Regulatory regimes, urban infrastructure and housing affordability: Insights from US cities

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Abstract

It is commonly considered that more restrictive land use planning regulations constrain housing supply and thus increase prices and reduce housing affordability. Analysis of American Community Survey data for 35 US Metro Areas finds some support for the alternative view that incomes are the primary determinant of housing values.

Two different measures of housing affordability, including ongoing housing costs as a percentage of household income and the ratio of housing value to income - the often-used Median multiple, were found to increase with income. This is consistent with the conclusion of some research that as people get wealthier, they spend an increasing proportion of their income buying more housing space.

More highly regulated Metro Areas tend to have higher housing values, but that may be due to higher income communities motivating such regulations to protect their investment, rather than those regimes necessarily contributing significantly to higher prices.

As might be expected though, areas with higher Median multiples tend to have lower home ownership rates, consistent with the greater difficulty for first home buyers in saving for a deposit to access home ownership.

Some major US cities, including New York, Los Angeles, Miami and Washington, tend to be outliers in the data, with housing values and costs and affordability varying significantly from what would be expected based solely on resident incomes. Further investigation could consider whether factors such as their housing mix and visitor populations affect this.

Dallas, Houston and San Antonio, in the state of Texas, have experienced high rates of growth over the years, attributed partly to them having Median multiples towards the affordable end of the range. However, their ongoing housing costs as a percentage of income are above what would be expected based on income. These attributes relate partly to the use of Municipal Utility Districts, particularly in Houston, to fund urban infrastructure through ongoing taxes, which together with high general property tax rates reduce the prices paid upfront for housing. Such vehicles for financing urban infrastructure are worth investigating for Australia, to reduce housing prices. However, the high ongoing costs may still deter ownership to some extent, as the Texas cities have lower ownership rates than would be expected based on their Median multiples.

Introduction

The prevailing view in urban economics is that more restrictive land use planning regulations constrain the extent to which housing supply responds to increased demand and consequently increase urban land and housing prices and reduce housing affordability (e.g. Cheshire *et al.* 2014; Counsell 2025; Louie *et al.* 2025; Murray *et al.* 2025; Roige Valiente *et al.* 2024). Such regulations may include density controls and the scope, time delays and uncertainty of approvals required for development, among other things (Gyourko *et al.* 2021). Urban growth boundaries are commonly identified as a major factor constraining land and housing supply and reducing affordability because of the constraint they place on space and outward growth (e.g. Cheshire *et al.* 2014; Cox 2025; Burgess 2024).

However, recent research across about 300 United States (US) cities found supply constraints were '…relatively unimportant in explaining differences in rising house prices…' and instead found that '…higher income growth predicts the same growth in house prices, housing quantity and population regardless …' of the measure of housing supply constraints. (Louie *et al.* 2025, p.ii) That paper also references previous research that found a limited role for supply constraints, e.g. questioning whether relaxing regulatory barriers would be likely to improve affordability. (Louie *et al.* 2025; Murray *et al.* 2025) Others have similarly suggested that '…supply is a much more marginal determinant of house prices than other factors – local area incomes in particular.' (Sunderji and Sarthak 2024).

The tendency toward an absorption rate equilibrium, i.e. the rate at which it is most feasible for developers as a whole to supply a market area over time, is considered the primary determinant of the rate at which new private market housing supply is brought forward (Murray 2024). It has previously been hypothesised that the absorption rate principle applies subject to any overarching planning constraints, e.g. constraints on a particular more affordable dwelling type such as townhouses (Anstey 2025).

It is beyond the scope of this paper to enter fully into the economic and econometric debate regarding the associated pricing and consequent affordability issues raised by the prevailing and alternative views and the supporting research identified above. Instead, it seeks to provide insights which may inform the work of others, based on related data for US cities. Those cities provide a useful basis for comparison because of the availability of common data measures across a significant number of varying regulatory regimes, incomes, housing values, housing costs and affordability circumstances. Importantly, the analysis also informs the potential use of alternative approaches to the financing of urban infrastructure.

The key components of the paper are:

- observations of the relationship between housing values, income, costs, affordability, planning regulations and ownership rates at the US Metro Area level, and
- a focus on Texas cities and their use of Municipal Utility Districts (MUDs) to fund and finance urban infrastructure, and how that affects the pattern of urban growth, housing values, costs, affordability and ownership rates.

The findings are of interest to inform the debate about the role of planning regulations in affecting housing affordability. Implications are drawn from the analyses for the approach to infrastructure funding and financing in Australia.

Dwelling value, costs, income, affordability and regulatory indicators

Table 1 provides a summary of the following indicators (column headings in brackets) for each of 35 US Metro Areas (see Appendix A for the equivalent full statistical name of the respective Metro Areas):

- the Wharton Residential Land Use Regulatory Index 2018 (WRLURI2018) value, with Areas listed in order from most to least regulated – the availability of this index value determined the Metro Areas included in Table 1[1]

[1] It should be noted there were some boundary changes to some Metro Areas between the effective date of the WRLURI2018 index, i.e. 2018, and the American Community Survey (ACS) data used for Table 1, i.e. 2023. Most changes affect a small proportion of the Metro Area only. As the majority of each Metro Area remained the same it is considered reasonable to use the WRLURI2018 values in comparison to the 2023 data. It is beyond the scope of this paper to consider the impact of any regulatory changes since 2018.

- median housing unit value, across all housing unit types (Median value) – which is based on the American Community Survey (ACS) respondent's estimate of value (including land owned as part of the housing unit, for all housing units that were owned, being bought, vacant for sale or sold but not occupied at the time of survey)
- median household income (Median income) – which is based on the ACS respondent's reporting of total income for all household members 15 years or older
- median selected monthly owner costs with a mortgage (Median costs) – based on the ACS respondent's reporting, including payments for: mortgages; real estate taxes; fire, hazard and flood insurance; utilities (electricity, gas, water and sewer); fuels (oil, coal, kerosene, wood, etc); condominium (body corporate or homeowner association) fees; and mobile home costs, e.g. site rent
- median housing unit value expressed as a multiple of median household income (Median multiple) – calculated by dividing the Median value by the Median income to be comparable to the Median multiple reported by Demographia, which is included in brackets for comparison (the calculated figure is based on all dwelling types from the ACS, whereas the Demographia figure is for the housing type representing the majority of existing owned dwellings in each nation, which would generally be detached houses)
- median selected owner costs with a mortgage as a percentage of median household income (Costs %) – is based on the costs and household income for the actual ACS surveyed owner households with a mortgage, but the equivalent median calculated by dividing the Median costs by Median income (monthly) for all households, to be comparable to the Median multiple, is included in brackets for comparison
- home ownership rate (Owner %) – based on the ACS for occupied housing units (housing units may be a house, an apartment, a mobile home, a group of rooms or a single room that is occupied or intended to be occupied as separate living quarters)
- estimated resident population as at 1 July 2024 (2024 Pop).

(Cox 2025; Gyourko *et al.* 2021; US Census Bureau 2023a, 2023b, 2025)

The Median value, Median income, Median costs and Owner % indicators, and therefore the derived Median multiple and Costs % indicators, are based on 5-year estimates for the period 2019-2023 from the ACS. Dollar values are US dollars inflated to the 2023 dollar values using Consumer Price Index figures. While the estimates from the ACS, as a sample survey, are subject to error, the margins of error reported are generally quite small, i.e. there is a 90 per cent confidence level that the reported values are within about one per cent or less of the actual total population values (US Census Bureau 2020, 2023a, 2023b).

The shaded values have been included in Table 1 for San Jose only because it is the Metro Area with the highest Median value, Median income and Median multiple (latter from Cox 2025). However, it should be noted the estimated Median costs provided by the source, and therefore the bracketed Costs % figure, are indicative figures, i.e. higher than $4,000 and 30.5 per cent, respectively (US Census Bureau 2023a). Also, the WRLURI2018 value for San Jose is based on the relevant survey responses from only six communities, whereas all other such values are based on survey responses from at least 10 communities within the relevant Metro Area (Gyourko *et al.* 2021).

Figure 1 shows the 35 Metro Areas in their geographic context (US Census Bureau 2023c).

Table 1: Housing value, costs, income, affordability, ownership rates, regulatory index and population by US Metro Area

Metro Area	WRLURI2018	Median value	Median income	Median costs	Median multiple	Costs %	Owner %	2024 Pop
San Francisco	1.18	1,113,800	133,780	3839	8.3 *(10.0)*	23.9 *(34.4)*	55.4	4,648,486
New York	1.04	587,400	97,334	3232	6.0 *(7.4)*	24.3 *(39.8)*	51.5	19,940,274
Providence	0.93	385,900	85,646	2238	4.5 *(6.2)*	22.1 *(31.4)*	62.9	1,700,901
San Jose	0.92	1,342,700	157,444	4000+	8.5 *(12.1)*	22.9 *(30.5+)*	55.7	1,995,484
Los Angeles	0.73	825,300	93,525	3143	8.8 *(11.2)*	26.2 *(40.3)*	48.6	12,927,614
Seattle	0.73	673,500	112,594	2796	6.0 *(7.1)*	22.3 *(29.8)*	60.4	4,145,494
Riverside	0.68	493,600	86,031	2394	5.7 *(6.6)*	25.1 *(33.4)*	65.4	4,744,214
Miami	0.66	405,600	73,481	2302	5.5 *(8.1)*	26.4 *(37.6)*	60.3	6,457,988
Washington	0.66	553,000	123,896	2767	4.5 *(5.2)*	20.6 *(26.8)*	63.5	6,436,489
Phoenix	0.64	401,400	84,703	1841	4.7 *(5.4)*	20.1 *(26.1)*	66.3	5,186,958
Portland	0.6	526,500	94,573	2333	5.6 *(6.3)*	22.0 *(29.6)*	62	2,537,904
Philadelphia	0.48	326,700	89,273	2144	3.7 *(4.4)*	20.5 *(28.8)*	67	6,330,422
Denver	0.41	570,300	102,339	2414	5.6 *(6.2)*	21.5 *(28.3)*	64.3	3,052,498
Boston	0.3	610,900	112,484	2906	5.4 *(6.7)*	21.9 *(31.0)*	61.8	5,025,517
Indianapolis	0.3	244,000	77,065	1524	3.2 *(4.1)*	17.9 *(23.7)*	66.6	2,174,833
Milwaukee	0.24	283,800	76,404	1831	3.7 *(5.3)*	19.8 *(28.8)*	60.4	1,574,452
Dallas	0.17	330,300	87,155	2280	3.8 *(4.3)*	21.7 *(31.4)*	60	8,344,032
Nashville	0.17	376,800	82,499	1814	4.6 *(4.9)*	20.3 *(26.4)*	65.6	2,150,553
Hartford	0.14	309,300	92,823	2264	3.3 *(4.3)*	20.9 *(29.3)*	67	1,169,048
Kansas City	0.13	265,400	81,927	1784	3.2 *(4.2)*	19.5 *(26.1)*	65.6	2,253,579
San Antonio	0.1	258,700	74,297	1907	3.5 *(4.3)*	21.8 *(30.8)*	63.5	2,763,006
Buffalo	0.05	209,600	70,572	1553	3.0 *(4.0)*	18.6 *(26.4)*	66.5	1,160,172
Columbus	-0.01	274,300	79,847	1764	3.4 *(4.3)*	19.1 *(26.5)*	61.3	2,225,377
Houston	-0.04	275,200	80,458	2147	3.4 *(4.3)*	21.5 *(32.0)*	61.2	7,796,182
Pittsburgh	-0.06	204,500	73,942	1539	2.8 *(3.2)*	18.1 *(25.0)*	70.5	2,429,917
Chicago	-0.1	301,900	88,850	2179	3.4 *(4.4)*	21.6 *(29.4)*	65.3	9,408,576
Minneapolis	-0.1	354,400	98,180	2069	3.6 *(4.0)*	19.6 *(25.3)*	70.9	3,757,952
Atlanta	-0.12	335,100	86,338	1882	3.9 *(4.3)*	19.9 *(26.2)*	65.8	6,411,149
Cleveland	-0.28	201,000	68,507	1532	2.9 *(3.3)*	18.9 *(26.8)*	66.1	2,171,877
Grand Rapids	-0.31	261,600	80,296	1534	3.3 *(4.3)*	18.5 *(22.9)*	74.3	1,178,826
Rochester	-0.38	190,100	74,438	1599	2.6 *(3.6)*	19.0 *(25.8)*	67.2	1,057,218
Charlotte	-0.38	319,400	80,201	1694	4.0 *(5.1)*	18.7 *(25.3)*	65.8	2,883,370
Cincinnati	-0.38	240,200	79,490	1624	3.0 *(3.9)*	18.4 *(24.5)*	68.1	2,302,815
Detroit	-0.42	237,100	75,123	1678	3.2 *(3.9)*	19.4 *(26.8)*	70.9	4,400,578
St. Louis	-0.51	232,100	78,225	1628	3.0 *(3.5)*	18.7 *(25.0)*	70.1	2,811,927

Source: Indicators as identified in brackets compiled and calculated from: Gyourko *et al.* 2021 (WRURI2018); US Census Bureau 2023a (Median value, Median income, Median costs, Median multiple, Costs %, Owner %); US Census Bureau 2025 (2024 Pop); Cox 2025 (bracketed Median multiple)

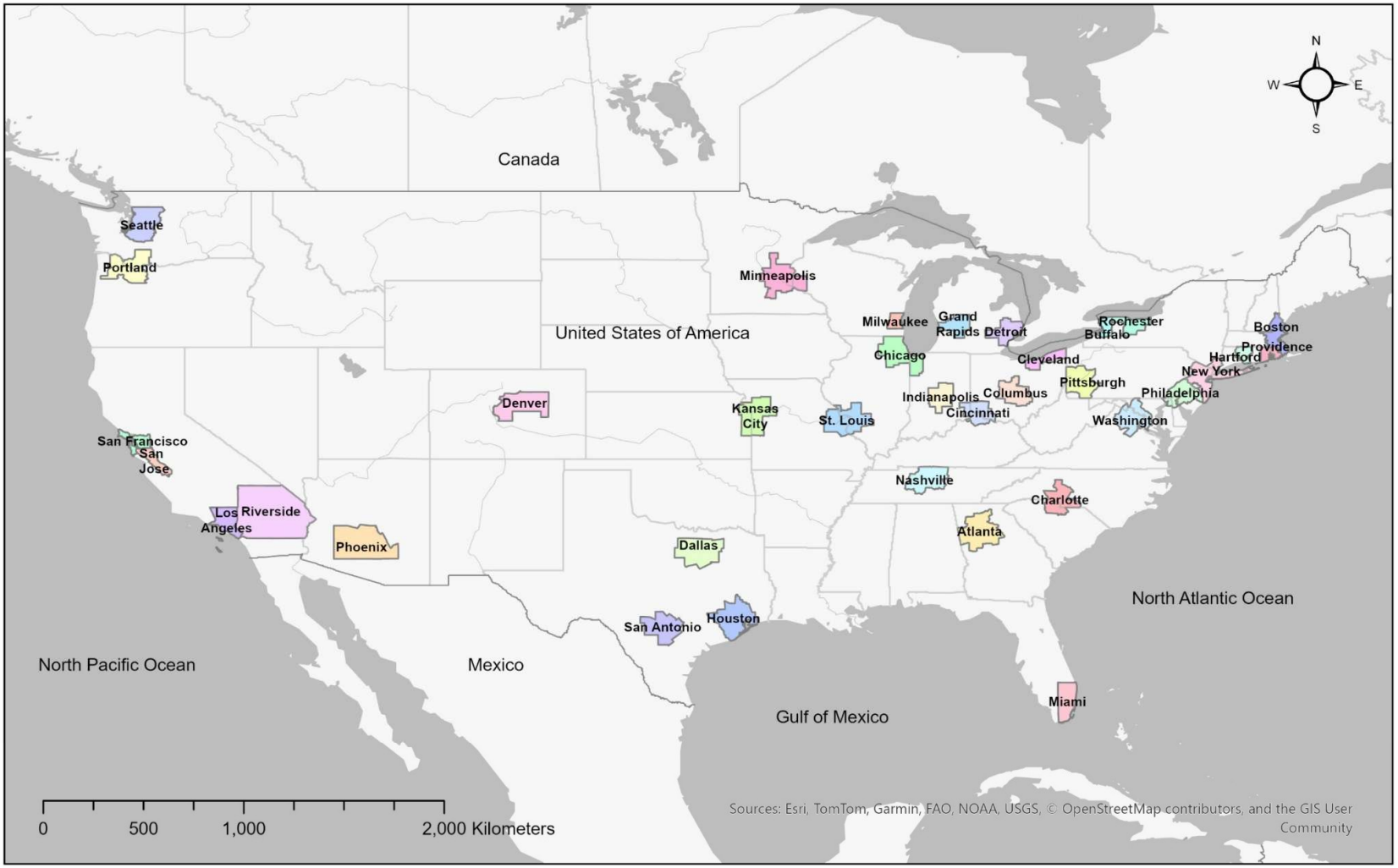


Figure 1: US Metro Areas (as included in Table 1)

Overview of data

Perhaps the most striking aspect of the data in Table 1 is the huge range of the Median value indicator, from a high median housing value (in 2023 US dollars) of $1,342,700 for San Jose to a low of only $190,100 for Rochester, different by a factor of 7. Such a range of median values is remarkable compared to Australia, for example, where the equivalent medians (in 2025 Australian dollars) for the six state capital cities range from $1,194,709 for Sydney to $664,462 for Hobart, different by a factor of only 1.8 (Core Logic 2025).

That large range in median dwelling values relates to a smaller but still significant range in median household incomes (Median income), from $157,444 for San Jose to a low of only $68,507 for Cleveland, different by a factor of 2.3. The equivalent median household income comparison for Australia's state capital cities ranges (in 2021) from $108,004 for Sydney to $80,184 for Hobart, different by a factor of only 1.3 (ABS 2021).

There are also significant ranges in the Median costs and the Median multiples across the 35 cities in Table 1, but the range of costs as a percentage of income (Costs %) are much smaller. The figures for the selected costs for homeowners with a mortgage range from 26.4 per cent of those households' incomes for Miami to 17.9 per cent for Indianapolis, different by a factor of only 1.5, and 23 of the 35 cities (66 per cent) are in the narrow range of 19 to 23 per cent. Considering the selected costs for homeowners relative to the median income for all households gives a range from 40.3 per cent for Los Angeles to 22.9 per cent for Grand Rapids, different by a factor of 1.8, but with 29 out of 35 cities (83 per cent) in the range of 25 to 35 per cent.

Based on the data reported in Table 1, the following sub-sections consider various relationships between the indicators using scatter plots, with each point on a graph representing one Metro Area, together with the associated red-dashed trend lines. Those trend lines, as produced by MS Excel, are a line which appears to best represent the relationship between the two indicators on average overall. For the sake of clarity and due to space limitations, only some Metro Areas are labelled on the graphs.

Median value vs Median income and WRLURI2018

The apparent correlation of values to incomes in Figure 2 below is consistent with the view that an area's incomes are an important determinant of prices (e.g. Sunderji and Sarthak 2024). While at a suburb level it might be argued that housing prices determine the incomes of those who can afford to buy there, these are whole Metro Areas whose economies would be expected to be the primary determinant of incomes, and they in turn of prices.

It should be noted that most of the 35 cities are in the bottom half of Figure 2, with San Jose and San Francisco, which together are broadly the home of Silicon Valley, the main standouts at the top end of both incomes and housing values. Washington and Los Angeles are the main outliers on the graph, with the former having higher incomes compared to relatively lower housing values, and Los Angeles the opposite. The R^2 value for Figure 2 is 0.82, indicating a strong correlation between the Median income and Median value indicators across the cities overall.[2]

[2] The R^2 value, the square of the Pearson product moment correlation coefficient, as calculated here by MS Excel, is a statistical measure of how much of the variation in one variable is explained by the other variable across the identified data points. For any data the R^2 value is always between 0 and 1, with higher values indicating a stronger correlation.

Figure 2: Median value compared to Median income for selected US Metro Areas

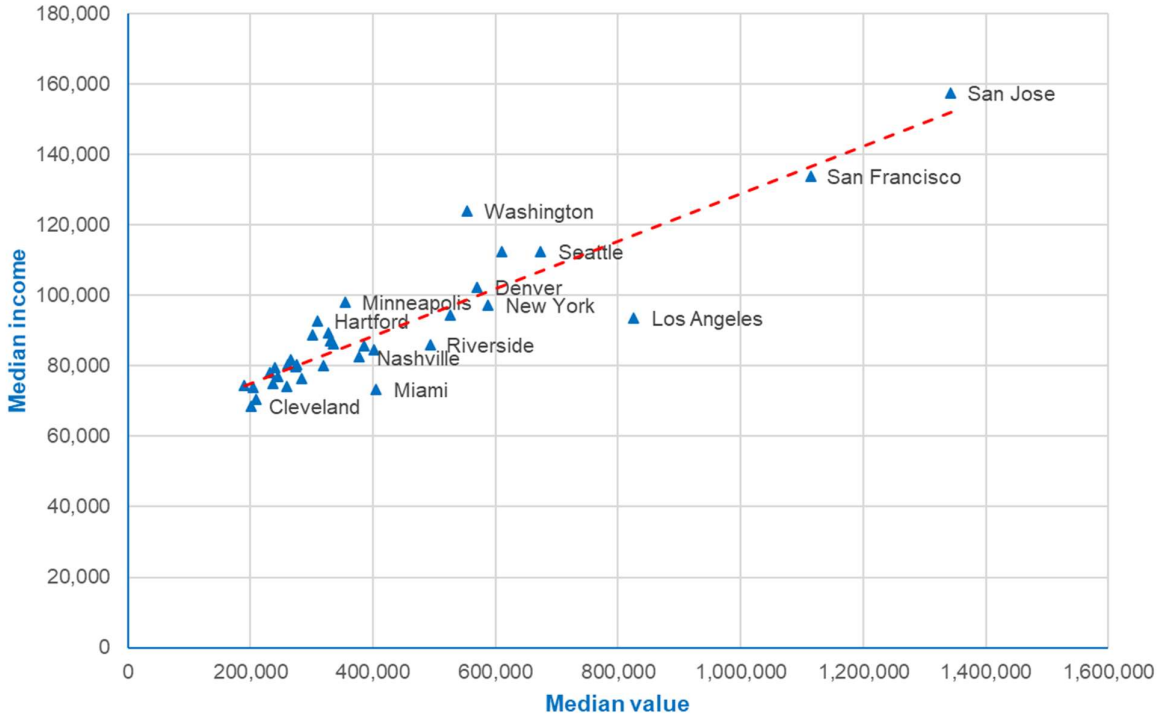
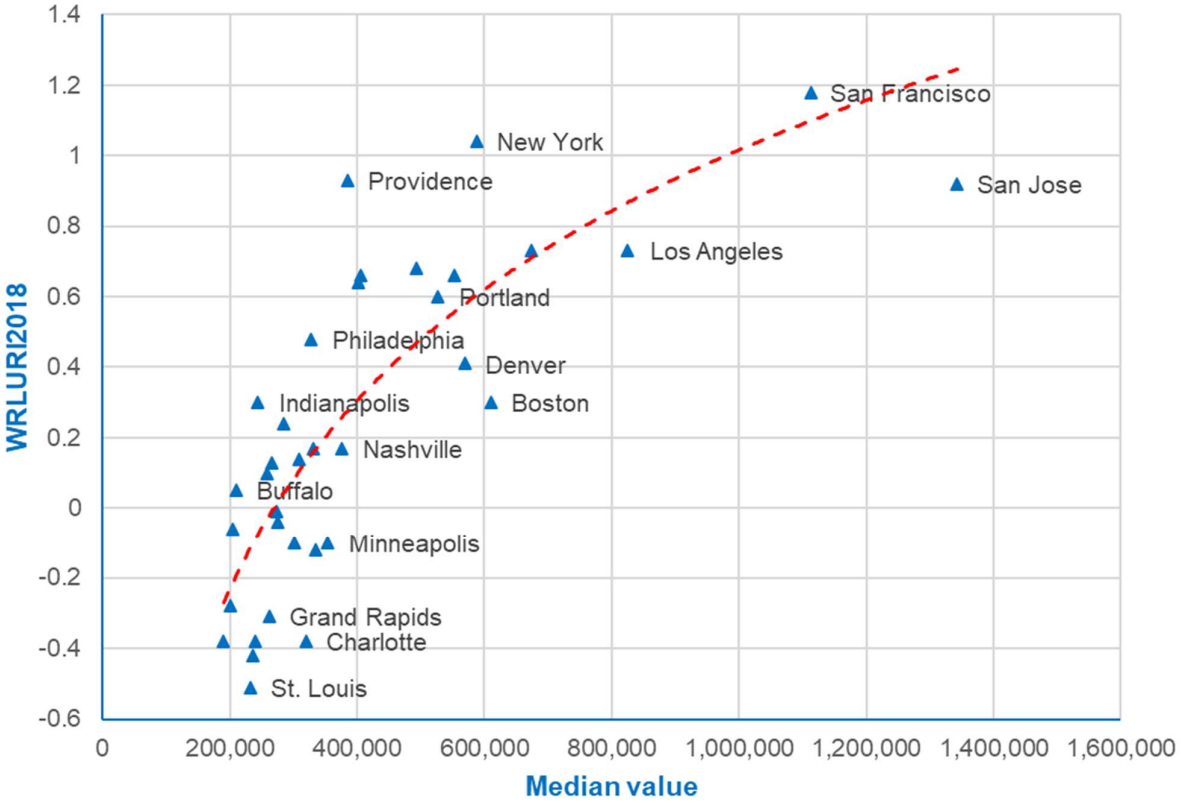


Figure 3 below shows that cities with higher median housing values tend to have higher values for the WRLURI2018 index, but there is a quite broad range of values for the index in each Median value range, so the relationship is not a linear correlation.

Those who produced the WRLURI2018 regulatory index noted that more highly regulated places tend to have higher incomes, higher home values and be more educated, on average (Gyourko *et al.* 2021). Others have noted how 'Residents of wealthier areas place a premium on protecting their amenity and de-risking asset ownership, and choose more specific and robust regulations to achieve that.' (Murray *et al.* 2025, p.19). So, the argument is that higher incomes and values may effectively result in the motivation of greater regulation to protect housing investments, rather than the regulation itself necessarily causing increased prices.[3]

[3] This is not to say that regulation does not or may not act to constrain supply, and consequently increase prices, in at least some circumstances, e.g. as hypothesised re supply in Anstey (2025), including in connection with constraints placed on townhouses in pre-2016 Auckland. It is just that this analysis is not able to identify any significant role for regulation over and above incomes as the primary determinant of housing prices/value.

Figure 3: WRLURI 2018 index compared to Median value for selected US Metro Areas



Due to the high correlation between Median value and Median income, as shown in Figure 2, the latter shows a similar relationship to the WRLURI2018 index as in Figure 3 above and is therefore not graphed separately here.

Median income vs affordability measures and home ownership rates

Two main affordability measures are presented in Table 1. The costs as a percentage of household income (Costs %) are better indicators of ongoing housing affordability for all households, while the Median multiple gives a better indication of the difficulty for first home buyers in saving a deposit to access home ownership.

To illustrate, Figure 4 below graphs housing costs as a percentage of household income, for those households with a mortgage (Costs %), against median household income for all households (Median income). The trend line indicates a general tendency for higher incomes to be associated with higher costs as a percentage of income. Although the R^2 measure of correlation between the two indicators is a low 0.17, that correlation increases to 0.49 if the four outliers at the top of the graph, Miami, Los Angeles and the adjacent Riverside, and New York, are removed.[4] The broad relationship between these indicators is consistent with

[4] Factors that may help to explain why these cities are outliers, for example and subject to further investigation, are:

- high proportions of multi-unit housing (New York – 57 per cent; Miami – 47 per cent; Los Angeles – 42 per cent) and the consequent condominium (body corporate or homeowner association) fees adding to ongoing costs and consequently detracting from value (US Census Bureau 2023a); and
- New York (8.9 M), Miami (4.4 M) and Los Angeles (3.6 M) had the three highest numbers of international visitors in 2023, indicative of their status as world cities and the associated visitor demand for residential space that may help to bid up housing values and costs (international Trade Administration 2025).

the Cheshire *et al.* conclusion that '…as people get richer they spend an increasing share of their incomes trying to buy more space.' (2014, p.98).

Dallas, Houston and San Antonio are pointed out in Figure 4 partly because they are all above the trend line, with higher costs than expected based just on incomes, but also because they are the focus of the second part of this paper looking at Municipal Utility Districts (MUDs). The Texas cities have homeowner costs that are a similar percentage of income to cities such as Boston and Portland that have significantly higher incomes.

Figure 4: Costs % compared to Median income for selected US Metro Areas

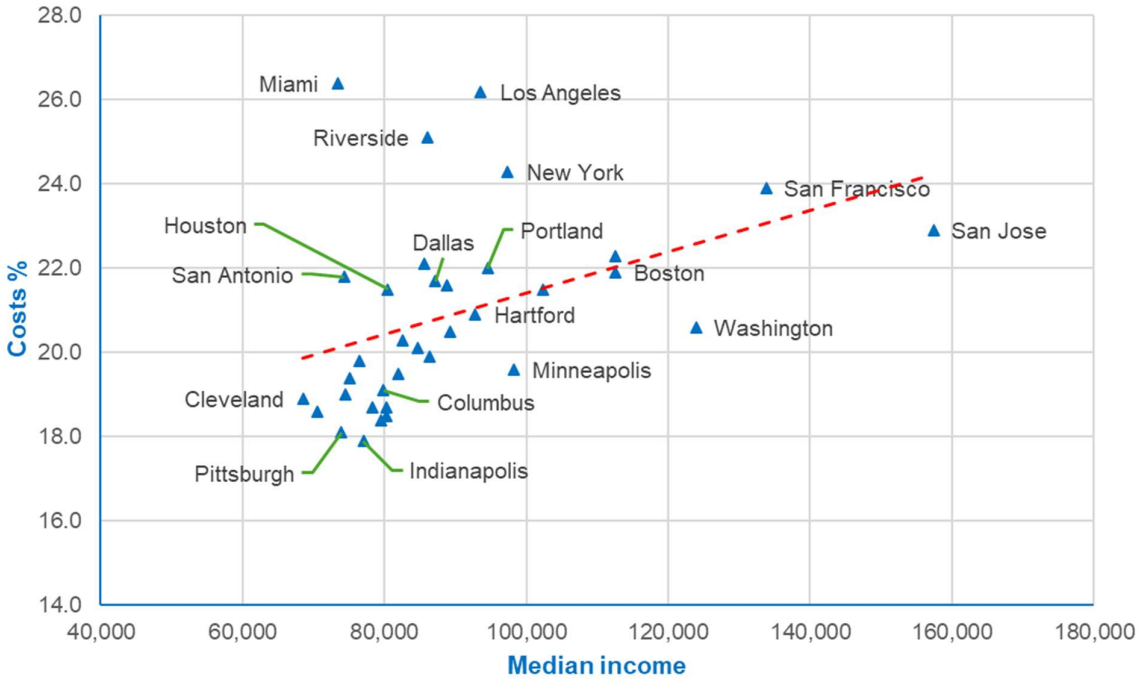
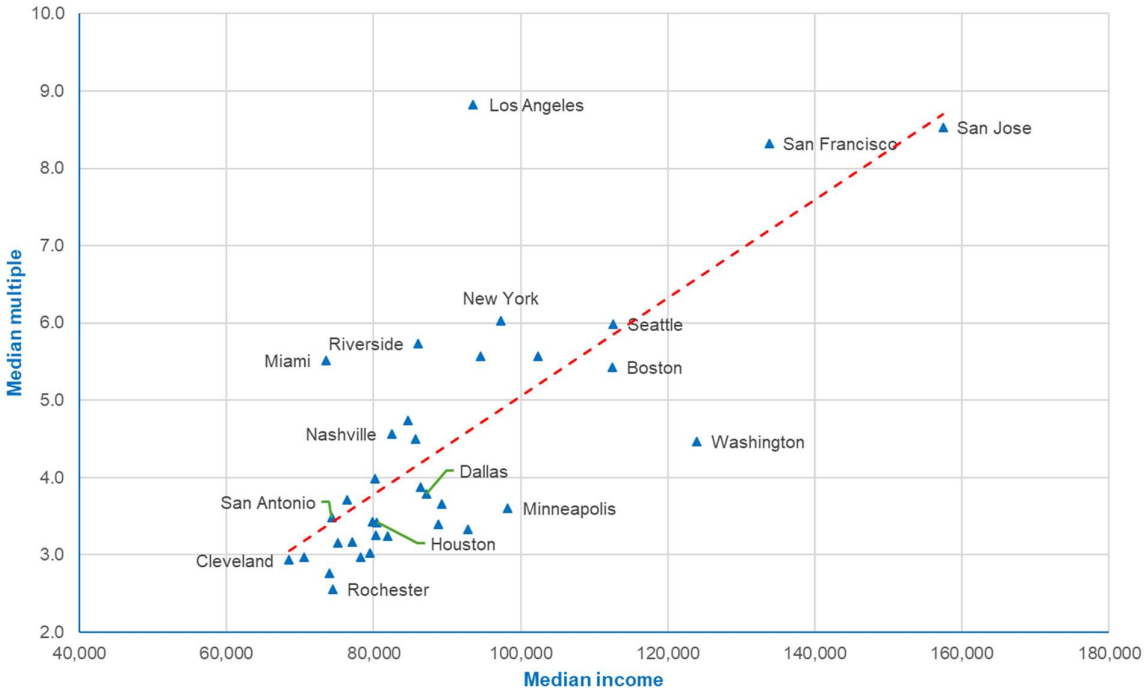


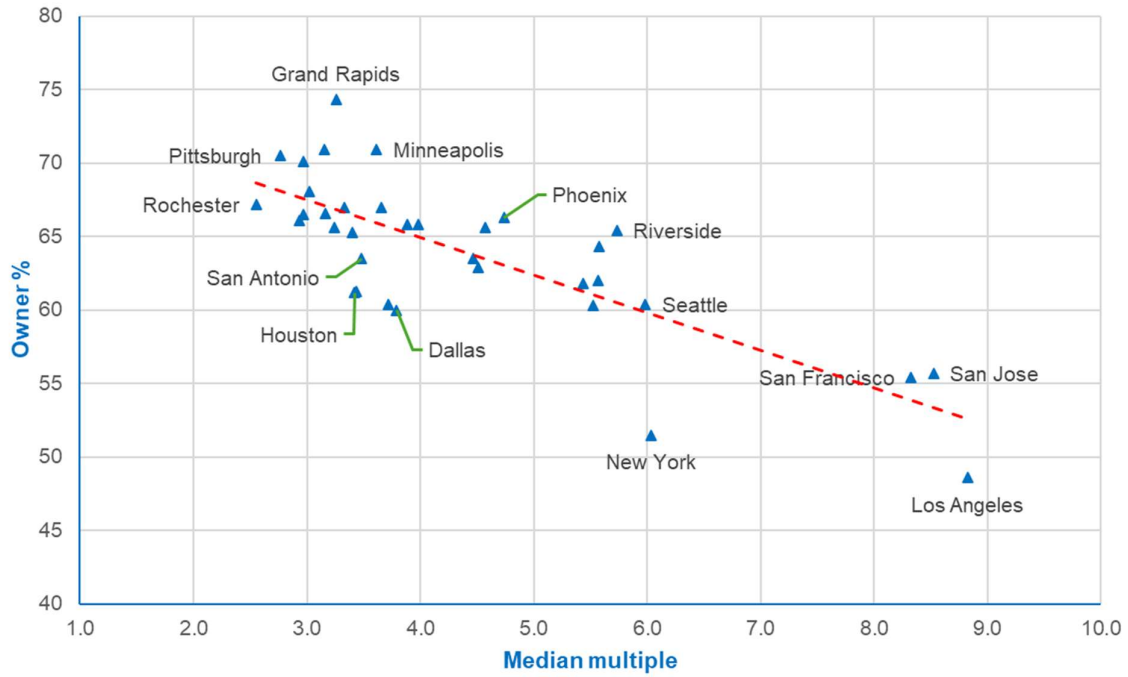
Figure 5 graphs the other affordability indicator, the Median multiple, against Median income. As with the Costs % indicator, there is a general tendency for the Median multiple to increase with income, with the R^2 measure of correlation being 0.54. The world cities of Los Angeles, Miami and to a lesser extent New York are again significant outliers on the graph, with the Median multiple higher than might be expected based just on income. Washington on the other hand is a major outlier in the other direction, with the Median multiple lower than might be expected based just on income. Notably, Dallas and Houston also have lower Median multiple values than might be expected based just on income.

Figure 5: Median multiple compared to Median income for selected US Metro Areas



To round out the analysis, Figure 6 shows noticeably lower rates of home ownership (Owner %) in those cities with higher Median multiples. These indicators are fairly highly correlated, with a R^2 of 0.61.

Figure 6: Owner % compared to Median multiple for selected US Metro Areas



Notably, Dallas, Houston and San Antonio are all below the trend line, with lower rates of home ownership than might be expected based solely on their Median multiples. The second part of this paper considers the potential role of MUDs in this outcome.

MUDs: urban growth, housing values, costs and affordability

As indicated in Table 1 above, the three Metro Areas in the state of Texas, Dallas (3.8), Houston (3.4) and San Antonio (3.5), have Median multiples towards the lower, more affordable end of the range for the US cities reported in this paper. Relative housing affordability has been identified as a factor in those cities experiencing high rates of housing growth over a number of years (Dougherty 2025; Pugh and Sunderji 2025; Wolf 2025). However, as shown in Figure 5 above, for all three cities the housing costs for those households with a mortgage are above what might be expected based on Median income.

MUDs have been an important vehicle for funding much of the infrastructure required in support of the growth in Texas. The sections below consider MUDs, related urban growth patterns, associated costs and their relationship to housing values and affordability.

MUDs explained

In overview, MUDs are 'special tax districts', effectively created by developers with government approval, specifically for the purpose of funding urban utility infrastructure, mostly water supply, sewerage and drainage. Developers provide the infrastructure but are reimbursed through issuance of a bond by the MUD. That bond is sold to investors who receive investment income via ongoing taxes on property owners in the MUD area. As a further benefit for the property owners and the approach to financing, the interest payments on such bonds are tax-exempt, meaning the rates are lower than mortgage rates, and the MUD taxes are generally deductible from the owner's income tax. (Bumgardner and Hemyari 2017; Elliott 2024; Peiser 1983)

Importantly, in order to be established, MUDs must satisfy the Texas Commission on Environmental Quality (TCEQ) requirements for engineering and feasibility. The latter seek to determine whether the land can support the ongoing tax rate necessary to service required bond payments. They also '…incentivise developers to make smart investment decisions by only rewarding the developer if the land has become attractive to residents, therefore making it more valuable.' The TCEQ rules provide a further incentive in that 100% of developer contributions are only reimbursed '…in circumstances that indicate a high likelihood of bond repayment due to increased property value.'. (Bumgardner & Hemyari 2017, Pp. 390-391)

Spatial extent and growth pattern of MUDs

For various geographical and institutional reasons, MUDs are very common and spatially extensive in Houston, but less so in other Texas cities. Dallas has some MUDs, but nothing like the prevalence in Houston, and San Antonio has fewer still, as shown in Table 2 below. (Peiser 1983; TCEQ 2025)

Table 2: Number and area of MUDs across Texas

Metro Area	Number of MUDs	Area of MUDs (acres)
Austin[5]	259	143,884
Dallas	161	112,134
Houston	1,183	676,310
San Antonio	28	44,857
Other (including non-Metro)	173	3,377,204
TOTAL TEXAS	1,804	4,354,388

Figure 7 overleaf illustrates the spatial extent and timing of creation of MUDs across the Houston Metro Area (TCEQ 2025). Notable features of the pattern of urban growth include:

- urban growth has occurred on most sides of Houston, indicating multiple competitive options for growth, which itself would be expected to contribute to affordability, and
- while growth to some extent appears scattered, particularly in the most recent period, most growth has occurred in quite well-defined spatial zones, progressively further out over time.

The latter characteristic may be related to the TCEQ feasibility requirements noted above, i.e. the land and resulting development need to be of sufficient value to support the necessary bond and associated tax payments over time. Locations more accessible to other urban development and existing infrastructure may thus tend to be favoured.

Importantly, the TCEQ feasibility requirement can be seen as a form of urban development regulation which is informed by the market for urban fringe land and the associated infrastructure funding and financing requirements. Given the multiple competitive options for urban growth on most sides of Houston, this form of urban growth management can be seen as more suited to the local geography than an urban growth boundary, for example. However, what are the impacts on housing costs, values, affordability and ownership rates?

MUD costs, housing values, affordability and ownership rates

The taxes payable by property owners within a MUD can be a major part of housing costs. For example, in 2018 the Elyson community on the north-west edge of Houston identified a MUD tax rate of 1.5 per cent of the total property value (land and house), and such taxes are in addition to ongoing utility usage fees (Elliott 2024; Elyson 2018).

The MUD taxes are also additional to general property taxes payable to the local government. For example, in Harris County, Houston such taxes currently average 1.6 per cent of total property value, with similar average rates in Tarrant County, Dallas and Bexar County, San Antonio (Zillow 2025). A combined annual MUD and general property tax bill for Harris County of 3.1 per cent of the total property value would be equivalent to paying 3.875 per cent extra interest on a loan of 80 per cent of the property value.

While local governments in the US generally provide more services than those in Australia, for example, these tax bills nonetheless affect the affordability of home ownership and consequently reduce purchase prices (Murray 2023). Those lower prices/values are reflected in lower Median multiples for the Texas cities, but the overall housing costs in Texas are higher than would be expected based on those Median multiples.

A clear benefit of higher ongoing housing costs (relative to income) as occurs in Texas, and the consequently reduced purchase prices, is that it reduces the savings required by first

[5] The Austin Metro Area is not covered by Table 1 and the associated analyses of this paper due to the unavailability of the WRLURI2018 index for that area.

home buyers for a deposit. However, the higher ongoing costs may still act as a deterrent for home ownership, as reflected in the lower ownership rates than might be expected in the Texas cities based solely on their Median multiples (see Figure 6 above).

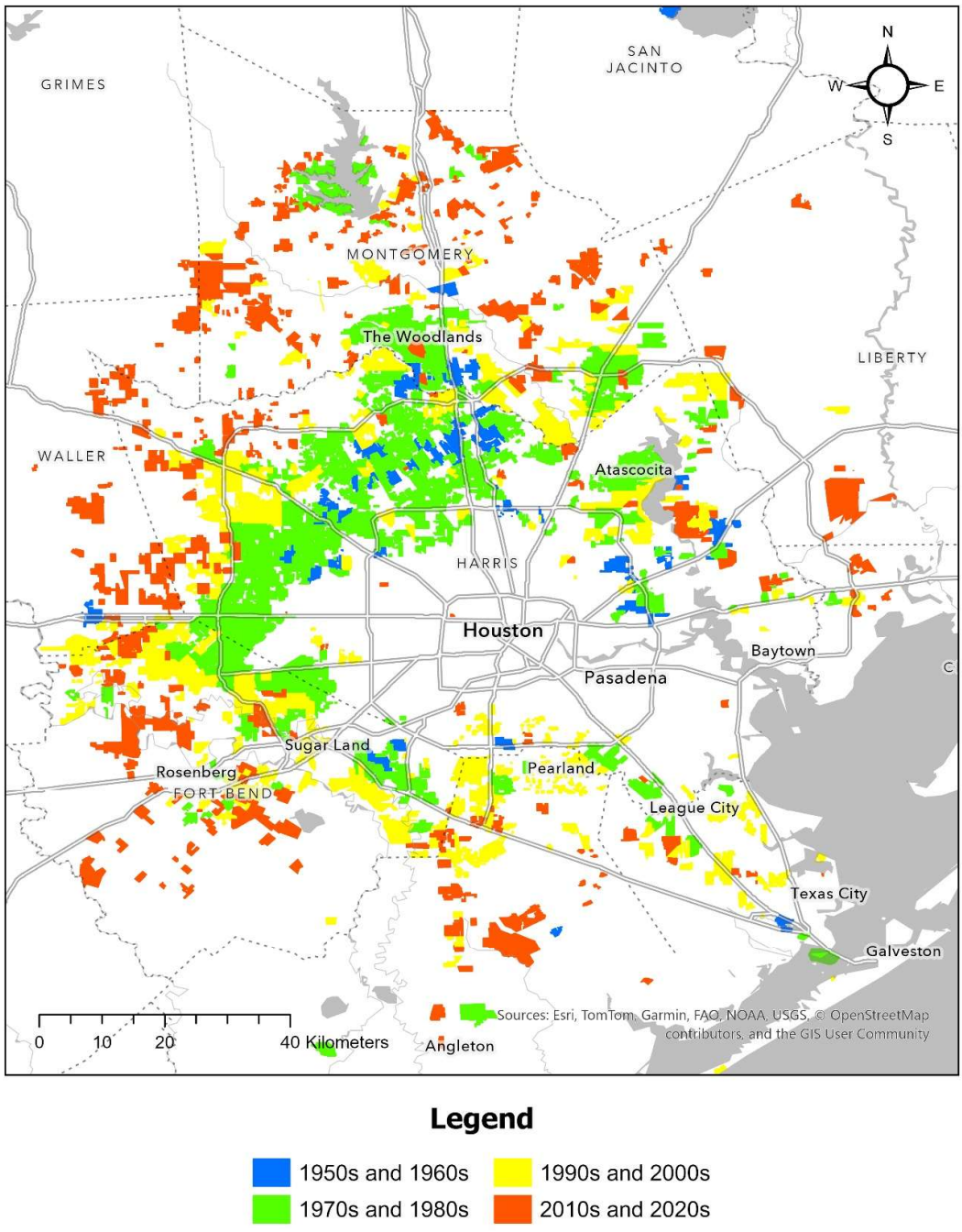


Figure 7: Creation periods of MUDs in Houston Metro Area

It should be noted that Dallas and San Antonio have similar housings costs as a percentage of income and Median multiples to Houston, even though MUDs are less extensive in those cities. Regional utility providers are the most significant infrastructure players in those areas (Peiser 1983; SAWS 2025). While detailed investigation of infrastructure funding arrangements and the structure of housing costs across the cities is beyond the scope of this paper, that may be warranted to inform further consideration of MUDs, or similar approaches, as a vehicle for infrastructure funding in Australia. Similar 'Special Purpose Vehicles' were introduced in New Zealand in 2020 under the Infrastructure Funding and Financing Act 2020 (IFF) to raise finance for urban infrastructure and collect multi-year levies to repay the finance over a period of up to 50 years (Cox 2025; NIFF 2024).

Conclusions and implications

This paper found a strong correlation between median household income and median housing values across 35 US Metro Areas. While it also found higher median housing values tended to be associated with more highly regulated areas, that regulation has been seen more as a consequence of higher incomes rather than a cause of higher values. The finding is consistent with recent US research that suggested planning constraints on supply were relatively unimportant in explaining higher housing prices. Of course, at a local or suburb level, housing prices themselves may help to determine the incomes of purchasers, explaining the correlation. However, at the level of whole Metro Areas as compared here, the economies of those areas would be expected to determine incomes and thus prices.

Another key finding is that both housing costs as a percentage of income and the Median multiple tend to increase with income across the 35 cities. This is consistent with the conclusion of previous research that as people get wealthier, they spend an increasing proportion of their income buying more housing space. However, higher Median multiples are also associated with lower rates of home ownership across the 35 cities, consistent with the greater difficulty for first home buyers in saving for a deposit and accessing ownership in such areas.

The most internationally-oriented US cities, including New York, Los Angeles and Miami, tend to be outliers in the data, with higher housing costs as a percentage of income and lower affordability than would be expected based purely on resident household incomes. On the other hand, Washington is an outlier in the other direction, i.e. lower costs and more affordable than would be expected based solely on household incomes. Further investigation could consider what factors are contributing to these differences, e.g. perhaps including the housing type mix and visitor populations.

Dallas, Houston and San Antonio have experienced high rates of growth over the years, which has been at least partly attributed to them having Median multiples towards the affordable end of the range. However, their ongoing housing costs as a percentage of income are above what would be expected based solely on income. This relates partly to the use of MUDs by the Texas cities, particularly Houston, to fund urban utility infrastructure through ongoing taxes. Together with high general property tax rates, they reduce the prices paid upfront for housing.

MUDs or equivalent vehicles for the funding and financing of infrastructure would be worth investigating for Australia. This could reduce upfront housing costs and therefore also reduce the deposit savings required of first home buyers, facilitating home ownership. However, the ongoing costs that property owners incur to finance the infrastructure may still deter ownership, as may have contributed to lower ownership rates than would be expected based solely on the Median multiples of Dallas, Houston and San Antonio.

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Appendix A – US Metro Areas full statistical names

Metro Area (short version)	Metro Area (full statistical name)
San Francisco	San Francisco-Oakland-Fremont, CA Metro Area
New York	New York-Newark-Jersey City, NY-NJ Metro Area
Providence	Providence-Warwick, RI-MA Metro Area
San Jose	San Jose-Sunnyvale-Santa Clara, CA Metro Area
Los Angeles	Los Angeles-Long Beach-Anaheim, CA Metro Area
Seattle	Seattle-Tacoma-Bellevue, WA Metro Area
Riverside	Riverside-San Bernardino-Ontario, CA Metro Area
Miami	Miami-Fort Lauderdale-West Palm Beach, FL Metro Area
Washington	Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area
Phoenix	Phoenix-Mesa-Chandler, AZ Metro Area
Portland	Portland-Vancouver-Hillsboro, OR-WA Metro Area
Philadelphia	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area
Denver	Denver-Aurora-Centennial, CO Metro Area
Boston	Boston-Cambridge-Newton, MA-NH Metro Area
Indianapolis	Indianapolis-Carmel-Greenwood, IN Metro Area
Milwaukee	Milwaukee-Waukesha, WI Metro Area
Dallas	Dallas-Fort Worth-Arlington, TX Metro Area
Nashville	Nashville-Davidson--Murfreesboro--Franklin, TN Metro Area
Hartford	Hartford-West Hartford-East Hartford, CT Metro Area
Kansas City	Kansas City, MO-KS Metro Area
San Antonio	San Antonio-New Braunfels, TX Metro Area
Buffalo	Buffalo-Cheektowaga, NY Metro Area
Columbus	Columbus, OH Metro Area
Houston	Houston-Pasadena-The Woodlands, TX Metro Area
Pittsburgh	Pittsburgh, PA Metro Area
Chicago	Chicago-Naperville-Elgin, IL-IN Metro Area
Minneapolis	Minneapolis-St. Paul-Bloomington, MN-WI Metro Area
Atlanta	Atlanta-Sandy Springs-Roswell, GA Metro Area
Cleveland	Cleveland, OH Metro Area
Grand Rapids	Grand Rapids-Wyoming-Kentwood, MI Metro Area
Rochester	Rochester, NY Metro Area
Charlotte	Charlotte-Concord-Gastonia, NC-SC Metro Area
Cincinnati	Cincinnati, OH-KY-IN Metro Area
Detroit	Detroit-Warren-Dearborn, MI Metro Area
St. Louis	St. Louis, MO-IL Metro Area