

# DEMOGRAPHIA INTERNATIONAL HOUSING AFFORDABILITY

2022 EDITION

*Presented by the Urban Reform Institute and the Frontier Centre for Public Policy*



Urban Reform Institute (URI)  
is a 501(c)(3) national think tank. URI focuses on the study  
of cities as generators of upward mobility.

For a comprehensive collection of URI  
publications and commentary, go to  
**[urbanreforminstitute.org](http://urbanreforminstitute.org)**

The Frontier Centre for Public Policy (FCPP) is an independent  
Canadian public policy think tank based in western Canada whose  
mission is to explore options for the future by undertaking research  
and education that supports economic growth and opportunity.

Our research aims to analyze current affairs and public policies  
and develop effective and meaningful ideas for good governance  
and reform. We provide a platform for public debate and engage  
with the public through our numerous publications and events.

For a comprehensive collection of FCPP  
publications and research, visit  
**[fcpp.org](http://fcpp.org)**

# TABLE OF CONTENTS

Introduction **v**

Executive Summary **1**

1 Assessing Housing Affordability **3**

2 Context: The Pandemic Demand Shock **4**

3 International Housing Affordability in 2021 **6**

4 Threat to Middle-Income Standard of Living **10**

5 Severely Unaffordable Housing:  
The Ultimate Agglomeration Diseconomy **13**

Sources and Methods **18**

## TABLES

ES-2 Housing Affordability Ratings by Nation	1
ES-1 Demographia Housing Affordability Ratings	1
1 Demographia Housing Affordability Ratings	3
2 Number of Severely Unaffordable Markets by Nation	5
3 Housing Affordability Ratings by Nation	6
4 Housing Markets Ranked by Affordability	14
5 All Housing Markets by Nation	16

## FIGURES

1 Demand Shock: Housing Affordability	5
2 Largest Housing Affordability Deterioration	5
3 International House Price-to-Income Ratios	5
4 Middle-Income Housing Affordability	6
5 Housing Affordability Range 1981-2021: Australia	7
6 Middle-Income Housing Affordability: Canada	7
7 Housing Affordability Range 1971-2021: Canada	8
8 Median House Price to Median Earnings: Wales, England & Regions	9
9 U.S. Housing Affordability by Category	9
10 Housing Affordability Range 1969-2021: U.S.	10
11 Housing Share of Excess Costs of Living: U.S.	11
12 Urban Containment Effect	12



# Introduction

The Urban Reform Institute and the Frontier Centre for Public Policy are pleased to present the 2022 edition of *Demographia International Housing Affordability*. This report provides housing affordability ratings, using the median multiple, a measurement of income in relation to housing prices, for 92 major markets (metropolitan areas) in eight nations for the third quarter of 2021.

As the pandemic and lockdowns continued into a second year, the movement of households from denser urban neighborhoods to larger homes, often with large yards (gardens) in suburban and outlying areas has continued. The result has been to drive up prices at unprecedented rates in many markets. As a result many low-income and middle-income households who already have suffered the worst consequences from housing inflation will see their standards of living further decline.

As we approached publication, there were two stark reminders of the worsening situation. The National Association of Home Builders announced that nearly 70% of US households cannot afford the median (middle) priced house, while Canada’s Parliamentary Budget Officer reported that house prices had virtually doubled in just six years.

Housing affordability is particularly critical due to the strong increase in remote working (tele-work) during the pandemic which is accelerating the movement to more affordable places. It will likely also help flatten or even reduce prices in the highest cost housing markets as other households seek less costly housing elsewhere.

We hope that the losses sustained during the pandemic will be quickly reversed and the increasing inequality attributable to higher house prices will become a thing of the past.

The author, Wendell Cox is a senior fellow at both the Frontier Centre for Public Policy and the Urban Reform Institute.



**Charles Blain**  
President  
Urban Reform Institute.  
3900 Essex Lane, Suite 1200  
Houston, Texas 77027



**Peter Holle**  
President  
Frontier Centre for Public Policy  
203-2727 Portage Avenue  
Winnipeg, Manitoba R3J 0R2

# Executive Summary

*Demographia International Housing Affordability* rates middle-income housing affordability in 92 major housing markets in eight nations (Australia, Canada, China, Ireland, New Zealand, Singapore, the United Kingdom and the United States). This edition covers the third quarter (September quarter) of 2021.

**Assessing Housing Affordability:** Sometimes housing affordability is evaluated by simply comparing house prices. However, without consideration of incomes, housing affordability cannot be assessed with any real meaning for potential buyers. Housing affordability is house prices *in relation to incomes*.

*Demographia International Housing Affordability* uses the “median multiple” to rate middle-income housing affordability (Table ES-1). The median multiple is a price-to-income ratio, which is the median house price divided by the gross median household income (pre-tax).

Table ES-1 DEMOGRAPHIA 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	

Middle-income housing affordability is rated in four categories, ranging from the most affordable (“affordable”) to the least affordable (severely affordable):

Housing markets are metropolitan areas, which are also labor markets. In a well-functioning market, the median priced house should be affordable to a large portion of middle-income households, as was overwhelmingly the case a few decades ago.

Housing affordability comparisons can be made, (1) between housing markets (such as comparison between Adelaide and Melbourne) or (2) over time within the same housing market (such between years in Adelaide).

Housing affordability in 2021 is summarized by nation in Table ES-2.

Table ES-2 Housing Affordability Ratings by Nation: Totals by Market						
Nation	Affordable (3.0 & Under)	Moderately Unaffordable (3.1-4.0)	Seriously Unaffordable (4.1-5.0)	Severely Unaffordable (5.1 & Over)	Total	Median by Nation
Australia	0	0	0	5	5	8.0
Canada	0	2	0	4	6	6.0
China: Hong Kong	0	0	0	1	1	23.2
Ireland	0	0	0	1	1	5.7
New Zealand	0	0	0	1	1	11.2
Singapore	0	0	0	1	1	5.8
United Kingdom	0	1	9	11	21	5.1
United States	1	9	19	27	56	5.0
TOTAL	1	12	28	51	92	5.2

**International Housing Affordability in 2021:** Housing affordability in 2021 is considerably worse than before, with a five times increase in markets with at median multiples of at 10.0 or more as just a decade ago.

The least affordable market is Hong Kong, with a median multiple of 23.2, followed by Sydney at 15.3, Vancouver at 13.3, San Jose at 12.6 and Melbourne at 12.1. The most affordable market is Pittsburgh, at 2.7, followed by Oklahoma City and Rochester at 3.3, with Edmonton and St. Louis at 3.6.

Housing affordability for all 92 markets is shown by median multiple in Table 4 and by nation in Table 5 (following Section 5 in the report below).

**Context: The Pandemic Demand Shock:** There has been an unprecedented deterioration in housing affordability during the pandemic. The number of severely unaffordable markets rose 60% in 2021 compared to 2019, the last pre-pandemic year.

**Lowering the Middle-Income Standard of Living:** There is a broad view that declining housing affordability is driving higher costs of living that threaten the future of the middle-class.

In *Under Pressure: The Squeezed Middle-Class*, the OECD finds that the middle-class faces ever costs of living and that rising owned house prices are the “main driver of rising middle-class expenditure.”

French economist Thomas Piketty’s analysis of growing wealth inequality also evidences the deteriorating standards of living middle-income and lower income households. In the United States more than 85% of cost of living differences between high cost and average cost metropolitan areas are due to housing costs.

Academic research associates the declining housing affordability over recent decades with stronger land use regulation. In particular, urban containment regulation can produce substantially higher costs. In *Rethinking Urban Sprawl: Moving Toward Sustainable Cities*, OECD concludes that the urban growth boundaries and greenbelts of urban containment must be accompanied by sufficient land for urban expansion to maintain affordability. This land needs to be competitively priced to keep house prices from rising disproportionately to incomes. In housing markets with the least affordable housing, urban containment policy is typical.

**Severely Unaffordable Housing: The Ultimate Agglomeration Diseconomy:** Economists have long recognized the positive agglomeration economies of urban areas. Yet, more recently, there has been a strong association between falling standards of living and the most stringent land use regulation, especially for those with middle-incomes and low-incomes. The failure to maintain housing affordability may be the ultimate agglomeration diseconomy (negative impacts of larger cities, as opposed to benefits).

*Elaboration and sources are in the report below.*

# DEMOGRAPHIA INTERNATIONAL HOUSING AFFORDABILITY: 2022 EDITION

*Demographia International Housing Affordability*<sup>1</sup> rates middle-income housing affordability in 92 major housing markets<sup>2</sup> in eight nations: Australia, Canada, China, Ireland, New Zealand, Singapore, the United Kingdom and the United States. This 2022 edition rates housing affordability for the third quarter (September quarter) of 2021.

## 1 Assessing Housing Affordability

Sometimes housing affordability is evaluated simply by comparing house prices. However, without consideration of incomes, housing affordability cannot be assessed. Housing affordability is house prices *in relation to incomes*.

*Demographia International Housing Affordability* uses the “median multiple” to rate middle-income housing affordability. The median multiple is a price-to-income ratio of the median house price divided by the gross median household income. Price-to-income ratios have been widely used, such as by the World Bank,<sup>3</sup> the

United Nations, the Organization for International Cooperation and Development (OECD), the Joint Center for Housing Studies at Harvard University and others. Median price and income measures better reflect the economic impacts on middle-income and lower-income households, as opposed to averages, which are skewed upward by the inclusion of the highest incomes and prices.

Middle-income housing affordability is rated in four categories, ranging from the most affordable (“affordable”) to the least affordable (severely affordable), as indicated in Table 1 (above).

<b>Housing Affordability Rating</b>	<b>Median Multiple</b>
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 *Demographia International Housing Affordability* provides analysis similar to the major market analysis in the 16 editions of the *Demographia International Housing Affordability Survey*, co-authored by Wendell Cox and Hugh Pavletich (2005 to 2020).

2 Major metropolitan areas have 1,000,000 or more residents.

3 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.



## The Geography of Housing Affordability

Most international housing affordability comparisons are at national level. However, these higher level housing affordability measures miss the substantial differences in housing affordability between housing markets in the same nations. For this reason, Demographia focuses at the housing market level within nations. Regrettably, much housing affordability analysis, both media and academic overlooks these differences.

A housing market is defined by the ability of residents to reach employment by daily commutes. Generally this can be defined as a maximum 60 minute one-way commute time, while average work trip times tend to be about 30 minutes in most areas. Housing markets are thus also labor markets, which are also called metropolitan areas.<sup>4</sup> In a well-functioning market, the median priced house should be affordable to middle-income households. Such affordability was the reality in nearly all markets included in this report.

Housing affordability comparisons can be made, (1) between housing markets (such as comparison between Adelaide and Melbourne) or (2) over time within the same housing market (such between years in Adelaide).

## 2 Context: The Pandemic Demand Shock

There has been an unprecedented deterioration in housing affordability. The driving factor has been the result of the pandemic and its related demand shock. According to Sam Khater, chief economist at the US Federal Home Loan Mortgage Corporation (Freddie Mac) characterized “the effect of the Covid-19 pandemic” as “unusual in that it spurred housing demand because higher-income households who were able to work from home wanted more space and were willing to live farther from their offices. At the same time, the pandemic caused supply-chain bottlenecks and permitting delays that slowed new-home construction.” The pandemic continues to disrupt standards of living, housing markets and national economies.

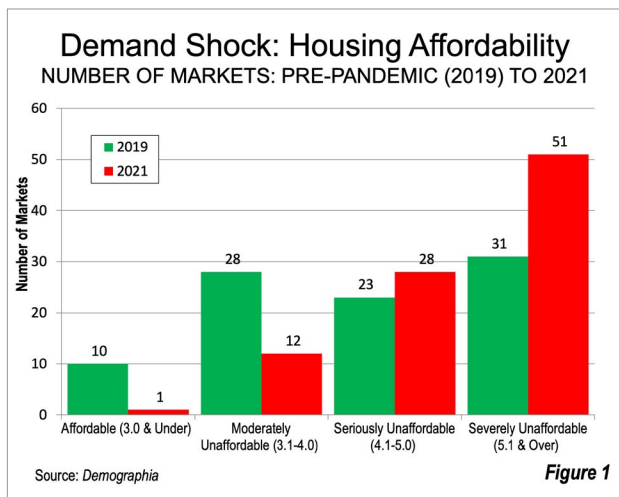
Further, it is likely that housing supply shortages in markets that have become more stringently regulated could have worsened the pandemic housing affordability losses.

<sup>4</sup> Housing markets (and labor markets) are generally metropolitan areas, which are the “functional” definition of cities. This is in contrast to individual municipalities, often called cities, and are typically numerous in all but a few of the housing markets in *Demographia International Housing Affordability*.

Nation	2019	2021	Change
Australia	5	5	0
Canada	2	4	2
China: Hong Kong	1	1	0
Ireland	0	1	1
New Zealand	1	1	0
Singapore	0	1	1
United Kingdom	8	11	3
United States	14	27	13
<b>TOTAL</b>	<b>31</b>	<b>51</b>	<b>20</b>

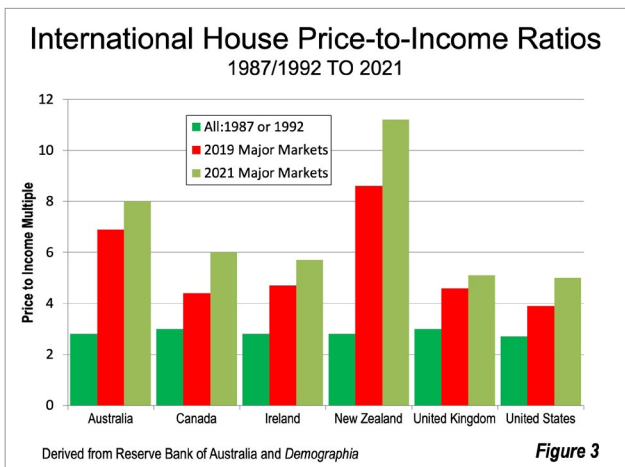
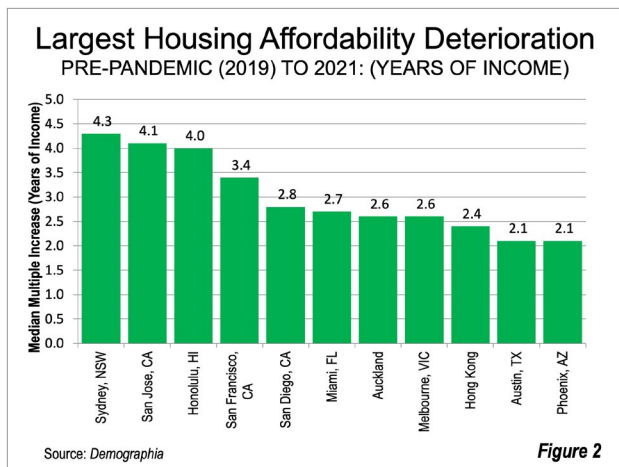
There has been a strong trend away from affordability. The number of severely unaffordable markets rose 60% in 2021 compared to 2019, the last pre-pandemic year (Figure 1). There were also more seriously unaffordable markets. At the same time, the number of affordable and moderately affordable markets declined by nearly two thirds.

At the national level, the number of severely unaffordable markets increased by 2 in Canada, by 3 in the United Kingdom and by 14 in the United States (Table 2, above).



Some markets have experienced exceptionally large median multiple increases in the two years since before the pandemic (Figure 2). For example, housing affordability deteriorated by 4.1 years of median household income in San Jose, which was nearly sufficient to purchase the median priced house in 1996 (4.2), compared to the present 12.6. Similarly, Sydney's increase of 4.3 median multiple points nearly equaled that needed to purchase the median priced house in 1986 (4.5), well below the 2021 15.3.

All of these increases are after prolonged housing affordability deterioration starting from 1990, when national price-to-income ratios were "affordable," at 3.0 or less in Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States (Figure 3).



### 3 International Housing Affordability in 2021

Housing affordability in 2021 is summarized by nation in Table 3.

Nation	Affordable (3.0 & Under)	Moderately Unaffordable (3.1-4.0)	Seriously Unaffordable (4.1-5.0)	Severely Unaffordable (5.1 & Over)	Total	Median by Nation
Australia	0	0	0	5	5	8.0
Canada	0	2	0	4	6	6.0
China: Hong Kong	0	0	0	1	1	23.2
Ireland	0	0	0	1	1	5.7
New Zealand	0	0	0	1	1	11.2
Singapore	0	0	0	1	1	5.8
United Kingdom	0	1	9	11	21	5.1
United States	1	9	19	27	56	5.0
<b>TOTAL</b>	<b>1</b>	<b>12</b>	<b>28</b>	<b>51</b>	<b>92</b>	<b>5.2</b>

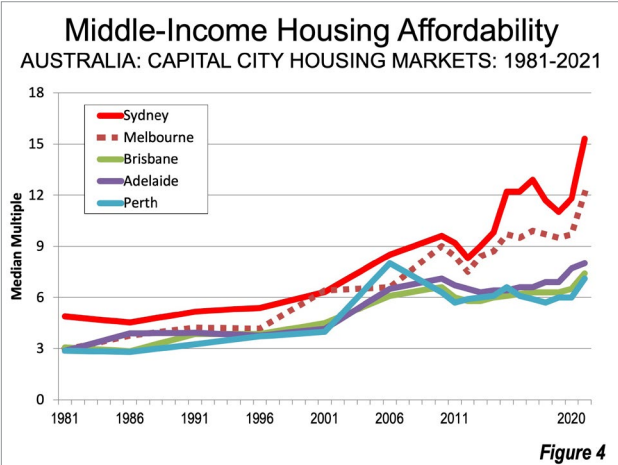
Housing affordability in 2021 is considerably worse than before. There are now five times as many markets with median multiples of at least 10.0 as a decade ago, up to 11 from two.

The least affordable market is Hong Kong, with a median multiple of 23.2, followed by Sydney at 15.3, Vancouver at 13.3, San Jose at 12.6 and Melbourne at 12.1. The most affordable market is Pittsburgh, at 2.7, followed by Oklahoma City and Rochester at 3.3, with Edmonton and St. Louis at 3.6.

Housing affordability for all 92 markets is shown by median multiple in Table 4 and by nation in Table 5.

**Australia:** Australian markets have a median multiple of 8.0, up from 6.9 two years ago (2019). This is an increase of 1.1 years of median household income.

All of five Australia’s major housing markets have been severely unaffordable since the early 2000s.

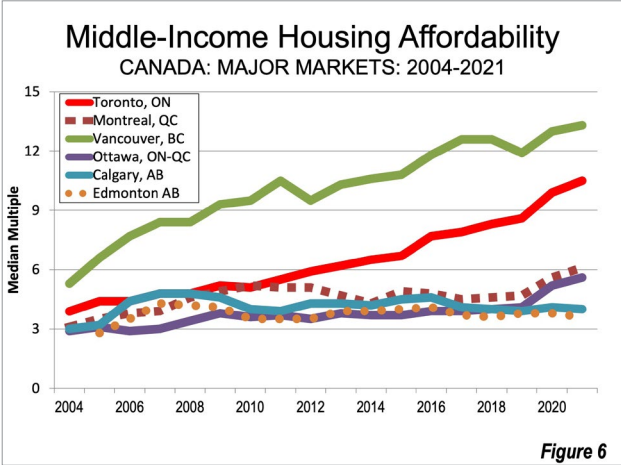
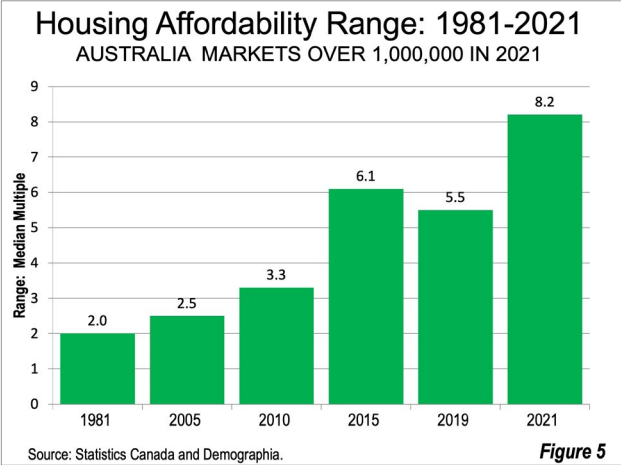


Sydney has the least affordable market, with a median multiple of 15.3, the second least affordable market internationally (ranking 91<sup>st</sup> in affordability out of 92 markets). No market except for Hong Kong has reached this level of unaffordability in the 18 years of *Demographia* reports. Since before the pandemic, Sydney median prices have risen 4.3 years of median household income. This two year increase alone is nearly equal to the 4.5 years of income required to buy the median priced Sydney house in 1986 (Figure 4).

With a median multiple of 12.1, Melbourne is the 88<sup>th</sup> least affordable of the 92 markets. This elevated median multiple has only been reached before in Australia by Sydney.

Perth is the most affordable market in Australia, yet has a severely affordable median multiple of 7.1. Perth is the 73<sup>th</sup> least affordable out of 92.

The affordability range between markets in Australia has widened materially from 2.0 median multiple points in 1981 to 8.2 in 2021. The range expanded substantially during the pandemic (Figure 5).<sup>5</sup>



**Canada:** The markets in Canada have a median multiple of 6.0, up from 4.4 in pre-pandemic 2019. This increase of 1.6 years in median household income is the largest among included nations in the report. Four of the six markets in Canada are rated severely unaffordable.

Vancouver is the 90<sup>th</sup> least affordable of the 92 markets, with higher median multiples only in Hong Kong and Sydney. Vancouver is the least affordable market in Canada, with a 13.3 median multiple. This is up from 11.9 in 2019, an increase of 1.4 years of median household income. Severely unaffordable housing has spread from Vancouver to smaller markets, as metro Vancouver has shed domestic migration to smaller markets in British Columbia, such as Chilliwack, the Fraser Valley, and Kelowna and markets on Vancouver Island.

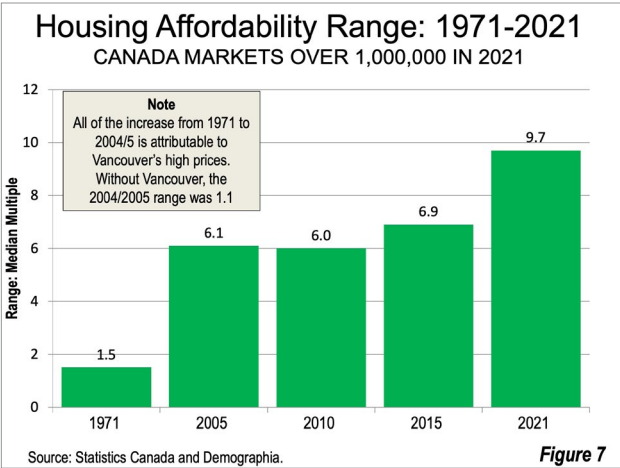
Toronto is the second least affordable market in Canada and ranks 83<sup>rd</sup> out of 92 markets in international affordability, with a median multiple of 10.5. This is up from the 2019 figure of 8.6, indicating that the median price has increased 1.9 years of median household income.

Overall housing affordability in Toronto has deteriorated precipitously, by 6.6 median multiple points from 2004, when the median multiple was 3.9. By contrast, there was no housing affordability deterioration in the more than three decades from 1970 to 2004.<sup>6</sup> Severely unaffordable housing has spread to smaller markets in Ontario, such as Kitchener-Waterloo, Brantford, London and Guelph, as residents of metro Toronto seek lower costs of living.

5 By 2004, all of the major markets in Australia and New Zealand had become severely unaffordable, unlike the United States and Canada.

6 Derived from Statistics Canada and Demographia data.

Montreal (6.1) and Ottawa-Gatineau (5.4) are also severely unaffordable. The most affordable market is Edmonton, with the median multiple of 3.6 (Figure 6, above).



In Canada, the affordability difference among the six major markets was 1.5 median multiple points in 1971, rising to 2.5 in the mid-2000s during the pandemic has risen to 9.3, more than six times that of 1971 (Figure 7).

**China:** Hong Kong is the least affordable market in Demographia International Housing Affordability, with a median multiple of 23.2. This is an increase of 2.4 points from the 20.9 in 2019. About half of this increase is due to lower incomes.<sup>7</sup>

There are important proposals to increase the housing supply in Hong Kong to improve housing affordability. These include a new 2.5 million resident “metropolis” on the undeveloped land between Hong Kong and adjacent Shenzhen.

**Ireland:** Dublin became severely unaffordable this year, with a median multiple of 5.7. This is up from 4.6 in 2019, an increase of 1.1 years of median household income.

**New Zealand:** Auckland has a severely unaffordable median multiple of 11.2. This is up from 8.6 in 2019, an increase of 2.6 times the annual median household income. Auckland ranks 85<sup>th</sup> in affordability out of 92 markets.

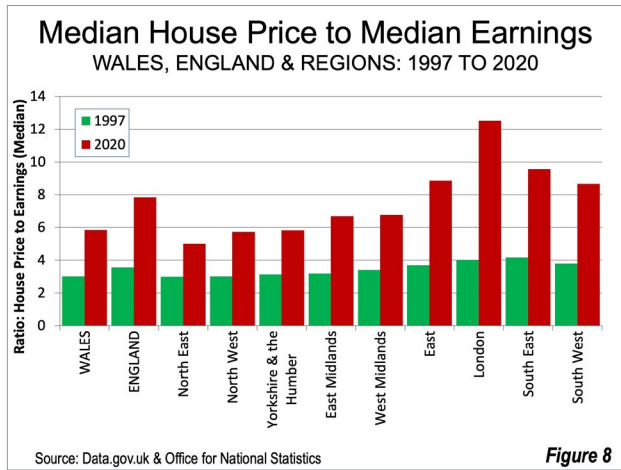
**Singapore:** In the early 1960s Singapore had a desperate housing situation, which has been characterized as “unhygienic slums and crowded squatter settlements.”<sup>8</sup> To address the issue, Singapore established the Housing and Development Board (HDB), which in its 1964 Annual Report expressed the intention to ...encourage a property-owning democracy in Singapore and to enable Singapore citizens in the lower middle-income group to own their own homes. This objective has been achieved, with an 88% home ownership rate in 2020. Moreover, this housing affordability objective is unique the nations covered by Demographia International Housing Affordability.

Singapore’s median multiple rose from 4.6 in 2019, to a severely unaffordable 5.8 in 2021, reflecting the impacts of the pandemic shock. Singapore ranks 53<sup>rd</sup> in affordability out of 92 markets.

**United Kingdom:** The United Kingdom had a 5.1 median multiple in 2021. This is up from 4.6 in 2019, equal to a six month increase in median household income. There are 11 severely unaffordable markets, up from eight in 2019.

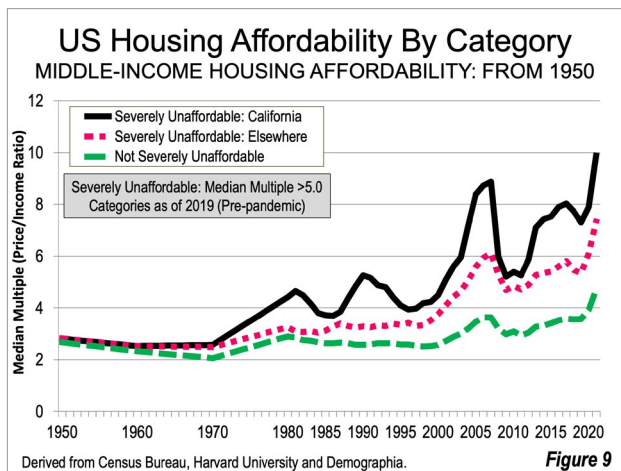
7 Hong Kong produces the most current annual household income data among the markets in *Demographia International Housing Affordability*.  
 8 Parts of this discussion are based on “Focus on Singapore,” the introduction to last year’s 16th Annual Demographia Housing Affordability Survey.

London is the least affordable market in the United Kingdom, with median multiple of 8.0, ranking 79<sup>th</sup> out of 92 in affordability. The most affordable market was Glasgow, with a median multiple of 3.8 ranking 7<sup>th</sup> in affordability out of 92.



The United Kingdom has the longest experience with urban containment policy, yet house price increases have continued to race ahead of incomes. By 2020, median house prices rose 2.2 times relative to earnings in England, and 1.9 times in Wales (Figure 8).<sup>9</sup> In London (Greater London Authority) prices more than tripled relative to earnings between 1997 and 2020.

**United States:** The US median multiple is 5.0. This is up from 3.9 in 2019, an increase of 1.1 years of median household income. There were 27 severely unaffordable markets in 2021, compared to 14 in 2019.

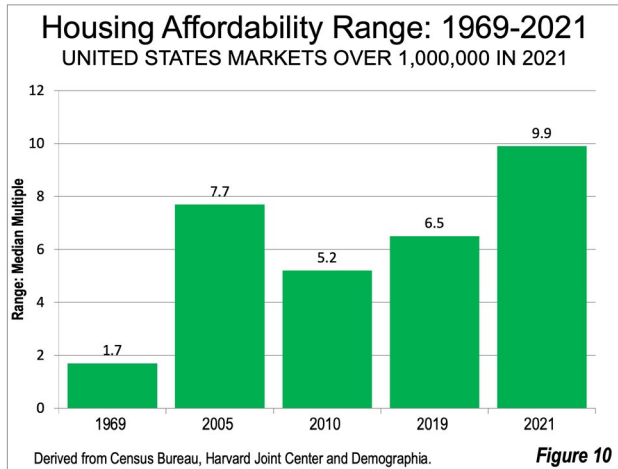


California has the largest concentration of severely unaffordable markets, with four of the nation's five highest cost markets relative to incomes (Figure 9). The most costly among these is San Jose at a median multiple of 12.6, ranking 89<sup>th</sup> affordable out of 92 (fourth least affordable). Honolulu has a median multiple of 12.0 and ranks 87<sup>th</sup> in affordability out of 92. San Francisco has a median multiple of 11.8 and ranks 86<sup>th</sup> in affordability, Los Angeles has a median multiple of 10.7 and ranks 84<sup>th</sup> in affordability. San Diego has a median multiple of 10.1, ranking 82<sup>nd</sup> worse in affordability.

But there are a number of other severely unaffordable rated markets, with the least affordable in Miami (8.1), Seattle (7.5), Riverside-San Bernardino (7.4), Denver (7.2), New York (7.1), Boston (7.0) and Portland (7.0). Each of these markets had median multiples under 6.0 just two years ago. Seven other markets deteriorated to median multiples of 6.0 or more, Sacramento, Las Vegas, Fresno, Phoenix, Salt Lake City, Austin and Tucson. Eight more became severely unaffordable with median multiples above 5.0, Tampa-St. Petersburg, Providence, Orlando, Charlotte, Washington, Richmond, Milwaukee and Jacksonville.

9 Median multiple data is not readily available.

The most affordable market was Pittsburgh, with median multiple of 2.6, which was also the most affordable internationally. The changing demand of the pandemic has pushed many markets out of “affordable” ratings, with only Pittsburgh remaining among the 10 from 2019.



Oklahoma City (3.3), Rochester (3.3), St. Louis (3.6), Cleveland (3.7), Cincinnati (3.8), Buffalo (3.9), Kansas City (4.0), Louisville (4.0) and Tulsa (4.0) were moderately affordable.

The range between the least affordable and most affordable markets in the US accelerated from 2019 by more than one-half and nearly six times from 1970 (Figure 10).

## 4 Threat to Middle-Income Standard of Living

There is a broad view that deteriorating housing affordability is an existential threat to the middle-class.

In *Under Pressure: The Squeezed Middle-Class*, the OECD: “finds that the middle-class faces ever rising costs relative to incomes and that its survival is threatened.” Further that “..., the cost of essential parts of the middle-class lifestyle have increased faster than inflation; house prices have been growing three times faster than household median income over the last two decades.” Further OECD found that “Housing has been the main driver of rising middle-class expenditure,” with the largest increases in the costs of ownership (or housing affordability), rather than rents.

Urban Reform Institute Executive Director Joel Kotkin’s book *The Coming of Neo-Feudalism: A Warning to the Global Middle Class* provides a similar perspective.

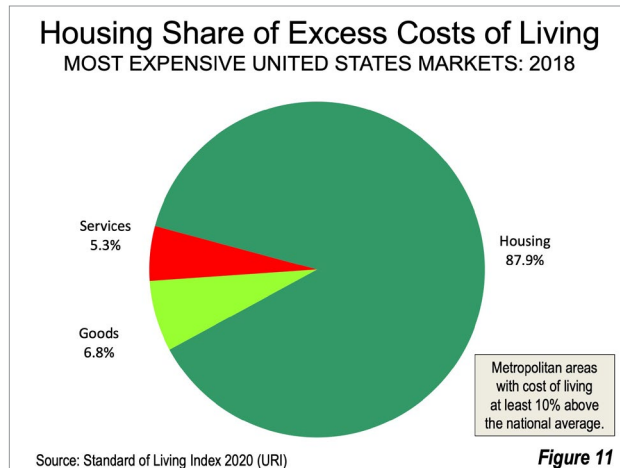
French economist Thomas Piketty has documented the recent growth wealth inequality around the world.<sup>10</sup> It is not surprising that in this environment, many middle-income and lower income households have sustained deteriorating standards of living and the causes of this do not bode well for the future.

<sup>10</sup> Thomas Piketty, (2014). *Capital in the Twenty-First Century*.

Indeed, pandemic demand shock has reinforced these trends, with unprecedented increases in house prices relative to incomes.

### Housing Affordability and the Cost of Living

Much of the already greater inequality that Piketty described is attributable to increased house values, according to research by Matthew Rognlie, now at Northwestern University.<sup>11</sup>



In the United States more than 85% of cost of living differences between metropolitan areas (Figure 11) are due to housing costs. Similarly, Bloomberg reports that nearly all of London's higher cost of living is associated with higher housing costs.

A considerable body of research associates the deterioration of housing affordability of recent decades with stronger land use regulation.<sup>12</sup>

For example, Giani La Cava of the Bank for International Settlements found that rising inequality in the United States was largely associated with increased housing values in markets with more severe housing supply constraints.

At the same time, many housing markets have adopted stringent land use regulation, especially urban containment policy, which is associated with substantially higher land costs. In Rethinking Urban Sprawl: Moving Toward Sustainable Cities, OECD concludes that urban containment policies, such as urban growth boundaries and greenbelts can lead to higher house prices, unless sufficient land is maintained for urban expansion (Box: Urban Containment). In housing markets with the least affordable housing, urban containment policy is typical.

Rognlie (above) suggests that "A natural first step to combat the increasing role of housing wealth would be to reexamine these regulations and expand the housing supply."<sup>13</sup>

11 Matthew Rognlie, "A note on Piketty and diminishing returns to capital," June 15, 2014. Available online at [http://mattrognlie.com/piketty\\_diminishing\\_returns.pdf](http://mattrognlie.com/piketty_diminishing_returns.pdf).

12 See, for example, K. Herkenhoff, L. Ohanian, and E. Prescott. 2018. "Tarnishing the Golden and Empire States: Land-Use Restrictions and the U.S. Economic Slowdown." *Journal of Monetary Economics*. [https://www.nber.org/system/files/working\\_papers/w23790/w23790.pdf](https://www.nber.org/system/files/working_papers/w23790/w23790.pdf), Edward Glaeser and Joseph Gyourko. 2018. "The Economic Implications of Housing Supply." *Journal of Economic Perspectives*, <https://www.aeaweb.org/articles?id=10.1257/jep.32.1.3>, Chang-Tai Hsieh and Enrico Moretti. 2019. "Housing Constraints and Spatial Misallocation." *American Economic Journal: Macroeconomics*, <https://www.aeaweb.org/articles?id=10.1257/mac.20170388>, Wendell Cox, "A Question of Values: Middle-Income Housing Affordability and Urban Containment Policy," *Frontier Centre for Public Policy*, 2015. <https://fcpp.org/sites/default/files/documents/Cox%20-%20A%20Question%20of%20Values.pdf>.

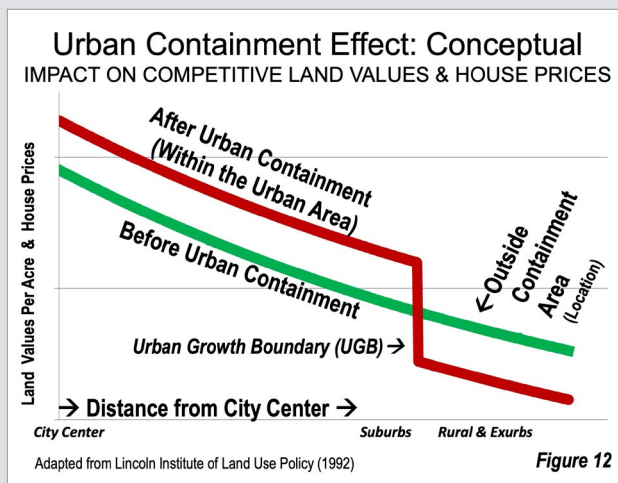
13 Matthew Rognlie, "A note on Piketty and diminishing returns to capital," June 15, 2014. Available online at [http://mattrognlie.com/piketty\\_diminishing\\_returns.pdf](http://mattrognlie.com/piketty_diminishing_returns.pdf)



## URBAN CONTAINMENT

The largest housing affordability differences between major metropolitan areas arose as significant restrictions on urban fringe housing development were applied. These measures are called “urban containment” which includes related “growth management” and “compact city” policies. A principal purpose of urban containment is to curb the physical expansion of urban areas – that is, conversion of rural land to urban land (“urban sprawl”<sup>14</sup>). Whatever its advantages, urban containment has been associated with huge cost of living and housing cost escalation relative to incomes, thereby increasing poverty and inequality.. This has an important social cost to the many in society already challenged to maintain their standards of living as costs rise disproportionately.

Urban containment’s prototypical strategy is urban growth boundaries (or greenbelts) that encircle urban areas. Along with other strategies, urban containment make it impossible to profitably build tracts of housing affordable to middle-income households due to much higher land prices. According to urban planning literature: “Urban development is steered to the area inside the line and discouraged (if not prevented) outside it.” Urban containment is contrasted with “...traditional approaches to land use regulation by the presence of policies that are explicitly designed to limit the development of land outside a defined urban area...”<sup>15</sup>



Harvard University’s William Alonso showed that the value of land tends to rise from the low agricultural values outside the built up urban area to the center.<sup>16</sup> Normally, without urban containment, land values tend to rise gradually, as distances increase from the center. As noted above, with urban containment, it is expected that there will be abrupt land value increases, such as at urban growth boundaries. Land values (and house prices) tend to be higher throughout the entire area of urban containment (Figure 12<sup>17</sup>).

14 See: Judge Glock, “Sprawl is Good: The Environmental Case for Suburbs,” <https://thebreakthrough.org/journal/no-15-winter-2022/sprawl-is-good-green>

15 Arthur C. Nelson and Casey J. Dawkins (2004), “Urban Containment in the United States: History, Models and Techniques for Regional and Metropolitan Growth Management,” American Planning Association Planning Advisory Service

16 William Alonso (1964), *Location and Land Use: Toward a General Theory of Land Rent* (Cambridge, Massachusetts, Harvard University Press).

17 Figure is adapted from other works dealing with urban growth boundaries. Other graphical representations of this relationship can be found in Gerrit Knaap and Arthur C. Nelson, *The Regulated Landscape: Lessons on State Land Use Planning from Oregon*, Cambridge, Massachusetts: Lincoln Institute of Land Policy, 1992; William A. Fischel, *Zoning Rules! The Economics of Land-use Regulation*, Lincoln Institute of Land Policy, 2015; Gerard Mildner, “Public Policy & Portland’s Real Estate Market,” *Quarterly and Urban Development Journal*, 4th Quarterly 2009: 1-16, and others. Under traditional land use regulation, where there is no urban containment boundary, the land price gradient would be smooth (the green line labeled “Before Urban Growth Boundary”). On the other hand, an abrupt increase occurs at the urban boundary in an environment with an urban containment boundary (the red line labeled “After Urban Growth Boundary”).

Indeed, higher land prices are both an expected and intended result.<sup>18</sup> Planners expected housing affordability to be maintained by rising densities. However, even with densification, *housing affordability has deteriorated substantially*, for example in Sydney, Auckland, Vancouver, Toronto, San Francisco, Seattle and many other markets.

The OECD described how this can happen. In *Rethinking Urban Sprawl: Moving Toward Sustainable Cities*, the OECD cautions that housing affordability can deteriorate if sufficient developable land is not kept available within urban growth boundaries.<sup>19</sup> This urban expansion land must be large enough to retain the competitive market for land, the preservation of which was stressed by Anthony Downs of the Brookings Institution.<sup>20</sup>

Otherwise land and house prices are likely to escalate disproportionately to incomes, as has occurred in many markets. According to Alain Bertaud, former principal urban planner at the World Bank, urban growth boundaries and greenbelts put “arbitrary limits on city expansion” and that “the result is predictably higher prices.”<sup>21</sup>

The largest housing affordability losses have been in markets with urban containment. Before the current demand shock, *all severely unaffordable* markets had urban containment.

Long-time Reserve Bank of New Zealand Governor Donald Brash<sup>22</sup> commented on the continuing failure of public policy to restore housing affordability, *despite political promises to the contrary*: “One thing I can say with confidence, however, is that house prices will not return to more affordable levels until land becomes available at more reasonable prices.”

## 5 Severely Unaffordable Housing: The Ultimate Agglomeration Diseconomy

Economists have long recognized the positive agglomeration economies of cities (urban areas). Certainly, the unprecedented prosperity in the last two centuries demonstrates this.<sup>23</sup> Yet, more recently, there has been a strong association between falling standards of living and the most stringent land use regulation, especially for those with middle-incomes and low-incomes. The failure to maintain housing affordability may be the *ultimate agglomeration diseconomy*, which in some metropolitan areas more than nullifies the economic benefits of urbanization for many households.

18 Arthur C. Nelson and Casey J. Dawkins, *Urban Containment in the United States: History, Models and Techniques for Regional and Metropolitan Growth Management*, American Planning Association Planning Advisory Service. [https://www.researchgate.net/publication/288101674\\_Urban\\_containment](https://www.researchgate.net/publication/288101674_Urban_containment)

19 Organization for Economic Cooperation and Development (OECD), *Rethinking Urban Sprawl: Moving Towards Sustainable Cities*. 2018, <https://www.oecd.org/publications/rethinking-urban-sprawl-9789264189881-en.htm>

20 Anthony Downs, *New Visions for Metropolitan America*, (1994), <https://www.brookings.edu/book/new-visions-for-metropolitan-america/>

21 Bertaud, *Order without Design*.

22 Governor Brash contributed the Introduction to the *4th Annual Demographia International Housing Affordability Survey* (2008).

23 See: Diedre Nansen McClosky, 2016, *Bourgeois Equality How Ideas, Not Capital or Institutions, Enriched the World*, <https://press.uchicago.edu/ucp/books/book/chicago/B/bo22655327.html> and Robert J. Gordon, *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War*, <https://www.newgeography.com/content/005364-robert-gordons-notable-history-economics-and-living-standards>

**Table 4**  
**HOUSING MARKETS RANKED BY AFFORDABILITY: MOST AFFORDABLE TO LEAST AFFORDABLE**  
**Median Multiple (Median House Price/Median Household Income): 2021: Third Quarter (revised March 9, 2022)**

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
1	U.S.	Pittsburgh, PA	2.7	46	U.S.	Washington, DC-VA-MD-WV	5.2
2	U.S.	Oklahoma City, OK	3.3	48	U.K.	Birmingham & West Midlands	5.4
2	U.S.	Rochester, NY	3.3	49	U.S.	Charlotte, NC-SC	5.5
4	Canada	Edmonton, AB	3.6	50	Canada	Ottawa-Gatineau, ON-QC	5.6
4	U.S.	St. Louis,, MO-IL	3.6	51	Ireland	Dublin	5.7
6	U.S.	Cleveland, OH	3.7	51	U.K.	Leicester & Leicestershire	5.7
7	U.K.	Glasgow	3.8	53	Singapore	Singapore	5.8
7	U.S.	Cincinnati, OH-KY-IN	3.8	53	U.K.	Northampton & Northamptonshire	5.8
9	U.S.	Buffalo, NY	3.9	53	U.K.	Swindon & Wiltshire	5.8
10	Canada	Calgary, AB	4.0	56	U.S.	Orlando, FL	5.9
10	U.S.	Kansas City, MO-KS	4.0	56	U.S.	Providence, RI-MA	5.9
10	U.S.	Louisville, KY-IN	4.0	56	U.S.	Tampa-St. Petersburg, FL	5.9
10	U.S.	Tulsa, OK	4.0	59	U.S.	Tucson, AZ	6.0
14	U.S.	Detroit, MI	4.1	60	Canada	Montreal, QC	6.1
14	U.S.	Hartford, CT	4.1	60	U.K.	Plymouth & Devon	6.1
16	U.K.	Blackpool & Lancashire	4.2	60	U.S.	Austin, TX	6.1
16	U.S.	Grand Rapids, MI	4.2	63	U.S.	Salt Lake City, UT	6.2
16	U.S.	Virginia Beach-Norfolk, VA-NC	4.2	64	U.S.	Phoenix, AZ	6.3
19	U.K.	Middlesbrough & Durham	4.3	65	U.K.	London Exurbs (E & SE England)	6.4
19	U.K.	Newcastle & Tyneside	4.3	66	U.K.	Bristol-Bath	6.5
19	U.K.	Sheffield & South Yorkshire	4.3	66	U.S.	Fresno, CA	6.5
19	U.S.	Columbus, OH	4.3	68	U.S.	Las Vegas, NV	6.6
19	U.S.	Indianapolis, IN	4.3	69	U.S.	Sacramento, CA	6.7
19	U.S.	Minneapolis-St. Paul, MN-WI	4.3	70	U.K.	Bournemouth & Dorsett	6.8
25	U.S.	Baltimore, MD	4.4	71	U.S.	Boston, MA-NH	7.0
25	U.S.	Philadelphia, PA-NJ-DE-MD	4.4	71	U.S.	Portland, OR-WA	7.0
27	U.K.	Derby & Derbyshire	4.5	73	Australia	Perth, WA	7.1
27	U.S.	Atlanta, GA	4.5	73	U.S.	New York, NY-NJ-PA	7.1
27	U.S.	Chicago, IL-IN-WI	4.5	75	U.S.	Denver, CO	7.2
27	U.S.	Houston, TX	4.5	76	Australia	Brisbane, QLD	7.4
31	U.K.	Liverpool & Merseyside	4.6	76	U.S.	Riverside-San Bernardino, CA	7.4
31	U.K.	Stoke on Trent & Staffordshire	4.6	78	U.S.	Seattle, WA	7.5
31	U.S.	Memphis, TN-MS-AR	4.6	79	Australia	Adelaide, SA	8.0
34	U.K.	Leeds & West Yorkshire	4.7	79	U.K.	London (Greater London Authority)	8.0
34	U.S.	Birmingham, AL	4.7	81	U.S.	Miami, FL	8.1
36	U.K.	Hull & Humber	4.8	82	U.S.	San Diego, CA	10.1

**Table 4, contd.**  
**HOUSING MARKETS RANKED BY AFFORDABILITY: MOST AFFORDABLE TO LEAST AFFORDABLE**  
**Median Multiple (Median House Price/Median Household Income): 2021: Third Quarter (revised March 9, 2022)**

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
36	U.S.	Dallas-Fort Worth, TX	4.8	83	Canada	Toronto, ON	10.5
36	U.S.	San Antonio, TX	4.8	84	U.S.	Los Angeles, CA	10.7
39	U.S.	New Orleans, LA	4.9	85	N.Z.	Auckland	11.2
40	U.K.	Manchester / Greater Manchester	5.0	86	U.S.	San Francisco, CA	11.8
40	U.K.	Nottingham & Nottinghamshire	5.0	87	U.S.	Honolulu, HI	12.0
40	U.S.	Nashville, TN	5.0	88	Australia	Melbourne, VIC	12.1
40	U.S.	Raleigh, NC	5.0	89	U.S.	San Jose, CA	12.6
44	U.S.	Jacksonville, FL	5.1	90	Canada	Vancouver, BC	13.3
44	U.S.	Milwaukee, WI	5.1	91	Australia	Sydney, NSW	15.3
46	U.S.	Richmond, VA	5.2	92	China	Hong Kong	23.2

**Table 5**  
**ALL HOUSING MARKETS BY NATION**  
**Median Multiple (Median House Price/Median Household Income): 2021: Third Quarter**

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
79	Australia	Adelaide, SA	8.0	19	U.S.	Columbus, OH	4.3
76	Australia	Brisbane, QLD	7.4	36	U.S.	Dallas-Fort Worth, TX	4.8
88	Australia	Melbourne, VIC	12.1	75	U.S.	Denver, CO	7.2
73	Australia	Perth, WA	7.1	14	U.S.	Detroit, MI	4.1
91	Australia	Sydney, NSW	15.3	66	U.S.	Fresno, CA	6.5
10	Canada	Calgary, AB	4.0	16	U.S.	Grand Rapids, MI	4.2
4	Canada	Edmonton, AB	3.6	14	U.S.	Hartford, CT	4.1
60	Canada	Montreal, QC	6.1	87	U.S.	Honolulu, HI	12.0
50	Canada	Ottawa-Gatineau, ON-QC	5.6	27	U.S.	Houston, TX	4.5
83	Canada	Toronto, ON	10.5	19	U.S.	Indianapolis, IN	4.3
90	Canada	Vancouver, BC	13.3	44	U.S.	Jacksonville, FL	5.1
92	China	Hong Kong	23.2	10	U.S.	Kansas City, MO-KS	4.0
51	Ireland	Dublin	5.7	68	U.S.	Las Vegas, NV	6.6
85	N.Z.	Auckland	11.2	84	U.S.	Los Angeles, CA	10.7
53	Singapore	Singapore	5.8	10	U.S.	Louisville, KY-IN	4.0
48	U.K.	Birmingham & West Midlands	5.4	31	U.S.	Memphis, TN-MS-AR	4.6
16	U.K.	Blackpool & Lancashire	4.2	81	U.S.	Miami, FL	8.1
70	U.K.	Bournemouth & Dorset	6.8	44	U.S.	Milwaukee, WI	5.1
66	U.K.	Bristol-Bath	6.5	19	U.S.	Minneapolis-St. Paul, MN-WI	4.3
27	U.K.	Derby & Derbyshire	4.5	40	U.S.	Nashville, TN	5.0
7	U.K.	Glasgow	3.8	39	U.S.	New Orleans, LA	4.9
36	U.K.	Hull & Humber	4.8	73	U.S.	New York, NY-NJ-PA	7.1
34	U.K.	Leeds & West Yorkshire	4.7	2	U.S.	Oklahoma City, OK	3.3
51	U.K.	Leicester & Leicestershire	5.7	56	U.S.	Orlando, FL	5.9
31	U.K.	Liverpool & Merseyside	4.6	25	U.S.	Philadelphia, PA-NJ-DE-MD	4.4
79	U.K.	London (Greater London Authority)	8.0	64	U.S.	Phoenix, AZ	6.3
65	U.K.	London Exurbs (E & SE England)	6.4	1	U.S.	Pittsburgh, PA	2.7
40	U.K.	Manchester / Greater Manchester	5.0	71	U.S.	Portland, OR-WA	7.0
19	U.K.	Middlesbrough & Durham	4.3	56	U.S.	Providence, RI-MA	5.9
19	U.K.	Newcastle & Tyneside	4.3	40	U.S.	Raleigh, NC	5.0
53	U.K.	Northampton & Northamptonshire	5.8	46	U.S.	Richmond, VA	5.2
40	U.K.	Nottingham & Nottinghamshire	5.0	76	U.S.	Riverside-San Bernardino, CA	7.4
60	U.K.	Plymouth & Devon	6.1	2	U.S.	Rochester, NY	3.3
19	U.K.	Sheffield & South Yorkshire	4.3	69	U.S.	Sacramento, CA	6.7
31	U.K.	Stoke on Trent & Staffordshire	4.6	63	U.S.	Salt Lake City, UT	6.2
53	U.K.	Swindon & Wiltshire	5.8	36	U.S.	San Antonio, TX	4.8
27	U.S.	Atlanta, GA	4.5	82	U.S.	San Diego, CA	10.1

**Table 5, contd.**  
**ALL HOUSING MARKETS BY NATION**  
**Median Multiple (Median House Price/Median Household Income): 2021: Third Quarter**

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
60	U.S.	Austin, TX	6.1	86	U.S.	San Francisco, CA	11.8
25	U.S.	Baltimore, MD	4.4	89	U.S.	San Jose, CA	12.6
34	U.S.	Birmingham, AL	4.7	78	U.S.	Seattle, WA	7.5
71	U.S.	Boston, MA-NH	7.0	4	U.S.	St. Louis,, MO-IL	3.6
9	U.S.	Buffalo, NY	3.9	56	U.S.	Tampa-St. Petersburg, FL	5.9
49	U.S.	Charlotte, NC-SC	5.5	59	U.S.	Tucson, AZ	6.0
27	U.S.	Chicago, IL-IN-WI	4.5	10	U.S.	Tulsa, OK	4.0
7	U.S.	Cincinnati, OH-KY-IN	3.8	16	U.S.	Virginia Beach-Norfolk, VA-NC	4.2
6	U.S.	Cleveland, OH	3.7	46	U.S.	Washington, DC-VA-MD-WV	5.2

## Sources and Methods

House price data is estimated from sources reporting on housing types representing the majority of existing dwellings in each nation. Official government produced sales registers are used where available (Ireland, Scotland, England and Wales). Other sources include authoritative real estate time series and market reports.

Pre-tax median household incomes for the present year are estimated based on official government data. Income indicators have become more difficult due to pandemic related challenges faced by government statistical agencies.

### CONTACTS:

Urban Reform Institute  
Wendell Cox, Senior Fellow  
demographia@gmx.com

Frontier Centre for Public Policy  
Gerard Lucyshyn, VP Research  
gerard.lucyshyn@fcpp.org

### BIOGRAPHICAL NOTE:



Author **Wendell Cox** is a Senior Fellow at the Urban Reform Institute (Houston) and the Frontier Centre for Public Policy (Winnipeg), as well as a member of the Board of Advisors at the Center for Demographics and Policy at Chapman University. He is principal of Demographia.com, author of *Demographia World Urban Areas* and was co-author (with Hugh Pavletich) of the *Demographia International Housing Affordability Surveys* (16 annual editions). He was appointed to three terms as a member of the Los Angeles County Transportation Commission by Mayor Tom

Bradley and by Speaker of the House of Representatives Newt Gingrich to fill the unexpired term of New Jersey Governor Christine Todd Whitman on the Amtrak Reform Council. He earned a BA in Government from California State University, Los Angeles and an MBA from Pepperdine University in Los Angeles.