IN	3.1	\$184,000	\$58,600
33		24	U.S.	Lubbock, TX	2.8	\$139,000	\$49,800
84		68	U.S.	Lynchburg, VA	3.2	\$177,000	\$54,500
125		101	U.S.	Madison, WI	3.7	\$273,000	\$74,000
101		83	U.S.	Manchester, NH	3.4	\$283,000	\$82,100
58		46	U.S.	McAllen, TX	3.0	\$114,000	\$37,900
154		122	U.S.	Melbourne, FL	4.0	\$215,000	\$53,300
101	15	83	U.S.	Memphis, TN-MS-AR	3.4	\$176,000	\$52,300
262		176	U.S.	Merced, CA	6.0	\$286,000	\$47,900
253	71	173	U.S.	Miami, FL	5.7	\$317,500	\$55,900
135	26	107	U.S.	Milwaukee, WI	3.8	\$231,000	\$60,900
101	15	83	U.S.	Minneapolis-St. Paul, MN-WI	3.4	\$267,000	\$79,200
58		46	U.S.	Mobile, AL	3.0	\$142,000	\$46,900
224		158	U.S.	Modesto, CA	5.0	\$304,000	\$61,200
33		24	U.S.	Montgomery, AL	2.8	\$141,000	\$50,300
171		132	U.S.	Myrtle Beach, SC-NC	4.2	\$206,000	\$49,000
237		164	U.S.	Naples, FL	5.3	\$375,000	\$70,100
143	29	114	U.S.	Nashville, TN	3.9	\$256,000	\$65,800
101		83	U.S.	New Haven CT	3.4	\$230,000	\$67,100
72		57	U.S.	New London, CT	3.1	\$227,000	\$72,300
154	33	122	U.S.	New Orleans, LA	4.0	\$208,000	\$52,500
243	66	167	U.S.	New York, NY-NJ-PA	5.5	\$435,000	\$78,500
101		83	U.S.	Ocala, FL	3.4	\$155,000	\$45,300
125		101	U.S.	Ogden, UT	3.7	\$274,000	\$74,400
25	3	19	U.S.	Oklahoma City, OK	2.7	\$159,000	\$58,200
143		114	U.S.	Olympia, WA	3.9	\$299,000	\$76,000
25		19	U.S.	Omaha, NE-IA	2.7	\$185,000	\$67,500
196	48	146	U.S.	Orlando, FL	4.5	\$253,000	\$56,400
283		178	U.S.	Oxnard, CA	7.1	\$599,000	\$84,700
121		98	U.S.	Pensacola, FL	3.6	\$196,000	\$54,900
6		4	U.S.	Peoria, IL	2.3	\$135,000	\$59,400
101	15	83	U.S.	Philadelphia, PA-NJ-DE-MD	3.4	\$239,800	\$70,200
178	43	133	U.S.	Phoenix, AZ	4.3	\$273,000	\$63,400
18	1	13	U.S.	Pittsburgh, PA	2.6	\$159,000	\$60,900
190		142	U.S.	Port St. Lucie, FL	4.4	\$231,000	\$52,900
143		114	U.S.	Portland, ME	3.9	\$279,000	\$70,800



SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2018: Third Quarter
15th Annual Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
233	63	162	U.S.	Portland, OR-WA	5.2	\$392,000	\$74,700
178	43	133	U.S.	Providence, RI-MA	4.3	\$285,000	\$66,600
178		133	U.S.	Provo, UT	4.3	\$319,000	\$73,900
135	26	107	U.S.	Raleigh, NC	3.8	\$294,000	\$76,400
25		19	U.S.	Reading, PA	2.7	\$171,000	\$62,600
259		174	U.S.	Reno, NV	5.8	\$371,000	\$63,800
125	24	101	U.S.	Richmond, VA	3.7	\$254,000	\$69,100
247	68	169	U.S.	Riverside-San Bernardino, CA	5.6	\$359,000	\$63,800
84		68	U.S.	Roanoke, VA	3.2	\$175,000	\$55,100
18	1	13	U.S.	Rochester, NY	2.6	\$150,000	\$58,200
2		1	U.S.	Rockford, IL	2.2	\$126,000	\$58,200
247	68	169	U.S.	Sacramento, CA	5.6	\$388,000	\$69,800
224		158	U.S.	Salem, OR	5.0	\$293,000	\$58,400
285		179	U.S.	Salinas, CA	7.5	\$544,000	\$72,700
143		114	U.S.	Salisbury, MD-DE	3.9	\$226,000	\$58,400
190	46	142	U.S.	Salt Lake City, UT	4.4	\$328,000	\$74,700
143	29	114	U.S.	San Antonio, TX	3.9	\$230,000	\$58,600
289	80	182	U.S.	San Diego, CA	7.8	\$610,000	\$78,600
300	84	185	U.S.	San Francisco, CA	8.8	\$963,000	\$108,900
304	87	187	U.S.	San Jose, CA	9.4	\$1,185,000	\$126,100
292		183	U.S.	San Luis Obispo, CA	8.1	\$606,000	\$75,000
285		179	U.S.	Santa Barbara, CA	7.5	\$558,000	\$74,100
305		188	U.S.	Santa Cruz, CA	9.6	\$799,000	\$82,800
285		179	U.S.	Santa Rosa, CA	7.5	\$626,000	\$83,900
202		151	U.S.	Sarasota, FL	4.6	\$273,000	\$59,200
84		68	U.S.	Savannah, GA	3.2	\$191,000	\$58,800
13		9	U.S.	Scranton, PA	2.5	\$132,000	\$52,900
247	68	169	U.S.	Seattle, WA	5.6	\$497,000	\$88,900
164		127	U.S.	Shreveport, LA	4.1	\$165,000	\$40,000
72		57	U.S.	Sioux Falls, SD	3.1	\$205,000	\$66,700
18		13	U.S.	South Bend, IN-MI	2.6	\$137,000	\$53,500
84		68	U.S.	Spartanburg, SC	3.2	\$154,000	\$48,800
178		133	U.S.	Spokane, WA	4.3	\$240,000	\$55,800
135		107	U.S.	Springfield, MA	3.8	\$214,000	\$56,500
58		46	U.S.	Springfield, MO	3.0	\$149,000	\$50,000
33	4	24	U.S.	St. Louis, MO-IL	2.8	\$181,000	\$64,700
261		175	U.S.	Stockton, CA	5.9	\$370,000	\$62,900
6		4	U.S.	Syracuse, NY	2.3	\$135,000	\$57,900
125		101	U.S.	Tallahassee, FL	3.7	\$191,000	\$52,200
164	39	127	U.S.	Tampa-St. Petersburg, FL	4.1	\$222,000	\$53,900
13		9	U.S.	Toledo, OH	2.5	\$130,000	\$52,000
84		68	U.S.	Trenton, NJ	3.2	\$258,000	\$79,600
154	33	122	U.S.	Tucson, AZ	4.0	\$212,000	\$53,400
72		57	U.S.	Tulsa, OK	3.1	\$166,000	\$53,900
2		1	U.S.	Utica-Rome, NY	2.2	\$118,000	\$53,600
240		166	U.S.	Vallejo, CA	5.4	\$427,000	\$78,400
113	18	94	U.S.	Virginia Beach-Norfolk, VA-NC	3.5	\$229,000	\$65,400
202		151	U.S.	Visalia, CA	4.6	\$221,000	\$48,400
96		79	U.S.	Waco, TX	3.3	\$162,000	\$49,000
154	33	122	U.S.	Washington, DC-VA-MD-WV	4.0	\$412,000	\$102,600
33		24	U.S.	Wichita, KS	2.8	\$156,000	\$55,900
224		158	U.S.	Wilmington, NC	5.0	\$247,000	\$49,400
96		79	U.S.	Winston-Salem, NC	3.3	\$164,000	\$50,000



SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2018: Third Quarter
15th Annual Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
135		107	U.S.	Worcester, MA-CT	3.8	\$271,000	\$71,300
178		133	U.S.	Yakima, WA	4.3	\$208,000	\$48,900
33		24	U.S.	York, PA	2.8	\$186,000	\$65,300
2		1	U.S.	Youngstown, OH-PA	2.2	\$100,000	\$46,400
				Median Market	3.5		

Financial data in local currency.

*Average Multiple (Japan)



ANNEX: SOURCES, METHODS AND USES

House price data is obtained or estimated from sources that account for the majority of existing dwellings sold in each of the nations

Most international housing affordability sources and "city" rating sources focus on higher end housing that would be demanded by executives who might be transferred from one nation to another (expatriates). The *Demographia International Housing Affordability Survey* is unique in focusing on the middle of the market --- reporting on middle-income housing affordability.

Further, the focus is on housing markets, rather than higher-cost inner areas or expensive neighborhoods. This is an important distinction. The data in the *Demographia International Housing Affordability Survey* does not relate, for example to Belgravia in London, New York's Upper East Side or Beverly Hills in Los Angeles. It rather encompasses entire metropolitan markets (where there is sufficient reporting), which for example, in the New York metropolitan area includes more than 20 counties in the states of New York, New Jersey and Pennsylvania⁷² (where included housing can be 75 miles [120 kilometers] or more from the upscale areas of the urban core, where prices are the highest).

Geographical Coverage: The nine nations and corresponding housing markets that are included in the *15th Annual Demographia International Housing Affordability Survey* have sufficient current sources of house prices and household income data to estimate housing affordability using the Median Multiple.

Demographia receives periodic requests to expand its coverage to other nations. The addition of continental European nations, mainland China and India has been most frequently requested. *Demographia* would be pleased to add other nations and will do so wherever consistent data of sufficient quality can be identified. Readers are encouraged to contact the authors with any such information.

House Characteristics: The indexes and data on which the *Survey* is based reflect the majority of existing housing in each of the national markets. At the same time, there are differences in house types, housing characteristics and lot size between the included nations and markets. The *Demographia International Housing Affordability Survey* does not adjust the Median Multiples to reflect these differences. For example, the average size of housing, particularly new housing, is small by New World standards in the United Kingdom and Hong Kong.⁷³

Methods: Median house prices are estimated based on published data and other publicly available data from government and industry reports, using the housing stock upon which they report. Official government produced sales registers are used where available (Ireland, Scotland, England and Wales). In other cases, estimates are developed from multiple industry sources, where available. If average house prices are available, median house prices are estimated from historic conversion factors. The principal sources are real estate time series that have become established as authoritative, national sales transaction registries and other government sources.

In a limited number of smaller market cases, insufficient data requires reliance on individual monthly data within the third quarter, or second quarter data.

⁷² As defined by the United States Bureau of Management and the Budget.

⁷³ See [2nd Annual Demographia International Housing Affordability Survey](#), Pages 16-18.



Median household incomes are estimated for the markets using national census or other official data. The income base is then adjusted to the current year, using the best available indicators of annual income changes. This requires periodic recalibration of base year data to reflect the latest available data.

Caution is urged in time-series comparisons in individual markets. Changes in data sources, base year income information, housing data sources and geographical definitions can make precise year to year comparisons less reliable. The most reliable comparisons are between the housing affordability rating categories ("affordable," moderately unaffordable," "seriously unaffordable" and "severely unaffordable").⁷⁴

Sources: The following principal sources have been consulted:

Australian Bureau of Statistics
Australian Property Monitors
Bank of Canada
Bank of England
Bank of Ireland
Calgary Real Estate Board
Canada Mortgage and Housing Corporation
Canadian Home Builders Association
Canadian Real Estate Association
Census and Statistical Office: Government of Hong Kong
Central Statistics Office, Ireland
Chambre immobilière du Grand Montréal
Communities and Local Government (Ministry), United Kingdom
Conference Board of Canada
Core Logic
Department of the Environment, Heritage and Local Government (Ireland)
Domain.com.au (Australia)
Edmonton Real Estate Board
Federal Reserve Board (United States)
Fédération des chambres immobilières du Québec
Harvard University Joint Center on Housing
Housing and Development Board (Singapore)
Housing Industry Association (Australia)
HM Land Registry (England and Wales)
Ireland Environment, Heritage and Local Government
John Burns Real Estate Consulting
The Land Registry (Hong Kong)
National Association of Home Builders (USA)
National Association of Realtors (USA)
National Statistics (United Kingdom)
Northern Ireland Statistics and Research Agency
Northern Territory Department of Treasury and Finance
Property Services Regulatory Authority (Ireland)
Real Estate Institute of Australia

⁷⁴ Demographia attempts to use the most representative available data at the time of report preparation.



Real Estate Institute of New South Wales
 Real Estate Institute of New Zealand
 Real Estate Institute of Northern Territory
 Real Estate Institute of Queensland
 Real Estate Institute of Tasmania
 Real Estate Institute of Victoria
 Real Estate Institute of Western Australia
 Realestateview.com.au
 Registers of Scotland
 Reserve Bank of Australia
 Reserve Bank of New Zealand
 realestate.com.au
 Royal Bank of Canada
 Smartline.com (Queensland)
 Singapore Department of Statistics
 Singapore Real Estate Exchange (SRX)
 Statistics Canada
 Statistics New Zealand
 Title Guaranty Hawaii
 Toronto Real Estate Board
 United Kingdom Department of Communities and Local Government
 United States Department of Commerce: Bureau of Economic Analysis
 United States Department of Commerce: Bureau of the Census
 United States Department of Housing and Urban Development
 Urban Development Institute of Australia
 Yukon Government
 Wells Fargo Bank
 Zillow.com

Notes on Figures

Figure 2: House Price-to-Income Ratios: 1987 & 1992 estimated from Reserve Bank of Australia data. This data was first portrayed in Figure 1 of the *11th Annual Demographia International Housing Affordability Survey*. No comparable data identified for Hong Kong and Singapore.

Figure 4: Housing Affordability & Land Regulation: 2,000,000+ Population: 2018: In the United States, urban containment (Table 1) includes those classified as “growth management,” “growth control,” “containment” and “contain-lite” in *From Traditional to Reformed A Review of the Land Use Regulations in the Nation’s 50 largest Metropolitan Areas* (Brookings Institution, 2006) as well as additional markets Demographia has determined have urban containment policy (New York, Boston, Minneapolis-St. Paul, Washington and Honolulu). Outside the United States, more urban containment markets include all in the United Kingdom, Ireland, Australia, and New Zealand, as well as Hong Kong and Singapore. In Canada, urban containment policy has been adopted in Toronto, Montréal, Vancouver, Ottawa and Calgary. Markets not classified as urban containment are classified as liberal (see Table 3).

Figure 10: Middle-Income Housing Affordability: New Zealand: Median Multiple values for 2014 through 2016 scaled using change rate from 2013 to 2017 to account for restatement of median household



incomes by Statistics New Zealand. One year trend to 2018 influenced by subsequent downward restatement of 2017 median household incomes.

Table 10 Housing Market Selection Criteria	
Nation	Markets Included (Where Sufficient Public Data is Available)
Australia	Housing markets corresponding to urban centres over 50,000 population
Canada	Housing markets over 75,000 population
China	Hong Kong
Ireland	Housing markets over 50,000 population
New Zealand	Markets corresponding to urban areas over 75,000 population
Singapore	Singapore
United Kingdom	Markets corresponding to urban areas over 150,000 population and London Exurbs (E & SE England).
United States	Housing markets over 250,000 population
Selected additional markets. Housing markets are generally metropolitan areas (labour market areas) or their equivalent.	

Figure 13: Urban Containment Effect on House Prices: Urban Growth Boundary (Conceptual): Figure illustrates impact of an urban containment boundary on land values, consistent with treatments in Gerrit Knaap and Arthur C. Nelson, *The Regulated Landscape: Lessons on State Land Use Planning from Oregon*, Cambridge, Massachusetts: Lincoln Institute of Land Policy, 1992; William A. Fischel, *Zoning Rules! The Economics of Land-use Regulation*, Lincoln Institute of Land Policy, 2015; Gerard Mildner, “Public Policy & Portland’s Real Estate Market,” *Quarterly and Urban Development Journal*, 4th Quarterly 2009: 1-16, and others. Similar impact on house prices have been typically documented in the economic research (see: [4 Question of Values: Urban Containment Policy and Middle-Income Housing Affordability](#)).

Table 11 Footer Illustrations: New Houses (Left to Right)	
<ul style="list-style-type: none"> Suburban Kansas City, United States Suburban Montréal, Canada East of England (London Exurbs), U.K. Suburban Tseung Kwan O (Hong Kong) 	<ul style="list-style-type: none"> Suburban Dublin, Ireland Suburban Auckland, New Zealand Suburban Adelaide, Australia



AUTHOR BIOGRAPHIES

Wendell Cox

Wendell Cox is co-author of the *Demographia International Housing Affordability Survey*. He is a public policy consultant and principal of Demographia, an international public policy firm.. He is a senior fellow at the [Center for Opportunity Urbanism](#) (Houston), senior fellow for housing affordability and municipal policy at the [Frontier Centre for Public Policy](#) (Winnipeg) and a member of the advisory board of the [Center for Demographics and Policy](#) at Chapman University in California.

Wendell Cox has also served as a visiting professor at the Conservatoire National des Arts et Metiers in Paris (a national university). He has served as vice-president of CODATU, a Lyon (France) based international research organization dedicated to improving transport in developing world urban areas. He is author of the *Evolving Urban Form* series at [newgeography.com](#). He authored the "Measuring Urban Cores and Suburbs" chapter in the Massachusetts Institute of Technology volume *Infinite Suburbia*, published by the Princeton Architectural Press. Among his most recent policy reports were *A Question of Values: Urban Containment Policy and Middle-Income Housing Affordability*, *Canada's Middle-Income Housing Affordability Crisis*, *Restrictive Land-Use Regulation: Strategies, Effects and Solutions*, and *Improving the Competitiveness of Metropolitan Areas* for the Frontier Centre for Public Policy, *Putting People First: An Alternative Perspective with and Evaluation of the NCE Cities 'Trillion Dollar' Report*, *Best Cities for Minorities: Gauging the Economics of Opportunity* (co-author with Joel Kotkin) for the Center for Opportunity Urbanism, *Evaluation of Plan Bay Area* for the Pacific Research Institute and a "framing essay" entitled *Toward More Prosperous Cities*. He is also author of the *Demographia Residential Land and Regulation Cost Index*.

Wendell Cox has lectured widely, including a month long tour to all Australian state and territory capitals and university lectures in the United Kingdom, France, China, Egypt and Australia. He has also conducted transport and urban planning training seminars in Romania, Togo and Ethiopia. He has completed projects in the United States, Western Europe, Canada, Australia and New Zealand in urban policy, demographics and transport.

He was appointed to three terms on the Los Angeles County Transportation Commission by Mayor Tom Bradley and to the Amtrak Reform Council by Speaker of the U. S. House of Representatives Newt Gingrich.

Demographia annually publishes *Demographia World Urban Areas*, the only annual list of world urban areas (agglomerations) over 500,000 population with coordinate urban land area, population and population density estimates. Demographia sponsors [demographia.com](#) and [www.publicpurpose.com](#). The [www.publicpurpose.com](#) website has been twice honored by the *National Journal* as one of the nation's top internet transport sites.

In 2004 he teamed with Hugh Pavletich of [Performance Urban Planning](#) to develop the *Demographia International Housing Affordability Survey*.



15th Annual Demographia International Housing Affordability Survey (2018: 3rd Quarter)

Hugh Pavletich

Hugh Pavletich, the co-author of the *Demographia International Housing Affordability Survey*, resides in “severely unaffordable” (5.4 Median Multiple) Christchurch, New Zealand, which since September 2010 has experienced [in excess of 13,000 earthquakes](#). He has written extensively on these issues.

He operates the archival website [Performance Urban Planning](#) and is the Managing Director of Pavletich Properties Ltd, a commercial property development and investment company.

He commenced his working life as a farm worker and wool classer (wool classifier) in 1967 and moved to Christchurch in 1980, where he started developing small factory units and has developed commercial and industrial property on freehold and Maori leasehold land in other centers of the South Island as well.

His industry involvement commenced when elected President of the South Island Division of the Property Council of New Zealand (then the Building Owners & Managers Association – BOMA) soon after its inception in 1991, which he led for four years.

He has had extensive involvement with public policy issues of local authority financial management, land use regulation and heritage. In 2004, he was elected a fellow of the Urban Development Institute of Australia (UDIA) for services to the industry.

He felt there was a need for an international measure of housing affordability and teamed up with Wendell Cox in 2004, to develop the annual *Demographia International Housing Affordability Survey*.

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