DEMOGRAPHIA

16th Annual Demographia International Housing Affordability Survey: 2020

Rating Middle-Income Housing Affordability

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

With special coverage of
Housing Affordability in Russia

Introduction:
Focus on Singapore

Data for 3rd Quarter 2019

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16th Annual Demographia International Housing Affordability Survey

Rating Middle-Income Housing Affordability

(2020 Edition: Data from 3rd Quarter 2019)

INTRODUCTION:
FOCUS ON SINGAPORE

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

Background

Over the six decades since Singapore achieved its independence, it has transitioned from a comparatively poor nation to one of the most affluent in the world. In 1960, Singapore's gross domestic product per capita was one-seveth that of the United States, according to the Maddison Historical Statistics. Today, according to the World Bank, Singapore's GDP per capita is third highest among world sovereign nations (only Qatar and Luxembourg are higher), and obviously higher than that of any nation covered by the *Demographia International Housing Affordability Survey*. Singapore's enabling of broad home ownership has been an important element in its economic advance.

Present at the Creation: Singapore's Housing Crisis

In 1960, the new nation faced a dire housing situation. Most households lived in "unhygienic slums and crowded squatter settlements." According to the 1947 British Colony of Singapore government Housing Committee Report, Singapore had one of the world's worst slums, calling it "a disgrace to a civilized community." Solving the problem would be a daunting task.

Singapore's Unequaled Housing Challenge

No major metropolitan area in the high-income world faces the housing affordability challenge of Singapore. Singapore's six million people live on a a fully developed island nation so small that it could fit into one-half of Tokyo Bay. As a result, Singapore lacks the "supply vent" of low-cost suburban or exurban land that moderates house prices across an urban area. Further, Singapore is by far the most densely populated sovereign nation outside the microstate of Monaco. Indeed, Singapore is approximately 75 percent as dense as the *core city* of New York and 50 percent more dense than London (GLA).

Singapore's topographics and international barriers constitute, in effect, a rigid and inflexible urban containment boundary. Nature and international boundaries preclude its elimination or reform.

Inside an urban containment boundary, effective land management is necessary to maintain housing affordability, because demand tends to exceed supply. Singapore has effectively managed its scarce land supply and established a market that produces middle-income housing affordability. According to the 2018 *UBS Global Real Estate Bubble Index*, "there has been no difference between house price and income growth in Singapore over the last 30 years."

This contrasts with the most severely unaffordable markets in, for example, Australia, Canada and the United States, where middle-income households have been largely priced out of the median price housing by spiraling cost increases. This is despite their plentiful supplies of developable land. (Sections 3.1, 3.2, 3.8 and 4).

Prioritizing Home Ownership and Housing Affordability

Singapore established the Housing and Development Board (HDB) in 1960 to solve the problem. In the early years, HDB focused on producing rental housing. This was and remains the emphasis of many subsidized low-income housing programs around the world. But the HDB vision was not confined to subsidized housing. The *1964 HDB Annual Report* expressed the intention to:

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

HDB has viewed home ownership as important to maintaining social stability and building neighbourhoods. Home ownership was also favoured because it encouraged a work ethic among households, which was necessary to save for and maintain their homes. Singapore considers home ownership as the "cornerstone" of the HDB program.

By 1968, the government began to allow purchasers to access funds from their social security (Central Provident Fund) accounts both for down payments and to assist in servicing their mortgages.

More recently (2006):

> *… the Additional CPF Housing Grant Scheme was introduced to help lower income families own their first homes. Since then, other grants have been put in place and enhanced from time to time to help home buyers afford HDB flats. With these measures, buyers would need to use less than a quarter of their monthly household income to pay for the mortgage instalment of their first flat, a figure lower than the international benchmarks for affordable housing.*

HDB housing is referred to locally as "public housing," yet unlike other public housing programs, HDB houses are owned (under 99 year leases) by purchasers who are able to sell their units after five years of occupancy. The primary market is new houses, which are built and sold by HDB. The secondary market is sales by home owners who may have purchased their houses from HDB or

from other owners. New houses are sold at subsidized prices, which makes the nation's mainstream housing market accessible to lower income households.

Including lower income households in the middle-income HDB housing market avoids the social stigma that has often been observed in nations where lower-income housing estates are separate from the middle-class market. This is particularly important in Singapore, whose citizens have among the most diverse origins in the world.

Results

HDB has supplied more than 1,000,000 homes in Singapore, 9 in 10 of which are owner occupied. As a result, Singapore has one of the highest home ownership rates in the world.

The after-grant price for averaged sized new houses (approximately 90 square meters or 970 square feet) was 3.3 times the median household income.

Fundamentals of HDB Strategy

To successfully meet its goals, HDB adopted a housing strategy with three "crucial fundamentals:"

> ***The concept of a sole agency:*** *A sole agency in charge of public housing enabled more effective resource planning and allocation. This concept made it possible to secure the land, raw materials, and manpower for large-scale construction to optimise results and achieve economies of scale.*
>
> ***A total approach to housing:*** *By adopting a total approach covering planning and design, land assembly, development and rejuvenation, the housing task was carried out as a seamless whole – through allocation, management, and maintenance.*
>
> ***Strong government support:*** *Support from the government in the form of political and financial commitment, complemented by legislation, helped put early public housing on the right track quickly, which made housing the nation that much smoother and fruitful a journey.*

Social Objectives

HDB also seeks to achieve social objectives through its policies, such as to:

> ***Promote progressivity*** *by giving a higher grant amount to the lower income.*
>
> ***Promote family formation*** *by providing bigger grant amounts for families than for singles*
>
> ***Promote mutual care and support*** *by encouraging families to live with or close to their parents or children*

In addition, the Singapore government "heavily invests" in upgrading and renewal of HDB neighborhoods. This helps to "forestall urban decay" in older areas and allows home owners of all income levels a quality living environment comparable to newer neighborhoods.

The Singapore Model: Lessons

Singapore's success is particularly notable in light of the international threat to the middle-income standard of living, as described by the by Organisation for Economic Cooperation and Development (OECD) in *Under Pressure: The Squeezed Middle-Class*. Noting that the middle-class costs of living risen much faster than incomes, OECD indicates that "Housing has been the main driver of rising middle-class expenditure" (Section 4).

For over one-half century Singapore has enabled lower income to upper middle-income households to own their own homes. An important key to Singapore's success lies in its recognition of the value of home ownership to households and to the nation.

Moreover, according to HDB, the program "is widely understood to have supported the country's overall economic, social, and political stability."

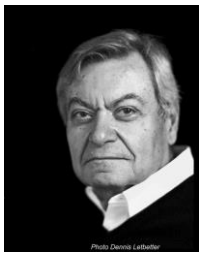
The lesson of Singapore for the world is not so much the intricacies of its housing market design. Rather, it is that Singapore pro-actively and successfully prioritized affordable home ownership for its citizens, and developed means to accomplish that objective based upon its unique conditions.

No metropolitan area is the same as Singapore. Yet, virtually every metropolitan area has the ability to facilitate housing affordability by prioritizing the issue and implementing measures to produce the intended policy outcomes (sometimes this requires multiple governments acting cooperatively). Intentions are not enough --- they must be converted into tangible results. Singapore's success is in *facilitating* results consistent with intentions, that are both meaningful and routinely evaluated.

The net effect of Singapore's housing policy is "to improve outcomes for people," which Paul C. Cheshire, Max Nathan and Henry G. Overman of the London School of Economics have called the "ultimate objective of urban policy."

Note: This Introduction relies on Internet and academic sources and information from the Housing and Development Board (HDB) of Singapore.

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



[Alain Bertaud, New York University](#)

Formerly
The World Bank

(#15: 2019)

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.

We know that unaffordable housing causes a lot of hardship for households that do not yet own their home, in particular, the youngest ones.

High housing prices misallocate resources toward real estate at the expense of the rest of the economy.

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

[The main objective of the planner should be to maintain mobility and housing affordability](#)

[Felipe Carrozi, Paul Cheshire and Christian Hilbur](#)

[London School of Economics](#)

(#14 2018)

Apart from the median multiple being simple and useful, it is also the only measure out there for purposes of international comparison.

... 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.

... 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

[Oliver Hartwich, Executive Director. The New Zealand](#)

(#13: 2017)

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.

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.

[Senator Bob Day, AO, Senate of Australia](#)

(#12: 2016)

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.

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.

	Dr. Shlomo Angel, New York University (#11: 2015)	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.
	Alain Bertaud, New York University (#10: 2014)	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. 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.
	Hon. Bill English, Deputy Prime Minister, New Zealand *Later Prime Minister (2016-2017)* (#9: 2013)	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.
	Robert Bruegmann, PhD, University of Illinois, Chicago (#8: 2012)	… 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.
	Joel Kotkin, Chapman University (#7: 2011)	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.
	Dr. Tony Recsei, Save Our Suburbs, Sydney (#6: 2010)	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. Unless we are vigilant, high-density zealots will do their best to reverse centuries of gains and drive us back towards a Dickensian gloom.

	Dr. Shlomo Angel, New York University (#5: 2009)	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 artifically constrained. 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.
	Dr. Donald Brash, Fomer Governor, Reserve Bank of New Zealand (#4: 2008)	...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. 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...

2007: 3rd Edition 2006: 2nd Edition 2005: 1st Edition

Demographia International Housing Affordability Survey

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> *…to encourage a property-owning democracy … and to enable … citizens in the lower middle income group to own their own homes*
>
> -Singapore Housing and Development Board 1964 Annual Report

EXECUTIVE SUMMARY

The *16th 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 2019. Ninety-two major metropolitan markets (housing markets) are evaluated, including three megacities, with more than 10 million residents, New York, London and Los Angeles.

Middle-Income Housing Affordability

The *Demographia International Housing Affordability Survey* rates middle-income housing affordability (Section 1) 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
Demographia International Housing Affordability Survey
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.

Middle-Income Housing Affordability Drives the Need for Low-Income Housing

Because eligibility for housing subsidies is based on the inability to afford market rate housing, higher house prices increase the cost of subsidized housing programs and increase the number of households that are eligible. More often than not, at least in the nations surveyed, low-income housing subsidies have not been sufficient to meet the need as defined in law and policy. In fact, the most effective strategy for reducing the shortage of subsidized housing is to improve middle-income housing affordability. Lower house prices make market rate housing affordable to more low-income households (Section 1.4).

Housing Affordability in 2019

Over the past year, there has been moderation of house price increases in some of the least affordable major markets. However, the trends were insufficient to materially improve housing affordability (Section 2). `

Major market housing affordability is summarized by nation in Section 3. Schedule 1 includes Median Multiples for all 92 major markets.

Table ES-2
Housing Affordability Ratings by Nation: Major Housing 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	2	2	2	6	4.4
China: Hong Kong	0	0	0	1	1	20.8
Ireland	0	0	1	0	1	4.7
New Zealand	0	0	0	1	1	8.6
Singapore	0	0	1	0	1	4.6
United Kingdom	0	3	10	8	21	4.6
United States	10	23	9	14	56	3.9
TOTAL	10	28	23	31	92	4.3

The most affordable major housing markets are in the United States, with the median market having a moderately unaffordable Median Multiple of 3.9, followed by Canada's median market, at 4.4. Singapore and the United Kingdom at 4.6 and Ireland at 4.7. The median markets of Australia (6.9), New Zealand (8.6) and China (20.8) are severely unaffordable (Table ES-2).

This year, there are 10 affordable major housing markets, all in the United States. There are 31 severely unaffordable major housing markets, including all in Australia (5), New Zealand (1) and China (1). Fourteen of the major markets in the United States are severely unaffordable (out of 56), eight in the United Kingdom (out of 21) and two in Canada (out of six).

The affordable major housing markets include Rochester, with a Median Multiple of 2.5, followed by Oklahoma City and Cleveland (2.7), Buffalo, Cincinnati, Pittsburgh and St. Louis (2.8), Indianapolis and Hartford (2.9) and Tulsa (3.0).

Hong Kong is the least affordable, with a Median Multiple of 20.8, modestly improved from 20.9 last year. Vancouver is second least affordable major housing market, with a Median Multiple of 11.9. Sydney ranks third least affordable, at 11.0, followed by Melbourne, at 9.5 and Los Angeles, at 9.0. Toronto and Auckland are tied for sixth least affordable, at a Median Multiple of 8.6. San Jose has a Median Multiple of 8.5 and San Francisco 8.4. London (Greater London Authority) has a Median Multiple of 8.2 and is the 10th least affordable major market.

Table ES-3 summarizes housing affordability in all markets. Schedule 2 includes Median Multiples for all 309 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	3	5	14	23	5.9
Canada	8	18	6	18	50	3.9
China: Hong Kong	0	0	0	1	1	20.8
Ireland	1	1	3	0	5	4.1
New Zealand	0	0	0	8	8	7.0
Singapore	0	0	1	0	1	4.6
United Kingdom	0	7	16	10	33	4.5
United States	44	79	36	29	188	3.6
TOTAL	54	108	67	80	309	3.9

Threat to the Middle-Class Standard of Living

One of the principal advances of the past two centuries has been the drastic reduction in poverty and the rise of a large middle-class, which is detailed by economists Diedre McClosky and Robert Gordon. At the heart of this trend was increasing home ownership.

Yet there has been material deterioration of middle-income affluence in many metropolitan areas, some that are covered in the *Demographia International Housing Affordability Survey*. In short, the middle-class is under threat. This is the subject of the Organization for Economic Cooperation and Development (OECD) report, *Under Pressure: The Squeezed Middle-Class*, which indicated that "there are now signs that this bedrock of our democracies and economic growth is not as stable as in the past."

OECD emphasizes that the threats to the middle-class crisis are in large measure the result of costs of living that have risen at rates far greater than incomes. The OECD particularly notes that: "…, the cost of essential parts of the middle-class lifestyle have increased faster than inflation; house

prices have been growing three times faster than household median income over the last two decades." These higher housing costs are a threat to the *middle-income lifestyle*, because they reduce discretionary income and thus, the standard of living.

As a result, adult children can no longer depend on having higher incomes than their parents, at least in the United States, the United Kingdom, Canada, Australia, New Zealand, Ireland and elsewhere. It is not surprising that there is increasing concern about income inequality.

Facilitating broadly affluent living standards is a fundamental function of domestic public policy. This requires elimination of planning requirements that undermine prosperity, which has not been recognized in many nations. There are important exceptions, such as Singapore (See: Introduction: Focus on Singapore), which has had housing affordability as a core strategy for half a century and New Zealand, which is seeking to implement substantive proposals to restore housing affordability.

It took millennia to create the incomparably broad prosperity of the modern middle-class. It is worth both preserving and restoring.

Special Coverage: Housing Affordability in Russia

Housing affordability in the major metropolitan areas of Russia is reported, using information from a report published by the Institute for Urban Economics in Moscow (IUE). Like the *Demographia Survey,* the IUE report uses a price-to-income ratio (Median Multiple) as the basis of its housing affordability evaluation. Among the 17 markets, two are seriously unaffordable, three are moderately unaffordable and 12 are affordable The median market has an affordable Median Multiple of 2.6.

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Rating Middle-Income Housing Affordability

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> *…to encourage a property-owning democracy … and to enable … citizens in the lower middle income group to own their own homes*[1]
>
> -Singapore Housing and Development Board 1964 Annual Report

1: MIDDLE-INCOME HOUSING AFFORDABILITY

The *16th Annual Demographia International Housing Affordability Survey* measures middle-income housing affordability in 92 major metropolitan housing markets[2] in Australia, Canada, China (Hong Kong only), Ireland, New Zealand, Singapore, the United Kingdom and the United States. These include three megacities[3] New York, Los Angeles, and London.[4]

In total, the *16th Annual Demographia International Housing Affordability Survey* provides ratings for 309 housing markets located in the same eight nations, with data principally from the third quarter of 2019 (September quarter).[5]

The *Demographia 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 among 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] yet this dispersion of housing market performance was missed in aggregate analyses.

The *Demographia International Housing Affordability Survey* focuses on middle-income housing affordability. Middle-income housing affordability is different from subsidized low – income housing affordability (which is often referred to as "affordable housing").[7] Shelter is a fundamental

[1] *Housing and Development Board 1964 Annual Report.* http://www.globalurban.org/GUDMag07Vol3Iss1/Yuen.htm.
[2] Metropolitan areas with 1,000,000+ population.
[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 within Canada and within the United States.
[7] Including social housing.

need and subsidies are required when market prices or rents are unaffordable. Where middle-income housing is affordable, there is less need for subsidized housing, because more lower-income households can afford market priced houses (Section 1.4).

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 *Wealth Report*). In the vernacular of this populist era, middle-income housing affordability might be characterized as relating to the "99 percent," with the "one percent" relating to the luxury market.

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.

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 at the metropolitan areas level, which is also the labor market and the housing market. Metropolitan areas are the economic (or functional) dimension of cities and include both the built up urban area and exurban areas from which a significant share of workers commute.[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.

> ***"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."***

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).

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[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.

[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*

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 income[11]) 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 Bank[12] 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
Demographia International Housing Affordability Survey
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 change.

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 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.

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.

[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).

Historically, the Median Multiple has been remarkably similar in nations that had liberal land use regulation within recent decades. The Median Multiple was 3.0 or less until the late 1980s or 1990s, in Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States (Figure 1).[15]

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

The *Demographia International Housing Affordability Survey* has been published for 16 years to emphasize the importance of housing affordability to an affluent standard of living. More severely unaffordable housing is strongly correlated with higher overall costs of living and thus lower standards of living between housing markets. As this report indicates, many major metropolitan markets are severely unaffordable and their higher costs of living, largely attributable to housing, deny affluent standards of living to many of their residents. Yet, higher standards of living and

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

[15] See: 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).

lower poverty rates are principal domestic policy priorities in virtually all nations. This requires attention to housing affordability (Section 4).

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.[16] 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 permit[17] 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).[18] 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.[19] Urban containment may be imposed public policy by any level of government and 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 2,000,000 population) is described in Figure 4 and in the Annex.

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. Each of the major metropolitan areas with "severely unaffordable" housing has "urban containment," (Table 3) which has been associated with deteriorating housing affordability. The Organisation for Economic Cooperation and Development (OECD) has recently published a report, *Under Pressure: The Squeezed Middle-Class*, which documents the threat to the future

[16] Liberal land use policy may vary widely, from the near deregulation in some areas of Texas to the "light-handed" zoning regulations operating throughout much of the rest of the United States.
[17] Called urban consolidation in Australia.
[18] See: Wendell Cox, "Restrictive Land-Use Regulation: Strategies, Effects and Solutions," Frontier Centre for Public Policy, https://fcpp.org/wp-content/uploads/FC197_RestrictiveLandUse_JN2817_F2.pdf.
[19] Robert W. Burchell (2002)., George Lowenstein, William R. Dolphin, Catherine C. Galley, Anthony Downs, Samuel Seskin, Katherine Gray Still and Terry Moore. *Costs of Sprawl – 2000*. Transportation Research Board of the National Research Council (2002).

of the middle-class in a number of nations and cites house price increases as an important driving factor (Section 4).

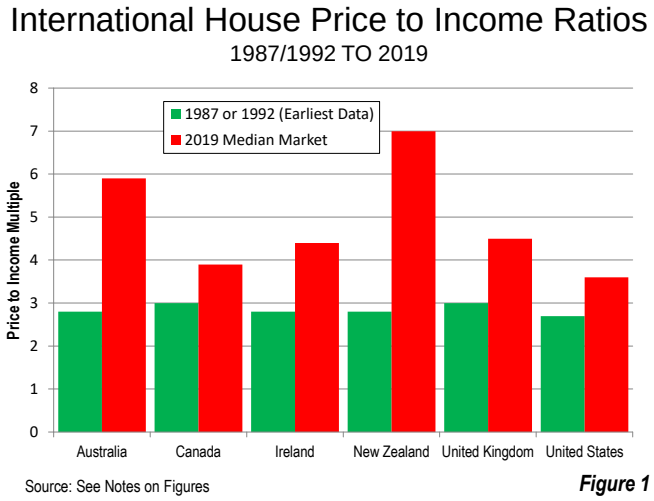
1.4: Middle-Income Housing Affordability: Driving the Need for Low-Income Housing

The consequences of the middle-income housing affordability crisis extend beyond the threat to the middle-class standard of living, which as documented by OECD. Low-income households are also victims of the housing affordability crisis because the cost of subsidized housing rises with market prices.

Each of the major metropolitan areas with "severely unaffordable"

The result is that fewer households can afford housing and the need for subsidized housing increases. At the same time, higher house prices tend to increase the per unit cost of subsidized housing.

With pressure on governments to control public expenditure, there may be little public support for additional spending on affordable housing. Many metropolitan areas have waiting lists for subsidized housing. Public officials make frequent statements about the need to provide more low-income housing, but may fail to recognize that its greater need and rising costs is driven in large measure by inordinately rising house prices.



Source: See Notes on Figures

Figure 1

In fact, the most effective strategy for reducing the shortage of subsidized housing is to improve middle-income housing affordability. Lower house prices make market rate housing affordable to more low-income households.

2: HOUSING AFFORDABILITY IN 2019: INTERNATIONAL SUMMARY

The *16th Annual Demographia International Housing Affordability Survey* provides housing affordability ratings for 92 major housing markets and overall, 309 markets in eight nations. Over the past year, there has been moderation of house prices in a number of the most unaffordable markets. However, in none of these has the improvement been substantial enough to materially improve housing affordability or the standard of living.

Where middle-income housing is affordable, there is less need for subsidized housing, because more lower-income households can afford market priced houses.

2.1: Major Housing Markets

There are 10 "affordable" major metropolitan areas, all in the United States. There are 31 "severely unaffordable" major markets. Only Singapore and Ireland do not have severely unaffordable markets.

Table 4
Housing Affordability Ratings by Nation: Major Housing 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	2	2	2	6	4.4
China: Hong Kong	0	0	0	1	1	20.8
Ireland	0	0	1	0	1	4.7
New Zealand	0	0	0	1	1	8.6
Singapore	0	0	1	0	1	4.6
United Kingdom	0	3	10	8	21	4.6
United States	10	23	9	14	56	3.9
TOTAL	10	28	23	31	92	4.3

For the sixth year in a row, the United States has the most affordable housing costs among major housing markets. The median market in the US has a moderately affordable Median Multiple 3.9 [20] The median market of Canada has a Median Multiple of 4.4, Singapore and the United Kingdom are at 4.6 and Ireland (Dublin) is at 4.7, all of which are seriously unaffordable. The major metropolitan markets are severely unaffordable in Australia, China (Hong Kong) and New Zealand (Table 4). The trend in annual Median Multiples among median markets is shown in Figure 2).

Table 5
Major Housing Markets: 10 Most Affordable

Rank (Out of 92)	Nation	Metropolitan Market	Median Multiple
1	U.S.	Rochester, NY	2.5
2	U.S.	Cleveland, OH	2.7
2	U.S.	Oklahoma City, OK	2.7
4	U.S.	Buffalo, NY	2.8
4	U.S.	Cincinnati, OH-KY-IN	2.8
4	U.S.	Pittsburgh, PA	2.8
4	U.S.	St. Louis,, MO-IL	2.8
8	U.S.	Hartford, CT	2.9
8	U.S.	Indianapolis. IN	2.9
10	U.S.	Tulsa, OK	3.0

Most Affordable Major Housing Markets: The 10 affordable major housing markets are all in the United States (Table 5). Rochester is the most affordable, with a Median Multiple of 2.5. Oklahoma City and Cleveland are second most affordable, with Median Multiples of 2.7. Buffalo, Cincinnati, Pittsburgh and St. Louis Median Multiples of 2.8. Indianapolis and Hartford have Median Multiples of 2.9 and Tulsa has a Median Multiple of 3.0. All of the affordable markets have liberal land use regulation.

[20] This is the Median Multiple of the median market (not the average of the Median Multiples).

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. Eight of the 21 major markets in the United Kingdom, and 14 of the 56 major markets in the United States are severely unaffordable.

The 31 severely unaffordable major housing markets are shown in Table 6. Hong Kong has a Median Multiple of 20.8, slightly improved from 2018. For the tenth year in a row, Hong Kong has the least affordable housing among the markets included in the *Demographia International Housing Affordability Survey.*

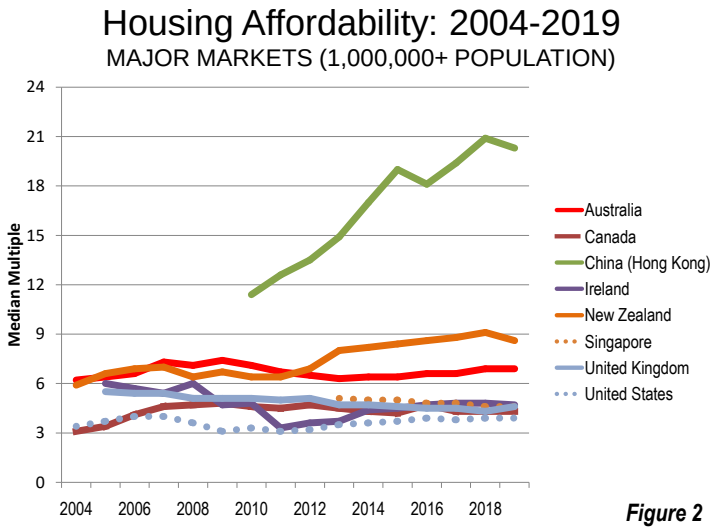


Figure 2

Vancouver is second least affordable major housing market, with a Median Multiple of 11.9. Sydney ranks third least affordable, at 11.0, followed by Melbourne, at 9.5 and Los Angeles, at 9.0. Toronto and Auckland are tied for sixth least affordable, at a Median Multiple of 8.6. San Jose has a Median Multiple of 8.5 and San Francisco 8.4. London (Greater London Authority) has a Median Multiple of 8.2 and is the 10th least affordable major market (Table 6).

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 3. All of the severely unaffordable major markets have urban containment (Table 3).

Three of the seven markets rated by the UBS Global Real Estate Bubble Index 2018 as having the greatest bubble risk are included in the *16th Annual Demographia International Housing Affordability Survey,* each with severely unaffordable ratings. This includes Toronto (#2), Hong Kong (#3, tied with Amsterdam), and Vancouver (#7).

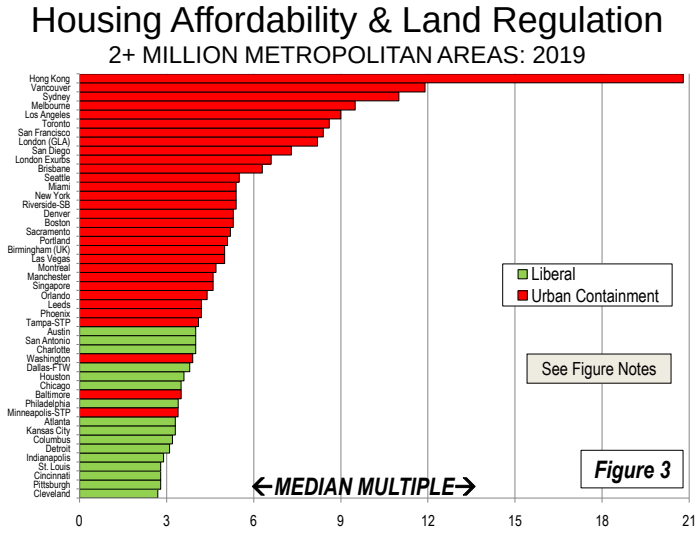


Figure 3

Major market data is summarized in Schedule 1, with additional information in Schedule 3.

Table 6 Severely Unaffordable Major Housing Markets (Least Affordable)							
Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
62	U.S.	Portland, OR-WA	5.1	78	U.K.	London Exurbs (E & SE England)	6.6
63	U.S.	Fresno, CA	5.2	79	Australia	Adelaide, SA	6.9
63	U.S.	Sacramento, CA	5.2	79	U.K.	Bournemouth & Dorsett	6.9
65	U.S.	Boston, MA-NH	5.3	81	U.S.	San Diego, CA	7.3
65	U.S.	Denver, CO	5.3	82	U.S.	Honolulu, HI	8.0
67	U.K.	Leicester & Leicestershire	5.4	83	U.K.	London (Greater London Authority)	8.2
67	U.S.	Miami, FL	5.4	84	U.S.	San Francisco, CA	8.4
67	U.S.	New York, NY-NJ-PA	5.4	85	U.S.	San Jose, CA	8.5
67	U.S.	Riverside-San Bernardino, CA	5.4	86	N.Z.	Auckland	8.6
71	U.S.	Seattle, WA	5.5	86	Canada	Toronto, ON	8.6
72	U.K.	Northampton & Northamptonshire	5.7	88	U.S.	Los Angeles, CA	9.0
73	U.K.	Swindon & Wiltshire	5.8	89	Australia	Melbourne, VIC	9.5
74	Australia	Perth, WA	6.0	90	Australia	Sydney, NSW	11.0
74	U.K.	Plymouth & Devon	6.0	91	Canada	Vancouver, BC	11.9
76	Australia	Brisbane, QLD	6.3	92	China	Hong Kong	20.8
77	U.K.	Bristol-Bath	6.5				

2.2: All Housing Markets

Among all 309 markets, the United States has the most affordable housing costs, with a Median Multiple of 3.6 in the median market. The median market in Canada has a Median Multiple of 3.9, followed by Ireland (4.1), the United Kingdom (4.5) and Singapore(4.6). Overall, the least affordable median market Median Multiples are in China (Hong Kong), at 20.8, Australia (6.0) and New Zealand (7.0), each severely unaffordable. Table 7 summarizes housing affordability ratings by nation for all 309 markets.

All markets are ranked by housing affordability in Schedule 2 and listed alphabetically in Schedule 3.

Table 7 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	3	5	14	23	5.9
Canada	8	18	6	18	50	3.9
China: Hong Kong	0	0	0	1	1	20.8
Ireland	1	1	3	0	5	4.1
New Zealand	0	0	0	8	8	7.0
Singapore	0	0	1	0	1	4.6
United Kingdom	0	7	16	10	33	4.5
United States	44	79	36	29	188	3.6
TOTAL	54	108	67	80	309	3.9

Among all markets, 54 are affordable (Median Multiple of 3.0 or less). The affordable markets are in Australia (1), Canada (8), Ireland (1), and the United States (44). There are no affordable markets in China (Hong Kong), New Zealand, Singapore or the United Kingdom.

Canada has the most affordable market, in Fort MacMurray, AB, at a Median Multiple of 1.8. For MacMurray has suffered serious economic disruption as a result of petroleum market developments and product transport shortages. Two other Canadian markets are in the most affordable ten, Fredericton, NB and Saint John, NB (Table 8).

Table 8
All Housing Markets: 10 Most Affordable

Rank	Nation	Metropolitan Market	Median Multiple
1	Canada	Fort MacMurray, AB	1.8
2	U.S.	Peoria, IL	2.1
3	U.S.	Davenport, IA-IL	2.2
3	U.S.	Rockford, IL	2.2
5	U.S.	Utica-Rome, NY	2.3
6	U.S.	Akron, OH	2.4
6	Canada	Fredericton, NB	2.4
6	U.S.	McAllen, TX	2.4
6	Canada	Saint John, NB	2.4
6	U.S.	Syracuse, NY	2.4

Among the 79 severely unaffordable markets, most are in the United States (29), Canada (18) and Australia (14).

3: HOUSING AFFORDABILITY IN 2019: 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 15 *Demographia International Housing Affordability Surveys,* all of Australia's five major housing markets are severely unaffordable (Figure 4).

Even so, housing 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 *Demographia Survey* was published.

Sydney is again the third least affordable market, with a 11.0, while Melbourne is fourth least affordable at 9.5

OECD expressed the following assessment of the Australian housing market (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."

Major Markets: Sydney is again Australia's least affordable market, with a Median Multiple of 11.0, and ranks third least affordable overall, trailing Hong Kong and Vancouver.

Melbourne has a Median Multiple of 9.5 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 14th least affordable of the 92 major markets. Brisbane has a Median Multiple is 6.3 and is ranked 17th least affordable, while Perth, with a Median Multiple of 6.0 is the 19th least affordable major housing market in this year's *Demographia Survey*.

Other Housing Markets: Overall, Australia's housing markets have a severely unaffordable Median Multiple of 5.9. There is only one affordable market, Gladstone, Queensland, with a Median Multiple of 2.8. Overall 14 markets in Australia are rated severely unaffordable. The least affordable are the Sunshine Coast, Queensland (8.4) and the Gold Coast, Queensland (8.0).

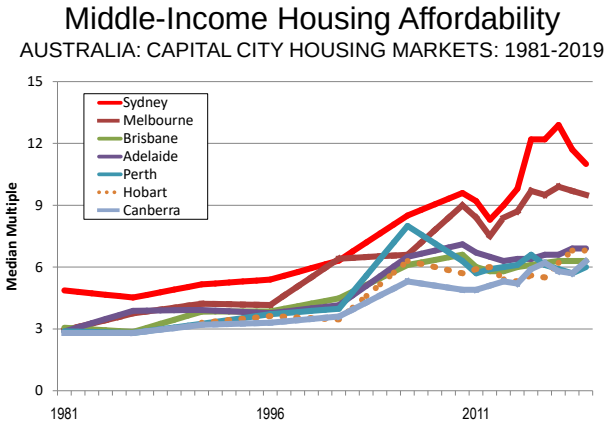


Figure 4

Subsidized Low-Income Housing: Australia's high house prices have increased the cost and demand for subsidized housing. The Australian Housing and Urban Research Institute estimated that "current housing need in Australia to be 1.3 million households," and expected the need to worsen. A Parliamentary briefing book found that " …the stock of social housing is not increasing at a rate sufficient to keep up with demand, and waiting lists for social housing remain long."

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). The price-to-income ratio in Australia was below 3.0 three decades ago (Figure 1).

3.2: Canada

There has long been concern about deteriorating housing affordability in Canada. In addition to its international attention to the middle-class standard of living, OECD has expressed concern about decline of the middle-class in Canada and the substantial role of house price increases in that phenomenon.

Canada's new Liberal Party led government has appointed a Minister of Middle-Class Prosperity. The principal threat to the standard of living is that house prices have been rising strongly ahead of income. A 2016 Frontier Centre for Public Policy research report reviewed the strongly rising house prices relative to incomes in 35 markets since 2000.[21]

Major Housing Markets: Canada has two of the 10 least affordable major markets in the *Demographia Survey* (Figure 5).

Vancouver has the second least affordable housing among the major markets, with a Median Multiple of 11.9, trailing only Hong Kong.

British Columbia imposed a foreign buyers tax in 2016. This year's Median Multiple is below last year's 12.6, but is approximately the same as when the foreign buyers tax was imposed.

Vancouver has the second least affordable housing among the major markets, with a Median Multiple of 11.9.

The 2019 UBS Global Real Estate Bubble Index rates Vancouver as having the sixth 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 11.9, equivalent to an additional 6.6 years of pre-tax median household income.

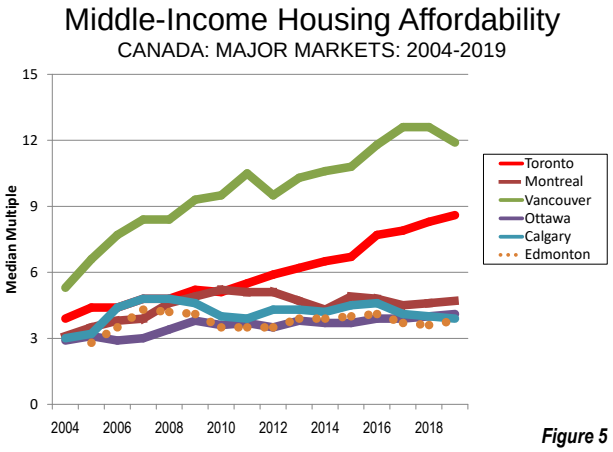


Figure 5

Toronto also has severely unaffordable housing, with its Median Multiple deteriorating to 8.6 from 8.3 in 2018 and 3.9 in 2004 (the first *Demographic International Housing Affordability Survey*) The 2019 UBS Global Real Estate Bubble Index rates Toronto as having the second worst housing "bubble risk" in the world (after Munich), worse than least affordable Hong Kong and second least affordable Vancouver.

The province of Ontario imposed a foreign buyers tax in 2017. Since that time, Toronto's house prices have become less volatile, especially in more expensive housing. However, housing affordability in Toronto has continued to deteriorate at the middle of the market.

In Toronto, house prices have deteriorated from 3.9 to 8.6 times annual incomes in 15 years

[21] 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.

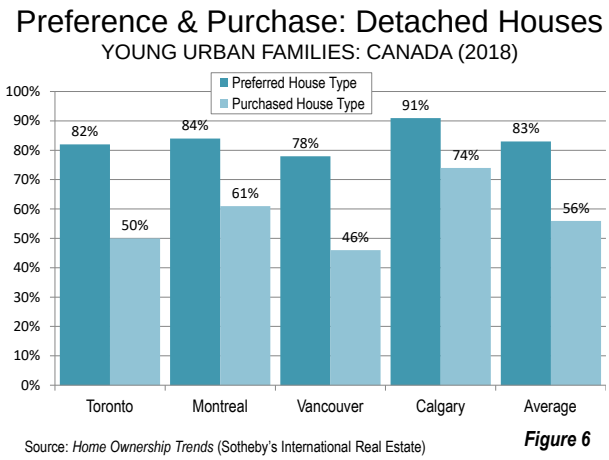
In Toronto, the housing affordability loss has been associated with the mid-2000s adoption of urban containment policy ("Places to Grow"), including a Green Belt and other draconian restrictions. A *Demographia Survey* co-author predicted at the time that this would lead to worsened housing affordability.[22]

Montréal has seriously unaffordable housing (4.7), having deteriorated from a moderately unaffordable 3.1 in 2004.

Calgary has a moderately unaffordable Median Multiple of 3.9, 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 became seriously unaffordable, with a Median Multiple of 4.1. This is a deterioration from an affordable Median Multiple of 2.9 in 2004. Canada's most affordable major market is Edmonton (3.8), 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 *Demographia Survey*.

Housing Choice Denied in Major Metropolitan Areas: A Sotheby's Real Estate International poll reported that a large percentage of households prefer detached housing, as has historically been the case in Canada. Yet rising prices have, in effect, limited housing choice, forcing many new buyers into attached housing (such as row houses, semi-detached and row houses) and apartment condominiums (Figure 6). In Vancouver, Toronto, Montréal, and Calgary from 78 to 91 percent of young urban households were found to prefer detached housing. Each of these four metropolitan areas have urban containment.



Source: *Home Ownership Trends* (Sotheby's International Real Estate)

Figure 6

Ryerson University researchers have responded to the serious housing affordability concerns by proposing a substantial expansion of the lower density ground oriented housing (detached, semi-detached, attached and row houses) preferred by the market.[23] 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 2019 illustrates the financial impossibilities faced by middle-income households

[22] Wendell Cox (2004), *Myths about Urban Growth and the Toronto Greenbelt,* Fraser Institute.
[23] 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

in Canada's severely unaffordable markets. In Vancouver, the median income household would need to pay *all* of its pre-tax income in housing costs to afford the median priced house. This is about triple or more the amount of household income that would be required in Winnipeg, Halifax, Regina, St. John's or Saskatoon. In Toronto, it requires nearly 80 percent, about double that of Calgary or Edmonton. In both Vancouver and Toronto, affording the least expensive housing, apartment condominiums is considerably above the Canada Mortgage and Housing Corporation 30 percent housing affordability guideline (Figure 7).

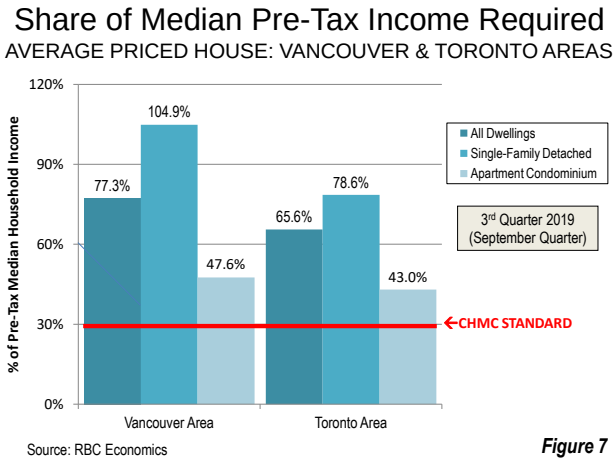


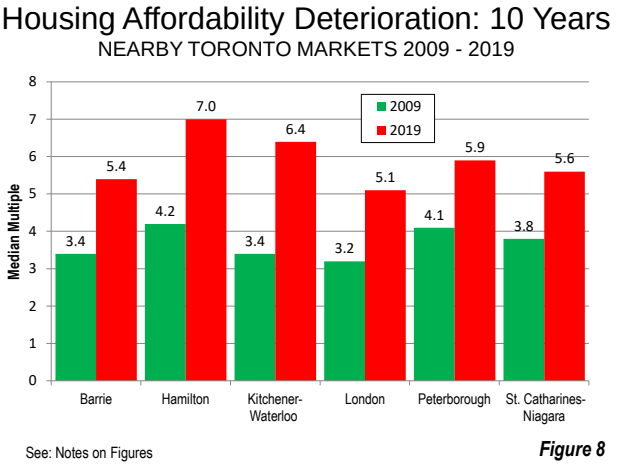
Figure 7

Other Housing Markets: The overall Median Multiple for the 50 markets in Canada is a moderately unaffordable 3.9, a slight improvement from last year's 4.0.

As in California (Section 3.8), severely unaffordable housing has spread from the least affordable major markets. In British Columbia, this is evident in Victoria (8.1), the Fraser Valley (7.8), Nanaimo (7.5), Comox Valley (7.5), Chilliwack (7.3) and Kelowna (6.7).

Similarly, markets in the extended Toronto area (generally the "Greater Golden Horseshoe") have become severely unaffordable, including Hamilton (7.0), Guelph (6.5), Kitchener-Waterloo (6.4), Cambridge (6.0), Oshawa (5.9), Peterborough (5.9), St. Catharines-Niagara (5.5), Barrie (5.5), Brantford (5.6) and London (5.1). This indicates housing affordability deterioration (Median Multiple increases) of 40 percent to 90 percent in just a decade (Figure 8).

Outside of the severely unaffordable markets of Ontario and British Columbia, Canada's house prices are much more affordable. There are eight affordable markets, with Fort MacMurray as the most affordable market in any nation in this year's *Demographia Survey* (Median Multiple of 1.8). Fort MacMurray is suffering a severe economic decline as a result of negative petroleum market dynamics. Other affordable markets include Fredericton (NB) and Saint John (NB) at 2.4, Cape Breton (NS) at 2.6, Moncton (NB) at 2.6, Saguenay (QC) at 2.7, Trois Rivieres (QC) at 2.8 and Thunder Bay (ON) at 3.0.



See: Notes on Figures

Figure 8

Subsidized Low-Income Housing: The escalation of house prices has increased the number of households eligible for subsidized housing, while substantially increasing costs. In Vancouver and Toronto there are waiting lists. In Vancouver, "…new residential projects "are not affordable for lower income households." Land cost escalation around transit stations "can foster gentrification and demolition of rental stock" that can cause displacement of low-income households.

In Toronto, RBC reports that there has been a huge increase in apartment rental construction, but it is largely unaffordable to lower-income households. The supply of such housing is expected to fall far short of the need in coming years. Data in the Ontario Non-Profit Housing Association indicated that there were more than 100,000 households on waiting lists in the Toronto metropolitan area.

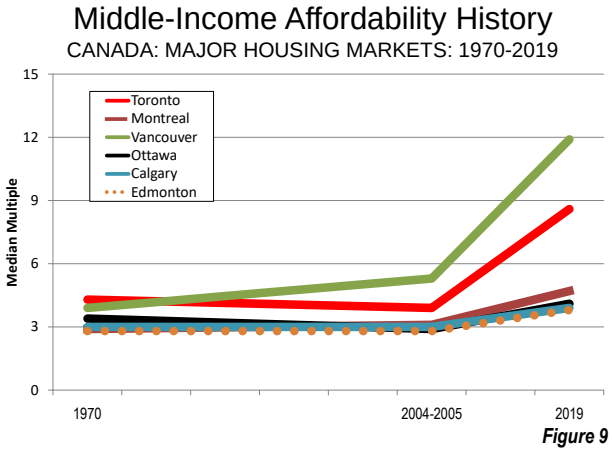


Figure 9

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* 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 tenth straight year, with a Median Multiple of 20.8. This is improved from last year's Median Multiple of 20.9.

Hong Kong has improved its position in the UBS Global Real Estate Bubble Index. Last year, Hong Kong had the greatest "bubble risk" of any rated market. The 2019 report places Hong Kong behind Toronto and Amsterdam, which have greater bubble risks.

Hong Kong has the least affordable housing in the Survey, with a Median Multiple of 20.8.

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. In 2019, private housing developers contributed portions of their land holdings to alleviate the housing shortage.

Subsidized Low-Income Housing: Hong Kong has a large subsidized housing program. Nonetheless, there is a shortage of subsidized housing and the Hong Kong Housing Authority reports the average waiting time for general applicants to have been 5.4 years in September 2019.

Historical Context: Since colonial times (at least 1970), new residential development has been strongly controlled by government, which has been the sole supplier of new land to residential developers. This is unlike nations that have had liberal land use regimes (Section 1.3). Higher house prices have been associated with this restrictive regulatory environment, [24] which includes the urban containment strategy of greenbelts.

3.4: Ireland

Overall, Ireland's median market Median Multiple is a moderately unaffordable 4.1.

Major Housing Market: Dublin is Ireland's only major metropolitan area market and has a seriously unaffordable Median Multiple, of 4.7, a slight improvement from last year's 4.8. Even so, housing affordability has worsened by nearly 50 percent since 2011 from a Median Multiple of 3.3.

Other Housing Markets: Galway and Cork are seriously unaffordable, both with a Median Multiple of 4.1. Waterford deteriorated to moderately unaffordable (3.2) while Limerick (3.0) remains affordable.

Historical Context: Ireland had a price-to-income multiple of less than 3.0 in the early 1990s and remained affordable to the late 1990s (Figure 1).

3.5: New Zealand

Recent New Zealand Median Multiple trends have been influenced by government restatement of median income data.[25]

Largest Markets: Auckland, New Zealand's only major housing market has a severely unaffordable 8.6 Median Multiple. This is an improvement from 9.0 in 2018. Even so, Auckland's housing affordability has deteriorated from a Median Multiple of 5.9 in the first *Demographia Survey* (2004), thus adding nearly three years in pre-tax median household income to the house prices.. Auckland[26] is the sixth least

Auckland has been severely unaffordable in all 16 Demographia Surveys

[24] C. M. Hui & F. K. Wong (2003), "Dynamic Impact of Land Supply on Population Mobility with Evidence from Hong Kong," http://www.prres.net/Papers/Hui_Dynamic_impact_of_land_supply_on_population_mobility.pdf.
[25] 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.
[26] The city of Auckland governs virtually the entire metropolitan area (housing market area or labor market area). Auckland and Honolulu are unusual among major metropolitan markets, with local governance by a single local authority.

affordable among the 92 major housing markets, and has been severely unaffordable in all 16 *Demographia International Housing Affordability Surveys.*

New Zealand's' second and third largest markets have experienced significantly different housing affordability trends over the last decade. Second largest Christchurch has a Median Multiple of 5.4, an improvement of 0.7 points from the 6th annual *Demographia International Housing Affordability Survey.* Third largest Wellington has a Median Multiple of 6.8, a deterioration of 1.2 points over the past decade (Figure 10).

Subsidized Low-Income Housing: New Zealand's middle-income housing crisis has strained government low-income housing budgets. Emergency aid has been increased to accommodate some low-income households in motels and waiting lists have been growing.

Housing Affordability and Public Policy Initiatives: Housing affordability remains an issue of considerable public concern in New Zealand. The latest IPSOS New Zealand Issues Monitor (November 2019), with 62 percent respondents believing that they cannot afford to purchase a house in their own market. Housing affordability has been a principal issue from the time of the lead – up to the 2008 election and Parliaments 2007-8 Commerce Committee Housing Affordability Inquiry, chaired by the National Party's Hon. Gerry Brownlee. National's then Housing Spokesman and later Minister Hon. Phil Heatley toured the United States and United Kingdom prior to the election to study housing.

The Labour Party led coalition government's Urban Growth agenda calls for intensified residential development, both greenfield and infill. This includes the abolishment of the Auckland urban containment boundary. The government is also proceeding with plans to reform infrastructure finance to rely on debt to be serviced by residents of new developments, rather than public expenditures.

During the December 1st Reading of the Infrastructure Funding and Financing Bill , Urban Development Minister Twyford acknowledged the broad political support for the Bill. Just prior to this, the Urban Development Bill was introduced in Parliament.

Twyford addressed the Government Economics Network Conference in December, reiterating the government's commitment to improving housing affordability.

> *The argument I want to make to you is that generations of urban land use policy have lacked a decent grounding in economics. The consequences of that have been disastrous. And if we want to turn it around it is going to take bold reform and policies informed by an understanding of urban spatial economics.*

He continued, noting that the *potential economic advantages of cities can only be realised if workers, consumers and suppliers are able to exchange their labour, products and ideas with minimum friction.*

Consider the effect on the country's labour productivity of two-thirds of Kiwis not being able to afford to buy into the Auckland housing market and thus not being available for the city's jobs. Real estate is so expensive it distorts the allocation of labour and capital to the detriment of our productive economy.

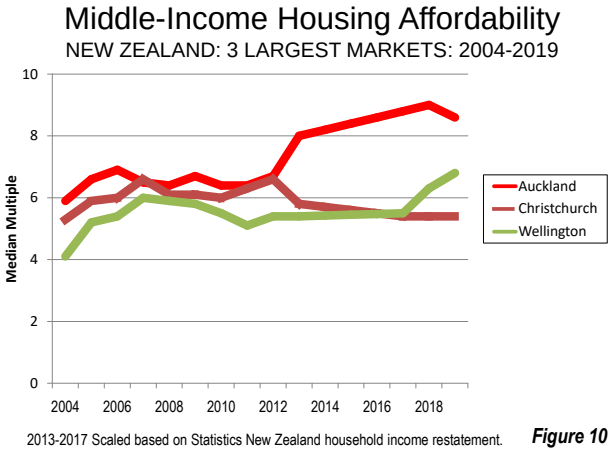


Figure 10

Historical Context: 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). As indicated in Figure 1 (above), New Zealand's price-to-income ratio was below 3.0 in the early 1990s.

3.6: Singapore

The Introduction to this year's *Demographia Survey* is "Focus on Singapore," which contains additional information.

Singapore's Median Multiple is 4.6, seriously unaffordable. As is indicated in the *Introduction: Focus on Singapore* (above), obtaining and maintaining housing affordability is a far greater challenge in Singapore than virtually any other major metropolitan area, confined to a small island and constrained by international borders.

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

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, approximately 80 percent of residents live in HDB housing. Further, Singapore has an overall 91 percent rate of home ownership, the highest of any country in the *Demographia 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.

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.

Historical Context: According to the 2018 *UBS Global Real Estate Bubble Index*, "there has been no difference between house price and income growth in Singapore over the last 30 years."

3.7: United Kingdom

The United Kingdom has a seriously unaffordable Median Multiple of 4.6 for major markets and 4.5 for all markets.

Major Housing Markets: Eighteen of the United Kingdom's 21 major housing markets are either severely unaffordable or seriously unaffordable. Three major markets, Blackpool & Lancashire (3.9), Sheffield & South Yorkshire (3.9) and Glasgow (4.0) are all moderately unaffordable.

London (the Greater London Authority, inside the greenbelt) is the least affordable market, with a Median Multiple of 8.2 and is rated the 10th least affordable major market in the *Demographia Survey*. Seven other major markets are severely unaffordable, including Bournemouth & Dorset, at 6.9, the London Exurbs (East and Southeast England, virtually all outside the London greenbelt) at 6.6, Bristol-Bath at 6.5, Plymouth & Devon at 6.0, Swindon & Wiltshire at 5.8, Northampton & Northamtptonshire at 5.7 and Leicester & Leicestershire at 5.4.

Other Housing Markets:. None of the other housing markets in the United Kingdom is affordable. Four are moderately unaffordable, including Dundee (3.9), Swansea (3.9), Aberdeen (3.9) and Falkirk (3.8).

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"

Subsidized Low-Income Housing: The high house prices in the UK have had the expected impact on low-income housing, with a House of Commons research briefing paper indicating the need to increase the rate of construction. More than 800,000 households were reported to be remaining on waiting lists.

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.[27] A report by the International Monetary Fund[28] indicated the need to alleviate supply-side constraints, "notably pertaining to planning restrictions…"

[27] 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.
[28] International Monetary Fund, Country Report: United Kingdom: Selected Issues, http://www.imf.org/external/pubs/ft/scr/2015/cr14234.pdf, 2015.

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

The loss of middle-income housing affordability is indicated by the escalation of house prices in English regions relative to earnings (Figure 12). In London (GLA), house prices rose 3.3 times as rapidly as earnings in little more than two decades (1997 to 2018). Even in the comparatively depressed North East, house prices rose at 1.8 times earnings, while in all of the regions, house prices were nearly double their 1997 ratio to earnings.

Despite the perception that there is little rural land left in the United Kingdom, 2011 census data indicates that less than 10 percent of the land in England and Wales was in built-up urban areas.[29]

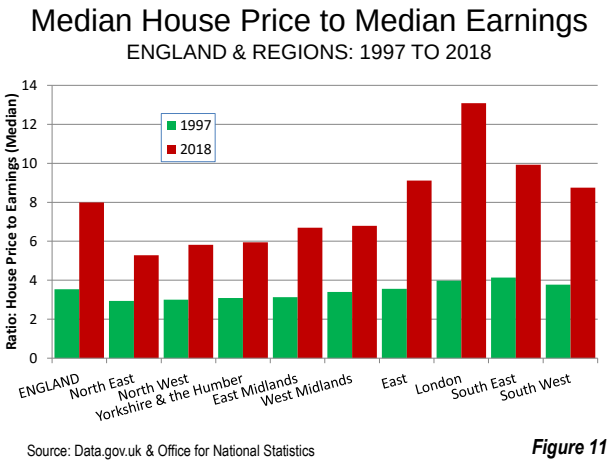


Figure 11

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 are subject to urban containment policy. As Figure 1 (above) indicates, the price-to-income ratio in the United Kingdom was 3.0 in the early 1990s.

3.8: United States

Overall, the United States has a moderately unaffordable Median Multiple of 3.6, the best housing affordability in this year's *Demographia Survey*. This has been aided by recent household income increases that have finally exceeded[30] late 1990s levels (inflation adjusted). This has been 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 3.9 in its major markets. This is the most favorable major market housing affordability in this year's *Demographia Survey*. There are 10 affordable major housing markets in the United States and 14 severely unaffordable markets.

[29] Calculated from 2011 Census data.
[30] Federal Reserve Bank of St. Louis, "Real Median Household Income in the United States," https://fred.stlouisfed.org/series/MEHOINUSA672N

The most affordable major housing markets are Rochester (NY), with a Median Multiple of 2.5. Cleveland (OH) and Oklahoma City follow with a Median Multiple of 2.7. Buffalo (NY), Cincinnati (OH-KY-IN), Pittsburgh (PA) and St. Louis (MO-IL) all have a Median Multiple of 2.8. Hartford (CT) and Indianapolis (IN) have a Median Multiple of 2.9. Tulsa (OK) ranks 10th, with a Median Multiple of 3.0.

The five major housing markets with the poorest U.S. housing affordability are in California and Hawaii. Los Angeles (CA) has the worst housing affordability, with a Median Multiple of 9.2, followed by San Jose (CA) at 8.5 and San Francisco at (CA) at 8.4. These latter two markets are in the San Francisco Bay Area, which has the world's strongest information technology industry. Honolulu (HI) has a Median Multiple of 8.0 and San Diego (CA) has a Median Multiple of 7.3.

There are nine additional severely unaffordable major housing markets in the United States, including Seattle, (WA) at 5.5, Miami (FL), Riverside-San Bernardino (CA), and New York (NY-NJ-PA) at 5.4, Denver (CO) and Boston (MA-NH) at 5.3, Sacramento (CA) and Fresno (CA) at 5.2 and Portland (OR-WA) at 5.1.

All Housing Markets: Overall, 44 of the 188 U.S. housing markets are affordable. The most affordable markets in this year's *Demographia Survey* are Peoria, (IL) with a Median Multiple of 2.1, Davenport (IA-IL) and Rockford (IL) at 2.2, Utica-Rome (NY) at 2.3 as well as Akron (OH), McAllen (TX) and Syracuse (NY), at 2.4. Among markets outside the United States, only Fort MacMurray (AB), Canada is more affordable than these markets.

The California markets of Salinas, Santa Cruz and San Luis Obispo are the least affordable among the other markets, each with a Median Multiple of 8.4.

Affordability Concerns: Despite the more favorable housing affordability in the United States, a recent poll by the National Association of Home Builders (NAHB) found that four of five households believe there is a housing affordability crisis. According to NAHB Chair Greg Ugalde, "Policymakers must roll back inefficient zoning rules, costly impact fees and outmoded land development regulations that are driving up housing costs, contributing to the mounting lack of affordable housing and hurting middle- and low-income households."

The US median lot value was $49,500 in 2018, and less in parts of the nation.

A National Association of Home Builders compilation of US Census Bureau data found that the median value of building lots (sections) for new single-family houses in the United States reached a record $49,500 in 2018, though were less in more affordable parts of the nation. The lowest median lot values were in two Census Divisions, at $38,000 and $40,000. Included in these Divisions are metropolitan areas such as Atlanta, Charlotte, Nashville and Louisville, as well as the generally less affordable metropolitan areas of Florida. Even with the recent increase, lot values have risen little over the past two decades, adjusted for inflation (Link to NAHB Chart).

Decline of the Middle Class Evident in US Mortgage Qualification Data: The decline of the middle-class in the United States is evident from data from the minimum qualifying incomes for median priced house mortgages made by the National Association of Realtors. Generally, the middle-class has been priced out of the median house price market in the least affordable metropolitan areas.

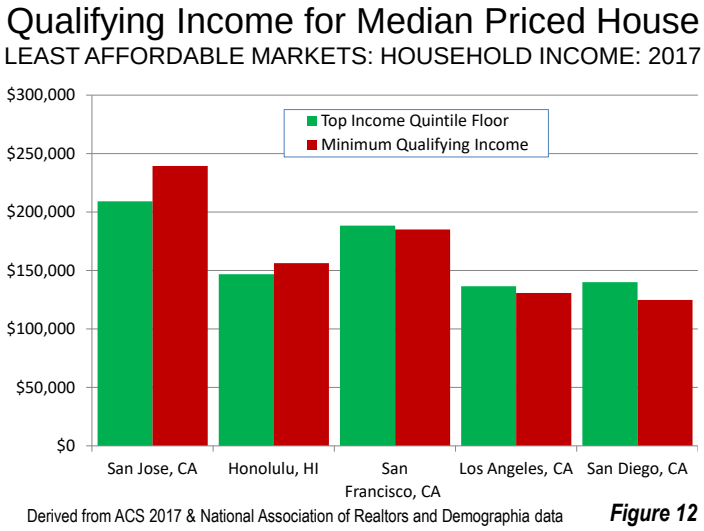


Figure 12

Only three percent of middle-class households had sufficient income to qualify for a mortgage on the median priced house among the five least affordable metropolitan areas (Los Angeles, San Diego, San Francisco and San Jose as well as Honolulu). Each of these markets has severely unaffordable housing.[31] (This analysis defines the middle-class as comprising the middle three quintiles, encompassing the 20th to 80th percentiles of household income).

In San Jose and Honolulu, ***no middle-class households would have qualified***, with the qualifying income being in the high income quintile. In Los Angeles, San Francisco and San Diego, the qualifying income nearly reaches the threshold of the top quintile (Figure 12).

In the nine severely unaffordable markets *outside* coastal California and Honolulu, only 33 percent of households had sufficient incomes to qualify. Among all severely unaffordable markets (coastal California and Honolulu included) 22 percent of middle-income households had sufficient income to qualify for a mortgage on the median priced house.

In seriously unaffordable markets, it is estimated that 58 percent of middle-income households would have qualified. The figure rises to 67 percent in moderately unaffordable markets. In the

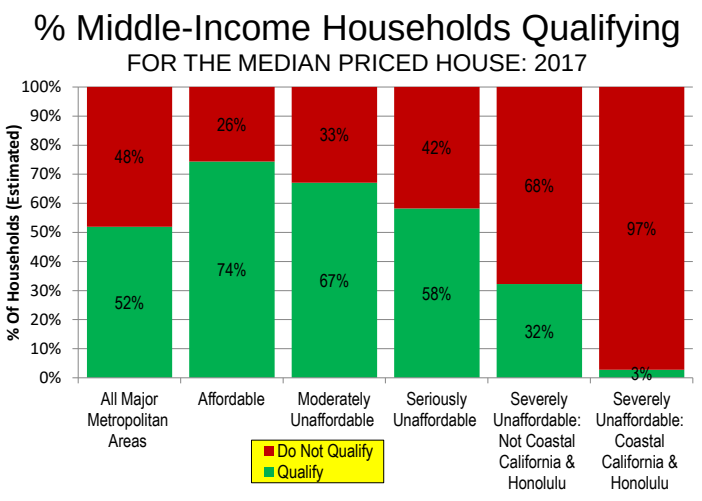


Figure 13

[31] Estimates modeled using American Community Survey and Current Population Survey data, with middle-incomes defined as Quintiles 2 through 4. The national distribution of households by income within these quintiles is applied to the quintiles in the metropolitan areas.

affordable markets, 74 percent of middle-income households are estimated to have had enough income to qualify for a mortgage on the median priced house (Figure 13).

It is estimated that approximately 52 percent of US middle-income households in major metropolitan areas had sufficient income to qualify for a mortgage on the median priced house under typical terms (2017).

Before the imposition of stronger land use regulations in some markets (1970 Census), the Median Multiple among US major metropolitan areas was 2.1, well within the "affordable" range and well below the present 3.9 average. It is likely that nearly all households had sufficient income to qualify for the median priced house in 1970.

Subsidized Low-Income Housing: The United States has had a long standing shortage of affordable housing for low-income households. The Center for Housing Policy reported in 2016 that 21 percent of "working households" had "severe housing cost burdens." California had the most serious problem, and the Los Angeles metropolitan area had the highest percentage of households with severe housing cost burdens" among the major metropolitan areas. Recently, the California Department of Housing and Community Development estimated a shortfall of 550,000 affordable housing units in the extended Los Angeles metropolitan area[32] alone.

In 2016, 21% of working households in the United States had severe housing cost burdens – Center for Housing Policy

Many jurisdictions in the United States have long waiting lists for subsidized housing and it is not unusual for such lists to be closed to additional households.

The Housing Crisis in California: California has the three least affordable major metropolitan areas in the nation and all of its metropolitan areas are severely unaffordable (Figure 14).

Prospects for improvement appear to be bleak. Already, the inexpensive new urban fringe housing, which drives housing affordability, is prohibited or severely limited by state and local policy.

At the same time, California has had the highest housing cost adjusted poverty rate of any US state for as long as such data has been reported (8 years). California also has the highest rate in the nation of homelessness, which is getting more severe.[33] 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, as well as in Los Angeles.

The state continues to shed residents, losing a 900,000 net domestic migrants since 2010. The exodus is accelerating. The average loss was under 50,000 from 2011 through 2015, and rose to

[32] Los Angeles combined statistical area.
[33] 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.

130,000 from 2016 to 2018. In 2019, the loss was more than 200,000, the largest of any state.[34] Domestic migration losses have accelerated in the extended Los Angeles metropolitan area (combined statistical area) and the San Francisco Bay Area, which have among the least affordable housing in the United States. There is also a significant outflow of business investment.[35]

As is occurring in Canada, markets nearby the least affordable major markets in California have become severely affordable, including major markets Riverside-San Bernardino, Sacramento and Fresno. Other nearby San Francisco, San Jose and Los Angeles have also become severely unaffordable, including Vallejo, Oxnard, Santa Cruz, Santa Rosa. Stockton and Modesto (the latter two in the San Joaquin Valley). San Luis Obispo and Santa Barbara are also severely unaffordable.

California has had the highest housing cost adjusted poverty rate of any US state for 8 years.

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 "supply vent" of urban expansion on competitively priced land, California's housing affordability is unlikely to materially improve.

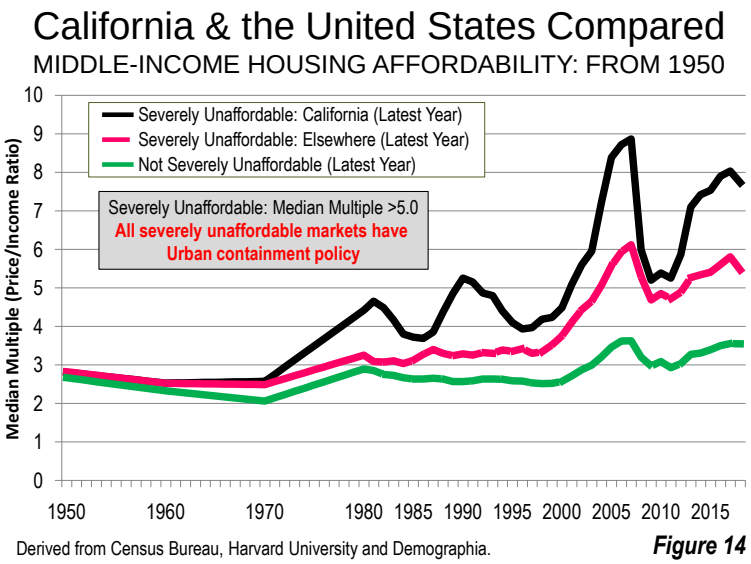


Figure 14

It has been suggested that urban fringe development is impossible because of topographic barriers in some California metropolitan areas. 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.

[34] Wendell Cox (2020), "U.S. Population Growth Down 1/3 in 5 Years, California Down 85%." http://www.newgeography.com/content/006519-us-population-growth-down-13-5-years-california-down-85.
[35] 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.

Historical Perspective: The United States had generally affordable housing through much of the period following World War II. Median Multiples in the United States were virtually all "affordable" (3.0 or below) until the 1970s and the major median market Median Multiple remained an affordable 3.0 until 2000, early in the housing bubble.

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 and Maryland. 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.

Median Multiples in the United States were virtually all below 3.0 until the 1970s and the major metropolitan area average remained affordable until 2000.

More recently, middle-income housing has been increasing in emerging economies, on the urban fringes of Mexico, the Philippines, Chile, Indonesia, Thailand, Malaysia and countries in Central America.

4: THREAT TO THE MIDDLE-CLASS STANDARD OF LIVING

If planning helps people, they ought to be better off as a result, not worse off.
-Jane Jacobs[36]

One of the principal advances of the past two centuries has been the drastic reduction in poverty and the rise of a large middle-class, which is detailed by economists Diedre McClosky and Robert Gordon. At the heart of this trend was the increase in the home ownership rate among the rapidly growing metropolitan population, which increasingly located in the suburbs, where land and houses were less expensive per square foot and which had good access to jobs, shopping and recreation.

… this bedrock (the middle-class) of our democracies and economic growth is not as stable as in the past - OECD.

Yet there has been material deterioration of middle-income affluence in many metropolitan areas, some that are covered in the *Demographia International Housing Affordability Survey.* In short, the middle-class is under threat. This is evident in recently published research by the Organization for Economic Cooperation and Development (OECD).

OECD: *The Squeezed Middle-Class*

This is happening broadly through the western world and beyond. In a report entitled *Under Pressure: The Squeezed Middle-Class*, the OECD noted:

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

> The middle class used to be an aspiration. For many generations it meant the assurance of living in a comfortable house and affording a rewarding lifestyle, thanks to a stable job with career opportunities. It was also a basis from which families aspired to an even better future for their children. At the macro level, the presence of a strong and prosperous middle class supports healthy economies and societies. Through their consumption, investment in education, health, and housing, their support for good quality public services, their intolerance of corruption, and their trust in others and in democratic institutions they are the very foundations of inclusive growth. However, there are now signs that this bedrock of our democracies and economic growth is not as stable as in the past.

OECD added: "...the current generation is one of the most educated, and yet has lower chances of achieving the same standard of living as its parents."

The report further noted that households of the millennial generation are being "squeezed out of the ranks of the middle class" in advanced economies around the world.

Housing has been the main driver of rising middle-class expenditure - OECD.

The strongest evidence of the middle-income decline is in rising costs of living, which has been far more significant than the well documented income stagnation. OECD emphasizes that the threats to the middle-class crisis are in large measure the result of costs of living that have risen at rates far greater than incomes. Higher costs of living are a threat to the *middle-income lifestyle*, because they reduce the share of discretionary income and in doing so, reduce the standard of living.

The OECD particularly notes that: "…, the cost of essential parts of the middle-class lifestyle have increased faster than inflation; house prices have been growing three times faster than household median income over the last two decades." Further OECD finds that "Housing has been the main driver of rising middle-class expenditure," and that the largest housing cost increases are in the costs of ownership, rather than rents.

The Cost of Living and Land Use Regulation

Housing tends to be the largest item of household expenditure. Moreover, the cost of living is largely driven by housing costs. In the United States, for example, housing accounts for nearly all (87%) of the higher costs of living in the most expensive markets (Figure 15). This cost differential largely also correlates with land use regulation stringency, which in the United States varies the most among the nations covered in the *Demographia Survey*.

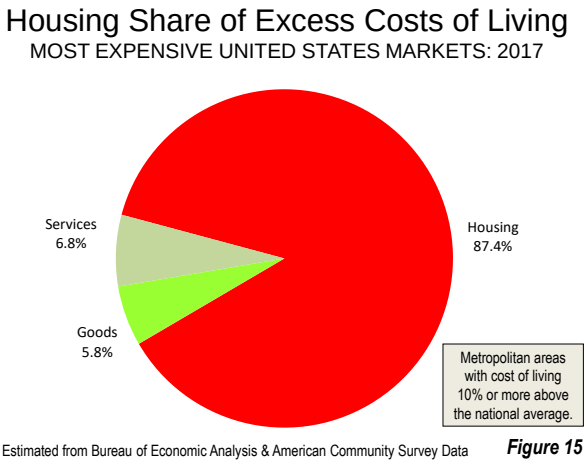


Figure 15

Generally, house prices (to a greater extent than other major expenditure categories) have disproportionately increased relative to incomes where land use regulation has become significantly more rigid (especially with urban containment).

Even in metropolitan areas with administrative mechanisms to ensure sufficient land supplies, housing affordability has deteriorated markedly (such as in Portland, Toronto, and Melbourne).

Land Prices, House Prices and Subsidized Housing

Urban containment policy, generally favored in urban planning, has been associated with driving up land prices on the urban periphery, and as a consequence, throughout the urban area (Figure 16). In the process, housing affordability has deteriorated.

For example, the United States Federal Home Loan Mortgage Corporation (Freddie Mac) reports that land costs can account for "upward of 70 percent of the cost of building a home" in Los Angeles and San Francisco area markets. This compares to the national average of "about 23 percent," according to Freddie Mac. The land cost differences can be substantially greater. Finished lot costs up to 13 times that of liberally regulated markets have been identified in US urban containment markets.

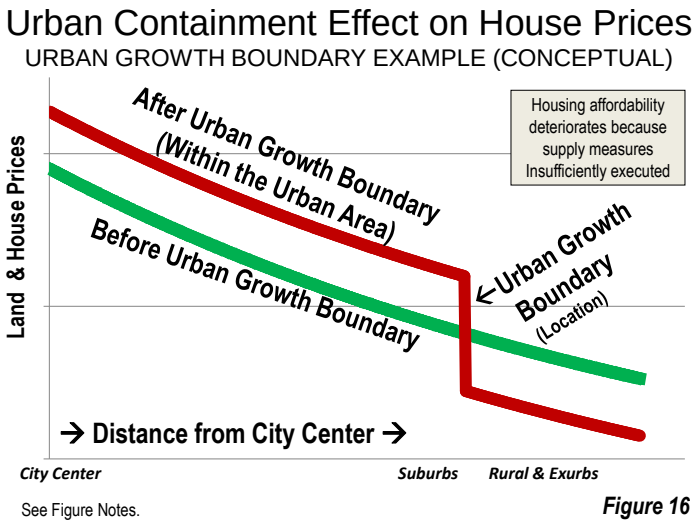


Figure 16

Further, higher housing costs increase the cost of subsidized housing programs and increase the number of households that are dependent on such programs. Paradoxically, a principal rationale for urban containment has been an expectation that housing will become affordable for low-income residents. The reality is the opposite. Where house prices are higher relative to incomes, subsidized housing becomes less affordable.

Incorporating Economics Into Urban Policy

In his recent book (*Order without Design: How Markets Shape Cities*) former World Bank principal planner Alain Bertaud suggests the necessity of applying "basic economic principles to the practice of urban planning." He adds: "Poorly conceived urban strategies are not just innocent utopias. They misdirect scarce urban investments toward locations where they are the least needed and, in doing so, greatly reduce the welfare of urban households." One of the most important ways that household welfare is reduced is by excluding the middle-class from middle-class housing.

The increasing exclusion is illustrated in the United States, where *no level of middle-class income* is sufficient to qualify for a mortgage on the median priced house in the least affordable metropolitan areas. Only 22 percent qualified in the 14 severely unaffordable markets (Section 3.8). The financial stress on middle-income households is likely at least as intense in the severely unaffordable markets outside the United States.

"Equality Clearly Matters"

A defining characteristic of the improved standard of living has been that children have generally had higher incomes than their parents. There are indications that this is no longer the case, both in academic literature and in public perceptions. This has been indicated in (at least) the United States, the United Kingdom, Canada, Australia, New Zealand, Ireland and elsewhere. A United Kingdom study indicates that millennials will be the first generation to be worse off than their parents since the 1800s.

Given these developments, it is not surprising that there is increasing concern about income inequality.

In his *The Moral Consequences of Economic Growth*, Harvard University economist Benjamin Friedman suggested that "equality clearly matters." According to Friedman:

> *…what matters most is not so much how people's incomes and living standards compare to the year before or even the year before that but whether the average citizen can see the evidence of progress over the last decade or even over the last generation: whether people have a sense of getting ahead compared to how their parents live, and whether their experience gives them confidence that their children will do even better.*

Much of the rising inequality is due to rising housing costs. Matthew Rognlie, now at Northwestern University, found that virtually all of the rising inequality identified by French economist Thomas Piketty has been in the increase in housing values.

> *… [T]he literature studying markets with high housing costs finds that these costs are driven in large part by artificial scarcity through land use regulation …. A natural first step to combat the increasing role of housing wealth would be to reexamine [sic] these regulations and expand the housing supply.*[37]

That will require fundamental reform in urban planning. Bertaud suggests the appropriate focus: "The main objective of the planner should be to maintain mobility and housing affordability." More recently, New Zealand's Minister of Urban Development Phil Twyford reiterated the point, saying that "affordability and mobility" … "must be the primary objectives of urban policy."

Twyford further referred to "the consequences of this market dysfunction have had a harmful systemic effect on the health of our urban economies." Similar points have been made on the

[37] MatthewRognlie, "A note on Piketty and diminishing returns to capital," June 15, 2014. Available online at http://www.mit.edu/~mrognlie/piketty_diminishing_returns.pdf.

consequences of restrictive land use regulation on national economies and inequality, such as by Herkenhoff, Ohanian and Prescott (2017), and Hseih and Moretti (2015) as well as by La Cava (2016)

***Urban policy should focus on "people rather than places"* – LSE Economists**

Facilitating better standards of living is a principal domestic policy function. This requires urban policy that focuses on "people rather than places," as Paul C. Cheshire, Max Nathan and Henry G. Overman of the London School of Economics have posited. Planning requirements that undermine prosperity need to be eliminated.

It took millennia to create the incomparably broad prosperity of the modern middle-class. Where a prosperous middle-class remains it is worth preserving and where it has been lost it should be restored.

5: SPECIAL COVERAGE: HOUSING AFFORDABILITY IN RUSSIA

For some years, the Institute for Urban Economics (IUE) has analyzed housing affordability in the 17 metropolitan areas in Russia with more than one million residents. Most recently, IUE has published results for the third quarter (September quarter) of 2019. Demographia is pleased to share results from the IUE report.

IUE provides data on median house prices, median household income and price to income ratios (the Median Multiple). Useful contextual information is also provided, such as metropolitan area populations, population growth rates and new housing unit build rates. This information is summarized below. The report, *Housing affordability in the major Russian metropolitan areas:3rd quarter 2019*.

Russia's house prices are generally within the "affordable" range, with 12 of the 17 metropolitan areas having a Median Multiple of 3.0 or below.[38] (Table 9). The median market has a Median Multiple of 2.6.[39] This is considerably better than in any of the nations in the *Demographia International Housing Affordability Survey*. Relative to incomes, housing is 50% more expensive in the United States, where the median market has a Median Multiple of 3.9. The US major market Median Multiple was an affordable 2.8 as late as 2000.

Table 9
Housing Affordability Ratings: Russia: Major Housing Markets

Rating	*Median Multiple*	*# of Markets*
Severely Unaffordable	5.1 & Over	0
Seriously Unaffordable	4.1 to 5.0	2
Moderately Unaffordable	3.1 to 4.0	3
Affordable	3.0 & Under	12
Median Market/Total Markets	2.6	17

[38] Affordability ratings are shown in Table 1.
[39] This is the Median Multiple of the median market (not the average of the Median Multiples).

Among the major metropolitan areas, none in Russia are "severely unaffordable." Two are rated "seriously unaffordable," three "moderately unaffordable" and 12 "affordable." Data on the individual metropolitan areas is in Table 10, which also includes population estimates. The metropolitan area locations are illustrated in Figure 17.

The largest metropolitan area and national capital, Moscow, is also Russia's one megacity (over 10,000,000 population). Moscow is growing very quickly, having added nearly 10 percent to its population between 2010 and 2016. This is stronger growth than in any of the three megacities reported upon in the *Demographia Survey,* somewhat faster than Greater London and far faster than New York and Los Angeles. Moscow's Median Multiple is a seriously unaffordable 4.2.

The long-time historic capital, Baltic port, and second largest metropolitan area, St. Petersburg, also has a Median Multiple of 4.2.

The other 15 metropolitan areas are considerably more affordable, ranging from a Median Multiple of 2.0 to 3.3. Krasnoyarsk, in Siberia and Kazan, on the Volga River have Median Multiples of 3.3 and the Pacific port of Vladivostok has a Median Multiple of 3.2 (all rated moderately unaffordable).

The most affordable major metropolitan area is Krasnodar (in the north Caucasus), with a Median Multiple of 2.0. This is more affordable than Rochester (NY) in the US, which at 2.5 is the most affordable major metropolitan area in the *Demographia Survey*. Krasnodar is also has the fastest growth rate among the major metropolitan areas, at more than 15 percent from 2010 to 2016. This is more than 50 percent greater than Moscow's growth rate, which is the second largest.

Six of the 17 metropolitan areas are more affordable than Rochester and two more are as affordable. As a matter of interest, Volgograd, site of the definitive World War II Battle of Stalingrad, is among the affordable major metropolitan areas, with a Median Multiple of 2.7.

The IUE report also provides an analysis of build rates by metropolitan area (new housing units per 1,000 population). Generally, IUE finds Russia's build rates to be high by international comparisons. IUE notes that "liberal urban planning and land use policy in the Russian metropolitan areas which induced high levels of housing construction"

According to the IUE report "the relatively high housing affordability rate in Russia is accompanied with the set of urban development problems such as excessive high-rise residential construction and population density at the metropolitan fringe, traffic congestion, lack of public infrastructure, and substantial part of deteriorating housing. It is also important to take into account the relatively low standards of housing (still very small floor space of units)".

Demographia notes that Russia's superior housing affordability is an important strength. Russia needs to retain affordability to foster a growing and affluent middle-class and to avoid the "squeezed middle-class" that OECD has found in many nations (Section 4).

Table 10
RUSSIA ALL MAJOR METROPOLITAN AREA HOUSING MARKETS: 2019: Third Quarter
From: Institute for Urban Economics (IUE)

Rank	Metropolitan Market	Price to Income Ratio (Median Multiple	Median Price (In Russian Rubles: ₽)	Median Household Income (Annual)	Population in Millions
1	Krasnodar	2.0	₽2,448,000	₽1,250,000	1.6
2	Voronezh	2.1	₽2,240,000	₽1,051,000	1.5
3	Yekaterinburg	2.2	₽2,738,000	₽1,245,000	2.3
3	Nizhny Novgorod	2.2	₽2,607,000	₽1,204,000	2.1
5	Saratov	2.3	₽1,855,000	₽811,000	1.2
6	Rostov-on-Don	2.4	₽2,450,000	₽1,012,000	2.1
7	Chelyabinsk	2.5	₽1,850,000	₽731,000	1.6
7	Samara (Togliatti)	2.5	₽2,300,000	₽909,000	2.7
9	Novosibirsk	2.6	₽2,840,000	₽1,080,000	2.3
10	Volgograd	2.7	₽2,173,000	₽806,000	1.5
10	Ufa	2.7	₽3,035,000	₽1,137,000	1.5
12	Perm	3.0	₽2,500,000	₽846,000	1.4
13	Vladivostok	3.2	₽4,133,000	₽1,275,000	1.0
14	Kazan	3.3	₽3,549,000	₽1,069,000	1.7
14	Krasnoyarsk	3.3	₽2,570,000	₽776,000	1.4
16	Saint Petersburg	4.2	₽5,013,000	₽1,184,000	6.4
17	Moscow	4.2	₽6,849,000	₽1,641,000	17.7
	Median Market	2.6			

Adapted from Institute for Urban Economics

Figure 17

SCHEDULE 1
MAJOR HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2019: Third Quarter
16th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
1	U.S.	Rochester, NY	2.5	46	U.S.	New Orleans. LA	4.3
2	U.S.	Cleveland, OH	2.7	48	U.S.	Orlando, FL	4.4
2	U.S.	Oklahoma City, OK	2.7	48	U.S.	Providence, RI-MA	4.4
4	U.S.	Buffalo, NY	2.8	48	U.K.	Stoke on Trent & Staffordshire	4.4
4	U.S.	Cincinnati, OH-KY-IN	2.8	51	U.K.	Newcastle & Tyneside	4.5
4	U.S.	Pittsburgh, PA	2.8	51	U.K.	Nottingham & Nottinghamshire	4.5
4	U.S.	St. Louis,, MO-IL	2.8	53	U.K.	Hull & Humber	4.6
8	U.S.	Hartford, CT	2.9	53	U.K.	Manchester & Greater Manchester	4.6
8	U.S.	Indianapolis. IN	2.9	53	U.S.	Salt Lake City, UT	4.6
10	U.S.	Tulsa, OK	3.0	53	Singapore	Singapore	4.6
11	U.S.	Detroit, MI	3.1	57	Ireland	Dublin	4.7
11	U.S.	Grand Rapids, MI	3.1	57	U.K.	Middlesbrough & Durham	4.7
13	U.S.	Birmingham, AL	3.2	57	Canada	Montreal, QC	4.7
13	U.S.	Columbus, OH	3.2	60	U.K.	Birmingham & West Midlands	5.0
13	U.S.	Louisville, KY-IN	3.2	60	U.S.	Las Vegas, NV	5.0
16	U.S.	Atlanta, GA	3.3	62	U.S.	Portland, OR-WA	5.1
16	U.S.	Kansas City, MO-KS	3.3	63	U.S.	Fresno, CA	5.2
18	U.S.	Minneapolis-St. Paul, MN-WI	3.4	63	U.S.	Sacramento, CA	5.2
18	U.S.	Philadelphia, PA-NJ-DE-MD	3.4	65	U.S.	Boston, MA-NH	5.3
20	U.S.	Baltimore, MD	3.5	65	U.S.	Denver, CO	5.3
20	U.S.	Chicago, IL-IN-WI	3.5	67	U.K.	Leicester & Leicestershire	5.4
20	U.S.	Virginia Beach-Norfolk, VA-NC	3.5	67	U.S.	Miami, FL	5.4
23	U.S.	Houston, TX	3.6	67	U.S.	New York, NY-NJ-PA	5.4
23	U.S.	Memphis, TN-MS-AR	3.6	67	U.S.	Riverside-San Bernardino, CA	5.4
25	U.S.	Dallas-Fort Worth, TX	3.8	71	U.S.	Seattle, WA	5.5
25	Canada	Edmonton, AB	3.8	72	U.K.	Northampton & Northamptonshire	5.7
25	U.S.	Milwaukee, WI	3.8	73	U.K.	Swindon & Wiltshire	5.8
25	U.S.	Raleigh, NC	3.8	74	Australia	Perth, WA	6.0
25	U.S.	Richmond, VA	3.8	74	U.K.	Plymouth & Devon	6.0
30	U.K.	Blackpool & Lancashire	3.9	76	Australia	Brisbane, QLD	6.3
30	Canada	Calgary, AB	3.9	77	U.K.	Bristol-Bath	6.5
30	U.S.	Jacksonville, FL	3.9	78	U.K.	London Exurbs (E & SE England)	6.6
30	U.K.	Sheffield & South Yorkshire	3.9	79	Australia	Adelaide, SA	6.9
30	U.S.	Washington, DC-VA-MD-WV	3.9	79	U.K.	Bournemouth & Dorsett	6.9
35	U.S.	Austin, TX	4.0	81	U.S.	San Diego, CA	7.3
35	U.S.	Charlotte, NC-SC	4.0	82	U.S.	Honolulu, HI	8.0
35	U.K.	Glasgow	4.0	83	U.K.	London (Greater London Authority)	8.2
35	U.S.	San Antonio, TX	4.0	84	U.S.	San Francisco, CA	8.4
39	U.K.	Liverpool & Merseyside	4.1	85	U.S.	San Jose, CA	8.5
39	U.S.	Nashville, TN	4.1	86	N.Z.	Auckland	8.6
39	Canada	Ottawa-Gatineau, ON-QC	4.1	86	Canada	Toronto, ON	8.6
39	U.S.	Tampa-St. Petersburg, FL	4.1	88	U.S.	Los Angeles, CA	9.0
39	U.S.	Tucson, AZ	4.1	89	Australia	Melbourne, VIC	9.5
44	U.K.	Leeds & West Yorkshire	4.2	90	Australia	Sydney, NSW	11.0
44	U.S.	Phoenix, AZ	4.2	91	Canada	Vancouver, BC	11.9
46	U.K.	Derby & Derbyshire	4.3	92	China	Hong Kong	20.8

SCHEDULE 2
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2019: Third Quarter
16th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
1	Canada	Fort MacMurray, AB	1.8	46	U.S.	Green Bay, WI	3.0
2	U.S.	Peoria, IL	2.1	46	U.S.	Hagerstown, MD-WV	3.0
3	U.S.	Davenport, IA-IL	2.2	46	U.S.	Jackson, MS	3.0
3	U.S.	Rockford, IL	2.2	46	U.S.	Kalamazoo, MI	3.0
5	U.S.	Utica-Rome, NY	2.3	46	Ireland	Limerick	3.0
6	U.S.	Akron, OH	2.4	46	U.S.	Little Rock, AR	3.0
6	Canada	Fredericton, NB	2.4	46	Canada	Thunder Bay, ON	3.0
6	U.S.	McAllen, TX	2.4	46	U.S.	Tulsa, OK	3.0
6	Canada	Saint John, NB	2.4	55	U.S.	Allentown, PA-NJ	3.1
6	U.S.	Syracuse, NY	2.4	55	U.S.	Amarillo, TX	3.1
11	Canada	Cape Breton, NS	2.5	55	U.S.	Atlantic City, NJ	3.1
11	U.S.	Lansing, MI	2.5	55	U.S.	Augusta, GA-SC	3.1
11	U.S.	Rochester, NY	2.5	55	U.S.	Columbia, SC	3.1
11	U.S.	Scranton, PA	2.5	55	U.S.	Columbus, GA-AL	3.1
11	U.S.	Toledo, OH	2.5	55	U.S.	Detroit, MI	3.1
16	U.S.	Canton, OH	2.6	55	U.S.	Duluth, MN-WI	3.1
16	U.S.	Cedar Rapids, IA	2.6	55	U.S.	Grand Rapids, MI	3.1
16	U.S.	Dayton, OH	2.6	55	U.S.	Hickory, NC	3.1
16	U.S.	Erie, PA	2.6	55	U.S.	Killeen, TX	3.1
16	U.S.	Harrisburg, PA	2.6	55	U.S.	Lubbock, TX	3.1
16	Canada	Moncton, NB	2.6	55	Canada	North Bay, ON	3.1
16	U.S.	South Bend, IN-MI	2.6	55	Canada	Red Deer, AB	3.1
23	U.S.	Cleveland, OH	2.7	55	U.S.	Roanoke, VA	3.1
23	U.S.	Flint, MI	2.7	55	Canada	St. John's, NL	3.1
23	U.S.	Fort Wayne, IN	2.7	71	U.S.	Beaumont-Port Arthur, TX	3.2
23	U.S.	Oklahoma City, OK	2.7	71	U.S.	Birmingham, AL	3.2
23	U.S.	Reading, PA	2.7	71	U.S.	Columbus, OH	3.2
23	Canada	Saguenay, QC	2.7	71	Canada	Drummondville, QC	3.2
29	U.S.	Buffalo, NY	2.8	71	U.S.	Fayetteville, AR-MO	3.2
29	U.S.	Cincinnati, OH-KY-IN	2.8	71	U.S.	Gulfport, MS	3.2
29	U.S.	Evansville, IN-KY	2.8	71	U.S.	Huntsville, AL	3.2
29	Australia	Gladstone, QLD	2.8	71	U.S.	Louisville, KY-IN	3.2
29	U.S.	Pittsburgh, PA	2.8	71	Canada	Regina, SK	3.2
29	U.S.	St. Louis,, MO-IL	2.8	71	U.S.	Trenton, NJ	3.2
29	Canada	Trois-Rivieres, QC	2.8	71	Ireland	Waterford	3.2
29	U.S.	Wichita, KS	2.8	71	U.S.	Youngstown, OH-PA	3.2
37	U.S.	Albany, NY	2.9	83	U.S.	Atlanta, GA	3.3
37	U.S.	Des Moines, IA	2.9	83	U.S.	Kansas City, MO-KS	3.3
37	U.S.	Fayetteville, NC	2.9	83	U.S.	Lancaster, PA	3.3
37	U.S.	Fort Smith, AR-OK	2.9	83	U.S.	Laredo, TX	3.3
37	U.S.	Hartford, CT	2.9	83	Canada	Lethbridge, AB	3.3
37	U.S.	Huntington, WV-KY-OH	2.9	83	U.S.	Lexington-Fayette, KY	3.3
37	U.S.	Indianapolis. IN	2.9	83	U.S.	Lincoln, NE	3.3
37	U.S.	Montgomery, AL	2.9	83	U.S.	New Haven CT	3.3
37	U.S.	Omaha, NE-IA	2.9	83	U.S.	New London, CT	3.3
46	U.S.	Brownsville, TX	3.0	83	U.S.	Spartanburg, SC	3.3

SCHEDULE 2
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2019: Third Quarter
16th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
83	U.S.	Springfield, MO	3.3	130	U.S.	Ogden, UT	3.8
94	Canada	Charlottetown, PEI	3.4	130	U.S.	Raleigh, NC	3.8
94	U.S.	Chattanooga, TN-GA	3.4	130	U.S.	Richmond, VA	3.8
94	U.S.	Greensboro, NC	3.4	130	U.S.	Salisbury, MD-DE	3.8
94	U.S.	Kingsport, TN-VA	3.4	130	U.S.	Savannah, GA	3.8
94	U.S.	Lafayette, LA	3.4	130	U.S.	Tallahassee, FL	3.8
94	U.S.	Minneapolis-St. Paul, MN-WI	3.4	130	U.S.	Waco, TX	3.8
94	U.S.	Mobile, AL	3.4	130	U.S.	Worcester, MA-CT	3.8
94	U.S.	Philadelphia, PA-NJ-DE-MD	3.4	147	U.K.	Aberdeen	3.9
94	Canada	Quebec, QC	3.4	147	U.K.	Blackpool & Lancashire	3.9
103	U.S.	Baltimore, MD	3.5	147	Canada	Calgary, AB	3.9
103	U.S.	Chicago, IL-IN-WI	3.5	147	U.K.	Dundee	3.9
103	U.S.	Clarksville, TN-KY	3.5	147	U.S.	Jacksonville, FL	3.9
103	U.S.	Ocala, FL	3.5	147	U.S.	Madison, WI	3.9
103	U.S.	Pensacola, FL	3.5	147	U.K.	Sheffield & South Yorkshire	3.9
103	Australia	Rockhampton, QLD	3.5	147	U.S.	Shreveport, LA	3.9
103	Canada	Sherbrooke, QC	3.5	147	U.K.	Swansea	3.9
103	U.S.	Sioux Falls, SD	3.5	147	Australia	Townsville, QLD	3.9
103	U.S.	Virginia Beach-Norfolk, VA-NC	3.5	147	U.S.	Washington, DC-VA-MD-WV	3.9
103	U.S.	Winston-Salem, NC	3.5	158	U.S.	Austin, TX	4.0
113	U.S.	Baton Rouge, LA	3.6	158	U.S.	Charlotte, NC-SC	4.0
113	Canada	Chatham, ON	3.6	158	U.S.	Gainesville, FL	4.0
113	U.S.	Houston, TX	3.6	158	U.K.	Glasgow	4.0
113	U.S.	Lynchburg, VA	3.6	158	U.S.	San Antonio, TX	4.0
113	U.S.	Manchester, NH	3.6	163	U.S.	Cape Coral, FL	4.1
113	U.S.	Memphis, TN-MS-AR	3.6	163	Ireland	Cork	4.1
113	Canada	Winnipeg, MB	3.6	163	U.S.	Daytona Beach, FL	4.1
120	U.S.	Corpus Christi, TX	3.7	163	Ireland	Galway	4.1
120	U.S.	El Paso, TX	3.7	163	U.K.	Liverpool & Merseyside	4.1
120	Canada	Granby, QC	3.7	163	U.S.	Nashville, TN	4.1
120	Canada	Halifax, NS	3.7	163	Canada	Ottawa-Gatineau, ON-QC	4.1
120	U.S.	Knoxville, TN	3.7	163	U.S.	Port St. Lucie, FL	4.1
120	U.S.	Melbourne, FL	3.7	163	U.S.	Portland, ME	4.1
120	Canada	Sarnia, ON	3.7	163	U.S.	Tampa-St. Petersburg, FL	4.1
120	Canada	Saskatoon, SK	3.7	163	U.S.	Tucson, AZ	4.1
120	U.S.	Springfield, MA	3.7	174	U.S.	Albuquerque, NM	4.2
120	Canada	Windsor, ON	3.7	174	Australia	Alice Springs, NT	4.2
130	U.S.	Anchorage, AK	3.8	174	U.S.	Fort Walton Beach, FL	4.2
130	U.S.	Ann Arbor, MI	3.8	174	U.S.	Kennewick, WA	4.2
130	U.S.	Dallas-Fort Worth, TX	3.8	174	U.K.	Leeds & West Yorkshire	4.2
130	Australia	Darwin, NT	3.8	174	U.S.	Myrtle Beach, SC-NC	4.2
130	Canada	Edmonton, AB	3.8	174	U.K.	Perth	4.2
130	U.K.	Falkirk	3.8	174	U.S.	Phoenix, AZ	4.2
130	U.S.	Greenville, SC	3.8	174	U.S.	York, PA	4.2
130	U.S.	Lakeland, FL	3.8	183	U.K.	Belfast	4.3
130	U.S.	Milwaukee, WI	3.8	183	U.S.	Charleston, SC	4.3

SCHEDULE 2
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2019: Third Quarter
16th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
183	U.K.	Derby & Derbyshire	4.3	230	U.S.	Portland, OR-WA	5.1
183	U.S.	New Orleans. LA	4.3	230	U.S.	Salem, OR	5.1
183	Canada	Whitehorse, YT	4.3	230	U.S.	Vallejo, CA	5.1
183	U.S.	Yakima, WA	4.3	234	U.S.	Fresno, CA	5.2
189	U.S.	Bridgeport-Stamford, CT	4.4	234	U.S.	Modesto, CA	5.2
189	U.K.	Cardiff	4.4	234	U.S.	Naples, FL	5.2
189	Canada	Kingston, ON	4.4	234	U.S.	Sacramento, CA	5.2
189	U.S.	Orlando, FL	4.4	234	U.K.	Telford & Shropshire	5.2
189	U.S.	Providence, RI-MA	4.4	239	U.S.	Boston, MA-NH	5.3
189	U.S.	Sarasota, FL	4.4	239	Australia	Cairns, QLD	5.3
189	U.S.	Spokane, WA	4.4	239	U.S.	Denver, CO	5.3
189	U.K.	Stoke on Trent & Staffordshire	4.4	242	Canada	Barrie, ON	5.4
197	U.S.	Bakersfield, CA	4.5	242	Australia	Bendigo, VIC	5.4
197	U.S.	College Station, TX	4.5	242	N.Z.	Christchurch	5.4
197	U.S.	Colorado Springs, CO	4.5	242	U.K.	Leicester & Leicestershire	5.4
197	U.S.	Durham, NC	4.5	242	U.S.	Miami, FL	5.4
197	U.K.	Edinburgh	4.5	242	U.S.	New York, NY-NJ-PA	5.4
197	Australia	Mackay, QLD	4.5	242	U.S.	Riverside-San Bernardino, CA	5.4
197	U.K.	Newcastle & Tyneside	4.5	249	U.S.	Eugene, OR	5.5
197	U.K.	Nottingham & Nottinghamshire	4.5	249	U.S.	Seattle, WA	5.5
197	U.S.	Olympia, WA	4.5	251	Canada	Brantford, ON	5.6
206	U.S.	Greeley, CO	4.6	251	U.S.	Fort Collins, CO	5.6
206	U.K.	Hull & Humber	4.6	251	Canada	St. Catharines-Niagara, ON	5.6
206	U.K.	Manchester & Greater Manchester	4.6	251	U.K.	Warwickshire	5.6
206	U.S.	Provo, UT	4.6	255	U.K.	Northampton & Northamptonshire	5.7
206	U.S.	Salt Lake City, UT	4.6	255	U.S.	Stockton, CA	5.7
206	Singapore	Singapore	4.6	257	U.K.	Swindon & Wiltshire	5.8
206	Australia	Toowoomba, QLD	4.6	258	Canada	Oshawa, ON	5.9
213	Ireland	Dublin	4.7	258	Canada	Peterborough, ON	5.9
213	U.K.	Middlesbrough & Durham	4.7	258	U.S.	Reno, NV	5.9
213	Canada	Montreal, QC	4.7	261	Australia	Ballarat, VIC	6.0
213	U.K.	Newport	4.7	261	Canada	Cambridge, ON	6.0
217	Australia	Albury-Wodonga, NSW-VIC	4.8	261	N.Z.	Palmerston North	6.0
217	U.S.	Bremerton, WA	4.8	261	Australia	Perth, WA	6.0
217	Australia	Bundaberg, QLD	4.8	261	U.K.	Plymouth & Devon	6.0
217	U.S.	Merced, CA	4.8	266	Australia	Brisbane, QLD	6.3
217	U.S.	Wilmington, NC	4.8	266	Australia	Canberra, ACT	6.3
222	U.S.	Asheville, NC	4.9	268	Canada	Kitchener-Waterloo, ON	6.4
222	Canada	Belleville, ON	4.9	269	U.S.	Boulder, CO	6.5
222	U.S.	Boise, ID	4.9	269	U.K.	Bristol-Bath	6.5
222	Canada	Kamloops. BC	4.9	269	Australia	Fraser Coast, QLD	6.5
222	U.S.	Visalia, CA	4.9	269	Canada	Guelph, ON	6.5
222	U.K.	Warrington & Cheshire	4.9	273	U.K.	London Exurbs (E & SE England)	6.6
228	U.K.	Birmingham & West Midlands	5.0	274	Canada	Kelowna, BC	6.7
228	U.S.	Las Vegas, NV	5.0	275	N.Z.	Wellington	6.8
230	Canada	London, ON	5.1	276	Australia	Adelaide, SA	6.9

SCHEDULE 2
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
Median Multiple (Median House Price/Median Household Income): 2019: Third Quarter
16th Annual Demographia International Housing Affordability Survey

Rank	Nation	Metropolitan Market	Median Multiple		Rank	Nation	Metropolitan Market	Median Multiple
276	U.K.	Bournemouth & Dorsett	6.9		294	Canada	Victoria, BC	8.1
276	N.Z.	Dunedin	6.9		295	U.K.	London (Greater London Authority)	8.2
279	N.Z.	Hamilton	7.0		296	U.S.	Salinas, CA	8.4
279	Canada	Hamilton, ON	7.0		296	U.S.	San Francisco, CA	8.4
279	Australia	Hobart, TAS	7.0		296	U.S.	San Luis Obispo, CA	8.4
279	U.S.	Oxnard, CA	7.0		296	U.S.	Santa Cruz, CA	8.4
283	Canada	Chilliwack, BC	7.3		296	Australia	Sunshine Coast, QLD	8.4
283	U.S.	San Diego, CA	7.3		301	U.S.	San Jose, CA	8.5
283	U.S.	Santa Rosa, CA	7.3		302	N.Z.	Auckland	8.6
286	Australia	Geelong, VIC	7.4		302	Canada	Toronto, ON	8.6
286	N.Z.	Napier-Hastings	7.4		304	U.S.	Los Angeles, CA	9.0
288	Canada	Comox Valley, BC	7.5		305	N.Z.	Taraunga-Western Bay of Plenty	9.3
288	Canada	Nanaimo, BC	7.5		306	Australia	Melbourne, VIC	9.5
290	Canada	Fraser Valley, BC	7.8		307	Australia	Sydney, NSW	11.0
291	U.S.	Santa Barbara, CA	7.9		308	Canada	Vancouver, BC	11.9
292	Australia	Gold Coast, QLD	8.0		309	China	Hong Kong	20.8
292	U.S.	Honolulu, HI	8.0					

SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2019: Third Quarter
16th Annual Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
276	79	17	Australia	Adelaide, SA	6.9	$472,000	$68,600
217		8	Australia	Albury-Wodonga, NSW-VIC	4.8	$332,000	$69,800
174		5	Australia	Alice Springs, NT	4.2	$455,000	$107,200
261		12	Australia	Ballarat, VIC	6.0	$397,000	$66,600
242		11	Australia	Bendigo, VIC	5.4	$358,000	$66,700
266	76	14	Australia	Brisbane, QLD	6.3	$546,000	$86,700
217		8	Australia	Bundaberg, QLD	4.8	$265,000	$55,100
239		10	Australia	Cairns, QLD	5.3	$397,000	$74,300
266		14	Australia	Canberra, ACT	6.3	$692,000	$109,800
130		3	Australia	Darwin, NT	3.8	$460,000	$120,500
269		16	Australia	Fraser Coast, QLD	6.5	$326,000	$50,300
286		19	Australia	Geelong, VIC	7.4	$551,000	$74,100
29		1	Australia	Gladstone, QLD	2.8	$261,000	$93,800
292		20	Australia	Gold Coast, QLD	8.0	$625,000	$77,700
279		18	Australia	Hobart, TAS	7.0	$497,000	$71,000
197		6	Australia	Mackay, QLD	4.5	$358,000	$80,400
306	89	22	Australia	Melbourne, VIC	9.5	$843,000	$88,700
261	74	12	Australia	Perth, WA	6.0	$504,000	$84,600
103		2	Australia	Rockhampton, QLD	3.5	$257,000	$72,700
296		21	Australia	Sunshine Coast, QLD	8.4	$593,000	$70,200
307	90	23	Australia	Sydney, NSW	11.0	$1,080,000	$97,900
206		7	Australia	Toowoomba, QLD	4.6	$335,000	$72,400
147		4	Australia	Townsville, QLD	3.9	$310,000	$80,000
				Median Market	6.0		
242		34	Canada	Barrie, ON	5.4	$473,000	$87,400
222		31	Canada	Belleville, ON	4.9	$338,000	$69,100
251		35	Canada	Brantford, ON	5.6	$413,000	$74,400
147	30	26	Canada	Calgary, AB	3.9	$399,000	$101,300
261		39	Canada	Cambridge, ON	6.0	$497,000	$83,500
11		4	Canada	Cape Breton, NS	2.5	$141,000	$56,900
94		15	Canada	Charlottetown, PEI	3.4	$238,000	$69,700
113		18	Canada	Chatham, ON	3.6	$225,000	$62,900
283		44	Canada	Chilliwack, BC	7.3	$521,000	$71,300
288		45	Canada	Comox Valley, BC	7.5	$511,000	$67,700
71		12	Canada	Drummondville, QC	3.2	$183,000	$57,900
130	25	25	Canada	Edmonton, AB	3.8	$363,000	$96,100
1		1	Canada	Fort MacMurray, AB	1.8	$360,000	$196,900
290		47	Canada	Fraser Valley, BC	7.8	$661,000	$85,100
6		2	Canada	Fredericton, NB	2.4	$174,000	$72,100
120		20	Canada	Granby, QC	3.7	$229,000	$62,000
269		41	Canada	Guelph, ON	6.5	$570,000	$87,900
120		20	Canada	Halifax, NS	3.7	$277,000	$74,700
279		43	Canada	Hamilton, ON	7.0	$569,000	$81,600
222		31	Canada	Kamloops. BC	4.9	$387,000	$79,700
274		42	Canada	Kelowna, BC	6.7	$515,000	$77,200
189		29	Canada	Kingston, ON	4.4	$338,000	$77,000
268		40	Canada	Kitchener-Waterloo, ON	6.4	$532,000	$83,500
83		14	Canada	Lethbridge, AB	3.3	$251,000	$76,800
230		33	Canada	London, ON	5.1	$354,000	$70,000
16		5	Canada	Moncton, NB	2.6	$175,000	$67,800
213	57	30	Canada	Montreal, QC	4.7	$318,000	$68,200

SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2019: Third Quarter
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
288		45	Canada	Nanaimo, BC	7.5	$513,000	$68,300
55		9	Canada	North Bay, ON	3.1	$221,000	$70,300
258		37	Canada	Oshawa, ON	5.9	$549,000	$92,700
163	39	27	Canada	Ottawa-Gatineau, ON-QC	4.1	$365,000	$88,800
258		37	Canada	Peterborough, ON	5.9	$418,000	$71,100
94		15	Canada	Quebec, QC	3.4	$243,000	$72,200
55		9	Canada	Red Deer, AB	3.1	$267,000	$87,300
71		12	Canada	Regina, SK	3.2	$283,000	$89,600
23		6	Canada	Saguenay, QC	2.7	$179,000	$65,400
6		2	Canada	Saint John, NB	2.4	$168,000	$68,700
120		20	Canada	Sarnia, ON	3.7	$284,000	$76,600
120		20	Canada	Saskatoon, SK	3.7	$326,000	$88,100
103		17	Canada	Sherbrooke, QC	3.5	$210,000	$59,300
251		35	Canada	St. Catharines-Niagara, ON	5.6	$391,000	$69,600
55		9	Canada	St. John's, NL	3.1	$261,000	$83,000
46		8	Canada	Thunder Bay, ON	3.0	$222,000	$74,100
302	86	49	Canada	Toronto, ON	8.6	$726,000	$84,800
29		7	Canada	Trois-Rivieres, QC	2.8	$162,000	$57,200
308	91	50	Canada	Vancouver, BC	11.9	$905,000	$75,800
294		48	Canada	Victoria, BC	8.1	$617,000	$76,300
183		28	Canada	Whitehorse, YT	4.3	$441,000	$103,200
120		20	Canada	Windsor, ON	3.7	$264,000	$71,400
113		18	Canada	Winnipeg, MB	3.6	$276,000	$76,000
				Median Market	3.9		
309	92	1	China	Hong Kong	20.8	$7,040,000	$338,000
163		3	Ireland	Cork	4.1	€245,000	€59,400
213	57	5	Ireland	Dublin	4.7	€325,000	€68,600
163		3	Ireland	Galway	4.1	€220,000	€53,600
46		1	Ireland	Limerick	3.0	€185,000	€60,700
71		2	Ireland	Waterford	3.2	€178,000	€55,900
				Median Market	4.1		
302	86	7	N.Z.	Auckland	8.6	$830,000	$96,000
242		1	N.Z.	Christchurch	5.4	$461,000	$85,000
276		4	N.Z.	Dunedin	6.9	$472,000	$68,000
279		5	N.Z.	Hamilton	7.0	$580,000	$83,000
286		6	N.Z.	Napier-Hastings	7.4	$505,000	$68,000
261		2	N.Z.	Palmerston North	6.0	$402,000	$67,000
305		8	N.Z.	Taraunga-Western Bay of Plenty	9.3	$654,000	$70,000
275		3	N.Z.	Wellington	6.8	$637,000	$93,000
				Median Market	7.0		
206	53	1	Singapore	Singapore	4.6	$408,000	$88,000
147		2	U.K.	Aberdeen	3.9	£182,000	£47,100
183		11	U.K.	Belfast	4.3	£147,000	£34,100
228	60	23	U.K.	Birmingham & West Midlands	5.0	£175,000	£34,800
147	30	2	U.K.	Blackpool & Lancashire	3.9	£138,000	£35,400
276	79	32	U.K.	Bournemouth & Dorsett	6.9	£280,000	£40,400
269	77	30	U.K.	Bristol-Bath	6.5	£275,000	£42,300
189		13	U.K.	Cardiff	4.4	£167,000	£37,900

SCHEDULE 3
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
183	46	11	U.K.	Derby & Derbyshire	4.3	£170,000	£39,200
147		2	U.K.	Dundee	3.9	£142,000	£36,600
197		15	U.K.	Edinburgh	4.5	£194,000	£43,000
130		1	U.K.	Falkirk	3.8	£135,000	£35,700
158	35	7	U.K.	Glasgow	4.0	£146,000	£36,900
206	53	18	U.K.	Hull & Humber	4.6	£155,000	£34,000
174	44	9	U.K.	Leeds & West Yorkshire	4.2	£150,000	£35,600
242	67	25	U.K.	Leicester & Leicestershire	5.4	£205,000	£38,300
163	39	8	U.K.	Liverpool & Merseyside	4.1	£140,000	£34,200
295	83	33	U.K.	London (Greater London Authority)	8.2	£470,000	£57,300
273	78	31	U.K.	London Exurbs (E & SE England)	6.6	£305,000	£46,400
206	53	18	U.K.	Manchester & Greater Manchester	4.6	£165,000	£35,500
213	57	20	U.K.	Middlesbrough & Durham	4.7	£125,000	£26,400
197	51	15	U.K.	Newcastle & Tyneside	4.5	£145,000	£32,300
213		20	U.K.	Newport	4.7	£179,000	£37,900
255	72	27	U.K.	Northampton & Northamptonshire	5.7	£220,000	£38,300
197	51	15	U.K.	Nottingham & Nottinghamshire	4.5	£161,000	£35,400
174		9	U.K.	Perth	4.2	£176,000	£42,000
261	74	29	U.K.	Plymouth & Devon	6.0	£228,000	£38,000
147	30	2	U.K.	Sheffield & South Yorkshire	3.9	£136,000	£34,600
189	48	13	U.K.	Stoke on Trent & Staffordshire	4.4	£169,000	£38,100
147		2	U.K.	Swansea	3.9	£135,000	£34,200
257	73	28	U.K.	Swindon & Wiltshire	5.8	£247,000	£42,300
234		24	U.K.	Telford & Shropshire	5.2	£198,000	£38,100
222		22	U.K.	Warrington & Cheshire	4.9	£210,000	£43,000
251		26	U.K.	Warwickshire	5.6	£250,000	£44,600
				Median Market	4.5		
6		5	U.S.	Akron, OH	2.4	$154,000	$63,300
37		29	U.S.	Albany, NY	2.9	$217,000	$75,200
174		131	U.S.	Albuquerque, NM	4.2	$227,000	$53,900
55		45	U.S.	Allentown, PA-NJ	3.1	$212,000	$69,500
55		45	U.S.	Amarillo, TX	3.1	$172,000	$56,000
130		102	U.S.	Anchorage, AK	3.8	$324,000	$85,400
130		102	U.S.	Ann Arbor, MI	3.8	$291,000	$75,700
222		156	U.S.	Asheville, NC	4.9	$273,000	$55,200
83	16	67	U.S.	Atlanta, GA	3.3	$243,000	$73,200
55		45	U.S.	Atlantic City, NJ	3.1	$200,000	$64,500
55		45	U.S.	Augusta, GA-SC	3.1	$172,000	$55,500
158	35	120	U.S.	Austin, TX	4.0	$325,000	$81,100
197		145	U.S.	Bakersfield, CA	4.5	$247,000	$54,400
103	20	84	U.S.	Baltimore, MD	3.5	$299,000	$84,800
113		92	U.S.	Baton Rouge, LA	3.6	$217,000	$61,000
71		58	U.S.	Beaumont-Port Arthur, TX	3.2	$169,000	$53,100
71	13	58	U.S.	Birmingham, AL	3.2	$192,000	$59,500
222		156	U.S.	Boise, ID	4.9	$318,000	$64,700
239	65	167	U.S.	Boston, MA-NH	5.3	$491,000	$93,500
269		177	U.S.	Boulder, CO	6.5	$571,000	$88,300
217		153	U.S.	Bremerton, WA	4.8	$386,000	$81,100
189		140	U.S.	Bridgeport-Stamford, CT	4.4	$427,000	$96,000
46		38	U.S.	Brownsville, TX	3.0	$120,000	$40,500
29	4	23	U.S.	Buffalo, NY	2.8	$166,000	$59,200
16		12	U.S.	Canton, OH	2.6	$140,000	$54,400

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ALL HOUSING MARKETS BY NATION: 2019: Third Quarter
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
163		124	U.S.	Cape Coral, FL	4.1	$241,000	$59,200
16		12	U.S.	Cedar Rapids, IA	2.6	$173,000	$66,300
183		137	U.S.	Charleston, SC	4.3	$292,000	$67,800
158	35	120	U.S.	Charlotte, NC-SC	4.0	$260,000	$65,400
94		77	U.S.	Chattanooga, TN-GA	3.4	$194,000	$57,700
103	20	84	U.S.	Chicago, IL-IN-WI	3.5	$260,000	$74,600
29	4	23	U.S.	Cincinnati, OH-KY-IN	2.8	$187,000	$66,100
103		84	U.S.	Clarksville, TN-KY	3.5	$188,000	$54,000
23	2	18	U.S.	Cleveland, OH	2.7	$160,000	$59,200
197		145	U.S.	College Station, TX	4.5	$240,000	$53,200
197		145	U.S.	Colorado Springs, CO	4.5	$323,000	$71,100
55		45	U.S.	Columbia, SC	3.1	$177,000	$56,700
55		45	U.S.	Columbus, GA-AL	3.1	$165,000	$52,400
71	13	58	U.S.	Columbus, OH	3.2	$215,000	$67,500
120		97	U.S.	Corpus Christi, TX	3.7	$212,000	$57,200
130	25	102	U.S.	Dallas-Fort Worth, TX	3.8	$277,000	$73,200
3		2	U.S.	Davenport, IA-IL	2.2	$128,000	$58,600
16		12	U.S.	Dayton, OH	2.6	$153,000	$57,900
163		124	U.S.	Daytona Beach, FL	4.1	$221,000	$54,100
239	65	167	U.S.	Denver, CO	5.3	$443,000	$83,800
37		29	U.S.	Des Moines, IA	2.9	$219,000	$75,200
55	11	45	U.S.	Detroit, MI	3.1	$195,000	$63,800
55		45	U.S.	Duluth, MN-WI	3.1	$173,000	$56,700
197		145	U.S.	Durham, NC	4.5	$294,000	$65,500
120		97	U.S.	El Paso, TX	3.7	$171,000	$46,200
16		12	U.S.	Erie, PA	2.6	$132,000	$50,600
249		172	U.S.	Eugene, OR	5.5	$306,000	$56,000
29		23	U.S.	Evansville, IN-KY	2.8	$164,000	$58,400
71		58	U.S.	Fayetteville, AR-MO	3.2	$194,000	$61,000
37		29	U.S.	Fayetteville, NC	2.9	$143,000	$49,200
23		18	U.S.	Flint, MI	2.7	$139,000	$50,700
251		174	U.S.	Fort Collins, CO	5.6	$423,000	$74,900
37		29	U.S.	Fort Smith, AR-OK	2.9	$134,000	$46,700
174		131	U.S.	Fort Walton Beach, FL	4.2	$285,000	$67,200
23		18	U.S.	Fort Wayne, IN	2.7	$156,000	$58,500
234	63	163	U.S.	Fresno, CA	5.2	$290,000	$55,500
158		120	U.S.	Gainesville, FL	4.0	$212,000	$53,200
55	11	45	U.S.	Grand Rapids, MI	3.1	$208,000	$66,800
206		150	U.S.	Greeley, CO	4.6	$364,000	$80,000
46		38	U.S.	Green Bay, WI	3.0	$196,000	$64,700
94		77	U.S.	Greensboro, NC	3.4	$179,000	$52,700
130		102	U.S.	Greenville, SC	3.8	$225,000	$58,800
71		58	U.S.	Gulfport, MS	3.2	$161,000	$50,000
46		38	U.S.	Hagerstown, MD-WV	3.0	$194,000	$64,600
16		12	U.S.	Harrisburg, PA	2.6	$178,000	$67,700
37	8	29	U.S.	Hartford, CT	2.9	$235,000	$81,400
55		45	U.S.	Hickory, NC	3.1	$155,000	$50,100
292	82	182	U.S.	Honolulu, HI	8.0	$709,000	$89,000
113	23	92	U.S.	Houston, TX	3.6	$248,000	$68,900
37		29	U.S.	Huntington, WV-KY-OH	2.9	$139,000	$48,000
71		58	U.S.	Huntsville, AL	3.2	$213,000	$67,200
37	8	29	U.S.	Indianapolis. IN	2.9	$189,000	$64,300
46		38	U.S.	Jackson, MS	3.0	$175,000	$58,700

SCHEDULE 3 ALL HOUSING MARKETS BY NATION: 2019: Third Quarter *16th Annual Demographia International Housing Affordability Survey*							
International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
147	30	116	U.S.	Jacksonville, FL	3.9	$248,000	$63,500
46		38	U.S.	Kalamazoo, MI	3.0	$179,000	$59,000
83	16	67	U.S.	Kansas City, MO-KS	3.3	$227,000	$69,300
174		131	U.S.	Kennewick, WA	4.2	$288,000	$68,400
55		45	U.S.	Killeen, TX	3.1	$174,000	$56,600
94		77	U.S.	Kingsport, TN-VA	3.4	$151,000	$44,200
120		97	U.S.	Knoxville, TN	3.7	$206,000	$56,400
94		77	U.S.	Lafayette, LA	3.4	$183,000	$53,600
130		102	U.S.	Lakeland, FL	3.8	$206,000	$54,500
83		67	U.S.	Lancaster, PA	3.3	$231,000	$69,900
11		8	U.S.	Lansing, MI	2.5	$155,000	$62,700
83		67	U.S.	Laredo, TX	3.3	$162,000	$49,400
228	60	159	U.S.	Las Vegas, NV	5.0	$304,000	$60,200
83		67	U.S.	Lexington-Fayette, KY	3.3	$198,000	$59,900
83		67	U.S.	Lincoln, NE	3.3	$204,000	$61,700
46		38	U.S.	Little Rock, AR	3.0	$166,000	$54,900
304	88	188	U.S.	Los Angeles, CA	9.0	$687,000	$76,500
71	13	58	U.S.	Louisville, KY-IN	3.2	$193,000	$60,500
55		45	U.S.	Lubbock, TX	3.1	$164,000	$52,700
113		92	U.S.	Lynchburg, VA	3.6	$192,000	$53,900
147		116	U.S.	Madison, WI	3.9	$288,000	$74,300
113		92	U.S.	Manchester, NH	3.6	$303,000	$83,200
6		5	U.S.	McAllen, TX	2.4	$98,000	$41,300
120		97	U.S.	Melbourne, FL	3.7	$227,000	$61,000
113	23	92	U.S.	Memphis, TN-MS-AR	3.6	$190,000	$53,100
217		153	U.S.	Merced, CA	4.8	$293,000	$60,900
242	67	169	U.S.	Miami, FL	5.4	$323,000	$59,400
130	25	102	U.S.	Milwaukee, WI	3.8	$243,000	$63,900
94	18	77	U.S.	Minneapolis-St. Paul, MN-WI	3.4	$285,000	$83,900
94		77	U.S.	Mobile, AL	3.4	$153,000	$45,400
234		163	U.S.	Modesto, CA	5.2	$329,000	$63,600
37		29	U.S.	Montgomery, AL	2.9	$160,000	$54,700
174		131	U.S.	Myrtle Beach, SC-NC	4.2	$227,000	$54,400
234		163	U.S.	Naples, FL	5.2	$380,000	$73,600
163	39	124	U.S.	Nashville, TN	4.1	$286,000	$69,500
83		67	U.S.	New Haven CT	3.3	$234,000	$71,500
83		67	U.S.	New London, CT	3.3	$232,000	$70,800
183	46	137	U.S.	New Orleans. LA	4.3	$227,000	$53,000
242	67	169	U.S.	New York, NY-NJ-PA	5.4	$445,000	$82,700
103		84	U.S.	Ocala, FL	3.5	$165,000	$47,000
130		102	U.S.	Ogden, UT	3.8	$310,000	$80,800
23	2	18	U.S.	Oklahoma City, OK	2.7	$165,000	$60,600
197		145	U.S.	Olympia, WA	4.5	$343,000	$76,600
37		29	U.S.	Omaha, NE-IA	2.9	$204,000	$69,800
189	48	140	U.S.	Orlando, FL	4.4	$269,000	$61,800
279		178	U.S.	Oxnard, CA	7.0	$627,000	$89,100
103		84	U.S.	Pensacola, FL	3.5	$213,000	$61,100
2		1	U.S.	Peoria, IL	2.1	$127,000	$61,800
94	18	77	U.S.	Philadelphia, PA-NJ-DE-MD	3.4	$254,000	$74,600
174	44	131	U.S.	Phoenix, AZ	4.2	$284,000	$67,900
29	4	23	U.S.	Pittsburgh, PA	2.8	$175,000	$62,900
163		124	U.S.	Port St. Lucie, FL	4.1	$240,000	$58,700
163		124	U.S.	Portland, ME	4.1	$300,000	$73,800

SCHEDULE 3
ALL HOUSING MARKETS BY NATION: 2019: Third Quarter
16th Annual Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
230	62	160	U.S.	Portland, OR-WA	5.1	$408,000	$79,700
189	48	140	U.S.	Providence, RI-MA	4.4	$302,000	$68,600
206		150	U.S.	Provo, UT	4.6	$363,000	$79,400
130	25	102	U.S.	Raleigh, NC	3.8	$303,000	$79,200
23		18	U.S.	Reading, PA	2.7	$175,000	$65,900
258		176	U.S.	Reno, NV	5.9	$394,000	$66,900
130	25	102	U.S.	Richmond, VA	3.8	$272,000	$71,400
242	67	169	U.S.	Riverside-San Bernardino, CA	5.4	$375,000	$69,200
55		45	U.S.	Roanoke, VA	3.1	$180,000	$58,100
11	1	8	U.S.	Rochester, NY	2.5	$159,000	$63,400
3		2	U.S.	Rockford, IL	2.2	$130,000	$58,800
234	63	163	U.S.	Sacramento, CA	5.2	$404,000	$77,100
230		160	U.S.	Salem, OR	5.1	$307,000	$60,200
296		183	U.S.	Salinas, CA	8.4	$624,000	$74,500
130		102	U.S.	Salisbury, MD-DE	3.8	$240,000	$62,400
206	53	150	U.S.	Salt Lake City, UT	4.6	$356,000	$77,700
158	35	120	U.S.	San Antonio, TX	4.0	$239,000	$60,500
283	81	179	U.S.	San Diego, CA	7.3	$609,000	$83,300
296	84	183	U.S.	San Francisco, CA	8.4	$950,000	$113,700
301	85	187	U.S.	San Jose, CA	8.5	$1,120,000	$131,400
296		183	U.S.	San Luis Obispo, CA	8.4	$628,000	$75,000
291		181	U.S.	Santa Barbara, CA	7.9	$648,000	$81,700
296		183	U.S.	Santa Cruz, CA	8.4	$774,000	$91,600
283		179	U.S.	Santa Rosa, CA	7.3	$629,000	$85,800
189		140	U.S.	Sarasota, FL	4.4	$283,000	$64,200
130		102	U.S.	Savannah, GA	3.8	$230,000	$61,300
11		8	U.S.	Scranton, PA	2.5	$140,000	$57,000
249	71	172	U.S.	Seattle, WA	5.5	$508,000	$92,700
147		116	U.S.	Shreveport, LA	3.9	$172,000	$44,200
103		84	U.S.	Sioux Falls, SD	3.5	$224,000	$64,500
16		12	U.S.	South Bend, IN-MI	2.6	$151,000	$57,700
83		67	U.S.	Spartanburg, SC	3.3	$178,000	$54,700
189		140	U.S.	Spokane, WA	4.4	$269,000	$61,700
120		97	U.S.	Springfield, MA	3.7	$224,000	$61,000
83		67	U.S.	Springfield, MO	3.3	$163,000	$49,400
29	4	23	U.S.	St. Louis,, MO-IL	2.8	$188,000	$66,200
255		175	U.S.	Stockton, CA	5.7	$388,000	$67,600
6		5	U.S.	Syracuse, NY	2.4	$149,000	$61,900
130		102	U.S.	Tallahassee, FL	3.8	$203,000	$53,400
163	39	124	U.S.	Tampa-St. Petersburg, FL	4.1	$235,000	$57,900
11		8	U.S.	Toledo, OH	2.5	$137,000	$54,100
71		58	U.S.	Trenton, NJ	3.2	$268,000	$85,000
163	39	124	U.S.	Tucson, AZ	4.1	$229,000	$56,400
46	10	38	U.S.	Tulsa, OK	3.0	$175,000	$58,600
5		4	U.S.	Utica-Rome, NY	2.3	$133,000	$58,300
230		160	U.S.	Vallejo, CA	5.1	$450,000	$89,000
103	20	84	U.S.	Virginia Beach-Norfolk, VA-NC	3.5	$241,000	$69,100
222		156	U.S.	Visalia, CA	4.9	$250,000	$51,500
130		102	U.S.	Waco, TX	3.8	$188,000	$49,900
147	30	116	U.S.	Washington, DC-VA-MD-WV	3.9	$425,000	$107,700
29		23	U.S.	Wichita, KS	2.8	$167,000	$60,000
217		153	U.S.	Wilmington, NC	4.8	$267,000	$55,600
103		84	U.S.	Winston-Salem, NC	3.5	$177,000	$51,300

SCHEDULE 3 ALL HOUSING MARKETS BY NATION: 2019: Third Quarter *16th Annual Demographia International Housing Affordability Survey*							
International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
130		102	U.S.	Worcester, MA-CT	3.8	$284,000	$74,700
183		137	U.S.	Yakima, WA	4.3	$235,000	$54,300
174		131	U.S.	York, PA	4.2	$292,000	$68,800
71		58	U.S.	Youngstown, OH-PA	3.2	$161,000	$50,000
				Median Market	3.6		
Financial data in local currency.							

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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 Pennsylvania[40] (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 *16th 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.

[40] As defined by the United States Bureau of Management and the Budget.

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.[41]

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 use where available (Ireland, Scotland, England and Wales). 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.

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").[42]

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

[41] See *2nd Annual Demographia International Housing Affordability Survey*, Pages 16-18.
[42] Demographia attempts to use the most representative available data at the time of report preparation.

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
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
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 1: 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. The 2019 data is the Median Multiple of the median market among all metropolitan areas surveyed in the *Demographia Survey*.

Figure 3: Housing Affordability & Land Regulation: 2,000,000+ Population: 2019: 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 8: Includes only markets covered in 2009 by the *Demographia Survey*.

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

Table 11
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.	

Table 12
Footer Illustrations: New Houses (Left to Right)

• Suburban Kansas City, United States • Suburban Montréal, Canada • East of England (London Exurbs), U.K. • Suburban Tseung Kwan O (Hong Kong)	• 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.*

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.*