

DEMOGRAPHIA

13th Annual
Demographia International
Housing Affordability
Survey: 2017
Rating Middle-Income Housing Affordability

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

With comparisons to External Indexes for
China and Malaysia

Introduction by
Oliver Hartwich
The New Zealand Initiative

Data for 3rd Quarter 2016

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13th Annual Demographia International Housing Affordability Survey

INTRODUCTION

Housing Affordability: A Social Imperative

Oliver Hartwich
Executive Director,
The New Zealand Initiative



It is a great honour to provide the foreword to this year's *Demographia International Housing Affordability Survey*. Not just because I am humbly following in the footsteps of previous contributors to the series, many of whom I know personally and admire deeply. But mainly because I have been a fan of Demographia's indices since they started in 2005.

I first became involved in housing debates in that year when I was a researcher at London think tank Policy Exchange. I remember very well how difficult it was to put a figure to housing affordability which is also internationally comparable.

Demographia's 'median multiple' approach closed this gap. It firmly established a benchmark for housing affordability by linking median house prices to median household incomes. It is as simple as it is ingenious. And it is probably the index I have cited most often in my career.

The 'median multiple' is not a perfect measure because it does not account for house sizes or build quality. But it is the only index that allows a quick comparison of different housing markets, and it is the best approximation of housing affordability measures we have to date.

So first of all, my congratulations and thanks to Wendell Cox and Hugh Pavletich: You have done the world a great service with your annual surveys and with your advocacy for housing affordability.

When John Lennon met Elvis for the first time he said, "Before you there was nothing." I feel the same way about your housing affordability index. Thank you.

Demographia's reports and countless other surveys and studies do not leave the slightest doubt that unaffordable housing is almost everywhere and every time caused by the same factor: housing supply restrictions. The more restrictive the market, the more prices will increase over time.

To any undergraduate student of economics, this will not come as a surprise. But it is still a relatively novel discovery for many planners and politicians.



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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.¹ As was to be expected, greater land supply went hand in hand with lower price increases.

The same link can be seen internationally. On its website, *The Economist* [allows readers to compare house price developments across a range of developed economies](#).² The linked figure contrasts the United Kingdom, Australia, the United States and Germany and other countries over the past 40 years.

What stands out about *The Economist's* graph is the stark contrast between Germany on the one hand and the English-speaking world on the other. It was this contrast which initially drew me into the housing debate.

Germany is probably the country with the most boring housing market in the world. It is a place where nothing ever happens (at least as far as housing is concerned). German house prices remain stable, and if it had not been for the euro crisis and negative interest rates, the Germans would probably still be able to buy houses for the same prices in real terms that they paid twenty or thirty years ago.

The story for other countries like Australia, New Zealand, the United Kingdom and large parts of the United States is a different one. There, house prices have gone through the (now unaffordable) roof.

My own housing research focused on this difference: Why did Germany (and similarly Switzerland) provide housing stability where much of the Anglosphere did not?³

In a nutshell, the answer to this question has a lot to do with the way councils are funded. In jurisdictions where local decision-makers stand to gain from new development, they will be much more eager to make it happen.

In Germany and Switzerland, council budgets largely depend on their ability to attract new residents and taxpayers. This is why both countries have traditionally had a more responsive and flexible housing supply side. The available financial incentives to planners and councillors made all the difference to house prices in the long run.

In our work at The New Zealand Initiative, we have developed this 'incentives approach' further. We have argued that it could be the key to solving housing affordability in New Zealand⁴, and we have applied this thinking to other aspects of local government and resource management as well.⁵

Of course, planning reform and liberalisation remain both important and desirable. But without a financial framework that encourages and incentivises development, we will always struggle to deliver the houses we need.

We need to tackle housing affordability urgently because the effects of unaffordable housing on society are becoming more visible by the day. Policies that raise housing costs are always likely to hit those on low incomes the hardest. Thus in our work on different measures of poverty and inequality, we have argued that the best way to tackle both issues would be to make housing more affordable.⁶



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Especially at a time when there is a growing threat of populism to Western democracies, there is a social imperative for making housing more affordable.

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.

Of course, if you are an investment banker, a media personality or a sports star, you will always be able to live a decent life, no matter how expensive your city is. And if you are within this group, you will also benefit most from the amenities that global cities provide.

If, however, you are teacher, a nurse, or shop assistant your experience of city life would be very different. You would then have to put up with all the downsides of extreme price levels without being able to participate in metropolitan life.

But is this the kind of society we want to live in? And isn't this kind of social polarisation exactly the breeding ground for populism and resentment we are witnessing?

For these reasons, I believe that making housing affordable for all citizens is more important today than it has ever been.

I applaud Demographia's continued advocacy in this area and welcome this latest edition of the *Demographia International Housing Affordability Survey*

Wellington, December 2016

Oliver Hartwich

**THE
NEW ZEALAND
INITIATIVE**

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¹ Laura Kusisto (April 18, 2016), „Why the Great Divide is Growing Between Affordable and Unaffordable U.S. Cities, *The Wall Street Journal* <http://blogs.wsj.com/economics/2016/04/18/why-the-great-divide-is-growing-between-affordable-and-expensive-u-s-cities/>. Based on research by University of California and Buildzoom.com economist Issi Romem.

² The Data Team (March 31, 2016), “Global House Prices,” *The Economist*, <http://www.economist.com/blogs/dailychart/2011/11/global-house-prices>.

³ Alan Evans and Oliver Hartwich, *Unaffordable Housing: Fables and Myths*, London: Policy Exchange, 2005; Alan Evans and Oliver Hartwich, *Bigger Better Faster More: Why some countries plan better than others*, London: Policy Exchange, 2005; Alan Evans and Oliver Hartwich, *Better Homes, Greener Cities*, London: Policy Exchange, 2006.

⁴ Michael Bassett and Luke Malpass, *Priced Out: How New Zealand lost its housing affordability*, Wellington: The New Zealand Initiative, 2013; Michael Bassett and Luke Malpass, *Different Places, Different Means: Why some countries build more than others*, Wellington: The New Zealand Initiative, 2013; Michael Bassett, Luke Malpass and Jason Krupp, *Free to Build: Restoring New Zealand’s Housing Affordability*, Wellington: The New Zealand Initiative, 2013.





⁵ Jason Krupp, *Poverty of Wealth: Why minerals need to be part of the rural economy*, Wellington: The New Zealand Initiative, 2014; Jason Krupp, *From Red Tape to Green Gold*, Wellington: The New Zealand Initiative, 2015; Jason Krupp and Bryce Wilkinson, *The Local Formula: Myths, Facts & Challenges*, Wellington: The New Zealand Initiative, 2015; Eric Crampton and Khyaat Acharya, *In the Zone: Creating a Toolbox for Regional Prosperity*, Wellington: The New Zealand Initiative, 2015; Jason Krupp, *The Local Benchmark: When smaller is better*, Wellington: The New Zealand Initiative, 2016; Jason Krupp, *The Local Manifesto: Restoring local government accountability*, Wellington: The New Zealand Initiative, 2016.

⁶ Bryce Wilkinson and Jenesa Jeram, *Poorly Understood: The State of Poverty in New Zealand*, Wellington: The New Zealand Initiative, 2016; Bryce Wilkinson and Jenesa Jeram, *The Inequality Paradox: Why inequality Matters Even Though it has Barely Changed*, Wellington: The New Zealand Initiative, 2016.



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Highlights from Previous Introductions to the
Demographia International Housing Affordability Survey

	<p>Senator Bob Day, AQ, Senate of Australia</p> <p>(#12: 2016)</p>	<p>The distortion in the housing market... resulting from the supply-demand imbalance is enormous ... and affects every other area of a country's economy. New home owners pay a much higher percentage of their income on house payments than they should.</p> <p>However, the real culprit ... was the refusal of ... governments ... to provide an adequate and affordable supply of land for new housing stock to meet demand. ... the "scarcity" that drove up land prices is wholly contrived - it is a matter of political choice, not geographic reality. It is the product of restrictions imposed through planning regulation and zoning.</p>
	<p>Dr. Shlomo Angel, New York University</p> <p>(#11: 2015)</p>	<p>We all understand what it means to prepare adequate lands for urban expansion, enough land to accommodate both residences and workplaces, so as to ensure that land—and particularly residential land—remains affordable for all.</p> <p>Unfortunately, municipalities of many rapidly growing cities often underestimate the amount of land needed to accommodate urban expansion. In the minority of cases where expansion is effectively contained by draconian laws, it typically results in land supply bottlenecks that render housing unaffordable to the great majority of residents.</p>
	<p>Alain Bertaud, New York University</p> <p>(#10: 2014)</p>	<p>It is time for planners to abandon abstract objectives and to focus their efforts on two measurable outcomes that have always mattered since the growth of large cities during the 19th century's industrial revolution: workers' spatial mobility and housing affordability.</p> <p>As a city develops, nothing is more important than maintaining mobility and housing affordability. Mobility takes two forms: first, the ability to travel in less than an hour from one part of a city to another; and second, the ability to trade dwellings easily with low transactions costs.</p>
	<p>Hon. Bill English, Deputy Prime Minister, New Zealand <i>(Now Prime Minister)</i></p> <p>(#9: 2013)</p>	<p>Housing affordability is complex in the detail – governments intervene in many ways – but is conceptually simple. It costs too much and takes too long to build a house in New Zealand. Land has been made artificially scarce by regulation that locks up land for development. This regulation has made land supply unresponsive to demand.</p>



	<p>Robert Bruegmann, PhD, University of Illinois, Chicago</p> <p>(#8: 2012)</p>	<p>... I think it is fair to say that a growing number of people who have looked at the figures have tended to agree that a good many well-meaning policies involving housing may be pushing up prices to such an extent that the negative side-effects are more harmful than the problems the policies were intended to correct.</p>
	<p>Joel Kotkin, Chapman University</p> <p>(#7: 2011)</p>	<p>Although usually thought of as “progressive” in the English speaking world, the addiction to “smart growth” can more readily be seen as socially “regressive”. In contrast to the traditional policies of left of center governments that promoted the expansion of ownership and access to the suburban “dream” for the middle class, today regressive “progressives” actually advocate the closing off of such options for potential homeowners.</p>
	<p>Dr. Tony Recsei, Save Our Suburbs, Sydney</p> <p>(#6: 2010)</p>	<p>During the 18th century, especially after the industrial revolution, rural dwellers desperate to make a living streamed into the cities, converting many areas into overcrowded slums. However, as the new economic order began to generate wealth, standards of living improved, allowing an increase in personal living space.</p> <p>Unless we are vigilant, high-density zealots will do their best to reverse centuries of gains and drive us back towards a Dickensian gloom.</p>
	<p>Dr. Shlomo Angel, New York University</p> <p>(#5: 2009)</p>	<p>For cities to expand outward at their current pace — to accommodate their growing populations or the increased demand for space resulting from higher incomes — the supply of land must not be artificially constrained.</p> <p>The more stringent the restrictions, the less is the housing market able to respond to increased demand, and the more likely house prices are to increase. And when residential land is very difficult to come by, housing becomes unaffordable.</p>
	<p>Dr. Donald Brash, Fomer Governor, Reserve Bank of New Zealand</p> <p>(#4: 2008)</p>	<p>...the affordability of housing is overwhelmingly a function of just one thing, the extent to which governments place artificial restrictions on the supply of residential land.</p> <p>Australia is perhaps the least densely populated major country in the world, but state governments there have contrived to drive land prices in major urban areas to very high levels, with the result that in that country housing in major state capitals has become severely unaffordable...</p>
<p>2007: 3rd Edition</p>		<p>2006: 2nd Edition</p>
<p>2005: 1st Edition</p>		



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13th Annual Demographia International Housing Affordability Survey

Rating Middle-Income Housing Affordability
(2017 Edition: Data from 3rd Quarter 2016)

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

EXECUTIVE SUMMARY

The 13th Annual Demographia International Housing Affordability Survey covers 406 metropolitan housing markets (metropolitan areas) in nine countries (Australia, Canada, China, Ireland, Japan, New Zealand, Singapore, the United Kingdom and the United States) for the third quarter of 2016. A total of 92 major metropolitan markets (housing markets) --- with more than 1,000,000 population --- are included, including five megacities (Tokyo-Yokohama, New York, Osaka-Kobe-Kyoto, Los Angeles, and London).

Rating Middle-Income Housing Affordability

The *Demographia International Housing Affordability Survey* rates middle-income housing affordability using the “Median Multiple,” which is the median house price divided by the median household income. The Median Multiple is widely used for evaluating urban markets, and has been recommended by the World Bank and the United Nations and is used by the Joint Center for Housing Studies, 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.

Historically, liberally regulated markets have exhibited median house prices that are three times or less that of median household incomes, for a Median Multiple of 3.0 or less.

Demographia uses the following housing affordability ratings (Table ES-1).

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



Housing Affordability in 2016

There are 11 affordable major housing markets, all in the United States. There are 29 severely unaffordable major housing markets, including all in Australia (5), New Zealand (1) and China (1). There are 13 severely unaffordable major markets in the United States, out of 54. Seven of the United Kingdom's 21 major markets are severely unaffordable and two of Canada's six.

The most affordable major housing markets in 2015 are in the United States, with a moderately unaffordable Median Multiple of 3.9, followed by Japan (4.1), the United Kingdom (4.5), Canada (4.7), Ireland (4.7) and Singapore (4.8). Overall, the major housing markets of Australia (6.6), New Zealand (10.0) and China (18.1) are severely unaffordable.(Table ES-2).

There are 11 affordable major housing markets in 2016, all in the United States. Rochester is the most affordable, with a Median Multiple of 2.5, followed by Buffalo (2.6), Cincinnati (2.7), Cleveland (2.7), Pittsburgh (2.7), Oklahoma City (2.9), St. Louis (2.9) and four at 3.0, Detroit, Grand Rapids, Indianapolis and Kansas City.

There are 26 severely unaffordable major housing markets in 2016. Again, Hong Kong is the least affordable, with a Median Multiple of 18.1, down from 19.0 last year. Sydney is again second, at 12.2 (the same Median Multiple as last year). Vancouver is third least affordable, at 11.8, where house prices rose the equivalent of a full year's household income in only a year. Auckland is fourth least affordable, at 10.0 and San Jose has a Median Multiple of 9.6.

The least affordable 10 also includes Melbourne (9.5), Honolulu (9.4), Los Angeles (9.3), where house prices rose the equivalent of 14 months in household income in only 12 months. San Francisco has a Median Multiple of 9.2 and Bournemouth & Dorset is 8.9.

San Diego has a Median Multiple of 8.6 and London 8.5, the same as last year. Toronto has a Median Multiple of 7.7, like Vancouver, showing a year-on-year house price increase equal to a year of household income.

There are 99 affordable housing markets of all sizes including 82 in the United States, 10 in Canada, 4 in Australia and 3 in Ireland (Table ES-3). The most affordable market is Racine (WI) in the United States, with a Median Multiple of 1.8.

There are 94 severely unaffordable markets, with 36 (of 262) in the United States, 33 (of 54) in Australia, 11 (of 33) in the United Kingdom, 7 (of 40) in Canada, 6 (of 8) in New Zealand and the one market in China. Singapore, Japan and Ireland have no severely unaffordable housing markets.

The least affordable among the smaller markets is Santa Cruz (CA) in the United States, with a Median Multiple of 11.6.



Table ES-2 Housing Affordability Ratings by Nation: Major Housing Markets (Over 1,000,000 Population)						
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	6.6
Canada	0	1	3	2	6	4.7
China: Hong Kong	0	0	0	1	1	18.1
Ireland	0	0	1	0	1	4.7
Japan	0	1	1	0	2	4.1
New Zealand	0	0	0	1	1	10.0
Singapore	0	0	1	0	1	4.8
United Kingdom	0	2	12	7	21	4.5
United States	11	22	8	13	54	3.9
TOTAL	11	26	26	29	92	4.2

Table ES-3 Housing Affordability Ratings by Nation: All 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	4	3	14	33	54	5.5
Canada	10	13	10	7	40	3.9
China (Hong Kong)	0	0	0	1	1	18.1
Ireland	3	1	1	0	5	3.4
Japan	0	1	1	0	2	4.1
New Zealand	0	0	2	6	8	5.9
Singapore	0	0	1	0	1	4.8
United Kingdom	0	4	18	11	33	4.6
United States	82	94	50	36	262	3.6
TOTAL	99	116	97	94	406	4.0

“Best Cities” for Middle-Income Households

Every year, “best cities” and “most livable cities” lists are produced by various organizations. Aimed at the high end of the housing market, these surveys virtually never evaluate housing affordability. Yet, the media often mischaracterizes the findings as relevant to the majority of households.

In fact, a city cannot be livable, nor can it be a best city to middle-income households that cannot afford to live there. Households need adequate housing.

The “best cities” for housing affordability are often better on middle-income outcomes than the high-end best cities that attract media attention. This is illustrated by a comparison between Dallas-Fort Worth, where housing affordability is far better than in Toronto, which was rated as the “best city” by *The Economist*. In addition to better housing affordability, traffic congestion is better. This is



despite the fact that Toronto employs the most favored urban strategies, which Dallas-Fort Worth does not. This is not to dispute Toronto's luxury rating, but it is of little use to the much larger number of middle-income households being priced out of home ownership.

Another comparison shows that Kansas City has substantially better housing affordability than all of *The Economist's* top 10 cities. Kansas City also is rated as having the best traffic conditions of any metropolitan area with more than 1,000,000 population in the world.

Prime Minister Bill English of New Zealand noted in his introduction to the 9th *Annual Demographia International Housing Affordability Survey* that "Land has been made artificially scarce by regulation" locking up land for development. "This regulation has made land supply unresponsive to demand" and "translates to higher prices rather than more houses.

Excessive housing regulation has been identified as having significantly reduced economic growth in the United States and inequality internationally. It has made the job of central reserve banks more difficult by fueling inflation.

Economic uncertainty is a substantial concern for households. It is important to keep housing affordable, so that households can have a better standard of living and poverty rates can be lower. This requires avoiding urban planning policies associated with artificially raising house prices, specifically urban containment. Failing that, housing affordability is likely to worsen further.

Paul Cheshire, Max Nathan and Henry Overman of the London School of Economics recently suggested that "... that the ultimate objective of urban policy is to improve outcomes for people rather than places" and that "... improving places is a means to an end, rather than an end in itself."

Following that policy prescription, a number of cities (such as Dallas-Fort Worth, Kansas City and others) have achieved the objective of putting *people over place*. For most of society, middle-income households as well as lower income households, the best cities are where governments have overseen local housing markets competently, evidenced by housing that is affordable, all else equal. In such cities, the cost of living tends to be lower, as households are able to afford a more affluent life.



13th Annual Demographia International Housing Affordability Survey (2017 Edition: Data from Third Quarter 2016)

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

1: RATING MIDDLE-INCOME HOUSING AFFORDABILITY

The *13th Annual Demographia International Housing Affordability Survey* measures middle-income housing affordability in 92 major housing markets¹ in Australia, Canada, Hong Kong, Ireland, Japan, New Zealand, Singapore, the United Kingdom and the United States (Table 1: What is Middle-Income Housing Affordability?). These include five of the largest metropolitan areas in the high income world, the megacities of Tokyo-Yokohama, New York, Osaka-Kobe-Kyoto, Los Angeles, and London.²

In total, the *Annual Demographia International Housing Affordability Survey* provides ratings for 406 housing markets located in the same nine geographies, with data from the third quarter (September quarter) of 2016.³ In addition, recent housing affordability results from other sources are summarized for China and Malaysia (Section 4). The *Survey* provides perhaps the largest collection of housing affordability data at the housing market level in the world. House price data is obtained or estimated from sources that account for the majority of existing dwellings sold in each of the geographies. The data is reported at the housing market level, unmasking significant differences in housing affordability within nations.⁴

1.1: The Median Multiple: Measuring Housing Affordability

The *Demographia International Housing Affordability Survey* uses the “Median Multiple” (median house price divided by gross annual median household income⁵) to assess housing affordability. The Median Multiple (a house price to income ratio) is widely

Without exception, severely unaffordable markets have severe land use restrictions (usually "urban containment policies")

¹ Metropolitan areas with more than 1,000,000 population.

² Metropolitan areas with more than 10 million population.

³ The perspective of the Demographia International Housing Affordability Survey is that domestic public policy should, first and foremost be focused on improving the standard of living and reducing poverty.

⁴ This is most evident in the United States, where there are many affordable housing markets and many severely unaffordable markets.

⁵ This is to be contrasted with median "family" income.



used for evaluating urban markets, and has been recommended by the World Bank⁶ and the United Nations and is used by the Joint Center for Housing Studies, Harvard University.⁷ 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*⁸) and others.

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.

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. Further to this, the Median Multiple provides a solid foundation for the consideration of structural policy options for restoring and maintaining housing affordability in local housing markets.

Table 1 WHAT IS MIDDLE-INCOME HOUSING AFFORDABILITY?
<p>Housing affordability is measured in comparison to household incomes.⁹ According to the United Nations,¹⁰ "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."</p>
<p>Middle-income housing affordability is different than luxury housing affordability, which is reported upon by a number of organizations (such as such as by Frank Knight, LLC). In the vernacular of this populist era, middle-income housing affordability might be characterized as relating to the 99 percent, rather than the luxury 1 percent of the market. .</p>
<p>The <i>Demographia International Housing Affordability Survey</i>, uses a price-to-income ratio, the Median Multiple (Section 1.2) for measuring middle-income housing affordability in housing markets. Housing markets are metropolitan areas (or labor markets), which are the economic (or functional) dimension of cities.¹¹ Housing</p>

⁶ *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.

⁷ *Indicators of Sustainable Development: House Price-to-income Ratio*: http://esl.jrc.it/envind/un_meths/UN_ME050.htm.

⁸ For example, *The Economist* publishes a housing affordability index for metropolitan areas in China (see Section 4).

⁹ 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://www.whitehouse.gov/sites/default/files/page/files/20151120_barriers_shared_growth_land_use_regulation_and_economic_rents.pdf.

¹⁰ 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>.

¹¹ 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,"



markets are used, rather than neighborhoods or parts of housing markets, because they represent the selection of housing that is locally available to households and from which businesses draw their employees.

Housing affordability is evaluated on two levels, between housing markets (such as between Adelaide and Melbourne) and historically within the same housing market (such as Adelaide from 1980 to 2015). Middle-income housing affordability is also evaluated in relation to a housing affordability standard (Section 1.3).

Housing affordability between housing markets is an important consideration for households seeking better opportunities and to companies evaluating economic factors in making facility location decisions. For example, in the United States, severely unaffordable housing is strongly associated with net domestic out-migration.¹² It has also been an important factor in business location decisions, especially as companies have left California for more affordable housing markets.¹³

1.2: Housing Affordability Ratings

The *Demographia International Housing Affordability Survey* uses the housing affordability ratings are shown in Table 2.

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	

1.3: The Median Multiple: Historical & International Consistency

Historically, the Median Multiple has been remarkably similar among six surveyed nations, with median house prices from 2.0 to 3.0 times median household incomes (Australia, Canada, Ireland,

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*](#)

¹² For example, since 2000, California's generally unaffordable housing markets have suffered substantial net domestic migration losses. This is despite their reputations for strong consumer demand. Overall, the state has lost nearly a net 1,900,000 domestic migrants since 2000 (U.S. Census Bureau).

¹³ A classic case is the relocation of the North American headquarters of Toyota from Los Angeles to Dallas-Fort Worth. The trend of companies exiting California is documented by Joseph Vranich (2016), *California Business Departures: An Eight-Year Review 2008 -2015*, Spectrum Location Solutions, <http://www.spectrumlocationsolutions.com/pdf/Businesses-Leave-California-.pdf>



New Zealand, the United Kingdom and the United States). Housing affordability remained generally within this range until the late 1980s or late 1990s in each of these nations (Figure 1).¹⁴

Definitive historical data has not been identified for Hong Kong, Japan and Singapore.

The Median Multiple of 3.0 continues to be evident in some markets of the United States, Canada and Ireland.¹⁵

1.4: Threat to Middle-Income Housing Affordability

Demographia International Housing Affordability Survey focuses on middle-income housing affordability. Middle-income housing affordability is different from low – income affordable housing,¹⁶ which often relies on public subsidies. Even so, low-income housing costs and the demand for social housing are generally driven up by the failure to maintain middle-income housing affordability.

In recent decades, house prices have escalated far above household incomes in many parts of the world. The *Demographia International Housing Affordability Survey* has been published for 13 years to highlight this trend and its consequences.

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, which in some cases have even declined.

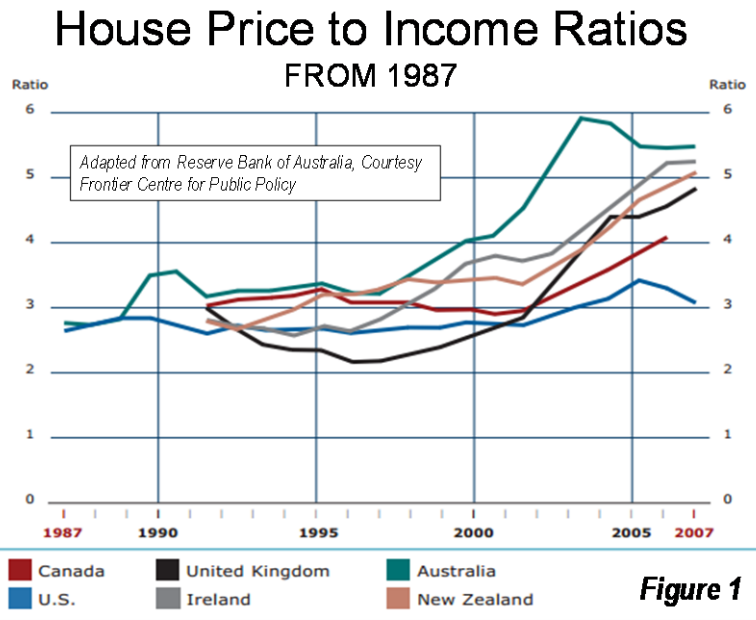


Figure 1
 * Various combinations of median and mean measures of house prices and incomes uses depending on availability.
 Sources: ABS; BIS; Bureau of Economic Analysis; Central Statistics Office Ireland; Communications and Local Government (UK); National Statistics website; OECD; REIA; Reserve Bank of New Zealand; Statistics Canada; Statistics New Zealand; Thomson Financial.

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

¹⁴ 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).

¹⁵ A value below 2.0 is affordable, but may indicate depressed economic conditions.

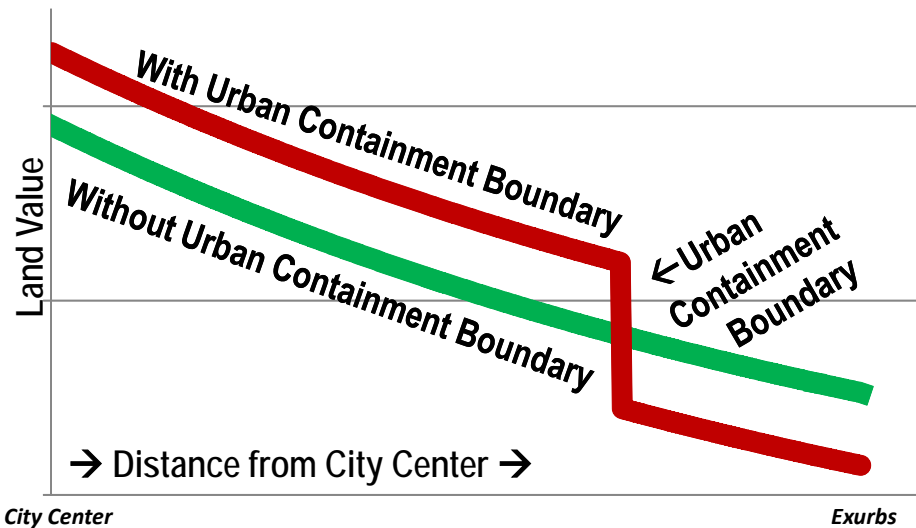
¹⁶ Including social housing.



However, in many housing markets, house prices have skyrocketed compared to household incomes. The most severe house price increases have been limited to housing markets where urban containment policy (or its equivalent) have been implemented. Generally, urban containment policy draws a development limit around the urban area and seriously limits or even prohibits greenfield development of housing tracts on the urban fringe. Consistent with the basics of economics, this is associated with higher land prices and, in consequence higher house prices (Figure 2).¹⁷ Virtually across the road land value gaps of ten or more times result.¹⁸ This destroys the competitive market for land by removing the “supply vent”¹⁹ necessary to maintain housing affordability (Table 3).

As Deputy Prime Minister (now Prime Minister) Bill English of New Zealand noted in his introduction to the 9th *Annual Demographia International Housing Affordability Survey*:

Urban Containment & Land Values VERSUS LIBERAL REGULATION (NO URBAN CONTAINMENT)



Adapted from Lincoln Institute of Land Use Policy

Figure 2

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. When demand shocks occur, as they did in the mid-2000s in New Zealand and around the world, much of that shock translates to higher prices rather than more houses. It simply takes too long to make new land available for development.²⁰

¹⁷ These house price increases are often exacerbated by excessively high development impact fees on new homes.

¹⁸ See: Wendell Cox. "A Question of Values: Middle-Income Housing Affordability and Urban Containment Policy." *Frontier Centre for Public Policy*, October 2015. https://www.fcpc.org/a_question_of_values.

¹⁹ See Table 3.

²⁰ From the Introduction to the 9th *Annual Demographia International Housing Affordability Survey*.



There are serious consequences for residents. The higher house prices reduce discretionary incomes, which reduces potential standards of living and raises relative poverty rates.²¹ This is a particular concern, because housing is the largest household expenditure in virtually all housing markets.

Further, there has been substantial domestic migration away from the more costly housing markets. This is particularly true in the United States.²²

In view of the importance of housing affordability to achievement and maintenance of a strong middle-class, it may be surprising that governments have not given it a higher priority. Indeed, as is shown by the data in this *Survey*, in many housing markets, governments have implemented public policies that do the opposite --- by severely reducing housing affordability. There has been no shortage of rhetorical concern, but serious initiatives have been absent.

...it may be surprising that governments have not given housing affordability a higher priority.

There are notable exceptions, such as Singapore’s half-century institutional initiative to keep housing affordable (Section 3.7) and the recent New Zealand government initiatives (Section 3.6). However, there has been little serious attention to the problem of severely unaffordable housing elsewhere, as governments have stood idly by as house prices doubled and tripled relative to incomes.

In effect, governments implementing urban containment policy choose pursuit of a particular urban form at the expense of a better standard of living and less poverty.

There has been a price. The declining financial situations of middle-income households, partly due to housing affordability losses, has contributed to the rise of populist political movements,²³ as people express their disaffection at more intense economic uncertainty.

Table 3 LAND USE REGULATION CLASSIFICATIONS
<p>The <i>Demographia International Housing Affordability Survey</i> uses the following land use regulation classifications:</p> <p>Liberal Land Use Policy (Less Restrictive Markets) applies in markets not classified as having more restrictive land use regulation (where competitive land markets are permitted to operate on the urban fringe). In these markets, residential development is allowed to occur based upon consumer preferences, subject to basic environmental regulation.²⁴ 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 <i>traditional</i> or <i>liberal</i> 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.</p>

²¹ Poverty rates that are adjusted for the cost of living (unlike, for example the official poverty rate in the United States, which is based on a single schedule of incomes, without regard to geographical cost of living differences).

²² Peter Ganong and Daniel Shoag, “Why Has Regional Income Convergence in the U.S. Declined?” HKS Working Paper No. RWP12-028.

²³ Among the geographies covered in the *Survey*, the most obvious examples have been the Brexit referendum in the United Kingdom and the 2016 United States presidential election.

²⁴ 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.



Liberal land use regulation has also been called "traditional" regulation.

More Restrictive Land Use Regulation uses urban containment policy or other mechanisms (such as comprehensive plans or development limits) to such an extent that the competitive market for land is not permitted to operate on the urban fringe. More restrictive land use regulation seeks to outlaw the liberal regulation that produced middle-income housing affordability.

Urban containment strategies²⁵ are the most important of more restrictive land use regulation. Generally, urban containment regulation is "plan-driven," as planning departments and governments determine where new housing is allowed to be built. There is a "negative presumption," with new development generally prohibited, except in limited areas where it is permitted by government plans. Typically, urban containment policies include 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. Urban containment policy may also be characterized by terms such as "densification policy," "compact development", "urban consolidation", "growth management" and "smart growth."

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

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

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

2: HOUSING AFFORDABILITY IN 2016: INTERNATIONAL SUMMARY

The *13th Annual Demographia International Housing Affordability Survey* provides housing affordability ratings on 92 major housing markets (over 1,000,000 population) and an overall total of 406 markets. Markets in 9 nations are rated.

2.1: Major Housing Markets

There was a reduction in the number of affordable major housing markets from 13 to 11 in 2016. At the same time, the number of severely unaffordable major housing markets rose from 26 to 29 (Table 4).

Sacramento became severely unaffordable, with a Median Multiple of 5.1. Severely unaffordable Honolulu (9.4), was reclassified to major market status,²⁶ having been severely unaffordable in all 13 editions of the *Demographia International Housing Affordability Survey*. Bournemouth & Dorset (8.9) and Warrington & Cheshire (5.1) were also added by reclassification. Bournemouth & Dorset has been severely unaffordable in previous *Surveys*.

Among the seven cities rated by the [UBS Global Real Estate Bubble Index](#) with the most intense "bubble risk," all five that are also rated in the *Demographia International Housing Affordability Survey* have severely unaffordable housing. This includes Vancouver, London, Sydney, Hong Kong and San

²⁵ The term "urban containment" is used throughout the *Survey* to denote more restrictive land use regulation, because this particular strategy is most associated with huge housing affordability losses.

²⁶ Honolulu is projected to have reached 1,000,000 population in 2016.



Francisco. Stockholm and Munich were also included in the seven most bubble prone, but were not included in the *Demographia* Survey because comparable housing affordability data is not available.

Data for all major housing markets is in Schedules 1 and 2.

Table 4 Distribution of Markets by Housing Affordability Rating				
Rating	Median Multiple	Major Markets (Number)	All Markets (Number)	
Affordable	3.0 or Less	11	99	
Moderately Unaffordable	3.1 to 4.0	26	116	
Seriously Unaffordable	4.1 to 5.0	26	97	
Severely Unaffordable	5.1 & Over	29	94	
TOTAL		92	406	

For the fourth year in a row, the United States has the most affordable housing among major housing markets, with a moderately unaffordable Median Multiple of 3.9. Japan has an Average Multiple of 4.1, the United Kingdom (4.5), Canada (4.7) Ireland (4.7), and Singapore (4.8) have seriously unaffordable housing.

Three national markets are severely unaffordable, with Median Multiples of 5.1 or above. These included China (Hong Kong), with a Median Multiple of 18.1, New Zealand, at 10.1 and Australia at 6.6. The trend in annual major housing market Median Multiples are shown in Figure 3. Ireland, Japan and Singapore are the only geographies with no severely unaffordable major housing markets (Table 5).

Table 5 Housing Affordability Ratings by Nation: Major Housing Markets (Over 1,000,000 Population)						
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	6.6
Canada	0	1	3	2	6	4.7
China: Hong Kong	0	0	0	1	1	18.1
Ireland	0	0	1	0	1	4.7
Japan	0	1	1	0	2	4.1
New Zealand	0	0	0	1	1	10.0
Singapore	0	0	1	0	1	4.8
United Kingdom	0	2	12	7	21	4.5
United States	11	22	8	13	54	3.9
TOTAL	11	26	26	29	92	4.2



Most Affordable Major Housing Markets: The 11 affordable major housing markets are all in the United States (Table 6). Rochester is the most affordable, with a Median Multiple of 2.5, while Buffalo ranks second with a Median Multiple of 2.6. There is a three-way tie for third most affordable between Cincinnati, Cleveland and Pittsburgh, with Median Multiples of 2.7. Oklahoma City and St. Louis have Median Multiples of 2.9. Four major housing markets have affordable Median Multiples of 3.0, Detroit, Grand Rapids, Indianapolis and Kansas City.

Housing Affordability: 2004-2016
MAJOR MARKETS (OVER 1,000,000 POPULATION)

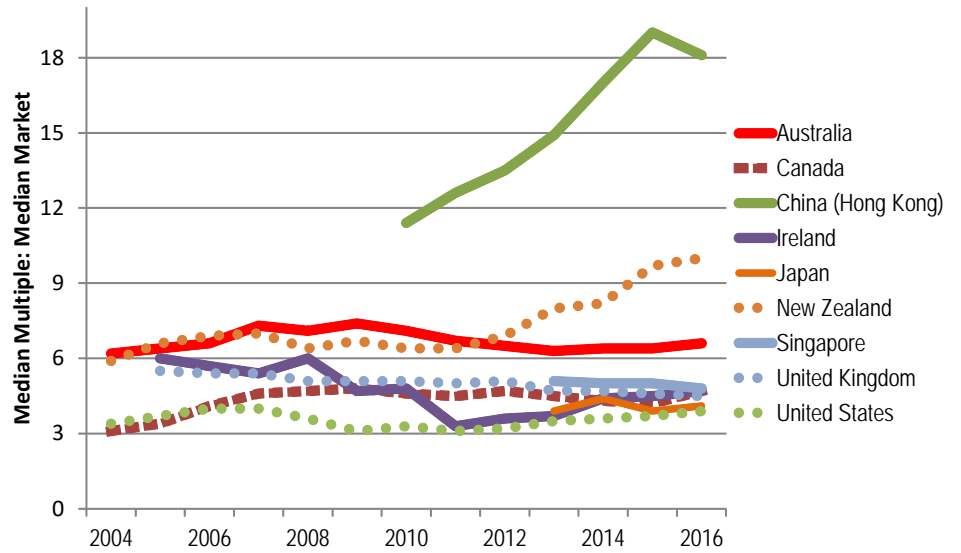


Figure 3

The affordable markets are generally characterized by more liberal land use regulation, which is associated with greater housing affordability.

Affordability Rank (Out of 92)	Nation	Housing market	Median Multiple
1	U.S.	Rochester, NY	2.5
2	U.S.	Buffalo, NY	2.6
3	U.S.	Cincinnati, OH-KY-IN	2.7
3	U.S.	Cleveland, OH	2.7
3	U.S.	Pittsburgh, PA	2.7
6	U.S.	Oklahoma City, OK	2.9
6	U.S.	Saint Louis, MO-IL	2.9
8	U.S.	Detroit, MI	3.0
8	U.S.	Grand Rapids, MI	3.0
8	U.S.	Indianapolis, IN	3.0
8	U.S.	Kansas City, MO-KS	3.0



Least Affordable Major Housing Markets: The severely unaffordable major markets include all in Australia (5), New Zealand (1) and China (1). Two of Canada’s six markets are severely unaffordable. Seven of the 21 major markets in the United Kingdom are severely unaffordable, and 13 of the 54 markets in the United States.

The 10 least affordable major housing markets are shown in Table 7. Hong Kong has least affordable housing, with a Median Multiple of 18.1, an improvement from last year’s worst ever recorded 19.0. Hong Kong has had the worst housing affordability in for all of the seven years it has been included in the *Demographia International Housing Affordability Survey*.

Sydney is again the second least affordable market, repeating is 12.2 Median Multiple from last year. Vancouver remains the third least affordable major housing market, with a Median Multiple of 11.8, adding a full year’s household income to its house prices in a single year (from a Median Multiple of 10.8 last year).

Vancouver and Toronto house prices increased the equivalent of annual household incomes over the last year.

Auckland has the fourth worst housing affordability, with a Median Multiple of 10.0. The bottom 10 in major market housing affordability is rounded out by San Jose (9.6), Melbourne (9.5), Honolulu (9.4), Los Angeles (9.3), San Francisco (9.2) and Bournemouth and Dorset (8.9). The most significant deterioration among these is in Los Angeles, where the Median Multiple rose to 9.3 in 2016 from 8.1 last year, equaling more than 14 months of median household income.

Los Angeles house prices increased the equivalent of 14 months annual household incomes over the last year.

Table 7
10 Least Affordable Major Housing Markets

Rank: Least Affordable	Affordability Rank (Out of 92)	Nation	Housing market	Median Multiple
1	92	China	Hong Kong	18.1
2	91	Australia	Sydney, NSW	12.2
3	90	Canada	Vancouver, BC	11.8
4	89	N.Z.	Auckland	10.0
5	88	U.S.	San Jose, CA	9.6
6	87	Australia	Melbourne, VIC	9.5
7	86	U.S.	Honolulu, HI	9.4
8	85	U.S.	Los Angeles, CA	9.3
9	84	U.S.	San Francisco, CA	9.2
10	83	U.K.	Bournemouth & Dorset	8.9

As in the past, each of the severely unaffordable major markets are characterized by urban containment policy or variations (Table 1, above and Figure 4).



2.2: All Housing Markets

Among the 406 markets, Ireland has the most affordable housing with a national Median Multiple of 3.4 (moderately unaffordable). The United States is second (3.5), followed by Canada (3.9). Japan (4.1), the United Kingdom (4.6) and Singapore (4.8) are all rated seriously unaffordable. The least affordable markets are China (Hong Kong), at 18.1, Australia (5.5) and New Zealand (5.7), both severely unaffordable (Figure 5 and Table 8).

Among all markets, 99 are affordable (Median Multiple of 3.0 or less). There are 116 moderately unaffordable markets (Median Multiple of 3.1 to 4.0) and 97 seriously unaffordable markets (Median Multiple of 4.1 to 5.0). A total of 94 markets are severely unaffordable, with a Median Multiple of 5.1 or higher.

All 406 housing markets are ranked by housing affordability in Schedules 3 and 4. The 100 affordable markets (having a Median Multiple of 3.0 or below) are in Australia²⁷ (4), Ireland (3), Canada (10) and the United States (83). There are no affordable markets in China (Hong Kong), Japan, New Zealand, Singapore or the United Kingdom.

Housing Affordability & Land Regulation

2+ MILLION METROPOLITAN AREAS: 2016

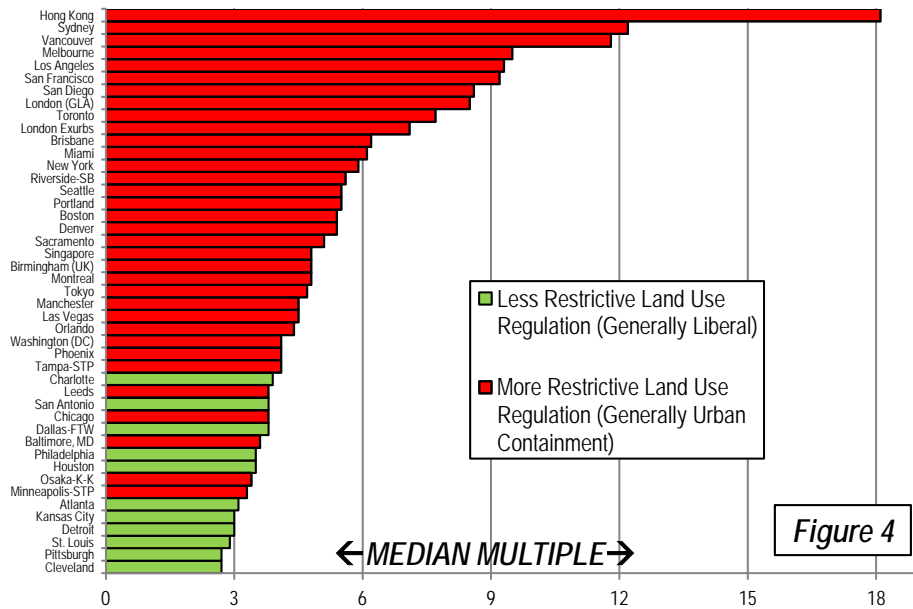


Figure 4

Due to an 11 way tie for 5th most affordable, the top 10 includes 14 entries. Twelve of these are in the United States, with Racine, WI (1.8), Bay City, MI (1.9), Decatur, IL (2.0) and Elmira, NY (2.0) being the most affordable. Canada has one entry in the top ten, Moncton, NB (2.1) as does Australia with Karratha (2.1), which with nine other housing markets are ranked fifth most affordable (Table 9).

²⁷ See caution, Section 3.1.



Table 8 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	4	3	14	33	54	5.5
Canada	10	13	10	7	40	3.9
China (Hong Kong)	0	0	0	1	1	18.1
Ireland	3	1	1	0	5	3.4
Japan	0	1	1	0	2	4.1
New Zealand	0	0	2	6	8	5.9
Singapore	0	0	1	0	1	4.8
United Kingdom	0	4	18	11	33	4.6
United States	82	94	50	36	262	3.6
TOTAL	99	116	97	94	406	4.0

Among the 94 severely unaffordable markets, 33 are in Australia, 36 in the United States, 11 in the United Kingdom, seven in both Canada and six in New Zealand. There is one severely unaffordable market in China (Hong Kong).

Outside the major housing markets, the least affordable are Santa Cruz, CA, (Table 9) and Santa Barbara (CA), both in the United States. Santa Cruz has the worst housing affordability in the history of the *Survey* outside Hong Kong, Sydney and Vancouver. Wingcaribbee, NSW (9.8) and Tweed Heads (9.7) in Australia also among the 10 least affordable housing markets (Table 10).

National Housing Affordability: 2016 ALL 406 MARKETS

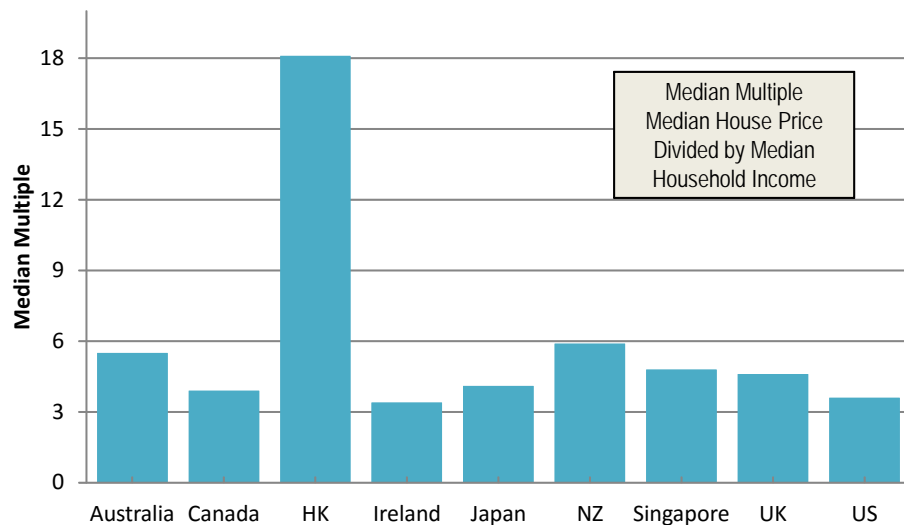


Figure 5



Table 9 All Housing Markets: 10 Most Affordable				
Affordability Rank (Out of 406)	Nation	Housing market	Median Multiple	
1	U.S.	Racine, WI	1.8	
2	U.S.	Bay City, MI	1.9	
3	U.S.	Decatur, IL	2.0	
3	U.S.	Elmira, NY	2.0	
5	U.S.	East Stroudsburg, PA	2.1	
5	Australia	Karratha, WA	2.1	
5	U.S.	Lima, OH	2.1	
5	Canada	Moncton, NB	2.1	
5	U.S.	Peoria, IL	2.1	
5	U.S.	Rockford, IL	2.1	
5	U.S.	Scranton-Wilkes Barre, PA	2.1	
5	U.S.	Springfield, OH	2.1	
5	U.S.	Terre Haute, IN	2.1	
5	U.S.	Youngstown, OH-PA	2.1	

Table 10 All Housing Markets: 10 Least Affordable				
Rank: Least Affordable	Affordability Rank (Out of 367)	Nation	Metropolitan Market	Median Multiple
1	406	China	Hong Kong	18.1
2	405	Australia	Sydney, NSW	12.2
3	404	Canada	Vancouver, BC	11.8
4	403	U.S.	Santa Cruz, CA	11.6
5	402	U.S.	Santa Barbara, CA	11.3
6	401	N.Z.	Auckland	10.0
7	400	Australia	Wingcaribbee, NSW	9.8
8	399	Australia	Tweed Heads, NSW	9.7
9	398	U.S.	San Jose, CA	9.6
10	397	Australia	Melbourne, VIC	9.5

3: HOUSING AFFORDABILITY IN 2016: GEOGRAPHICAL SUMMARIES

The housing affordability situation is summarized by geography below for both major housing markets and all markets. The housing affordability data for each housing market is provided in Schedules 1 through 4.

3.1 Australia

Again, as in each of the 13 annual *Demographia International Housing Affordability Surveys* all of Australia's five major housing markets are severely unaffordable (Figure 6)²⁸. The overall major housing market Median Multiple is 6.6.

²⁸ House price data for Australia is estimated or obtained from multiple sources, such as the Real Estate Industry Association of Queensland (*Queensland Market Monitor*), the Real Estate Institute of Victoria, the Real Estate Institute of South Australia, the Real Estate Institute of Western Australia, Australian Property Monitors, the Real Estate Institute of Australia and various real estate internet web sites. House price data for some smaller markets is year to date data.



Overall, Australia's 54 housing markets have a severely unaffordable Median Multiple of 5.5. Four housing markets are affordable (see caution below), three are moderately unaffordable, 14 are seriously unaffordable and 33 are severely unaffordable.

Major Markets:

Sydney is again Australia's least affordable market, with a Median

Multiple of 12.2, the same as last year, and ranks second worst overall, trailing Hong Kong. Consistent with the experience in other overly expensive housing markets, Sydney is experiencing substantial domestic out-migration.²⁹

In 2004 (the first *Survey*), Sydney's Median Multiple is 7.6, and has risen 60 percent since then. Sydney's 12.2 Median Multiple (in the last two years) represents the poorest housing affordability ever recorded by the *Survey* outside Hong Kong. The [UBS Global Real Estate Bubble Index](#) rates Sydney as having the world's fourth worst housing bubble risk.

Melbourne has a Median Multiple of 9.5 and is the fifth least affordable major housing market. Only Hong Kong, Sydney, Vancouver, Auckland and San Jose are less affordable than Melbourne. Adelaide has a severely unaffordable 6.6 Median Multiple and is the 16th least affordable of the 92 major markets. Brisbane has a Median Multiple is 6.2 and is ranked 18th least affordable, while Perth, with a Median Multiple of 6.1 is the 20th least affordable major housing market.

Other Housing Markets: Four smaller housing markets are affordable in Australia, including Karratha, WA (2.1), Port Hedland, WA (2.3), Kalgoorlie, WA (2.6) and Gladstone, QLD (2.8). Each of these markets is heavily dependent upon resource extraction, which includes industries that have experienced a severe downturn in recent years. House prices have fallen substantially, however the

Middle-Income Housing Affordability AUSTRALIA: CAPITAL CITY HOUSING MARKETS: 1981-2016

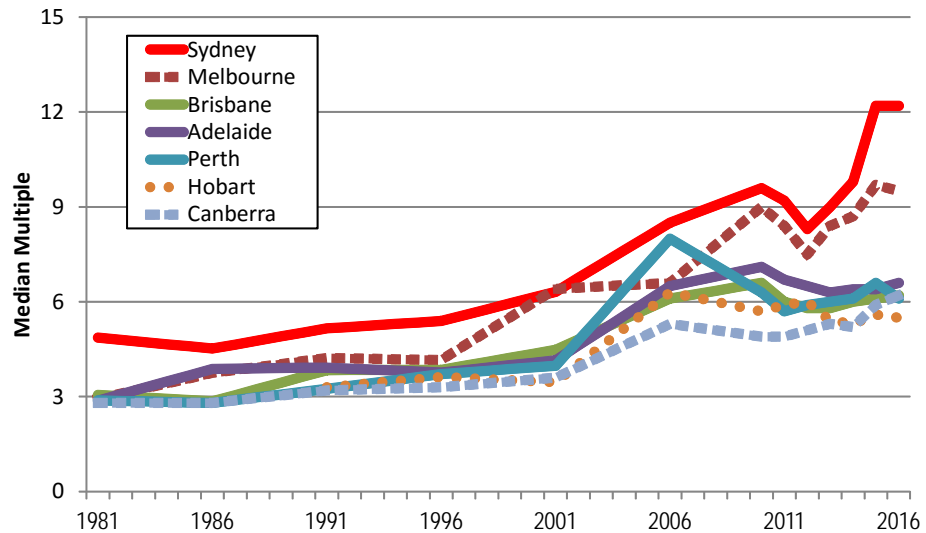


Figure 6

²⁹ Wendell Cox. "A Question of Values: Middle-Income Housing Affordability and Urban Containment Policy." *Frontier Centre for Public Policy*, October 2015. https://www.fcpp.org/a_question_of_values.



broader geographic income data may not sufficiently account for apparent downward trends. As a result, the Median Multiples in these markets could be higher. As a result, *caution is suggested in interpreting these results.*

Outside of the major markets, 28 in Australia are rated severely unaffordable. The least affordable of these are Wingcaribbee, NSW (9.8), Tweed Head, NSW (9.7), Gold Coast, QLD (9.0) and Sunshine Coast, QLD (9.0).³⁰

Historical Context: Australia's generally unfavorable housing affordability is in significant contrast to the broad affordability that existed before implementation of urban containment (urban consolidation) policies. As is indicated in Figure 1, the price-to-income ratio in Australia was below 3.0 in the late 1980s. All of Australia's major housing markets have severely unaffordable housing and all have urban containment policy.

As in all previous Surveys, all of Australia's five major housing markets are severely unaffordable.

3.2: Canada

The health of the housing market has been deteriorating rapidly in Canada. Both international and national organizations have expressed concern about the damage that rising prices (some suggest a "housing bubble") could do to the national economy.³¹

Among major markets, Canada has a seriously unaffordable Median Multiple of 4.7. There are no affordable major markets, one major market is rated as moderately unaffordable, three are rated seriously unaffordable and two are rated severely unaffordable.

The Median multiple for all housing markets in Canada is 3.9. Canada's overall housing affordability trails only that of Ireland and the United States. Among the 40 markets in Canada, 10 are affordable, 13 are moderately unaffordable, 10 are seriously unaffordable and seven are severely unaffordable.³²

Major Housing Markets: As in all of the previous *Surveys*, Vancouver is rated as having the worst housing affordability in Canada. Vancouver is rated severely unaffordable, with a Median Multiple of 11.8. Vancouver has also experienced modest net domestic out-migration.

Toronto also has a severely unaffordable housing market, with the Median Multiple deteriorating to 7.7 in 2016, adding an equivalent of a year's income to last year's 6.7. Consistent with other high cost housing markets, Toronto has had substantial domestic outmigration. Montréal has seriously

³⁰ Previously reported as Bowral-Mittagong.

³¹ See, for example, Organisation for Economic Co-operation and Development, "OECD Economic Surveys Canada," June 2014. http://www.oecd.org/eco/surveys/Overview%20CANADA_2014.pdf. International Monetary Fund, "2014 Article IV Consultation – Staff Report; Staff Statement; and Press Release," *IMF Country Report No. 15/22*, January 2015. <https://www.imf.org/external/pubs/ft/scr/2015/cr1522.pdf>. Bank of Canada, "Financial System Review – December 2015." <http://www.bankofcanada.ca/2015/12/fsr-december-2015/>.

³² Median house prices are estimated or obtained from the Canada Mortgage and Housing Corporation, national, provincial and metropolitan real estate associations and the Statistics Canada National Household Survey data.



unaffordable housing (4.8), and has also experienced substantial net domestic out-migration.³³ Calgary (4.6) and Edmonton (4.1) are also seriously unaffordable. Canada’s most affordable major market is Ottawa-Gatineau (3.9), which is rated as moderately unaffordable (Figure 7).

Recently the federal government Canada Mortgage and Housing Corporation (CMHC) issued a “red warning” on the Toronto and Vancouver housing markets. CMHC noted that the rapidly rising house prices were spreading from Toronto and Vancouver to nearby markets. This is confirmed by the data in this *Survey*, in severely unaffordable Hamilton and Oshawa as well as seriously unaffordable Barrie Brantford, Guelph, Kitchener and Peterborough. The Vancouver “ripple effect” is evident in severely unaffordable Victoria and the Fraser Valley.

Over 13 years, Toronto’s house prices have nearly doubled compared to household incomes.

According to CMHC the red warnings are due to “strong evidence of problematic conditions for Canada overall. Home prices have risen ahead of economic fundamentals such as personal disposable income and population growth, resulting in overvaluation in many Canadian housing markets.”

Indeed, house prices have been rising well above the economic fundamentals in Canada for at least a decade. Vancouver had already developed a severely unaffordable housing market in the first *Survey* (2004),

which has been associated with its urban containment policy, adopted about five decades ago. Vancouver has experienced the greatest housing affordability deterioration among major markets in the *Demographia Annual International Housing Affordability Survey*, with its Median Multiple more than doubling, from 5.4 to 11.8. The [UBS Global Real Estate Bubble Index](#) rates Vancouver as having the world’s worst housing bubble risk.

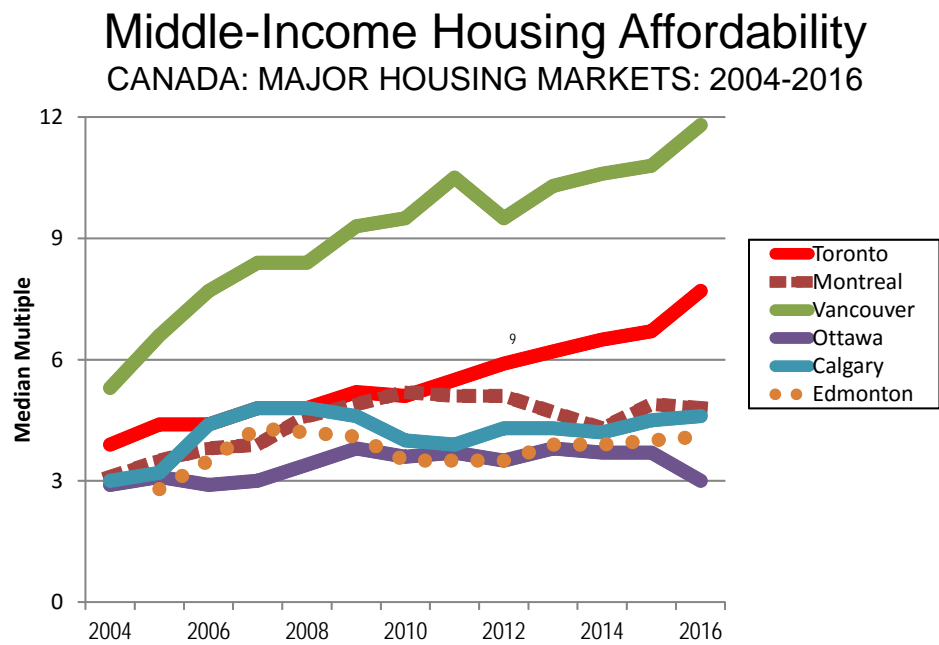


Figure 7

³³ Domestic migration data is summarized in Cox, *A Question of Values*.



Vancouver’s rapid escalation in house prices has stalled since August, after the imposition by the British Columbia government of a foreign buyers tax. The most demanded market segment, detached houses, dropped 17 percent in average value in the first month, but recovered two-thirds of the loss in the following four months. Overall, the Real Estate Board of Greater Vancouver (REBGV) benchmark price has dropped about three percent since July. Even so, REBGV’s benchmark price was up 17 percent in 2016, up 48 percent over the past three years and up 84 percent over the past 10 years,³⁴ far outstripping income growth.

For the fifth year in a row, Moncton (NB) was the most affordable market in Canada.

Toronto’s housing affordability deterioration has been much more recent. In 2004, Toronto had a moderately unaffordable Median Multiple of 3.9. By 2016, it nearly doubled to a severely unaffordable 7.7.

In the years of the *Demographia International Housing Affordability Survey*, only Vancouver has experienced a greater Median Multiple percentage increase. In Toronto, the housing affordability loss has been associated with the middle-2000s adoption of urban containment policy (“Places to Grow”), which a *Survey* co-author predicted would lead to much worsened housing affordability.³⁵

Middle-Income Affordability History CANADA: MAJOR HOUSING MARKETS: 1970-2016

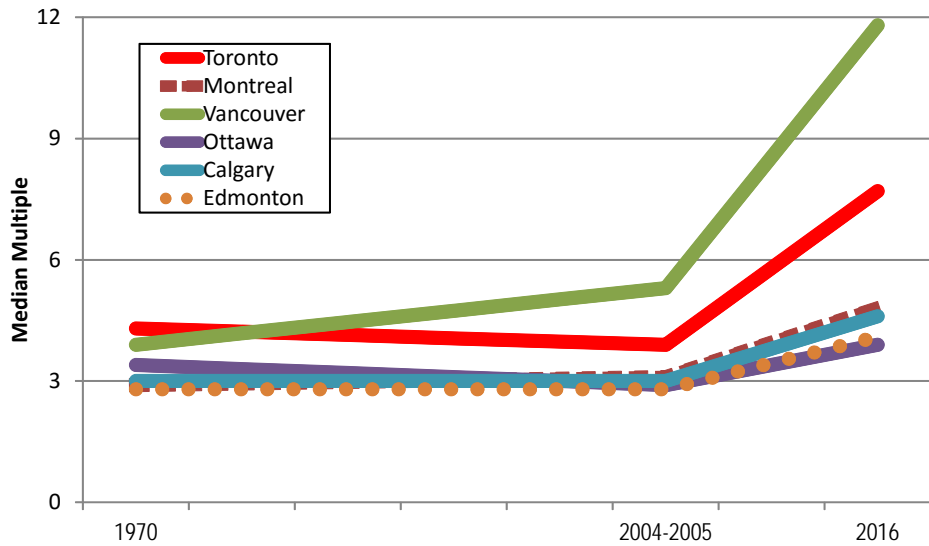


Figure 8

At the same time, other major markets in Canada are experiencing worsening housing affordability, such as Montréal, Calgary and Edmonton, which are seriously unaffordable and Ottawa-Gatineau, which is moderately unaffordable.

Other Housing Markets: For the fifth year in a row, Moncton (NB) is the most affordable market in Canada. Moncton, with a Median Multiple of 2.1, is followed by Fredericton (NB), with an affordable Median Multiple of 2.2. The other affordable markets are Charlottetown (PEI), Moose

³⁴ Data derived from Real Estate Board of Greater Vancouver data.

³⁵ Wendell Cox (2004), *Myths about Urban Growth and the Toronto Greenbelt*, Fraser Institute.



Jaw (SK), Saguenay (QC) Saint John (NB), Sudbury (ON), Thunder Bay (ON), Trois-Rivières (QC) and Windsor (ON).

The least affordable smaller housing markets are in British Columbia. This includes Victoria (8.1), the Fraser Valley (7.1), and Kelowna (6.4). Markets nearby Toronto are also severely unaffordable, including Hamilton (5.7) and Oshawa (5.1).

Historical Context

A 2016 Frontier Centre for Public Policy research report reviewed the strongly rising house prices relative to incomes in 35 markets across the nation.³⁶

This represents a “sea change” from the decades of relatively stable housing affordability across Canada. From the early 1970s to their first inclusion in the *Survey*, there was virtually no housing affordability deterioration in the major markets, with the exception of Vancouver. The rapidly escalating prices of houses has been associated with wider adoption of urban containment policies. (Figures 8).

3.3: China

Hong Kong is China's only market in the *Demographia International Housing Affordability Survey*. Hong Kong has the least affordable housing for the seventh straight year, with a Median Multiple of 18.1.³⁷ This is an improvement from 2015, when Hong Kong had the least affordable Median Multiple ever recorded in the *Survey* (19.0).

This improvement is a positive development. However, much greater improvement in housing affordability is needed. In 2010, Hong Kong's Median Multiple was 11.4. Hong Kong's Median Multiple of 18.1 represents a substantial deterioration in its housing affordability, The [UBS Global Real Estate Bubble Index](#) rates Hong Kong as having the world's sixth worst housing bubble risk.

Historical Context: Hong Kong's housing affordability was far better in the early 2000's. According to [The Chinese University of Hong Kong's Quality of Life Index](#) the house price-to-income ratio rose approximately 275 percent between 2002 and 2014.³⁸ Academic research has indicated that Hong Kong's house prices have been driven considerably higher by restrictive land-use regulation.³⁹

Hong Kong, had the least affordable housing for the 7th straight year, with a Median Multiple of 18.1.

³⁶ 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>.

³⁷ Estimated from Hong Kong Residential Units Consideration Range and Hong Kong Private Domestic Price Index.

³⁸ Average house price divided by median income.

³⁹ C. M. Hui & F. K. Wong (n.d.), "Dynamic Impact of Land Supply on Population Mobility with Evidence from Hong Kong," http://www.prrs.net/Papers/Hui_Dynamic_impact_of_land_supply_on_population_mobility.pdf.



3.4: Ireland

For the fourth straight year, Ireland is the most affordable geography in the *Survey*, with a Median Multiple of 3.4, an affordable rating.

Major Housing Market: Housing affordability continued to decline in Ireland's only major metropolitan area market, Dublin, where the Median Multiple reached a seriously unaffordable 4.7 in 2016, up from 3.3 in 2011. Dublin could be headed toward the severe unaffordability reached during the housing bust in 2008.⁴⁰

Dublin could be headed toward severe unaffordability

University College economist Colm McCarthy [continues to warn](#) that house prices are rising far too rapidly in the Dublin area. He suggests that a new housing "bubble" could be developing despite the market cooling policies of the Central Bank.

Other Housing Markets: Galway (3.4) and Cork (3.5) are moderately unaffordable, while Waterford (2.6) and Limerick (2.3) are rated affordable.

Historical Context: As is indicated in Figure 1, Ireland had a price-to-income multiple of less than 3.0 in the early 1990s.

3.5: Japan

The Average Multiple (average house price divided by average household income) is used for the markets in Japan.⁴¹ Japan has a seriously unaffordable major market Median Multiple of 4.1 in 2016.

Tokyo-Yokohama and Osaka-Kobe-Kyoto have the most favorable housing affordability of any megacities (over 10 million residents)

Major Housing Markets: Data is available for only two of Japan's two major housing markets, Tokyo-Yokohama and Osaka-Kobe-Kyoto. Tokyo-Yokohama is the world's largest urban area (38 million).⁴² The metropolitan area covers all or part of four prefectures, Tokyo,⁴³ as well as largely suburban Kanagawa, Saitama and Chiba.

Osaka-Kobe-Kyoto ranks as the 14th largest urban area in the world (17 million) and the third largest housing market covered in the *Demographia International Housing Affordability Survey* (After

⁴⁰ Median house prices calculated from the Residential Property Price Register of the Property Services Regulatory Authority.

⁴¹ Data for calculating Median Multiples is not available. The Average Multiple is generally comparable to the Median Multiple in the United States and Canada (see the *10th Annual Demographia Housing Affordability Survey*).

⁴² *Demographia World Urban Areas*, <http://demographia.com/db-worldua.pdf>.

⁴³ Tokyo prefecture is called the Tokyo metropolis, which can be misleading, because the prefecture has only one-third of the metropolitan area population. The failure to understand this distinction has resulted in invalid demographic analyses, not only popular but also academic. The 23 wards of the former city of Tokyo are within the prefecture of Tokyo and comprise approximately 70 percent of its population.



Tokyo and New York). Osaka-Kobe-Kyoto covers all or part of Osaka, Hyogo, Kyoto and Nara prefectures.⁴⁴

Osaka-Kobe-Kyoto is the most affordable megacity (over 10 million population) in the *Survey*, with an Average Multiple of 3.4, earning a moderately unaffordable rating. Tokyo-Yokohama is the second most affordable megacity in the *Survey*, with a seriously unaffordable Average Multiple of 4.7.

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

3.6: New Zealand

Overall, housing in New Zealand is rated as severely unaffordable, with a Median Multiple of 5.9.

Major Housing Market: Auckland, New Zealand's only major housing market has a severely unaffordable 10.0 Median Multiple. Housing affordability has deteriorated from a Median Multiple of 5.9 in the first *Survey* (2004). Auckland⁴⁵ is the fourth least affordable among the 92 major housing markets, following only Hong Kong, Sydney and Vancouver and has been severely unaffordable in all 13 *Demographia International Housing Affordability Surveys*.⁴⁶

Auckland has been severely unaffordable in all 13 Demographia Surveys

Other Housing Markets: Christchurch has severe unaffordability, with a Median Multiple of 5.9, while Wellington is also severely unaffordable, at 5.7.

Housing Affordability and the National Policy Agenda: Outside Singapore, New Zealand is the only nation in the *Survey* with a serious public policy priority to restore and maintain middle-income housing affordability. In New Zealand, as in Australia, housing had been rated as affordable until approximately a quarter century ago. However, across the nation, urban containment policies were adopted, 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 9).

Meanwhile, public opinion placed the issue of housing affordability near the top of the policy agenda. A new National Party government was elected in 2008 and committed itself to address the housing affordability crisis. The government set out a program to establish special housing areas to improve middle income housing affordability. There have been proposals to produce more efficient infrastructure for supporting the new housing.

A Productivity Commission of New Zealand analysis was undertaken, preparatory to possible land use reforms. The Commission found that land use authorities have a responsibility to provide

⁴⁴ See *Demographia World Urban Areas: 2016*, <http://demographia.com/db-worldua.pdf>.

⁴⁵ The city of Auckland governs virtually the entire metropolitan area (housing market area or labor market area). Auckland and Honolulu are unique among cities in governing virtually all of their metropolitan areas with more than 1,000,000 population.

⁴⁶ Median house prices are from the Real Estate Institute of New Zealand.



“capacity to house a growing population while delivering a choice of quality, affordable dwellings of the type demanded”⁴⁷

Consistent with that finding, the Productivity Commission proposed a measure that would automatically expand the supply of greenfield land when housing affordability targets are not met. The Commission said, “Where large discontinuities emerge between the price of land that can be developed for housing and land that cannot be developed, this is indicative of the inadequacy of development

capacity being supplied within the city.” The Productivity Commission expansion of greenfield land for development where the difference between land prices on either side of an urban containment boundary become too great.⁴⁸

At the same time, the consensus for improving housing affordability has spread to opposition parties. The principal opposition, the Labour Party has developed a strong position on housing affordability. Coming from different sides of the political spectrum, the Labour Party’s Shadow Minister of Housing, Phil Twyford and the New Zealand Initiative’s Oliver Hartwich co-authored a [New Zealand Herald commentary](#) concluding that “Our own research leaves no doubt that planning rules are a root cause of the housing crisis, particularly in Auckland...”

Local Government Leadership: Meanwhile, local government officials have been taking steps to improve housing affordability themselves.

Middle-Income Housing Affordability
NEW ZEALAND: 3 LARGEST HOUSING MARKETS: 2004-16

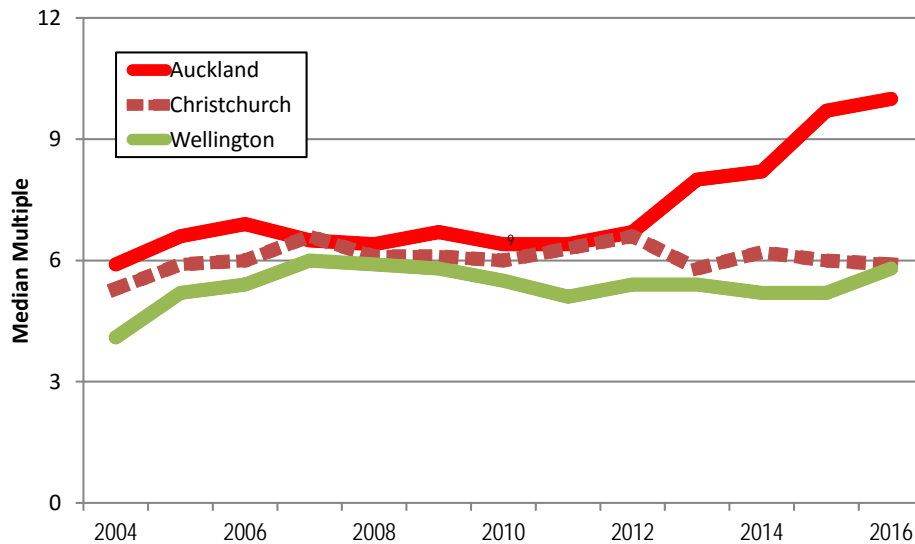


Figure 9

⁴⁷ Productivity Commission of New Zealand, “Using Land for Housing.”

⁴⁸ The Productivity Commission did not propose a standard.



Auckland: In Auckland, the Chief Economist of the Auckland City Council recommended adoption of an objective to reduce the price-to-income ratio by approximately 50 per cent between 2015 and 2030. This would require various strategies, such as expanding greenfield land supply and allowing higher population densities in inner areas.⁴⁹ (London School of Economics and Political Science economists Paul C. Cheshire, Max Nathan and Harry G. Overman have made a similar recommendation.)⁵⁰

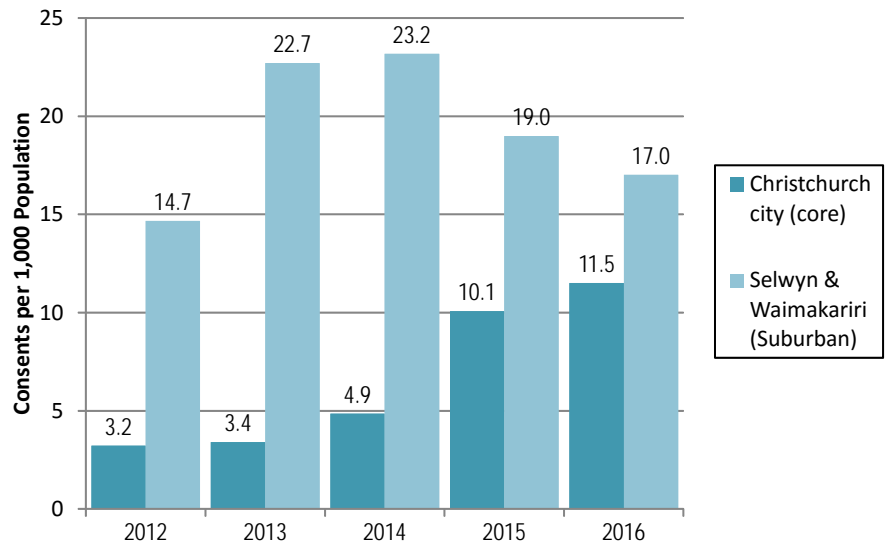
Outside Singapore, New Zealand is the only nation in the Survey with a public policy priority to restore middle-income housing affordability.

Christchurch: Suburban local governments have played an important role following the devastating 2011 earthquakes that devastated Christchurch, destroying many homes and making more uninhabitable. The resulting housing shortage needed to be eliminated quickly. Otherwise Christchurch, which was already severely unaffordable, could experience a substantial worsening in its housing affordability.

Remarkably, the housing shortage was [remedied within three years](#), and housing affordability did not deteriorate. Much of the credit goes to suburban districts⁵¹ (counties) of Selwyn and Waimakariri, which quickly authorized new middle-income housing construction.

These small and independently governed local governments ramped up residential building consents to a rate more than five times that of New Zealand as a whole. Selwyn and Waimakariri accounted for approximately one half of the new housing in the Christchurch area between 2012 and 2014, despite having little more than one-fifth of the

Post-Earthquake Housing Consents CHRISTCHURCH AREA



Derived from Statistics New Zealand

Figure 10

⁴⁹ Wendell Cox, “Auckland Tackles Housing Affordability Crisis,” [newgeography.com](http://www.newgeography.com), February 11, 2015.

<http://www.newgeography.com/content/005086-auckland-tackles-housing-affordability-crisis>.

⁵⁰ Cheshire, Nathan and Overman, *Urban Economics and Urban Policy*.

⁵¹ The term “suburban” in this context refers to its broad definition as used in much of the world, areas outside the urban core, as opposed to “neighborhood,” without respect to location in the urban area as it is often used in New Zealand and Australia.



population. Even after the housing lost during the earthquakes was replaced, the suburban districts continued a torrid pace of approvals through 2016, as the Christchurch city build rate has increased (Figure 10).⁵² Most new suburban housing has been the family-oriented single-family dwellings most demanded by New Zealanders 2016. The decentralized nature of governance in the Christchurch area aided these quick and important additions to the housing stock.⁵³

Historical Context: As indicated in Figure 1, New Zealand’s price-to-income ratio was below 3.0 in the early 1990s. Since that time urban containment policy has been widely adopted. At the same time, house prices have skyrocketed compared to incomes.

3.7: Singapore

The Median Multiple in Singapore is 4.8, for a seriously unaffordable rating. This is an improvement from the 5.1 Median Multiple in 2013, when Singapore was added to the report.

Singapore has perhaps the most land constrained geography of any major metropolitan area in the world, occupying a highly developed island, with no mainland periphery within its national jurisdiction. As a result, there is virtually no potential for greenfield development and it is difficult to maintain a competitive supply of land.⁵⁴

These unique circumstances led the Singapore government to establish a publicly sponsored housing construction program, which sells houses to consumers. The result of this public program is a vibrant private housing market. According to the Housing and Development Board (HDB), which administers the program, 83 percent of residents live in HDB housing.⁵⁵ Further, Singapore has an overall 88 percent rate of home ownership, the highest of any country in the *Survey*. Buyers are free to sell their own houses as in other nations with private ownership. Further, there are restrictions on foreign ownership, which may have shielded Singapore from the heightened cost escalation occurring from globalization of the real estate markets in an environment of significant land supply restrictions (such as urban containment policy).

Singapore’s unique success ... appears to result from its long-standing public commitment to keeping house prices under control

HDB has materially increased the rate of construction, and the additional supply appears to have produced the expected result, better housing affordability. Moreover, housing affordability for new houses appears to be better (Table 11: New Houses in Singapore: Affordability).⁵⁶

⁵² Calculated from Statistics New Zealand data.

⁵³ The two suburban districts have had strong employment growth. In Selwyn, employment grew at seven times the national rate from 2005 to 2015 and in Waimakariri employment growth was more than four times the national rate (calculated from Ministry of Business & Innovation data).

⁵⁴ Faced with a similar situation, treaties between Switzerland, France and Germany effectively create international metropolitan areas (labor markets) by the use of [cross border commuting permits](#) in the Basel and Geneva areas.

⁵⁵ Housing Development Board, *Key Statistics for FY 2015/2016*, <http://www10.hdb.gov.sg/eBook/AR2016/key-statistics.html>.

⁵⁶ Median house price is from the Singapore Real Estate Exchange (resale houses).



Singapore has been far more successful in controlling housing affordability than in markets that have followed the British urban containment model, which can be largely traced to the Town and Country Planning Act of 1947.

Thus, Singapore has a highly regulated housing market, but has not had its affordability deteriorate to the acute levels of severe unaffordability reached in other highly regulated markets, such as Hong Kong, Vancouver, Auckland, San Francisco, Sydney, Melbourne, Auckland and London. Singapore's rare success of regulation appears to result from the unique public commitment to keeping house prices under control.

Singapore's unique success relative to similar markets appears to result from its long-standing public commitment to keeping house prices under control. HDB has a government imposed mandate to ensure housing affordability: As HDB transitioned from a program principally aimed at rented social housing to one of home ownership, the 1964 *HDB Annual Report*, stated its 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*⁵⁷

In the intervening years, Singapore has succeeded in this objective. The contrast is great between the present situation and that of 50 years ago, when there were large squatter settlements.

Table 11
NEW HOUSE AFFORDABILITY IN SINGAPORE

In recent years, the Housing and Development Board has taken additional actions to improve housing affordability. One strategy has been to increase what are effectively "across the board" subsidies for all new houses (not counting special grants, such as for first home buyers). The result has been to reduce new house prices to levels well below those of existing houses.

There is not a overall median price index for new HDB homes. However, data by type of unit from the Housing and Development Board Annual Report suggests that the Median Multiple for new houses is better than for existing houses.⁵⁸

Should the present policy continue, it is likely that resale house prices will rise slower or even fall in the future, improving Singapore's housing affordability. At the same time, price-reducing grants are available to eligible resale house buyers. As in other nations, the *Survey* does not account for these grants in measuring housing affordability. However, it is noted that the practice in Singapore may be substantially greater than in other nations, which would seem to have a positive influence on housing affordability. HDB indicates that if new houses and the various government incentives were included, Singapore's Median Multiple would have been 4.4 last year, rather than the reported 5.0.⁵⁹

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

⁵⁷ *Housing and Development Board 1964 Annual Report*. <http://www.globalurban.org/GUDMag07Vol3Iss1/Yuen.htm>.

⁵⁸ Estimated from data in Housing and Development Board, *Key Statistics: 2014-2015*.

⁵⁹ Correspondence from the Housing Development Board to Demographia, November 21, 2016.



3.8: United Kingdom

The United Kingdom has a seriously unaffordable major market Median Multiple of 4.5 in 2016 and a severely unaffordable Median Multiple of 4.6 overall.⁶⁰

Major Housing Markets: None of the United Kingdom's 21 major housing markets is affordable. Two major markets are moderately unaffordable, 12 are seriously unaffordable and seven are severely unaffordable.

The U.K.'s largest market, London (the Greater London Authority, inside the London greenbelt) has a severely unaffordable Median Multiple of 8.5. The [UBS Global Real Estate Bubble Index](#) rates London as having the world's second worst housing bubble risk. Further, London has experienced substantial domestic out-migration, as its high house prices appear to be repelling population growth.⁶¹

Six other major markets are severely unaffordable, including Bournemouth & Dorset, at 8.9, Plymouth & Devon, at 7.1 and the London Exurbs (East and Southeast England, virtually all outside the London greenbelt) at 7.1, Bristol-Bath (6.2) as well as Liverpool & Merseyside (5.1) and Warrington & Cheshire (5.1).

The most affordable major markets are rated as moderately unaffordable major markets, including Leeds & West Yorkshire, with a Median Multiple of 3.8, and Glasgow has a Median Multiple of 4.0.

Other Housing Markets: Outside the major housing markets, the most affordable are Falkirk (3.6) and Belfast (4.0), both rated moderately unaffordable. There are four severely unaffordable markets, including Swindon & Wiltshire (6.9), Telford & Shropshire (5.8), Warwickshire (5.6), and Northampton & Northamptonshire (5.1).

Historical Context: 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 (which have evolved from the Town and Country Planning Act of 1947). Sir Peter Hall, et al, expressed concerns about the housing affordability losses associated with urban containment in the early 1970s.⁶²

... the need to "...unblock supply and build more housing."
(Financial Times)

⁶⁰ Median house prices are calculated from the Land Registry of England and Wales, the Registers of Scotland and Northern Ireland Residential Property Price Index.

⁶¹ Cox, *A Question of Values*.

⁶² 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.



A report by the International Monetary Fund⁶³ indicated the need to alleviate supply-side constraints, “notably pertaining to planning restrictions...”

In an article entitled "[Britain's Self Perpetuating Property Racket](#)," Financial Times Chief Financial Commentator Martin Wolf notes that “The restrictions on land availability are man-made.” [A Financial Times editorial](#) reiterated the need to “unblock supply and build more housing.”

Recently, Paul C. Cheshire, Max Nathan and Henry G. Overman, all economists at the London School of Economics and Political Science published [Urban Economics and Urban Policy: Challenging Conventional Policy Wisdom](#), which makes an urgent case for reversing the causes of lost housing affordability under urban containment policy (Section 4).⁶⁴

As Figure 1 indicates, the price-to-income ratio was below 3.0 until after 2000 in the United Kingdom. The Town and Country Planning Act (1947) contained the first important urban containment restrictions and has been a model for such restrictions around the world. Land use restrictions were

substantially strengthened during the 1990s and early 2000s. All markets have urban containment policy.

The severely unaffordable housing in Liverpool-Merseyside and other northern housing markets are examples of how that urban containment policy produces severe or seriously unaffordable housing affordability even in metropolitan areas have experienced weak economies (Figure 11).

Middle-Income Housing Affordability: 2016 UNITED KINGDOM: MAJOR HOUSING MARKETS

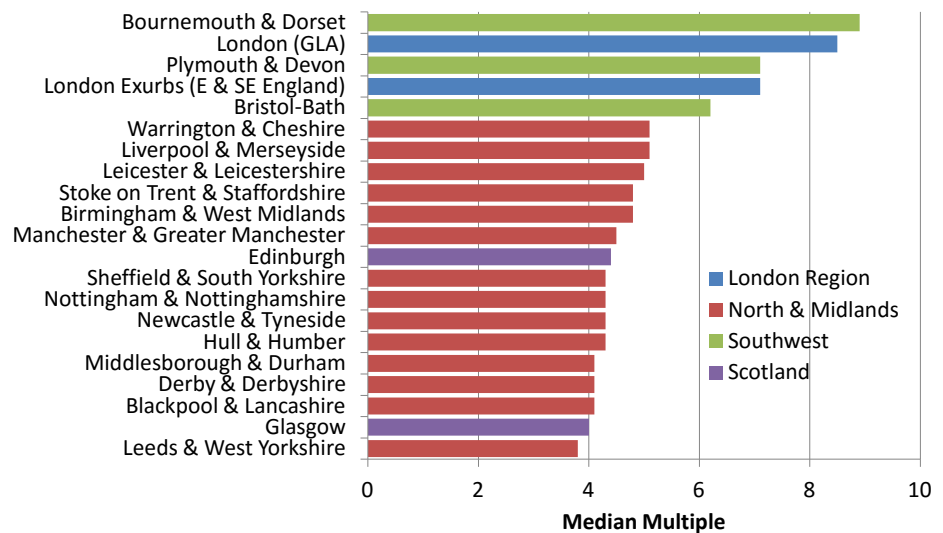


Figure 11

3.9: United States

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 *Survey*. There are 11 affordable

⁶³ International Monetary Fund, Country Report: United Kingdom: Selected Issues, <http://www.imf.org/external/pubs/ft/scr/2015/cr14234.pdf>, 2015.

⁶⁴ Paul Cheshire, Max Nathan and Henry Overman. *Urban Economics and Urban Policy*.



major housing markets in the United States, 22 that are moderately unaffordable, eight that are seriously unaffordable and 13 that are severely unaffordable.

Overall, the United States has a moderately unaffordable Median Multiple of 3.6,⁶⁵ the second most favorable after Ireland. Among all housing markets, 83 are rated affordable, 111 are rated moderately unaffordable, 56 are rated seriously unaffordable and 36 are rated severely unaffordable

Major Housing Markets: The most affordable major housing market is Rochester, with a Median Multiple of 2.5, followed by Buffalo (2.6). Cincinnati, Cleveland and Pittsburgh each have Median Multiple of 2.7. St. Louis and Oklahoma City have a Median Multiple of 2.9. Three more major housing markets are affordable, including Indianapolis, Grand Rapids, Detroit and Kansas City, with a Median Multiple of 3.0.

The five housing markets with the poorest housing affordability are in California and Hawaii. San Francisco Bay Area housing market San Jose is the least affordable, with a severely unaffordable Median Multiple of 9.8. Honolulu is the second least affordable, with a Median Multiple of 9.4. Los Angeles is the third least affordable, with a Median Multiple that deteriorated from 8.1 to 9.3. San Francisco is close behind, with a Median Multiple of 9.2. The [UBS Global Real Estate Bubble Index](#) rates San Francisco as having the world's seventh worst housing bubble risk.

San Diego is the fifth least affordable major housing market, with a Median Multiple of 8.6. There are eight additional severely unaffordable major housing markets in the United States, including Miami (6.1), New York (5.7) and Riverside-San Bernardino (5.6), which is adjacent to Los Angeles. Riverside-San Bernardino had achieved an affordable Median Multiple of 3.0 in 2009, but its trend since that time could indicate that housing affordability may well be a thing of the past throughout all of Southern California.

The five markets with the poorest affordability are in California and Hawaii

Portland, Oregon's housing affordability continued to deteriorate to a Median Multiple of 5.5, up from 3.2 in 2000. The severely unaffordable also include Seattle (5.5), Denver (5.4), and Boston (5.4), where housing affordability has deteriorated, but at a somewhat slower rate.

Sacramento (5.1) is a new entrant to severe unaffordability, where a torrid pace of housing affordability losses have occurred since 2012, when there was an affordable 2.9 Median Multiple. Sacramento is more than halfway to its peak of 6.8, during the housing bubble.

⁶⁵ Median house prices from the National Association of Realtors and the National Home Builders Association, Zillow and metropolitan area real estate associations.

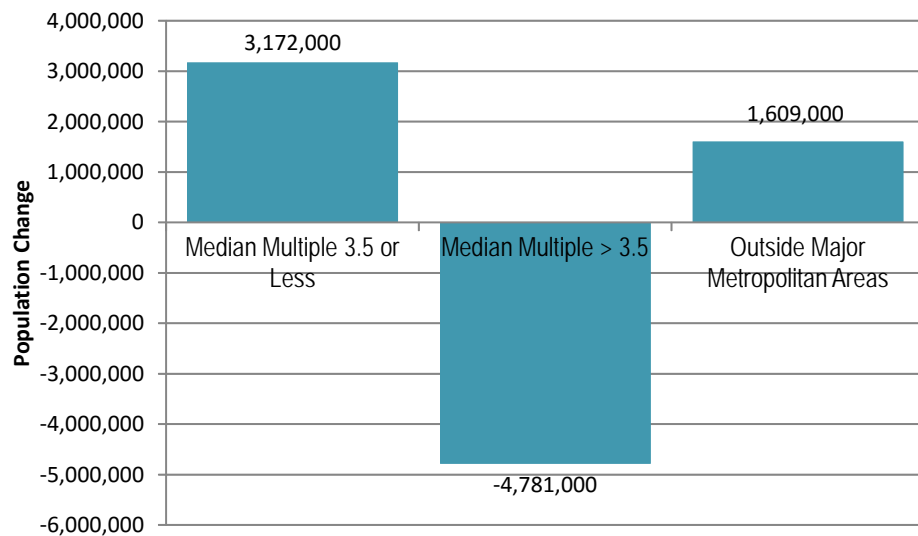


Strong domestic out-migration trends have been associated with more serious housing affordability in the United States. Using the average of Median Multiples from 2000 to 2015, major housing markets with a Median Multiple of 3.6⁶⁶ or over have lost a net 4.8 million residents. Major housing markets with Median Multiples of 3.5 or less gained 3.2 million domestic migrants, an 8 million difference compared to more expensive markets. The balance of 1.6 million net domestic migrants settled in smaller markets, most of which were more affordable (Figure 12).

Sacramento is a new entrant to severe unaffordability, where a torrid pace of housing affordability losses have occurred since 2012

Other Housing Markets: There are 82 affordable housing markets in the United States. The most affordable housing market in this year's Survey is Racine, WI, with a Median Multiple of 1.8. Bay City, MI (1.9), Decatur, IL (2.0) and Elmira, NY (2.0) occupied the next three positions. Eight housing markets have Median Multiples of 2.1, including East Stroudsburg, PA, which is in exurban New York⁶⁷ and Scranton-Wilkes Barre, PA, which is adjacent.

US Net Domestic Migration by Affordability US MAJOR METROPOLITAN AREAS: 2000-2015



Derived from Census Bureau data & City Sector Model 2015 Revision

Figure 12

Santa Cruz (CA), located in the San Francisco Bay Area, is the least affordable market in the in the United States. With a severely unaffordable Median Multiple of 11.6, Santa Cruz's housing affordability has deteriorated to a level not before recorded in the United States.⁶⁸ Outside the United States, only Hong Kong, Vancouver and Sydney have registered worse housing affordability.

Close behind Santa Cruz is Santa Barbara (CA), with a Median Multiple of 11.3, a depth of housing affordability only reached by two housing markets in the United States, Santa Cruz and Los Angeles. Four other housing markets reached Median Multiples of 8.0 or more, Salinas-Monterey, CA (9.2),

⁶⁶ The mid-point of the moderately unaffordable classification.

⁶⁷ The New York combined statistical area.

⁶⁸ During the housing bubble, Los Angeles reached a Median Multiple of 11.5 in 2007.

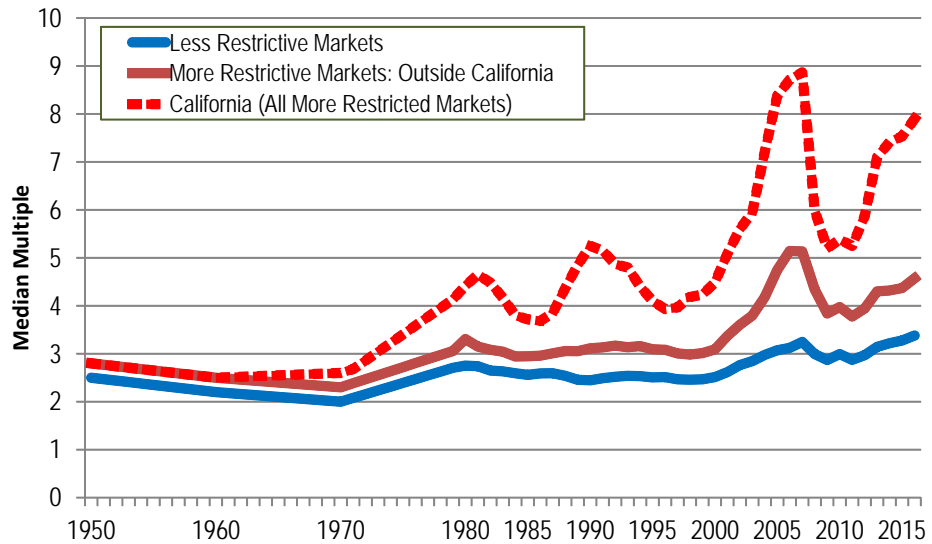


San Luis Obispo, CA (9.0), as well as San Francisco Bay area housing markets Santa Rosa, CA (8.7) and Napa, CA (8.4).

Historical Perspective: The United States had generally affordable housing through much of the period following World War II. The key was provision of tract housing on competitively priced inexpensive land in the suburbs, the beginnings of which have been credited to entrepreneurs such as William Levitt,

who built “Levittowns” and other similar developments in New York, New Jersey, Pennsylvania, Maryland and Puerto Rico. These communities were copied and improved upon, increasing the number of households able to live a middle-income quality of life. Similar communities emerged from Canada, Australia and New Zealand to other parts of the high income world, and now increasingly to other nations, including Mexico, the Philippines, Chile, Central America and elsewhere.

Middle-Income Housing Affordability CALIFORNIA & THE UNITED STATES: 1950-2016



Derived from Census Bureau, Harvard University and Demographia.

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

The most important exception, however, was California, where decades of restrictive land use regulation, including court decisions and far stronger environmental regulation than in the rest of the nation, has been associated with huge housing affordability losses.⁶⁹ This is illustrated in Figure 13 which shows California’s substantial housing affordability deterioration compared to the rest of the United States. There has also been deterioration among other more restrictively regulated housing markets, where more restrictive regulation typically occurred later. Liberally regulated housing markets have performed far better.

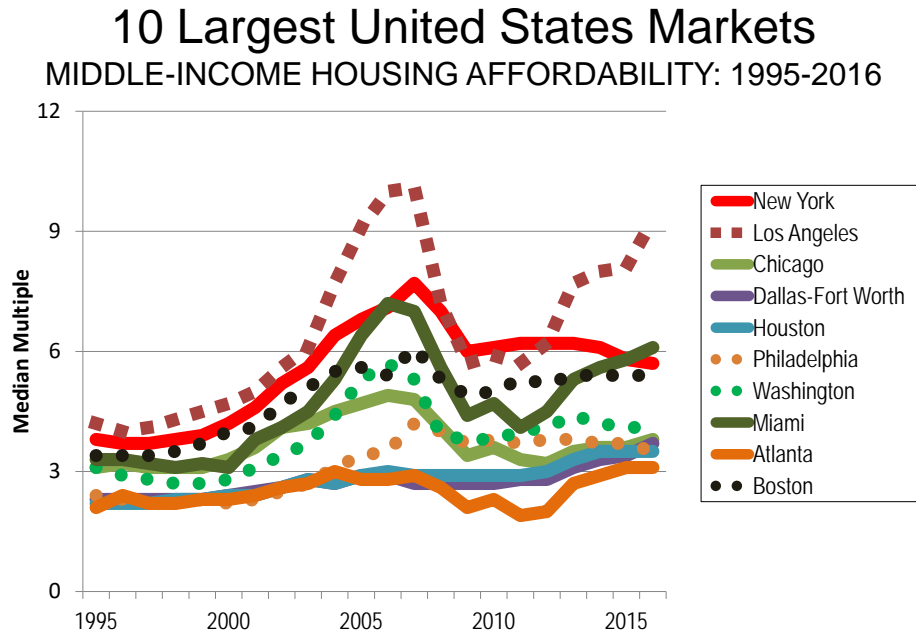
⁶⁹ William A. Fischel, *Regulatory Takings: Law, Economics, and Politics*. Harvard University Press, 1995.



More recent data on the 10 largest housing markets indicates the rising house costs in Los Angeles, which is indicative of other California housing markets. The figure also indicates other more restrictively regulated markets, such as New York, Miami and Boston which have also had severe losses in housing affordability.

Other markets, Chicago, Philadelphia and Washington experienced large house price increases during the housing bubble, but have settled back into more affordable territory. Washington, with its county level urban containment efforts, had reached a severely unaffordable Median Multiple of 5.7 in 2006.

Liberally regulated Dallas-Fort Worth, Houston and Atlanta experienced little in house price increases during the housing bubble and remain the most affordable (Figure 14).



Source: Harvard Joint Housing Center and Demographia

Figure 14

Prospects appear to be particularly bleak in California. Already, the new urban fringe housing, which drives housing affordability, is [prohibited or severely limited by state and local policy](#). Further, there are proposals to further strengthen housing regulations. Already, there is an [increase in short term investments](#) (“speculation”) in California, which is not surprising given the potential for windfall profits as housing supply is kept to well below normal demand.

4: OTHER HOUSING AFFORDABILITY SURVEYS: CHINA AND MALAYSIA

Other organizations publish surveys using housing affordability multiples similar to the Median Multiple, including E-House in China and the Khazanah Research Institute in Malaysia.⁷⁰ *Demographia* routinely features highlights from such surveys.

⁷⁰ A similar analysis of external reports from China and Korea was included in the *11th Annual Demographia International Housing Affordability Survey*.



4.10: China

E-House in Shanghai has published annual reports on housing affordability in China, using price-to-income ratios. The [latest *E-House* report](#) (for 2015) provided data for all provinces, including three housing markets that coincide with provinces. Beijing was the least affordable at 14.5, which was below the 19.0 Median Multiple indicated for Hong Kong in the 2015 *Demographia Survey*. Shanghai had an Average Multiple of 14.0 and Tianjin had an Average Multiple of 10.0. The most affordable provincial level jurisdiction was Inner Mongolia, with a moderately unaffordable Average Multiple of 4.4. Among the three major markets for which data is available, China has a seriously unaffordable Median Multiple of 12.8. The overall Median Multiple for China was a severely unaffordable 10.2.

4.11: Malaysia

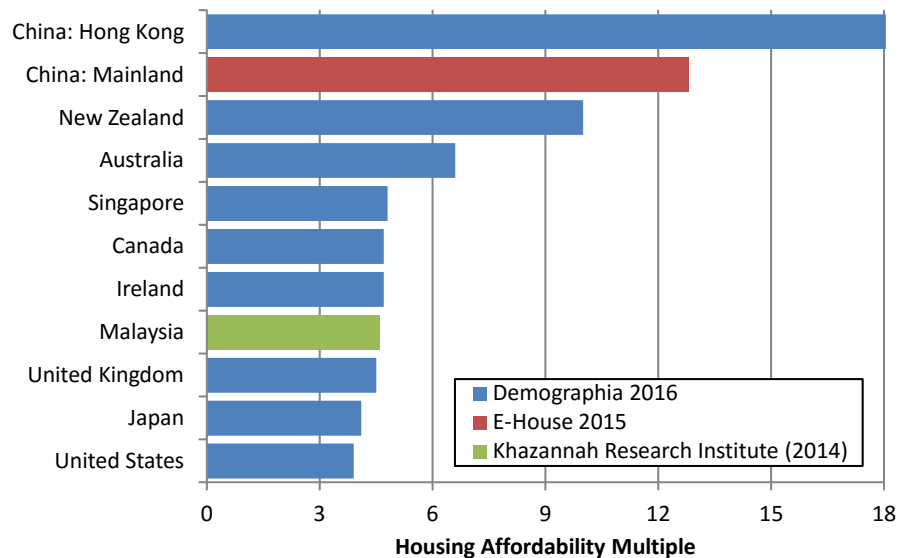
The Khazannah Research Institute analyzed house prices and incomes in Malaysia found that the national Median Multiple was 4.4 in 2014, in its book [Making Housing Affordable: 2015](#). Housing affordability was best in the state of Melaka, at an “affordable” 3.0. The national capital district, Kuala Lumpur had a severely unaffordable Median Multiple of 5.4. However, housing was considerably more affordable throughout the Kuala Lumpur metropolitan region, which includes the state of Selangor

and the federal district of Putrajaya. Selangor had a population more than three times that of Kuala Lumpur, and a Median Multiple of 4.0. Using population weighted medians, it is estimated that the Median Multiple for the Kuala Lumpur metropolitan region was a seriously unaffordable 4.3 in 2014. Kuala Lumpur would have had the eighth best housing affordability out of the 18 metropolitan

regions with more than 5 million population in the 2014 *Demographia International Housing Affordability Survey*. Another major housing market, Penang, had a severely unaffordable Median Multiple of 5.2. Across the Johor Straits from Singapore, major market Johor Bahru had a Median Multiple of 4.2. Malaysia’s major market Median Multiple was a seriously unaffordable 4.6.

International Affordability: Major Markets

E-HOUSE, KAZANNAH & DEMOGRAPHIA: 2016



Sources: E-House , Estimated from Khazannah, Demographia

Figure 15



Much of the initiative for the report is the result of the [Malaysian government’s focus on housing affordability](#).

4.3: Comparisons between the Surveys

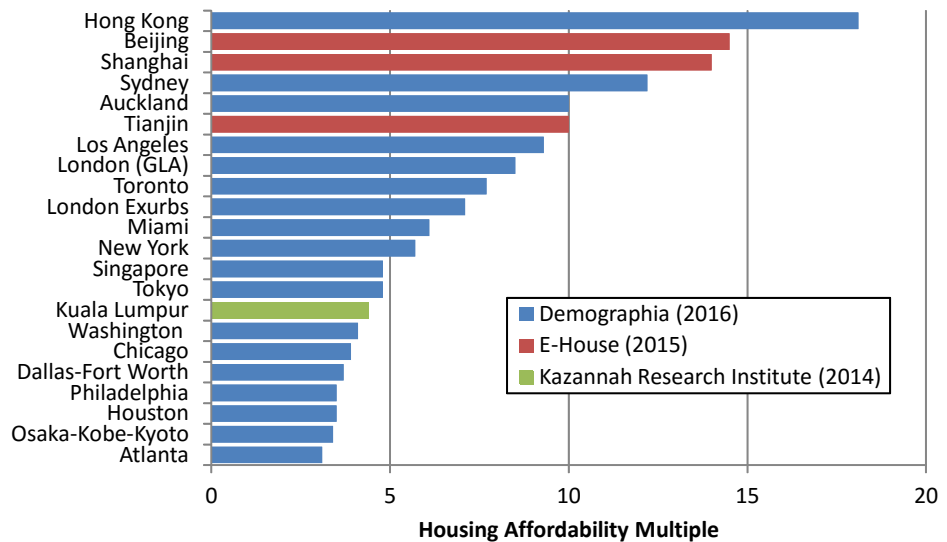
The housing affordability multiples of E-House and the Khazanah Research Institute are compared to the 13th Annual *Demographia*

International Housing Affordability Survey in Figure 15. Figure 16 compares housing affordability multiples from housing markets (metropolitan areas) with more than 5 million population from all three surveys.

These data do not account for differences in house sizes (This issue is discussed in the *10th Annual Demographia International Housing Affordability Survey*).

Affordability in the Largest Housing Markets

HOUSING MARKETS OVER 5,000,000 POPULATION



Sources: E-House , Estimated from Khazannah, Demographia

Figure 16

5: “BEST CITIES” FOR MIDDLE-INCOME HOUSEHOLDS

Various organizations, such as *The Economist* regularly publish international “best cities” and “most livable city” lists. The press and the public often misinterpret these rankings as indicating that these are generally the most “livable” metropolitan areas in the world. The rankings are aimed at wealthy households, not middle-income households and at corporate relocation experts advising executives who might move to different housing markets. Housing affordability is not a principal concern and it is thus not surprising that the “Best Cities” routinely exclude evaluation of middle-income housing affordability.

As a result, the “Best Cities” lists cannot genuinely rate livability for middle-income households. Indeed, the “best city” lists might be characterized as representing the “1 percent,” rather than the



“99 percent” that that is dominated by middle-income households and includes low-income households.⁷¹

5.1: “Luxury” Livability and “Middle-Income” Livability

Luxury livability is different from middle-income livability. The first principle of livability is affordability. Middle-income households must be able to afford adequate housing. If they cannot, then a city cannot be livable. Indeed, such a city is anything but a “best city” or “most livable city” for households with insufficient wealth to afford middle-income housing.

Luxury livability is different from middle-income livability.

Middle-income households often face severe budgetary constraints. Their incomes and employment opportunities have become more constrained. As the largest household expenditure, housing, increases, there is less money left over for other needs and desires. Housing affordability is pivotal to living a middle-income lifestyle.

The “best cities” are often among the most unaffordable for average households. This is illustrated by the 2015 *Economist* “best cities” list. Eight of the 10 “best cities” were rated in the 2016 *Demographia International Housing Affordability Survey* (ratings for 2015). Six housing markets were severely unaffordable and the other was seriously unaffordable. Three of the top 10 were not included (Zurich, Vienna and Helsinki) due to the lack of comparable information. Each of the seven *Survey* cities in *The Economist* top ten has strong urban containment policy, and since its implementation has evolved from much greater affordability to severe or serious unaffordability.

The following examples illustrate the distinction between livability for the luxury market and middle-income livability.

Toronto and Dallas-Fort Worth: *The Economist* rated Toronto as “[the best city in the world](#)” Yet, Toronto was the 13th *least affordable* city among the major metropolitan areas ranked in the last *Survey*, and housing affordability has deteriorated substantially in the subsequent year.

Dallas-Fort Worth has nearly the same population as Toronto. Residents in Dallas-Fort Worth pay about one-half as much for houses than in Toronto. Dallas-Fort Worth has the least traffic congestion of any city in the world with more than 5,000,000 population.⁷² Traffic is 40 percent less congested than in Toronto, and average work trip travel times are less. This is in large measure because of the lower built-up urban area density and more dispersed employment pattern in Dallas-Fort Worth (Figure 17). In short, these middle-income outcomes in Dallas-Fort Worth are

... middle-income outcomes in Dallas-Fort Worth are better than in “best city” Toronto, with its severely unaffordable housing

⁷¹ Impact on low income and taxation and subsidies, etc.

⁷² Derived from [Tom Tom 2015 traffic congestion ratings](#).



better than in “best city” Toronto, with its severely unaffordable housing.⁷³ This is despite the fact that Toronto employs the most “in vogue” urban strategies, unlike Dallas-Fort Worth. This is not to dispute Toronto’s luxury rating, but it is of little use to the much larger number of middle-income households being priced out of home ownership.

Kansas City and “The Economist Top 10: Another example is [Kansas City](#), which is usually excluded from the “Best Cities” lists. Yet, [Kansas City has better housing affordability that any of The Economist’s top 10](#)

livable cities (Figure 18).⁷⁴ Kansas City’s traffic is tied for best in the world with Richmond, VA and is less congested than any of *The Economist’s*, top 10 for which there is data. Middle-income outcomes in Kansas City compete very well with *The Economist’s* top 10.⁷⁵

Moreover, there are many other cities with middle-income housing affordability superior to those of the “best cities.”

Toronto & Dallas-Fort Worth URBAN FORM & MIDDLE-INCOME OUTCOMES

Characteristics	Toronto “Best City”	Dallas-Ft. Worth	DFW/ Toronto
URBAN FORM			
Urban Area Population*	5,133,000	5,122,000	-0.2%
Land Area (Square Miles)	1,751	4,605	+163.0%
Density: 2011/2010	2,931	1,112	-62.1%
MIDDLE-INCOME OUTCOMES			
Median Multiple: 2015	7.7	3.7	-51.9%
One Way Work Trip 2011	32.8	26.6	-18.9%
Work Trip Under 30 Minutes	48%	58%	+20.8%
Excess Time in Traffic	28%	17%	-39.3%
Transit Work Trip Share	21.7%	1.4%	-93.5%

* Called “population centre” in Canada
Sources: Statistics Canada, US Census Bureau, Brookings, Tom Tom

Figure 17

5.2: Urban Containment and Severely Unaffordable Housing

Excessive land use regulation (housing regulation), principally urban containment policy, has been implemented in the major housing markets with severely unaffordable housing. Urban containment has been associated with much higher house prices, which is to be expected, because severe limitations on supply drive prices higher (as the experience with oil and OPEC shows).⁷⁶

⁷³ Dallas-Fort Worth also has a [35 percent higher gross domestic product](#) per capita than Toronto.

⁷⁴ The subject report does not include data for Vienna, Helsinki and Zurich. However, another source, indicates price to income ratios in all three cities that are more than three times that of Kansas City. This is for houses that are about one-half as large (90 square meters) in the three European cities, compared to 177 square meters in Kansas City (or 969 square feet compared to 1,900 square feet). Sources: <https://www.numbeo.com/property-investment/rankings.jsp> and American Housing Survey.

⁷⁵ Kansas City also ranks well in incomes, with a gross domestic product per capita higher than that of all but three of the best 10 cities.

⁷⁶ See Fischel, *Regulatory Takings*, Cheshire, Nathan and Overman, *Urban Economics and Urban Policy*, and Cox, *A Question of Values*.



Now Prime Minister Bill English of New Zealand (then Deputy Prime Minister) noted in his introduction to the 9th *Annual Demographia International Housing Affordability Survey* that “Land has been made artificially scarce by regulation” locking up land for development. “This regulation has made land supply unresponsive to demand” and “translates to higher prices rather than more houses.

5.3: Impact on National Economies

Strong housing regulation also has serious consequences for national economies.

This is illustrated by research in the United States. Higher house prices have been associated with an *annual reduction* of nearly \$2-trillion US in the United States’ gross domestic product, according to *Chang-Tai Hsieh* of the University of Illinois and *Enrico Moretti* of the University of California. An economic loss of this magnitude would equal more than 10 per cent of the U.S. gross domestic product (2009). This was “almost entirely driven” by regulatory constraints on housing. They referred to the effect as a “large *negative externality*.” [emphasis in original].⁷⁷

Matthew Rognlie of the Massachusetts Institute of Technology has shown that much of the rising inequality is from housing wealth. According to Rognlie, “... [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 re-examine these regulations and expand the housing supply.”⁷⁸

In reviewing the overpriced housing market, the Productivity Commission of New Zealand cited higher house prices for social consequences (negative externalities) such as lower home

Kansas City & Economist Top 10 MIDDLE-INCOME HOUSING AFFORDABILITY

Rank	Metropolitan Area	Housing Affordability (Median Multiple): 2015
1	Kansas City	2.9
2	Calgary	4.2
3	Adelaide	6.4
4	Perth	6.6
5	Toronto	6.7
6	Melbourne	9.7
6	Auckland	9.7
8	Vancouver	10.8
9	Sydney	12.2
*	Vienna	Note
*	Helsinki	Note
*	Zurich	Note

Derived from *The Economist, Kansas City: Genuinely World Class* report

Figure 18

...middle-income outcomes of Kansas City compete very well with The Economist’s top ten.

A \$2 trillion loss in US GDP...”almost entirely driven” by regulatory constraints on housing

⁷⁷ Chang-Tai Hsieh and Enrico Moretti, “Why Do Cities Matter? Local Growth and Aggregate Growth,” The National Bureau of Economic Research, May 2015. <http://www.nber.org/papers/w21154>.

⁷⁸ Matthew Rognlie, “A Note on Piketty and Diminishing Returns to Capital,” June 15, 2014. http://www.mit.edu/~mrognlie/piketty_diminishing_returns.pdf.



ownership, greater overcrowding and increased low-income housing subsidy requirements.⁷⁹

The higher house prices also have an impact on monetary policy. Cheshire, Nathan and Overman note that urban containment policy: "...makes monetary policy more difficult even for independent central bankers since it becomes increasingly difficult to ignore housing-market pressures rather than just inflation targeting."⁸⁰

**"...planning ...
has become the
externality."**

According to New Zealand's Prime Minister Bill English, [urban planning has become a negative externality](#), by virtue of its impact on house prices, equality and the economy.

5.4: Today's World

Over the past year, the world has seen populist results at the ballot box. Only time will tell whether the "Brexit" vote to take the United Kingdom out of the European Union or the election of Donald Trump as US president will be more significant. There was also the populist rejection of constitutional revisions in Italy and populist political parties seem to be on the ascendancy in Europe and elsewhere.

One of the most important issues driving this populism is economic uncertainty. For example, in the United States, median household incomes have only recently been restored to their 1998 level and [remain below intermediate peaks](#) since that time. Economic growth has not yet been sufficiently restored. At the recent G-20 conference in Hangzhou, leaders expressed concern that "growth is still weaker than desirable) and committed to inclusive economic growth and the eradication of poverty.

The Role of Housing Affordability: Housing affordability is important to the achievement of such objectives. The economic uncertainty is not just about stagnant or slow income growth, but it is also characterized by a decline in discretionary incomes as households experience housing cost growth far in excess of income growth in many housing markets. Further, as prices have risen compared to incomes, households have been forced to accept smaller houses, with fewer amenities.

Middle-income housing affordability is likely to continue worsening unless urban containment policy is either withdrawn or seriously liberalized.

"The problem is it is utterly unviable in the long term. With every passing decade the problems would get worse, the wider economic costs would become more penalising, the economy and monetary policy more unmanageable and the outcomes – the divide between the property haves and the property have-nots – more unacceptable."⁸¹

⁷⁹ New Zealand Productivity Commission, "Using Land for Housing," September 2015. <http://www.productivity.govt.nz/inquiry-content/2060?stage=4>.

⁸⁰ Cheshire, Nathan & Overman, *Urban Economics and Urban Policy*.

⁸¹ Cheshire, Nathan and Overman, *Urban Economics and Urban Policy*.



As co-author Hugh Pavletich indicates, the urban fringe is the “[supply valve](#)” that is necessary to preserve affordability in a housing market (Table 12). Moreover, there is little prospect that middle-income affordability in a housing market can be maintained or restored by higher densities, since removal of density restrictions, in itself, raises land values.⁸²

“...the ultimate objective of urban policy is to improve outcomes for people rather than places”

The house price increasing result of severe restrictions on housing supply is fundamental to economics --- limiting supply leads to higher prices, all else equal.⁸³ Moreover, the very creation of land scarcity induces well funded interests to invest for the extraordinary returns available markets “strangled” by an excess of demand over supply.

Table 12 AFFORDABLE HOUSING MARKETS: DEFINITION
<p>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.</p> <p>The critically important “development ratios”⁸⁴ for this new fringe starter housing should be 17 - 23% serviced lot / section cost - the balance the actual housing construction.</p> <p>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.</p> <p style="text-align: right;"><i>-Hugh Pavletich Performance Urban Planning</i></p>

5.5: People: A Higher Priority than Place

Paul Cheshire, Nathan and Overman of the London School of Economics recently suggested that “... that the ultimate objective of urban policy is to improve outcomes for people rather than places” and that “... improving places is a means to an end, rather than an end in itself.”⁸⁵

“...improving places is a means to an end, rather than an end in itself.”

Cities like Dallas-Fort Worth, Kansas City and many others that have remained more affordable have put people over place. Their urban policy outcomes have been more favorable for the vast majority of the population, including both middle-income and lower income households.⁸⁶

⁸² Also see [Romem](#).

⁸³ Cox, *A Question of Values*.

⁸⁴ The development ratio is the cost of the finished land (underlying infrastructure complete) divided by the house construction cost plus the finished land. This issue is extensively discussed with respect to the United States market in the [Demographia Residential Land & Regulation Cost Index](#).

⁸⁵ Cheshire, Nathan and Overman, *Urban Economics and Urban Policy*.



The best cities for middle-income and lower-income households are where governments have competently managed housing markets, by keeping housing affordable (all else equal). In such cities, housing takes up less of the household budget, the cost of living tend to be lower and households are able to afford a more affluent life. As The New Zealand Initiative's Oliver Hartwich put it in the Introduction to this volume, "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."

The best cities for middle-income households are where governments have competently managed housing markets by keeping housing affordable

⁸⁶ Lower income housing affordability is largely driven by the cost structure of middle-income housing in a city. Better middle-income housing affordability means better lower-income housing.



SCHEDULE 1
MAJOR HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
(Housing Markets over 1,000,000 Population)

Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
33	1	27	U.S.	Rochester, NY	2.5	\$139,300	\$54,800
45	2	38	U.S.	Buffalo, NY	2.6	\$138,900	\$52,900
55	3	44	U.S.	Cincinnati, OH-KY-IN	2.7	\$157,000	\$58,000
55	3	44	U.S.	Cleveland, OH	2.7	\$138,900	\$52,100
55	3	44	U.S.	Pittsburgh, PA	2.7	\$150,000	\$55,200
77	6	64	U.S.	Oklahoma City, OK	2.9	\$154,800	\$53,300
77	6	64	U.S.	Saint Louis, MO-IL	2.9	\$170,000	\$57,700
91	8	77	U.S.	Detroit, MI	3.0	\$163,500	\$54,800
91	8	77	U.S.	Grand Rapids, MI	3.0	\$170,100	\$56,600
91	8	77	U.S.	Indianapolis, IN	3.0	\$164,100	\$55,500
91	8	77	U.S.	Kansas City, MO-KS	3.0	\$188,000	\$61,800
99	12	83	U.S.	Atlanta, GA	3.1	\$191,500	\$61,500
99	12	83	U.S.	Columbus, OH	3.1	\$181,600	\$59,400
112	14	95	U.S.	Louisville, KY-IN	3.2	\$171,800	\$54,000
116	15	99	U.S.	Hartford, CT	3.3	\$241,200	\$73,800
116	15	99	U.S.	Memphis, TN-MS-AR	3.3	\$161,900	\$49,600
116	15	99	U.S.	Minneapolis-St. Paul, MN-WI	3.3	\$240,300	\$72,500
130	18	1	Japan	Osaka-Kobe-Kyoto*	3.4	¥20,110,000	¥5,920,000
138	19	119	U.S.	Houston, TX	3.5	\$217,400	\$62,800
138	19	119	U.S.	Philadelphia, PA-NJ-DE-MD	3.5	\$234,800	\$66,500
148	21	126	U.S.	Baltimore, MD	3.6	\$264,300	\$74,100
148	21	126	U.S.	Birmingham, AL	3.6	\$187,300	\$52,600
148	21	126	U.S.	Virginia Beach-Norfolk, VA-NC	3.6	\$220,000	\$61,400
162	24	137	U.S.	Dallas-Fort Worth, TX	3.7	\$230,500	\$63,000
162	24	137	U.S.	Raleigh, NC	3.7	\$250,200	\$67,200
176	26	148	U.S.	Chicago, IL	3.8	\$244,100	\$64,500
176	26	2	U.K.	Leeds & West Yorkshire	3.8	£145,000	£37,900
176	26	148	U.S.	San Antonio, TX	3.8	\$212,300	\$56,300
190	29	159	U.S.	Charlotte, NC-SC	3.9	\$215,900	\$56,000
190	29	159	U.S.	Nashville, TN	3.9	\$230,000	\$59,200
190	29	159	U.S.	New Orleans, LA	3.9	\$191,300	\$49,400
190	29	20	Canada	Ottawa-Gatineau, ON-OC	3.9	\$315,300	\$81,800
190	29	159	U.S.	Richmond, VA	3.9	\$239,800	\$62,000
204	34	3	U.K.	Glasgow	4.0	£131,800	£32,600
204	34	168	U.S.	Jacksonville, FL	4.0	\$219,000	\$54,300
204	34	168	U.S.	Salt Lake City, UT	4.0	\$271,800	\$67,200
204	34	168	U.S.	Tucson, AZ	4.0	\$193,300	\$48,100
216	38	177	U.S.	Austin, TX	4.1	\$284,000	\$68,600
216	38	5	U.K.	Blackpool & Lancashire	4.1	£131,100	£32,100
216	38	5	U.K.	Derby & Derbyshire	4.1	£150,000	£36,300
216	38	24	Canada	Edmonton, AB	4.1	\$356,000	\$87,000
216	38	5	U.K.	Middlesbrough & Durham	4.1	£117,300	£28,400
216	38	177	U.S.	Milwaukee, WI	4.1	\$238,000	\$57,400
216	38	177	U.S.	Phoenix, AZ	4.1	\$235,300	\$56,700



SCHEDULE 1
MAJOR HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
(Housing Markets over 1,000,000 Population)

Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
216	38	177	U.S.	Tampa-St. Petersburg, FL	4.1	\$205,000	\$49,900
216	38	177	U.S.	Washington, DC-VA-MD-WV	4.1	\$393,500	\$95,300
246	47	9	U.K.	Hull & Humber	4.3	£145,000	£33,900
246	47	9	U.K.	Newcastle & Tyneside	4.3	£133,000	£30,700
246	47	9	U.K.	Nottingham & Nottinghamshire	4.3	£149,500	£34,400
246	47	9	U.K.	Sheffield & South Yorkshire	4.3	£128,000	£30,000
255	51	13	U.K.	Edinburgh	4.4	£169,100	£38,700
255	51	198	U.S.	Orlando, FL	4.4	\$229,900	\$52,200
265	53	206	U.S.	Las Vegas, NV	4.5	\$236,400	\$52,600
265	53	14	U.K.	Manchester & Greater Manchester	4.5	£145,000	£32,500
265	53	206	U.S.	Providence, RI-MA	4.5	\$273,700	\$60,200
273	56	28	Canada	Calgary, AB	4.6	\$427,700	\$93,100
276	57	5	Ireland	Dublin	4.7	€276,000	€58,400
276	57	2	Japan	Tokyo-Yokohama*	4.7	¥31,620,000	¥6,760,000
285	59	18	U.K.	Birmingham & West Midlands	4.8	£154,000	£32,400
285	59	30	Canada	Montréal, QC	4.8	\$284,700	\$59,500
285	59	1	Singapore	Singapore	4.8	\$412,500	\$85,400
285	59	18	U.K.	Stoke on Trent & Staffordshire	4.8	£154,500	£31,900
300	63	21	U.K.	Leicester & Leicestershire	5.0	£175,000	£35,200
312	64	23	U.K.	Liverpool & Merseyside	5.1	£137,500	£27,200
312	64	227	U.S.	Sacramento, CA	5.1	\$327,000	\$64,100
312	64	23	U.K.	Warrington & Cheshire	5.1	£185,000	£36,200
325	67	231	U.S.	Boston, MA-NH	5.4	\$435,300	\$80,500
325	67	231	U.S.	Denver, CO	5.4	\$386,800	\$71,800
329	69	234	U.S.	Portland, OR-WA	5.5	\$358,500	\$65,200
329	69	234	U.S.	Seattle, WA	5.5	\$422,100	\$76,900
340	71	238	U.S.	Riverside-San Bernardino, CA	5.6	\$319,000	\$57,300
345	72	241	U.S.	New York, NY-NJ-PA	5.7	\$397,600	\$70,200
355	73	245	U.S.	Miami, FL	6.1	\$315,000	\$51,500
355	73	35	Australia	Perth, WA	6.1	\$528,300	\$87,300
357	75	36	Australia	Brisbane, QLD	6.2	\$495,000	\$79,400
357	75	28	U.K.	Bristol-Bath	6.2	£255,000	£41,200
363	77	39	Australia	Adelaide, SA	6.6	\$435,000	\$66,000
372	78	30	U.K.	London Exurbs (E & SE England)	7.1	£285,000	£40,400
372	78	30	U.K.	Plymouth & Devon	7.1	£215,000	£30,400
378	80	38	Canada	Toronto, ON	7.7	\$615,800	\$79,700
383	81	32	U.K.	London (Greater London Authority)	8.5	£440,000	£51,800
384	82	253	U.S.	San Diego, CA	8.6	\$589,300	\$68,700
386	83	33	U.K.	Bournemouth & Dorset	8.9	£265,000	£29,900
393	84	256	U.S.	San Francisco, CA	9.2	\$835,400	\$90,400
395	85	258	U.S.	Los Angeles, CA	9.3	\$593,900	\$63,900
396	86	259	U.S.	Honolulu, HI	9.4	\$745,300	\$78,900
397	87	51	Australia	Melbourne, VIC	9.5	\$740,000	\$78,200
398	88	260	U.S.	San Jose, CA	9.6	\$1,000,000	\$104,100



SCHEDULE 1
MAJOR HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
(Housing Markets over 1,000,000 Population)

Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
401	89	8	N.Z.	Auckland	10.0	\$830,800	\$83,000
404	90	40	Canada	Vancouver, BC	11.8	\$830,100	\$70,500
405	91	54	Australia	Sydney, NSW	12.2	\$1,077,000	\$88,000
406	92	1	China	Hong Kong	18.1	\$5,422,000	\$300,000

Financial data in local currency.

*Average Multiple (Japan)



SCHEDULE 2
MAJOR HOUSING MARKETS BY GEOGRAPHY (Over 1,000,000 Population)
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
363	77	39	Australia	Adelaide, SA	6.6	\$435,000	\$66,000
357	75	36	Australia	Brisbane, QLD	6.2	\$495,000	\$79,400
397	87	51	Australia	Melbourne, VIC	9.5	\$740,000	\$78,200
355	73	35	Australia	Perth, WA	6.1	\$528,300	\$87,300
405	91	54	Australia	Sydney, NSW	12.2	\$1,077,000	\$88,000
273	56	28	Canada	Calgary, AB	4.6	\$427,700	\$93,100
216	38	24	Canada	Edmonton, AB	4.1	\$356,000	\$87,000
285	59	30	Canada	Montréal, QC	4.8	\$284,700	\$59,500
190	29	20	Canada	Ottawa-Gatineau, ON-QC	3.9	\$315,300	\$81,800
378	80	38	Canada	Toronto, ON	7.7	\$615,800	\$79,700
404	90	40	Canada	Vancouver, BC	11.8	\$830,100	\$70,500
406	92	1	China	Hong Kong	18.1	\$5,422,000	\$300,000
276	57	5	Ireland	Dublin	4.7	€276,000	€58,400
130	18	1	Japan	Osaka-Kobe-Kyoto*	3.4	¥20,110,000	¥5,920,000
276	57	2	Japan	Tokyo-Yokohama*	4.7	¥31,620,000	¥6,760,000
401	89	8	N.Z.	Auckland	10.0	\$830,800	\$83,000
285	59	1	Singapore	Singapore	4.8	\$412,500	\$85,400
285	59	18	U.K.	Birmingham & West Midlands	4.8	£154,000	£32,400
216	38	5	U.K.	Blackpool & Lancashire	4.1	£131,100	£32,100
386	83	33	U.K.	Bournemouth & Dorset	8.9	£265,000	£29,900
357	75	28	U.K.	Bristol-Bath	6.2	£255,000	£41,200
216	38	5	U.K.	Derby & Derbyshire	4.1	£150,000	£36,300
255	51	13	U.K.	Edinburgh	4.4	£169,100	£38,700
204	34	3	U.K.	Glasgow	4.0	£131,800	£32,600
246	47	9	U.K.	Hull & Humber	4.3	£145,000	£33,900
176	26	2	U.K.	Leeds & West Yorkshire	3.8	£145,000	£37,900
300	63	21	U.K.	Leicester & Leicestershire	5.0	£175,000	£35,200
312	64	23	U.K.	Liverpool & Merseyside	5.1	£137,500	£27,200
383	81	32	U.K.	London (Greater London Authority)	8.5	£440,000	£51,800
372	78	30	U.K.	London Exurbs (E & SE England)	7.1	£285,000	£40,400
265	53	14	U.K.	Manchester & Greater Manchester	4.5	£145,000	£32,500
216	38	5	U.K.	Middlesbrough & Durham	4.1	£117,300	£28,400
246	47	9	U.K.	Newcastle & Tyneside	4.3	£133,000	£30,700
246	47	9	U.K.	Nottingham & Nottinghamshire	4.3	£149,500	£34,400
372	78	30	U.K.	Plymouth & Devon	7.1	£215,000	£30,400
246	47	9	U.K.	Sheffield & South Yorkshire	4.3	£128,000	£30,000
285	59	18	U.K.	Stoke on Trent & Staffordshire	4.8	£154,500	£31,900
312	64	23	U.K.	Warrington & Cheshire	5.1	£185,000	£36,200
99	12	83	U.S.	Atlanta, GA	3.1	\$191,500	\$61,500
216	38	177	U.S.	Austin, TX	4.1	\$284,000	\$68,600
148	21	126	U.S.	Baltimore, MD	3.6	\$264,300	\$74,100
148	21	126	U.S.	Birmingham, AL	3.6	\$187,300	\$52,600
325	67	231	U.S.	Boston, MA-NH	5.4	\$435,300	\$80,500
45	2	38	U.S.	Buffalo, NY	2.6	\$138,900	\$52,900
190	29	159	U.S.	Charlotte, NC-SC	3.9	\$215,900	\$56,000



SCHEDULE 2
MAJOR HOUSING MARKETS BY GEOGRAPHY (Over 1,000,000 Population)
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
176	26	148	U.S.	Chicago, IL	3.8	\$244,100	\$64,500
55	3	44	U.S.	Cincinnati, OH-KY-IN	2.7	\$157,000	\$58,000
55	3	44	U.S.	Cleveland, OH	2.7	\$138,900	\$52,100
99	12	83	U.S.	Columbus, OH	3.1	\$181,600	\$59,400
162	24	137	U.S.	Dallas-Fort Worth, TX	3.7	\$230,500	\$63,000
325	67	231	U.S.	Denver, CO	5.4	\$386,800	\$71,800
91	8	77	U.S.	Detroit, MI	3.0	\$163,500	\$54,800
91	8	77	U.S.	Grand Rapids, MI	3.0	\$170,100	\$56,600
116	15	99	U.S.	Hartford, CT	3.3	\$241,200	\$73,800
396	86	259	U.S.	Honolulu, HI	9.4	\$745,300	\$78,900
138	19	119	U.S.	Houston, TX	3.5	\$217,400	\$62,800
91	8	77	U.S.	Indianapolis, IN	3.0	\$164,100	\$55,500
204	34	168	U.S.	Jacksonville, FL	4.0	\$219,000	\$54,300
91	8	77	U.S.	Kansas City, MO-KS	3.0	\$188,000	\$61,800
265	53	206	U.S.	Las Vegas, NV	4.5	\$236,400	\$52,600
395	85	258	U.S.	Los Angeles, CA	9.3	\$593,900	\$63,900
112	14	95	U.S.	Louisville, KY-IN	3.2	\$171,800	\$54,000
116	15	99	U.S.	Memphis, TN-MS-AR	3.3	\$161,900	\$49,600
355	73	245	U.S.	Miami, FL	6.1	\$315,000	\$51,500
216	38	177	U.S.	Milwaukee, WI	4.1	\$238,000	\$57,400
116	15	99	U.S.	Minneapolis-St. Paul, MN-WI	3.3	\$240,300	\$72,500
190	29	159	U.S.	Nashville, TN	3.9	\$230,000	\$59,200
190	29	159	U.S.	New Orleans, LA	3.9	\$191,300	\$49,400
345	72	241	U.S.	New York, NY-NJ-PA	5.7	\$397,600	\$70,200
77	6	64	U.S.	Oklahoma City, OK	2.9	\$154,800	\$53,300
255	51	198	U.S.	Orlando, FL	4.4	\$229,900	\$52,200
138	19	119	U.S.	Philadelphia, PA-NJ-DE-MD	3.5	\$234,800	\$66,500
216	38	177	U.S.	Phoenix, AZ	4.1	\$235,300	\$56,700
55	3	44	U.S.	Pittsburgh, PA	2.7	\$150,000	\$55,200
329	69	234	U.S.	Portland, OR-WA	5.5	\$358,500	\$65,200
265	53	206	U.S.	Providence, RI-MA	4.5	\$273,700	\$60,200
162	24	137	U.S.	Raleigh, NC	3.7	\$250,200	\$67,200
190	29	159	U.S.	Richmond, VA	3.9	\$239,800	\$62,000
340	71	238	U.S.	Riverside-San Bernardino, CA	5.6	\$319,000	\$57,300
33	1	27	U.S.	Rochester, NY	2.5	\$139,300	\$54,800
312	64	227	U.S.	Sacramento, CA	5.1	\$327,000	\$64,100
77	6	64	U.S.	Saint Louis, MO-IL	2.9	\$170,000	\$57,700
204	34	168	U.S.	Salt Lake City, UT	4.0	\$271,800	\$67,200
176	26	148	U.S.	San Antonio, TX	3.8	\$212,300	\$56,300
384	82	253	U.S.	San Diego, CA	8.6	\$589,300	\$68,700
393	84	256	U.S.	San Francisco, CA	9.2	\$835,400	\$90,400
398	88	260	U.S.	San Jose, CA	9.6	\$1,000,000	\$104,100
329	69	234	U.S.	Seattle, WA	5.5	\$422,100	\$76,900
216	38	177	U.S.	Tampa-St. Petersburg, FL	4.1	\$205,000	\$49,900
204	34	168	U.S.	Tucson, AZ	4.0	\$193,300	\$48,100
148	21	126	U.S.	Virginia Beach-Norfolk, VA-NC	3.6	\$220,000	\$61,400



SCHEDULE 2
MAJOR HOUSING MARKETS BY GEOGRAPHY (Over 1,000,000 Population)
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
216	38	177	U.S.	Washington, DC-VA-MD-WV	4.1	\$393,500	\$95,300

Financial data in local currency.
 *Average Multiple (Japan)



SCHEDULE 3
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
1		1	U.S.	Racine, WI	1.8	\$104,000	\$58,400
2		2	U.S.	Bay City, MI	1.9	\$91,000	\$47,500
3		3	U.S.	Decatur, IL	2.0	\$99,400	\$49,100
3		3	U.S.	Elmira, NY	2.0	\$109,400	\$54,200
5		5	U.S.	East Stroudsburg, PA	2.1	\$123,000	\$58,500
5		1	Australia	Karratha, WA	2.1	\$363,000	\$171,900
5		5	U.S.	Lima, OH	2.1	\$110,000	\$51,400
5		1	Canada	Moncton, NB	2.1	\$134,900	\$65,200
5		5	U.S.	Peoria, IL	2.1	\$123,100	\$57,500
5		5	U.S.	Rockford, IL	2.1	\$111,900	\$52,100
5		5	U.S.	Scranton-Wilkes Barre, PA	2.1	\$109,000	\$50,700
5		5	U.S.	Springfield, OH	2.1	\$102,000	\$49,000
5		5	U.S.	Terre Haute, IN	2.1	\$88,000	\$41,800
5		5	U.S.	Youngstown, OH-PA	2.1	\$90,300	\$44,000
15		13	U.S.	Binghamton, NY	2.2	\$111,900	\$50,400
15		2	Canada	Fredericton, NB	2.2	\$151,000	\$68,800
15		13	U.S.	Utica, NY	2.2	\$110,000	\$50,000
18		15	U.S.	Cumberland, MD-WV	2.3	\$94,400	\$40,200
18		15	U.S.	Davenport, IA-IL	2.3	\$128,700	\$56,700
18		1	Ireland	Limerick	2.3	€128,300	€55,900
18		2	Australia	Port Hedland, WA	2.3	\$390,000	\$168,700
18		15	U.S.	Saginaw, MI	2.3	\$100,000	\$44,300
18		15	U.S.	Springfield, IL	2.3	\$135,800	\$59,100
24		19	U.S.	Bloomington, IL	2.4	\$158,300	\$65,200
24		19	U.S.	Homosassa Springs, FL	2.4	\$100,000	\$41,100
24		19	U.S.	Kankakee, IL	2.4	\$129,700	\$55,000
24		19	U.S.	Mansfield, OH	2.4	\$110,000	\$46,100
24		3	Canada	Saint John, NB	2.4	\$161,900	\$68,000
24		19	U.S.	Syracuse, NY	2.4	\$137,000	\$57,600
24		19	U.S.	Topeka, KS	2.4	\$127,100	\$52,800
24		19	U.S.	Waterloo, IA	2.4	\$127,400	\$53,400
24		19	U.S.	Wheeling, WV	2.4	\$115,000	\$48,700
33		27	U.S.	Akron, OH	2.5	\$131,500	\$52,700
33		27	U.S.	Appleton, WI	2.5	\$156,900	\$62,500
33		27	U.S.	Canton, OH	2.5	\$125,000	\$50,400
33		27	U.S.	Carbondale, IL	2.5	\$110,000	\$43,200
33		27	U.S.	Evansville, IN	2.5	\$125,000	\$49,700
33		27	U.S.	Ft. Wayne, IN	2.5	\$127,700	\$51,900
33		27	U.S.	Muskegon, MI	2.5	\$120,000	\$48,500
33		27	U.S.	Odessa, TX	2.5	\$169,000	\$66,800
33		27	U.S.	Oshkosh, WI	2.5	\$134,300	\$53,200
33	1	27	U.S.	Rochester, NY	2.5	\$139,300	\$54,800



SCHEDULE 3
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
33		4	Canada	Saguenay, QC	2.5	\$170,000	\$66,700
33		27	U.S.	Toledo, OH	2.5	\$119,800	\$48,100
45		38	U.S.	Battle Creek, MI	2.6	\$116,000	\$44,000
45	2	38	U.S.	Buffalo, NY	2.6	\$138,900	\$52,900
45		5	Canada	Charlottetown, PEI	2.6	\$174,700	\$67,500
45		38	U.S.	Erie, PA	2.6	\$127,400	\$48,400
45		3	Australia	Kalgoorlie, WA	2.6	\$312,000	\$118,100
45		38	U.S.	Lansing, MI	2.6	\$138,300	\$52,900
45		38	U.S.	Monroe, MI	2.6	\$145,000	\$55,500
45		5	Canada	Trois-Rivières, QC	2.6	\$148,300	\$56,400
45		2	Ireland	Waterford	2.6	€125,000	€48,100
45		38	U.S.	Wichita, KS	2.6	\$135,700	\$52,700
55	3	44	U.S.	Cincinnati, OH-KY-IN	2.7	\$157,000	\$58,000
55	3	44	U.S.	Cleveland, OH	2.7	\$138,900	\$52,100
55		44	U.S.	Dayton, OH	2.7	\$134,100	\$50,600
55		44	U.S.	Elizabethtown, KY	2.7	\$135,000	\$50,000
55	3	44	U.S.	Pittsburgh, PA	2.7	\$150,000	\$55,200
55		44	U.S.	Roanoke, VA	2.7	\$139,000	\$51,600
55		44	U.S.	South Bend, IN	2.7	\$128,500	\$48,200
55		44	U.S.	Wichita Falls, TX	2.7	\$127,000	\$46,600
55		7	Canada	Windsor, ON	2.7	\$187,100	\$68,800
64		52	U.S.	Cedar Rapids, IA	2.8	\$166,700	\$59,200
64		52	U.S.	Champaign, IL	2.8	\$146,700	\$52,700
64		52	U.S.	Duluth, MN	2.8	\$147,000	\$51,600
64		52	U.S.	Flint, MI	2.8	\$126,000	\$45,000
64		52	U.S.	Gainesville, GA	2.8	\$155,000	\$56,200
64		4	Australia	Gladstone, QLD	2.8	\$275,000	\$98,600
64		52	U.S.	Green Bay, WI	2.8	\$157,100	\$56,000
64		52	U.S.	Gulfport, MS	2.8	\$126,200	\$45,300
64		52	U.S.	Harrisburg, PA	2.8	\$164,800	\$59,400
64		52	U.S.	Kalamazoo, MI	2.8	\$145,000	\$52,300
64		52	U.S.	Little Rock, AR	2.8	\$138,600	\$50,100
64		52	U.S.	Omaha, NE-IA	2.8	\$175,100	\$62,300
64		52	U.S.	Reading, PA	2.8	\$162,100	\$57,300
77		64	U.S.	Beaumont, TX	2.9	\$145,200	\$50,800
77		64	U.S.	Decatur, AL	2.9	\$137,100	\$47,100
77		64	U.S.	Elkhart, IN	2.9	\$149,000	\$50,600
77		64	U.S.	Lexington, KY	2.9	\$157,300	\$54,200
77		64	U.S.	Montgomery, AL	2.9	\$133,700	\$46,600
77		64	U.S.	New London, CT	2.9	\$191,600	\$67,200
77	6	64	U.S.	Oklahoma City, OK	2.9	\$154,800	\$53,300
77		64	U.S.	Rochester, MN	2.9	\$193,000	\$67,000
77	6	64	U.S.	Saint Louis, MO-IL	2.9	\$170,000	\$57,700
77		64	U.S.	Sierra Vista, AZ	2.9	\$128,000	\$44,200
77		64	U.S.	Sioux City, IA, NE, SD	2.9	\$154,000	\$53,800
77		64	U.S.	Springfield, MO	2.9	\$132,000	\$45,700



SCHEDULE 3
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
77		8	Canada	Sudbury, ON	2.9	\$221,600	\$77,100
77		64	U.S.	York, PA	2.9	\$170,900	\$59,600
91	8	77	U.S.	Detroit, MI	3.0	\$163,500	\$54,800
91	8	77	U.S.	Grand Rapids, MI	3.0	\$170,100	\$56,600
91		77	U.S.	Hagerstown, MD-WV	3.0	\$167,300	\$56,300
91	8	77	U.S.	Indianapolis, IN	3.0	\$164,100	\$55,500
91	8	77	U.S.	Kansas City, MO-KS	3.0	\$188,000	\$61,800
91		9	Canada	Moose Jaw, SK	3.0	\$187,700	\$62,000
91		9	Canada	Thunder Bay, ON	3.0	\$207,500	\$69,600
91		77	U.S.	Tulsa, OK	3.0	\$156,500	\$52,400
99		83	U.S.	Allentown, PA	3.1	\$194,400	\$62,000
99		83	U.S.	Amarillo, TX	3.1	\$161,700	\$52,800
99	12	83	U.S.	Atlanta, GA	3.1	\$191,500	\$61,500
99	12	83	U.S.	Columbus, OH	3.1	\$181,600	\$59,400
99		83	U.S.	Des Moines, IA	3.1	\$193,100	\$63,300
99		83	U.S.	Glens Falls, NY	3.1	\$172,300	\$56,400
99		83	U.S.	Huntsville, AL	3.1	\$183,900	\$59,000
99		83	U.S.	Killeen, TX	3.1	\$152,000	\$49,600
99		83	U.S.	Lancaster, PA	3.1	\$185,000	\$60,500
99		83	U.S.	Mobile, AL	3.1	\$135,400	\$43,600
99		11	Canada	North Bay, ON	3.1	\$212,200	\$68,200
99		83	U.S.	Sioux Falls, SD	3.1	\$192,300	\$61,100
99		83	U.S.	Yuma, AZ	3.1	\$127,000	\$41,400
112		95	U.S.	Columbia, SC	3.2	\$165,900	\$52,500
112		95	U.S.	Fairbanks, AK	3.2	\$236,000	\$74,500
112		95	U.S.	Lincoln, NE	3.2	\$174,500	\$55,100
112	14	95	U.S.	Louisville, KY-IN	3.2	\$171,800	\$54,000
116		99	U.S.	Abilene, TX	3.3	\$157,500	\$48,400
116		99	U.S.	Albany, NY	3.3	\$212,100	\$64,400
116		99	U.S.	Charleston, WV	3.3	\$141,700	\$43,400
116		99	U.S.	Greensboro, NC	3.3	\$155,000	\$46,700
116	15	99	U.S.	Hartford, CT	3.3	\$241,200	\$73,800
116		99	U.S.	McAllen, TX	3.3	\$120,000	\$36,500
116	15	99	U.S.	Memphis, TN-MS-AR	3.3	\$161,900	\$49,600
116	15	99	U.S.	Minneapolis-St. Paul, MN-WI	3.3	\$240,300	\$72,500
116		99	U.S.	Ocala, FL	3.3	\$135,000	\$40,900
116		99	U.S.	Ogden, UT	3.3	\$220,000	\$66,900
116		99	U.S.	Pensacola, FL	3.3	\$172,000	\$51,600
116		99	U.S.	Sherman, TX	3.3	\$160,000	\$49,100
116		99	U.S.	Waco, TX	3.3	\$154,000	\$47,300
116		99	U.S.	Winston-Salem, NC	3.3	\$151,500	\$46,100
130		113	U.S.	Columbia, MO	3.4	\$173,400	\$51,600
130		113	U.S.	Dover, DE	3.4	\$200,000	\$58,000
130		113	U.S.	El Paso, TX	3.4	\$151,200	\$44,600
130		3	Ireland	Galway	3.4	€170,000	€49,600
130		113	U.S.	Kingston, NY	3.4	\$205,200	\$61,000



SCHEDULE 3
ALL HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
130		113	U.S.	Knoxville, TN	3.4	\$169,600	\$49,400
130	18	1	Japan	Osaka-Kobe-Kyoto*	3.4	¥20,110,000	¥5,920,000
130		113	U.S.	Tyler, TX	3.4	\$168,000	\$50,100
138		119	U.S.	Atlantic City, NJ	3.5	\$195,200	\$55,200
138		119	U.S.	Baton Rouge, LA	3.5	\$193,400	\$55,900
138		119	U.S.	Chattanooga, TN-GA	3.5	\$170,100	\$48,800
138		4	Ireland	Cork	3.5	€185,000	€53,500
138		119	U.S.	Fayetteville, AR-MO	3.5	\$180,100	\$51,900
138	19	119	U.S.	Houston, TX	3.5	\$217,400	\$62,800
138		5	Australia	Mackay, QLD	3.5	\$319,800	\$90,300
138		12	Canada	Medicine Hat, AB	3.5	\$246,900	\$70,600
138	19	119	U.S.	Philadelphia, PA-NJ-DE-MD	3.5	\$234,800	\$66,500
138		119	U.S.	Spartanburg, SC	3.5	\$155,900	\$45,000
148	21	126	U.S.	Baltimore, MD	3.6	\$264,300	\$74,100
148	21	126	U.S.	Birmingham, AL	3.6	\$187,300	\$52,600
148		126	U.S.	Charlottesville, VA	3.6	\$235,000	\$65,300
148		1	U.K.	Falkirk	3.6	£115,500	£32,300
148		126	U.S.	Fargo, ND-MN	3.6	\$204,100	\$57,200
148		126	U.S.	Farmington, NM	3.6	\$180,600	\$50,700
148		126	U.S.	Florence, SC	3.6	\$138,800	\$38,900
148		126	U.S.	Kennewick, WA	3.6	\$224,900	\$62,700
148		126	U.S.	Lake Havasu City, AZ	3.6	\$151,000	\$41,800
148		126	U.S.	Manchester, NH	3.6	\$271,500	\$75,900
148		126	U.S.	New Haven, CT	3.6	\$229,600	\$63,100
148		13	Canada	Québec, QC	3.6	\$234,100	\$65,300
148		13	Canada	Regina, SK	3.6	\$284,800	\$79,600
148	21	126	U.S.	Virginia Beach-Norfolk, VA-NC	3.6	\$220,000	\$61,400
162		137	U.S.	Albany, OR	3.7	\$180,000	\$48,500
162		137	U.S.	Anchorage, AK	3.7	\$293,000	\$79,900
162		137	U.S.	Brownsville, TX	3.7	\$129,000	\$34,800
162		137	U.S.	Corpus Christi, TX	3.7	\$189,800	\$51,300
162	24	137	U.S.	Dallas-Fort Worth, TX	3.7	\$230,500	\$63,000
162		137	U.S.	Ithaca, NY	3.7	\$219,000	\$59,300
162		137	U.S.	Jackson, MS	3.7	\$176,500	\$47,700
162		137	U.S.	Lakeland, FL	3.7	\$167,000	\$45,000
162		15	Canada	Lethbridge, AB	3.7	\$262,400	\$70,200
162	24	137	U.S.	Raleigh, NC	3.7	\$250,200	\$67,200
162		15	Canada	Red Deer, AB	3.7	\$292,800	\$80,200
162		137	U.S.	Trenton, NJ	3.7	\$276,900	\$74,000
162		15	Canada	Winnipeg, MB	3.7	\$257,400	\$69,800
162		137	U.S.	Worcester, MA	3.7	\$249,600	\$66,800
176		148	U.S.	Bismarck, ND	3.8	\$251,000	\$66,600
176	26	148	U.S.	Chicago, IL	3.8	\$244,100	\$64,500
176		148	U.S.	Fayetteville, NC	3.8	\$162,100	\$42,800
176		148	U.S.	Great Falls, MT	3.8	\$177,000	\$46,600
176		148	U.S.	Laredo, TX	3.8	\$155,000	\$40,600



SCHEDULE 3
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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
176	26	2	U.K.	Leeds & West Yorkshire	3.8	£145,000	£37,900
176		18	Canada	London, ON	3.8	\$249,400	\$66,400
176		148	U.S.	Midland, TX	3.8	\$229,000	\$60,500
176		148	U.S.	Palm Bay, FL	3.8	\$197,000	\$51,500
176		148	U.S.	Salisbury, MD	3.8	\$209,000	\$55,400
176	26	148	U.S.	San Antonio, TX	3.8	\$212,300	\$56,300
176		148	U.S.	Shreveport, LA	3.8	\$170,000	\$44,200
176		148	U.S.	Springfield, MA	3.8	\$209,700	\$54,500
176		18	Canada	St. John's, NL	3.8	\$274,900	\$72,900
190		159	U.S.	Albuquerque, NM	3.9	\$193,800	\$50,000
190		159	U.S.	Ann Arbor, MI	3.9	\$247,100	\$63,300
190		159	U.S.	Boise, ID	3.9	\$209,000	\$53,000
190	29	159	U.S.	Charlotte, NC-SC	3.9	\$215,900	\$56,000
190		159	U.S.	Greenville, SC	3.9	\$191,900	\$49,200
190		20	Canada	Halifax, NS	3.9	\$270,000	\$68,700
190		20	Canada	Kingston, ON	3.9	\$272,900	\$69,800
190		159	U.S.	Madison, WI	3.9	\$254,700	\$65,500
190	29	159	U.S.	Nashville, TN	3.9	\$230,000	\$59,200
190	29	159	U.S.	New Orleans, LA	3.9	\$191,300	\$49,400
190	29	20	Canada	Ottawa-Gatineau, ON-QC	3.9	\$315,300	\$81,800
190		6	Australia	Port Augusta, SA	3.9	\$225,000	\$58,200
190	29	159	U.S.	Richmond, VA	3.9	\$239,800	\$62,000
190		20	Canada	St. Catharine's-Niagara, ON	3.9	\$242,500	\$62,900
204		3	U.K.	Belfast	4.0	£133,600	£33,800
204		7	Australia	Bunbury, WA	4.0	\$340,000	\$84,300
204		168	U.S.	Daytona Beach, FL	4.0	\$175,000	\$44,200
204		168	U.S.	Gainesville, FL	4.0	\$193,300	\$47,900
204	34	3	U.K.	Glasgow	4.0	£131,800	£32,600
204	34	168	U.S.	Jacksonville, FL	4.0	\$219,000	\$54,300
204		168	U.S.	Panama City, FL	4.0	\$195,000	\$49,100
204		168	U.S.	Pittsfield, MA	4.0	\$207,800	\$51,800
204	34	168	U.S.	Salt Lake City, UT	4.0	\$271,800	\$67,200
204	34	168	U.S.	Tucson, AZ	4.0	\$193,300	\$48,100
204		168	U.S.	Vero Beach, FL	4.0	\$200,000	\$50,400
204		168	U.S.	Yakima, WA	4.0	\$192,200	\$48,200
216	38	177	U.S.	Austin, TX	4.1	\$284,000	\$68,600
216		177	U.S.	Bakersfield, CA	4.1	\$215,000	\$52,400
216	38	5	U.K.	Blackpool & Lancashire	4.1	£131,100	£32,100
216		177	U.S.	Bremerton, WA	4.1	\$275,000	\$67,500
216	38	5	U.K.	Derby & Derbyshire	4.1	£150,000	£36,300
216		5	U.K.	Dundee	4.1	£133,300	£32,700
216	38	24	Canada	Edmonton, AB	4.1	\$356,000	\$87,000
216		177	U.S.	Greeley, CO	4.1	\$294,000	\$71,700
216		24	Canada	Kitchener, ON	4.1	\$333,400	\$82,100
216	38	5	U.K.	Middlesbrough & Durham	4.1	£117,300	£28,400
216	38	177	U.S.	Milwaukee, WI	4.1	\$238,000	\$57,400



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International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
216		8	Australia	Murray Bridge, SA	4.1	\$239,500	\$58,800
216		177	U.S.	Myrtle Beach, SC	4.1	\$198,000	\$48,400
216		177	U.S.	Olympia, WA	4.1	\$259,000	\$63,500
216	38	177	U.S.	Phoenix, AZ	4.1	\$235,300	\$56,700
216		177	U.S.	Portland, ME	4.1	\$260,800	\$63,400
216		177	U.S.	Provo, UT	4.1	\$273,000	\$66,500
216		177	U.S.	Punta Gorda, FL	4.1	\$189,300	\$46,500
216		8	Australia	Rockhampton, QLD	4.1	\$287,000	\$69,700
216	38	177	U.S.	Tampa-St. Petersburg, FL	4.1	\$205,000	\$49,900
216		8	Australia	Townsville, QLD	4.1	\$330,000	\$79,900
216	38	177	U.S.	Washington, DC-VA-MD-WV	4.1	\$393,500	\$95,300
216		8	Australia	Whyalla, SA	4.1	\$227,000	\$55,700
239		190	U.S.	Hanford, CA	4.2	\$197,000	\$46,700
239		12	Australia	Latrobe, VIC	4.2	\$233,000	\$55,300
239		190	U.S.	Port St. Lucie, FL	4.2	\$205,000	\$49,000
239		26	Canada	Sherbrooke, QC	4.2	\$223,500	\$52,800
239		190	U.S.	St. George, UT	4.2	\$236,000	\$56,100
239		190	U.S.	Wilmington, NC	4.2	\$226,700	\$53,800
245		13	Australia	Alice Springs, NT	4.3	\$459,000	\$107,700
245		194	U.S.	Burlington, VT	4.3	\$296,000	\$68,200
245		194	U.S.	College Station, TX	4.3	\$205,000	\$47,300
245		194	U.S.	Colorado Springs, CO	4.3	\$264,700	\$61,700
245	47	9	U.K.	Hull & Humber	4.3	£145,000	£33,900
245	47	9	U.K.	Newcastle & Tyneside	4.3	£133,000	£30,700
245	47	9	U.K.	Nottingham & Nottinghamshire	4.3	£149,500	£34,400
245	47	9	U.K.	Sheffield & South Yorkshire	4.3	£128,000	£30,000
245		194	U.S.	Tallahassee, FL	4.3	\$193,900	\$45,200
254		198	U.S.	Bridgeport, CT	4.4	\$387,100	\$88,200
254		198	U.S.	Cape Coral, FL	4.4	\$225,000	\$51,700
254		198	U.S.	Charleston, SC	4.4	\$252,800	\$57,600
254		198	U.S.	Durham, NC	4.4	\$244,400	\$55,300
254	51	13	U.K.	Edinburgh	4.4	£169,100	£38,700
254		198	U.S.	Hilton Head, SC	4.4	\$251,000	\$57,100
254		14	Australia	Mount Gambier, SA	4.4	\$244,300	\$55,400
254		198	U.S.	Mount Vernon, WA	4.4	\$259,000	\$58,300
254	51	198	U.S.	Orlando, FL	4.4	\$229,900	\$52,200
254		198	U.S.	Spokane, WA	4.4	\$214,400	\$48,600
264		206	U.S.	Fresno, CA	4.5	\$215,000	\$47,900
264	53	206	U.S.	Las Vegas, NV	4.5	\$236,400	\$52,600
264	53	14	U.K.	Manchester & Greater Manchester	4.5	£145,000	£32,500
264		14	U.K.	Perth	4.5	£166,500	£37,400
264	53	206	U.S.	Providence, RI-MA	4.5	\$273,700	\$60,200
264		206	U.S.	Salem, OR	4.5	\$240,700	\$53,600
264		27	Canada	Saskatoon, SK	4.5	\$345,000	\$77,000
264		206	U.S.	The Villages, FL	4.5	\$235,000	\$52,400
272		16	U.K.	Aberdeen	4.6	£182,500	£40,100



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272	56	28	Canada	Calgary, AB	4.6	\$427,700	\$93,100
272		16	U.K.	Newport	4.6	£158,000	£34,200
275	57	5	Ireland	Dublin	4.7	€276,000	€58,400
275		211	U.S.	El Centro, CA	4.7	\$196,000	\$41,700
275		211	U.S.	Fort Walton Beach, FL	4.7	\$254,500	\$54,600
275		15	Australia	Geraldton, WA	4.7	\$345,000	\$73,700
275		29	Canada	Guelph, ON	4.7	\$400,300	\$85,300
275		1	N.Z.	Palmerston North-Manawatu	4.7	\$255,800	\$54,900
275		211	U.S.	Prescott, AZ	4.7	\$230,000	\$49,100
275		211	U.S.	Sarasota, FL	4.7	\$259,000	\$54,800
275		15	Australia	Shepparton, VIC	4.7	\$268,000	\$56,800
275	57	2	Japan	Tokyo-Yokohama*	4.7	¥31,620,000	¥6,760,000
285	59	18	U.K.	Birmingham & West Midlands	4.8	£154,000	£32,400
285		17	Australia	Darwin, NT	4.8	\$550,000	\$114,900
285	59	30	Canada	Montréal, QC	4.8	\$284,700	\$59,500
285	59	1	Singapore	Singapore	4.8	\$412,500	\$85,400
285	59	18	U.K.	Stoke on Trent & Staffordshire	4.8	£154,500	£31,900
285		215	U.S.	Visalia, CA	4.8	\$210,000	\$43,300
285		215	U.S.	Yuba City, CA	4.8	\$250,000	\$52,300
292		217	U.S.	Asheville, NC	4.9	\$226,000	\$45,800
292		31	Canada	Brantford, ON	4.9	\$332,000	\$67,700
292		18	Australia	Devonport, TAS	4.9	\$240,000	\$48,500
292		217	U.S.	Flagstaff, AZ	4.9	\$265,000	\$54,300
292		18	Australia	Orange, NSW	4.9	\$347,000	\$70,600
292		217	U.S.	Santa Fe, NM	4.9	\$281,000	\$56,900
292		20	U.K.	Swansea	4.9	£127,000	£25,900
292		18	Australia	Wagga Wagga, NSW	4.9	\$340,000	\$69,400
300		32	Canada	Barrie, ON	5.0	\$401,900	\$80,300
300		220	U.S.	Bellingham, WA	5.0	\$280,000	\$56,200
300		21	U.K.	Cardiff	5.0	£152,000	£30,300
300		220	U.S.	Eugene, OR	5.0	\$240,100	\$48,300
300	63	21	U.K.	Leicester & Leicestershire	5.0	£175,000	£35,200
300		220	U.S.	Madera, CA	5.0	\$240,000	\$48,200
300		220	U.S.	Merced, CA	5.0	\$214,000	\$42,900
300		21	Australia	Mildura, VIC	5.0	\$257,000	\$51,800
300		220	U.S.	Modesto, CA	5.0	\$270,000	\$53,500
300		220	U.S.	Ocean City, NJ	5.0	\$290,000	\$58,300
300		32	Canada	Peterborough, ON	5.0	\$331,300	\$66,200
300		220	U.S.	Redding, CA	5.0	\$239,000	\$47,700
312		22	Australia	Albury-Wodonga, NSW-VIC	5.1	\$310,800	\$61,000
312		227	U.S.	Fort Collins, CO	5.1	\$335,000	\$66,300
312		22	Australia	Launceston, TAS	5.1	\$280,000	\$54,800
312	64	23	U.K.	Liverpool & Merseyside	5.1	£137,500	£27,200
312		23	U.K.	Northampton & Northamptonshire	5.1	£190,000	£37,400
312		34	Canada	Oshawa, ON	5.1	\$469,700	\$91,700
312	64	227	U.S.	Sacramento, CA	5.1	\$327,000	\$64,100



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312	64	23	U.K.	Warrington & Cheshire	5.1	£185,000	£36,200
320		229	U.S.	Hilo, HI	5.2	\$316,200	\$61,300
321		230	U.S.	Bend, OR	5.3	\$310,000	\$58,600
321		24	Australia	Dubbo, NSW	5.3	\$345,000	\$65,600
323	67	231	U.S.	Boston, MA-NH	5.4	\$435,300	\$80,500
323	67	231	U.S.	Denver, CO	5.4	\$386,800	\$71,800
323		2	N.Z.	Dunedin	5.4	\$322,000	\$59,700
323		231	U.S.	Reno, NV	5.4	\$314,400	\$57,800
323		25	Australia	Warrnambul, VIC	5.4	\$325,000	\$60,300
328		26	Australia	Ballarat, VIC	5.5	\$320,000	\$58,000
328		26	Australia	Bathurst, NSW	5.5	\$381,000	\$69,100
328		234	U.S.	Carson City, NV	5.5	\$239,000	\$43,100
328		26	Australia	Hobart, TAS	5.5	\$338,700	\$61,200
328		234	U.S.	Medford, OR	5.5	\$246,000	\$44,900
328	69	234	U.S.	Portland, OR-WA	5.5	\$358,500	\$65,200
328	69	234	U.S.	Seattle, WA	5.5	\$422,100	\$76,900
328		26	Australia	Tamworth, NSW	5.5	\$325,000	\$59,500
328		26	Australia	Toowoomba, QLD	5.5	\$330,000	\$60,100
337		238	U.S.	Barnstable Town, MA	5.6	\$375,200	\$67,500
337		31	Australia	Bundaberg, QLD	5.6	\$270,800	\$48,200
337		238	U.S.	Corvallis, OR	5.6	\$300,000	\$54,000
337	71	238	U.S.	Riverside-San Bernardino, CA	5.6	\$319,000	\$57,300
337		26	U.K.	Warwickshire	5.6	£226,500	£40,800
342		32	Australia	Baw Baw, VIC	5.7	\$340,000	\$59,700
342		32	Australia	Bendigo, VIC	5.7	\$335,000	\$58,300
342		35	Canada	Hamilton, ON	5.7	\$426,200	\$74,400
342		3	N.Z.	Napier-Hastings	5.7	\$340,500	\$59,300
342	72	241	U.S.	New York, NY-NJ-PA	5.7	\$397,600	\$70,200
342		241	U.S.	Vallejo, CA	5.7	\$389,500	\$68,900
348		27	U.K.	Telford & Shropshire	5.8	£183,000	£31,500
348		4	N.Z.	Wellington	5.8	\$463,700	\$79,600
350		34	Australia	Cairns, QLD	5.9	\$395,000	\$66,500
350		243	U.S.	Chico, CA	5.9	\$275,000	\$46,600
350		5	N.Z.	Christchurch	5.9	\$435,300	\$73,900
350		243	U.S.	Stockton, CA	5.9	\$322,000	\$54,800
354	73	245	U.S.	Miami, FL	6.1	\$315,000	\$51,500
354	73	35	Australia	Perth, WA	6.1	\$528,300	\$87,300
356	75	36	Australia	Brisbane, QLD	6.2	\$495,000	\$79,400
356	75	28	U.K.	Bristol-Bath	6.2	£255,000	£41,200
356		36	Australia	Canberra, ACT	6.2	\$661,900	\$106,400
356		6	N.Z.	Hamilton-Waikato	6.2	\$444,900	\$72,100
356		246	U.S.	Naples, FL	6.2	\$395,000	\$63,400
361		36	Canada	Kelowna, BC	6.4	\$450,600	\$70,100
361		38	Australia	Lismore, NSW	6.4	\$335,000	\$52,500
363	77	39	Australia	Adelaide, SA	6.6	\$435,000	\$66,000
363		39	Australia	Albany, WA	6.6	\$393,000	\$59,500



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363		39	Australia	Newcastle-Maitland, NSW	6.6	\$463,900	\$70,800
366		42	Australia	Fraser Coast, QLD	6.7	\$300,000	\$44,600
367		43	Australia	Mandurah, WA	6.8	\$402,000	\$59,400
368		29	U.K.	Swindon & Wiltshire	6.9	£230,000	£33,200
369		247	U.S.	Boulder, CO	7.0	\$515,200	\$73,500
369		247	U.S.	Eureka, CA	7.0	\$290,000	\$41,300
369		37	Canada	Fraser Valley	7.0	\$545,400	\$78,200
372		249	U.S.	Kahului (Maui), HI	7.1	\$510,000	\$72,000
372	78	30	U.K.	London Exurbs (E & SE England)	7.1	£285,000	£40,400
372	78	30	U.K.	Plymouth & Devon	7.1	£215,000	£30,400
375		44	Australia	Geelong, VIC	7.2	\$440,000	\$61,500
376		250	U.S.	Kapaa (Maui), HI	7.3	\$577,800	\$78,800
377		45	Australia	Hawksbury, NSW	7.4	\$620,000	\$84,200
378		251	U.S.	Oxnard, CA	7.7	\$629,400	\$81,700
378	80	38	Canada	Toronto, ON	7.7	\$615,800	\$79,700
380		46	Australia	Coff's Harbour, NSW	7.9	\$430,000	\$54,600
381		39	Canada	Victoria, BC	8.1	\$542,400	\$67,300
382		252	U.S.	Napa, CA	8.4	\$650,000	\$77,100
383	81	32	U.K.	London (Greater London Authority)	8.5	£440,000	£51,800
384	82	253	U.S.	San Diego, CA	8.6	\$589,300	\$68,700
385		254	U.S.	Santa Rosa, CA	8.7	\$590,000	\$68,100
386	83	33	U.K.	Bournemouth & Dorset	8.9	£265,000	£29,900
386		47	Australia	Wollongong, NSW	8.9	\$601,800	\$67,700
388		48	Australia	Gold Coast, QLD	9.0	\$579,000	\$64,300
388		48	Australia	Port Macquarie, NSW	9.0	\$459,000	\$50,900
388		255	U.S.	San Luis Obispo, CA	9.0	\$574,800	\$64,000
388		48	Australia	Sunshine Coast, QLD	9.0	\$520,000	\$57,800
392		256	U.S.	Salinas-Monterey, CA	9.2	\$566,500	\$61,800
392	84	256	U.S.	San Francisco, CA	9.2	\$835,400	\$90,400
394	85	258	U.S.	Los Angeles, CA	9.3	\$593,900	\$63,900
395	86	259	U.S.	Honolulu, HI	9.4	\$745,300	\$78,900
396	87	51	Australia	Melbourne, VIC	9.5	\$740,000	\$78,200
397	88	260	U.S.	San Jose, CA	9.6	\$1,000,000	\$104,100
398		7	N.Z.	Tauranga-Western Bay of Plenty	9.7	\$591,900	\$61,200
398		52	Australia	Tweed Heads, NSW	9.7	\$490,000	\$50,300
400		53	Australia	Wingcaribbee, NSW	9.8	\$650,000	\$66,500
401	89	8	N.Z.	Auckland	10.0	\$830,800	\$83,000
402		261	U.S.	Santa Barbara, CA	11.3	\$732,500	\$65,000
403		262	U.S.	Santa Cruz, CA	11.6	\$774,500	\$66,500
404	90	40	Canada	Vancouver, BC	11.8	\$830,100	\$70,500
405	91	54	Australia	Sydney, NSW	12.2	\$1,077,000	\$88,000
406	92	1	China	Hong Kong	18.1	\$5,422,000	\$300,000

Financial data in local currency.

*Average Multiple (Japan)



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
363	77	39	Australia	Adelaide, SA	6.6	\$435,000	\$66,000
363		39	Australia	Albany, WA	6.6	\$393,000	\$59,500
312		22	Australia	Albury-Wodonga, NSW-VIC	5.1	\$310,800	\$61,000
245		13	Australia	Alice Springs, NT	4.3	\$459,000	\$107,700
328		26	Australia	Ballarat, VIC	5.5	\$320,000	\$58,000
328		26	Australia	Bathurst, NSW	5.5	\$381,000	\$69,100
342		32	Australia	Baw Baw, VIC	5.7	\$340,000	\$59,700
342		32	Australia	Bendigo, VIC	5.7	\$335,000	\$58,300
356	75	36	Australia	Brisbane, QLD	6.2	\$495,000	\$79,400
204		7	Australia	Bunbury, WA	4.0	\$340,000	\$84,300
337		31	Australia	Bundaberg, QLD	5.6	\$270,800	\$48,200
350		34	Australia	Cairns, QLD	5.9	\$395,000	\$66,500
356		36	Australia	Canberra, ACT	6.2	\$661,900	\$106,400
380		46	Australia	Coff's Harbour, NSW	7.9	\$430,000	\$54,600
285		17	Australia	Darwin, NT	4.8	\$550,000	\$114,900
292		18	Australia	Devonport, TAS	4.9	\$240,000	\$48,500
321		24	Australia	Dubbo, NSW	5.3	\$345,000	\$65,600
366		42	Australia	Fraser Coast, QLD	6.7	\$300,000	\$44,600
375		44	Australia	Geelong, VIC	7.2	\$440,000	\$61,500
275		15	Australia	Geraldton, WA	4.7	\$345,000	\$73,700
64		4	Australia	Gladstone, QLD	2.8	\$275,000	\$98,600
388		48	Australia	Gold Coast, QLD	9.0	\$579,000	\$64,300
377		45	Australia	Hawkesbury, NSW	7.4	\$620,000	\$84,200
328		26	Australia	Hobart, TAS	5.5	\$338,700	\$61,200
45		3	Australia	Kalgoorlie, WA	2.6	\$312,000	\$118,100
5		1	Australia	Karratha, WA	2.1	\$363,000	\$171,900
239		12	Australia	Latrobe, VIC	4.2	\$233,000	\$55,300
312		22	Australia	Launceston, TAS	5.1	\$280,000	\$54,800
361		38	Australia	Lismore, NSW	6.4	\$335,000	\$52,500
138		5	Australia	Mackay, QLD	3.5	\$319,800	\$90,300
367		43	Australia	Mandurah, WA	6.8	\$402,000	\$59,400
396	87	51	Australia	Melbourne, VIC	9.5	\$740,000	\$78,200
300		21	Australia	Mildura, VIC	5.0	\$257,000	\$51,800
254		14	Australia	Mount Gambier, SA	4.4	\$244,300	\$55,400
216		8	Australia	Murray Bridge, SA	4.1	\$239,500	\$58,800
363		39	Australia	Newcastle-Maitland, NSW	6.6	\$463,900	\$70,800
292		18	Australia	Orange, NSW	4.9	\$347,000	\$70,600
354	73	35	Australia	Perth, WA	6.1	\$528,300	\$87,300
190		6	Australia	Port Augusta, SA	3.9	\$225,000	\$58,200
18		2	Australia	Port Hedland, WA	2.3	\$390,000	\$168,700
388		48	Australia	Port Macquarie, NSW	9.0	\$459,000	\$50,900
216		8	Australia	Rockhampton, QLD	4.1	\$287,000	\$69,700
275		15	Australia	Shepparton, VIC	4.7	\$268,000	\$56,800
388		48	Australia	Sunshine Coast, QLD	9.0	\$520,000	\$57,800
405	91	54	Australia	Sydney, NSW	12.2	\$1,077,000	\$88,000
328		26	Australia	Tamworth, NSW	5.5	\$325,000	\$59,500



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
328		26	Australia	Toowoomba, QLD	5.5	\$330,000	\$60,100
216		8	Australia	Townsville, QLD	4.1	\$330,000	\$79,900
398		52	Australia	Tweed Heads, NSW	9.7	\$490,000	\$50,300
292		18	Australia	Wagga Wagga, NSW	4.9	\$340,000	\$69,400
323		25	Australia	Warrnambul, VIC	5.4	\$325,000	\$60,300
216		8	Australia	Whyalla, SA	4.1	\$227,000	\$55,700
400		53	Australia	Wingcaribbee, NSW	9.8	\$650,000	\$66,500
386		47	Australia	Wollongong, NSW	8.9	\$601,800	\$67,700
				Median Market	5.5		
300		32	Canada	Barrie, ON	5.0	\$401,900	\$80,300
292		31	Canada	Brantford, ON	4.9	\$332,000	\$67,700
272	56	28	Canada	Calgary, AB	4.6	\$427,700	\$93,100
45		5	Canada	Charlottetown, PEI	2.6	\$174,700	\$67,500
216	38	24	Canada	Edmonton, AB	4.1	\$356,000	\$87,000
369		37	Canada	Fraser Valley	7.0	\$545,400	\$78,200
15		2	Canada	Fredericton, NB	2.2	\$151,000	\$68,800
275		29	Canada	Guelph, ON	4.7	\$400,300	\$85,300
190		20	Canada	Halifax, NS	3.9	\$270,000	\$68,700
342		35	Canada	Hamilton, ON	5.7	\$426,200	\$74,400
361		36	Canada	Kelowna, BC	6.4	\$450,600	\$70,100
190		20	Canada	Kingston, ON	3.9	\$272,900	\$69,800
216		24	Canada	Kitchener, ON	4.1	\$333,400	\$82,100
162		15	Canada	Lethbridge, AB	3.7	\$262,400	\$70,200
176		18	Canada	London, ON	3.8	\$249,400	\$66,400
138		12	Canada	Medicine Hat, AB	3.5	\$246,900	\$70,600
5		1	Canada	Moncton, NB	2.1	\$134,900	\$65,200
285	59	30	Canada	Montréal, QC	4.8	\$284,700	\$59,500
91		9	Canada	Moose Jaw, SK	3.0	\$187,700	\$62,000
99		11	Canada	North Bay, ON	3.1	\$212,200	\$68,200
312		34	Canada	Oshawa, ON	5.1	\$469,700	\$91,700
190	29	20	Canada	Ottawa-Gatineau, ON-QC	3.9	\$315,300	\$81,800
300		32	Canada	Peterborough, ON	5.0	\$331,300	\$66,200
148		13	Canada	Québec, QC	3.6	\$234,100	\$65,300
162		15	Canada	Red Deer, AB	3.7	\$292,800	\$80,200
148		13	Canada	Regina, SK	3.6	\$284,800	\$79,600
33		4	Canada	Saguenay, QC	2.5	\$170,000	\$66,700
24		3	Canada	Saint John, NB	2.4	\$161,900	\$68,000
264		27	Canada	Saskatoon, SK	4.5	\$345,000	\$77,000
239		26	Canada	Sherbrooke, QC	4.2	\$223,500	\$52,800
190		20	Canada	St. Catharine's-Niagara, ON	3.9	\$242,500	\$62,900
176		18	Canada	St. John's, NL	3.8	\$274,900	\$72,900
77		8	Canada	Sudbury, ON	2.9	\$221,600	\$77,100
91		9	Canada	Thunder Bay, ON	3.0	\$207,500	\$69,600
378	80	38	Canada	Toronto, ON	7.7	\$615,800	\$79,700
45		5	Canada	Trois-Rivières, QC	2.6	\$148,300	\$56,400



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
404	90	40	Canada	Vancouver, BC	11.8	\$830,100	\$70,500
381		39	Canada	Victoria, BC	8.1	\$542,400	\$67,300
55		7	Canada	Windsor, ON	2.7	\$187,100	\$68,800
162		15	Canada	Winnipeg, MB	3.7	\$257,400	\$69,800
				Median Market	3.9		
406	92	1	China	Hong Kong	18.1	\$5,422,000	\$300,000
138		4	Ireland	Cork	3.5	€185,000	€53,500
275	57	5	Ireland	Dublin	4.7	€276,000	€58,400
130		3	Ireland	Galway	3.4	€170,000	€49,600
18		1	Ireland	Limerick	2.3	€128,300	€55,900
45		2	Ireland	Waterford	2.6	€125,000	€48,100
				Median Market	3.4		
275	57	2	Japan	Tokyo-Yokohama*	4.7	¥31,620,000	¥6,760,000
130	18	1	Japan	Osaka-Kobe-Kyoto*	3.4	¥20,110,000	¥5,920,000
				Median Market*	4.1		
401	89	8	N.Z.	Auckland	10.0	\$830,800	\$83,000
350		5	N.Z.	Christchurch	5.9	\$435,300	\$73,900
323		2	N.Z.	Dunedin	5.4	\$322,000	\$59,700
356		6	N.Z.	Hamilton-Waikato	6.2	\$444,900	\$72,100
342		3	N.Z.	Napier-Hastings	5.7	\$340,500	\$59,300
275		1	N.Z.	Palmerston North-Manawatu	4.7	\$255,800	\$54,900
398		7	N.Z.	Tauranga-Western Bay of Plenty	9.7	\$591,900	\$61,200
348		4	N.Z.	Wellington	5.8	\$463,700	\$79,600
				Median Market	5.9		
285	59	1	Singapore	Singapore	4.8	\$412,500	\$85,400
272		16	U.K.	Aberdeen	4.6	£182,500	£40,100
204		3	U.K.	Belfast	4.0	£133,600	£33,800
285	59	18	U.K.	Birmingham & West Midlands	4.8	£154,000	£32,400
216	38	5	U.K.	Blackpool & Lancashire	4.1	£131,100	£32,100
386	83	33	U.K.	Bournemouth & Dorset	8.9	£265,000	£29,900
356	75	28	U.K.	Bristol-Bath	6.2	£255,000	£41,200
300		21	U.K.	Cardiff	5.0	£152,000	£30,300
216	38	5	U.K.	Derby & Derbyshire	4.1	£150,000	£36,300
216		5	U.K.	Dundee	4.1	£133,300	£32,700
254	51	13	U.K.	Edinburgh	4.4	£169,100	£38,700
148		1	U.K.	Falkirk	3.6	£115,500	£32,300
204	34	3	U.K.	Glasgow	4.0	£131,800	£32,600
245	47	9	U.K.	Hull & Humber	4.3	£145,000	£33,900
176	26	2	U.K.	Leeds & West Yorkshire	3.8	£145,000	£37,900
300	63	21	U.K.	Leicester & Leicestershire	5.0	£175,000	£35,200



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
312	64	23	U.K.	Liverpool & Merseyside	5.1	£137,500	£27,200
383	81	32	U.K.	London (Greater London Authority)	8.5	£440,000	£51,800
372	78	30	U.K.	London Exurbs (E & SE England)	7.1	£285,000	£40,400
264	53	14	U.K.	Manchester & Greater Manchester	4.5	£145,000	£32,500
216	38	5	U.K.	Middlesbrough & Durham	4.1	£117,300	£28,400
245	47	9	U.K.	Newcastle & Tyneside	4.3	£133,000	£30,700
272		16	U.K.	Newport	4.6	£158,000	£34,200
312		23	U.K.	Northampton & Northamptonshire	5.1	£190,000	£37,400
245	47	9	U.K.	Nottingham & Nottinghamshire	4.3	£149,500	£34,400
264		14	U.K.	Perth	4.5	£166,500	£37,400
372	78	30	U.K.	Plymouth & Devon	7.1	£215,000	£30,400
245	47	9	U.K.	Sheffield & South Yorkshire	4.3	£128,000	£30,000
285	59	18	U.K.	Stoke on Trent & Staffordshire	4.8	£154,500	£31,900
292		20	U.K.	Swansea	4.9	£127,000	£25,900
368		29	U.K.	Swindon & Wiltshire	6.9	£230,000	£33,200
348		27	U.K.	Telford & Shropshire	5.8	£183,000	£31,500
312	64	23	U.K.	Warrington & Cheshire	5.1	£185,000	£36,200
337		26	U.K.	Warwickshire	5.6	£226,500	£40,800
				Median Market	4.6		
116		99	U.S.	Abilene, TX	3.3	\$157,500	\$48,400
33		27	U.S.	Akron, OH	2.5	\$131,500	\$52,700
116		99	U.S.	Albany, NY	3.3	\$212,100	\$64,400
162		137	U.S.	Albany, OR	3.7	\$180,000	\$48,500
190		159	U.S.	Albuquerque, NM	3.9	\$193,800	\$50,000
99		83	U.S.	Allentown, PA	3.1	\$194,400	\$62,000
99		83	U.S.	Amarillo, TX	3.1	\$161,700	\$52,800
162		137	U.S.	Anchorage, AK	3.7	\$293,000	\$79,900
190		159	U.S.	Ann Arbor, MI	3.9	\$247,100	\$63,300
33		27	U.S.	Appleton, WI	2.5	\$156,900	\$62,500
292		217	U.S.	Asheville, NC	4.9	\$226,000	\$45,800
99	12	83	U.S.	Atlanta, GA	3.1	\$191,500	\$61,500
138		119	U.S.	Atlantic City, NJ	3.5	\$195,200	\$55,200
216	38	177	U.S.	Austin, TX	4.1	\$284,000	\$68,600
216		177	U.S.	Bakersfield, CA	4.1	\$215,000	\$52,400
148	21	126	U.S.	Baltimore, MD	3.6	\$264,300	\$74,100
337		238	U.S.	Barnstable Town, MA	5.6	\$375,200	\$67,500
138		119	U.S.	Baton Rouge, LA	3.5	\$193,400	\$55,900
45		38	U.S.	Battle Creek, MI	2.6	\$116,000	\$44,000
2		2	U.S.	Bay City, MI	1.9	\$91,000	\$47,500
77		64	U.S.	Beaumont, TX	2.9	\$145,200	\$50,800
300		220	U.S.	Bellingham, WA	5.0	\$280,000	\$56,200
321		230	U.S.	Bend, OR	5.3	\$310,000	\$58,600
15		13	U.S.	Binghamton, NY	2.2	\$111,900	\$50,400
148	21	126	U.S.	Birmingham, AL	3.6	\$187,300	\$52,600
176		148	U.S.	Bismarck, ND	3.8	\$251,000	\$66,600



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
24		19	U.S.	Bloomington, IL	2.4	\$158,300	\$65,200
190		159	U.S.	Boise, ID	3.9	\$209,000	\$53,000
323	67	231	U.S.	Boston, MA-NH	5.4	\$435,300	\$80,500
369		247	U.S.	Boulder, CO	7.0	\$515,200	\$73,500
216		177	U.S.	Bremerton, WA	4.1	\$275,000	\$67,500
254		198	U.S.	Bridgeport, CT	4.4	\$387,100	\$88,200
162		137	U.S.	Brownsville, TX	3.7	\$129,000	\$34,800
45	2	38	U.S.	Buffalo, NY	2.6	\$138,900	\$52,900
245		194	U.S.	Burlington, VT	4.3	\$296,000	\$68,200
33		27	U.S.	Canton, OH	2.5	\$125,000	\$50,400
254		198	U.S.	Cape Coral, FL	4.4	\$225,000	\$51,700
33		27	U.S.	Carbondale, IL	2.5	\$110,000	\$43,200
328		234	U.S.	Carson City, NV	5.5	\$239,000	\$43,100
64		52	U.S.	Cedar Rapids, IA	2.8	\$166,700	\$59,200
64		52	U.S.	Champaign, IL	2.8	\$146,700	\$52,700
254		198	U.S.	Charleston, SC	4.4	\$252,800	\$57,600
116		99	U.S.	Charleston, WV	3.3	\$141,700	\$43,400
190	29	159	U.S.	Charlotte, NC-SC	3.9	\$215,900	\$56,000
148		126	U.S.	Charlottesville, VA	3.6	\$235,000	\$65,300
138		119	U.S.	Chattanooga, TN-GA	3.5	\$170,100	\$48,800
176	26	148	U.S.	Chicago, IL	3.8	\$244,100	\$64,500
350		243	U.S.	Chico, CA	5.9	\$275,000	\$46,600
55	3	44	U.S.	Cincinnati, OH-KY-IN	2.7	\$157,000	\$58,000
55	3	44	U.S.	Cleveland, OH	2.7	\$138,900	\$52,100
245		194	U.S.	College Station, TX	4.3	\$205,000	\$47,300
245		194	U.S.	Colorado Springs, CO	4.3	\$264,700	\$61,700
130		113	U.S.	Columbia, MO	3.4	\$173,400	\$51,600
112		95	U.S.	Columbia, SC	3.2	\$165,900	\$52,500
99	12	83	U.S.	Columbus, OH	3.1	\$181,600	\$59,400
162		137	U.S.	Corpus Christi, TX	3.7	\$189,800	\$51,300
337		238	U.S.	Corvallis, OR	5.6	\$300,000	\$54,000
18		15	U.S.	Cumberland, MD-WV	2.3	\$94,400	\$40,200
162	24	137	U.S.	Dallas-Fort Worth, TX	3.7	\$230,500	\$63,000
18		15	U.S.	Davenport, IA-IL	2.3	\$128,700	\$56,700
55		44	U.S.	Dayton, OH	2.7	\$134,100	\$50,600
204		168	U.S.	Daytona Beach, FL	4.0	\$175,000	\$44,200
77		64	U.S.	Decatur, AL	2.9	\$137,100	\$47,100
3		3	U.S.	Decatur, IL	2.0	\$99,400	\$49,100
323	67	231	U.S.	Denver, CO	5.4	\$386,800	\$71,800
99		83	U.S.	Des Moines, IA	3.1	\$193,100	\$63,300
91	8	77	U.S.	Detroit, MI	3.0	\$163,500	\$54,800
130		113	U.S.	Dover, DE	3.4	\$200,000	\$58,000
64		52	U.S.	Duluth, MN	2.8	\$147,000	\$51,600
254		198	U.S.	Durham, NC	4.4	\$244,400	\$55,300
5		5	U.S.	East Stroudsburg, PA	2.1	\$123,000	\$58,500
275		211	U.S.	El Centro, CA	4.7	\$196,000	\$41,700



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
130		113	U.S.	El Paso, TX	3.4	\$151,200	\$44,600
55		44	U.S.	Elizabethtown, KY	2.7	\$135,000	\$50,000
77		64	U.S.	Elkhart, IN	2.9	\$149,000	\$50,600
3		3	U.S.	Elmira, NY	2.0	\$109,400	\$54,200
45		38	U.S.	Erie, PA	2.6	\$127,400	\$48,400
300		220	U.S.	Eugene, OR	5.0	\$240,100	\$48,300
369		247	U.S.	Eureka, CA	7.0	\$290,000	\$41,300
33		27	U.S.	Evansville, IN	2.5	\$125,000	\$49,700
112		95	U.S.	Fairbanks, AK	3.2	\$236,000	\$74,500
148		126	U.S.	Fargo, ND-MN	3.6	\$204,100	\$57,200
148		126	U.S.	Farmington, NM	3.6	\$180,600	\$50,700
138		119	U.S.	Fayetteville, AR-MO	3.5	\$180,100	\$51,900
176		148	U.S.	Fayetteville, NC	3.8	\$162,100	\$42,800
292		217	U.S.	Flagstaff, AZ	4.9	\$265,000	\$54,300
64		52	U.S.	Flint, MI	2.8	\$126,000	\$45,000
148		126	U.S.	Florence, SC	3.6	\$138,800	\$38,900
312		227	U.S.	Fort Collins, CO	5.1	\$335,000	\$66,300
275		211	U.S.	Fort Walton Beach, FL	4.7	\$254,500	\$54,600
264		206	U.S.	Fresno, CA	4.5	\$215,000	\$47,900
33		27	U.S.	Ft. Wayne, IN	2.5	\$127,700	\$51,900
204		168	U.S.	Gainesville, FL	4.0	\$193,300	\$47,900
64		52	U.S.	Gainesville, GA	2.8	\$155,000	\$56,200
99		83	U.S.	Glens Falls, NY	3.1	\$172,300	\$56,400
91	8	77	U.S.	Grand Rapids, MI	3.0	\$170,100	\$56,600
176		148	U.S.	Great Falls, MT	3.8	\$177,000	\$46,600
216		177	U.S.	Greeley, CO	4.1	\$294,000	\$71,700
64		52	U.S.	Green Bay, WI	2.8	\$157,100	\$56,000
116		99	U.S.	Greensboro, NC	3.3	\$155,000	\$46,700
190		159	U.S.	Greenville, SC	3.9	\$191,900	\$49,200
64		52	U.S.	Gulfport, MS	2.8	\$126,200	\$45,300
91		77	U.S.	Hagerstown, MD-WV	3.0	\$167,300	\$56,300
239		190	U.S.	Hanford, CA	4.2	\$197,000	\$46,700
64		52	U.S.	Harrisburg, PA	2.8	\$164,800	\$59,400
116	15	99	U.S.	Hartford, CT	3.3	\$241,200	\$73,800
320		229	U.S.	Hilo, HI	5.2	\$316,200	\$61,300
254		198	U.S.	Hilton Head, SC	4.4	\$251,000	\$57,100
24		19	U.S.	Homosassa Springs, FL	2.4	\$100,000	\$41,100
395	86	259	U.S.	Honolulu, HI	9.4	\$745,300	\$78,900
138	19	119	U.S.	Houston, TX	3.5	\$217,400	\$62,800
99		83	U.S.	Huntsville, AL	3.1	\$183,900	\$59,000
91	8	77	U.S.	Indianapolis, IN	3.0	\$164,100	\$55,500
162		137	U.S.	Ithaca, NY	3.7	\$219,000	\$59,300
162		137	U.S.	Jackson, MS	3.7	\$176,500	\$47,700
204	34	168	U.S.	Jacksonville, FL	4.0	\$219,000	\$54,300
372		249	U.S.	Kahului (Maui), HI	7.1	\$510,000	\$72,000
64		52	U.S.	Kalamazoo, MI	2.8	\$145,000	\$52,300



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
24		19	U.S.	Kankakee, IL	2.4	\$129,700	\$55,000
91	8	77	U.S.	Kansas City, MO-KS	3.0	\$188,000	\$61,800
376		250	U.S.	Kapaa (Maui), HI	7.3	\$577,800	\$78,800
148		126	U.S.	Kennewick, WA	3.6	\$224,900	\$62,700
99		83	U.S.	Killeen, TX	3.1	\$152,000	\$49,600
130		113	U.S.	Kingston, NY	3.4	\$205,200	\$61,000
130		113	U.S.	Knoxville, TN	3.4	\$169,600	\$49,400
148		126	U.S.	Lake Havasu City, AZ	3.6	\$151,000	\$41,800
162		137	U.S.	Lakeland, FL	3.7	\$167,000	\$45,000
99		83	U.S.	Lancaster, PA	3.1	\$185,000	\$60,500
45		38	U.S.	Lansing, MI	2.6	\$138,300	\$52,900
176		148	U.S.	Laredo, TX	3.8	\$155,000	\$40,600
264	53	206	U.S.	Las Vegas, NV	4.5	\$236,400	\$52,600
77		64	U.S.	Lexington, KY	2.9	\$157,300	\$54,200
5		5	U.S.	Lima, OH	2.1	\$110,000	\$51,400
112		95	U.S.	Lincoln, NE	3.2	\$174,500	\$55,100
64		52	U.S.	Little Rock, AR	2.8	\$138,600	\$50,100
394	85	258	U.S.	Los Angeles, CA	9.3	\$593,900	\$63,900
112	14	95	U.S.	Louisville, KY-IN	3.2	\$171,800	\$54,000
300		220	U.S.	Madera, CA	5.0	\$240,000	\$48,200
190		159	U.S.	Madison, WI	3.9	\$254,700	\$65,500
148		126	U.S.	Manchester, NH	3.6	\$271,500	\$75,900
24		19	U.S.	Mansfield, OH	2.4	\$110,000	\$46,100
116		99	U.S.	McAllen, TX	3.3	\$120,000	\$36,500
328		234	U.S.	Medford, OR	5.5	\$246,000	\$44,900
116	15	99	U.S.	Memphis, TN-MS-AR	3.3	\$161,900	\$49,600
300		220	U.S.	Merced, CA	5.0	\$214,000	\$42,900
354	73	245	U.S.	Miami, FL	6.1	\$315,000	\$51,500
176		148	U.S.	Midland, TX	3.8	\$229,000	\$60,500
216	38	177	U.S.	Milwaukee, WI	4.1	\$238,000	\$57,400
116	15	99	U.S.	Minneapolis-St. Paul, MN-WI	3.3	\$240,300	\$72,500
99		83	U.S.	Mobile, AL	3.1	\$135,400	\$43,600
300		220	U.S.	Modesto, CA	5.0	\$270,000	\$53,500
45		38	U.S.	Monroe, MI	2.6	\$145,000	\$55,500
77		64	U.S.	Montgomery, AL	2.9	\$133,700	\$46,600
254		198	U.S.	Mount Vernon, WA	4.4	\$259,000	\$58,300
33		27	U.S.	Muskegon, MI	2.5	\$120,000	\$48,500
216		177	U.S.	Myrtle Beach, SC	4.1	\$198,000	\$48,400
382		252	U.S.	Napa, CA	8.4	\$650,000	\$77,100
356		246	U.S.	Naples, FL	6.2	\$395,000	\$63,400
190	29	159	U.S.	Nashville, TN	3.9	\$230,000	\$59,200
148		126	U.S.	New Haven, CT	3.6	\$229,600	\$63,100
77		64	U.S.	New London, CT	2.9	\$191,600	\$67,200
190	29	159	U.S.	New Orleans, LA	3.9	\$191,300	\$49,400
342	72	241	U.S.	New York, NY-NJ-PA	5.7	\$397,600	\$70,200
116		99	U.S.	Ocala, FL	3.3	\$135,000	\$40,900



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
300		220	U.S.	Ocean City, NJ	5.0	\$290,000	\$58,300
33		27	U.S.	Odessa, TX	2.5	\$169,000	\$66,800
116		99	U.S.	Ogden, UT	3.3	\$220,000	\$66,900
77	6	64	U.S.	Oklahoma City, OK	2.9	\$154,800	\$53,300
216		177	U.S.	Olympia, WA	4.1	\$259,000	\$63,500
64		52	U.S.	Omaha, NE-IA	2.8	\$175,100	\$62,300
254	51	198	U.S.	Orlando, FL	4.4	\$229,900	\$52,200
33		27	U.S.	Oshkosh, WI	2.5	\$134,300	\$53,200
378		251	U.S.	Oxnard, CA	7.7	\$629,400	\$81,700
176		148	U.S.	Palm Bay, FL	3.8	\$197,000	\$51,500
204		168	U.S.	Panama City, FL	4.0	\$195,000	\$49,100
116		99	U.S.	Pensacola, FL	3.3	\$172,000	\$51,600
5		5	U.S.	Peoria, IL	2.1	\$123,100	\$57,500
138	19	119	U.S.	Philadelphia, PA-NJ-DE-MD	3.5	\$234,800	\$66,500
216	38	177	U.S.	Phoenix, AZ	4.1	\$235,300	\$56,700
55	3	44	U.S.	Pittsburgh, PA	2.7	\$150,000	\$55,200
204		168	U.S.	Pittsfield, MA	4.0	\$207,800	\$51,800
239		190	U.S.	Port St. Lucie, FL	4.2	\$205,000	\$49,000
216		177	U.S.	Portland, ME	4.1	\$260,800	\$63,400
328	69	234	U.S.	Portland, OR-WA	5.5	\$358,500	\$65,200
275		211	U.S.	Prescott, AZ	4.7	\$230,000	\$49,100
264	53	206	U.S.	Providence, RI-MA	4.5	\$273,700	\$60,200
216		177	U.S.	Provo, UT	4.1	\$273,000	\$66,500
216		177	U.S.	Punta Gorda, FL	4.1	\$189,300	\$46,500
1		1	U.S.	Racine, WI	1.8	\$104,000	\$58,400
162	24	137	U.S.	Raleigh, NC	3.7	\$250,200	\$67,200
64		52	U.S.	Reading, PA	2.8	\$162,100	\$57,300
300		220	U.S.	Redding, CA	5.0	\$239,000	\$47,700
323		231	U.S.	Reno, NV	5.4	\$314,400	\$57,800
190	29	159	U.S.	Richmond, VA	3.9	\$239,800	\$62,000
337	71	238	U.S.	Riverside-San Bernardino, CA	5.6	\$319,000	\$57,300
55		44	U.S.	Roanoke, VA	2.7	\$139,000	\$51,600
77		64	U.S.	Rochester, MN	2.9	\$193,000	\$67,000
33	1	27	U.S.	Rochester, NY	2.5	\$139,300	\$54,800
5		5	U.S.	Rockford, IL	2.1	\$111,900	\$52,100
312	64	227	U.S.	Sacramento, CA	5.1	\$327,000	\$64,100
18		15	U.S.	Saginaw, MI	2.3	\$100,000	\$44,300
77	6	64	U.S.	Saint Louis, MO-IL	2.9	\$170,000	\$57,700
264		206	U.S.	Salem, OR	4.5	\$240,700	\$53,600
392		256	U.S.	Salinas-Monterey, CA	9.2	\$566,500	\$61,800
176		148	U.S.	Salisbury, MD	3.8	\$209,000	\$55,400
204	34	168	U.S.	Salt Lake City, UT	4.0	\$271,800	\$67,200
176	26	148	U.S.	San Antonio, TX	3.8	\$212,300	\$56,300
384	82	253	U.S.	San Diego, CA	8.6	\$589,300	\$68,700
392	84	256	U.S.	San Francisco, CA	9.2	\$835,400	\$90,400
397	88	260	U.S.	San Jose, CA	9.6	\$1,000,000	\$104,100



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
388		255	U.S.	San Luis Obispo, CA	9.0	\$574,800	\$64,000
402		261	U.S.	Santa Barbara, CA	11.3	\$732,500	\$65,000
403		262	U.S.	Santa Cruz, CA	11.6	\$774,500	\$66,500
292		217	U.S.	Santa Fe, NM	4.9	\$281,000	\$56,900
385		254	U.S.	Santa Rosa, CA	8.7	\$590,000	\$68,100
275		211	U.S.	Sarasota, FL	4.7	\$259,000	\$54,800
5		5	U.S.	Scranton-Wilkes Barre, PA	2.1	\$109,000	\$50,700
328	69	234	U.S.	Seattle, WA	5.5	\$422,100	\$76,900
116		99	U.S.	Sherman, TX	3.3	\$160,000	\$49,100
176		148	U.S.	Shreveport, LA	3.8	\$170,000	\$44,200
77		64	U.S.	Sierra Vista, AZ	2.9	\$128,000	\$44,200
77		64	U.S.	Sioux City, IA, NE, SD	2.9	\$154,000	\$53,800
99		83	U.S.	Sioux Falls, SD	3.1	\$192,300	\$61,100
55		44	U.S.	South Bend, IN	2.7	\$128,500	\$48,200
138		119	U.S.	Spartanburg, SC	3.5	\$155,900	\$45,000
254		198	U.S.	Spokane, WA	4.4	\$214,400	\$48,600
18		15	U.S.	Springfield, IL	2.3	\$135,800	\$59,100
176		148	U.S.	Springfield, MA	3.8	\$209,700	\$54,500
77		64	U.S.	Springfield, MO	2.9	\$132,000	\$45,700
5		5	U.S.	Springfield, OH	2.1	\$102,000	\$49,000
239		190	U.S.	St. George, UT	4.2	\$236,000	\$56,100
350		243	U.S.	Stockton, CA	5.9	\$322,000	\$54,800
24		19	U.S.	Syracuse, NY	2.4	\$137,000	\$57,600
245		194	U.S.	Tallahassee, FL	4.3	\$193,900	\$45,200
216	38	177	U.S.	Tampa-St. Petersburg, FL	4.1	\$205,000	\$49,900
5		5	U.S.	Terre Haute, IN	2.1	\$88,000	\$41,800
264		206	U.S.	The Villages, FL	4.5	\$235,000	\$52,400
33		27	U.S.	Toledo, OH	2.5	\$119,800	\$48,100
24		19	U.S.	Topeka, KS	2.4	\$127,100	\$52,800
162		137	U.S.	Trenton, NJ	3.7	\$276,900	\$74,000
204	34	168	U.S.	Tucson, AZ	4.0	\$193,300	\$48,100
91		77	U.S.	Tulsa, OK	3.0	\$156,500	\$52,400
130		113	U.S.	Tyler, TX	3.4	\$168,000	\$50,100
15		13	U.S.	Utica, NY	2.2	\$110,000	\$50,000
342		241	U.S.	Vallejo, CA	5.7	\$389,500	\$68,900
204		168	U.S.	Vero Beach, FL	4.0	\$200,000	\$50,400
148	21	126	U.S.	Virginia Beach-Norfolk, VA-NC	3.6	\$220,000	\$61,400
285		215	U.S.	Visalia, CA	4.8	\$210,000	\$43,300
116		99	U.S.	Waco, TX	3.3	\$154,000	\$47,300
216	38	177	U.S.	Washington, DC-VA-MD-WV	4.1	\$393,500	\$95,300
24		19	U.S.	Waterloo, IA	2.4	\$127,400	\$53,400
24		19	U.S.	Wheeling, WV	2.4	\$115,000	\$48,700
55		44	U.S.	Wichita Falls, TX	2.7	\$127,000	\$46,600
45		38	U.S.	Wichita, KS	2.6	\$135,700	\$52,700
239		190	U.S.	Wilmington, NC	4.2	\$226,700	\$53,800
116		99	U.S.	Winston-Salem, NC	3.3	\$151,500	\$46,100



SCHEDULE 4
ALL HOUSING MARKETS BY GEOGRAPHY
 Median Multiple (Median House Price/Median Household Income): 2016 – 3rd Quarter
Demographia International Housing Affordability Survey

International Affordability Rank	Major Market Rank	National Rank	Nation	Housing market	Median Multiple*	Median Price	Median Household Income
162		137	U.S.	Worcester, MA	3.7	\$249,600	\$66,800
204		168	U.S.	Yakima, WA	4.0	\$192,200	\$48,200
77		64	U.S.	York, PA	2.9	\$170,900	\$59,600
5		5	U.S.	Youngstown, OH-PA	2.1	\$90,300	\$44,000
285		215	U.S.	Yuba City, CA	4.8	\$250,000	\$52,300
99		83	U.S.	Yuma, AZ	3.1	\$127,000	\$41,400
				Median Market	3.6		

Financial data in local currency.
 *Average Multiple (Japan)



ANNEX: USES, METHODS AND SOURCES

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 --- housing affordability for average households.

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, which for example, in the New York metropolitan area includes more than 20 counties in the states of New York, New Jersey and Pennsylvania⁸⁷ (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 *13th 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 (the similar "Average Multiple" is used in Japan).

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 geographies covered. 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 abnormally small by New World standards in the United Kingdom and Hong Kong.⁸⁸

Methods: Median house price information is obtained from leading metropolitan reporting agencies and includes the housing stock as reported upon. Where only average house prices are available, median house prices are estimated from historic conversion factors, except in Japan. The principal sources are real estate time series that have become established as authoritative, national sales transaction registries and other government sources.

Median household income data is estimated for each housing markets using national census data or other national surveys. The income base is then adjusted to account for changes to produce an up-

⁸⁷ As defined by the United States Bureau of Management and the Budget.

⁸⁸ See [2nd Annual Demographia International Housing Affordability Survey](#), Pages 16-18.



to-date estimate, 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. Comparisons should be generally limited to the housing affordability rating categories of "affordable," moderately unaffordable," "seriously unaffordable" and "severely unaffordable."⁸⁹

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
City Wire (Arkansas)
Communities and Local Government (Ministry), United Kingdom
Conference Board of Canada
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
Hawaii Information Service
Housing and Development Board (Singapore)
Housing Industry Association (Australia)
Ireland Environment, Heritage and Local Government
Japan Statistics Bureau
John Burns Real Estate Consulting
The Land Institute of Japan
Land Registry of England and Wales
The Land Registry (Hong Kong)

⁸⁹ Demographia attempts to use the most reliable available data at the time of report preparation. This necessitates adopting more representative sources as they become available, including new sources and updates.



National Association of Home Builders (USA)
 National Association of Realtors (USA)
 National Statistics (United Kingdom)
 Northern Ireland Research and Statistics Agency
 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
 Residential Property Price Register of the Property Services Regulatory Authority (Ireland)
 RP Data (realestate.com.au)
 Singapore Department of Statistics
 Singapore Real Estate Exchange (SRX)
 Statistics Canada
 Statistics New Zealand
 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
 Wells Fargo Bank
 Zillow.com

Expanded Notes on Selected Figures:

Figure 1: House Price-to-income Ratios: Reserve Bank of Australia data. Figure courtesy of Frontier Centre for Public Policy (<https://www.fcpp.org/posts/housing-affordability-and-the-standard-of-living-in-toronto>)

Figure 3: Housing Affordability & Land Regulation: In the United States, more restrictive regulation markets (Table 1) include 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 other U.S. metropolitan areas to have urban containment policy or other policies that have similar effects (New York, Boston, Chicago, Minneapolis-St. Paul,



Washington and Honolulu). Outside the United States, more restrictively regulated markets are identified based upon the extent of their use of urban containment strategies (significant restriction or prohibition of urban fringe development). This includes all markets in the United Kingdom (principally under the Town and Country Planning Act), Ireland (under the National Spatial Strategy), Hong Kong and all of the markets of Australia and New Zealand. In Canada, urban containment policy has been adopted in Toronto, Montréal, Vancouver, Ottawa and Calgary. Markets not classified as more restrictively regulated are classified as liberal (see Table 3).

Table 13 Housing Market Selection Criteria	
Nation	Markets Included (Where Sufficient Data is Available)
Australia	Housing markets corresponding to urban centres over 50,000 population & Pilbara housing markets
Canada	Housing markets over 75,000 population
China	Hong Kong
Ireland	Housing markets over 50,000 population
Japan	Two largest markets (only markets available)
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 75,000 population
Selected additional markets. Housing markets are metropolitan areas (labour market areas) or their equivalent.	

Footer Illustrations: New Houses (Left to Right):
 Suburban Kansas City, United States
 Suburban Montréal, Canada
 East of England (London Exurbs), United Kingdom
 Suburban Tseung Kwan O (Hong Kong)
 Suburban Dublin, Ireland
 Suburban Auckland, New Zealand
 Suburban Adelaide, Australia



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 headquarters), senior fellow for housing affordability and municipal policy at the [Frontier Centre for Public Policy](#) in Canada (Winnipeg headquarters) 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 a contributing editor at [newgeography.com](#) and author of the *Evolving Urban Form* series, which provides development profiles of individual world urban areas. Among his most recent policy reports were *A Question of Values: Urban Containment Policy and Middle-Income Housing Affordability and Canada's Middle-Income Housing Affordability Crisis*, 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, *Improving the Competitiveness of Metropolitan Areas* for the Frontier Centre for Public Policy *Evaluation of Plan Bay Area* for the Pacific Research Institute and a "framing essay" entitled *Toward More Prosperous Cities*.

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 three internet web sites, including [demographia.com](#), [www.publicpurpose.com](#) and [www.rentalcartours.net](#). The [www.publicpurpose.com](#) website has been twice honored by the *National Journal* as one of the nation's top internet transport sites. He is also author of the *Demographia Residential Land and Regulation Cost Index*.



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” (6.1 Median Multiple) Christchurch, New Zealand, which since 4 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*.

DEMOGRAPHIA

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