



# DEMOGRAPHIA INTERNATIONAL HOUSING AFFORDABILITY

2021 EDITION

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



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## Introduction

The Urban Reform Institute and the Frontier Centre for Public Policy are pleased to present the 2021 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 2020.

In this year of the global pandemic and lockdowns, it is not surprising that housing affordability — given the large influx of new buyers, particularly in suburban and outlying areas — has continued to deteriorate. 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.

The affordability issue is particularly critical due to the strong increase in remote working (telework) 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.

Wendell Cox is the author, having previously co-authored the annual *Demographia International Housing Affordability Survey*, with Hugh Pavletich of Performance Urban Planning. Cox is a senior fellow at both the Frontier Centre for Public Policy and the Urban Reform Institute.



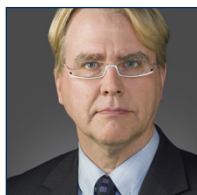
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# 1 Assessing Housing Affordability

Demographia International Housing Affordability rates middle-income housing affordability in 92 major housing markets<sup>1</sup> (1,000,000 or more population) in 8 nations (Australia, Canada, China [Hong Kong only], Ireland, New Zealand, Singapore, the United Kingdom and the United States).<sup>2</sup> This 2021 edition rates housing affordability for the third quarter (September quarter) of 2020.

Sometimes housing affordability is evaluated simply by comparing house prices. Between housing markets, however, housing affordability requires consideration of both house prices and incomes. 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. Housing affordability measures that use median house prices and incomes particularly to measure middle-income housing affordability. This is done in part by measuring middle of the income and house price distributions, which excludes the influence of higher income and luxury housing.

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

Table 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	

## The Geography of Housing Affordability

Most international housing affordability evaluations are at national level, but Demographia focuses at the major housing market level within nations because differences between housing markets in a country can be substantial.

- 1 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*.
- 2 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).
- 3 See Shlomo Angel, *Housing Policy Matters: A Global Analysis*. Oxford University Press, 2000.

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. In a well-functioning market, middle-income households should be able to afford the median priced house.

Thus, affordability measured at the housing market level is different than housing affordability in a neighborhood or part of the housing market. Even if housing is unaffordable in part of the housing market, there should still be enough housing stock affordable enough to meet the demands of middle-income households.

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 as between years in Adelaide).

## 2 International Major Market Housing Affordability in 2020

Housing affordability has deteriorated materially in recent decades (Section 3), which has been a principal factor in an internationally observed reduction in middle-income standards of living (Section 4).

Table 2 summarizes the housing markets by housing affordability ratings by nation and Table 3 includes the housing affordability ratings for all 92 markets in 8 nations.<sup>4</sup>

<b>Nation</b>	<b>Affordable (3.0 &amp; Under)</b>	<b>Moderately Unaffordable (3.1-4.0)</b>	<b>Seriously Unaffordable (4.1-5.0)</b>	<b>Severely Unaffordable (5.1 &amp; Over)</b>	<b>Total</b>	<b>Median Market</b>
Australia	0	0	0	5	5	7.7
Canada	0	1	1	4	6	5.4
China: Hong Kong only	0	0	0	1	1	20.7
Ireland	0	0	0	1	1	5.4
New Zealand	0	0	0	1	1	10.0
Singapore	0	0	1	0	1	4.7
United Kingdom	0	3	9	9	21	4.8
United States	4	20	17	15	56	4.2
<b>TOTAL</b>	<b>4</b>	<b>24</b>	<b>28</b>	<b>36</b>	<b>92</b>	<b>4.6</b>

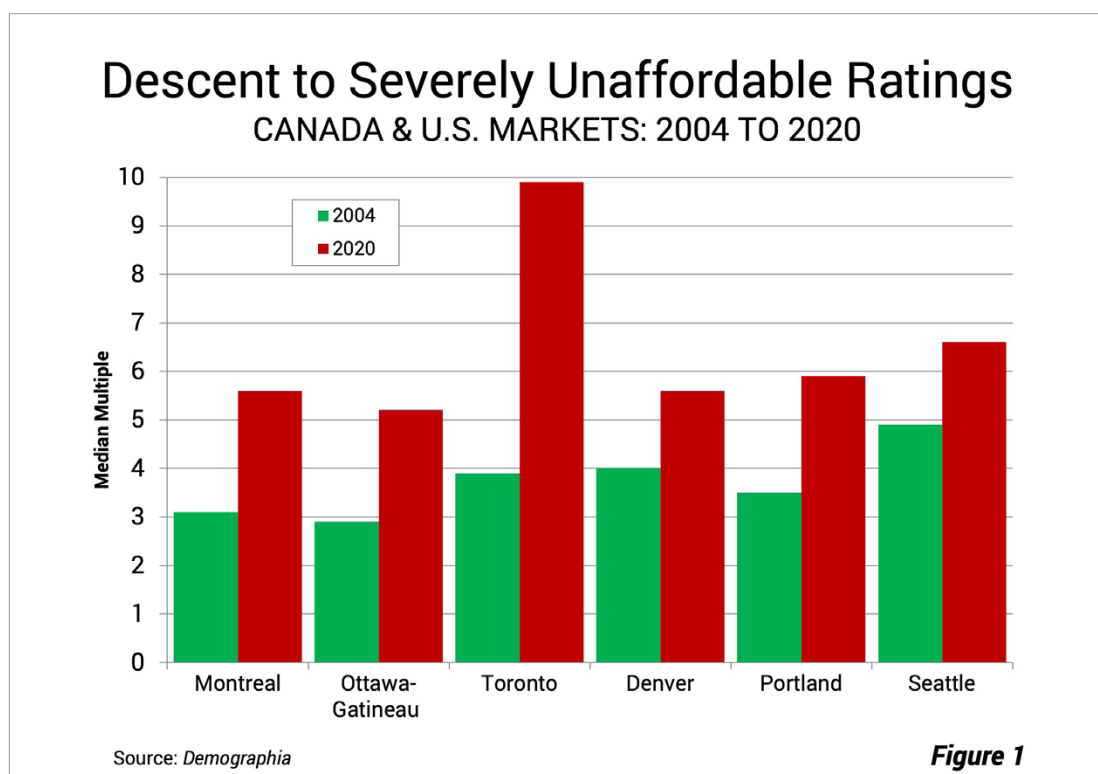
Only four markets are rated affordable (with median multiples of 3.0 or less) --- Pittsburgh, Rochester, Buffalo, and St. Louis (all in the United States).

<sup>4</sup> As a matter of information, the Institute for Urban Economics in Moscow (IUE) has produced its second annual national housing affordability report (Housing affordability in the major Russian metropolitan areas: 3rd quarter 2020) which uses the median multiple.

At the other end of the scale, there are 36 severely unaffordable major housing markets. The least affordable are Hong Kong (20.7), Vancouver (13.0), Sydney (11.8), Auckland (10.0), Toronto (9.9), Melbourne (9.7), San Jose (9.6), San Francisco (9.6), Honolulu (9.1), London (8.6) and San Diego (8.0).

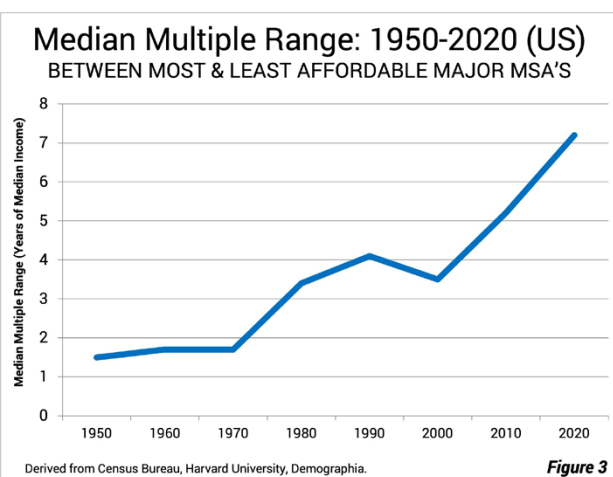
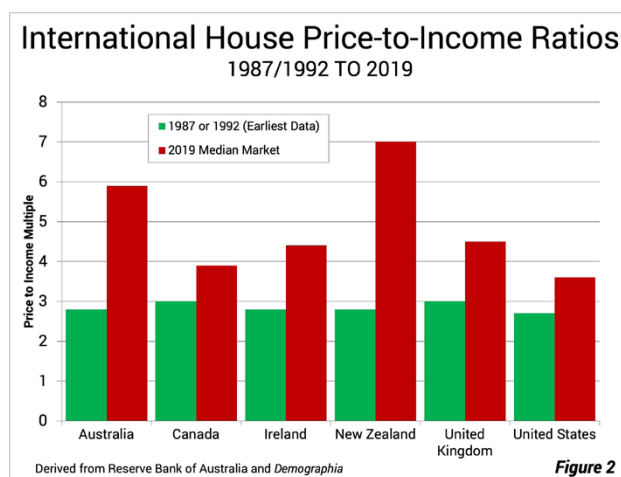
The last year has involved material setbacks, mostly due to the impact of the pandemic (Section 4), which has led to a home buying boom in some areas while suppressing incomes. Housing affordability deteriorated by more than 1.0 median multiple points in just one year, — the equivalent of one year's *pre-tax* median household income — in Vancouver, San Jose, San Francisco and Honolulu, with the greatest deterioration in Auckland (1.4 points) and Toronto (1.3 points). The deterioration was from 0.5 to 1.0 — six months of household income — in Sydney and San Diego. Virtually all of the markets with severely unaffordable housing have urban containment policies that severely restrict building on the periphery (Section 3).

The number of housing markets that have become severely unaffordable in the United States and Canada has grown steadily since 2004. Housing affordability deteriorated the equivalent of six years of annual household incomes in Toronto, between two and three years in Montreal, Portland and Ottawa-Gatineau and by 1.5 to 2.0 points in Seattle and Denver (Figure 1). By 2004, all of the major markets of Australia and New Zealand had become severely unaffordable.

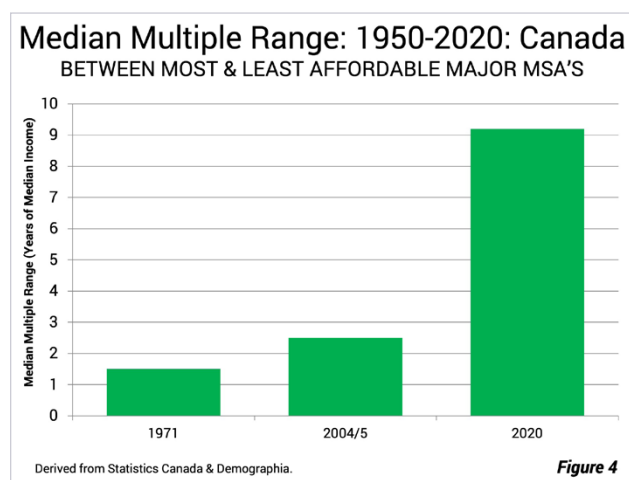


## 3 Decades of Worsening Housing Affordability

Historically, housing affordability had been similar between nations until a few decades ago. For example, national price-to-income ratios were 3.0 or less in Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States until the late 1980s or 1990s. However since that time, housing affordability has deteriorated significantly and by 2019 national median multiples had increased to 4.0 in the United States and Canada, nearly 6.0 in Australia and 7.0 in New Zealand (Figure 2).



Before, there was relatively little difference in housing affordability measured against incomes among housing markets. For example, in the United States, all but one of today's 53 major metropolitan areas in the United States were "affordable" in 1970 (New York was the exception, with a median multiple of 3.2).<sup>5</sup> The difference between the least affordable and most affordable markets, measured in median multiple points, expanded from 1.7 in 1970 to 3.5 in 2000 and 7.2 in 2020 --- more than four times that of 1970 (Figure 3, above).



In Canada, the difference among the six major markets was 1.5 median multiple points in 1971, rose to 2.5 in the mid-2000s and is now 9.3, more than six times that of 1971 (Figure 4). In Australia, the maximum difference was 2.0 median multiple points in 1981, which had risen to 5.8 in 2020.<sup>6</sup>

<sup>5</sup> Derived from data reported in the 1970 United States census.

<sup>6</sup> By 2004, all of the major markets in Australia and New Zealand had become severely unaffordable, unlike the United States and Canada.

These trends have been more pronounced since the early 2000s. The earliest Demographia International Housing Affordability Surveys rated up to 16 major markets in Canada and the United States as “affordable,” with a median multiple of 3.0 or less. By 2019, the number had dropped to 10, and, as noted above, has fallen even further in the pandemic year of 2020, with only four markets rated “affordable.”

A considerable body of research associates worsening housing affordability with the implementation of stronger land use regulation.<sup>7</sup> At the same time, many housing markets have adopted perhaps the most stringent land use regulation, urban containment at the housing market level, which is associated with substantially higher land costs.

## 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” and include “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, or what some refer to as “urban sprawl.” Unfortunately, this is can be to middle-income households.

Urban containment’s prototypical strategy is urban growth boundaries encircling urban areas. Urban containment can render 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>8</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>9</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.**

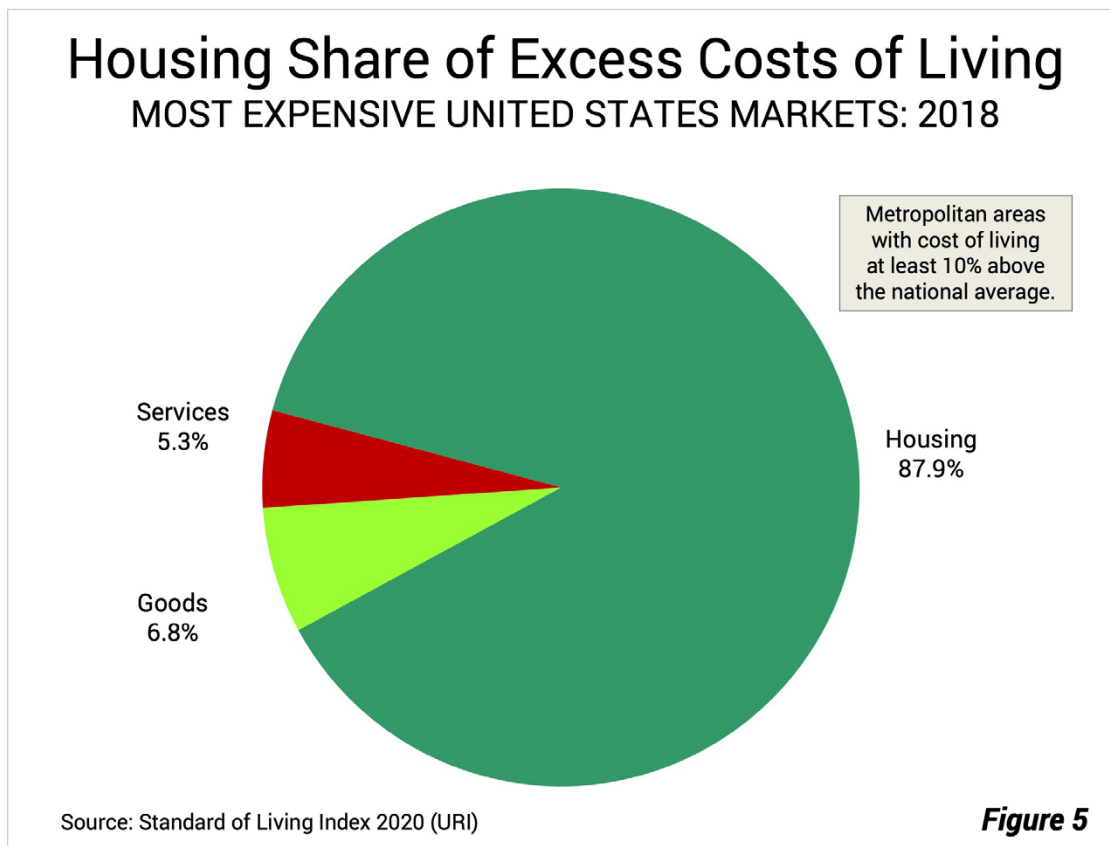
7 See, for example, Wendell Cox, “A Question of Values: Middle-Income Housing Affordability and Urban Containment Policy,” Frontier Centre for Public Policy, 2015. <https://fcpp.org/sites/default/files/documents/Cox%20-%20A%20Question%20of%20Values.pdf>.

8 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.

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

## 4 The Housing Affordability Problem: Threat to Middle-Income Households

The deterioration in housing affordability represents an existential threat to the middle-income households. Higher housing costs relative to incomes are strongly correlated with higher overall costs of living and thus lower standards of living. In the United States more than 85% of cost of living differences between metropolitan areas (Figure 5) are reflected in housing cost differences. Similarly, Bloomberg reports that nearly all of London's higher cost of living relative to the rest of the nation is associated with higher housing costs.



In a report entitled *Under Pressure: The Squeezed Middle-Class*, the OECD found 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.

Much of the already greater inequality that has developed in recent decades is attributable to rising housing costs. Matthew Rognlie, now at Northwestern University, found that virtually all the increased wealth inequality in the United States was to increased house values, and noted 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>10</sup>

Similarly, **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.

In a pre-pandemic analysis, author Joel Kotkin echoed concerns about the decline of the middle class in his book **The Coming of Neo-Feudalism: A Warning to the Global Middle Class**. The pandemic has exacerbated these already worrying trends.

## 5 Pandemic Year

The continuing pandemic has exacted a huge toll in fatalities and health outcomes. Measures intended to minimize the COVID-19 spread, such as “social distancing” and “lockdowns” have severely impacted households, businesses and social activity. Millions of workers have become unemployed and many others have had their incomes reduced, virtually overnight.

Many households were shielded from these consequences by the expansion of telework (Section 6). However, the tragedy of lockdowns lay most on those whose jobs could not be performed remotely. Generally, these workers have lower incomes and are less likely to have college degrees. According to the OECD, such “labor market effects of COVID-19 (and of the lockdown measures) may have contributed to increase pre-existing inequalities.”

However, to make matters worse, house prices have escalated amidst the pandemic in a number of housing markets, even as incomes have been dropping for a large portion of middle-income households. This is in large measure a result of substituting telework for physical commuting, which gave households the flexibility to seek new housing with more space, indoors and outdoors. This rapidly developing demand shock drove house prices up.

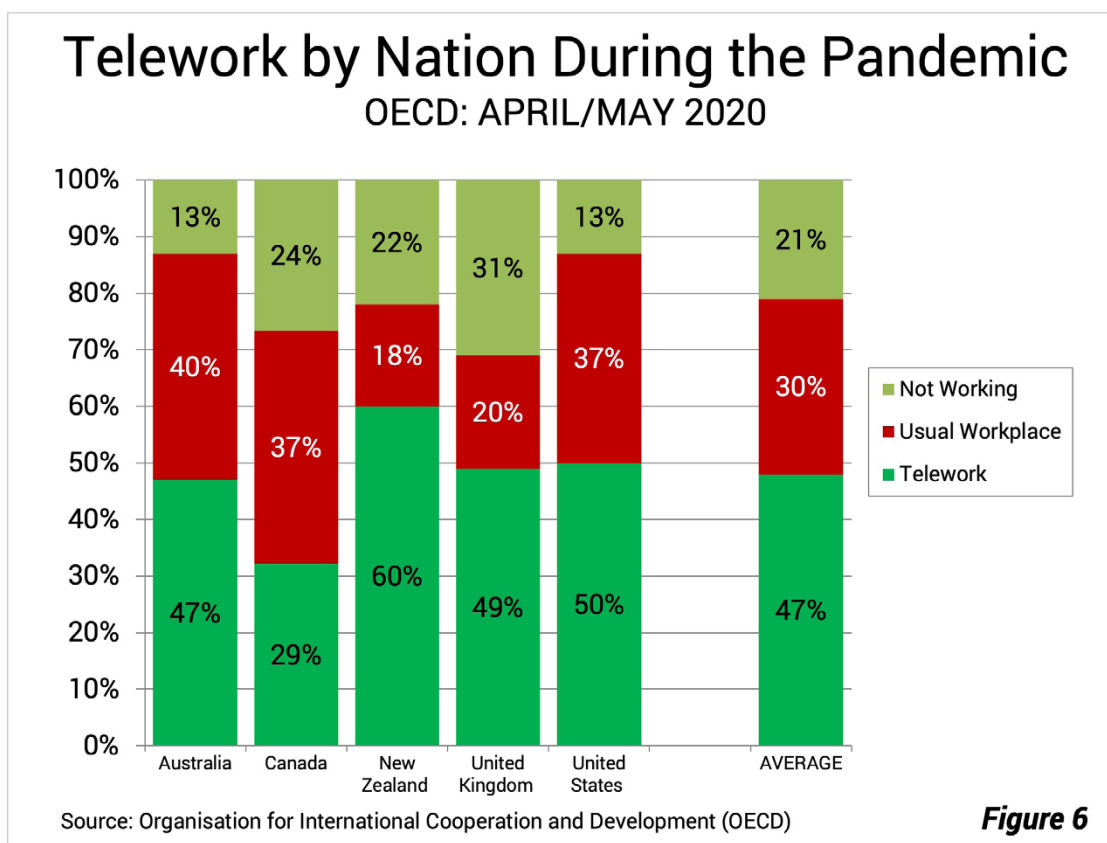
In its October **World Economic Outlook**, the International Monetary Fund found that “The pandemic will reverse the progress made since the 1990s in reducing global poverty and will increase inequality.”

10 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).

The effect of telework is discussed further in Section 6.

## 6 Telework (Remote Work) and Housing Affordability: A Ray of Hope?

At the same time, the pandemic lockdowns encouraged a huge increase in remote work (telework). OECD found that telework became a majority of employment in Australia, New Zealand, the United Kingdom and the United States. This shielded many middle-income households from job and economic losses. At the same time, many others were no longer working (Figure 6).



The flexibility of telework, and the disruption of life in the highest density employment and residential areas led many to relocate to more spacious houses with gardens (yards). As Liz Richie, **Regional Australia Institute** chief executive (RAI), told the Australian Broadcasting Corporation, "If people's work can be done from anywhere, if location is no longer a barrier, we will see more

and more regional mobility.” **University of Pennsylvania Professor Susan Wachter** noted that telework eliminates the choice between long commutes and “inordinate housing costs.”

Griffith University (Australia) urban planner Tony Matthews says that “**The move out of cities is on; we’re not going backward from this.**” He notes that “The most important connection had been a train line; now the most important infrastructure is a decent broadband connection.” His continues: “Early settlement was based on urban city cores and then there was suburbanization and then metro-regionalism as places like Geelong and the Central Coast<sup>11</sup> effectively became outposts of the major cities. “Metro-regionalism is now becoming full regionalism.”

The hope for improvement has been expressed in Ireland’s just released ***National Remote Work Strategy***, which emphasizes the potential to improve housing affordability through telework. Introducing the Strategy, Minister for Enterprise, Trade and Employment Leo Varadkar noted:

The pandemic has changed our world. It has also changed the world of work forever. Millions of people and businesses around the world had to change overnight moving from the office to home working and from interactions that occurred in person to interactions that occurred mainly on-line. This shift might have taken decades if it had been planned. Instead it took days.

The Strategy further states: “Remote work also provides the opportunity to relieve accommodation pressures in cities where demand has caused rent and house prices to increase significantly above the national average.” According to the Strategy, this also “provides the opportunity” to reduce auto commuting, which has been increasing “strongly.” This, according to the Strategy is “better for transport emissions and the quality of life.”

Similar conclusions were recently published in a **Federal Reserve Bank of Kansas City** economic report and an article in ***The Atlantic***.

Thus, greater remote working could begin to remove housing as a principal source of inequality. This could reduce housing demand in the least affordable areas, providing relief at every price point, including for many middle-income households whose living standards have decline as house prices have raced ahead of incomes. It provides the global middle class a ray of hope.

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11 Housing markets outside the larger housing markets of Melbourne and Sydney, respectively.

**Table 3**  
**MAJOR HOUSING MARKETS RANKED BY AFFORDABILITY: Most Affordable to Least Affordable**  
**Median Multiple (Median House Price/Median Household Income): 2020 Third Quarter**

Rank	Nation	Metropolitan Market	Median Multiple	Rank	Nation	Metropolitan Market	Median Multiple
1	U.S.	Pittsburgh, PA	2.6	45	U.S.	Charlotte, NC-SC	4.6
1	U.S.	Rochester, NY	2.6	45	U.S.	Phoenix, AZ	4.6
3	U.S.	Buffalo, NY	2.9	45	U.S.	Washington, DC-VA-MD-WV	4.6
4	U.S.	St. Louis,, MO-IL	3.0	50	Singapore	Singapore	4.7
5	U.S.	Tulsa, OK	3.1	50	U.K.	Hull & Humber	4.7
6	U.S.	Cleveland, OH	3.2	50	U.S.	Salt Lake City, UT	4.7
6	U.S.	Oklahoma City, OK	3.2	53	U.K.	Manchester & Greater Manchester	4.8
8	U.S.	Cincinnati, OH-KY-IN	3.3	53	U.K.	Nottingham & Nottinghamshire	4.8
8	U.S.	Grand Rapids, MI	3.3	55	U.S.	Orlando, FL	4.9
10	U.S.	Hartford, CT	3.4	55	U.S.	Providence, RI-MA	4.9
11	U.S.	Atlanta, GA	3.6	57	Canada	Ottawa-Gatineau, ON-QC	5.2
11	U.S.	Detroit, MI	3.6	57	U.K.	Birmingham & West Midlands	5.2
13	U.S.	Indianapolis. IN	3.7	59	Ireland	Dublin	5.4
13	U.S.	Louisville, KY-IN	3.7	60	U.S.	Las Vegas, NV	5.5
13	U.S.	San Antonio, TX	3.7	61	Canada	Montreal, QC	5.6
13	U.S.	Virginia Beach-Norfolk, VA-NC	3.7	61	U.K.	Leicester & Leicestershire	5.6
17	Canada	Edmonton, AB	3.8	61	U.S.	Sacramento, CA	5.6
17	U.K.	Glasgow	3.8	64	U.S.	Fresno, CA	5.7
17	U.S.	Columbus, OH	3.8	64	U.S.	Riverside-San Bernardino, CA	5.7
17	U.S.	Kansas City, MO-KS	3.8	66	U.S.	Denver, CO	5.8
21	U.S.	Birmingham, AL	3.9	67	U.K.	Northampton & Northamptonshire	5.9
21	U.S.	Minneapolis-St. Paul, MN-WI	3.9	67	U.S.	New York, NY-NJ-PA	5.9
21	U.S.	Philadelphia, PA-NJ-DE-MD	3.9	67	U.S.	Portland, OR-WA	5.9
21	U.S.	Raleigh, NC	3.9	70	Australia	Perth, WA	6.0
25	U.K.	Blackpool & Lancashire	4.0	71	U.K.	Swindon & Wiltshire	6.1
25	U.K.	Sheffield & South Yorkshire	4.0	71	U.S.	Boston, MA-NH	6.1
25	U.S.	Chicago, IL-IN-WI	4.0	73	U.K.	Plymouth & Devon	6.3
25	U.S.	Houston, TX	4.0	73	U.S.	Miami, FL	6.3
29	Canada	Calgary, AB	4.1	75	Australia	Brisbane, QLD	6.6
29	U.S.	Milwaukee, WI	4.1	75	U.S.	Seattle, WA	6.6
29	U.S.	New Orleans. LA	4.1	77	U.K.	London Exurbs (E & SE England)	6.9
29	U.S.	Richmond, VA	4.1	78	U.K.	Bristol-Bath	7.0
33	U.S.	Baltimore, MD	4.2	79	U.K.	Bournemouth & Dorsett	7.5
33	U.S.	Memphis, TN-MS-AR	4.2	80	Australia	Adelaide, SA	7.7
33	U.S.	Nashville, TN	4.2	81	U.S.	San Diego, CA	8.0
36	U.K.	Middlesborough & Durham	4.3	82	U.K.	London (Greater London Authority)	8.6
36	U.K.	Newcastle & Tyneside	4.3	83	U.S.	Los Angeles, CA	8.9
36	U.S.	Austin, TX	4.3	84	U.S.	Honolulu, HI	9.1
36	U.S.	Dallas-Fort Worth, TX	4.3	85	U.S.	San Francisco, CA	9.6
36	U.S.	Jacksonville, FL	4.3	85	U.S.	San Jose, CA	9.6
36	U.S.	Tampa-St. Petersburg, FL	4.3	87	Australia	Melbourne, VIC	9.7
36	U.S.	Tucson, AZ	4.3	88	Canada	Toronto, ON	9.9
43	U.K.	Derby & Derbyshire	4.4	89	N.Z.	Auckland	10.0
43	U.K.	Liverpool & Merseyside	4.4	90	Australia	Sydney, NSW	11.8
45	U.K.	Leeds & West Yorkshire	4.6	91	Canada	Vancouver, BC	13.0
45	U.K.	Stoke on Trent & Staffordshire	4.6	92	China	Hong Kong	20.7

## Sources and Methods

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

Because median income indicators are generally unavailable for the pandemic year (2020), 2019 income estimates are used in Demographia International Housing Affordability. It seems clear that median incomes will show declines from 2019, so even that is likely to understate the seriousness of emerging housing unaffordability trends on middle-income households. More reliable data should be available over the next year.

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